PLAN FOR THE ERADICATON OF MYNA BIRDS FROM KIRIBATI
31 March 2015.

DRAFT

Photo. Common myna foraging in KiribatiOIL yard at Betio.

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1. Background

The Ministry of Environment, Lands and Agricultural Development (MELAD) has received funds through the regional GEF-PAS Invasives project coordinated by the Secretariat for the Pacific Regional Environment Programme (SPREP) to eradicate two species of myna found in Kiribati. The Common Myna (*Acridotheres tristis*) and the Jungle Myna (*A. fuscus*) are two of the world's most destructive invasive species, originally from Asia. They damage food crops such as papaya and breadfruit, attack native birds, nest in the roofs of houses where they make a mess with their droppings, are very noisy, and can carry diseases and parasites.

There have been unsuccessful, uncoordinated efforts to eradicate myna since 2003 using a variety of methods including trapping and destroying nests. Two previous project proposals have been written and some funding provided by the Darwin Foundation but little significant process made. Now that further dedicated funds are available, eradication can be pursued with the necessary time and resources provided.

This plan has been developed following surveys of Onotoa Atoll and Betio, Tarawa Atoll in November 2014 that identified only a very small number of birds remaining (see below). Consultations were then started to determine of more birds were present on other atolls in the Gilbert Group and to date the results have come back negative.

The few remaining birds are in a challenging situation at Betio. It proved logistically difficult to observe birds there, dependent largely on being present between dawn (c.5.55am) and 8am. Useful information was obtained on the birds' movements, which needs updating, but there was insufficient time to attract them to baits.

It was clear that success would depend on having as many fine days as possible during the eradication operation. It was thus delayed from an original anticipated date of mid-March and this proved the correct decision as the country has experienced severe rainfall in recent weeks, was affected by Cyclone Pam in March and still subject to heavy rain over the last two weeks (as at 31 March).

This plan sets out a series of preparatory activities including updating the status of the birds and some preliminary baiting. Once these are largely complete, a date for the operation will be determined and 2 weeks concentrated fieldwork carried out. There will be a review of progress at this point to determine if and when the 3rd week of time allocated to Dave Butler to support the project will be utilised.

2. Current Situation & Work to Date

A survey was carried out in November 2014 during which one week was spent on Onotoa Island and two weeks on Tarawa concentrated in the port area at Betio (Environment & Conservation 2014).

Onotoa Island

It was concluded that myna have died out on Onotoa Island with community efforts contributing to this.

Onotoa Island history:

- 1999 birds taken to the island
- Birds moved to centre of Otowae Village and reached peak numbers of c.10.
- November 2012 – 2-3 pairs recorded. Community menbers had destroyed a nest and killed two birds

- March 2014 two birds consistently seen at Otowae.
- c. May 2014 locals reported in November that the last birds were seen in the village about two months after the March survey.
- November 2014 no birds found or reported as present.

Tarawa Island

Four birds are present in the port village of Betio (3 common and 1 jungle) and these are considered likely to be the only myna on the island. However Rikamati Naare obtained breadfruit with probable myna feeding damage from an area outside the port during Biosecurity Training in June 2012. He needs to be interviewed to identify this locality so it can be searched and local people asked whether they saw myna there.

Carrying out dawn surveys at Betio proved challenging as the Government Staff involved did not live there and the main road through South Tarawa was in poor condition and subject to major road works, such that it took almost 2 hours to drive from the office to the site.

Tarawa population history:

2002 – The issue was first identified and according to an early proposal there were apparently around 300 birds in the country, most of them at Betio with a small number at Bairiki Village (Saavedra & Peltenburg 2003). However this figure seems have been based on anecdotal information and may be a significant over-estimation, as one of the co-authors recalls that "*They were in very low numbers – I only ever saw up to two at a time I think*" (Peltenburg, S. *pers. comm*.).

June 2012 – Dawn surveys on 9th and 16th located at least 6 jungle myna (including a pair prospecting for a nest site) and a probable two pairs of common myna one of which was unusually marked with limited feathers on the head.

November 2014. During two weeks of periodic surveys three common myna were found (a pair always together and a single bird) and a single jungle myna. The unusually marked common myna seen in 2012 was not present. There was no evidence of breeding.

30 January 2015. Dawn survey by Keebwa Teremita and Ray Pierce.
Findings as in November 2014, 3 common myna and I jungle myna – no signs of breeding.

Tabiteuea North

A population was identified on this island in 2003 concentrated around the Government station at Utiroa. However this island was not included in the recent pre-eradication survey as indications are that no birds remain.

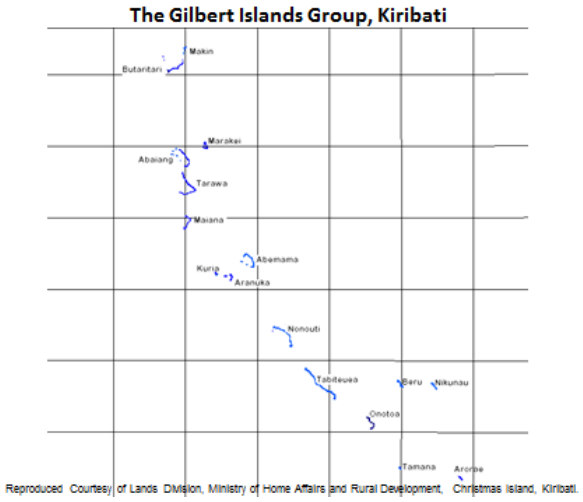
Tabiteuea South

Tabiteuea South was visited by a Departmental team undertaking consultations for the National Biodiversity Strategy and Action Plan (NBSAP) in November 2014. During consultations at the Junior High School participants from Taku village claimed that a single myna had nested there at the Catholic Maneaba. The team visited Taku on 29th and 30th November 2014 to confirm the existence of myna

Photo. Landfill at Betio, an important myna foraging area

through dawn surveys, consultation with villagers and site visit to nesting site. No myna were seen and apparently the nest at the maneaba was destroyed 3 days prior to the visit to Taku. The team concluded there was no strong evidence of birds, only reports from the village that myna have been there since 1999. A further request was made for the Agricultural Assistant to check there.

Other islands in Gilbert Group



Butaritari

Abaiang

Maiana

This island was visited by Government teams during consultations around KAP II and NBSAP and there were no reports of myna being present.

Kuria

Abemama

Aranuka

Nonouti

Tabiteuea Meang

Tabiteuea Maiaki

Beru

~~Nikunau~~

Nikunau

Tamana

Arorae

3. Eradication Plan

The plan has 3 activities.

Activity 1 provides updated information on the numbers and distribution of the two species within the Gilbert Group to identify where birds need to be killed.

Activity 2 undertakes the preparatory work to provide the technical and staff resources needed to undertake a successful eradication.

Activity 3 sets out the eradication programme itself.

Activity 1: Defining current numbers and distribution

Work to date has confirmed the following with a high degree of certainty:

- The earlier population on Onotoa Island has died out.
- Only four birds remain of the population centred on the port area in Betio.

Some investigations have been carried out to answer the following questions:

- Are birds present in Betio outside the port area? A presentation was made to the Junior High School at Betio in December 2014 just prior to the end of term.
- Are birds present on other villages on Tarawa? [Information provided to Junior High Schools…]

- Are birds present in other islands in the Gilbert Group? [Add information from Tabiteuea North & South]

Actions:

1.1 Follow up with Junior High School at Betio. School consultation to Betio JSS is carried out on Friday 1st May 2015 during their inter-team. One to one interviewed reveals that one student seen a pair mynah birds eaten pawpaw at Tatirerei compound- KUC Betio. Have any pupils seen myna outside the port area during their holidays?

1.2 Follow up with Agriculture Assistant on Tabiteuea South. Has he visited Takuu village where there was a report of a possible myna from JHS visit?

1.3 Follow-up with Tabiteuea North. **ECD team through the KAP III mangrove follow up (22-29 April 2015) has consulted participants regarding the presence of myna birds. No indication reported. This conclude that Tabiteuea North is free of myna birds.** Has the JHS been involved? Has someone checked the site of the former population there, carried out any dawn surveys and spoken to villagers?

1.4 Follow up with other Junior High Schools on Tarawa and other islands. Has information been circulated to all JHS's and presented to classes? Are there any indications that myna are present?

Activity 2: Preparation for eradication

The choice of techniques proposed for the eradication has been based on two key review documents Parkes (2006) and Parkes (2012), the experiences of others working with small myna populations and in the Pacific, and the local situation.

In a feasibility study for the eradication of common myna on Mangaia, Cook Islands, Parkes (2006) concluded that of the four main options for control of mynas, poisoning, shooting, netting and trapping, only poisoning could kill a high proportion of birds in a limited time. In a later review of best practice he also added nest snares to the list of control methods and identified Starlicide™ as the most useful toxin to use (Parkes 2012). Nestbox traps were utilised in an eradication operation on Fakaofo Atoll in Tokelau (PII 2006).

Preparations are being undertaken to ensure a variety of techniques are available for the eradication in Kiribati with an emphasis on poisoning. Nestbox traps are not proposed at present as the eradication is planned for a time when the birds do not appear to be breeding, though they can be built in Kiribati if this changes.

Activity 2.1 Organise for Starlicide to be available

Action 2.1.1 Obtain Government approvals for Starlicide use

An application was submitted to the Ministry on 20 January and further information supplied on 19 February after questions were raised. Follow-ups are required with Lily Reue, Environment Inspector, ECD to resolve any other issues so that approval can be obtained in time. The Environment Liciese on using starlicide is now ready

Action 2.1.2 Identify a source of Starlicide and organise its import

Starlicide can be supplied in powder form by Animal Control Products (ACP) in New Zealand and is in stock. Mixed 1:4 with icing sugar (which conceals any bitterness from feeding birds) it does not trigger

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any Dangerous Goods requirements. ACP have couriered Starlicide to other countries in the Pacific using TNT Couriers, so importation should be straightforward once approval is obtained.

Activity 2.2 Organise the construction of traps

One trap has been constructed to date using lightweight wire mesh available 'off the shelf' in Betio, using the 'PeeGee's Starling and Myna Trap' design developed by the Canberra Indian Myna Action Group. Heavier mesh can be ordered from Taotin.

Another design has been obtained from the Cook Islands: the 'Atiu Twin-door Myna Trap' which uses a drop door rather than a funnel like the 'PeeGee'. This has worked well there and in French Polynesia and the materials to build several of these will be obtained.

Action 2.2.1 Order materials to build additional traps

Both traps require 25 x 25mm wire mesh 900mm wide, the PeeGee one of 1.25mm gauge and the Atiu one 2mm gauge, as well as wire and cable ties. Costings should be available to order from Taotin or suitable mesh may be in stock at Slim Price and TTT companies.

Action 2.2.2 Construct traps

It is suggested that the Kiribati Institute of Technology be approached to request the students there to build traps. Alternatively they will be built by the eradication team.

Activity 2.3 Organise necessary additional equipment

The following items are suggested:

- Binoculars – 2-3 pairs
- GPS – Garmin
- Waterproof notebooks
- Plastic mesh and fishing line for loop traps
- Mist net(s)
- Plastic trays, bait, etc for use with Starlicide
- Sound playback system

Action 2.3.1 Finalise and approve equipment budget

Suggested budget is set out below.

1. Binoculars – 2-3 pairs – suggested model is Nikon Aculon A30 10x25 priced at NZ$170-180 each
2. GPS – I contacted the specialist supplier KiwiGPS to identify the most suitable model for Kiribati and they suggested the Garmin 64. They may be able to load on some Kiribati maps. Likely cost NZ$450.
3. Waterproof notebooks – available at c.NZ$15 each – 4 suggested = c$60
4. Plastic mesh and fishing line for loop traps – cNZ$40
5. Mist net(s) – Not to be purchased – Butler to borrow 1 or 2 as he did for survey
6. Plastic trays, bait, etc for use with Starlicide – to be bought locally – c. AU$100
7. Sound playback system - Not to be purchased – Butler to borrow 1 or 2 as he did for survey (when birds did not respond)

Action 2.3.2 Obtain equipment

Butler would source most of the items from New Zealand, pay for them and then submit receipts for reimbursement.

Activity 2.4 Organise for shooters to be available on standby

Shooting may be a last resort option if birds cannot be attracted to take poison baits or enter traps or nets.

In January it was identified that the Ministry's office on Kiritimati Island had a shotgun available (no ammunition) and staff with gun licences needing renewal. Refresher training on the handling of shotguns was required and funds were being sought for Derek Brown (ex-NZ Department of Conservation officer) to conduct the course. The support of the Police Department would be needed to import ammunition and significant documentation would be required.

In discussions with the Police Department it was identified that an experienced bird shooter from overseas could be brought in to assist with the eradication. He/she must have a valid licence from his/her country. The police would be in charge of the supervision of the public when the shooting starts. Liaison with Customs Office would be needed for a permit to bring in the weapon(s).

Action 2.4.1 Update the situation regarding licences for Ministry staff at Kiritimati.

Action 2.4.2 Maintain liaison with Police Department on this issue.

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Activity 2.5 Organise access to necessary sites at Betio

The team were given excellent access to sites during the survey by talking to site managers, owners, heads of agencies, or security staff. Similar access will be needed during the survey but more discussion will be required in order to place traps and baits including poison. The use of poisons may require dogs to be temporarily removed from some sites. Based on the survey the following sites are likely to be used:

- Landfill
- 'Old' shipyard
- COPRA yard
- Kiribati OIL (KOIL) compound (dogs present)
- BP compound (adjacent to KOIL)
- Kiribati Institute of Technology
- Sports Complex
- Area of trees close to Biosecurity Office

Other sites may be required if the birds' behaviour differs from that seen in November 2014 and late January 2015.

Action 2.5.1 Identify whose approval is required for use of different sites
Approval for different sites such as landfill, KOIL, KFL and KIT will be confirmed during the stakeholders meeting

Action 2.5.2 Contact those people to obtain approvals and organise day to day site liaison.
Contact for approval will be based on the daily schedule assigned by the implementation team and to contact to seek approval prior implementation or to be confirmed during the stakeholders meeting

Activity 3.1 Organise necessary personnel.

A significant team needs to be organised and based at Betio for the duration of the programme because much of the work needs to take place in the first two hours after dawn and possibly the evenings up to dusk. Birds are very difficult to locate through most of the hotter part of the day and do not appear to feed so much then.

Ideally at least 6 people would be required. It is suggested that the team consist of:

- Mr Keebwa Teremita, GEF-PAS Invasive Species Project Coordinator, Environment & Conservation Division (ECD)
- Mr Burangke Tabeibeti, Biosecurity Officer, Agriculture & Lands Division (ALD)
- Dr David Butler, New-Zealand based consultant to GEF-PAS Invasive Species Project.
- Ms.Tekimwau Otiawa, Climate Change Officer, (ECD) (as available) (Ms Otiawa was previously involved in the myna project and has important skills and experience related to this).
- Other staff of ECD and Biosecurity, ALD (as available)

Action 3.1.1 Work with staff and their managers to obtain their participation in the eradication.
Eradication team will be selected by the manager (ECD Director) to confirm participation in the process.
Action 3.1.2 Organise for staff to be based at Betio during the programme (including providing accommodation and any necessary allowances)
Base on ECD management advices.

Activity 3.2 Organise necessary logistical support

Action 3.2.1 Organise vehicles

Butler will hire a car as during the surveys using his DSA. An additional vehicle will need to be organised either through ECD or ALD or hired by the project.

Action 3.2.2 Organise team communication

All staff involved should have cellphones to be able to communicate instantly as birds move from site to site. It is assumed that they will have their own phones and that the project should pay for 'top-ups'.

Activity 3.3 Organise public awareness

The public awareness campaign will have several general aims as follows:

- To inform people that an eradication is planned and invite them to send in reports
- To inform people, particularly in Betio of the eradication programme just before it starts
- To emphasise why this eradication is being undertaken to prevent future problems for the people of Kiribati, which in turn will assist with ongoing biosecurity.

Details will be determined in discussion with Robite Teaete, Environment Awareness Officer, identifying the different media (TV, radio, newspapers, internet) to be utilised and the information and press releases to be provided. It has been decided to sponsor the news at the same time that myna information is provided.

More specific information will be provided locally as part of the health & safety provisions for the use of the poison Starlicide. The public will be informed two weeks before poison baiting starts through radio announcements. It is expected that baits will mostly be used in private sites with no public access and prior approval will be gained from owners to apply baits at their sites. These sites cannot be decided now but will depend on where the myna birds are living and feeding at the time of the eradication. It is possible that public sites may also need to be used, e.g. the Betio Sports Complex. If this is the case, safety notices and tapes will be put up and staff will be present at all times that baits are present to keep people away from areas where they are in use.

Activity 3.4 Finalise schedule

The **timing** of the operation is determined by several factors:

1. Confirmation of the sites where myna are present (Activity 1)
2. Completion of necessary organisation (Activity 2)
3. Contractual requirements
4. GEF-PAS project timeframe
5. Weather variables
6. Agreement on technical aspects
7. Behaviour of target birds

Examining these in more detail:

1. Confirmation of the sites where myna are present (Activity 1)

Further work is being undertaken now to follow up with Junior High Schools on the different atolls and islands. The priorities are Tabiteuea and Betio on Tarawa. The eradication can go ahead once there is feedback from the schools on these, as it is considered unlikely that myna are present on other atolls.

2. Completion of necessary organisation (Activity 2)

The key activities to be completed are:

- Approval for use of Starlicide
- Providing the public with awareness about use of Starlicide

- Purchase of materials for traps

Other activities should be able to be completed in a relatively short period of time.

3. Contractual requirements

Butler is currently contracted to implement the eradication by 26 June and has 3 weeks allocated to a visit to Kiribati. The original contract was amended to delay the eradication to avoid the season of greater rain/wind.

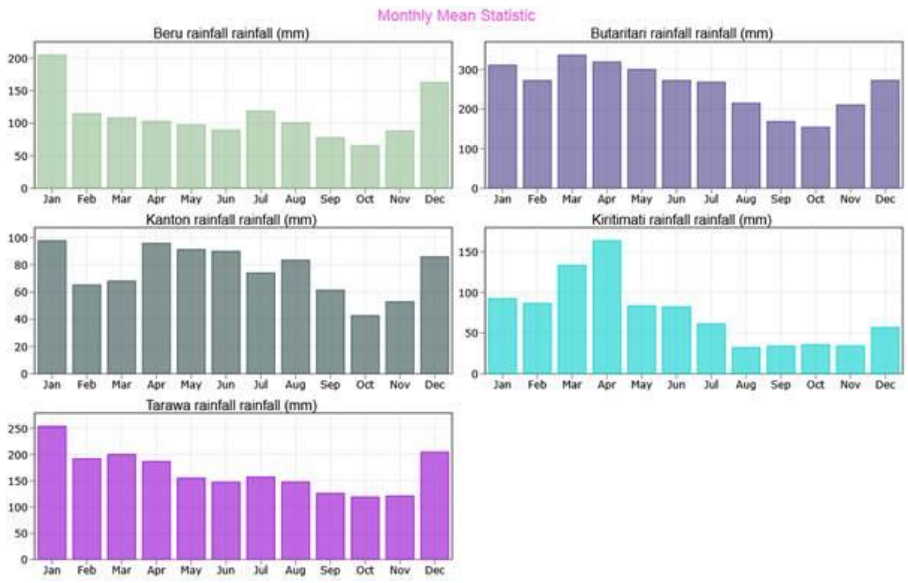
4. GEF-PAS project timeframe

The project has been extended until [to be confirmed]. The eradication needs to be completed and reported on before the end of the project.

5. Weather variables

The graph for Tarawa (purple below) from the Kiribati Meteorology Service for 2013 suggests that rainfall drops off each month from the start of the year, and more significantly after April. The cyclone season in the central and southern Pacific is considered to finish at the end of April – Kiribati recently had some storm damage from Cyclone Pam (March 2013) (that went on to devastate islands in Vanuatu). Reports then identified that Kiribati had experienced 'severe flooding in recent weeks' suggesting that delaying the eradication had been a good decision.

It is suggested that weather is not now going to determine when the eradication occurs, unless it is an unusual year with higher rainfall than normal at this time. The weather should be suitable once all other arrangements are in place.



6. Agreement on technical aspects

This draft is to be circulated within the Ministry and to overseas experts before it becomes an approved plan. Two weeks probably needs to be allowed for comments.

7. Behaviour of target birds

The four birds at Betio have behaved the same between November and February. There is no sign yet of the pair breeding though another check will be made soon. If behaviour changes this might alter the ideal timing – nesting might provide a better opportunity to catch birds for example.

Conclusion on timing:

2-4 weeks may be needed from here to complete preparations for the eradication and it should then proceed unless the birds' behaviour has changed in a way that would make it more difficult. It should be possible to finalise the timing in around 2 weeks.

The suggested **schedule** for the eradication is as follows:

1. Preparatory work from now on (completing activities identified up to this point in the plan)
2. Activities in the week before the operation
3. An initial 2-week eradication effort with Butler present

The results of these two weeks would then be used to determine the rest of the programme with three possible options:

Option 1: If the eradication was close to completion then Butler would stay for a third consecutive week with the aim of finishing it.

Option 2: If progress is being made but more than one more week is likely to be required, the local team would continue work (e.g. getting all birds feeding well on baits) and Butler would make a further 1-week visit to assist completing the work.

Option 3: If progress is not good a re-think would be needed. This could for example involve an experienced New Zealand shooter visiting (instead of Butler) to complete the job.

This seems a safer approach than organising a 3-week visit from Butler which puts 'all the eggs in one basket'.

Activity 3.5 Carry out eradication programme at Betio

Currently we believe 4 myna to be present, 1 jungle myna, a pair of common myna, and one single myna. To achieve eradication a minimum of two birds need to be killed.

The single jungle myna can probably be left to die out itself, if needed, as I have found no evidence that it can interbreed with the common myna. It was not observed to interact with the 3 common myna at all in November. It would be the most difficulty bird to kill as we frequently failed to locate it again after

it left its night roost, and it only occasionally used the feeding areas where the common myna were recorded.

Theoretically only one of the pair of common myna needs to be killed if the surviving bird and the other single myna were the same sex. If they were of the opposite sex it is highly likely they would form a new pair and thus be capable of breeding. However it is not possible to distinguish the sex of myna in the field (though only the female has a brood patch while nesting), so 2 common myna have to be killed.

Killing only two birds sounds simple in theory. However they will take longer to detect food set out for them, whether in a trap or containing poison, compared to a larger group of birds. They theoretically have little competition for food so maybe harder to attract to what we set out, and don't have other birds trying to defend territories so can be very flexible in their movements and have large home ranges.

Observations in November established some pattern as below. Most of the sites referred to are identified by letter on the Google earth image.

Night roosts:
The pair of common myna roosted at the very top of the large port crane (B).
The jungle myna roosted part of the way up the same crane.
The roost of the single common myna was not located.

Dispersal from night roosts:
The three birds on the crane left it soon after dawn. The jungle myna typically flew south into or over the COPRA yard (C) and disappeared. It was seen again some mornings visiting some of the sites used by common myna. The common pair typically flew west across to the landfill (A) or north to a large tree at the entrance to the shipyard (D) and from there either to the landfill, to elsewhere in the shipyard or west to the KOIL compound (F).

Feeding observations during the morning:

All four birds were seen at different times feeding on the ground in different areas around the port. The pair was always together and the single birds did not appear to interact with each other or the pair. Between around 6-8 am birds moved around different sites from the landfill (A) to west to the Kiribati Institute of Technology (H) to the east and out north to the container port (off map) at the end of the peninsula. They were occasionally seen at the Sports Complex (off the map to the south) but not at any other open areas (e.g. school sports ground) checked. The pair were followed most often and on two occasions they moved to roost soon after 8am once the day had significantly heated up into a tree near the Biosecurity Office (to south east of H). Other days they disappeared around 8am.

Observations in evenings:

On a few occasions, birds could be located in the same feeding areas in the evenings before three of them moved to the crane to roost.

Photo: Port crane used as night roost by 3 myna

Nesting:

No nesting behaviour has been observed between November and January though birds did investigate pipes in the KOIL yard a few times in November and one of these appeared to have some dry grass in it. Nesting has occurred in the past in the roof space of an open storage building in the container port.

Photo: Roof space at container port building where myna have built a nest in the past

Opportunities to catch/kill birds

The key opportunity is considered to be to catch or poison birds in the first two hours every morning, or in the evening. Catching birds at their high roosts on the crane is not possible. Mist-netting or noose trapping at the daytime roost tree by the Biosecurity Office could be considered if this is used consistently.

Effort will be concentrated on the pair which was easier to locate and follow (including being more vocal) and appeared to have a more consistent pattern of activity. If one of the pair can be caught alive it will be used as a decoy in a trap with the aim of catching its mate.

One of the challenges of poisoning is that we will not be sure when a bird has died as it is unlikely that a body will be found. However by working with the pair it should be clear if one has died and the other survived, or if both die as they can be fairly reliably located any morning.

Action 3.5.1. Establish updated picture of birds' movements

Bad weather has prevented some planned dawn observations in the past couple of months. Such observations need to be made more regularly from 1 April on to identify whether birds are still behaving the same and using the same group of feeding areas.

Action 3.5.2. Attract myna to baits

Once the areas where the birds are feeding have been identified, sweetened cooked rice and other baits (bread, rice with corned beef) will be scattered in patches at a range of sites to encourage birds to

specific areas where poison and traps can be deployed. This work will start prior to the two-week main effort.

Two approaches will be tried. The first will be to scatter baits over the ground and the second to place them on large coloured plastic trays. If birds associate these trays with food they will be utilised at all the sites and make it much easier to carry out successful poisoning.

Once birds are utilising certain areas regularly, then poisoning or trapping will be utilised depending on site variables including:

- Has the owner given permission for use of poison?
- Can the public be kept out of the site? If not then trapping to be used.
- Do dogs have access to the site? If yes then trapping to be used.
- Do feral pigeons feed at the site? If yes then trapping may need to be used though poisoning would not be ruled out if myna also fed with them

Action 3.5.3 Implement Trapping Programme

Traps of two designs will be utilised. It is currently expected that traps will be used at the landfill, KOIL, COPRA, Shipyard, KIT and Container Port, depending on where the birds are seen regularly feeding and where they can be attracted to baits. They will be set out in the shade where they can be watched by staff or others (e.g. those managing the landfill) so that the public do not interfere with them. They will be operated in the two hours each morning and in the evening when the team are on site, and wired open for the rest of the day to allow birds to feed freely in them. Those managing the sites would be asked to advise the team if birds are seen to enter traps at such times and they would then be set and observed. If one bird can be caught it will be used as a decoy.

Action 3.5.4. Implement Poisoning Programme

The poisoning programme will be applied in Betio in two phases. During surveys in November 2014 several potential baiting sites were identified for common myna (as earlier). However the birds feeding behaviour was not consistent enough for bait trials to work in the short time available. Cooked rice is the most likely bait to be used but bread will also be trialled. The poison could also be provided in drinking water in containers accessible to myna but this is only likely to work if the weather is dry and there is a shortage of natural water sources.

The timing of bait application will depend on the birds' behaviour. It is most likely to be conducted only in the first 2-3 hours in the morning. The poisoning has been shown to be most effective if done in the mornings, possibly due to birds ingesting the bait on an empty stomach. If birds can be located feeding in the afternoons baiting will take place then which has the slight advantage that no birds will show symptoms of poisoning until they are roosting at night. There is only a slight chance that birds will learn to avoid baits by watching others become ill, as the symptoms are delayed. We are dealing with such a small number of myna at Betio that even if one did learn it would not threaten the eradication.

During the operation the starlicide/sugar mix powder will be held securely in locked premises at Betio. It will be mixed with baits under the direct supervision of Dr Butler immediately before a baiting operation is to take place at a pre-approved site. Baits will then be placed out in these sites in small quantities and one of the team will remain with the baits at all times to ensure that there is no risk to people and to record the feeding of myna. Baits that have not been fed on will then be picked up again

after 1-2 hours. If used in grassy areas they will be placed on plastic trays to facilitate this and if on hard surfaces (concrete, tarmac, gravel etc.) they will be swept up. Small quantities of bait will be applied, e.g. a cup of rice or couple of slices of bread, so that the area where the bait is used can be watched carefully and all unused bait collected afterwards.

Details of Starlicide use

The main plan is to follow the technique used with success in the Cook Islands (as supplied by Gerald McCormack):

- Cook 250g rice with one tablespoon of sugar until al dente (soft outside, slightly hard inside). Drain and wash in cold water so the grains remain separate.
- Warm 20ml water and 20ml veg oil to about 37degC (warm to the little finger), put in closed vial and shake to mix, add 2.5g (1 packet) DRC1339 (Starlicide) and shake until all dissolved.
- Sprinkle over the cooked rice and mix thoroughly. Mix in about 100g of Corned Beef.
- Dry and store in a cool place out of sunlight. Use within five days.
- The poison is rapidly denatured by sunlight and rain. Place system in a shaded location.

However other baits will also be tried and the toxin perhaps used in water if birds seem short of site to drink (as was the case during some of November visit).

Action 3.5.5. Utilise other capture techniques.

If it is not possible to attract birds to baits for trapping or poisoning then more direct capture techniques will be required. These would be set-up during the day when birds are inactive. The following are possible options based on the November survey:

- Mist-netting at daytime roost trees
- Noose trapping on regularly used perches. The photos below show where birds perched or rested on several occasions. There are large lights (like the one by the port tower) close to the COPRA site and the pair often perched on these immediately after leaving the crane. There must be a ladder system available for the maintenance of these that could be used to place noose mats
- Noose trapping with mats on ground

Photo: Tree at entrance to shipyard.

Photo: Metal building 'skeleton' in shipyard.

Photo: Tower at container port

Photo: Pipe in which birds sat, KOIL

Action 3.5.6. Implement shooting programme.

Shooting will be a challenge in this environment with many structures and people. The aim is to establish the capability to do this and to implement it only once trapping and poisoning has failed.

Action 3.5.7. Collect feather samples for DNA

Feathers will be collected using established protocols from any birds caught or found dead. These will be stored dry for possible future DNA analysis in order to try to determine the country/island of origin of these birds. Identifying the pathway by which these birds reached Kiribati will help in designing biosecurity to prevent this happening again.

Action 3.5.8. Competition on catching myna birds –Bounty hunter.

Seeking public supports to eradicate myna birds is competition on catching myna birds means to rewards individual and groups who manage to catch them dead or alive. Each bird cost is $400.00 (to be advised by ECD management). informing public will be carried out 2-3 weeks before the implementation through radio news and publications.

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4. Draft Work Schedule

April – Preparatory Phase

Action	Suggested Responsibility
Circulate this draft plan	Keebwa Teremita (internal), Dave Butler (overseas recipients)
Carry out dawn surveys to update situation	Keebwa Teremita, Burangke Tabeibeti
Finalise and approve budget (Action 2.3.1)	KeebwaTeremita, Taouea Reiher, Taulehia Pulefou
Update situation regarding staff shooting licences (Action 2.4.1)	Ratita Bebe
Follow up on Starlicide application (Action 2.1.1)	Keebwa Teremita

Purchase equipment in NZ once budget approved	Dave Butler
Purchase Starlicide in NZ and arrange courier once approvals for use obtained (Action 2.1.2)	Dave Butler
Order/purchase mesh for traps (Action 2.2.1)	Keebwa Teremita
Complete programme to consult with Junior Secondary Schools of Gilbert Group (Actions 1.1, 1.3, 1.4)	Keebwa Teremita
Follow up with Agriculture Assistant re: Tabiteuea South (Action 1.2).	Keebwa Teremita or Burangke Tabeibeti
Finalise the public awareness programme (Activity 3.3)	KeebwaTeremita, Robite Teaete, Dave Butler
Interview Rikamati Naare to identify locality where he found myna feeding sign	KeebwaTeremita
Finalise staffing for eradication and their accommodation in Betio (Actions 3.1.1, 3.1.2)	Taouea Reiher, Taulehia Pulefou
Obtain approvals to work at different sites in Betio including possible use of poison baits (Actions 2.5.1, 2.5.2)	Keebwa Teremita, Burangke Tabeibeti

April – after preparatory phase largely completed (plan finalised, necessary approvals and equipment organised)

Action	Suggested Responsibility
Finalise timing of operation	ECD team, Burangke Tabeibeti, Dave Butler

To be confirmed – Carry out initial operation

Action	Suggested Responsibility
Finalise planning for operation including scope (Betio only or other sites)	Keebwa Teremita, Burangke Tabeibeti, Dave Butler
Monitor bird activity up prior to operation (Action 3.5.1)	Keebwa Teremita, Burangke Tabeibeti,
Undertake baiting work prior to 2-week operation (Action 3.5.2)	Keebwa Teremita, Burangke Tabeibeti
Undertake 2-week operation (actions 3.5.3 to 3.5.7	Keebwa Teremita, Burangke Tabeibeti, Dave Butler & team

After 2-week operation – Review

Action	Suggested Responsibility
Review progress to date	Keebwa Teremita, Burangke Tabeibeti, Dave Butler & ECD management
Finalise arrangements to complete the eradication	Keebwa Teremita, Burangke Tabeibeti, Dave Butler & ECD management

Options at this review would include the following:

1. Ending the operation if success achieved
2. Continue with the same activities for a 3rd week with Butler present (re-booked flights etc)
3. Re-schedule a further visit from Butler later after more work (baiting etc) by the Kiribati team in between visits.
4. Schedule a visit from an Experienced NZ bird shooter.

5. Budget

This budget table needs completion and approval.

Item	Estimated cost AU$	Notes
Starlicide (incl freight)	c$250	Freight cost to be confirmed
Mesh for traps	tbc	Costs to be obtained from 3 possible suppliers.
Hire of vehicle for Kiribati staff for 3 weeks	To be confirmed (tbc)	Only needed if Govt. vehicle unavailable
Vehicle fuel	tbc	To be estimated once accommodation arrangements finalised
Accommodation/allowances for Kiribati staff to be based in Betio for 3+ weeks	tbc	How this is to be organised to be worked out by ECD.
Staff allowances for working outside office hours and with toxins.	tbc	Depends on staffing procedures
Butler fees and travel	(already covered)	
Communications (cellphone top-ups)	tbc	
Public awareness (radio, TV, newspaper, notices)	tbc	Keebwa Teremita, Robite Teaete to work out with advice from Butler
Binoculars	$170 each	Need to decide if 2 or 3 pairs
GPS unit	$450	
Ammunition (incl. import)	tbc	
Miscellaneous supplies	$200	

6. Biosecurity Plan

A biosecurity plan needs to be developed to prevent further myna (or other invasive bird species) arriving in Kiribati and to carry out early detection and a further eradication if they do. It will also aim to make sure that if birds do arrive in the future that people do not take them from island to island. This plan will be developed over the next few months.

The fact that myna have failed to establish a significant population and spread through Tarawa, Tabiteuea and Onotoa, having reached these three atolls, suggests that Kiribati does not provide an

ideal environment for the species. They appeared to have died out on Fakaofo Atoll, Tokelau indicating this may be a wider effect. However this is not a reason for complacency as if new mynas reach the country in the future they may bring different traits that will allow them to adapt better to local conditions. Those conditions may also change to provide a better environment for myna.

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Saavedra, S. & Peltenburg, S. 2003. Eradication and Prevention of further establishment of the Common mynah, an invasive species, from the Republic of Kiribati. Unpubl. project proposal 17pp.

Individuals consulted:

Bill Nagle, Ray Pierce, Gerald McCormack, Simon Peltenburg, Jill Key, Bill Simmons, John Allan, Dave Moverley, Gianluca Serra, Posa Skelton, Tom Ghestemme, Susana Saavedra (recently contacted).

Individuals to whom this draft plan should be circulated:

- Staff of ECD and Biosecurity, Kiribati
- SPREP Staff;
- Bill Nagle, Ray Pierce – experience of myna in Kiribati
- Gerald McCormack & colleagues, Cook Islands
- Souad Boujelas, Pacific Invasives Initiative
- Susana Saavedra – experienced with myna control internationally and advising on Pacific projects
- Chris Feare, UK (involved in bird eradications in Indian Ocean)