

Date: 5 September 2018

Subject: Mediterranean fanworm (*Sabella*) incursion management options - Opuā

Situation to date:

- A single Mediterranean fanworm (*Sabella*) was detected on a mooring block opposite the Opuā Marina on 3 July 2018. Subsequent delimiting surveys by divers found *Sabella* at a site to the east of the marina (one individual) and at a number of sites around the Opuā Marina, including near the boatyard.
- Diver delimitation has found and removed a total of 88 individuals.
- NIWA's marine invasive taxonomic service have confirmed the reproductive ability of some of the fanworms detected.
- Around \$87,000 excl. GST has been spent on diver effort to delimit area looking at mooring blocks, sea floor transects, vessels, marina and other high risk structures (see GIS maps).
- Significant range extension of *Sabella spallanzanii* detected at Opuā, previously only established in Whangarei Harbour and eliminated from Tutukaka Marina (currently under surveillance) with no further detections since incursion and removal in 2015. Note: Elimination = achieved when no further detections made on the substrate. Eradication = declared after a reasonable time period comprising regular surveillance, for at least 5 years following last detection.

Response (or incursion) Management Options

1.	Step-wise local elimination	Attempt removal of population to 'zero density' in a step-wise manner, evaluating after each round of diver effort. Search and destroy operation.
2.	Progressive containment	Systematic removal over time with the aim of population suppression to minimise risk of transfer and impact.
3.	Continue with existing programmes	Continue to work with existing management tools such as rules preventing transfer of fanworm and biofouling but no further active measures in this area.

1. Local Elimination

Programme objectives –

1. eliminate *Sabella spallanzanii* to 'zero density', prevent further spread of the species from Opuā to the wider Bay of Islands. There are a number of inlets and bays that would provide ideal habitat for *Sabella* to thrive and this will not only impact on the values of the Bay of Islands but greatly increase the risk of spread from the Bay of Islands to other parts of Northland and New Zealand as the first port of call.
2. Protect environmental, economic (aquaculture & tourism) values of the area. Protect biodiversity and other values of the Bay of Islands, *Sabella* not only have the potential to compete with native species for habitat occupation and planktonic food, they also have the potential to change local water quality

conditions, they remove significant amounts of small particles from the water column through filter feeding.

Requirements

- Comprehensive management programme using divers to survey and remove fanworm.
- Effective project management and quality assurance procedures, clear lines of authority and rapid decision-making.
- Commitment of sufficient resources to meet project goals.
- Proven removal methods and adequate baseline knowledge (from delimitation).
- Buy-in from stakeholders, wider community and incentives for exacerbators to prevent spread.
- Consideration of managing vessels and potential spread. This may include extra searches of vessels in the area to be incorporated into the programme to ensure these vessels aren't transporting marine pests.

Considerations

- This option would involve a 'search and destroy' approach using diver effort. Work would be carried out in \$100k allocations with an assessment after each round of diver effort.
- Visibility is often low in the area which increases diver search time and decreases success rate. However, by using divers familiar with the area and conditions; efficacy can be expected.
- Strong currents affect precision of diver transect searches increasing the possibility of individuals being undetected.
- Weather events such as high rainfall will reduce visibility and lead to searches being postponed.
- The complexity of substrate and structure type will increase diver search time.
- The wide distribution of the individual fanworm can result in a low chance of detection.

Programme design

- Effort would be centred around the highest densities and largest individuals found in the initial delimitation survey. **Consideration of specimen maturity and rate of recruitment** needs to be examined so that we can obtain information on population dynamics to better focus diver effort.
- Manual removal of individuals will be conducted. Roughly 6km of transects can be afforded with a spend of \$100k. The area of concern is roughly 63 hectares. This is based on each detection of Sabella from the delimitation being given a 100m² grid. If a Sabella was detected, the surrounding 8 quadrats are identified as needing to be searched.
- Searches of surrounding 'high risk' areas by NRC staff including outer areas of the Bay of Islands. Most marine pest eradication programmes have failed because while focussing on the immediate search area another population thrived compromising the entire eradication programme.
- eDNA water sampling.

Hull surveillance will continue with strict requirements to have Sabella safely removed quickly from infested vessels to prevent further spread.

Marine farmers will have to thoroughly check and inspect their farms.

Public awareness and training for identification and prevention will promote public participation.

Eradication examples:

Location	Species	Outcome	Time span
Fiordland	<i>Undaria pinnatifida</i>	Failed	7 years
Marsden Cove	<i>Sabella spallanzanii</i>	Failed	3 years

Tutukaka Marina	<i>Sabella spallanzanii</i>	Under surveillance (One more clear round of inspections before eradication can be announced as successful)	5 years
Nelson Marina	<i>Sabella spallanzanii</i>	Elimination achieved 2018, surveillance required for 5 years before local eradication announced	5 years

Determining success / tipping point for change in management

- A significant increase in population size or area would need to be considered as a tipping point for elimination to no longer being a viable option. For example – a large population being discovered in another area of the Bay of Islands.
- Consideration of costs – management approach to be assessed after each round of diver effort.

2. Progressive Containment

Programme objectives - Suppress the current population to low numbers, reduce the rate of spread to other areas and number of reproductive individuals. Contain the population to the known area.

Requirements

- Baseline knowledge and an effective surveillance regime.
- Clear lines of authority and rapid decision-making.
- Commitment of sufficient resources to meet project goals.
- Buy-in from stakeholders, and incentives for exacerbators to prevent spread.
- Effective quarantine to prevent spread.
- Effective project management and quality assurance procedures.

Programme design

Divers re-enter the area already delimited and work outwards from Sabella detection sites to systematically search and remove Sabella found. Diver effort would be targeted and carried out twice in the next financial year with an approximate spend of \$150,000 per round, \$300,000 a year. This effort could be scaled up or down depending on findings.

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Marine farmers will have to thoroughly check and inspect their farms.

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Progressive containment examples:

Lyttleton

- Population suppression was carried out following an intensive eradication attempt by MPI in 2008/09. Appears to be successful but densities are low & there are climatic differences to the Bay of Islands – cooler water temps may suppress ability for population to spread.

- **Determining success / tipping point for change in management**
- Population not being suppressed. Increase in population is more than 25% in year 2.

Possible funding mechanisms

Council will need to consider what mechanisms are available for funding these include;

- Rates and/or investment dividends.
- Increasing the marine biosecurity charge for the Opuia area.

Other Funding partners

- MPI - council staff are trying to secure funding from MPI for management of this range extension for the initial delimitation cost and on-going work.
- Far North Holding Limited have indicated that they will not contribute to funding of either option 1 or 2 at this stage but do support council trying to achieve eradication.

3. Continue with existing programmes

Continue with existing programmes such as managing biofouling through the marine pathway management plan to reduce the risk of transfer and enforcing the movement rule for transporting marine pests around Northland. Rely on the possible suppression in the area to continue and with continued hull inspections and heightened public awareness manage the vector for further spread.

Programme design

Hull surveillance will continue with strict requirements to have Sabella safely removed quickly from infested vessels to prevent further spread.

Public awareness and training for identification and prevention will promote public participation.

- **Determining success / tipping point for change in management**
- Public opinion
- Contribution from additional funding partners (e.g. marina operator and other stakeholders).

Other

- Increased spread rate to the rest of the Bay of Islands, Northland and wider New Zealand.

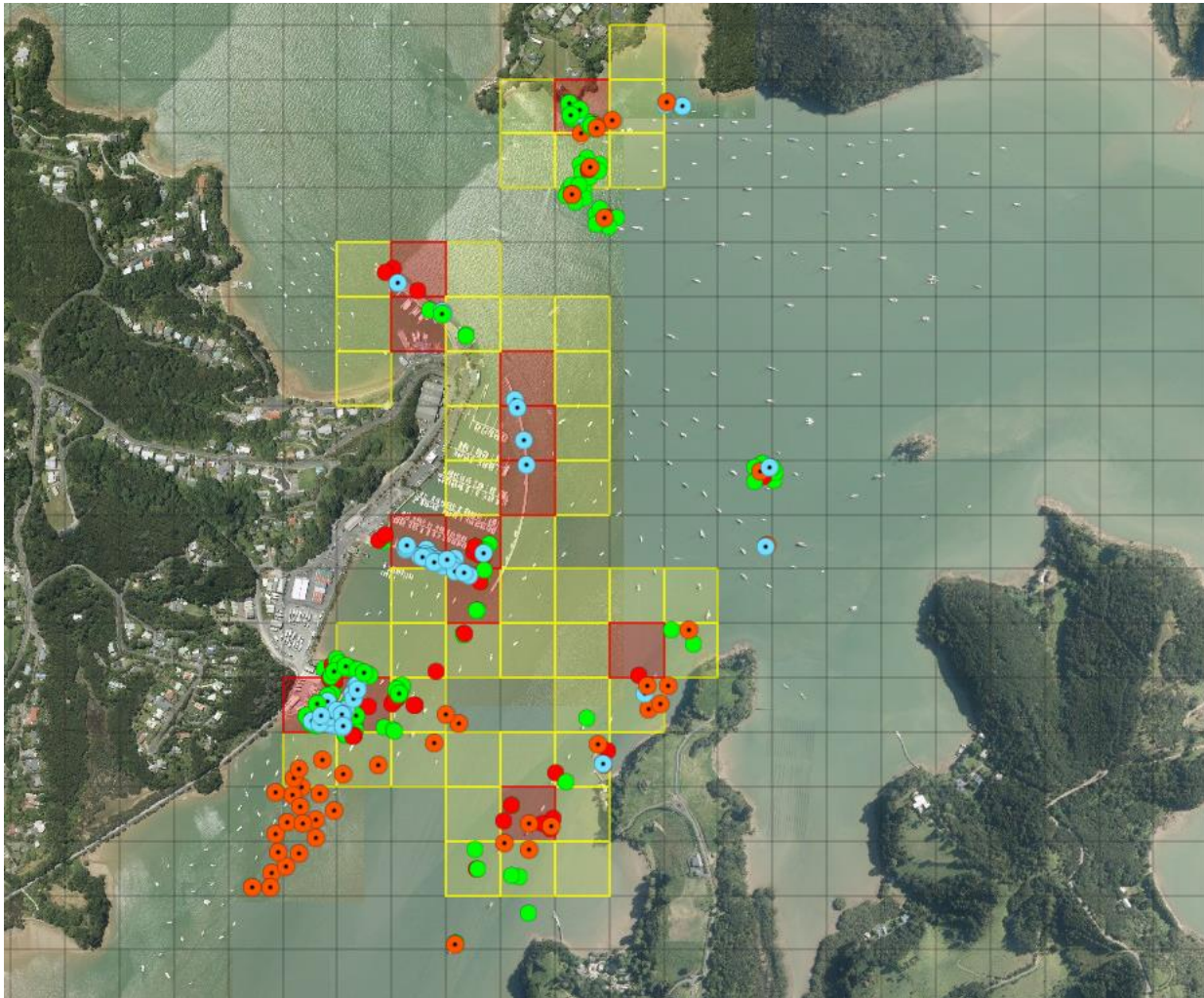







Figure 1. Map of diver delimitation including transects, sea bed and mooring inspections – red squares indicate presence of *Sabella Spallanzanii*.

Legend

Substrate and Structure Sampling

-  Artificial structure
-  Mooring
-  Reef
-  Seafloor
-  Shellfish bed

Transect Points

-  Start
-  End

Mediterranean Fanworm Presence

-  Yes
-  Maybe