# Survey of ants on Kiritmati Island, Kiribati in February – March 2013

## Purpose of the ant survey of Kiritimati

The purpose of the ant survey was to provide a baseline inventory of ants at key risk areas, and to identify any risk species present on Kiritimati. An earlier, brief survey in 2008 by Ray Pierce detected six species, including the African Big-headed ant *Pheidole megacephala*, one of the highest profile invasive ant species (Appendix 1).

Much of the ant survey work was combined with training activities as part of an Island Biosecurity training course held concurrently in Kiritimati as this provided an excellent opportunity for enhancing capability in a meaningful way. The exercise turned into a real life test of the skills learned during the course, when we discovered a yellow crazy ant infestation on Kiritimati. The course participants needed to assess the severity of the incursion and determine a course of action.

## Methods

The survey consisted of pitfall trapping in seven key sites (Table 1). At each site two plots were selected, approximately 50 – 100 metres apart. Three pitfall traps (specimen jars) were installed in each plot, 1/3 filled with propylene glycol and left for 24 hours. Luring (using sugar syrup baits) and visual inspection was undertaken at some of these sites and at additional sites where pitfall trapping was not undertaken (Table 1). All ants collected were identified top species level where possible using the Pacific Invasive Ants key (Sarnat 2008). Where it was not possible to identify ants to species level, they were identified to genus level using Bolton (1994).

## Table 1: List of survey locations and sampling methods

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Site |  | Visual inspection | Pitfall trapping | Luring (sugar) |
| 1. | Cassidy airport | X | X |  |
| 2. | JMB store | X (inside) | X |  |
| 3. | Captain Cook Hotel (CCH) | X | X |  |
| 4. | Agriculture food security facility | X | X |  |
| 5. | KPA port | X | X | X |
| 6. | Town dump | X |  | X |
| 7. | London town (around wharf) | X |  | X |
| 8. | MLPID offices | X |  |  |
| 9. | Dump close to CCH | X | X |  |
| 10. | Motu Tabu | X |  | X |
| 11. | South west Nimroona | X |  | X |
| 12. | KSC warehouse (YCA infestation) | X | X | X |
| 13. | Commerce buildings (YCA infestation | X | X | X |
| 14. | Tabwakea village sportsground | X |  | X |
| 15. | Hospital  | X |  |  |

## Results

The survey resulted in detection of a total of 20 ant species (Table 1). The ants found at most sites were *Monomorium floricola*, the two *Paratrechina* species and African big-headed ant *Pheidole megacephala*. The sites where the most species were found included the port, around the town near the wharf and JMB store. Note that lack of detection of a species does not indicate its absence from a site. However, common species are likely to be detected if they are present.

## Table 1: Ant species found during survey of Kiritimati February – March 2013.



African big-headed ants were found at most sites. However, our survey did not find this ant on the protected islands of Motu tabu and South west Nimroona. On these protected islands we found species of *Paratrechina*, which are also common across the Pacific. *Tetramorium* sp. ants were found on South west Nimroona and Motu Tabu.

Yellow crazy ants *Anoplolepis gracilipes* were initially found only at a well-defined area the KSC commerece warehouse and commerce buildings in London town, and the Water and Sanitation premises. These properties adjoin each other. Although yellow crazy ants were not detected at the Town dump on initial visual inspection, they were found in a single lure during identifications.

No tropical fire ants (*Solenopsis geminata*) were found during this survey, although they are known to occur on Tarawa and a ‘red ant’ has been reported on Kiritimati that may be *Solenopsis geminata*. No other fire ants (the red imported fire ant *Solenopsis invicta* and little fire ant *Wasmannia auropunctata*, the two worst invasive ant species) were detected.

## Conclusions and recommendations

Of the ants detected in this survey, the species of most potential concern are yellow crazy ants *Anoplolepis gracilipes* and African big-headed ants *Pheidole megacephala*. Currently no detectable negative effects have been reported for these ant species on Kiritimati.

On a positive note, we found no fire ants (*Solenopsis invicta* , *Solenopsis geminata*, *Wasmannia auropunctata*) and no ants of high concern on Motu Tabu or South west Nimroona. Although Motu Tabu has black crazy ants (*Paratrechina longicornis*), they potentially don’t have any effects to be too concerned about, as the seabird populations are doing well there.

The African big-headed ant is common in inhabited islands across the Pacific, where it causes few problems for humans (Wetterer 2007). However the ant may be of concern if it reaches uninhabited islands of conservation importance (Wetterer 2007).

The yellow crazy ant invasion of Kiritimati is apparently isolated and in low abundance, and therefore its effects are difficult to perceive or measure at present. The progress of a yellow crazy invasion in any given place is not predictable, and the ants may remain in low abundance for many years. However, when in high abundance these ants have devastating effects on the environment and human lifestyle in Pacific Island Nations.

For example, at present the yellow crazy ants are causing significant problems on Atafu atoll, Tokelau. The yellow crazy ants were first found here in 2008 and by 2011 they covered half the atoll (~37 hectares; Pierce et al. 2012). By 2012 the abundance of the ant on Atafu was so great that residents perceived it has driven the local coconut crab population to extinction, people cannot leave food outside, and the ants enter their homes and crawl over them at night, making sleep difficult (Gruber 2012). The cost to manage this ant to low levels of abundance on Atafu has been estimated at around AUD180,000. This management effort would not achieve eradication. The problems the ant can cause would be disastrous and expensive for Kiritimati and it is strongly recommended the ant be managed to be ‘safe rather than sorry’. While the distribution of the ant is relatively isolated, management is much less expensive.

The identification process found a crazy ant in one of the collections from the town dump. These ants weren’t obvious when the survey was being undertaken, so they are perhaps in low abundance, or they may have got there recently. Ray Pierce noted that rubbish was being taken to the dump from around the customs office. So the ants may have only been foraging workers, but this must be followed up. It is advised that the progress of the yellow crazy ant incursion be monitored and managed in case of spread. Before leaving Kiritimati Ray Pierce devised a set of first response actions (Appendix 2) to which Agriculture agreed to implement.

In summary I recommend continuing with the first response actions identified by Ray Pierce, intermittent monitoring on Motu Tabu and South west Nimroona (and other protected islands) to note any possible harassment of birds by ants, re-surveying the town dump area with sugar lures left out for a longer time (1 hour) to determine if yellow crazy ants have established there.

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## References

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# Appendix 1: Ant species collected by Ray Pierce in 2008

Ant Identification results – Kiritimati, Kiribati

(Collected – April 2008 by Ray Pierce)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Location** | **Type** | **Identification** |
| 1 | Cassidy Airport Arrival building | Sugar | *Monomorium* sp. (Salomonis group)*Paratrechina* sp. |
| 2 | Cassidy Airport Arrival building | Protein | *Monomorium* sp. (Salomonis group) |
| 3 | Cassidy Airport- Departure building | Sugar | *Monomorium* sp. (Salomonis group)*Pheidole megacephala* |
| 4 | Cassidy Airport- Departure building | Protein | *Monomorium* sp. (Salomonis group)*Pheidole megacephala**Paratrechina* sp. |
| 5 | London wharf | Sugar | *Pheidole megacephala**Paratrechina* sp. |
| 6 | London wharf | Sugar | *Pheidole megacephala**Paratrechina* sp. |
| 7 | London wharf | Protein | *Tetramorium similimum**Pheidole megacephala* |
| 8 | London wharf | Protein | *Pheidole megacephala* |
| 9 | Cassidy Airport Arrival building | Single ant | *Camponotus variegatus* |
| 10 | Wild life conservation unit building | Single ant | *Camponotus variegatus* |

Identified by Disna Gunawardana

MAF IDC

Auckland

17 May 2008

# Appendix 2: First response recommendations of Ray Pierce, Eco-Oceania

## Yellow crazy ant first response Kiritimati March 2013

*Anoplolepis gracilipes* was found during routine survey coordinated by Monica Gruber VUW at Kiritimati on 5 March 2013. The area of infestation was c.0.5 ha and centred on a KSC warehouse and 2 neighbouring properties – Commerce, and Water and Sanitation. Management began on 6 March and continued during the following week.

The following interim actions were discussed and agreed to be implemented by Agriculture on my departure 12 March.

1. Keep area secure – tape and signs
2. Rubbish – no collection, local incineration
3. Remind staff at Commerce, KSC warehouse, Water and Construction of need to keep area clear, no rubbish collected from properties
4. Search infestation area daily (or every 2nd day)
5. Treat all nests newly found – boiling water and/or hypersaline, kill queens
6. GPS new nests
7. Check all nests until no further activity
8. Carefully move heavy equipment to side and treat any new nests
9. Search more widely Ronton etc, rubbish, Noni bushes
10. Survey KOIL
11. Update LINNIX (now MLPID), Tarawa
12. Update table for Ray/Monica etc
13. Post small red ants to Monica
14. Apply for emergency funds (Ray and Monica to lead)
15. Update media

Ray Pierce

15 March 2013