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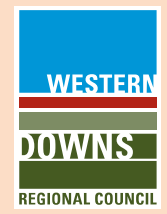
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TRAMP ANT PREVENTATIVE SURVEILLANCE APPROACHES AND COLLABORATION IN CENTRAL QUEENSLAND

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ABSTRACT

Tramp ants refer to a group of highly invasive ants that can have significant environmental, economic, and social impacts. The detection of yellow crazy ants (*Anoplolepis gracilipes*) at Shute Harbour in 2019 was the catalyst for Biosecurity Queensland to instigate a systematic, regional-scale preventative tramp ant surveillance program in Central Queensland. The first surveillance activity occurred at Port of Mackay in December 2020 and a regional tramp ant surveillance plan was subsequently finalised in November 2021. Target species include red imported fire ants (RIFA), tropical fire ants, electric ants, browsing ants and yellow crazy ants. Surveillance provides proof-of-freedom confidence for state eradication programs. Early detection of these, and other high-risk species, will enable a rapid response and increase the likelihood of extirpation (localised eradication).

Biosecurity Queensland has partnered with Department of Defence, local governments, marinas, Landcare groups and port authorities to coordinate 120 surveys to date. While no priority detections have occurred yet, recordings of some pest ants have local implications for key stakeholders. Biosecurity Queensland has increasingly sought to increase the capacity of others for collaborative and individual tramp ant surveillance efforts and outcomes. Through such partnerships with stakeholders, surveillance may be expanded to incorporate other potential incursion pathways and entry points.

Keywords: invasive ants, preventative surveillance, early detection

INTRODUCTION

Tramp ants refer to a diverse group of ant species that have established outside their native range as a result of human activities. They are highly invasive ants that can have significant environmental, economic, and social impacts. Kwong (2023) reports that, of the approximate 15,599 ant species worldwide, at least 520 ant species have been transported outside of their native ranges and 17 are evidently harmful. Similarly, the *National Invasive Ant Biosecurity Plan 2018 – 2028* identifies 16 high priority species (or species groups) that are either not present, under eradication or established in Australia.

In August 2019, one of these high-risk species, the yellow crazy ant was detected at Shute Harbour near Airlie Beach. This detection was the catalyst for Biosecurity Queensland to evaluate tramp ant threats to Central Queensland. While other regions have active eradication programs (and associated surveillance activities) for certain species, Central Queensland had previously relied on the protection afforded by Australian government-led biosecurity surveillance at Ports of Entry and associated Approved Arrangement facilities.

However, Queensland's history of tramp ant incursions demonstrates that, while Australia's biosecurity system is robust, it is not infallible. Additionally, with eradication of electric ants and RIFA in progress, any regional preventative surveillance program needed to consider not just international, but also interstate and intrastate pathways. Here we discuss our approaches to surveillance and capacity building in Central Queensland.

REGIONAL PREVENTATIVE SURVEILLANCE PLANNING

Based on pilot surveillance activities commenced in December 2020, a regional preventative surveillance plan was developed in November 2021 which identified high-risk threats, pathways for invasion, entry points, establishment of sentinel sites, and stakeholder collaboration and capacity building. The regional preventative surveillance plan and its objectives are consistent with the *Threat abatement plan to reduce the impacts of tramp ants on biodiversity in Australia and its territories* (2006) and the *National Invasive Ant Biosecurity Plan 2018-2028* (2019).

State and regional invasion history

Five priority tramp ants were identified as high-risk threats to the region – yellow crazy ants, RIFA, electric ants (*Wasmannia auropunctata*), browsing ants (*Lepisiota frauenfeldi* (also *L. incisa*; *L. canescens*)) and tropical fire ants (*Solenopsis geminata*). Yellow crazy ants were first detected in Cairns in 2001 and subsequently became established at over 30 other sites in Queensland including Townsville, Hervey Bay, and Brisbane. The first Central Queensland detection was in 2019 at Shute Harbour with subsequent incursions at Funnel Bay (2020), Hamilton Island (2021), Woodwark (2023) and Mandalay (2023) (Hardy 2023).

Other high-risk tramp ant incursions in Queensland include electric ants (2006), browsing ants (2019), RIFA (2001(x2), 2006, 2013 and 2014) and tropical fire ants (2002 & 2019) with these either eradicated or under active eradication programs. Of note, there have been two incursions of RIFA in Central Queensland, both of which were extirpated at Yarwun (2007) and Gladstone (2016) (Wylie *et al* 2016). These incursions do not include at-border detections.

Pathways for invasion and entry points

Invasion by tramp ants is known to occur through international movement of infested agricultural and forest products, machinery (e.g., military and mining equipment), packing materials, cargo containers, yachts and other ocean-going vessels, and imported goods (CASAP 2014). Interstate and intrastate spread may be facilitated by these vectors in addition to movement of infested building and raw material supplies, foodstuffs, landscaping supplies and in the soil of potted plants.

In consideration of these factors, potential entry points in Central Queensland initially included ports, military sites, marinas, and council depots. Additionally, landfill and waste transfer sites associated with major population centres were identified for attention. This was due to the volume and variety of waste potentially becoming a 'sink' for infestations of tramp ants from within the facilities' service area.

Sentinel site identification and prioritisation

Sentinel sites for systematic survey were identified based on most likely entry points and prioritised with consideration of pathways and risks. Higher risk sites are surveyed more regularly and more intensively. For example, the mixed-use Port of Mackay is prioritised over coal ports due to the type, volume, and frequency of imports. Conversely, lower use

council depots are given lower priority and surveyed less frequently. To avoid duplication, nil to limited Biosecurity Queensland-led activities occur where regular surveillance is undertaken by the federal Department of Agriculture, Fisheries and Forestry e.g., Port of Gladstone.

SURVEILLANCE METHODOLOGY

Regional surveillance occurs through targeted and systematic actions to help detect new tramp ant incursions. Biosecurity Queensland’s active surveillance in Central Queensland is tailored to a combination of sentinel site monitoring and promotion of community reporting. The sentinel site approach considers incursion and dispersal pathway analysis to determine where tramp ants are most likely to be found. Sentinel sites are surveyed at least once annually with higher risk sites targeted up to four times.

Surveillance methods are based on recognised guidelines such as the *Essential Guide to Sentinel Site Surveillance for Local Government* (DAF 2020). This typically involves setting lures (attractants) along customised line transects, though grid-based surveys are also sometimes used. The area surveyed may vary from 10 to 100% of a site and is determined by its overall size, accessibility restrictions, personnel available and intel provided by the site manager (e.g., type, volume, location and frequency, duration of goods and materials movement). Survey scheduling and timing may also consider tramp ant ecology, feeding behaviour, weather, and seasonal conditions.

Lures (small portions of skinless footy frank) are fixed to the ground with a skewer and marked by flagging tape. These are placed to maximise the likelihood of tramp ant detections through consideration of micro-habitat (e.g., building and electrical structures, concrete edges, rocks, timber, grass, and vegetation) at each site. Distance between lures has varied from 1 to 20 m, though currently averaging 13 m. Track route data is collected, and a survey sheet completed for each activity. Lures are left for approximately one hour and ant samples collected for later identification. Visual surveys may also be undertaken to gauge ant activity and spot sampling occurs if suspect ants are observed.

Ant specimens collected are identified by National Electric Ant Eradication Program (DAF) officers with results and any implications relayed to stakeholders. If a high-risk priority tramp ant is confirmed, a response will be determined based on the species, location, extent of incursion, legislative status, lead agency and resources. Advice on management of local or secondary priority tramp ants is provided on an as needs basis.

REGIONAL SURVEILLANCE IMPLEMENTATION AND OUTCOMES

There have been 120 surveys conducted since 2020. Of these, 103 were at sentinel sites and 17 at community or stakeholder reported suspect incursion sites (Table 1). Some sentinel sites have been surveyed multiple times including nine surveys at the Port of Mackay. Sentinel site surveys have recorded an average transect distance of 700 m using an average of 54 lures.

Table 1. Tramp ant preventative surveillance effort since program inception

Title	2020-21	2021-22	2022-23	Total
Sentinel site surveys	9	38	56	103
Suspect site surveys	2	3	12	17

Total transect distance (m)	5 357	24 224	46 669	76 250
Total lures	387	1 918	3 546	5 851

Since systematic preventative surveillance was initiated in December 2020, there have been no detections of high-risk target species in Central Queensland. The lack of detections is a significant achievement in providing proof-of-freedom confidence for electric ants and RIFA as state-wide eradication targets. While no high-risk target species have been detected, the number of yellow crazy ant infestations increased within the Whitsunday Regional Council area through community and/or council detections.

Surveys did detect secondary targets including Singapore ants (*Trichomyrmex destructor*) and African big-headed ants (*Pheidole megacephala*) which were found at multiple sites. These are considered established in Queensland but may be assessed for extirpation or asset protection where stakeholders deem these goals desirable or necessary.

COLLABORATION AND CAPACITY BUILDING

While many tramp ant surveys are conducted in conjunction with local government and industry, it was recognised that increasing the capacity and involvement of these and other stakeholders will better address the array of invasion pathways and entry points in Central Queensland. Biosecurity Queensland subsequently coordinated three training workshops for targeted stakeholders. This included delivery of a collaborative Biosecurity Queensland-Reef Catchments NRM Tramp Ant Workshop held in Mackay with 21 participants and two training events for 38 Queensland Parks and Wildlife Service officers from the Mackay-Whitsunday and Rockhampton Districts. The training sessions raised awareness with participants shown identification features of high-risk ants and provided demonstrations on surveillance techniques.

Capacity has also increased at a local government level post training workshops with council officers increasing participation in tramp ant surveillance in the Mackay Region. On-site training has also been provided to Department of Defence, Botanic Gardens and Landcare Groups and broader community awareness occurs through social and traditional media.

Biosecurity officers have assisted Department of Defence with tramp ant control programs at Shoalwater Bay Training Area where military facilities and assets were at risk of impact from Singapore ants. Additionally, support continues for Whitsunday Regional Council in managing yellow crazy ant infestations. This has included tramp ant identification, delimitation and population monitoring assistance, participation in Yellow Crazy Ant Committee meetings and specialist technical advice.

DISCUSSION

The program and its associated activities have provided the first systematic multi-target regional-scale preventative surveillance program for tramp ants in Queensland. It has provided proof-of-freedom confidence, drawn attention to the threat of tramp ants, facilitated collaboration and enhanced stakeholder capacity.

Based on learnings from the past 2.5 years of regional surveillance, the Program is currently under review with a revised plan in development. Invasion pathways and entry points were initially biased towards international and interstate pathways but will be reassessed to focus

more on intrastate incursion risks. This is particularly critical considering additional yellow crazy ant infestations within Whitsunday Regional Council area and the size and scope of RIFA infestations in south-east Queensland.

Broader consideration of invasion pathways and subject matter expert feedback (Morton 2023) supports an expansion of sentinel site surveillance to include freight depots, raw material hubs, building material yards, plant nurseries, caravan parks, camping areas and illegal dump sites.

Effective tramp ant surveillance programs in Central Queensland require continued collaboration with stakeholders to achieve successful outcomes. As a result, the Central Queensland Biosecurity team will continue to work with these stakeholders and the broader community to achieve these outcomes.

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