

Biosecurity Response to the Southern Saltmarsh Mosquito (*Aedes [Ochlerotatus] camptorhynchus*)

Background

Biology and Ecology

SSM is widely distributed on the Australian mainland, and is common in coastal areas in the southern and western part of its range. Adult activity is year round, with seasonal build-up of populations from spring to late summer. SSM prefers brackish water, but can occur in inland riverine habitat and will successfully breed in freshwater. Eggs are laid on moist substrate, are desiccation resistant, and exhibit instalment hatching after wetting events. Adult females will seek a blood meal up to 5kms from breeding sites, with potential for wind-assisted dispersion over much greater distances. Adults exhibit diurnal biting. Host preferences cover marsupials, humans, horses, cattle, sheep and birds. SSM is a potential vector for *Dirofilaria* sp., flaviviruses (e.g. Murray Valley encephalitis), alphaviruses (e.g. Ross River virus [RRV], Barmah Forest virus), *Eperythrozoon ovis*, and myxomatosis.

History in New Zealand

SSM was first detected in New Zealand in the Hawkes Bay region in December 1998. Since then, SSM has been detected and subjected to control measures in Gisborne, Auckland, Northland, Marlborough and Coromandel. Whereas Hawkes Bay District Health Board led the original response, Ministry of Health lead the national response from 2000 till June 2006, at which time Biosecurity New Zealand (MAF) assumed responsibility for the programme. Southern Monitoring Services has been the operational contractor since 2000.

The history of the New Zealand outbreak and response is summarised in Table 1. Funding to 31 August 2006 is summarised in Table 2. In August 2006, Cabinet allocated a further \$11M to the response covering the 2006-07 financial year, but requested a re-evaluation of the programme by MAF, reporting back to Cabinet by June 2007.

Potential impacts

Several health impact assessments have been conducted, with these indicating the following probable impacts:

Ecological impacts	Unknown effects on indigenous birds from biting.
Aesthetic / nuisance effects	Nuisance biting within 5km of habitat
Human health effects	Arbovirus vectoring. In particular, Ross River virus is considered a high risk given a high probability of release associated with viraemic travellers arriving from Australia.
Economic impact	Cost benefit analysis has focused on the economic impacts arising from RRV introduction and establishment, with human health impacts and resulting costs of mosquito and/or public health risk mitigation. Unknown effects on production animals from biting.

Other impacts	
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Table 1. Summarised history of the New Zealand SSM outbreak and response.

Zone	S-methoprene treatment started	Last adult detected	Last larvae detected	Treatment ceases	Eradication completed
Napier	Aug-99	Apr-00	Aug-00	Apr-01	Jul-02
Mahia	Nov-00	Apr-01	Aug-01	Aug-02	Aug-03
Tairāwhiti	Nov-00	Sep-02	Sep-02	Jun-03	Sep-04
Porangahau	Nov-00	Jun-02	Aug-02	Apr-03	Sep-04
Mangawhai	Oct-02	Dec-02	Nil	Apr-03	Dec-04
Whitford	Oct-02	Apr-02	Nov-02	Mar-04	Nov-04
Kaipara (north)	Oct-02	Sep-03	Feb-04	Jun-04	Jun-06
Kaipara (south)	Oct-02	May-06	May-06	TBA	TBA
Whangaparaoa	Jan-04	Nil	May-05	Apr-06	Due May 2007
Wairau/Grassmere	Feb-05	Oct-06	TBA	TBA	TBA
Coromandel	May-06	TBA	TBA	TBA	TBA

Table 2. Summarised financial history of the SSM response (to 31 August 2006).

Outbreak	Period	Govt funding (NZ\$M)
Napier	1998-2002	7.25
Gisborne, Mahia, Porangahau	2000-2005	4.81
Kaipara, Whitford, Whangaparaoa	2002-2006	27.02
Wairau, Grassmere	2004-2009	8.92
Coromandel	2006	1.02
Total		49

IDC Science Programme for the SSM Response

In August 2006 Cabinet provided one years further funding for the SSM eradication programme, conditional to a report back by 30 June 2007 providing further analysis of whether the objective of eradication remained technically feasible and the most appropriate option going forward.

In accordance with MAF Biosecurity New Zealand incursion response policy and processes, an Intelligence Team was established with the Investigation and Diagnostic Centre, Wallaceville, drawing on expertise in suppliers from a number of agencies, including:

- Southern Monitoring Services Ltd
- Institute of Environmental Science and Research
- Massey University EpiCentre
- AgriQuality Ltd

By December 2006, Science projects had been initiated following an initial scoping workshop. The science projects address the main elements of uncertainty associated

with Cabinet's requested report back, and so the timeline for these projects aligns with MAF's timeline for the report back to Cabinet. The science projects initiated to date include the following:

1. Coromandel Tracing Project.
2. SSM Modelling Project.
3. SSM Genetics Study.
4. RRV Livestock Sero-Survey.
5. RRV Critical Assumptions Review.
6. SSM Egg Survival Project.

The projects are funded by a specific appropriation from Cabinet for the Southern Saltmarsh Mosquito biosecurity response..