

# MARINE AND FRESHWATER

## MARINE SURVEILLANCE ANNUAL REPORT

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 identified as presenting a significant risk of arriving, establishing and having significant impacts on the New Zealand economy and environment. It 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 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 the Asian clam *Potamocorbula amurensis*) and secondary target species (Australian droplet tunicate *Eudistoma elongatum*, Asian bag mussel *Arcuatula senhousia*, Mediterranean fanworm *Sabella spallanzanii* and the clubbed tunicate *Styela clava*). All unidentified suspect samples detected during surveillance activities are sent for identification to the Marine Invasives Taxonomic Service (MITS) operated by NIWA, and are entered into the marine invasives database for future reference (available at <http://www.marinebiosecurity.org.nz/#panel-2>).

### Sample collection

A total of 2 996 sites were surveyed during the 2012 winter sampling period (May to September) and 2 989 sites were surveyed during the summer months (November 2012 to March 2013). Habitats sampled included soft and hard surfaces such as mud and gravel bottoms, intertidal rocky shores, and artificial structures including marina pontoons, pilings, moorings, jetties and commercial vessel berths. Techniques used included crab condos, crab box traps, epibenthic sled tows, 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 eight of the ports surveyed (Table 2). This represents range extensions for two of these secondary target species: *Sabella spallanzanii* in Whangarei Harbour and *Styela clava* in Wellington. However, the two *S. clava* specimens were unattached and

This annual report includes summary information for the National Marine High Risk Site Surveillance Programme and the Marine Invasive Taxonomic Service (MITS) for the summer and winter periods spanning April 2012 to March 2013.

may have been dislodged from a boat, so they may not represent an established population.



Figure 1: Locations of the 11 ports and marinas covered by the targeted surveillance programme.

**TABLE 1: SAMPLE COLLECTION SUMMARY FOR ALL HIGH-RISK SITES SURVEYED IN 2012–2013**

METHOD	TARGET SPECIES	NON-TARGET SPECIES	HABITAT	SPATIAL COVERAGE	EFFECTIVENESS
Epibenthic sled tows	<i>Asterias amurensis</i> <i>Eudistoma elongatum</i> <i>Arcuatula senhousia</i> <i>Potamocorbula amurensis</i> <i>Sabella spallanzanii</i> <i>Styela clava</i>	<i>Acentrogobius pflaumii</i> <i>Chaetopterus</i> sp. <i>Charybdis japonica</i> <i>Didemnum</i> sp. <i>Grateloupia turuturu</i> <i>Hypnea</i> sp. <i>Theora lubrica</i>	Subtidal soft sediments. Particular focus on known shellfish beds (for <i>Asterias</i> ) and areas next to public access (e.g., wharves, boat ramps, marinas for <i>Caulerpa</i> , <i>Sabella</i> ).	Narrow width but 50 m tow length and high replication enables a reasonably large area to be sampled (ca 2500m <sup>2</sup> per location).	Reliable sample collection including asteroids, infaunal and epifaunal bivalves and polychaetes and macroalgae.
Box (crab) traps	<i>Asterias amurensis</i> <i>Carcinus maenas</i> <i>Eriocheir sinensis</i>	<i>Acentrogobius pflaumii</i> <i>Charybdis japonica</i> <i>Pyromaia tuberculata</i>	Adjacent to wharf pilings and other artificial habitats. Intertidal and shallow subtidal rocky shores, breakwalls and saltmarsh, with a focus on habitats with complex physical structure	Area sampled depends on dispersion of bait odour. High replication possible.	Effectively samples other species of crabs (e.g., <i>Ovalipes</i> , <i>Macrophthalmus</i> , <i>Charybdis</i> ).
Crab condos	<i>Carcinus maenas</i> <i>Eriocheir sinensis</i>	<i>Acentrogobius pflaumii</i> <i>Charybdis japonica</i> <i>Pyromaia tuberculata</i>	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., <i>Helice</i> , <i>Macrophthalmus</i> ). Higher rates of detection of crabs than baited traps in some conditions.
Shoreline searches	<i>Carcinus maenas</i> <i>Eriocheir sinensis</i> <i>Eudistoma elongatum</i> <i>Arcuatula senhousia</i> <i>Sabella spallanzanii</i> <i>Styela clava</i>	<i>Chaetopterus</i> sp. <i>Charybdis japonica</i> <i>Clavelina lepadiformis</i> <i>Didemnum</i> sp. <i>Grateloupia turuturu</i> <i>Hypnea</i> sp.	Sloping sandy shorelines, intertidal rocky reefs and areas where drift material is likely to accumulate. Prevailing winds on preceding days are a useful guide to where material may accumulate.	Wide – can cover long stretches of intertidal habitat quickly.	Used effectively in delimitation studies of <i>Styela</i> .
Diver searches	<i>Asterias amurensis</i> <i>Carcinus maenas</i> <i>Eudistoma elongatum</i> <i>Sabella spallanzanii</i> <i>Styela clava</i>	<i>Chaetopterus</i> sp. <i>Charybdis japonica</i> <i>Clavelina lepadiformis</i> <i>Didemnum</i> sp. <i>Grateloupia turuturu</i>	Wharf piles, marina piles and pontoons and other artificial structures; intertidal and shallow subtidal reefs.	Good – large numbers of piles or lengths of hard substratum can be searched in detail.	Depends on water clarity and level of biofouling.

**TABLE 2: SUMMARY FOR THE MARINE HIGH-RISK SITS SURVEYED IN 2012–2013. SPECIES IN BOLD ARE RANGE EXTENSIONS**

LOCATION	SAMPLING ROUND	TARGET NUMBER OF SITES	ACTUAL NUMBER OF SITES	TARGET SPECIES FOUND
Opuā	Winter 2012	243	252	<i>Eudistoma elongatum</i> , <i>Styela clava</i>
	Summer 2012–2013	243	248	<i>E. elongatum</i> , <i>Styela clava</i>
Whangarei	Winter 2012	243	262	<i>Arcuatula senhousia</i> , <i>E. elongatum</i> , <b><i>Sabella spallanzanii</i></b> , <i>Styela clava</i>
	Summer 2012–2013	243	252	<i>A. senhousia</i> , <i>E. elongatum</i> , <i>Sabella spallanzanii</i> , <i>Styela clava</i>
Auckland	Winter 2012	486	492	<i>Sabella spallanzanii</i> , <i>Styela clava</i>
	Summer 2012–2013	486	497	<i>A. senhousia</i> , <i>Sabella spallanzanii</i> , <i>Styela clava</i>
Tauranga	Winter 2012	278	284	<i>A. senhousia</i>
	Summer 2012–2013	278	291	
New Plymouth	Winter 2012	243	244	
	Summer 2012–2013	243	244	
Wellington	Winter 2012	243	243	<b><i>Styela clava</i>*</b>
	Summer 2012–2013	243	242	
Picton & Havelock	Winter 2012	243	242	
	Summer 2012–2013	243	243	
Nelson	Winter 2012	243	248	<i>Styela clava</i>
	Summer 2012–2013	243	243	<i>Styela clava</i>
Lyttelton	Winter 2012	243	243	<i>Sabella spallanzanii</i> , <i>Styela clava</i>
	Summer 2012–2013	243	243	<i>Sabella spallanzanii</i> , <i>Styela clava</i>
Dunedin	Winter 2012	243	243	<i>Styela clava</i>
	Summer 2012–2013	243	243	<i>Styela clava</i>
Bluff	Winter 2012	243	243	
	Summer 2012–2013	243	243	

\* Two individuals collected off the sea-bed, unattached to the substrate

## Number of specimens collected and sent to MITS

A total of 61 specimens (25 for June to September and 36 for November to March) were sent to MITS for identification. Suspect specimens detected at high-risk sites represented 14 taxonomic groups and included 15 non-indigenous species (Table 3). None of these non-indigenous species are new records for New Zealand. MITS also received 105 samples through passive surveillance during this period via the exotic pest and disease hotline.

Most of the information collected from marine biosecurity surveillance is now available through the Marine Biosecurity Porthole webpage ([www.marinebiosecurity.org.nz/](http://www.marinebiosecurity.org.nz/)), which houses data from the MPI-funded marine surveillance programmes, MITS and other verified observations. Anyone with an interest in marine biosecurity can access the latest information on what has been recorded in New Zealand waters and where. The website enables users to view sites surveyed and examine distribution records for individual species. It also gives access to information about significant marine pests and a catalogue enabling information and reports to be found and downloaded.

**TABLE 3: SAMPLES COLLECTED AND SENT TO MITS FROM EACH SAMPLING LOCALITY, 2012–2013. NON-INDIGENOUS SPECIES ARE IN BOLD**

LOCATION	TAXONOMIC IDENTIFICATION		
	TAXONOMIC GROUP	SPECIES	
Opua	Bivalve	<i>Corbula zelandica</i> , <i>Maorimactra ordinaria</i> , <i>Zenatia acinaces</i> , <i>Musculus impactus</i>	
	Crab	<i>Pilumnus novaezealandiae</i> , <i>Liocarcinus novaezealandiae</i> , <b><i>Charybdis japonica</i></b>	
	Decapod	<i>Ogyrides delli</i> , <i>Hippolyte bifidirostris</i>	
	Alga	<b><i>Undaria pinnatifida</i></b>	
	Barnacle	<i>Conchoderma aurigatum</i> , <i>C. virgatum</i> , <i>Lepas anatifera</i>	
Whangarei	Decapod	<b><i>Metapenaeus bennettiae</i></b> , <i>Philocheas australis</i> , <i>Periclimenes yaldwyni</i>	
	Alga	Halymeniales€	
	Bivalve	<i>Pratulium pulchellum</i> , <i>Solemya parkinsoni</i>	
	Crab	<i>Liocarcinus corrugatus</i> , <i>Nepinnotheres atrinicola</i> , <b><i>Charybdis japonica</i></b>	
	Gastropod	<i>Cominella glandiformis</i> , <b><i>Nassarius burchardi</i></b>	
	Annelid worm	<b><i>Sabella spallanzanii</i></b>	
Auckland	Crab	<i>Liocarcinus corrugatus</i>	
	Ascidian	<i>Didemnum</i> sp., <i>Aplidium phortax</i>	
	Decapod	<i>Upogebia hirtifrons</i>	
Tauranga	Decapod	<i>Alpheus richardsoni</i>	
New Plymouth	Ascidian	<i>Molgula</i> sp. *, <b><i>Diplosoma listeranium</i></b>	
	Crab	<i>Liocarcinus corrugatus</i>	
Wellington	Ascidian	<b><i>Botryllus schlosseri</i></b> , <i>Didemnum vexillum</i> , <i>Didemnum incanum</i> , <b><i>Aplidium adamsi</i></b> , <i>Botrylloides leachii</i> , <b><i>Styela clava</i></b>	
	Hydroid	<b><i>Ectopleura crocea</i></b>	
	Bryozoan	<b><i>Watersipora subtorquata</i></b>	
	Crab	<i>Nepinnotheres atrinicola</i>	
	Sponge	<i>Dactylia</i> n. sp. 1‡	
	Annelid worm	Polychaeta§, <i>Aglaophamus verrilli</i>	
	Picton/Havelock	Ascidian	<i>Aplidium adamsi</i> , <b><i>Diplosoma listeranium</i></b>
		Bivalve	<i>Aulacomya maoriana</i> , <i>Limnoperna securis</i>
		Holothurian	<i>Chiridota nigra</i>
		Hydroid	<b><i>Ectopleura crocea</i></b>
Nelson	Red alga	<b><i>Grateloupia</i> sp. †</b>	
	Crab	<i>Nectocarcinus antarcticus</i>	
Lyttelton	Algae	<b><i>Grateloupia turuturu</i></b>	
	Nudibranch	<i>Tritonia</i> n. sp. ‡	
	Annelid worm	<i>Megalomma suspiciens</i> , <i>Ophiodromus angustifrons</i> , <i>Sternaspis scutata</i> , <i>Heterothyone alba</i> , <i>Sabella spallanzanii</i>	

Dunedin	Fish	<i>Bregmaceros maclellandii</i>
	Bryozoan	<i>Celleporina proximalis</i> , <b><i>Bugula flabellata</i></b>
	Hydroid	<i>Amphisbetia fasciculata</i>
	Alga	<b><i>Schizymenia apoda</i></b>
Bluff	Alga	<i>Schizoseris griffithsia</i>

- \* Specimen deteriorated, unidentifiable beyond genus  
† Requires molecular confirmation, unidentifiable beyond genus based on morphology  
§ Unidentifiable  
‡ Yet to be described new species  
€ Requires molecular confirmation

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