

BIOSECURITY FAILURES IN AUSTRALIA: 12 CASE STUDIES

1. RED IMPORTED FIRE ANTS

A case study of Australia's largest eradication program that is being put at risk by failures to prevent and detect new incursions and a looming lack of government commitment.

Species: Red imported fire ant (*Solenopsis invicta*)

Origin: South America

Australian occurrence: An accidental introduction on goods transported on ships. They have established in southeast Queensland and central Queensland (Gladstone). Genetic studies show that fire ants have arrived on four separate occasions, establishing twice in Brisbane (detected 2001) and twice in Gladstone (detected 2006 and 2013)¹.

Potential ecological impacts: Fire ants have been listed by the federal government as a key threatening process because they are harming a wide range of animals in the United States and similar impacts are expected in Australia if they are not eradicated.² They are listed as one of 100 of the worst invasive species in the world.³ The animals at most risk in North America include ground-dwelling animals and those that hatch from eggs in the soil; animals are typically stung to death. In Florida red-bellied turtles, only 29% of hatchlings in fire-ant invaded sites survived compared to 100% away from fire ants. In loggerhead turtles, nests with fire ants had 15% fewer hatchlings.⁴ Fire ants are implicated in declines of bobwhites, some of which have been precipitous, ground doves, the Texas horned lizard, the southern hognose snake and the peninsular intergrade kingsnake.⁵ They have also been recorded reducing breeding success of deer, rails and terns. Anecdotal evidence indicates impacts on many other species.⁶

In Australia there are concerns for many species that are declining already from other impacts, including threatened turtles (green turtle, leathery turtle, Pacific ridley, Bell's turtle, Mary River tortoise, hawksbill turtle and the Bellinger River Emydura), crocodiles, lizards, frogs, and ground-dwelling birds such as the malleefowl, black-breasted button-quail and plains wanderer, among many others.⁷

Australian plants may face risks from fire ants grazing on seedlings and disrupting seed dispersal, pollination and germination.⁸ Fire ants have more ecological impacts than most ants because they can reach extremely high densities of up to 2600 mounds per hectare.⁹

Potential social and economic impacts: Red imported fire ants in the United States cause many serious economic and social impacts. They sting people, occasionally causing the deaths of infants and elderly people, damage some crops, rob bee-hives, harm young domestic animals, and damage roads, footpaths and electrical equipment, often seriously.¹⁰ They have caused more than 80 human deaths.¹¹ Stings easily become infected



¹ <http://www.ccfqld.com/News-page/update-from-biosecurity-qld-fire-ants-in-the-gladstone-area/>

² Allen et al. (2004), Department of the Environment

³ Lowe et al. (2000)

⁴ Allen et al. (2004)

⁵ Allen et al. (2004)

⁶ Allen et al. (2004), Vinson (2013)

⁷ Moloney & Vanderwoude (2002), Department of the Environment

⁸ Department of the Environment

⁹ Department of the Environment

¹⁰ Vinson (2013)

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and may leave permanent scars. They provide some benefits by reducing certain crop pests. The damage caused in the US has been costed at \$7 billion each year, including actual control costs.¹² Modelling by the Queensland government indicates that in Southeast Queensland alone, if left untreated, fire ants would impose costs in the order of \$43 billion.¹³ To 30 June 2014, the federal, state and territory governments collectively spent \$292 million attempting to eradicate the ants.¹⁴ This doesn't include the significant costs borne by local governments, energy utilities, industry and others.

Pathways: Fire ants travel with cargo.

Summary of biosecurity issues: Of all the invasive species that should be kept out of Australia, red imported fire ants represent one of the most serious. They are also one of the most costly, and any flaws in quarantine that result in new incursions put at risk the >\$300 million already spent trying to eradicate them. The two incursions in Gladstone show that despite a strong quarantine focus it continues to breach Australia's borders. The incursions also highlight inadequate surveillance in Australia for high priority threats. The first incursions in Brisbane were not detected probably until 10 years after arrival, and the 2014 detection at Yarwun for probably 3 years after arrival.¹⁵ Because of national decision-making processes, even a single state can cause the eradication to be abandoned. Failure on a >\$300 million project looms unless sufficient continued funding is forthcoming.

Particular biosecurity issues

Quarantine and surveillance: The multiple incursions of red imported fire ants highlight serious gaps in quarantine. The fact that the incursions weren't discovered for several years after they established – maybe 10 years for the Brisbane incursions and 3 years for the most recent incursion at Gladstone imply lack of systematic surveillance.

Emergency response: In 2001, RIFA were found in two locations in Brisbane – around the main cargo port at Fisherman Islands, and in the suburbs of Wacol and Richlands. They were found later to be genetically distinct, indicating two incursions. The Queensland government immediately 'mounted an emergency response to delineate the invasion and if possible eradicate the fire ant, despite scepticism that eradication could be achieved, given no other country has been able to eradicate them.'¹⁶

An analysis of the eradication program shows that it came very close to eradication in 2003 but because it had failed to fully 'delimit the invasion' part of the infested area remained outside the searched and treated areas.¹⁷ 'If accurate estimates of the invasion boundary had been available, resources could have been reallocated to fully cover the infested region.' Keith and Springer note this result highlights 'the crucial importance of mathematical modelling of biological invasions'. Because of this missed opportunity the infested area has approximately doubled between 2004 and 2010.¹⁸ Keith and Spring recommend that the eradication strategy be designed to be more pre-emptive by modelling the likely expansion front of the ants and treating areas beyond where nests are detected to keep pace with their predicted movements. It highlights the importance of applying the very best science to eradications and involving external experts.

In May 2012 a new strategy was implemented using remote surveillance technology to detect new nests and determine the full extent of the infestation (ground-based surveillance is more expensive and inefficient).¹⁹ The program aims to search up to 100,000 ha per year.

¹¹ Vinson (2013)

¹² Avant (2014), Lard et al. (2006)

¹³ Antony et al. 2009

¹⁴ Costs to 30 June 2014, Mike Ashton, personal communication. Hafi et al. (2014) said the costs were \$411 million (but they don't give a source for it).

¹⁵ International Plant Protection Convention (2010). The 2001 detections were at Brisbane's main cargo port (Fisherman Islands), and in the southwestern suburbs of Wacol and Richlands.

¹⁶ Keith and Spring (2013)

¹⁷ Keith and Spring (2013)

¹⁸ Keith and Spring (2013b)

¹⁹ Keith et al. (2013)

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The researchers and Biosecurity consider it is feasible to achieve success in this eradication.²⁰ However, it needs a long-term funding commitment so that the program can make decisions to optimise its chances of success. Eradications don't succeed if they are half-hearted.

National cost-sharing: Soon after their detection the National Red Imported Fire Ant Eradication Program was established with cost sharing from Australian state and territory governments. The NEBRA was triggered for the 2013 Gladstone incursion. Earlier incursions were handled under ad-hoc arrangements.

This massive and expensive eradication effort represents an admirable commitment of Australian governments to eradicate red imported fire ants, which has been justified on the basis of the extremely high costs that will result if they are not eradicated. However, the commitment by some governments has been tenuous at times and there is as yet no funding commitment in place for 2014-15. One or more state governments are apparently wavering in their current commitment to the program²¹, which could put at risk the entire program because national cost-sharing arrangements rely on consensus from all federal, state and territory governments. That one state can veto an eradication response highlights the problematic nature of decision-making processes under the various agreements (in this case NEBRA). The National Management Group is not required to consult or publish reasons for decisions, so they can be made for reasons that have nothing to do with the public interest.

The implications of abandoning the eradication or it failing are extremely severe. There should be a transparent process to make such decisions so that the Australian public can be confident that decisions are well justified and in the public interest. This program needs a 5-10 year allocation so that managers can plan ahead.

Issues for the inquiry

Quarantine, surveillance

- What is going wrong with quarantine to allow fire ants to arrive in Gladstone twice?
- Can we be confident that fire ants are not entering through other ports and escaping detection?
- A large number of ant species are spreading around the world with trade. How confident can we be that other invasive ants are not entering Australia?
- What actions have been taken to reduce the risk of new arrivals of red imported fire ants?
- What procedures are in place pre-border and at border to reduce the risk of arrival of red imported fire ant and when were these procedures last reviewed?

Decision-making

- What resources are allocated for red imported fire ant eradication beyond 1 July 2014?
- What is preventing the allocation of additional resources over a 5-10 year time period?
- How can decision-making under nationally-funded eradication programs be improved to maximise the success of eradication.
- Should the National Management Group be required to consult on decisions and provide reasons for them?

Eradication planning

- What lessons have been learnt from efforts to eradicate the red imported fire ant that can be applied to eradications of other invasive species?

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²⁰ Keith et al. (2013)

²¹ SCoPI (2013)

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