Response to Ship Rat Incursion on the Chicken (Marotere) Islands January 2009

Summary of Operation and debrief

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Chicken (Marotere) Islands, Coppermine, Whatupuke, Lady Alice and west Chicken Islands with the Whangarei coastline in distance

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1 Introduction

In January 2009 rat prints were found on two of the Chickens (Marotere) Islands that were rodent free and hold threatened species that no longer occurred naturally on the mainland. An immediate, well organised, and sustained response to a rat incursion to achieve eradication on such islands was critical however "best practice" or actions to ensure early eradication success are still at a learning stage in incursion response. Through recording, reviewing the actions and results to this incidence we hope to build our knowledge and expertise in responding to such an event.

This document informs of the Department of Conservation (Whangarei Area Office):

- actions to determine the nature and extent of the rat incursion and achieve eradication
- the debrief/recommendations arising from the response following 4 months of recording no further rats

1.1 Description of Chicken (Marotere) Islands

The Marotere (Chicken) Islands are a group of islands located off the Whangarei coastline in Northland, New Zealand. The largest is Lady Alice (Mauimua) (155ha) followed by Whatupuke (Mauiroto) (102ha) and Coppermine (Mauipae) (80ha). These islands are surrounded by 12 smaller islands and islets (see Fig 1). The western most island of the group is approximately 8 kms off the mainland coast with the other islands strung out in an easterly direction over some 10kms. Distances between the larger islands vary from approximately 100 and 300 metres.

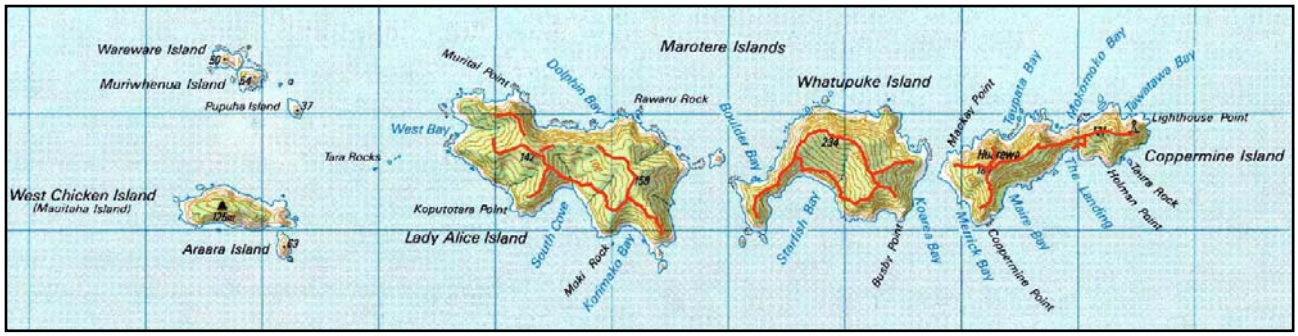


Figure 1: Map of the Chicken (Marotere) Islands. The red lines indicate management tracks.

In recognition of the diversity of their natural resources the islands were classified as Fauna and Flora reserves in 1973 and reclassified as Nature Reserves in 1977 with strict limits on permit authorised access. However unauthorised landing are known to occur on occasion.

Values present of the islands comprise many range restricted and threatened fauna and flora. These include tuatara, saddleback, kokako, grey faced petrels, diving petrels and Duvaucel's geckos.

Pacific rat (kiore) was the only mammalian threat to the biodiversity values of these islands and eradicated from Lady Alice (in 1993), Whatupuke (in 1994) and Coppermine (in 1997). This saw the significant recovery of some species already present (tuatara) and the implementation of a restoration plan ("Restoration of the Principal Marotere Islands" Towns & Parrish – 2003) that has seen the reintroduction of some species that had previously been present.

Parties and gear going to the islands are required to pass through quarantine procedures to avoid the inadvertent introduction of pests. However, a high level of public boating activity occurs around these islands and with vessels commonly moored within 20 meters of the shoreline they are a potential source of mammalian bio-security incursions to these islands (see photo 1). Annual monitoring is carried out to confirm the "rat-free" status of these islands using tracking cards and a rodent indicator dog.

The islands are unoccupied with infrastructure limited to a small hut on Lady Alice and established campsites with a water supply's on Coppermine and Whatupuke Islands. A track network is maintained on these three islands.

Photo 1: Boats at anchor 40 metres off Whatupuke Island shoreline. Rat captured at camp site 30 metres above island shoreline directly behind vessels.

1.2 Rat Incursion

1.2.1 Presence discovered

Black tracker tunnels and rat monitoring cards (baited with peanut butter) had been placed on Lady Alice, Whatupuke and Coppermine Islands on 8 December 2008. Checking on the 6 January 2009 recorded rat prints in 12 of 18 cards set over approximately 400 metres on Lady Alice and 1 of 6 set over 100 metres on Whatupuke Islands.

1.2.2 Confirmation of Species

Only traps were used (as against toxin) to supply a carcass for identification, confirm removal of animal and avoid use of a toxic method due to species conservation concern. Traps were set on Whatupuke and Lady Alice on 7 January at the locations where sign had been recorded and Copper Island. A rat was caught on Whatupuke (at the camp site) on the 8th and one on Lady Alice (30m east of hut) on 12 January both of which were confirmed as mature male Ship rats (Rattus rattus).

They were the 'alexandrinus' morph which is rare or absent from most of the North Island except Northland (Innes 2005) and Great Barrier Island (Barr 2009) suggesting they may have come from a local mainland population.

The Whatupuke male rat had an empty stomach possibly because it had digested its stomach content while in the live trap and weighed 230gms. The Lady Alice male rat had 7.5g of material in its gut and weighed 215gms. The weight of both specimens was outside the published ranges of ship rats recorded for the New Zealand mainland, although similar to those recorded on Big South Cape Island (G. Harper unpubl. Data. Cite in: Innes 2005). See dme:\\docdm-390133 for Craig Gillies necropsy notes.

These animals are held at DOC Northern Operations Hamilton and available for DNA samples should the need arise.

The only apparent commonality in the locations where the two rats were caught on the two islands was the presence of a small stream and a camp or hut site where some residual "attraction" from human activity (e.g. waste water discharge, toileting) would likely to be present. In the four months prior to the discovery of rats in January, parties had been present on Lady Alice for 8 days in Sept, 2 in Oct, 6 in Nov and 12 in Dec. and 8 days in October on Whatupuke.

1.2.3 Source & time of Incursion

With the nearest land based source of ship rats over 8 km from the islands the incursion could have only arisen from carriage in the gear of parties visiting the island(s) or off private or commercial boat(s) that operate close around all the islands (See photo 1). It was suggested that the incursion may have arisen from intentional wilful (anti protectionist protest) action, based on the premise that a rat(s) were found on two islands. With no evidence of any protest action or quarantine issues by parties visiting these island associated with rats, it has been concluded that the most like source was from off a boat.

These islands had been previously monitored by rodent dog and tracking tunnels 17-28 December 2007 and no evidence of rat(s) were recorded. It has not been possible to determine how long the rats may have been present on the islands. While the technique to determine age class has not been calibrated against known age animals in NZ; based upon overseas work, age class V suggests that these rats were adults probably between 1-2 years old. (C Gilles per comm.).

2 Incident Management & Response

2.1 Incident Management

The initial response to confirm the species of rat present was led by the Bio-diversity Programme Manager, Keith Hawkins. On confirmation of rats present on two islands (day 3 following discovery of sign) a Coordinated Incident Management System (CIMS) structure was implemented to upscale the response effort with Incident, Operations, Planning, Logistics Managers and a media liaison person appointed within staff of the Whangarei Area Office. An electronic folder (S drive Operation Lady Alice) was established for storing all images and mapping material and a hard copy folder for all CIMS meeting, actions and correspondence. A Home page was established as a central repository for electronic document sourcing see dme:\\docdm-394991.

2.1.1 Incident Manager's Practices

- Incident Manager – Lead the management team which met several times in the first week then weekly, scaling back once the response reached full implementation and the later down

sizing phases. The Ngatiwai Trust Board were involved in initial planning meetings and kept informed of actions. Keith Hawkins led this role.

- Operations – The Incident Action Plan (IAP) were prepared by the Ops Manager for specific 2 weekly periods that provided the tasks to be completed by the respective personnel. This period was extended after two months operation to longer timeframes but specific performance dates set for actions. Glen Coulston was the lead person in this role later replaced by Bryce Lummis.
- Logistics – Organised the personnel (both volunteers and staff), equipment, food and boat support. The administration team tracked financial expenditure, recorded minutes of all meetings and maintained a hard copy of all correspondence associated with the response. Clea Gardiner lead this role with Julie Redwood covered administration/financial and L. Gibson – volunteers, Lynn Davis – supplies. Additional people were required to support the Logistic section in supplying the gear to field teams.
- Planning – Organising the forward planning and new direction in association with Ops for each consecutive IAP. Focused on progressing long term contingencies such as toxin application consents. Researched the used of Judas rodents, rodent dogs and best practice techniques. Included specialists roles in Mapping – GIS data storage and map production. They liaised and provided technical support from the Islands Eradication Advisory Group, locals TSO's and people known to have incursion response expertise. Andrea Booth (TSO) led this role assisted by Nigel Miller (WAO), Kaye Seymour (TSO) –GIS, Pete Davis (TSO) – Toxin Consent application.
- Media – A person was designated to lead all internal and external media or information. Reuben Williams (WAO) covered this role.

Comments:

A conference call discussion with members of the Island Eradication Advisory Group on the confirmation of the incursion and throughout the implementation of the response was seen as extremely significant in the 'success' of the response decisions. Similarly, modelling on some of the practices carried out by DOC Warkworth with their recent incursion response in the Auckland area was a valuable aid in implementing the initial planning.

Having people experienced in CIMS functional roles leading the response management functions meant that systems and responses were immediately implemented instead of time having to be spent learning the role.

The demands on the key managers in the CIMS team in still having to maintain their primarily work functions resulted in unhealthy work pressures and an inability to give it the desired time to assess all factors fully in the establishment phase. As the operation extended and downsized the close management diminished and some quality control issues arose. Communications systems worked well with VHF radios and cell-phone coverage. Information transfer was an ongoing issue to field team members, with volunteers and new teams not always picking up the information given or fully engaging in the tasks. A briefing was held at the office and on the island with every team. The team leaders briefed and debriefed incoming/outgoing team leaders with the local situations. Interestingly, despite these efforts to ensure parties all knew their tasks and had the necessary information and tools to complete them, human error still resulted in gaps in methodologies and in the raw field data information collection.

The technical advice received from all those involved was considered by the IC to have been very valuable in the completion of the operation. The early use of a range of current documents giving direction on rat invasion biology and response were not used until the response was firmly implemented. This saw some best practice and direction not applied (e.g. snap trap used when rat species are unknown and risky if Norway present). It is not believed this compromised the response and saw testing or trying of alternatives. However early direction to the Planning team (in association with IC and Ops Manager) to source all key document at the commencement of the response is recommended and regular checking to compare the recommended practice with the work occurring to ensure critical aspects are not overlooked. Strategies developed were effective

in rolling out the trap and tracking tunnel networks, engaging Judas rats, predator dogs and integrating these activities with boating operations.

Field Delivery Standards. The quality of diligence with techniques and data capture was about 80% of a 100% excellence target. The info transfer, level of experience, attention to detail with data recording and the array of different equipment types confused many team members. This is discussed further in the report.

2.2 Response

2.2.1 Response Plan

The Management team initiated a dual contingency response plan:

Plan A

Objective 1 – Determine distribution and abundance of rats (by tracking tunnels, dogs, traps) on all the Marotere Islands (except Mauitaha/Araara where kiore were known present) and implement a ground based trapping operation to prevent their escalation and/or to eradicate a potentially localised and isolated incursion.

Objective 2 – Detection/trapping measures would continue for a period of 3 months following no sign of the pest. Then review.

Plan B

If the monitoring indicated widespread rat distribution or 'high' abundance then planning for an aerial toxin operation (at such time advice determined it would be successful) would be implemented. The preparation for a Resource Consent application for such work would commence at the same time as Plan A.

The decision not to use toxin in Plan A was due to: if used, may have compromised a later aerial drop. And if bait poison was consumed it may not been known whether it killed the targeted pest. The only exception was minor use on Coppermine Island where no rat sign was recorded (see comment under poison).

In implementing these actions the operative Conservancy Islands Bio-security Plan procedures were applied. It was quickly apparent the directions in this plan were inadequate to deal with the scale of the situation.

Similarly the Islands Response Contingency Plan was not current, being under review; however, the principals were applied. It was apparent the detailed prescriptions for response in the plan are inadequate to the realities of a response of this nature, as was the contents of the contingency response kit.

2.2.2 Response Actions

All key response actions undertaken were recorded in an Incident Log (see below) until 22 May 2009 (with full record in the Incident Action Plans dme:\\docdm-389690. Also a calendar was maintained that identified future action dates and completed results. (See table 1 – Incursion response dates).

Date	Action Incident Log
6.1.09	Rat(s) prints were recorded on rodent tracking indicators that had been located on L A & W Isds. Tracking papers had been placed on the 8.12.8 (baited with peanut butter) on C, W and L A. Isds.
7.1.09	Rodent dog to L.A Isld (M Ritchie) & covered tracks on the western end of Isd.Indicated sign at2 locations appro. 120 m apart. Further traps and rodent indicator cards set on the 3 islands. BL stays overnight Lady Alice.
8.1.09	1 male ship rat caught on Whatapuke. Tracking tunnels & traps reset on all 3 islands (Coppermine, Whatapuke, Lady Alice,) to further determine the species present &f rodent distribution. (Further details are available in map and log records).
9.1.09	CIM Team & planning implemented- Advice from specialist obtained. Arrangement & orders placed for implementation of major response on 12th Jan
10.1.09	Completion IAP and equipment , team for response on 12.1.09
12.1.09	Team out to all Islands on Rake. Further lines to be established on LA, WH & CP. Rodent dog to check LA, MU and Stacks to a build further understanding of rat distribution. Existing lines to be checked. 1Male rat caught on LA 15metres up stream from where track heads up the hill after leaving hut.
13.1.09	IM Team Meeting – See minutes IM Team Meetings Dog work continues on LA Island. Lines continue to be established on all three main islands. Dog work completed on W then moved back to LA
14.1.09	IM Team Meeting – See minutes IM Team Meetings More gear asked for to bring number of traps per island up to 400. Dog work continues on LA. Nothing detected
15.1.09	Staff briefing on work and IM meeting see IM Team Meeting notes IM Team Meetings. Dog work continues on LA. Nothing detected. Lines on all Islands still being established.
16.1.09	WH - all track lines installed with tunnel and trap pairs. Traps on east beach set at 10m spacing buffer to C. No Rodents caught. Middle Stack 2 tunnels established LA lines almost complete. Dog work continues on LA
19.1.09	IM team meeting IM Team Meetings
21.1.09	Whatupuke 180 tunnel and trap pairs established Lady Alice – 160 tunnel and trap pairs established Dog work carried out along A line and boulder bay on W, no indications of rats.
23.1.09	Conference call with IEAG and actions arising from it see IM Team Meetings. CIMS meeting afterwards –Team size to be reduced 4 to 3 generally to reduce costs. Cost forecast confirmed Checks completed on all Chickens islands.
25.1.09	Finn Buchan & dog out to Chickens to complete checks
26.1.09	Change over of teams on LA & W. Final tracking tunnels established on C. LA, W & C lines have been checked no sign of rodents. Fin and dog work Whatupuke Islands-no sign and shifted to L.A. Island. Pete Graham audit traps LA 26-28th.
27.1.09	Tracking tunnel checked Muriwhenua. Dog work continues on Chickens
28.1.09	Finn Buchan & Dog return from Chickens to WAO. Dog checked camp area of Whatupuke within 100m of camp. Checked NE shoreline of Whatupuke and western ex of Coppermine. No sign at any location. (see dog map)
29.1.09	IM team meeting. Report of rodent sign in tracking tunnel at south cove LA (1700). Initiated with placement of extra traps.
30.1.09	Injured worker, Clea G Sent as replacement and Vol worker evacuated Lady Alice. Rodent sign identified as a non target species.
4.2.09	Change over of teams on Whatupuke and Lady Alice. G.C & C.G supervised and audited work on L A. KH & N.M supervised –audited work on Whatupuke. Identified further tidy up required in recording and traps / tunnel set. Tracing tunnels all checked on C. Isd. NO rat sign on any islands since initial captures-

	ongoing monitoring and filling in gaps in coverage. Last rat response teams before wind down. By –catch; Pycrofts (WH) + 2 Duvaucel's gecko (WH/CP)
6.2.09	By-catch; 2 Duvaucel's gecko (LA/WH)
7.2.09	By-catch; Duvaucel's gecko (LA)+ Northern tuatara (LA)
8.2.09	All stations on L A and W checked. No sign of rodents. Last 5 day check period scaling back operation to checks every 7days. By-catch; Oligosoma suteri/ Cyclodina ornata (WH), 3 Duvaucel's gecko (2WH,1LA)
9.2.09	Change over of crews. Weed Team working on LA
10.2.09	Weed team advised not to do checks on the 11th as originally planned but make sure the checks are carried out by the 17th of Feb.
11.2.09	By-catch; Duvaucel's gecko, Thrush (LA) Rodent dog work and TT carried out on Tawhiti Rahi no sign detected.
12.2.09	Judas rat station placed out on Lady Alice. Coppermine checks were not done due to bad weather and swells.
17.2.09	Checks completed on L.A Ids, no sign of rodents By-catch; Duvaucel's gecko (LA)
18.2.09	Weed team check Whatupuke. Bryce & Tiff to complete C. Isd check and add new line on ridge. Assist Judas Researcher to Lady Alice. Nothing to report from C. Isd and new line established along coastal ridge. Check shows no sign on Whatupuke. 28 “Elliott” traps taken from LA. PRU to have come off Whatupuke along with all pots and pans.
19.2.09	Judas rats work report-rats all alive-Replacement water / food required every 5 days. No rat response. Plan to come off on 23rd as no further learning to be gained. CIM meeting to develop / draft next actions to end of April completed. Send to IAEG for comment. Complete IAP for next 2 wks.
23.2.09	Judas rats removed and all houses. No sign o rats –Idan has committed to providing report by mid March. Fomli Team goes to Whatupuke
24.2.09	Dog check of Aorangi and TT cards pulled from Tawhiti Rahi. No rat sign detected.
25.2.09	Bryce And FOMLI lizard team complete check on Whatupuke
26.2.09	Isd weed team changed over form Hen to L.A Isd to complete check with support from Darren and John. Bryce swapped from Whatupuke to Coppermine to complete checks with Matiu in support. No rodent indication was found. FOMLI team returns
17.3.09	IAP 6, first of 3 week check. Checks carried out on all of the Chickens Islands. All TT cards were replaced. All snap traps were De-set but left in place.
18.3.09	Cards checked for rodent sign and to check cards for sign of heavy tracking. No rodent sign was detected. Reassessment of the methodology if there was too much heavy tracking by insects is not required. Ok for a further 3 week period.
1.5.09	Check was delayed until this date due to ongoing bad weather. Snap traps and remaining gear was taken off Whatupuke and Coppermine. All TT cards were replaced. 90% of Lady Alice was completed with snap traps removed and TT cards replaced. All trap covers left in place.
6.5.09	All remaining TT cards were replaced and snap traps removed from Lady Alice but covers left.
20.5.09	All TT checked on CP

Incursion response dates (Monitoing and Trapping dates)

Checks due | Checks completed | Rat sign | Rat Kills | Dog | Judas rat

January 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Lady Alice							X	X				X									X					X					
Whatupuke							X	X				X									X					X					
Coppermine							X	X				X									X					X					
Muriwhenua												X															X				
Stack Rock												X															X				

Rodent caught in LA in snap trap

dog checks continued on All islands and stacks. No sign detected

Rat(s) prints were recorded in rodent tracking tunels on Lady Alice and Whatapuke Islands set out on 8/12/08

Rodent dog check on LA indication around hut and along ridge near west beach. Traps and extra TT placed out on LA, WH and CP

Rodent caught on WH in live trap near camp.Tracking tunnels and traps were reset

Full incident responce actioned. Lines to be established . Daily checks to commence. Dog checks on LA and Stacks.

change over, first 5 day check period starts

February 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Lady Alice				X				X				X					X						X			X		
Whatupuke				X				X										X							X			
Coppermine				X														X								X		
Muriwhenua																		X								X		
Stack Rock																		X								X		

Checks completed on LA, CP and Stacks

Judas rat traps set up on LA

Judas team off, no sign detected.

checks done on Whatapuke

Change over of crews. Audit completed.

Checks completed LA/WH no sign detected

check period scaling back

Checks completed on Lady Alice island, no sign

Checks completed on WH, CP and stacks

March 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Lady Alice																	X														
Whatupuke																	X														
Coppermine																	X														
Muriwhenua																	X														
Stack Rock																	X														

Checks carried out on all of the Chickens Islands. All TT cards were replaced. Ssnap traps de-set on LA

April 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Lady Alice																														
Whatupuke																														
Coppermine																														
Muriwhenua																														
Stack Rock																														

Checks delayed due to ongoing bad weather

May 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Lady Alice	X				X																					X				
Whatupuke	X																					X								
Coppermine	X																					X								
June 2009	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Lady Alice									X																						
Whatupuke									X																						
Coppermine									X																						
Muriwhenua									X																						

Snap traps removed from WH & CP. TT cards replaced. 90% of LA completed

remaining TT cards checked and snap trapsremoved

Cards to be checked and rebaited, replaced if nessary. CP completed

Final check and clean up of Islands. Cards removed but tunnels left in place. Tunnels remarked if nessary

2.2.2.1 Response Components

2.2.2.2 Personnel

The implementation of 2 weekly IAP's and intensive response on 16/01/09 saw two separate teams of 4 people located on Lady Alice and Whatupuke Islands for 10 days periods to deliver the work. During their 4 days off, relieving crews continued maintaining the rollout and maintenance work until the core teams returned. This continued for 6 weeks when all personal were removed from the island stay and day trips commenced, initially with weekly checks, then extending the time period between. The involvement of experienced CIMS trained staff in Planning Team was significant in ensuring the resources were available when required. The redirection of the Island Weed Control team to the response and the scheduling and commitment of personnel (staff, contractors and volunteers) for an initial 3 month period provided excellent forward planning. The work by volunteers was found to be of equal standard to employed staff. The terrain and facilities on the islands required a robust assessment of participant's ability and this was carried out for all volunteers. It was identified that adequate time needed to be provided to ensure all participants are assessed and are suitable to do the task. The Department vessel and a contracted charter vessel were necessary for logistic support and checking adjacent islands.

2.2.2.3 Tracking tunnel/Trapping station network

A response network was rolled out across the islands based on 50m spacing of station sites initially along and off the islands existing tracks. Safety risks saw the steep and/or unstable faces excluded from coverage. The traps and tunnels were set as pairs at each site. Rollout started with the existing track system and expanded into side creeks, ridges and contouring, with the aim of no greater (approx.) than 150m from any given station (see Figures 2-3). The lines of the eastern shoreline of Whatupuke were established at a closer distance of 25m as a defensive line to prevent a potential invasion of Coppermine.

This was largely achieved within 4 weeks after the response commenced. The extent of coverage is recorded in Figure 3. A conscious decision, based on costs, advice and lack of sign encountered, was made not to further extend coverage into the few gaps remaining and to also reduce the frequency of checks. The frequency of station checks was also gradually widened from daily checks to weekly to monthly checks as the information suggested we no longer needed to invest such intensive effort.

It was found that to capture accurate trap/tunnel catch and night data required considerable resourcing especially due to faults in the field information, varying check frequency and the movement of stations etc so this was not maintained. Table 2 gives the number of tunnels and traps on the respective Islands at the peak of the coverage and an approximation for what number of nights the stations were present. The trap nights are not to be taken as the number of trap nights as no calculation or correction has been undertaken to account for varying checking periods and the unknown of at what point a trap may have caught or been or set off before checking.

Island	Tracking cards	Approx tracking nights	Traps	Approx trap nights
Lady Alice	221	26395	221	12086
Whatupuke	188	23506	202	16751
Coppermine	49	5662	5	365
Stack A)	2	68		
Muriwhenua	6	774		

Table 2: Total Tracking tunnel/trap station on islands at peak of response and as estimate of the number of nights present up until 22 May 2009.

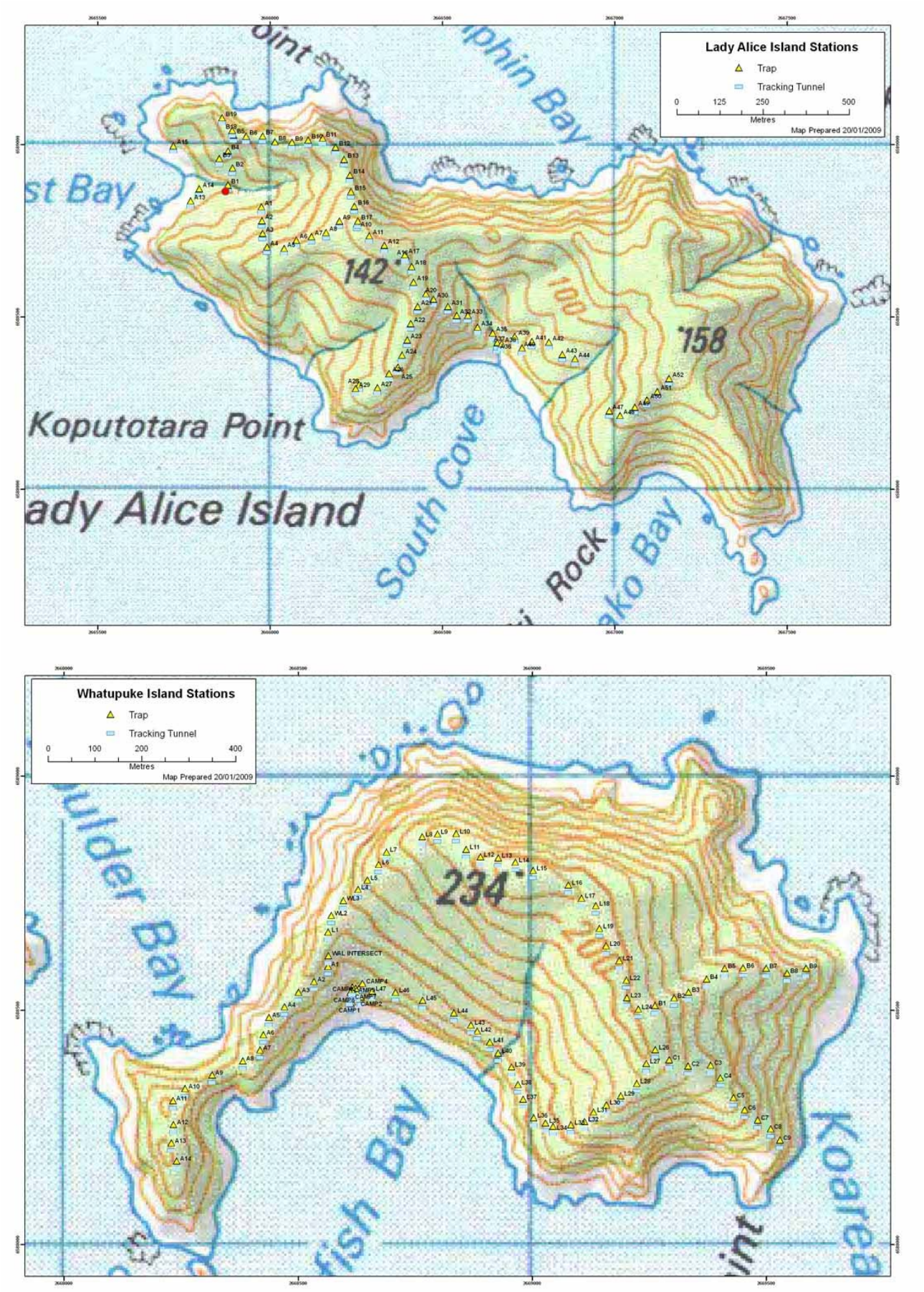
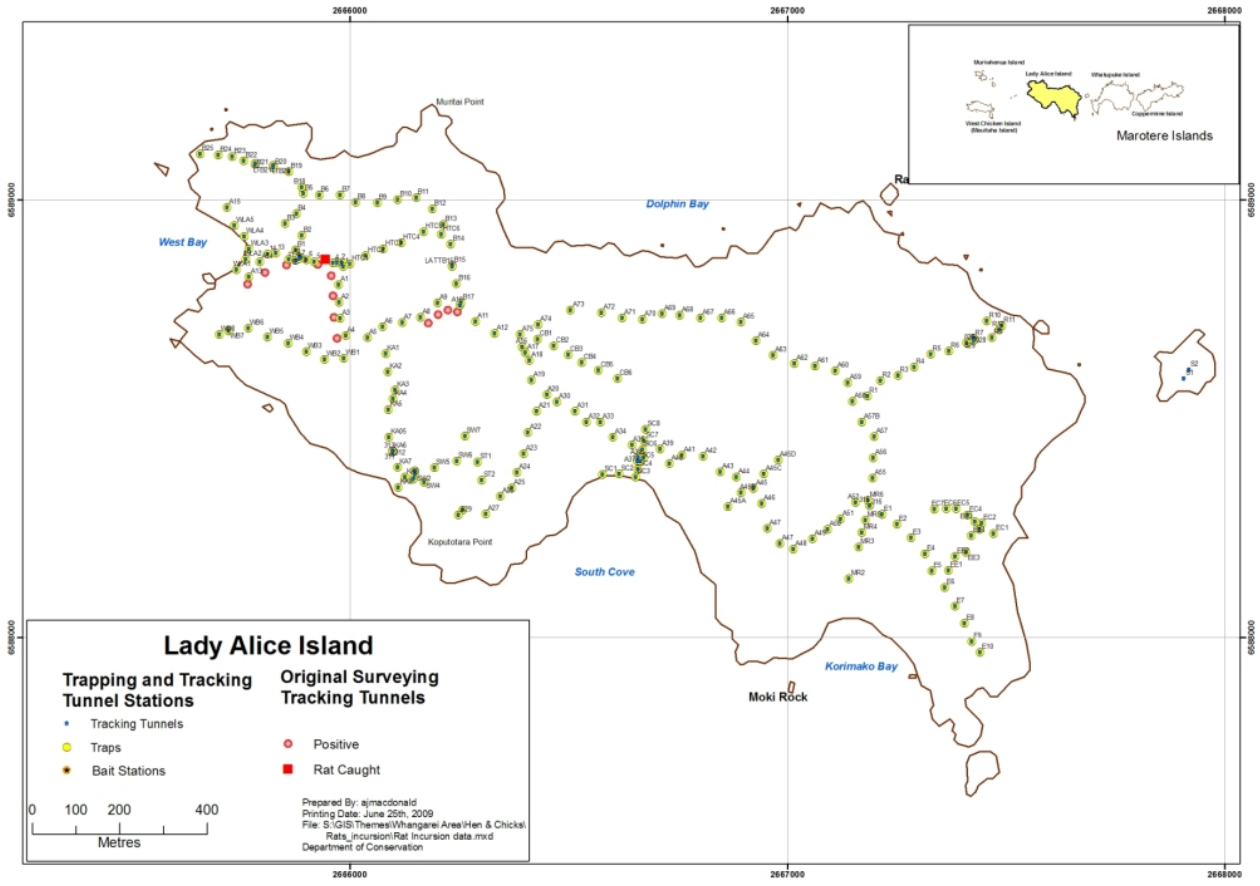


Figure 2: GPS locations of trapping and tracking tunnels lines on Lady Alice (top) and Whatupuke Islands (above) recorded on 20 January 2009.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South Cove
Korimako Bay
Moki Rock
Marotere Islands
Lady Alice Island
Trapping and Tracking Tunnel Stations
Tracking Tunnels
Traps
Bait Stations
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Rat Caught
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Prepared By: ajmacdonald
Printing Date: June 25th, 2009
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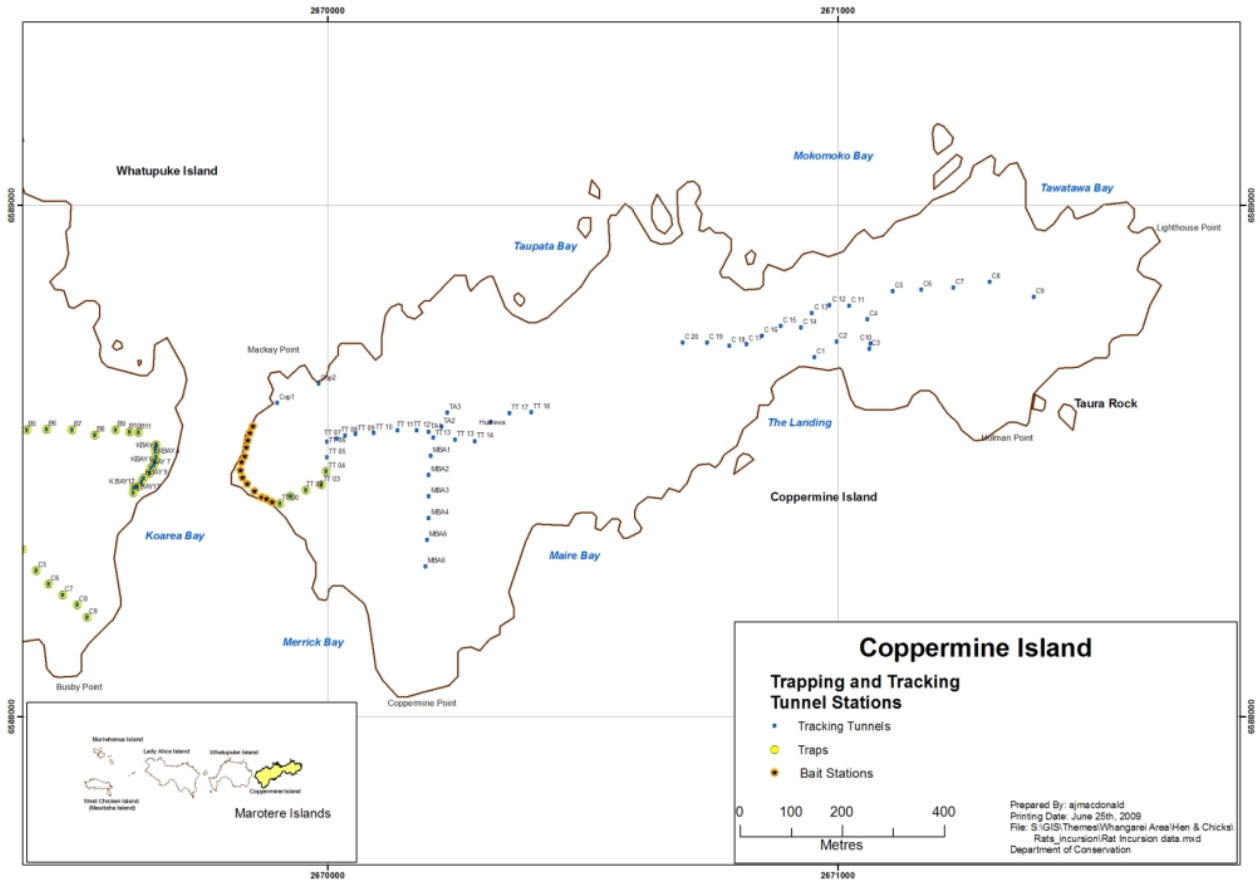
Department of Conservation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Koarea Bay
Maire Bay
Merrick Bay
Busby Point
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Marotere Islands
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Trapping and Tracking Tunnel Stations
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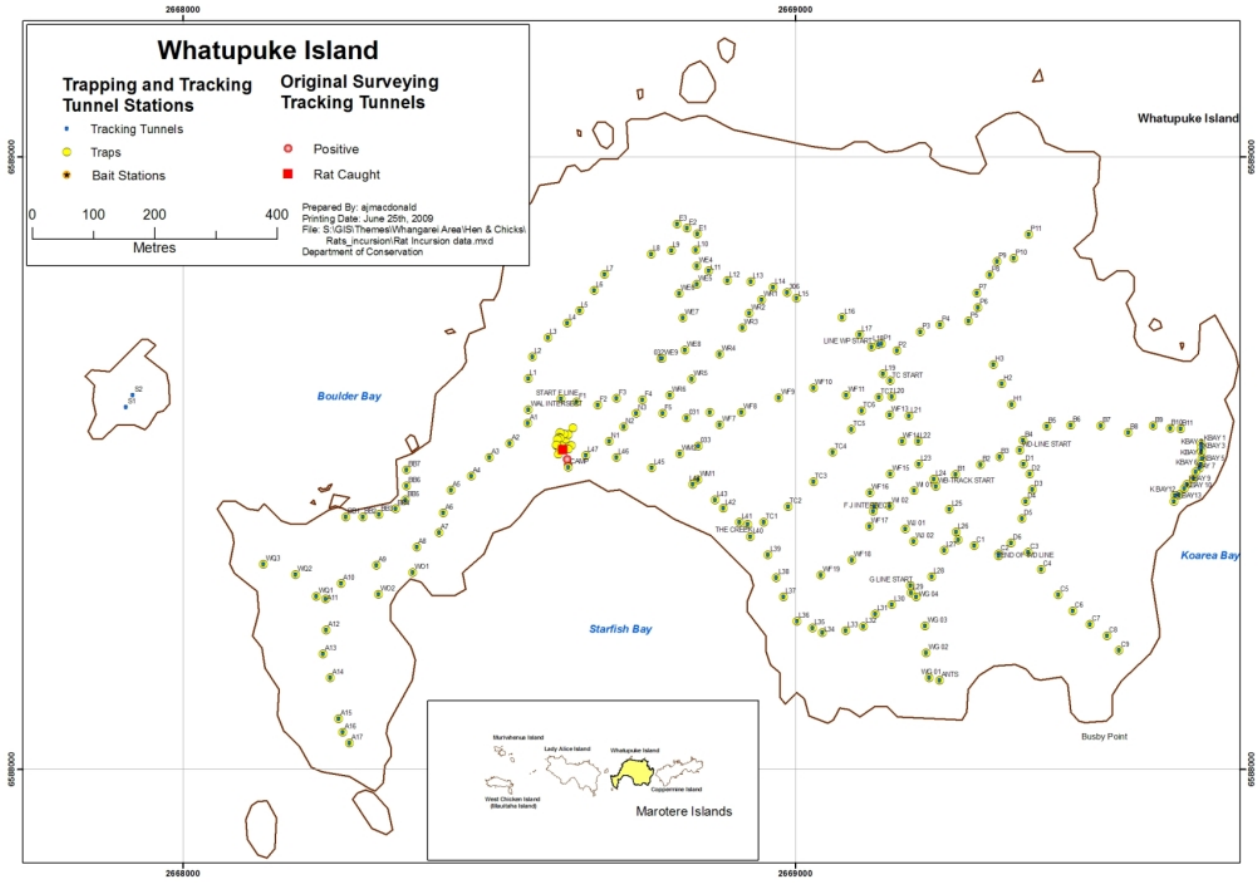

Figure 3: GPS locations of trapping and tracking tunnels lines coverage on Lady Alice, Coppermine, Whatupuke and Middle Stack Islands at the peak of coverage.

2.2.2.4 Trapping

'Victor Professional' and 'Supreme' wooden snap traps, Elliot, "bike chain" and Mongoose cage live traps were used during the response. Trap types used was determined by what was held in store by this office or assisting offices, checking regime and costs. No jaw traps were used. They were baited with a range of lures including peanut butter, cheese, white chocolate and bacon. The trapping response began the day after sign was recorded, in the areas where the sign was recorded and in the lower stream area at South Cove (Lady Alice). This saw approximately 39 to 73 snap and cage traps set at 10-20 metre spacing (high intensively – small area) to offering a range of baits and trap types. A male ship rat was caught on Whatupuke in a "bike chain" cage baited with bacon (after 1 trap night). On Lady Alice the rat was caught in an uncovered snap trap baited with peanut butter (checked after 4 nights) that was set .80m above group on an angled tree stem.

Snap trap lines were extended over these two islands at approximately 50m spacing along tracks and spurs to ensure wide coverage over the islands (see Figure 2 & 3). A greater intensity of traps were placed at the island camp sites where sign was initially recorded and the stream margins at West Bay, South Cove on Lady Alice and at the Whatupuke camp and eastern shoreline adjacent to Coppermine.

Traps remained set for 8 weeks (closed 17 March) on Lady Alice and 14 weeks (1 May) on Whatupuke following the initial rat captures with no further captures (other than non targets). Traps were all removed but trap covers left in situ adjacent to tracking tunnels should spring monitoring locate sign and to assist the marking of temporary monitoring lines.

Coppermine had a short line of snap traps set of the western shoreline as contingency for rats swimming over from Whatupuke.

The Victor Professional trap was found to be the easiest/best type to ensure a good set was achieved. The Elliot, Supreme and cage traps required greater care and experience to ensure consistent good sets were achieved and this was not always achieved even with training. Similarly staff understanding of what constitutes perfect trap placement sites was not always consistent in terms of levelling ground, clearing access ways, etc. The audit section below explains these issues.

2.2.2.4.1 Trap covers

The immediacy of response and gear available saw 4 different covers used – these were: Red box with one end blind/one wide open. White boxes with mesh on one end and a small entrance hole at the other, rough folded corflute and tin covers. Non targets were bigger issues with the red box, rough corflute and tin covers. White boxes offered the best non target protection. While the corflute covers were seen to potentially have a higher bio-security risk (egg case, insects), the cost and portability supported their use and any risks managed by using new or clean covers. The light weight of these covers identified that secure staking was necessary to avoid cover movement or being displaced. All forest birds, seabirds and tuatara were caught in open ended covers with the white boxes being the only effective excluders of these species. Albeit non target captures were still very low for the number of trap nights. These offending sets were modified by installing a mesh baffle over the entrance. It was also evident smaller lizards are impossible to exclude and therefore an unavoidable non target of snap trapping. Records show a total of 43 non targets caught, 35 of which were killed (as shown in Table 1) from at least 29,000 trap nights.

2.2.2.5 Tracking Tunnels/Cards

Black tracker tunnels and cards were deployed over Lady Alice, Whatupuke Island, Coppermine, Mid stack and Muriwhenua Islands.

Due to shortage of resources and delay in orders to arrive at the outset, make-shift tunnels and small number of red ink pads (on Coppermine Is), were used until sufficient black tracker tunnels and cards were arrived.

Dating and labelling of tracking cards was patchy. A stamp template was designed and used to ensure cards had headings to ensure all information required to be collected. Insect, lizard and seabird sign saturation was an issue in some sites that indicated a need for more frequent card replacement. Shifting the tunnel a matter of metres often eliminated non target interference. Dry conditions (Jan early Feb) also affected the longevity of the ink with the red ink found to dry in 1-2 day in the driest period. As a guide the cards were good for 4 weeks in damp, cool conditions and 2 weeks in dry conditions or with non target interference.

2.2.2.6 Trap by-catch

A number of non target species were caught in the traps (see Table 2). While those caught in live capture traps were subsequently released, captures in snap traps were killed in almost all instances. While the use of snap traps was carried potential risk to some fauna on the island, their use was seen as critical to ensure an effective response. Emphasis was placed on minimizing by-catch by the placement of traps covers but protected species were still killed especially Duvaucel's geckos. These lizards were known to have significantly increased in abundance since the removal of kiore and the number killed during the response of little conservation significance. It was suspected that fine setting the traps increased the rate of by-catch. The by-catch fauna killed was frozen and held for use to assess for the presence of brodifacoum toxin which has been used in pest control on these islands in the past.

Location	**Lady Alice**		**Whatupuke**		**Coppermine**		**Total**		
Species	*Dead*	*Released*	*Dead*	*Released*	*Dead*	*Released*	*Dead*	*Released*	*Full*
Pycroft's Petrel	3	0	1	0	0	0	4	0	4
Duvaucel's Gecko	6	3	14	1	1	0	21	4	25
Saddleback	0	1	2	0	0	0	2	1	3
Thrush	1	0	0	0	0	0	1	0	1
Northern Tuatara	1	0	0	1	0	0	1	1	2
Red Crowned Karkariki	0	0	1	0	0	0	1	0	1
Ornate Skink	0	0	1	0	0	0	1	0	1
Egg Laying Skink	0	0	2	0	0	0	2	0	2
Crab	0	0	0	0	1	0	1	0	1
Black Bird	0	1	1	0	0	0	1	1	2
Starling	0	1	0	0	0	0	0	1	1
TOTAL	11	6	22	2	2	0	35	8	43

Table 2: By-catch from trapping on Lady Alice, Whatupuke and Coppermine Islands.

2.2.2.7 Field Information, Quality Control, Audits

A key facts sheet was given to all team leaders informing of the background to the incident and key facts relating to ship rats and our response. Instructions on the tasks to be carried out by the island response personnel were given in both verbal and written form. It provided an island map and information on the marking tracks and stations (orange flagging tape and CPS fixes), setting of tracking tunnels and traps. Demonstrations were also given to party leaders if not known to be competent in the delivery of the tasks. Each Island camp had an information board that provided a further copy of all instructions, emergency responses, and, island track systems/monitoring line maps. Field record note books were established with basic data codes and standardised formatting for data recording.

In addition to field checks by CIMS managers, three trainers/auditors were sent to the islands to demonstrate and audit that the prescribed standards were met. All suspicious sign (droppings or in tracking tunnels) were reported immediately to the CIMS team for their directions on the response, with the sign (predominantly tracking cards) rechecked/audited by the Planning team.

Only on one occasion did the island teams report possible rat sign in a tunnel that was confirmed to be seabird sign. The audits revealed that there was a variance in the standard of monitoring work (marking of tracking, numbering of trap/tunnels and setting of traps) with the biggest risk being a poorly set trap resulting in a rodent escaping and becoming trap shy. The Victor snap traps required the least skill to achieve a good set.

2.2.2.8 Poison

The decision was made to minimise the use of toxins on the Islands, with Talon (Brodifacoum 20WB) poison only used in 13 wooden tunnels at 12 metre spacing's along the western shoreline of Coppermine Island. While no rodent sign was recorded on Coppermine Island this action was taken to provide a poison offering along the Coppermine shoreline should a rat have swum from Whatupuke Island. The toxin was removed on the 22 May with none having been consumed.

The preparation for an application for resource consent under the Resource Management Act (Plan B) to apply an aerial application of toxin (should it be necessary) was stopped on the 5 February when no further rats had been caught (in 3 weeks) and thus, negating the need for early action and expenditure. At that time a further 10 days of work was required to complete the application, Operation Plan, Monitoring plan and meeting with Iwi, Northland Regional Council and Medical officer of Health.

2.2.2.9 Rodent dogs

Two rodent tracking dogs were used to check all the islands in the Chicken's group with the exception of Mauitaha where kiore were present. Miriam Ritchie completed 7 days and Finn Buchanan 3 days working on the island on Days 2, 7, 11, 16 and 20 to 22 of the incident. GPS tracking was implemented to record areas searched (see Figures 4, 5, 6).

The use of a rodent dog on Day 2 indicated rats at Lady Alice in the 150 m vicinity where tracking tunnels had found rat presence. The dogs indicated no further rat presence on the islands following the second rat capture on Day 6. Similarly no rat tracking in tunnels or traps recorded rat presence after this date.

Early morning, late evening and cool days were seen as the optimal time for a dogs potential for indicating sign but transport requirements and handler availability made optimal use difficult to achieve.

The limited availability of certified rodent dogs was a constraint in preventing a full and thorough search of the island as preferred. It is critical to have rodent dogs readily available for these incidents and to have a clear response/call out procedure for island managers. However the work conducted was sufficient to determine that the incursion was not a large infestation, or wide spread and a reliance on tracking tunnels and traps to locate potential sign of any isolated individuals eventually surfacing, was considered acceptable.

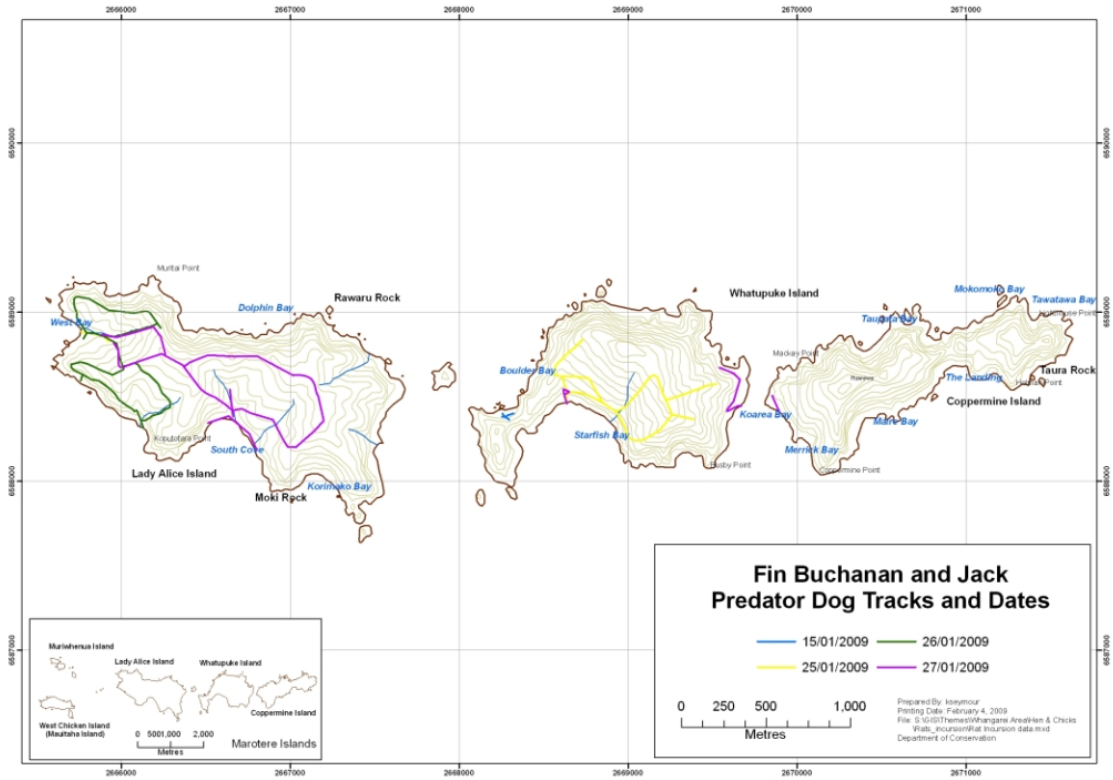

Figure 4: Record of dog coverage by Fin Buchanan and Jack (dog) for period 25-27/01/09

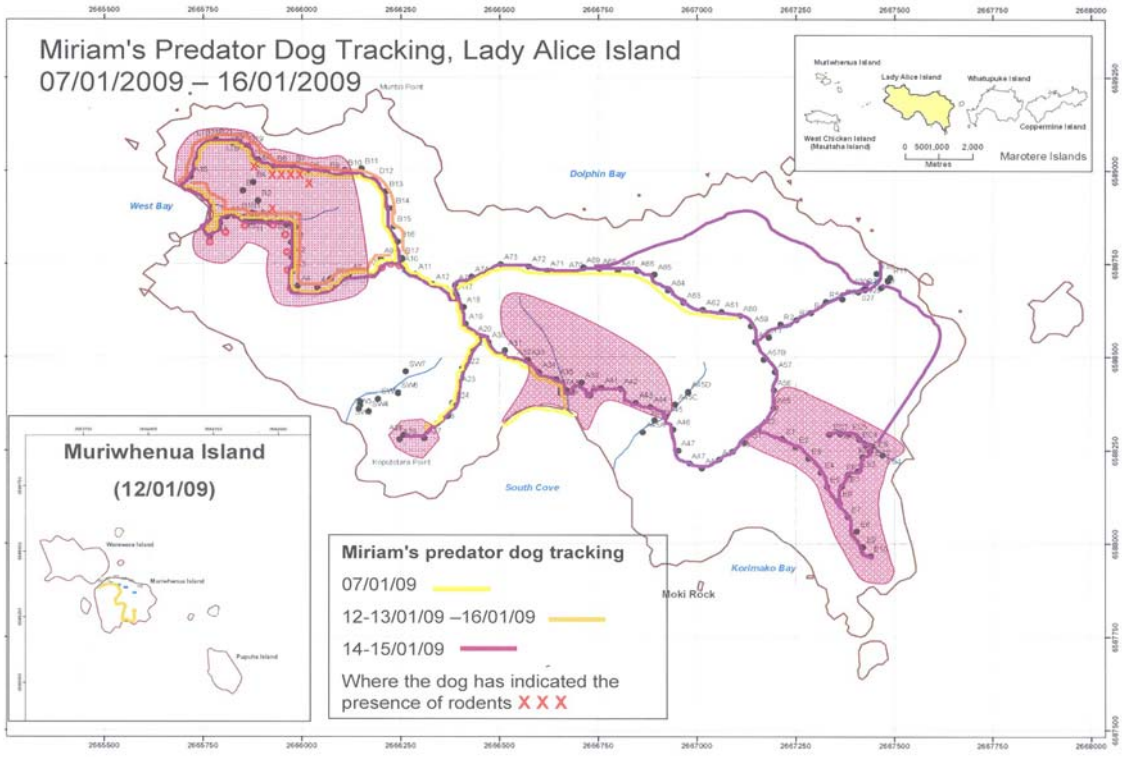

Figure 5: Record of dog coverage on Lady Alice Island by Miriam Ritchie and Occi (dog) on period 7-16 January 2009

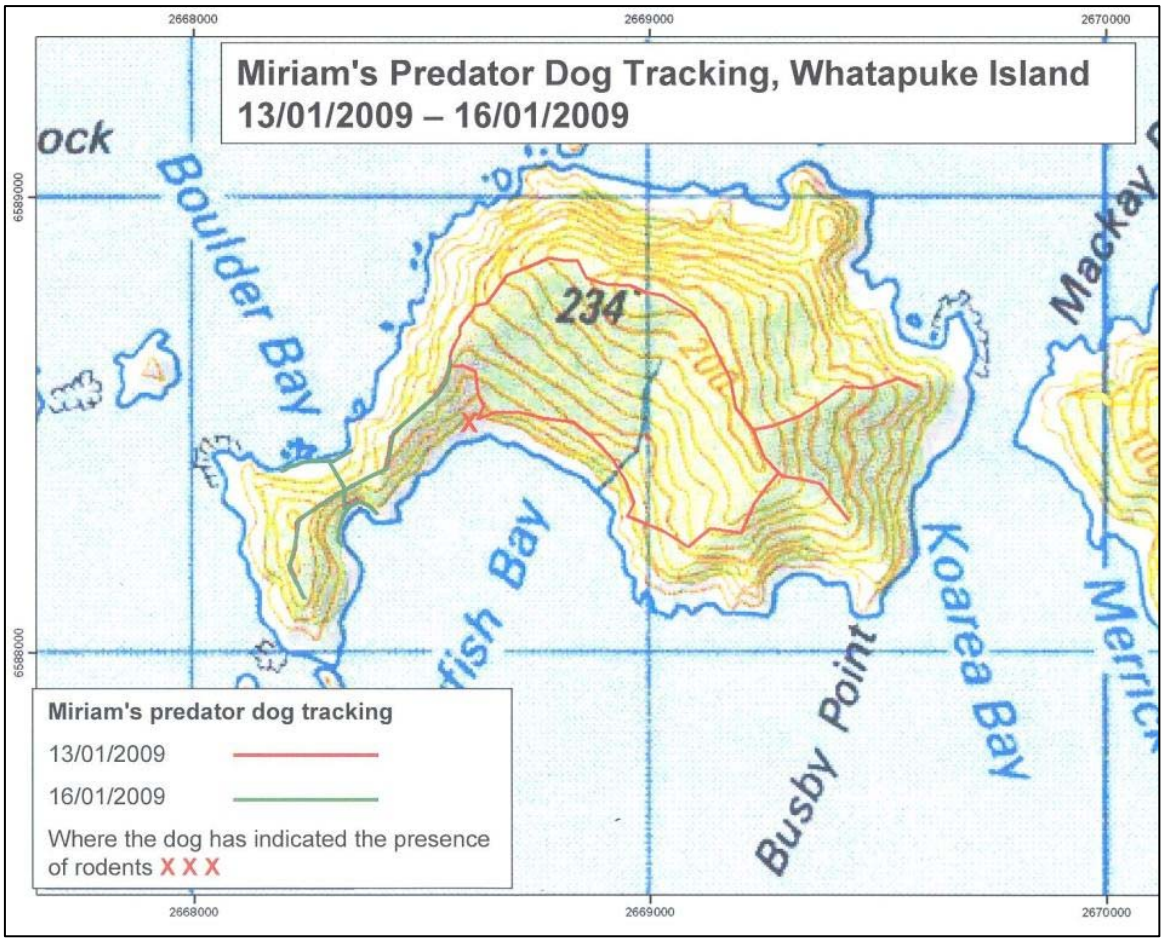

Figure 6: Record of dog coverage on Whatupuke Island by Miriam Ritchie and Occi (dog) for period 7-16 January 2009

2.2.2.10 Judas Rats

Animal ethics approval was gained for the use of Judas rats. Led by Idan Shapira (in association with Massey University), this was implemented on Lady Alice Island. This was a trial session for the detection of free rats: on the basis of olfactory communication to detect rat activity (if present) with the aid of caged rats. It was also used to test the technical difficulties and the intervals needed for monitoring the caged animals in terms of transport, water and food supply and the animal's welfare. The experiment used nine Norway lab rats (5 female, 4 male) and 1 male ship rat. The timeframe did not permit time to capture a complement of ships rats. No sign of rat activity was recorded over the days the work occurred. However, it is highly possible that the rat trapping event prior to this experiment had removed any free rats. The work provided valuable field testing of the deployment of domestic maintenance of animals in this enclosure. Further work with caged rats is warranted in areas with wild rat present to determine the application of this rat monitoring/capture technique. A link to the field report is in the appendix.

2.2.2.11 Mapping/GIS

The response work was supported by a GIS Officer (GIS) to map the response effort of delivery staff, such as the GPS's location of monitoring units (bait stations, tracking tunnels, traps, predator dog tracks) and incidences of captured rats. Field staff captured the information in notebook and GPS which was returned with the party (5-8 day intervals) from which maps were produced. These were electronically stored in a specific folder in the Whangarei Area Office S drive and accessible when required. Hard copy of these maps (showing station/trap locations) went out with each party with a copy located on an information board at each camp to manually record changes during that field trip. A person was tasked to collect all GPS and convey to the GIS officer.

2.2.2.12 Issues

A standardised naming systems was directed to be used for monitoring station (traps, tunnels etc) however teams repeatedly struggled to maintain a consistent approach. For example: Lady Alice Island lines and traps were to be established at LA, LB etc, with station numerically ordered however this did not entirely occur with mistakes in station numbering or the adding of extra station in the line later which resulted in an inconsistent labelling sequence. Similarly in recoding data to CPS some stations were missed and others were doubled up. These issues meant considerable time was wasted trying to sort the raw data and compromising the accuracy of some data (e.g. trap nights, number of stations) and the GIS mapping.

The time between the installation of the monitoring trap/station etc and being transferred to electronic maps was dictated by transport availability and costs. Issues such as shortage of suitable GPS's, staff forgetting to leave them for the next crew or not looking thoroughly in storage barrels etc meant GIS maps were always a few days behind the on the ground reality. This shouldn't have been an issue if the team leader gave a good briefing at hand over time and used the manual maps on the island to highlight these. However on occasion the quality of information transferred between these teams at changeover did not achieve what was required.

Though a single contact point at the Area and Conservancy used to handle the collation of GPS data their unavailability when data was to be collected (affected by varying time teams returned to the office), obtaining the GPS data and obtaining up-dated maps from the data was an issue.

2.3 Communication and Information Distribution

This was led by Whangarei Office Community Relations Programme Manager (CRPM) with the initial spokesperson being the Incident controller (IC). Demands on the IC saw full responsibility for all aspects of the role lie with the CRPM. A verbally agreed communication liaison plan was completed as compared to the formal written plan and found to be adequate with no shortcomings identified. The key initial functions that were completed:

- ⇒ The MTMAS to MoC's Office, Head Office staff or advised by the Conservator
- ⇒ Construct a formal media statement and have available for DOC spokesperson at HO
- ⇒ Communicate information to internal staff and inform them that all questions are to be directed to the spokesperson
- ⇒ External communication activity to be initially proactive, and then be restricted to responses to media enquiries and public requests for information

Key parties first advised were Ngatiwai Trust Board/Hori Parata, Islands Invasive Advisory Group, Tuatara Recovery Group, internal/external technical interests) on day 2 of the response.

A public media release was made by the Department on day 7 with the delay awaiting direction as to whether the Minister wished to make the release. Proactive engagement was made with local radio and newspapers with TV3 who gained prior notification and visited the island on day 7 to complete a report that ran in that evening news. See WAO Electronic S drive for TV coverage report. High media interest was expected and procedures were put in place to be proactive (not reactive) in managing this. However, this demand did not eventuate due to other hot media topics at the time. Each new CIMS action reports were circulated to key parties (and DOC Offices/technical staff) to inform of the present situation and actions occurring through the use of an email distribution list.

The immediate involvement of the Ngatiwai Trust Board and media release was seen as an important component of the response.

It was considered that the media aspects of this incident were well managed and it was used as a good opportunity to highlight the importance of Island bio-security to the public. Other media comment can be found at: dme:\\docdm-387235 and MTMANS report: dme:\\docdm-387197

2.4 Finances/Costs

An initial estimate (based on the recent Auckland response) suggested a potential response cost of $50,000. The direction was to respond as necessary and funding would be sourced. At the commencement of the project a special financial code was established to track expenditure. While this recorded all costs for which invoice payments were made, there were other significant response costs that did not get charged against the project. The most significant component would relate to personnel costs of Departmental staff involved. Staff came from many DOC office locations (Whangarei, Warkworth, Auckland, Kaitaia, BOI, Kauri Coast, Coromandel and Northland Conservancy) and their salaries and travel costs were covered by respective Offices where the individuals were employed. This resulted in personnel costs for a small amount of time paid at time 1 to staff having to support the project in excess of the normal 40hr week and 5 contractors for 6 days. There was also significant volunteer support for which no personnel or travel costs were incurred.

The seriousness of the rat incursion and the direction to initiate an immediate comprehensive response saw the need for the sourcing or purchasing requirement to support two field camp teams of 4 people on trips of up to 10 days on two islands and checking 3 other islands for several months. **The understanding that funding would be made available to support the response was significant in the achieving a strong response**. Direction that this office had to fund the response in the 3rd week of the response saw a refocus to ensure tight cost control was maintained. Contractors were minimised and greater use made of volunteers. In hindsight perhaps some non essential items were purchased due to the extent and length of time the response was required to achieve eradication being unknown and the urgency of actions. However it is believed less than 5% of the expenditure could have been reduced if the funding source and tighter financial by a separate auditor before purchase had been implemented but this would have slowed the operation implementation.

While the initial response was within the capacity of the Area Office, the scale and length of the response progressed this became a major concern and a factor in influencing decisions. If it was not for the labour supplied at no cost to this office the response is likely to have been significantly reduced to what occurred. To what extent this may have resulted in a different result is unknown.

Incursion Response Costs (to 22 May 2009)

Total Invoiced (funded by Whg Area Office see project – 6101115003)			$43081
	Hours		
Estimated Labour Costs (not charged to the project)			
Whangarei Area Staff	1840		
Other Areas (Coromandel, Waikato, KC, BOI, Kaitaia-8x48)	384		
Northland Conservancy (CIMS: 130-Audit: 8, field: 12)	140		
Total hours	2364		
Using average value of $25/hr cost this at to		$59100	
Other field allowances not charged were approximately		$400	
Vehicle (covered by other Areas) estimate		$800	
			$60300
Total Department Cost estimate			$103381
Note this excludes:			
Volunteer hours contributed amount was a minimum of	500		
If similar labour costing was used of $25/hr		$12500	
Total of response was a minimum of			$115881

2.5 Safety

Hazard Identification and emergency procedure briefings were conducted with all teams. Safety Management Plans were distributed to all teams and held at all campsites for full referral. Potential risks in gaining coverage in steep and unstable terrain on the islands saw those areas not receiving station coverage. One specific safety audit was carried out at Lady Alice camp which identified several minor actions to be considered. First aid, disinfectant, hand wash, fire extinguishers were part of the basic items provided to all camps. One minor incident occurred involving a self-inflicted minor laceration with a machete – the individual had chosen to use the machete without wearing the appropriate PPE.

2.6 Conclusions

- Though rats may exhibit neophobia and were at very low density on a relatively pristine island where abundant food assumed present, they were caught between 1-3 days of setting traps where sign had been recorded.

- It has not been possible to determine how the rat incursion on Lady Alice and Whatupuke Island occurred though believed to have involved conveyance by vessel at some stage.

- Since the initial rat captures on the two islands, 4.5 months of monitoring (using traps, tracking tunnels, rodent dogs and Judas rats) has occurred on Lady Alice, Whatupuke, Coppermine, Stack A and Muriwhenua, with no further evidence of rats.

- The response actions and results are sufficient to conclude that only a low number of animals were present on two islands at the commencement of the response. It is believed that no further animals are present however only further ongoing monitoring will confirm this.

- Response staff commitment and funding were seen as the key pillars in implementing and sustaining the incursion response as well as its final conclusion. Having staff skilled in the implementation of CIMS is important, as is the need for their structure to be well supported through to the conclusion of the response, to ensure staff, or the response success, is not put at risk.

- The use of the CIMS was critical in the quick and effective implementation of the response, supported by having people experienced in the roles. The pressures on the key CIMS managers (having to perform both a CIMS and their primary role) saw inappropriate pressures on them and affected their ability to deliver the role to the level desired in the establishment phase. Similarly, in the downsizing period and reduced CIMS structure saw the reduction in close monitoring of field work which resulted in a decline in the confidence of work and data.

- Confirmation of funding (amount and source) is critical from the outset of response planning to enable an appropriate response to incursions when detected.

- As the time period of no further rat captures or sign (after day 6) lengthened, issues of approaching winter weather, costs, sustaining effort, whether to continue to extend coverage or reduce/stop monitoring, became a major operational decision. The current advice of "when to call an Island pest free following an eradication attempt" was not applicable and a combination of the considerations above were used in deciding to downsize and then cease monitoring for an extended period. Only future monitoring on Lady Alice and Whatupuke will determine whether our decision to scale back in the manner in which we did, was the correct option.

- The last tracking station check was conducted on 22 May. With no sign found it suggested there was no benefit to continue ongoing monitoring of this nature until October when spring activity may possibly surface.

- Rat(s) may be easier to detect in winter when they are hungry by placing rat boxes containing food to record presence (by feeding sign). Placement at the sites on Whatupuke and Lady Alice where the rats were caught should be considered.

- It is unknown if certain individual rats may have avoided the traps and tracking tunnels completely. If further rats are found on these islands DNA from the rats killed may assist in determining whether they were from this event or a further incursion.

- While there is an annual islands rodent monitoring procedure currently in place to confirm the presence of this incursion, it can not be assumed it is sufficient. There is benefit in maintaining an increased level of monitoring to the current annual regime during next spring/summer.

- The risk of future incursion from vessels visiting the Islands shoreline remains, with no practical management actions identified to eliminate it.

2.7 Recommendations

2.7.1 Recommendations for future monitoring in response to this incursion

- Rat boxes containing food be placed on Whatupuke and Lady Alice and corflute feed/indicator cards be placed on these islands as a monitoring technique over the winter period and assessed for sign and future use in October.

- Tracking stations on Lady Alice, Whatupuke and Coppermine Islands have new cards installed 27-29 October 2009. Old cards will be removed and checked for sign. The new cards rechecked 12-14 November 2009.

- Rodent dog work should be undertaken on the tracks on Whatupuke, Coppermine, Lady Alice, and Muriwhenua Islands also in November.

- Timing of the above takes account of the season factors (rats, weather) and timing to implement a response pre Christmas if necessary.

- A further monitoring station assessment would be undertaken in mid January and cards checked 8-10 days later. If no rodent sign found the trap covers and tracking tunnel coverage reduced and the eradication incursion deemed successful.

- That the Whangarei Area expands their existing contingency surveillance tracking tunnel network and establishes names and numbered permanent tunnel sites on the islands at a 50m spacing. This would be usable as a network base to expand from when needed for an incursion. This work would occur post the November recheck for implementation in January.

2.7.2 Recommendation on the work undertaken during the incursion

- Incursions are likely to continue to occur, so consideration need to be given at a regional or national level on funding of a response as the funding capacity of an Area office may limit the success of the response.

- Having staff skilled in the implementation of CIMS is extremely valuable but critical their structure is well supported right through to the conclusion of the response to ensure staff, or the response success, is not put at risk.

- That the National Island Bio-security SOP incident response form be modified so that it is better suited as a planning tool than a data reporting tool. These forms should be based on standard Co-ordinated Incident Management Systems (CIMS).

- The Northland Conservancy give high priority to updating of the Conservancy Island Biosecurity Plan including:

  Updating the Northland Biosecurity Incursion Response Plan providing SOP information – how to set traps, record data, establish lines, station spacing etc and direction post-capture monitoring and demobilisation/clean up.

  Also the key documents (Task instruction, data collection etc) created during this operation are included as appendices to be used as templates for quick and easy access. This is to ensure line establishment prescriptions and data collection, right from the outset of a response, are consistent and uniform.

- That consent for use of ground application of toxins for a further 5 years is applied per DOC Animal Pest SOPs. If difficulties, then a pre-designed consent application to submit if the situation arises for signoff by the Area Manager.

- That the National Predator Dog Team gives priority to incursion on pest free islands over work such as trials and routine checks when they occur.

- Further work undertaken on tunnel design, height of trap cover entrance, materials, ground security, non target friendly, rat attractive etc.

- Support further field testing in the use of Judas rats so the method and designs for holding Judas rodents can be adopted as a best practice. Generic open Animal Ethics approval that apply to all operations being undertaken under the methodologies and prescriptions used. Consideration given to a number of holding cages being built to the specifications. These actions would enable quicker engagement of this tool and avoid the need for repeat application requirements each time.

2.8 Acknowledgements

There are a considerable number of people (e.g. volunteers, associates, staff etc) who gave a tremendous commitment to the incursion response in many ways. To start identifying each individual would see a greater number of pages than above so it must be just a simple “Thank you for your contributions”.

2.9 Appendices

2.9.1 Judas Rat Report dme:\\docdm-430946

2.9.2 Image Gallery dme:\\docdm-435758

DEBRIEF 26 MAY 2009

Response to Ship Rat Incursion on the Chicken (Marotere) Islands

Attendance:

John Gardiner, Keith Hawkins, Andy Robert, Glen Coulston, Steve McManus, Nigel Miller, Clea Gardiner, Julie Redwood, Bryce Lummis, Andy Cox, Ben Barr.

Apologies:

Clive Stone (Ngatiwai Trust Board)

1. Preparedness

1.1 SOP Directions

The following record the actions taken when measured against the operation flowchart in Part IV Contingency plan for pest invasion of islands in Northland

Performance standard	Response taken
1. Pest invasion is suspected or detected	***Incursion confirmed at outset***
2. Inform Programme Manager	***P.M. present when rat sign found***
3. Notify Area Manager and CTech. Officer	***A.M. advised on confirmation of sign*** ***CTO not advised***
4. Implement the pre-set plan	***No current preset plan. Existing one under review with scoping issues***
5. Area Manager Responsibilities	
• Ensure that CMIS is used in the incident-response & appoint an IC	***CIMS response implemented***
• Ensures this contingency process followed	***Achieved***
• Decision-maker for any contingency response inline with approved delegations	
• Keep Conservator and appropriate staff informed	***Achieved***
• Ensure that there is financial control over operations	***Completed***
• Area Manager appoints a skilled person to the role of IC	***Completed***
5. Incident Controller responsibilities	
• Co-ordinate/use CIMS and control the operation	***Used throughout***
• Keep Area Manager and other appropriate staff informed	***Regular briefings/emails***
• Ensure a completed Incident Record Form is held	***Completed***
• Ensure an incident log is initiated and comms with Islds	***Established & maintained***
• Obtain expert advice to develop an action plan	***Completed, IEAG, other experts***
• Prepare an action plan to resolve the invasion incident	***Completed IAP's***
7. Obtain expert advice	
• Obtain experts advice, should have input into the response, including the development of an action plan	***Expert group participated in planning***
• A.M. &d TS Manager approve/consult over approved experts	***TSM/staff support throughout***
10. Determine priority & urgency, and plan the response	
• Assess the island's values to determine contingency response	***Undertaken***
• Ensure that risk assessment for native species present	***Undertaken***
• Consultation with iwi and other interested parties may be required	***Briefed at outset, iwi involved in CIMS***

• Media liaison staff may be required	***Appointed at response outset***
Prioritising the contingency response that has a High consequence that may need additional external resourcing	***Identified at start cost could exceed $50,000***
The following questions need to be considered:	
• What are the constraints?	***Financial identified day 10***
• How long should the operation run	***A review at 6 & 12 weeks***
• What are the predictable results of the operation?	***Unknown at planning***
• What are the key operational targets and decision points along the way?	***Determine by extent of infestation***
• Decide on trigger points for reducing checks on the pest e.g. after how may days/months of no sign?	***Determined review at each IAP and stop after 3 month no sign and review***
Prioritising the contingency response	
• The response plan be prepared	***Eradication by Plan A otherwise Plan B***
• Decide of treatment method	***Completed e.g. traps, rodent dog, tracking cards***
• Decide on the regime of pesticide application	***Toxin only Coppermine otherwise Plan B***
11. Response Plan approval	
• Area Manager must approve the Response Plan	***Completed***
12. Implementing the Response Plan	
• Ensure safety in the whole operation	***Safety Plans, briefing audits completed***
• Obtain approvals (DOC, Resource Consents etc)	***Only Ethic Committee Approval required***
• Follow requirements from other SOP	***Completed***
• Ensure the public notification & media updates	***TV, newspaper & email coverage***
• Maintain clear lines of communication between IC experts and response team	***Briefing given, audits undertaken***
13. Monitor and review progress	
• Establish monitoring programme	***Audit undertaken of field work***
• Individually number and map all bait stations/traps	***Implemented***
• Check control measures at a regular interval & keep accurate records	***Audits carried out***
• Review operational plan if required	***Reviews occurred at each IAP***
• IC & experts to review success	***Actions in reviewed plan sent IAEG***
14. Debrief and review	
• Debrief within one month of the completion of response	***Held 26 May 2009***
• Copy of debrief to file	***Completed and saved to dme***

2. Incident Response

2.1 Incident Response and Management

The use of the Incident action plan emailed to relevant parties was a good communication tool that worked well keeping everyone up to date.

During the early stages the IC was over committed trying to organise logistics planning and assisting with the implementation, greater support in the areas of Planning and Logistics would have increased the ability to respond more quickly and also to develop longer term plans.

The CIMS system was essential for a good structural base to the incident. Staff need to be practiced and experienced which comes with using the approach, Focus is essential and distraction by the normal work day need parking as a lesser priority,

2.2 Incursion surveillance response

Well established permanent surveillance tracking tunnels (best practice) made of wood and set out to a layout plan that can be built on important. Rats bouncing around immediately after incursion. Sparse but wide spread surveillance best network. December-January picking up high use period. Use of dogs. Utilise teams staying at camps for “no cost” extra surveillance.

Look at research already available for toxin palatability, longevity etc and do what you think best, but, lobby for more research at its apparent there is a real knowledge voice with rodent toxins.

Get all by-catch samples in freezer sent for assayed for toxin residue in light finding brodifacoum in 2 out of 6 samples tested.

Pose the question to Raewyn and Keith’s group for advice on the toxin use option/

Communications networks designed as part of a CIMS framework need to be maintained throughout the incident. As scale of incident down sized, the Comms plan in the IAP should still be maintained but reflected the incident needs.

2.3 Logistical support

Logistical support was established to resource the operational needs. It was highly efficient. Only operational constrains arose from estimates of the quantities required, keep costs down and time lags for freighting. Supplies procurement and cost efficiencies were gained as the programme continued and systems for purchasing were standardised.

There was also a need for more 60csx GPS equipment as every team unit of the island establishing lines should have had one. Use of 72 and 76’s were ineffective under canopy which hampered accurate plotting at the time of installation and hence delayed mapping actual coverage.

If practical teams despatched with pre-prepared templates so that the naming and recording system starts and remain consistent throughout.

2.4 Planning and Advice

Response strength was the early contact and the quality of advice (IEAG). Use of pre-plans for the initial response scenarios would to aide reactive response would have assisted. Dust off and revamp the 'expired' Northland Island Contingency Response Plan ensure it contains on how to rollout the initial network of traps and capture data needs.
Transfer of GPS to GIS delayed and mistakes. If a remote location and people appropriately skilled deploy a computer and software to the field camp where GPS material can be downloaded and electronic maps checked, used in field. Correct data email or returned the date on USB for map production and CIMS operation requirements. The downloading of data and returning it on a USB stick also has the advantage that the GPS and data continued remains in the field for the replacement group.

In addition designate a person (with a back up) on the delivery team for each IAP to be responsible for managing GPS data collection and ensuring the field data, GIS down load info are corroborated before producing maps.

2.5 Equipment

Traps: Don't bother about using Elliot live capture traps too much risk of operator error and escapes.

Response kit: Review contents and ensure instruction for gear application present including revised 'Northland Island Contingency Response Plan'. Important to ensure consistency and compatibility of response kits across Areas so better combined response in incursion.

Tracking cards: Ask Agnew to add recording prompt on cards to improve field data recording.

GPS: Use ones with capability to read under canopy e.g. 60scx.

Trap covers: Review the traps cover holes sizes in best practice. Longer pins needed for trap covers.

Request Best practice advice on reviewing this response from Keith B/IEAG-what could have been done better e.g. traps types etc. Also currently DOC best practice standard would benefit having comment on the reasoning behind it- to assist field staff deciding the best action when there are other factors to weigh up e.g. funding, site issues etc. Explore options to improve attitudes of the public for bio-security awareness. Need to do more (novel approaches or opportunity for public to visit and promote a Community driven messages out rather than bureaucratic preaching.

2.6 Operational

2.6.1 Personnel

Consistency of skill base highly variable. More time spent on training and doing practice before. Recognise the value of volunteer's contribution. Opportunity to be involved, advocates and the work delivered.

2.6.2 Use of Judas animals

Information gathered from Massey University during the capture operation indicated that this is likely to be an effective tool. Continue to support development of this tool.

2.6.3 Use of Dogs and rodent detection

Can only work with what we've got. Dogs are an independent check. By nature of the effort to get dogs to standards there will never be enough to deliver everyone's needs around the country.

Coverage was enough to deduce we did not have a major infestation, but probably not enough coverage to thoroughly search the islands for the scenario of identifying isolated individual rodents. There was no information available on the timescale that would be required to gain a comprehensive coverage. Advice on the time require for a through search with dogs should come from the Dog handler to the IC based on the weather, topography, terrain and the animal being used once the handler was ashore and ware of the sites circumstance. Handlers needs to be available to go and stay on the job as long as it takes to gain the coverage required rather than be time bound by other work commitments as was the case.

The time frame and dog effort per hectare varied depending on the type of terrain; handler/dog agility, weather conditions affecting this etc.

Prioritising dog deployment on such incursions needs to be formalised nationally as priority until the incident is addressed adequately,

Dog effort was not optimised due in part to reality of logistics for travel arrangements. This resulted in searching during the heat of the day, being a lot less productive than the cooler part of the days and immediately after nocturnal foraging when scent lingers. Longer on-island stays could have addressed this.

2.6.4 Trapping operation

GPS marking of traps was incomplete because of a shortage of units and people who know how to use them, but, it was identified as important that the traps be well marked and recorded as they are likely to be checked and lifted by a different person that laid them.

Non-target By-catch issues: Lizards are unavoidable, but by-catch needs to be minimised as much as possible without compromising the maximum chances of rat capture. This was reactively addressed throughout the operation, but, to what extent the exclusion modifications to tunnel and trap entrances made on attractiveness to rodents remains unknown and untested.

2.6.5 Poisons use

Brodifacoum use if recommended in the National Island Biosecurity Best practice SOP but was not used during this operation (though they would have been laid during later stages if the rodent had not been caught) because:

1. Consultation, DOC approvals and MOH notification was required
2. It would have been very difficult to know if or what animals had been poisoned
3. Issues of such toxin use if then being followed by a bait drop

The group felt that the trapping implemented was the correct way to go but that in future pre-prepared ODC application for consent for toxins etc should be in place if the need arises ready for dating and signing. So that this does not need to be obtained urgently during an operation.

National advice/direction required (from IEAG and Incursions network groups) on the use poison as a safe guarding measure to reducing risk of incursions (poison stations) and incursion response. Encourage further research as a national level for improved rodent bait matrix and toxins to enable better use as a sentinel for incursion prevention.

2.6.6 Safety

Systems were implemented and effective but, specifically state and rule out any use of machetes in Safety Management plans and ensure they do not go to the island.

2.6.7 Media

Didn't get a lot of interest. Roll out some coverage post debrief to encourage public involved in bio-security considerations. Send completed report to Head Office to produce a national media angle on Island Bio-security.

2.6.8 Demobilisation

Rationalise what great is being left of ongoing surveillance and retrieve all surplus equipment off the islands. Demobilisation is time consuming with cleanup, wash-down and re-commissioning needing to be planned out and resourced.

3. Recommendations from Debrief

3.1 Communications

Send final report to all offices involved and giving thanks

Distribute to Island communication networks and island database

Front page intranet story

Advocate to Head Office for Island Biosecurity Incursions needs a national contingency fund. At $100K it's a considerable resource need and critical factor in response. It's a major spanner in the Area programmed business plans accommodating lost staff hours let alone the operational costs.

3.2 Response Equipment Needs

The Response kits needs reviewing and establishing with instructions on how to rollout the initial networks of traps and capture data needs.

Ensure consistency and compatibility of equipment and hardware across Areas so that it is simple and standardised for volunteers and staff to learn and use. Best practice trap and tunnel covers standardised and available in response kit. Coordination with other areas to standardise the same systems and conservancy resource inventory recorded in contingency response plans (same as Fire plans have).

Ask Agnew to add stamp detail to tracking cards as standard and save stamping ourselves. Until such time Tracking cards all pre-stamped in preparation (listing data needs required during establishment and collection) and kept in response kit.

Longer pins needed for trap covers due to their height, Upgrade WAO Kit with 50 White corflute trap covers (with mesh ends), 50 easi-set snap traps, 10 live capture cage traps, 100 Black tracker cards and tunnels.

Use only 60scx GPS's or betters.

Review the trap cover holes sizes in best practice. Request Best practice review with Keith B.

Update specific response kit's resource inventory/lists with new hardware and contents.

All other Area Rodent traps and associated hardware kept clean and sterile and sealed in barrels in the island quarantine store. Any general usage of this extra gear is to ensure it is put back as found. The Response kit is not to be used at all for other purposes so as to maintain its integrity and hygiene.

3.3 Bio security incursions preparedness and planning

Look into advocacy options to improve attitudes of the public for bio security awareness. E.g. Community driven messages rather than bureaucrats preaching.

Review Areas current annual surveillance networks as to bolstering on islands to cover the main track network and campsites at a 50m layout. The permanent tracking tunnels network established d with a numbering system from which further line network extensions can easily rollout if an incursion occurs.

Revamp old/develop better pre-planned response plan (Northland Island Invasion Response Plan) for the islands, i.e. line establishment patterns and name numbering, number of traps and tunnels required for each etc. Key Contracts lists etc. Hardcopy kept in the response kit and Area Records and electronic file refs for all documents noted for ease of location.

Templates of data collection formats and instruction that were developed during this exercise are available in the response plan (along the lines of CIMS templates) so that field staff have simple, standardised and consistent instructions from outset. Notebooks labelled with such.

Investigate the status of whether poison bait use is a waste of time or added value to either invasion contingencies and/or invasion response scenarios. Confirm with Island Surveillance Advice Group and IEAG for these matters.

Prepare 5yr approvals to lay toxins if advice from HO is that they are useful such situations.

3.4 Operational Response Practices

All new team members during a response are shown (before departure, and again on the islands) exactly how to set equipment and record data. Team members are to individually demonstrate competence at setting traps/tunnels and recording data to an expert/trainer before leaving for the island, and, again in the field environment.

Team leaders to ensure a full briefing and handover occurs between arriving and departing team leaders. Template briefing prompt card to be designed for this purpose to ensure info is not overlooked.

For efficiencies in time management, where possible utilise the same group of field people repeatedly so as to gain the skill and site knowledge sets required and save on communication repetition and new recruitment learning errors.

end