

NATIONAL SALTMARSH MOSQUITO SURVEILLANCE PROGRAMME 2013–2014

The National Saltmarsh Mosquito Surveillance Programme (NSP) is designed to detect exotic mosquito species post-border in breeding habitats associated with low coastal marshland habitat subject to saline influence. These habitats include classic natural saltmarsh subject to periodic tidal or wind/storm-driven flooding by seawater; former seabed uplifted by seismic action; former intertidal land reclaimed for agriculture; and drainage works intersecting saline habitat or saline water tables. The prototype exotic mosquito species upon which the NSP was originally modelled in 2005 is the southern saltmarsh mosquito (SSM) *Aedes (Ochlerotatus) camptorhynchus* (Thomson, 1869).

SSM was finally declared eradicated from New Zealand in June 2010. The estimated cost of the eradication programme, from December 1998 to June 2010, was \$70 million. There is strong evidence that the infestations of SSM in its various New Zealand locations were disseminated from a single introduction. The pathway by which SSM entered New Zealand before it was first detected in Napier (estimated to be at least three years prior) has not been identified. The NSP maintains surveillance in receptive habitats for high-risk exotic mosquitoes likely to use saline and associated habitats.

The NSP is flexible in its application of surveillance resources and responds to information on interceptions of relevant exotic mosquitoes species at the border. In May 2014, a suspect exotic mosquito was intercepted at a Transitional Facility (TF) by border control officers in Auckland and sent to the Mosquito Consulting Services NZ (MCSNZ) laboratory for identification. It was an adult mosquito identified as *Aedes (Ochlerotatus) taeniorhynchus* (Wiedemann, 1821) a saltmarsh mosquito native to North and South America. The NSP immediately re-prioritised tasking of surveillance officers and commenced enhanced field surveillance within a 10 km radius of the TF. At the time of this report, no further detections of *Ae. taeniorhynchus* had

been made but enhanced surveillance was continuing.

In 2013 the NSP underwent a major external review by Professors Scott Ritchie and Richard Russell (Ritchie & Russell, 2013) (**Figure 1**). The review assessed Mosquito Consulting Services NZ's discharge of its obligations under the existing NSP contract and considered changes that have occurred since the NSP's creation in 2005, especially in relation to a number of years' absence of SSM and increasing use of Transitional Facilities that create many virtual ports where border control processes are initiated. It is known that many, but at present an undefined number of, TFs are adjacent to potential receiving habitats for exotic mosquitoes.

The findings of the Ritchie and Russell review provided favourable commentary on the performance of NSP tasks by MCSNZ. The review also identified a number of recommendations to take the NSP forward in the context of changed and changing risk factors for surveillance of exotic mosquitoes in New Zealand.



Figure 1: Prof. Scott Ritchie during the NSP external review in 2013

In 2013–14 a total of 11 177 larvae and 1818 adult mosquitoes from 10 species across five genera were collected and processed for identification to species. **Tables 1 and 2** list the mosquitoes identified by species by the NSP last year. No exotic species were found by the NSP last year but the *Ae. taeniorhynchus* interception resulted in the NSP providing enhanced post-border surveillance.

Following the NSP external review and receipt of its recommendations, the NSP will develop a fresh model

TABLE 1: LARVAL MOSQUITOES IDENTIFIED, 2013–2014

<i>Cx. pervigilans</i>	9396
<i>Ae. antipodeus</i>	1126
<i>Ae. subalbirostris</i>	422
<i>Ae. australis</i>	118
<i>Ae. notoscriptus</i>	60
<i>Op. fuscus</i>	54
<i>Cx. quinquefasciatus</i>	1
Total	11 177

TABLE 2: ADULT MOSQUITOES IDENTIFIED, 2013–2014

<i>Ae. antipodeus</i>	819
<i>Cx. pervigilans</i>	810
<i>Cq. irucunda</i>	75
<i>Ae. notoscriptus</i>	52
<i>Cx. quinquefasciatus</i>	47
<i>Ae. subalbirostris</i>	9
<i>Cs. tonnoiri</i>	3
<i>Cq. tenuipalpis</i>	2
<i>Op. fuscus</i>	1
Total	1818

for future post-border mosquito surveillance. The risk algorithm input that previously applied high weighting on saltmarsh habitat formerly positive for *Ae. camptorhynchus* will be relaxed. The risk input of habitat proximity to a port of entry will, however, be modified to include Transitional Facilities as virtual ports of entry. With these changes, habitat surveillance effort (surveillance hours per site per year) will be recalculated in line with the expected shift in surveillance. The timely evolution of NSP, in response to changing risk input factors and their weighting, will ensure the government continues to receive value for money for this important post-border mosquito surveillance programme.

Darryl McGinn
Mark Disbury
Mosquito Consulting Services (NZ)
PO Box 30 719
Lower Hutt 5040
Darryl.McGinn@mcspty.com
Mark.Disbury@mcspty.com