

CASE STUDY: ARGENTINE ANTS ON NORFOLK ISLAND

UPDATED: NOVEMBER 2017

A case study of the potential to eradicate Argentine ants on Norfolk Island and impediments to protecting island biodiversity from invasive ants.

Species

Argentine ant (*Linepithema humile*).

Origin

South America.

Australian occurrence

Widely established in mostly urban areas in temperate Australia, including in southwest WA, SA (Adelaide), NSW (south of Sydney), across Victoria and Tasmania. Detected on Norfolk Island in 2005.

Potential environmental impacts

Argentine ant is one of the world's worst invasive species. It forms super-colonies and are aggressive competitors, displacing most other ant species. It can alter ecosystem processes such as pollination and seed dispersal of native plant species. An assessment for the federal environment department concluded that impacts on two bird species (of 33 species assessed), two reptile species (six were assessed) and one mammal species would 'be sufficiently severe to cause population declines'.¹ All five invertebrates assessed, including four snails listed as critically endangered, are predicted to suffer declines. Lach and Barker (2013) say, 'The consequences for most native invertebrate species and communities will be dire, with potential ecological cascade effects to other components of the foodweb that are dependent on invertebrates as a food resource.'

Potential and economic impacts

Argentine ants farm aphids for honeydew, and more abundant aphids can destroy or reduce the yield of horticultural crops. The permanent establishment of these ants on Norfolk Island would 'seriously



Argentine ant, *Linepithema humile*. Photo: Michele Esposito | www.AntWeb.org

threaten the island's self-sufficiency in horticultural production'.² Honey production would probably be affected. The ants are a household pest and could be a threat to tourism (Norfolk Island's main source of income) if they regularly invaded accommodation facilities or food-based enterprises.³

Pathways

It's unknown how the ants arrived on the island. Their dispersal to multiple sites on the island is attributed to the prior processing of contaminated garden waste at the island's waste management centre sold as mulch. This dispersal pathway has now been stopped.

BIOSECURITY ISSUES

Summary

This incursion highlights the need for stringent quarantine on islands. The five years it took to detect the Argentine ant on Norfolk Island exemplifies the limited capacity for surveillance on islands. Substantial effort has since been invested in surveillance and control of the ant, and there is good potential for eradication.

But Australia could lose this potential unless sufficient funding is forthcoming and quarantine is improved to prevent further incursions. Most ant eradication programs are threatened by insufficient or inconsistent funding.

Quarantine, surveillance and early response

The ant was first identified on the island in 2005, about five years after its arrival (according to modelling). A survey in 2006 found it was limited to two properties, and some control was undertaken.⁴ Unfortunately, one of these sites was a waste management centre selling green waste as mulch. An ant expert brought in in 2008 warned that it was likely to be spreading by this means and subsequent surveys found the ant at an additional eight sites. The expert warned that 'Norfolk Island provides an ideal environment for Argentine ants and, left untreated, they will eventually spread over its entire land surface area'.⁵ He recommended eradication.

The arrival of Argentine ant and other invaders such as myrtle rust on Norfolk



Emily Bay, Norfolk Island, looking out to Phillip Island and Nepean Island.
Photo: © Danny Hayes

Island shows the need for more rigorous quarantine. The delayed detection shows the need for regular surveillance and for community engagement and education to encourage reports of new invaders. Davis (2008) noted that the 'existence of a new and unusual ant species on Norfolk Island had been suspected for several years'. On islands where human populations are small, crucial time can be wasted due to a lack of local knowledge of the threats posed by invasive ants.⁶ The preventable spread of the ant on the Island shows the need for early expert advice on new incursions detected. Costs are typically higher on islands due to transport and limited access to experts. There were delays in treatment due to logistical problems with transporting the bait.⁷ Delays have made eradication a more difficult and costly task.

Eradication program

As of 2017, five discrete populations of Argentine ant are known to persist in covering approximately 240 hectares (the island is 3529 hectares).⁸ Treatment since 2008 is believed to have eradicated an additional six discrete populations covering approximately 20 ha. An eradication strategy was developed in 2014⁹, and was updated in 2017 with a plan to demonstrate proof-of-concept of

the techniques needed to achieve island-wide eradication.

Ants are believed to be the second-most eradicated taxa globally, second only to rodents¹⁰. More than 150 populations of ants have been eradicated globally, mostly in the past decade, and mostly from Australia¹¹. The most similar precedent is the recent eradication of African big-headed ant, *Pheidole megacephala*, from Lord Howe Island. A recent review of invasive ant eradication programs in Australia found that 'Australia is at the forefront of developing methodologies to implement eradication attempts on large scales and has made considerable progress'.¹² Much has been learned from programs for the red imported fire ant, electric ant and yellow crazy ant (on Christmas Island and in the Northern Territory) that can be applied to other invasions. Lach and Barker (2013) note that achieving eradication at this scale 'is a long-term process, requiring a sustained, dedicated effort, and lots of trial and error along the way'. Discontinuous or insufficient funding is the major threat.¹³

The island administration prior to the end of self-government in July 2016 had very limited financial capacity, so funding needed to come from the federal government. Caring for our Country

OUR MISSION

To protect the environment from harmful new invasive species through prevention and early action.



Stronger biosecurity is vital to protect the highly endemic wildlife of Australia and its many special wild places. This is Lord Howe Island, where invasive species have already caused several extinctions.
Photo: Robert Whyte

funds of \$240,000 were provided from 2011-2013, and the Department of Infrastructure and Regional Development provided \$24,000 in 2014, and \$270,000 in 2016. Insufficient and intermittent funding considerably delayed the prospects of eradication.

A 2017 CSIRO review recommended a two year program, currently under way, to demonstrate the feasibility of methods for treating larger and logistically difficult areas, as well as for surveying previously treated areas to confirm eradication of the ant. Once these challenges have been met, eradication is likely to require about \$2 million over five years.

Funding for eradication

The short-term cycles of most funding programs are not well suited to eradication projects, which often require consistent investment over many years and need funds for monitoring after treatments cease and it is considered that eradication may have been achieved. Australia should consider a new funding model to maximise the prospects of achieving eradications. In a review of projects funded through Caring for our Country, Lach and Barker (2013) say that it is not appropriate that Norfolk Island (and Lord Howe Island) had to apply for funding through Caring for our Country's open call for proposals to respond to invasive species incursions that threatened nationally and internationally significant biodiversity assets. Any lag between detection and treatment provides an opportunity for any invasive species, including ants, to spread. 'Commonwealth and state governments, in a coordinated manner, need to take the lead in immediate response to biosecurity incursions.¹⁴ We recommend a fund be established for eradications not eligible for cost-sharing under NEBRA to enable rapid responses after detection and financial commitments over the necessary timeframes to maximise the chances of success.

Threat abatement

Although Argentine ant is a major threat to biodiversity on the Australian mainland, threat abatement has been neglected. The 2012 review of the threat abatement plan found there had been 'minimal progress with Argentine

ant in relation to the objectives of the threat abatement plan to increase and improve: science-based knowledge; border detection and internal spread; and government action for this ant.¹⁵ Lach and Barker (2013) noted that if the 2006 threat abatement plan had been implemented 'it is likely that the invasive ant incursions on Lord Howe Island and Norfolk Island and their threats would have been recognised earlier, and coordinated management could have commenced sooner and more efficiently.'

CHANGES NEEDED

Biosecurity capacity

- The capacity to detect and respond to new biosecurity incursions on islands needs to be greatly strengthened.

Eradication

- More consistent and secure funding models are needed to sustain eradication programs over sufficient time to achieve their objectives.

Other changes

- The Invasive Species Council and Island Conservation completed a report that proposed 25 recommendations for stronger biosecurity on Norfolk Island.¹⁶ The report can be viewed at <https://invasives.org.au/download/reports/>.

ABOUT OUR CASE STUDIES

Our case studies illustrate the need for changes in how Australia prevents the establishment of new invasive species. They were compiled using publicly available information at the time of the last update. We would welcome new information or updates to biosecurity response for inclusion in future updates.

CONTACT US

- Visit invasives.org.au for more information about the Invasive Species Council and to get in touch.

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ENDNOTES

- 1 Lach and Barker (2013).
- 2 Davis (2008).
- 3 Thomas and Davidson (2014).
- 4 Lach and Barker (2013).
- 5 Davis (2008).
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- 16 Invasive Species Council and Island Conservation (2017).