Marine surveillance annual report

This annual report includes summary information for the National Marine High Risk Site Surveillance Programme and the Marine Invasive Taxonomic Service (MITS) for the winter and summer periods between May 2014 and April 2015.

The targeted surveillance programme for non-indigenous marine species focuses surveillance activities at 11 major ports and associated marinas around the country (**Figure 1**). Surveillance is designed to detect the presence of non-indigenous and potentially invasive marine flora and fauna, including selected species that have documented international impacts, that present a significant risk of arriving and becoming established, and are likely to have negative consequences for New Zealand's environment and economy. The programme also aims to monitor changes in the distribution of established non-indigenous or pest species at these high-risk locations.

The majority of marine pests targeted are listed in the New Zealand Register of Unwanted Organisms (http://www.biosecurity.govt.nz/pests/registers/uor) under the Biosecurity Act 1993. These include primary target species (Northern Pacific sea star *Asterias amurensis*, European shore crab *Carcinus maenas*, the marine aquarium weed *Caulerpa taxifolia*, Chinese mitten crab *Eriocheir sinensis* and Asian clam *Potamocorbula amurensis*) and secondary target species (Australian droplet tunicate *Eudistoma elongatum*, Asian bag mussel *Arcuatula senhousia*, Mediterranean fanworm *Sabella spallanzanii* and clubbed tunicate *Styela clava*). All unidentified suspect samples collected during surveillance activities are sent for identification to the Marine Invasives Taxonomic Service (MITS), a marine taxonomic clearing house funded by MPI and operated by NIWA. All of these identifications are subsequently entered into the marine non-native species database for future reference. The data are accessible from http://www.marinebiosecurity.org.nz/#panel-2.

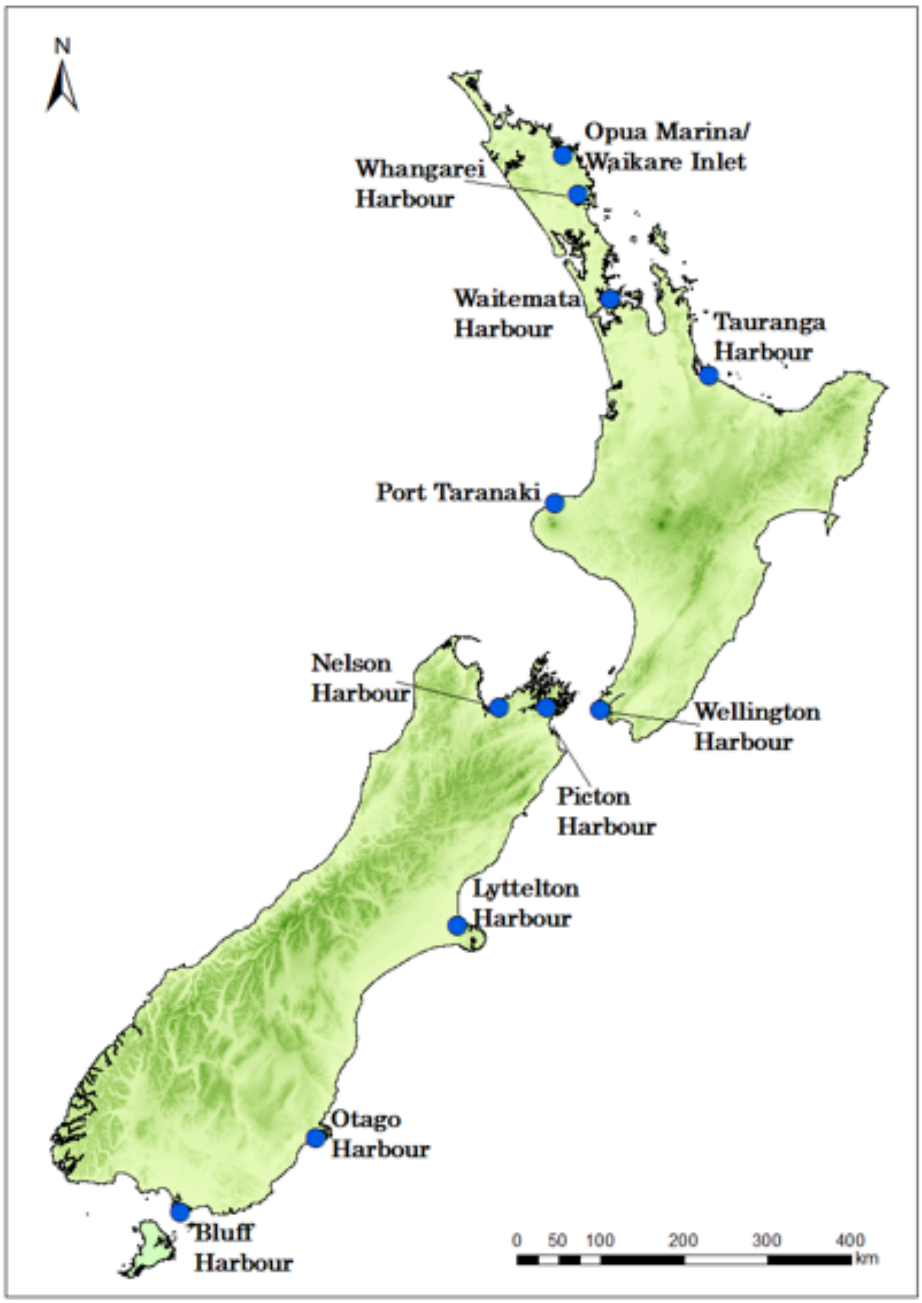

Figure 1: Locations of the 11 ports and associated marinas surveyed in the targeted surveillance programme. Note that Havelock is associated and included with Picton Harbour.

Sample collection

A total of 2 930 sites were surveyed during the 2014 winter sampling period (May to October) and 2 911 sites were surveyed during the summer months (November 2014 to April 2015), representing 100.9 percent and 100.3 percent of the target number of sites, respectively. Habitats sampled included soft and hard surfaces such as mud and gravel bottoms, rocky shores and artificial structures including marina pontoons, pilings, moorings, jetties and vessel berths. Techniques used included epibenthic sled tows, crab box traps, crab condos and diver and shore searches (**Table 1**). No primary target species were

detected during the survey period across all high-risk sites, but at least one of the four secondary target species was found in nine of the ports surveyed (**Table 2**). This represents range extensions for two of these secondary target species: *Sabella spallanzanii* detected in Nelson Harbour and *Styela clava* in Picton.

Number of specimens collected and sent to MITS

In total 104 specimens were sent to MITS for identification: 32 for the winter round and 72 for the summer round. Suspect specimens found at high-risk sites represented 14 taxonomic groups and included 14 non-indigenous species (**Table 3**). Two of these are new records for New Zealand: the colonial ascidian *Distaplia viridis* Kot, 1957, detected in Whangarei in June 2014, and the brown alga *Stictyosiphon soriferus* (Reinke) Rosenvinge, 1935, detected in Wellington in February 2014.

MITS also identified 174 sample lots that were collected and submitted as part of MPI investigations into exotic marine organisms. These were generally received following notifications via the MPI exotic pest and disease hotline.

Most of the information collected from marine biosecurity surveillance programmes has now been uploaded and made available via the Marine Biosecurity Porthole webpage (www.marinebiosecurity.org.nz), which houses data from these MPI-funded programmes, MITS identifications and other verified observations. Anyone with an interest in marine biosecurity can access recent information on what has been recorded in New Zealand waters, where, and, in many cases, when it was reported. The website enables users to view sites surveyed and examine distribution records for individual species. It also gives information about significant marine pests and contains a catalogue that enables information and reports to be downloaded.

Table 1: Sample methods utilised for high-risk sites surveyed in 2014–2015*
Species in ***bold*** have been collected using this method during the present or previous surveillance programmes

Method	Target species	Non-target species	Habitat	Spatial coverage	Effectiveness
Epibenthic sled tows	*Asterias amurensis* ***Eudistoma elongatum*** ***Arcuatula senhousia*** *Potamocorbula amurensis* ***Sabella spallanzanii*** ***Styela clava***	***Acentrogobius pflaumii*** ***Chaetopterus* sp.** *Charybdis japonica* *Didemnum* sp. *Grateloupia turuturu* *Hypnea* sp. ***Theora lubrica*** ***Pyromaia tuberculata***	Subtidal soft sediments. Particular focus on known shellfish beds (for *Asterias*) and areas next to public access (e.g., wharves, boat ramps, marinas for *Caulerpa, Sabella*).	Narrow width but 50 m tow length and high replication enables a reasonably large area to be sampled (ca 2 500m^2 per location)	Reliable sample collection including asteroids, infaunal and epifaunal bivalves and polychaetes and macroalgae
Box (crab) traps	*Asterias amurensis* *Carcinus maenas* *Eriocheir sinensis*	*Acentrogobius pflaumii* ***Charybdis japonica*** ***Pyromaia tuberculata***	Adjacent to wharf pilings and other artificial habitats. Shores and shallow subtidal habitats, breakwalls and saltmarsh, with a focus on habitats with complex physical structure.	Area sampled depends on dispersion of bait odour. High replication possible.	Quick to deploy and recover so high replication is possible. Effectively samples other species of crabs (e.g., *Ovalipes, Hemiplax*).
Crab condos	*Carcinus maenas* *Eriocheir sinensis*	*Acentrogobius pflaumii* ***Charybdis japonica*** *Pyromaia tuberculata*	Intertidal and shallow subtidal banks of rivers. Particular focus on brackish water habitats with complex physical structure (e.g., saltmarsh or fringing vegetation)	High replication possible. Availability of suitable estuarine habitat may limit deployment.	Effectively samples other species of crabs (e.g., *Austrohelice, Hemiplax*). Higher rates of detection of crabs than baited traps in some conditions.
Shoreline searches	*Carcinus maenas* *Eriocheir sinensis* ***Eudistoma elongatum*** ***Arcuatula senhousia*** ***Sabella spallanzanii*** ***Styela clava***	***Chaetopterus* sp.** ***Charybdis japonica*** ***Clavelina lepadiformis*** ***Didemnum* sp.** ***Grateloupia turuturu*** ***Hypnea* sp.**	Sloping sandy shorelines, intertidal rocky reefs and areas where drift material is likely to accumulate. Wind direction on preceding days is a useful guide to where material may accumulate.	Wide: can cover long stretches of intertidal habitat quickly	Used effectively in delimitation studies of *Styela*
Diver searches	*Asterias amurensis* *Carcinus maenas* ***Eudistoma elongatum*** ***Sabella spallanzanii*** ***Styela clava***	***Chaetopterus* sp.** ***Charybdis japonica*** ***Clavelina lepadiformis*** ***Didemnum* sp.** ***Grateloupia turuturu*** ***Botrylloides giganteum***	Wharf piles, marina piles and pontoons and other artificial structures; intertidal and shallow subtidal reefs	Good: large numbers of piles or areas of hard substratum can be searched in detail	Depends on water clarity and level of biofouling

Table 2: Summary for the marine high-risk sites surveyed in 2014–2015

Location	Sampling round	Target number of sites	Actual number of sites	Target species found
Opua	Winter 2014	248	248	*Eudistoma elongatum, Styela clava*
	Summer 2014–2015	248	249	*E. elongatum, S. clava*
Whangarei	Winter 2014	243	246	*Arcuatula senhousia, E. elongatum, Sabella spallanzanii, S. clava*
	Summer 2014–2015	243	245	*A. senhousia, E. elongatum, S. spallanzanii, S. clava*
Auckland	Winter 2014	486	485	*A. senhousia, S. spallanzanii, S. clava*
	Summer 2014–2015	486	494	*A. senhousia, S. spallanzanii, S. clava*
Tauranga	Winter 2014	243	254	*S. spallanzanii*
	Summer 2014–2015	243	245	*S. spallanzanii*
New Plymouth	Winter 2014	243	243	
	Summer 2014–2015	243	244	
Wellington	Winter 2014	243	243	
	Summer 2014–2015	243	240	*S. spallanzanii, S. clava*
Picton & Havelock	Winter 2014	243	244	
	Summer 2014–2015	243	242	*S. clava*
Nelson	Winter 2014	243	242	*S. clava*
	Summer 2014–2015	243	241	*S. spallanzanii, S. clava*
Lyttelton	Winter 2014	243	243	*S. clava*
	Summer 2014–2015	243	243	*S. clava*
Otago	Winter 2014	243	243	*S. clava*
	Summer 2014–2015	243	243	*S. clava*
Bluff	Winter 2014	225	225	
	Summer 2014–2015	225	225	

Table 3: Samples collected and identified by MITS from each sampling locality, 2014–2015.

Non-indigenous species are in BOLD. Range extensions are in BLUE. First detections for New Zealand are in RED.

(Note: During the 2014-15 season no samples were sent for identification from the Port of Lyttelton)

Location	Taxonomic Identification	
	Taxonomic group	**Species**
Opua	Ascidian	*Microcosmus squamiger*
	Bivalve	*Corbula zelandica, Ennucula strangei, Maorimactra ordinaria, Musculus impactus*
	Bryozoan	***Conopeum seurati, Watersipora subatra***
	Decapod	*Heterozius rotundifrons*
	Anthozoan	*Culicia rubeola*
Whangarei	Algae	*Callithamnion* sp. ‡, *Griffithsia* sp. ‡, *Valeriemaya* sp. †
	Sea Anenome	*Epiactis thompsoni*
	Annelid	*Megalomma suspiciens,* ***Sabella spallanzanii****, Parasabella aberrans*
	Ascidian	***Botrylloides giganteum****, Didemnum vexillum,* ***Distaplia viridis****,* ***Styela clava***
	Bivalve	*Pratulum pulchellum*
	Decapod	*Pariliacantha georgeorum*
	Gastropod	Unidentified (Tonnoidea)Δ
Auckland	Ascidian	*Aplidium thomasi,* ***Botrylloides giganteum****, Botrylloides leachii, Molgula mortenseni*
	Porifera	*Clathrina coriacea*
Tauranga	Algae	*Anotrichium crinitum, Gigartina atropurpurea, Plocamium angustum, Schizoseris* sp.Δ
	Annelid	***Sabella spallanzanii***
	Ascidian	***Botrylloides giganteum****, Botrylloides leachii, Polyandrocarpa* sp. (cf. *robusta)* †
	Hydroid	*Aglaophenia* cf. *laxa*Δ*, Clytia hemisphaerica*
	Porifera	*Chelonaplysilla violacea*
New Plymouth	Algae	***Grateloupia turuturu****, Polysiphonia* sp.§*, Rhodymenia sp.* §
	Annelid	*Boccardia syrtis*
	Fish	*Tewara cranwellae*
	Gastropod	Gastropoda§
Wellington	Algae	***Striaria attenuata****, Gloioderma saccatum,* ***Stictyosiphon soriferus***
	Annelid	***Sabella spallanzanii***#
	Ascidian	***Ciona intestinalis, Styela clava***
	Bivalve	*Corbula zelandica, Ennucula strangei,* ***Limaria orientalis****, Pratulum pulchellum*
Picton/Havelock	Algae	***Grateloupia turuturu****,* ***Schizymenia apoda***
	Asteroid	*Sclerasterias mollis*
	Hydroid	***Ectopleura crocea***
Nelson	Algae	***Grateloupia turuturu***
	Decapod	*Halicarcinus varius*
Otago	Algae	*Rhodoglossum* cf. *latissimum*,* ***Schizymenia apoda***
	Ascidian	*Botrylloides* cf. *magnicoecum*‡
	Holothurian	*Chiridota nigra*
Bluff	Algae	*Callophyllis hombroniana, Centroceras clavulatum,* Kallymeniaceae*, *Plocamium* sp. ** Pugetia delicatissima*
	Ascidian	*Botrylloides leachii, Botrylloides* cf. *magnicoecum*‡
	Fish	*Auchenoceros punctatus, Grahamichthys radiata, Nemadactylus macropterus*

* Molecular techniques required for identification to species level
# Detected on a vessel hull
§ Unidentifiable
Δ Juvenile, or lacking morphological characteristics necessary for identification
† Species yet to be described
‡ Genus poorly understood in NZ

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