

Pacific Island Invasive Ant Surveillance Programme

(Pacific Ants Prevention Program - PAPP)

TRAINING MANUAL



Secretariat of the Land Pacific Community (SPC)
Land Resources Division

Contents

- 1 Purpose
- 2 Scope and Specifications
- 3 Definitions
- 4 Overview
- 5 Surveillance Requirements
- 6 Ensure Quality Management
- 7 Coordinator responsibilities
- 8 Surveillance Locations and Schedule
- 9 Environmental Conditions
- 10 Surveillance Requirements
- 10.1 Visual Surveillance
- 10.2 Specimen numbering system for locations where grid numbers and maps have been provided
- 10.3 Specimen numbering system for sites which do not contain an aerial map with grid numbers
- 10.4 Bait Trap Surveillance
- 11 Communications
- 12 Safety
- 13 Surveillance Procedures using GPS

Appendices

- 1 Favoured Ant Habitats
- 2 Collection Location Codes
- 3 Specimen Form for Pacific Island Ant Surveillance
- 4 Specimen Form for Pacific Island Ant Surveillance – continuation sheet
- 5 Specimen Form for Pacific Island Ant Surveillance - Example
- 6 Specimen Form for Pacific Island Ant Surveillance – Geocode version
- 7 Specimen Form for Pacific Island Ant Surveillance – continuation sheet – Geocode version

Training Manual for Pacific Island Invasive Ant Surveillance Programme

1 Purpose

This manual describes how Pacific Island Invasive Ant Surveillance should be carried out.

2 Scope and Specifications

This manual should be followed to meet the MAF Biosecurity New Zealand specifications for this operation.

3 Definitions

Target Species

RIFA	Red Imported Fire Ant (<i>Solenopsis invicta</i>) (S.in)
BIFA	Black Imported Fire Ant (<i>Solenopsis richteri</i>)
TFA	Tropical Fire Ant (<i>Solenopsis geminata</i>) (S.ge)
LFA	Little Fire Ant (<i>Wasmannia auropunctata</i>)
Site	A facility such as an airport or seaport.
Grid	15x15 metre square uniquely numbered for surveillance purposes
Ant Bait - Y	Smooth peanut butter, soybean oil and fatty sausage meat
Ant Bait - B	Plug of cotton wool soaked in 20% sugar solution (20g white sugar and 80mls water)
GIS	Means Geographical Information System
GPS	Means Global Positioning System
At risk locations	Identified international airports, seaports, container sites and timber yards.
Risk site	Is any place where an imported risk item may have rested within 50m of a favourable ant habitat

Surveillance area	Habitable ground within 150m radius of a risk site unless otherwise notified.
Risk Items	Sea containers, animal containers, used vehicles and machinery, non – wooden building materials eg tiles and pipes, natural untreated materials eg logs and bark, hay, used electrical equipment that has been stored outside on the ground, wharf-inspected packing materials for sea cargo and taro containers.
Air Temperature	Means an air temperature reading from a calibrated thermometer in the shade, not on the soil surface.
Specification”	Means the document that specifies essential technical requirements for items, materials or services, including the procedures to be used with which the product or service has to conform.
“SPC”	Means Secretariat of the Pacific Community
PAPP	Pacific Ant Prevention Plan
Favourable habitats	See appendix 1

4 Overview

Conduct effective visual and bait station surveillance, as described in this manual.

Record all ant species found visually and in geocoded or mapped bait stations;

Make arrangements for the efficient dispatch of euthanased ant samples from Pacific Island sites to New Zealand.

Submit all specimens appropriately packaged to screening laboratory

5 Surveillance Requirements

Conduct effective visual and bait station surveillance as described in this training manual at the specific sites.

Conduct surveillance as follows:

Ensure surveillance occurs within “surveillance areas”. Unless otherwise agreed, surveillance areas are defined as habitable ground within a 150-metre radius of a risk site. A risk site is any place where an imported risk item may have rested within 50 metres of a favoured ant habitat, (see clause 1 of Appendix 1); where any two high-risk areas fall to within 50 metres of each other, merge the two areas to create one high-risk area:

Divide “surveillance areas” within ports/airports into geocoded 15 x 15 metre grids, where this is not possible GPS each pottle location;

Visual surveillance is conducted over entire “surveillance areas”, looking for the ants of specific interest;

Bait station surveillance need occur only in favoured ant habitats within “surveillance areas”; and

Ensure bait stations are laid as described in baiting.

Ensure all ants collected as samples are killed prior to dispatch to New Zealand. (Frozen for at least 24 hours)

Air Courier all samples from high-risk location to the designated Approved Transitional Facility screening lab for the screening process

6 Ensure quality management as follows:

Local quarantine staff are specifically trained in ant search and data capture techniques using appropriate methods.

The training programme to include:

- Background on context (i.e. an introduction to the PAPP) and the biosecurity importance of the work;
- An outline of significant target species and their impacts, behavioural characteristics, foraging patterns, nesting habits and food preferences;
- An explanation and examples of suitable ant habitats to focus visual search and refine trap placement (see appendix 1);
- Instructions for, and a demonstration of, labelling and laying out bait stations and data capture methodology.
- Provision of this manual associated with the training to be used as reference;
- A certificate of recognition for course completion
- Assessment of individual competence in identification of specific ants, capture and preparation of specimen for transport to accredited laboratories
- A documented training record confirming completion of training for all survey staff, which can be produced as per reporting requirements.

7 Coordinator Responsibilities

Coordinators are responsible for ensuring:

- Then procedures in this manual are met including ensuring other surveillance staff which assist with surveillance at your location are trained and this training is documented.
- Ensuring that all staff meet the training manual requirements including safety requirements.
- Ensuring all surveillance staff have demonstrated suitable eyesight for the visual detection of ants for surveillance activities.
- Ensuring that all documentation is completed correctly and forwarded to appropriate location within the required time period

8 Surveillance Locations

22 International Sea and Airports across the Pacific Island Countries and Territories will be included in this surveillance programme.

9 Environmental Conditions

The air temperature for surveillance is consistently between 20 and 36 degrees Celsius but not above 36 degrees Celsius with no or low wind.

The thermometer means an air reading from a calibrated thermometer in the shade, not on the soil surface.

Surveillance should not occur during or after rain while the sealed surface is still wet. Also no rain is to occur between placement of bait traps and their retrieval.

If a shower falls while baits are out you will need appropriate suitable environmental conditions before retrieval otherwise rebaiting is necessary. The occurrence of rain should be recorded.

10 Surveillance Requirements (Visual completed same time as baiting)



RIFA Recruiting to a sugar bait
Photo Lester Mattson – Napier New Zealand

10.1 Visual Surveillance

Will be conducted in the surveillance area.

- Walk systematically over the designated survey area as a team
- Identify favourable habitats and search for target ants.
- Where favourable habitats exist, follow baiting procedures.
- Collect target ants or ants of uncertain identity for laboratory identification.
- Collect the ants with a paintbrush and place in a specimen pottle.
- All visual ant specimen locations must be marked on the ground by writing the pottle number and “Vis” with white crayon as first preference or paint as second preference or plant label in grassy areas for easy relocation.
Number the jar as per specimen numbering system although replace the letters Y or B with “Vis”.
- Complete a specimen form **ensuring the visual samples are recorded after the final bait sample is recorded** and mark the location of where the specimen was taken on the grid of the port map **using a blue ball point pen (no pencils) with a V with a circle around it** and high light grid #. Maintain grid # eligibility.

10.2 Specimen numbering system for locations where grid numbers and maps have been provided.

Using a blue ball point pen the specimen jars should be numbered by placing the location code (ref Appendix 3), against the name. Map number against doctor, sample number against the hospital number with a Y or B indication bait used and grid number against time.

Example	Name	L
	Doctor	416
	Hospital	01 B
	Time	J7

(This sample refers to Seaport of Lae map 416, sample 01 Blue and grid J7 on that map.)

10.3 Specimen numbering system for sites, which do not contain a map with grid numbers

Place the location code (ref appendix 2) allocated to each facility along side name on specimen jar label

Allocate map number along side doctor by placing a 001

On each site number the specimen jars sequentially starting at 01,02...etc and place along side hospital on specimen jar with a Y or B indicating bait used or Vis if visual collected. The geocode east should be placed along side time and geocode north put along side specimen of.

Example	<i>Name</i>	L
---------	-------------	----------

Doctor 001
Hospital 07 B
Time E2669739
Specimen of N6465104

This sample refers to Seaport of Lae map 001 and specimen 07 B (sugar ant bait) on that site with a geocode (E2669739 N6465104) which indicates where that pottle was placed.

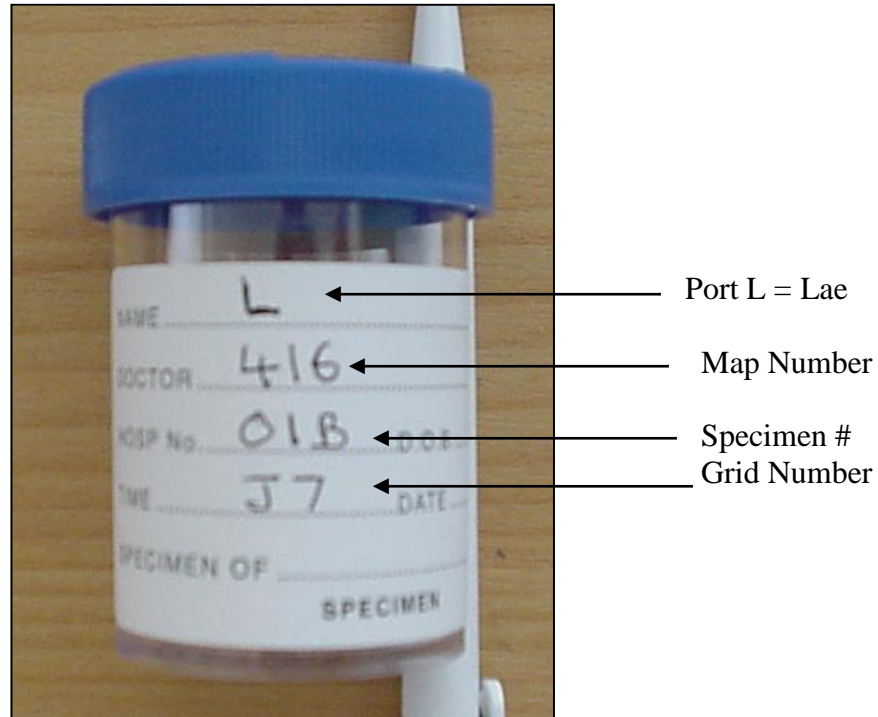


Photo Lester Mattson – New Zealand

10.4 Bait Trap Surveillance

Will be conducted in **favourable habitats** (see definition) in **designated survey areas**.

Separate protein and sugar based baits must be laid.

- Prepare your protein bait trap **Y** (Yellow Top) pottle by inserting a slice of processed fatty sausage meat (eg. Cocktail sausage) and smearing in a line the blended peanut butter and soybean oil (the size of half a pea) to the inner side of each bait container on the side corresponding with the back of the label out to the height of the label. Maintain a **1 cm gap between the slice of sausage meat and the smear of peanut butter** and immediately put on lid to prevent drying out.



Ingredients of smooth peanut butter, fatty sausage meat and vegetable oil
Photo Lester Mattson – New Zealand

- Prepare your bait trap **B** (Blue top) by placing a plug of cotton wool soaked in 20% sugar solution with excess removed on the inner side of each container and immediately put on lid to prevent drying out.
(Sugar solution 20% white sugar and 80% water)
- Place the two different baits in separate bags to take out into the field.
- Place two bait traps in each grid containing favourable habitat. One **Y** bait container and one **B** ant bait container maintaining a minimum **5m spacing between bait types** where possible but no closer than 100cm apart.
- Where appropriate and without compromising bait station placement, use shady positions for bait placement to ensure the bait does not dry out too quickly.
- Where it is not possible to bait in transport corridors bait but as close as possible where habitat exists.



Bait pottle being placed by an electricity source habitat
Photo Lester Mattson – New Zealand



Placing baits in the shade by suitable habitat when temperatures are high
Photo Lester Mattson – New Zealand

- Mark each bait container with the location number and map number if available, sample number and grid number or geocode which ever is applicable. Take off the lids and lay the bait container on its side so that the bait side contacts the ground with the entrance away from the prevailing wind.
- **All bait pottle locations must be marked on the ground** by writing the pottle number and colour with white crayon as first preference or

paint as second preference or plant label in grassy areas for easy relocation. If you use a fluorescent mark on the ground to act as an aid to find your pottle then **do not place it near the entrance** of the pottle.

- Put blue pen dots in each grid on the map as close to the actual position that is baited and highlight the grid number with a highlighter felt pen. Maintain grid # legibility at all times. (For sites which do not have grid maps complete a site map and place a dot where the bait was placed and number and code and highlight all numbers.)
- Collect pottles after **30 minutes** however, observe ant recruitment to both baits, if large numbers quickly consume bait, consider doubling quantity of bait in each pottle, or alternatively reduce the time the bait is exposed to the ants to 20mins, 15 mins, and 10 mins respectively. After the required period collect your bait containers and replace the lid securely to ensure ants are contained. Place the two different baits in separate bags. Tick the blue pen dots on your map as an indicator of collection and ensure that you have accounted for all bait containers.



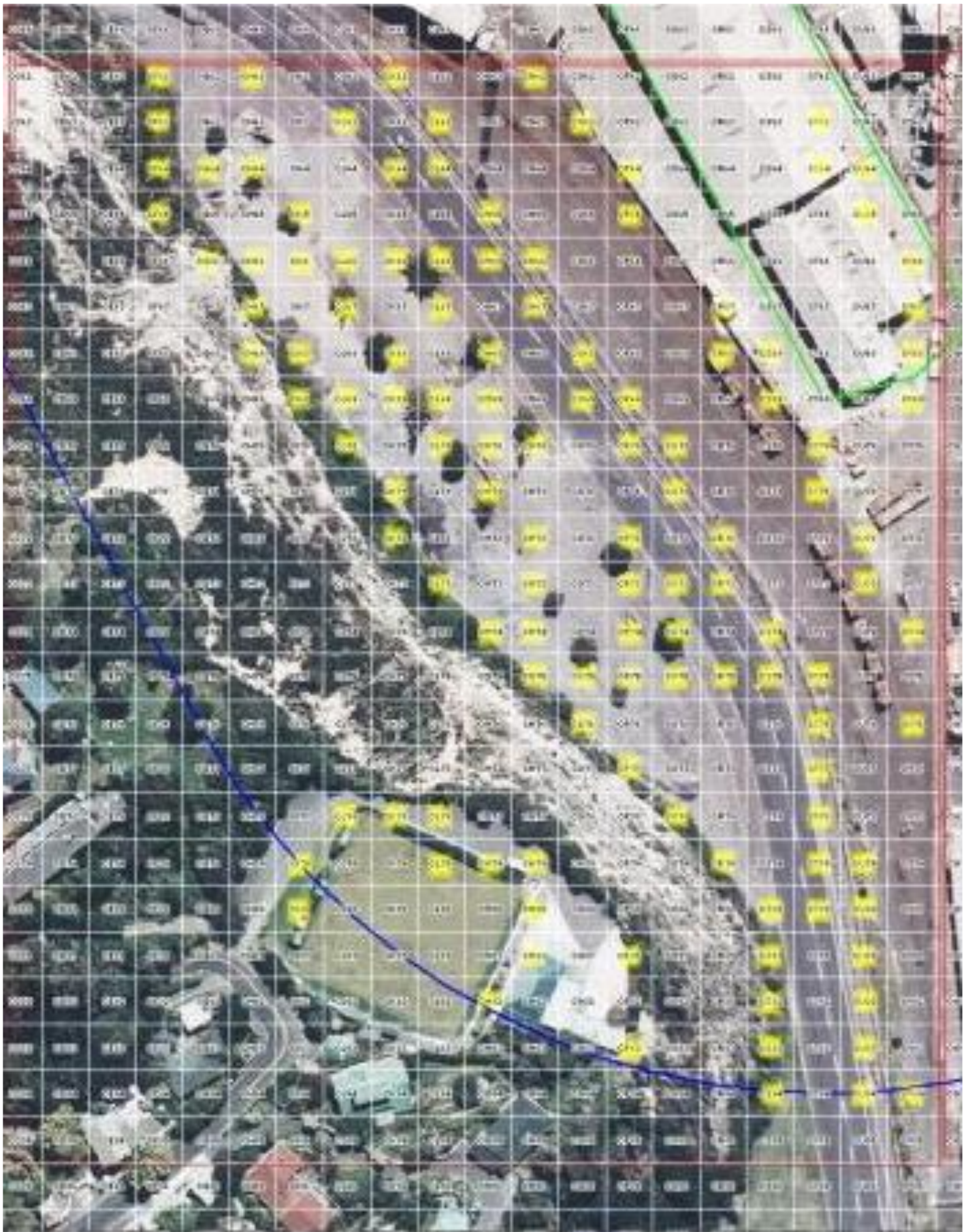
Ants feeding on sausage meat and peanut butter.

Photo Lester Mattson – New Zealand

- If a significant number of bait pottles in same locality have been crushed or are missing then re bait that area. Any surveillance equipment including bait containers and any other equipment not accounted for should be **immediately reported to your coordinator**.
- Complete Pacific Islands Invasive Ant Surveillance Submission form as you lay out ensuring that all appropriate information is recorded.

Please note that the time of placement and collection is required for each bait and the time when a visual was collected.

- Place all bait containers (including containers without ants) in a secure plastic bag ensuring that **yellow, blue and visual are placed in separate bags**. Place a copy of submission form in a separate plastic bag and then put all bags together in a third plastic bag and give these to the Coordinator.



Team Name: _____

Date Completed: / /2002

10m Buffer
 Pick Area
 Full 60 m Buffer

Map Number **214**

Example of map with 15 metre x 15 metre grids overlaid

11 Dispatch of Samples to New Zealand

- The Coordinator will remove the slice of sausage meat from each pottle and arrange for the specimen pottles to be frozen for at least 24 hours to ensure that all ants are dead before dispatch to new Zealand.
- The Coordinator will arrange for the all specimen pottles to be air freighted to the screening laboratory in New Zealand.

12 Communication

Please direct all enquiries or requests for further information to your appointed coordinator or the manager of the port quarantine service.

Any issues encountered such as non - cooperation from a particular facility. Please diffuse the situation by backing off and referring the matter immediately to the coordinator.

13 Safety

Please ensure that you and your staff meet the safety requirements at all facilities at all times including wearing appropriate safety equipment. In some locations this may include attending a facility safety induction course. Practice safe working practices as conveyed at the coordinators training including identifying hazards and appropriate safety instruction to all staff under your control.

All surveillance equipment including plastic bags, bait containers and wire staples should be accounted for at all times. Any equipment that cannot be accounted for should be immediately reported to your coordinator. This is particularly important at airports. All equipment needs to be accounted for at all times. Co-ordinators are to ensure this requirement is met and report any lost equipment immediately to the Operations manager. Where security passes are required they should be worn at all times. Loss of a security pass should be immediately reported to your coordinator and port security authority. Co-ordinators to report any lost security passes to the operations manager immediately.

APPENDIX 1

Favoured ANT habitats ANT HABITATS

The list of favoured habitats is long and should serve as a check list to reinforce habitat preference principles learned during training.

Number	Code	
1.	V	Tree trunks (visual inspection and bait at base if appropriate).
2.	V	Flowers and trunks of trees.
3.	V or L	Shrubs and poles.
4.	B	Building edges and foundations.
5.	BS	Concrete slab edges.
6.	BS	Cracked concrete.
7.	BS or S	Disturbed sites.
8.	W	Drains and culverts.
9.	L	Electrical generators and fittings.
10.	BS	Exposed rocks.
11.	B	Fence palings.
12.	V	Grass areas.
13.	V	Verges.
14.	W	Hot water pipes and heaters.
15.	V	Isolated weeds.
16.	V	Logs.
17.	BS	Loose gravel.
18.	V	Low vegetation (including grass).
19.	V	Plant pot bases.
20.	BS	Road margins.
21.	R	Rubbish piles.
22.	L	Shiny surfaces.
23.	S	Soil.
24.	V	Tree crotches and hollows.
25.	B	Vertical surfaces.
26.	V	Weed and plant re-growth.
27.	B	Wooden structures.
28.	BS	Underneath stones or concrete rubble.

1	V	Vegetation
2	S	Soil
3	BS	Broken Surfaces
4	W	Water
5	L	Light
6	B	Buildings
7	R	Rubbish

APPENDIX 2

Collection Location Codes

PIC	PORT	CODE
American Samoa	Pago Pago	PP
Cook Islands	Rarotonga	R
Fiji	Suva	S
Fiji	Nandi	N
French Polynesia	Papeete	P
French Polynesia	Tahiti	T
Guam	Hagatna	Hg
Guam	Guam – Antonio	G
Nauru	Nauru	NR
New Caledonia	Noumea	NM
New Caledonia	NC Tontouta	TN
PNG	Lae	L
PNG	Port Moresby	PM
PNG	Wewak	W
Samoa	Apia	A
Samoa	Faleolo	F
Solomon Islands	Honiara	H
Tuvalu	Funafuti	F
Tonga	Nukualofa	NI
Tonga	Fua'amotu	Fm
Vanuatu	Port Vila	PV
Vanuatu	Bauerfield	B

APPENDIX 3

Specimen Form for Pacific Island Ant Surveillance

Team :					Collection Date	Collection location code	Temp Range	Form				
								1 of				
Port: _____ Site Address: _____					Number of Samples	Map Number (Port)			Geocode East	Geocode North		
									E	N		
Sample #	Vis or Bait ID	Time Place (24hr clock)	Time Collect (24hr clock)	Grid Ref	Hab Loc	Anoplolepis gracilipes		Ant ID Init	Date	Validation	Validator	Date
	Y Or B					A.gr I.an L.hu M.ant M.pod O.gl P.lo P.va P.meg P.rug P.vig S.inv T.al T.gr T.me S.gem M.sydneyense D.da C.mi P.sp M.pha P.pro	Iridomyrmex anceps Linepithema humile Monomorium antarcticum Monomorium antipodum Ochetellus glaber Paratrechina longicornis Paratrechina vaga Pheidole megacephala Pheidole rugosula Pheidole vigilans Solenopsis invicta Technomyrmex albipes Tetramorium grassei Tapinoma melanocephalum Solenopsis germinata Monomorium sydneyense Doleromyrma darwinia Cardiocondyla minutior Polyrachis sp Monomorium pharaonis Pheidole proxima					

APPENDIX 4

Specimen Form for Pacific Island Ant Surveillance

Continuation sheet for Port name: _____ Form _____ Of _____
 Collection location code _____ Map # _____ Date _____

Sample #	Vis or Bait ID	Time Place (24hr clock)	Time Collect (24hr clock)	Grid Ref	Hab Loc V Veget S Soil BS Brok Surf W Water L Light B Build R Rubh	Anoplolepis gracilipes Iridomyrmex anceps Linepithema humile Monomorium antarcticum Monomorium antipodum Ochetellus glaber Paratrechina longicornis Paratrechina vaga Pheidole megacephala Pheidole rugosula Pheidole vigilans Solenopsis invicta Technomyrmex albipes Tetramorium grassi Tapinoma melanocephalum Solenopsis germinata Monomorium sydneyense Doleromyrma darwinia Cardiocondyla minutior Polyrachis sp Monomorium pharaonis Pheidole proxima	A.gr I.an L.hu M.ant M.pod O.gl P.lo P.va P.meg P.rug P.vig S.inv T.al T.gr T.me S.gem M.syd D.da C.mi P.sp M.pha P.pro	Ant ID Init	Date	Validation	Validator	Date
	Y Or B											

APPENDIX 5

Specimen Form for Pacific Island Ant Surveillance

Example

Team :					Collection Date	Collection location code	Temp Range	Form				
Lester Mattson, Cas Vanderwoude					15/01/06	PP	27.4 – 29.8	1 of 1				
Port: Pago Pago Seaport Island: Tutuila Island Country: American Samoa					Number of Samples	Map Number (Port)	Geocode East	Geocode North				
					17	416	E 000000	N 000000				
Sample #	Vis or Bait ID	Time Place	Time Collect	Grid Ref	Hab Loc	Anoplolepis gracilipes Iridomyrmex anceps Linepithema humile Monomorium antarcticum Monomorium antipodum Ochetellus glaber Paratrechina longicornis Paratrechina vaga Pheidole megacephala Pheidole rugosula Pheidole vigilans Solenopsis invicta Technomyrmex albipes Tetramorium grassi Tapinoma melanocephalum Solenopsis germinata Monomorium sydneyense Doleromyrma darwinia Cardiocondyla minutior Polyrachis sp Monomorium pharaonis Pheidole proxima	A.gr I.an L.hu M.ant M.pod O.gl P.io P.va P.meg P.rug P.vig S.inv T.al T.gr T.me S.gem M.syd D.da C.mi P.sp M.pha P.pro	Ant ID Init	Date	Validation	Validator	Date
01	Y	1000	1240	D38	V							
02	B	1002	1241	D38	V							
03	Y	1004	1242	E39	V							
04	B	1006	1243	E39	S							
05	Y	1010	1244	F39	V							
06	B	1011	1245	F39	BS							
07	Y	1014	1247	G39	V							
08	B	1020	1248	G39	BS							
09	Y	1023	1250	H39	B							
10	B	1025	1251	H39	B							
11	Y	1030	1253	H38	B							
12	B	1033	1254	H38	B							
13	Y	1037	1256	H37	W							
14	B	1040	1257	H37	B							
15	Y	1042	1259	H36	L							
16	B	1045	1300	H36	B							
17	Vis	1050	1050	H36	B							

APPENDIX 6

Specimen Form for Pacific Island Ant Surveillance

Team :				Collection Date	Collection location code	Temp Range	Form
							1 of
Port: _____		Number of Samples	Map Number (Port)			Geocode East	Geocode North
Site Address: _____						E	N

Sample #	Vis or Bait ID Y Or B	Time Place (24hr clock)	Time Collect (24hr clock)	Geocode		Hab Loc V Veget S Soil BS Brok Surf W Water L Light B Build R Rubh	A.gr I.an L.hu M.ant M.pod O.gl P.lo P.va P.meg P.rug P.vig S.inv T.al T.gr T.me S.gem M.syd D.da C.mi P.sp M.pha P.pro	Ant ID Init	Date	Validation	Validator	Date
				East	North							

APPENDIX 7

Specimen Form for Pacific Island Ant Surveillance

Continuation sheet for Port name: _____ Form _____ of _____
 Collection location code _____ Map # _____ Date _____

Sample #	Vis or Bait ID	Time Place (24hr clock)	Time Collect (24hr clock)	Geocode		Hab Loc V Veget S Soil BS Brok Surf W Water L Light B Build R Rubh	A.gr I.an L.hu M.ant M.pod O.gl P.lo P.va P.meg P.rug P.vig S.inv T.al T.gr T.me S.gem M.syd D.da C.mi P.sp M.pha P.pro	Ant ID Init	Date	Validation	Validator	Date
				East	North							

Pacific Ant Prevention Programme (PAPP)

Pacific Invasive Ant Surveillance

GPS specs

1. Requirements

- One (or two) Garmin Extrex GPS – set to correct projection for your country– need to ensure this correct prior to commencement. If unsure contact PAPP coordinator at SPC prior to any surveillance activity commencing. Also take spare batteries into the field. If using two units, they will be numbered clearly 1 and 2.

<http://www.sopac.org/tiki/tiki-index.php?page=Pacific+Projections#Samoa>

- One (or two) laminated port over view maps or a plan showing operational area of port. Aerial photos are the best as it helps in navigation but it is not critical. Using local knowledge draw on 'surveillance area' (using white board marker) based on movement and set down of risk goods.

Ensure surveillance occurs within 'surveillance areas'. Unless otherwise agreed, surveillance areas are defined as habitable ground within a 150m radius of a risk site. A risk site is any place where an imported risk item may have rested within 50m of a favoured ant habitat, (see clause 1 of Appendix 1); where any two high risk areas fall to within 50m of each other, merge the two areas to create one high risk area

- One (or two) clipboards to carry map and data forms

- White crayon to mark pottle location

-500-700 hospital specimen jars, ½ need yellow lids, half need blue lids. These are referred to as pottles from here on in.

2. Methodology

(a) Bait preparation should occur the afternoon immediately prior to the first surveillance morning. Once prepared that afternoon, place in fridge (not freezer) ready for use the following morning. An average size port should take approximately 500 pottles i.e. 250 sausage meat and peanut butter, 250 sugar soaked cotton wool.

Separate protein and sugar based baits must be laid and composed as follows:

1. Protein-based bait composition. **(YELLOW LID)** Prepare protein pottle by smearing in a line the blended (smooth) peanut butter and soybean oil (the size of half a pea) to the inner side of each bait container on the side corresponding with the back of the label. Place a small section of hard sausage (smoked if possible) In the same pottle.
2. Sugar-based bait composition. **(BLUE LID)** Prepare sugar based pottle by placing a plug of cotton wool soaked in 20% sugar solution (ie 1 part sugar to five parts water) on the inner side of each container.

- (b) **Within the chosen surveillance areas move to one end of the port or airport, preferably aligned with a boundary fence or straight line.**
- (c) Sighting the far end of the port or airport (within the surveillance area) walk a transect placing prepared baited pottles in favoured ant habitat. Each subsequent transect will be approximately 15 away from the previous one and running parallel with the previous one.
- (d) Each time a pottle is placed on the ground take a waypoint (See Appendix 2 for instructions in GPS use) with the Garmin Etrex and write the port code, date and waypoint number on the pottle label and a corresponding row on the data form. The waypoint number will be the pottle identifier, so all numbers will need to be unique from a given port. Using the hospital specimen jar label layout record the following:

Name	=Port code eg L
Doctor	= Date eg12-2-06
Hospital	= WPT eg 001
Time	...(blank)..
- (e) If two GPS are in operation ensure one units starts number from 1 and the other from 1000. The GPS should automatically allocate next wpt in numerical order.
- (f) When placing protein pottles (sausage and peanut butter) ensure the sausage meat is separate from the peanut butter as this will allow more than one ant species to feed in the same pottle. Ensure both peanut butter and sausage meat are on the surface closest to the ground to allow easy feeding.
- (g) When placing sugar pottles in suitable ant habitat, give the pottle a tap to ensure cotton wool is on the floor of the pottle (lying on its side).
- (h) Ensure GPS is kept on during duration of surveillance activities, this will improve accuracy and reduce any down time in unit searching for signals. If signal is weak due to obstruction (eg container stack or building) move away from high objects and take the reading. (10 -15 m accuracy is fine, but the less the better).
- (i) Preferred pottle placement is 30mins. Observe ant recruitment to both baits. If large numbers quickly consume bait, consider doubling quantity of bait in each pottle, or alternatively reduce the time the bait is exposed to the ants to 20mins, 15 mins, and 10 mins respectively. Where appropriate and without compromising bait station placement, use shady positions for bait placement to ensure bait does not dry out too quickly.
- (j) You may need to lean stones or sticks on the pottles to keep them from moving in wind and as shelter from the sun. The pottles act like little glass houses and quickly dries the bait. Dry bait is less attractive than moist bait.
- (k) Carry out pottle placement for approx 1 hr then retrieve placed pottles starting at the beginning and picking up the latest placed one last. This will mean the first pottles will be out longer than 30mins and the last one place may be less than 30 mins but that is OK. Place lids on pottles quickly and tightly to prevent escape of ants. CAUTION: Ensure lids are done up TIGHT as many ants will find their way out a loose lid. Store these pottles and recommence walking transects from the lasts pottle picked up.
- (l) Each transect should be approximately 15 m apart.
- (m) Try to pick suitable ant habitat that is not going to be destroyed by machinery, fork lifts or containers.

- (n) As Little fire ant (*Wasmannia auropunctata*) is largely arboreal, make a concerted effort to bait bases of trees that are in and around margins of port/airport area.
 - (o) IMPORTANT: Ensure paper work for each batch of pottles remains with the pottles at all times (yes, in the freezer too)
 - (p) Collect any unusual visual samples as you are walking and placing out baited pottles. Again take a waypoint at sample location and label the pottle accordingly. Do not sample all visual ants just those that appear out of the ordinary relative to the ant awareness training you have received. (i.e. suspect RIFA or LFA.)
2. Sample preparation and dispatch (inc GPS download).
Ant samples must be stored for 48hrs in freezer at -18C to kill ants. If this temperature can not be reached, extend storage period to 72 hrs. **Use temperature probe to determine this or if freezer has a gauge use that.**
 3. After required freezing time undo each pottle containing sausage meat and remove the meat from the pottle ensuring ants are left behind intact (as possible). This will be relatively easy when the meat is frozen and can be carried out by tapping tooth pick with sausage on it on the side of the pottle to dislodge ants. Also inspect for live ants whilst doing this work as some ants on the centre of the freezer may not be exposed to the same sort of temperatures as those on the outside. If movement of ants is detected check freezer for adjustment and refreeze for further 48 hrs.
 4. Repeat process for cotton wool soaked with sugar solution. Now no pottle should contain any bait except peanut butter and no live ants.
 5. Place the corresponding GPS unit (1 or 2) with the associated data sheets and pottles in the sealed bag. Package ready for shipping to NZ for identification.
 6. Data forms: These should be filled out as placing pottles on the ground and double checked when de-baiting pottles after freezing. Write WPT number in 1st column, a 'vis', 'y' or 'b' in the second column signifying a visual, protein or sugar sample.
 7. Results will be sent to you as a list of species present. If a target species is present, results will be sent to you as quickly as validation is made, along with GPS coordinates for locating nest site. Any subsequent ant response decisions can then made in conjunction with SPC Pacific Ant Prevention Programme coordinator.

APPENDIX 1 Favoured ANT habitats

1. ANT HABITATS

The list of favoured habitats is long and should serve as a check list to reinforce habitat preference principles learned during training.

29.	Tree trunks (visual inspection and bait at base if appropriate).
30.	Flowers and trunks of trees.
31.	Shrubs and poles.
32.	Building edges and foundations.
33.	Concrete slab edges.
34.	Cracked concrete.
35.	Disturbed sites.
36.	Drains and culverts.
37.	Electrical generators and fittings.
38.	Exposed rocks.
39.	Fence palings.
40.	Grass areas.
41.	Verges.
42.	Hot water pipes and heaters.
43.	Isolated weeds.
44.	Logs.
45.	Loose gravel.
46.	Low vegetation (including grass).
47.	Plant pot bases.
48.	Road margins.
49.	Rubbish piles.
50.	Shiny/corrugated surfaces.
51.	Soil.
52.	Tree bases, crotches and hollows.
53.	Vertical surfaces.
54.	Weed and plant re-growth.
55.	Wooden structures.
56.	Underneath stones or concrete rubble.

Appendix II

Garmin Etrex GPS waypoint capture for PIAS

1. Turn on GPS using flat button on LHS.
2. Allow 5mins startup time in new location to allow GPS to locate it self globally. Once this has occurred and subsequent startups will only require approx 30secs.
3. There are 6 main pages within the opening main directory. Each page can be accessed by pressing the 'page button'. It is the protruding RHS top button above the power switch. You should only ever require one page for Ant Surveillance. Keep pressing this button until the following menu appears as per step 4.
4. It is the one that lists:
 - Mark
 - Waypoints
 - Routes
 - Tracks
 - Setup
5. The 'mark' option should automatically be highlighted upon opening the menu page.
6. Now that the 'mark' option is highlighted press the 'enter' button. This is the last button and is the larger one on the LHS at the below the arrow buttons. The 'mark' options allows the creation of a waypoint (henceforth referred to as a WPT)
7. Now a screen showing the ant surveyor holding a flag will appear. It is asking you if you want to create a waypoint at this location, and the letters OK? Are highlighted.
8. By pressing the enter button you are effectively saying 'yes'
9. If you are satisfied with the WPT name press the enter button.
10. The coordinates of WPT 001 has now been created and stored in the GPS memory.
11. Each subsequent WPT will follow on numerically from the previous up to WPT number 500. That is, 500 WPTs can be stored on the one GPS unit.
12. As we are using the WPT numbers as pottle identifiers, it is important that if more than 500 pottles are laid, we have some way of capturing and differentiating any WPT data captured on another GPS.
13. For example if 2 GPS units were used then there would be tow sets of data with the same WPT numbers and we would not easily know which pottle came from either of the 2 locations. To get around this we have a special system to ensure all WPTs have a unique number regardless of the number of GPSs used at a given site.
14. GPS unit 1 (it should clearly be marked as such) will automatically start numbering from 001 upwards
15. GPS unit 1 should not exceed WPT 499
16. GPS unit 2 (also clearly marked) will have to be manually programmed to start number WPTs from 500 upwards. This should be set so that upon 'marking' the first WPT the GPS gives you the option of naming the first one 700. They should follow numerically from that point on.
17. It does not matter if sites change eg from port to airport keep compiling new WPT in numerical order, but note change of site on data forms.
18. Ensure GPS unit/s are sent back to NZ with bundled with the corresponding data forms (Appendix 3) and dead ant specimens.

The attached website address is for those who wish to download a good little mapping program. This will then allow you to down load data out of your GPS to create your own maps.

<http://www.easygps.com/download.asp>

