

# NATIONAL SALTMARSH MOSQUITO SURVEILLANCE PROGRAMME 2010–2011

All known saltmarsh habitat within New Zealand has been mapped. Allocation of resources (annual hours/site) for field sampling of saltmarsh mosquito immature stages and adults is prioritised using a statistical algorithm accounting for habitat size, tidal influences, presence of residual surface water, habitat quality for mosquito breeding, any prior presence of southern saltmarsh mosquito (SSM), proximity to port of entry, climate and relevant human activity. This statistical method provides 95 percent confidence of correctly identifying an exotic mosquito incursion in saltmarsh habitat within 12 months of arrival. There are several native mosquito species and some other established low-risk exotic species whose breeding habitat includes saltmarsh. The NSP routinely collects these in the course of site sampling. Identification of mosquito species collected in the field is completed at the NSP laboratory at Lower Hutt. All mosquitoes received are identified to species and reported. In 2010–2011 a total of 12 266 larvae and 2 995 adult mosquitoes were identified from the NSP field collections.

In 2010–2011, the NSP re-established surveillance in the areas previously included in the SSM eradication programme centred on Blenheim. A re-survey and intensive sampling programme was undertaken, confirming the saltmarsh habitat mapping and calculating new allocations of sampling hours for each site there. Throughout this year, there have been no *Ae. camptorhynchus* larvae or adults detected at this location or from any other previously positive SSM location in New Zealand. This result should provide further reassurance that the programme to eradicate SSM, conducted from December 1998 to June 2010, has been a success. This programme, estimated to have cost about NZ\$70 million, remains the only successful eradication of an exotic saltmarsh mosquito species anywhere in the world.

Species of high risk to public health (as determined by likelihood of entry and establishment, and potential to vector disease here) were listed by Mackereth *et al.* (2007), and the list was subsequently extended by McGinn (2008). The list includes two previously introduced but now irreversibly established species:

- *Culex (Culex) quinquefasciatus* (southern house or brown mosquito), and
- *Aedes (Finlaya) notoscriptus* (domestic container, or striped, or ankle-biting mosquito).

The National Exotic Saltmarsh Mosquito Surveillance Programme (NSP) aims at preventing the establishment of exotic mosquitoes of public health importance that breed in saline saltmarsh habitat. Mosquito Consulting Services New Zealand (MCSNZ) is contracted to the Ministry of Agriculture and Forestry (MAF) to provide the NSP service.

Exotic species that continue to pose a high risk are:

- *Aedes (Ochlerotatus) camptorhynchus* (southern saltmarsh mosquito – introduced but declared eradicated in 2010);
- *Aedes (Stegomyia) albopictus* (Asian tiger mosquito);
- *Aedes (Finlaya) japonicus* (Japanese rock pool or Asian bush mosquito);
- *Aedes (Ochlerotatus) vigilax* (saltmarsh mosquito – see **Figure 1**);
- *Culex (Culex) annulirostris* (common banded mosquito);
- *Aedes (Ochlerotatus) procax*; and
- *Coquillettidia (Coquillettidia) linealis*.



Figure 1: The exotic saltmarsh mosquito *Aedes (Ochlerotatus) vigilax* (Skuse 1889). This is a competent vector of Ross River virus and Barmah Forest virus. It is a highly aggressive biting species and control in southeast Queensland costs AU\$10 million annually.

In 2010–2011 the NSP surveillance detected nine mosquito species, all of which were either native or established species in New Zealand.

In October 2010 MAF received several reports from the public of unusual mosquito biting activity in North Canterbury. MCSNZ investigated these complaints to determine their cause and find out whether exotic species might be involved. Adult mosquito trapping and breeding habitat surveys were undertaken in the Pine Beach area. The investigation showed that after the 4 September 2010 earthquake in Christchurch, changes caused by liquefaction and disruption to drainage systems had increased surface water and created favourable conditions for mosquito breeding. However, all of the mosquitoes collected were the native *Aedes antipodeus*. This species is not known to transmit mosquito-borne disease directly, although several children badly bitten at the time developed secondary skin infections requiring medical treatment. Timely investigation and identification of the species involved and discovering the main cause of their population growth provided useful public information. Public health concern in the community was addressed and within a few days it was confirmed that no exotic species was involved.

## REFERENCES

Mackereth G *et al.* (2007). Vectors and vector borne diseases: Ecological research and surveillance development in New Zealand. Risk Assessment. Ministry of Agriculture and Forestry, Wellington.

McGinn D (2008). Mosquito Surveillance Review. Report commissioned by the Ministry of Agriculture & Forestry and Ministry of Health, Wellington.

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