

Bay of Plenty Marine Biosecurity Management Plan



Bay of Plenty Regional Council
Environmental Publication 2015/05
5 Quay Street
PO Box 364
Whakatāne 3158
NEW ZEALAND

ISSN: 1175-9372 (Print)
ISSN: 1179-9471 (Online)





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Prepared by Hamish Lass, Land Management Officer, BOPRC and
Boffa Miskell Ltd

Document development history

Prepared by: BOPRC and Boffa Miskell Ltd.

Date: 28 April 2014

Reviewed by: Hamish Lass

Date: 2 December 2014

Updated by:

Date:

Executive summary

The marine environment in the Bay of Plenty is highly valued for numerous reasons including economic values, cultural values, biodiversity, tourism, recreation, harvesting of seafood, aquaculture, natural character and amenity.

Marine pests are organisms (plants and animals) that can have significant adverse effects on the Bay of Plenty region's environment, economy and people. Pest management is critical for sustaining New Zealand's natural advantage.

The pathways for the arrival of marine pests is typically through ballast water and hull fouling. Management of marine pests is difficult because incursions are often not detected early enough to enable eradication.

Other regions are known to have marine pests that are not present in the Bay of Plenty and movement of vessels and equipment between regions presents a significant risk to the marine environment in the Bay of Plenty. Vessels and equipment moving from Auckland and Northland to the Bay of Plenty present the greatest risk because more marine traffic entering the Bay of Plenty originates from these regions.

Recent amendments to the Biosecurity Act and the development of the Pest Management National Plan of Action¹ have implications for regional councils regarding roles and responsibilities in marine biosecurity. Whilst regional councils have played and continue to play a significant role in regional biosecurity these functions have been expanded and clarified, particularly with respect to marine biosecurity.

A collaborative and strategic approach is required to manage marine pests in the region, whereby BOPRC, iwi, industry, MPI and other stakeholders work together towards common environmental, cultural, social and economic goals.

Based on the regulatory and legislative framework, regional councils marine biosecurity functions include:

- a) Acting as a leader for pest management within the region in terms of:
 - Ensuring that pest management in the region optimally contributes to relevant community and national strategies;
 - Ensuring that their regional pest management plans are aligned with national policy direction.
 - Promoting public support for pest management.
 - Facilitating communication and co-operation among those involved in pest management to enhance effectiveness, efficiency and equity of programmes.
- b) Identification of high risk areas, high risk activities, sensitive areas and high risk species.
- c) Providing pest and pathway management programmes to protect the public interest where best placed to do so.
- d) Facilitating communication and co-operation between those involved in pest management to enhance effectiveness, efficiency and equity of programme.

¹ MAF Biosecurity New Zealand, 2011. Pest Management National Plan of Action.

Regional councils also provide leadership by promoting co-ordination of pest management between regions.

Small-scale management programmes under s.100V of the Biosecurity Act provide the primary response tool to a regional council to manage new incursions of unwanted organisms that are not already included in their Regional Pest Management Plan (RPMP). The intention of a small-scale management programme is to enable a rapid response. Therefore there needs to be processes and procedures in place to allow for efficient deployment.

Effective engagement requires careful consideration of the roles of stakeholders and the extent to which they are likely to influence successful implementation of the Marine Biosecurity Management Plan. A **Stakeholder Engagement Plan** will be implemented as a part of the Plan development, but also with a view to sustaining its long-term implementation.

Active targeted **marine pest surveillance** will be undertaken to ensure early detection of new incursions, particularly at high priority locations. Targeted surveillance can be supplemented with enhanced passive surveillance by partners, stakeholders and general public at high priority locations. Lower priority locations could be monitored by enhanced passive surveillance as the most cost effective approach.

If an incursion is identified during surveillance activities, an **Incursion Response Plan** will be developed to manage the threat. The content of the plan will be developed specific to the incursion and will be dependent on a number of factors which cannot be determined at this stage.

Risks to, and costs involved in, the successful implementation of the Marine Biosecurity Pest Plan and the sub-plans (Stakeholder Engagement Plan, Small-scale Management Plan, Surveillance Plan and Incursion Response Plan) within the plan are estimated and evaluated.

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Part 1: Introduction

1.1 Why a Marine Biosecurity Management Plan is needed

There are more than 170 exotic species present in New Zealand's coastal environments, some of which are significant marine pests that have the potential to cause harm to valued marine species, ecosystems or environments. Marine pests also present a significant risk to our region's economic, social and cultural values.

Management of marine pests is also an integral part of kaitiakitanga, the customary system of caring for the environment.

The marine environment in the Bay of Plenty is highly valued for numerous reasons including economic values, cultural values, biodiversity, tourism, recreation, harvesting of seafood, aquaculture, natural character and amenity.

The pathways for the arrival of marine pests is typically through ballast water and hull fouling. Management of marine pests is difficult because incursions are often not detected early enough to enable eradication.

Recent amendments to the Biosecurity Act and the development of the Pest Management National Plan of Action² have implications for regional councils regarding roles and responsibilities in marine biosecurity. Whilst regional councils have played and continue to play a significant role in regional biosecurity these functions have been expanded and clarified, particularly with respect to marine biosecurity.

Specific to marine biosecurity, regional councils have the responsibility to be the lead decision-maker³ in some circumstances, namely:

- Where a pest is already present in New Zealand and there has been a decision not to eradicate or contain it nationally, and the pest is affecting public goods, and the pest has not previously established in the Bay of Plenty and management tools are available.
- Where there is risk to national or regional values associated with:
 - 1 Intra-regional movement of vectors (such as vessels or equipment);
 - 2 Development and maintenance of marinas, wharves, jetties and moorings;
 - 3 Dumping of organic material from vessels (within 12 nautical mile limit and on land).
- Where there are places recognised in regional policy as being of special value to regional communities (excluding marine reserves, wildlife sanctuaries, national parks and marine protected areas).

These roles have been acknowledged by Bay of Plenty Regional Council and form the basis of Council's response to managing marine pests.

² MAF Biosecurity New Zealand, 2011. Pest Management National Plan of Action.

³ Leading an intervention means bringing together the parties with the necessary powers, functions and resource to agree on a response to marine pest incursions, not necessarily taking full responsibility for the agreed response.

In order to fulfil the roles and responsibilities summarised above, a Marine Biosecurity Management Plan can provide guidance on advocacy, community engagement, policy, surveillance and incursion response.

The purpose of this document is to guide stakeholder engagement, surveillance, enforcement and incursion responses, and to outline education and advocacy around marine biosecurity. It is also a key communications tool between Bay of Plenty Regional Council, potential project partners (industry, iwi, research organisations, public etc.) and the Ministry for Primary Industries (MPI). It is intended that this is a living document that is regularly updated when new information is available and when new approaches to marine pest management are to be incorporated.

1.2 Benefits from the establishment of this plan

Marine pests are not covered under the current Regional Pest Management Plan for the Bay of Plenty Region 2011-2016 (RPMP) but could be considered as part of the next review of the RPMP. This plan facilitates the management of marine pests in the Bay of Plenty region, through the establishment of small-scale management plans, until such time as there is a National Domestic Pathway Management Plan for marine pests in place and until the next review of the RPMP is completed.

A collaborative and strategic approach is required to manage marine pests in the region, whereby BOPRC, iwi, industry, MPI and other stakeholders work together towards common environmental, cultural, social and economic goals.

This plan documents the approach to proactively manage marine pests and pathways in the region and the resources required.

1.3 Overview of marine pests

The current priority marine pests present in New Zealand⁴ include:

- Japanese kelp (*Undaria pinnatifida*)
- Didemnum sea squirt (*Didemnum vexillum*)
- Styela sea squirt (*Styela clava*)
- Mediterranean fan worm (*Sabella spallanzanii*)
- Asian clam (*Potamocorbula amurensis*)
- Caulerpa seaweed (*Caulerpa taxifolia*)
- Chinese mitten crab (*Eriocheir sinensis*)
- European shore crab (*Carcinus maenas*)
- Northern pacific star (*Asterias amurensis*)
- Asian paddle crab (*Charybdis japonica*)
- Australian tunicate (*Eudistoma elongatum*)

Prior to 2013, incursions of Japanese kelp, Asian date mussels and *Didemnum* sea squirt had been identified in the Bay of Plenty region. It is believed their current distribution is beyond what can be effectively controlled with current technologies, therefore active management is not feasible.

⁴ See Appendix 1 for more information on these species.

A Mediterranean fan worm (*Sabella spallanzanii*) was detected in Tauranga Harbour in September 2013. A survey was developed and led by Bay of Plenty Regional Council, in conjunction with the Ministry for Primary Industry. The University of Waikato and NIWA were involved in this response as advisors and contractors. A single *Sabella* and several *Styela clava*, were detected on a vessel moored in Pilot Bay. One was detected adjacent to the Pilot Bay Boat Ramp and three were found on floating walkway pontoons at the Bridge Marina. A vessel in the marina was also found to be infested with *Styela clava*. All organisms detected were controlled. The monitoring results indicated that there may be a low number of *Sabella* present within Tauranga Harbour.

Other regions are known to have marine pests that are not present in the Bay of Plenty and movement of vessels and equipment between regions presents a significant risk to the marine environment in the Bay of Plenty. Vessels and equipment moving from Auckland and Northland to the Bay of Plenty present the greatest risk because more marine traffic entering the Bay of Plenty originates from these regions and marine pests such as *Sabella spallanzanii*, *Styela clava* and Asian paddle crabs are known to be present there.

1.4 **Pest incursion pathways and risk reduction measures**

A marine pest incursion pathway is the mechanism by which a marine pest is introduced to the environment.

The primary marine pest incursion pathways are maritime transport, mining and exploration, commercial fishing, aquaculture, recreation and sport, and research/education.

Maritime transport pathway involves the movement of cargo and people by both New Zealand registered and foreign merchant ships, movement within New Zealand of passenger vessels, slow-moving barges, dredges and other non-trading commercial and recreational vessels. Transport of marine pests can occur through the uptake and discharge of ballast and bilge water, bio-fouling of vessels hulls, organisms attached to maritime equipment and from material removed from the seabed and deposited away from source.

Treatment of ballast water is recognised as the best option to minimise the risk posed by international shipping. New Zealand has signed up to a convention on ballast water which aims to develop international regulation on ballast water management. Ballast water poses a risk domestically as well, but is more difficult to manage as vessels move around coastal waters and are therefore not able to discharge in deep offshore water. In addition, regulation and guidelines around domestic ballast water management are not well developed at this stage.

Vessel bio-fouling risk can be reduced through use and maintenance of anti-fouling coatings, regular inspection and removal of bio-fouling in ship-yard facilities or in-water cleaning using specialist containment devices. Conditions of consent can be put in place to reduce the risk of marine pest transfer from dredged material and equipment.

Marine pests can be introduced on a range of vessels and equipment associated with mining and exploration. Plant and equipment can be decontaminated with high pressure water blasting, washing and air drying prior to relocating it to a new site.

Commercial fishing can spread marine pests through the uptake of ballast water, bio-fouling of hulls, equipment, movement of livestock and bait, and the discharge of waste from processing activities. Regular inspection and removal of bio-fouling in ship-yard facilities and other mitigation processes can form part of reducing the risk from commercial fishing.

Aquaculture can spread marine pests through the provision of additional habitat (generally artificial) for sessile organisms, uptake of seawater to vessels, movement of stock, movement of vessels used in aquaculture practices, use of equipment and the discharge of processing waste. There are a range of practical tools and processes to reduce these risks, many of which have been developed overseas.

Marine pests can be spread by recreation and sport through bilge water, catch or bait holding tanks, bio-fouling of vessels, and organisms caught on trailers, chains, anchors, and moorings etc. Wharves, jetties and marinas used by recreational craft provide substrate for sessile marine pests.

Activities undertaken by research and education organisations that can spread marine pests include use of vessels, equipment, and the collection and/or movement of organisms.

1.5 **Risk of marine pests to biodiversity, economy, social and cultural values**

Marine pests are organisms (plants and animals) that can have significant adverse effects on the Bay of Plenty region's environment, economy and people. Pest management is critical for sustaining New Zealand's natural advantage.

Risks from marine pests to our marine biodiversity values, kaimoana species, aquaculture and recreation are particularly of concern to our people and our economy in the Bay Plenty region.

Potential adverse effects of some marine pests include:

- Displacement and exclusion of native species.
- Changing seafloor habitat conditions.
- Consumption of large amounts of phytoplankton and zooplankton.
- Rapid proliferation which can dominate ethnic habitat.
- Reduction of fishing catches due to removal of fish habitat.
- Predation upon and competition with indigenous species.
- Threat to human health through carrying parasites.
- Competing with native and commercially valuable species for food and space.
- Nuisance to recreational and commercial fishers through clogging dredges and fouling of gear.
- Potential cost on industry/recreation involved in the need for more regular cleaning of vessels and equipment.

Given the limitations of effective control technologies for marine pests once they are established in New Zealand waters, biosecurity action primarily focuses on preventing the arrival of marine pests to New Zealand in the first instance and preventing the spread of organisms that have established in New Zealand between regions. Because of the limitations involved in controlling marine pests, it is important that significant effort and resources are put into prevention and avoidance measures.

Partnerships at a national and regional level, as well as with iwi, industry, and the public are critical in order to carry out effective pest management in the marine environment.

Part 2: Regulatory and legislative context

The principal legislation governing Council's role in marine biosecurity is:

- 1 The Local Government Act 1974 and 2002.
- 2 The Resource Management Act 1991.
- 3 The Biosecurity Act 1993.

The purpose and main mechanisms under these statutes is set out below.

2.1 Local Government Act 1974 and 2002

The Local Government Act 1974 and 2002 provides for local authorities to undertake a wide range of services and functions.

The purpose of local government is to enable democratic decision making and action, and to provide good quality services and function in terms of being efficient, effective and appropriate to present and anticipated future generations.

While biosecurity is not recognised as a core service of a local authority, the obligation to perform functions under other legislation is recognised.

Activities relevant to marine biosecurity include consenting of marina operations and boat launching ramps that provide pontoon and pile moorings for pleasure boats and small commercial vessels, and the employment of harbour masters to oversee navigation and safety.

2.2 Resource Management Act 1991

The Resource Management Act 1991 provides for central government and local authorities to manage adverse effects of activities through the development of Policy Statements and Plans including rules and consents.

Measures relevant to marine biosecurity include:

- New Zealand Coastal Policy Statement.
- Regional Policy Statement.
- Regional Coastal Plans to control adverse effects in the Coastal Marine Area (CMA).
- Consenting of activities and structures in the CMA including aquaculture structures and private moorings/jetties.
- Control of discharges from land and vessels.
- Monitoring of the State of the Environment, including distribution of exotic biota.
- Working with other agencies to promote sustainable management of the CMA e.g. Port of Tauranga.

2.3 **New Zealand Coastal Policy Statement (NZCPS)**

Policy 12 of the New Zealand Coastal Policy Statement provides councils with direction on managing the adverse effects of “harmful aquatic organisms” within the CMA. It requires a Regional Policy Statement (RPS) and plans to control activities that may release or spread marine pests.

2.4 **Bay of Plenty Regional Policy Statement (RPS)**

The RPS recognises that there a number of statutes that can be thought of as companions to the RMA in that their purpose can be interpreted as further supporting the sustainable management of natural and physical resources. The Biosecurity Act is specifically cited in this context⁵.

Regionally significant coastal environment issues include adverse effects on the natural character and ecological functioning of the coastal environment from the presence of pest plants and animals.

Objective 2 is for the preservation, restoration and enhancement of the natural character and ecological functioning of the coastal environment. This is to be achieved by Policy CE 2A, which is to preserve natural character within the coastal environment. Methods include identifying areas of high natural character in the coastal environment.

Objective 20 is for the protection of significant indigenous habitats and ecosystems. Policy IR 9B contributes to meeting this objective by taking an integrated approach towards biosecurity. Methods include implementation via resource consents, notices of requirement and when changing, varying, reviewing or replacing plans.

2.5 **Bay of Plenty Operative Regional Environment Coastal Plan (RCEP)**

The operative plan states that the Biosecurity Act will be used to facilitate the management of pest problems in the Coastal Habitat Preservation Zone and other sites of significance (section 6.2.4(a)).

The plan recognises that the discharge ballast water can present a risk for the introduction of exotic marine organisms, but that this activity is controlled by the former Ministry of Fisheries (now Ministry for Primary Industry) under the Biosecurity Act (section 9.1).

It is noted in section 16.1 that the plan does not specifically regulate the introduction of animal species into the CMA.

2.6 **Draft Bay of Plenty Regional Coastal Environment Plan**

Section 7 (Biosecurity) of the draft plan contains a number of policies around the introduction of pest organisms.

⁵ Policy 1.5.7

Policy BS 6 is the most relevant to this management plan:

Policy BS6 Include conditions on resource consents to avoid the adverse effects of harmful aquatic organisms being released or otherwise spread as a result of activities in the Coastal Marine Area. Such activities include:

- a) *the introduction of structures likely to be contaminated with harmful aquatic organisms;*
- b) *the discharge or disposal of organic material from dredging, or from vessels (including ballast water) and structures, whether during maintenance, cleaning or otherwise; and whether in the Coastal Marine or on land;*
- c) *the provision and ongoing monitoring and maintenance of moorings, marina berths, jetties and wharves; and*
- d) *The establishment and relocation of equipment and stock required for or associated with aquaculture.*

2.7 **The Biosecurity Act 1993**

The Biosecurity Act 1993 provides for regional councils to declare and manage animal and plant pest species. With reference to marine biosecurity these activities include:

- Preparation of Regional Pest Management Strategies/Plans (s. 68-78).
- Response to biosecurity breaches.
- Development of Pathway Management Plans (s. 88-98).
- Development of small-scale biosecurity management programmes (s.100v–100w).

2.7.1 **Regional Pest Management Plan for the Bay of Plenty 2011-2016 (RPMP)**

The RPMP clarifies Regional Council roles in marine pest management, acknowledging the roles and responsibilities established in the Pest Management National Plan of Action in 2011.

Roles and responsibilities are summarised in Table 1. Whilst BOPRC are the lead intervention decision-maker role for the marine environment in some circumstances (Table 1), it is important to note that this does not imply that BOPRC will be solely responsible for the management of incursions of marine pests. Rather it means that where BOPRC are the lead decision-maker, they will be responsible for ensuring that the appropriate parties with the appropriate powers, functions and resources are involved and agree to the nature and scope of the intervention.

The plan recognises that marine pest issues and individual pest threats have not been fully assessed to date, and that the plan will be updated once the risks and operational responses to the risks have been developed.

Table 1 Biosecurity responsibilities⁶.

Type	Circumstance	Lead intervention decision-maker	Reason for role	
Population management (Species-led management)	Pest not previously detected in New Zealand.	MPI	Manages border, national high-risk site surveillance and national incursion responses.	
	Pest already in New Zealand and an objective has been set to eradicate or contain nationally.	MPI	Leads national pest programmes and national surveillance.	
	Pest already present in New Zealand and there has been a decision not to eradicate or contain nationally.	Pests affecting public goods, and either not previously in the region or established, but tools to manage are available.	Regional council to coordinate joint decision-making with Crown agencies and interested parties (depending on nature of the pest).	Accountable for regional public interest and has regional capacity to act, but multiple interests and beneficiaries will likely be involved.
		Pests affecting a specific sector, industry or private interest, and either not previously in the region or established, but tools to manage are available.	Industry and/or interested parties to coordinate joint decision-making with those best placed to provide support.	Industry is the primary beneficiary but may need capabilities of other parties to be effective.
Pests widespread in the region and there has been a decision not to eradicate or contain regionally.	Becomes site management issue (see below).	Widespread pests that are not the subject of pest-led programmes can only be managed in specific places to meet site managers' priorities.		
Pathway / vector management	Prevention of pest establishment in New Zealand (at border activity – ballast water, bio-fouling, hitch-hiker organisms, goods and containers).	MPI	Manages border, national high-risk site surveillance and national incursion response.	
	Risk to any national or regional value associated with inter-regional vector movement.	MPI	Requires national focus as automatically multiregional.	
	Risk to coastal marine areas of the Sub-Antarctic Islands and Kermadec Islands (risks associated with vectors, in particular, vessels and their equipment).	Minister of Conservation	Minister of Conservation has the responsibilities, functions and powers of a regional council under section 30(1) (d) of the Resource Management Act 1991 for these specific areas. The Department of Conservation (DOC) may act on behalf of the Minister.	
	Risk to any national or regional value associated with intra-regional movement of vectors (for example, of structures, equipment and vessels).	Regional Councils	Have regional capacity and powers to act in the public interest.	
	Risk to any national or regional value associated with development of marinas, wharves, jetties and moorings and the on-going maintenance of such facilities.		Have powers under the Resource Management Act (for example, can include conditions in resource consents).	
	Risk to any national or regional value associated with dumping of organic material from vessels (within the 12 nautical mile limit and on land).		Administer the Resource Management (Marine Pollution) Regulations 1998.	
Risk to any national or regional value associated with dumping of organic material from vessels and offshore installations in the Exclusive Economic Zone (EEZ) (from the 12 to 200-mile nautical limit).	Maritime New Zealand	Has authority and responsibility in the EEZ under the Maritime Transport Act 1994.		

⁶ Sourced from Bay of Plenty Regional Pest Management Plan

2.8 Other relevant legislation

2.8.1 The Marine Reserves Act 1971

The Marine Reserves Act 1971 provides for the establishment and management of specific areas of sea and foreshore as marine reserves for the purposes of preserving them in their natural state as the habitat of life for scientific study. The Department of Conservation administer and manage marine reserves in New Zealand.

2.8.2 The Health Act 1956

The Health Act (administered by the Ministry of Health) requires local authorities to manage health risks to the community including water quality for contact recreation purposes and shellfish gathering, and notification of accidental discharges.

Part 3: Bay of Plenty region context

3.1 BOPRC's role and responsibility

Regulatory and legislative framework:

Based on the regulatory and legislative framework, regional council's marine biosecurity functions include:

- a) Acting as a leader for pest management within the region in terms of:
 - Ensuring that pest management in the region optimally contributes to relevant community and national strategies;
 - Ensuring that their regional pest management plans are aligned with national policy direction.
 - Promoting public support for pest management.
 - Facilitating communication and co-operation among those involved in pest management to enhance effectiveness, efficiency and equity of programmes.
- b) Identification of high risk areas, high risk activities, sensitive areas, high risk species.
- c) Providing pest and pathway management programmes to protect the public interest where best placed to do so.
- d) Facilitating communication and co-operation between those involved in pest management to enhance effectiveness, efficiency and equity of programme.

3.1.1 Marine Pest Management (Species-led management)

The table of responsibilities in the National Plan of Action and the RPMP identifies BOPRC as the lead intervention decision-maker for the Bay of Plenty region where:

- A pest is already present in New Zealand and there has been a decision not to eradicate or contain it nationally; and
- The pest is affecting public goods and either not previously in the region or established, but tools to manage the pest are available.

Regional council's role is to co-ordinate joint decision-making with Crown agencies and interested parties (depending on the nature of the pest). The reason for this role is because regional council is responsible for regional public interest and has regional capacity to act, however multiple interest and beneficiaries will likely be involved.

3.1.2 **Marine pest pathway/vector management**

In the following three circumstances, Regional Councils are identified as the lead intervention decision-maker:

- 1 Risk to any national or regional value⁷ associated with intra-regional movement of vectors (for example, of structures, equipment and vessels).
- 2 Risk to any national or regional value associated with development of marinas, wharves, jetties and moorings and the on-going maintenance of such facilities.
- 3 Risk to any national or regional value associated with dumping of organic material from vessels (within the 12 nautical mile limit and on land).

The reason for the role is because Regional Council have regional capacity and powers to act in the public interest, can access powers under the Biosecurity Act, have powers under the Resource Management Act (e.g. resource consent conditions) and administer the Resource Management (Marine Pollution) Regulations 1998.

Regional councils may have supporting roles in other circumstances.

3.1.3 **Marine pest site/place management (to protect values of specific places)**

Places recognised by formal regional policy as being of special value to regional communities that are not part of a marine reserve, wildlife sanctuary, national park, or Marine Protected Area are the responsibility of Regional Council because of their accountability to the regional community and regional council has the capacity and powers to act in the public interest.

Governance and management of marine biosecurity can be appropriately addressed through the same governance and management structure used for other biosecurity management by the regional council.

3.2 **Identification of priorities**

3.2.1 **Prioritisation of sites⁸**

High priority areas are sites or vessel nodes for international or domestic coastal vessel traffic. This non-local vessel traffic means these sites are at higher risk of marine pest incursions as vessels maybe transporting pests as bio-foul, in ballast water or by other means. These areas include ports, marinas, moorings, wharfs, slipways, recreational boating destinations, slipways, haul-outs, aquaculture areas (see maps in Appendix 2) and boat ramps and sites of high ecological, landscape or cultural value. Medium priority sites typically have lower non-local traffic volumes compared to high priority sites and low risk sites receive little non-local traffic.

3.2.2 **High value areas**

Areas of marine environment can be considered high value on the basis of ecological, landscape (seascape), cultural or commercial criteria.

⁷ For example; significant ecological areas.

⁸ See also Section 4.2 Surveillance/Prevention.

The Bay of Plenty Regional Coastal Plan identifies areas of high ecological value and landscape value. In addition, areas of high conservation value in the Bay of Plenty include Te Paepae o Aotea (Volkner Rocks) Marine Reserve and Tuhua (Mayor Island) Marine Reserve.

Culturally important areas for iwi in the region have not been mapped or identified in regional plans or other documents. However, there are numerous important/high value cultural sites in the marine environment. An understanding of the risk to culturally important sites from the threat of marine pests could be developed through partnerships and discussions with iwi. Shellfish beds around the region are important, as well as a range of fish species, crayfish, kina and scallops throughout the region.

Areas important for commercial fishing include Motiti Island, Town Point and the Pukehina Reefs for rock lobster and the wider region where trawlers and Danish seining occurs for wet fish (particularly in the eastern part of the region)⁹.

Recreational fishers focus on the same areas as the commercial fishers for rock lobster, with scallops also collected off Motiti Island. Cockles, pipi, tuatua and mussels are harvested throughout the region by recreational fishers, as are a range of fish species.

Aquaculture areas within Ohiwa Harbour are also recognised as high value areas. In addition, there are consented aquaculture areas adjacent off Opotiki that are yet to be utilised.

While the areas listed above are currently high value areas, expansion in the aquaculture industry is being proposed throughout the Bay of Plenty region. Marine pest incursions could impact future development of this industry and impact the region economically.

3.3 **Pest and Pathway Management Programmes**

A key risk for the Bay of Plenty region is vessel traffic from Auckland as the Waitemata Harbour already has several marine pests established. Many commercial and recreational vessels move between the Auckland region and the Bay of Plenty providing vectors for marine pest incursions. The Waikato region are in a similar position, with vessel traffic from Auckland being the primary risk for them. Accordingly, BOPRC and WRC are looking to align their marine pest management programmes.

MPI is looking to lead the development of a Domestic Pathway Management Plan for Marine Pests. Until that plan is finalised, BOPRC will need powers to manage the risk posed by inter-regional movement of vessels. These can be accessed through the development and implementation of a Small-scale Management Plan (SSMP) under the Biosecurity Act.

As noted in section 2.7 above, small-scale management programmes under s.100V of the Biosecurity Act provide the primary response tool to a regional council to carry out small-scale eradication or control programmes for unwanted organisms not listed in their RPMP. The intention of a small-scale management programmes is to enable a rapid response. Therefore there needs to be processes and procedures in place to allow for efficient deployment.

⁹ Information from a Tauranga Fisheries Officer.

Biosecurity Act powers to manage unwanted organisms that are not named in the RPMP, can only be activated by having a formalised SSMP process in place. The need for a SSMP would be reviewed in conjunction with review of the RPMP.

3.4 **Facilitating communication and co-operation**

Relationships and partnerships are critical to the success of regional marine biosecurity. BOPRC understand their responsibility as lead decision maker depending on the circumstance, but envisage success is more likely through a cooperative model. Partnerships involve sharing power and jointly determining responsibility for making decisions, resourcing and taking action. A partnership approach provides all parties with an understanding of their roles and where roles overlap in practice.

A partnership approach also provides opportunities to agree on priority actions and to coordinate work programmes to ensure resources are allocated and outcomes achieved as effectively and efficiently as possible.

In the Bay of Plenty region, the following groups or agencies have been identified as important partners for managing marine pests in the Bay of Plenty:

- Ministry for Primary Industry (MPI).
- Iwi.
- Department of Conservation (DOC).
- District and City Councils.
- Port owners and operators.
- Marina owners and operators.
- Ship builders, slip yards etc.
- Aquaculture industry.
- Tourism operators.
- Aquatic recreation clubs and societies.
- Research organisations (University of Waikato, NIWA, Cawthron etc.).
- Forest and Bird.
- Coast care groups.
- Public.
- Other regional councils.

3.4.1 **MPI's role**

MPI leads New Zealand's Biosecurity System. This encompasses facilitating international trade, protecting the health of New Zealanders and ensuring the welfare of our environment, flora and fauna, marine life and Maori resources. The biosecurity system takes a multifaceted approach from developing Import Health Standards designed to push risk offshore and border controls through to surveillance programmes and incursion responses.

MPI's main roles in marine biosecurity are:

- 1 To prevent the establishment of pests in New Zealand through managing and monitoring border activity such as ballast water, bio-fouling, hitch-hiker organisms, goods and containers.
- 2 Interventions when the pest concerned has not previously been detected in New Zealand or if an objective has been set to eradicate or contain a pest already in New Zealand at the national level.

MPI also co-ordinate and to provide marine biosecurity expertise in:

- Risk assessment methodologies.
- Surveillance methodologies.
- Control tools and techniques.
- Advocacy strategies and materials.

MPI has taken a strategic approach to its funding of marine pest management activities. Funding for marine pests is directed towards initiatives which build local marine capability, raise awareness of marine pests and help control the vectors which spread marine pests. MPI's approach is to tackle the vectors which spread marine pests through the development of a national domestic marine pathways plan.

MPI may contribute funding towards management of individual pest species if it can be shown that such a control programme is feasible, is supported by those impacted and that the benefits to New Zealand and individual region(s) outweigh the costs.

MPI also has a role in raising awareness of marine pests nationally, and encouraging behaviour change to reduce the risk of marine pest spread. For example, MPI encourages cleaning behaviour of recreational vessel owners through its "clean and anti-foul" messages.

MPI leads or co-ordinates responses to organisms where there is significant public or economic benefit in doing so. MPI's responsibilities in the event of new incursions to New Zealand are defined in the Policy for MPI's responses to risk organisms.

3.4.2 Iwi role in marine biosecurity

Iwi may have a number of potential roles in marine biosecurity. The first role may relate to their desire to exercise their customary rights over the plan area through fulfilling their kaitiakitanga responsibilities. This role brings with it particular knowledge and experience about many aspects of the sustainable use of marine resources within the region.

Another role is in respect of their interests in marine farming, aquaculture, fishing and other marine industries in the region. Iwi are in a unique position of being customary, commercial and recreational fishers and sometimes these interests may conflict or differ with marine farmers.

With respect to a customary role, it is expected that iwi will have an interest in any measures or programmes aimed at marine pests that impact on customary fisheries, as well as commercial fisheries.

Iwi may have an advisory role to working parties or groups established to oversee the planning and implementation of regional marine pest management.

3.4.3 Department of Conservation role in marine biosecurity

The Department of Conservation's diverse interests in the coastal and marine environment are centred on the protection and conservation of natural heritage values and on sustainable coastal management. Work programmes revolve around three general but overlapping areas of work:

- Resource Management Act (RMA) consent and planning processes; including supporting the Minister of Conservation's sustainable coastal management responsibilities relating to the New Zealand Coastal Policy Statement, Regional Coastal Plans and Restricted Coastal Activity applications.
- Marine mammal and wildlife management; e.g. strandings, tourism and fisheries interactions.
- Marine Protected Areas; e.g. marine reserve implementation, surveillance in marine reserves through monitoring of values, management and monitoring; progressing (with the Ministry of Fisheries) the Marine Protected Area Policy and Implementation Plan.

3.4.4 Role of industry

Industry are important partners in regional marine biosecurity given the potential risks around marinas, wharves, boat ramps, slipway and haul-out facilities.

Regional aquaculture interests are already engaged and involved through the Bay of Connections regional growth strategy. This group encourages collaboration between key groups across the region, improving well-being and encouraging innovation and leadership. The Bay of Connections Governance Group comprises ten members drawn from business, economic development agencies, Maori business representatives and local government.

This group provides an excellent opportunity to engage with industry and other partners around marine biosecurity. Industry are likely to be keen to be involved as they will recognise that there are economic benefits around avoiding and minimising marine pest incursions and that commercial vessel movements are one of the key risk activities for potentially bringing marine pests to the region.

In addition, industry have large networks that can assist with communicating messages to wider groups and to the public. A partnership between BOPRC and industry will be of great benefit, with industry being the eyes and ears on the ground and championing the cause to the wider public.

3.4.5 Role of interest groups and general public

The public and interest groups such as Forest and Bird, Coast Care, and marine recreational clubs and societies play an important role in marine environmental awareness and protection of values. The importance of these groups and the public was clearly demonstrated during and after the grounding of the *Rena*. Without their assistance the environmental outcomes for the region would have been significantly more adverse.

With respect to marine biosecurity, the public and interest groups have an important role of passive surveillance, particularly in areas that may not form part of routine surveillance by BOPRC in the future or by other organisations currently (e.g. the Port of Tauranga). As part of the Stakeholder Engagement Plan, it will be important to identify all interest groups that may wish to be involved in marine biosecurity and how best to engage with groups and individuals.

Part 4: Implementation Plan

4.1 Stakeholder Engagement Plan

Effective engagement requires careful consideration of the roles of stakeholders and the extent to which they are likely to influence successful implementation of the Marine Biosecurity Management Plan. An engagement plan should be implemented as a part of Plan development, but also with a view to sustaining its long-term implementation.

The key objective of the Stakeholder Engagement Plan is to ensure all parties receive the type and level of information and consultation required to ensure they understand the risks posed by marine pests and how they can help minimise the risks pest establishing or being transported. Methods for engagement differ among the different stakeholders, e.g. Memorandums of Understanding may be developed between BOPRC and stakeholders such as the Port of Tauranga, whereas information may be distributed to the public through publications. The types of stakeholders, engagement objectives and possible methods for engagement are summarised in Table 2 below.

Table 2 Stakeholder engagement matrix.

Stakeholder characteristic	Example	Engagement objective	Possible engagement method
Has statutory duties to perform or major influence on end results	<ul style="list-style-type: none"> • MPI. • Port. 	<ul style="list-style-type: none"> • Joint action. 	<ul style="list-style-type: none"> • Formal working party under an MoU. • Regular meetings. • Joint programmes.
Strongly influences end results	<ul style="list-style-type: none"> • DOC. • Marine resource users and related industries. • Research Institutes. • Iwi. 	<ul style="list-style-type: none"> • Commitment to supporting actions. • Aligned actions wherever possible 	<ul style="list-style-type: none"> • Consultation on formal programmes and plans. • Compliance Codes of Practice. • Working groups.
Moderately influences end results	<ul style="list-style-type: none"> • Marine Recreational Groups. • Environmental advocacy groups. • Coastcare. 	<ul style="list-style-type: none"> • Understanding of key issues. • Well informed contributors. 	<ul style="list-style-type: none"> • Information sharing through personal contact.
May influence end results	<ul style="list-style-type: none"> • General public. 	<ul style="list-style-type: none"> • Awareness of issues and raising potential incursions with BOPRC. 	<ul style="list-style-type: none"> • Information sharing through publications and publicity.

4.1.1 Iwi engagement

Iwi play a unique role as treaty partners. This is recognised in all of the legislation which empowers biosecurity measures where the relationship between Māori, their culture, and their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga must be taken into account.

Iwi will be engaged to determine the extent to which they wish to play a role in plan development and implementation.

In doing so, it will be important to avoid creation of ad hoc arrangements that cannot be sustained due to limits in capacity. Existing institutional arrangements should be used wherever possible.

4.2 Small-scale Management Plan

4.2.1 Development of Small-scale Management Programmes (s.100V)

The Biosecurity Act allows regional councils to carry out small-scale eradication or control programmes for unwanted organisms. This is currently the primary response tool available to BOPRC for managing incursions of unwanted organisms not classified in the RPMP. Powers to manage the unwanted organism can only be activated by having a formalised programme in place.

The council must declare the programme by giving public notice in a manner appropriate to the distribution of the organism and the persons likely to be affected by the programme.

Powers available to implement a SSMP are wide ranging, and include the powers of search, inspection and seizure as well as measures to eradicate or control the organism.

4.3 Surveillance Plan

No pathway management or intervention can be guaranteed to be 100% effective and it is probable that some marine pest incursions will continue to occur. The best chance of preventing these pest incursions from establishing is early detection and control. Targeted surveillance can be supplemented with enhanced passive surveillance by partners, stakeholders and general public.

4.3.1 Current surveillance

MPI undertake six-monthly surveillance for marine pests at 12 high risk sites throughout New Zealand, including Tauranga Harbour, as part of a national surveillance programme. The 12 sites that are the focus of these surveys were selected according to risk, based on the volume of international shipping that occurs to them, the availability of suitable habitat for the target species and their history of invasion by other non-indigenous species. The primary objective of the marine high risk site surveillance (MHRSS) is:

- To detect incursions of non-indigenous organisms listed on the Unwanted Organisms register at High Risk Sites throughout New Zealand.

At present the programme is targeted primarily at five species that are on the register of Unwanted Organisms, but which are not known to be present in New Zealand.

These are:

- Northern pacific sea star, *Asterias amurensis*.
- European shore crab, *Carcinus maenas*.
- Aquarium weed, *Caulerpa taxifolia*.
- Chinese mitten crab, *Eriocheir sinensis*.
- Asian clam, *Potamocorbula amurensis*.

The secondary objectives of the MHRSS are:

- To detect incursions of new non-indigenous or cryptogenic organisms not listed on the Unwanted Organisms register at high risk sites throughout New Zealand;
- To detect incursions (i.e. range extensions) of established non-indigenous or cryptogenic organisms that exhibit characteristics of pests and diseases.

The programme specifically targets four secondary pests that are known to be present in New Zealand, but which currently have restricted distributions. These are the:

- Mediterranean fan worm, *Sabella spallanzanii*.
- Clubbed tunicate, *Styela clava*.
- Asian date mussel, *Musculista senhousia*.
- Australian tunicate, *Eudistoma elongatum*.

4.3.2 **Planned surveillance**

The level of surveillance intensity planned will depend on the priority of the site. Surveillance will be pre-planned and based on advice from research agencies with expertise in marine surveillance such as NIWA and the University of Waikato. A summary of identified priority sites is provided in Table 3.

4.3.3 **High priority sites**

These sites are significant vessel nodes for international or domestic coastal vessel traffic. These areas typically contain ports, consented vessel moorings, boat ramps and aquaculture farms. It is proposed that surveillance of all high priority sites be carried out on a bi-annual basis in conjunction with the MPI Surveillance Programme.

4.3.4 **Medium priority sites**

Medium priority sites typically receive lower volumes of non-local vessel traffic (particularly international vessels) but may possess consented moorings, boat ramps, aquaculture farms and/or are of resource/ecological value.

Medium risk sites can be surveyed less frequently than high priority sites, on a

Surveillance of these sites will occur pre and post summer once every four years.

4.3.5 **Low priority sites**

These sites receive little non-local vessel traffic and have an overall lower degree of vessel movement or aquaculture associated activity.

Surveillance of low risk sites will be undertaken via passive surveillance.

Harnessing the capacity of vested stakeholders and the general public for the development of an enhanced passive surveillance network can be undertaken at a relatively low cost. This network could greatly increase the geographic and temporal coverage of surveillance while increasing community awareness of the threats posed by non-indigenous species. Stakeholders that could be engaged in the development of an enhanced passive surveillance strategy for the Bay of Plenty are:

- Aquaculture sector
- Tangata whenua
- Marina operators
- Charter operators
- Diving and fishing clubs
- Port of Tauranga
- Fishing and yacht clubs
- Recreational boaties
- Educational facilities (BOP Polytechnic, University of Waikato)

Engagement in passive surveillance will increase the chances of early detection of marine pests in the region, thereby enabling more options for management of marine pests at an earlier stage.

4.3.6 **Removal protocol when species are detected**

If surveillance detects any unwanted organism or suspicious plant or animal, its location and habitat will be recorded and a sample specimen collected for formal identification. The Waikato University will be engaged to assist with the development of Specimen Management Protocol.

4.3.7 **Notification procedure when new incursions are found**

If a notifiable organism is detected during surveillance both the Ministry for Primary Industries and the Bay of Plenty Regional Council must be notified within 24 hours of detection.

4.3.8 **Incursion Response Plan**

If an incursion is identified during surveillance activities, an Incursion Response Plan will be developed to manage the threat. The content of the plan will be developed specific to the incursion and will be dependent on a number of factors which cannot be determined at this stage.

Once an incursion is detected the following steps must be taken:

- 1 Confirm identification.
- 2 Carry out delimiting survey to ascertain the extent of the incursion.
- 3 Contain the incursion.
- 4 Evaluate options for management (see Figure 1).
- 5 Carry out eradication programme, if this is deemed feasible (this may require a Council decision if the proposed control operation is beyond budgeted resources).
- 6 If not feasible, investigate other control methods, or protect un-impacted, high value areas.
- 7 If an eradication operation is carried out, continue intensive monitoring for outlier sites and evaluate effectiveness of control.
- 8 Once all pests are removed, continue regular surveillance of the area within specific timelines.

Table 3 Sites in the Bay of Plenty Regional that are at risk of non-indigenous marine pest incursion and where surveillance activities would be best targeted.

Priority Ranking	Site	Description	Port	Marina	Aquaculture	Mooring/Anchorage Areas	Boat Ramp	Wharf	Slipway, Haul-out
High	Tauranga Harbour	Port of Tauranga	√						
High	Tauranga Harbour	Designated anchorages for vessels awaiting space in Port				√			
High	Tauranga Harbour	Sulphur Point Marina		√					
High	Tauranga Harbour	Bridges Marina		√					
High	Tauranga Harbour	Pilot Bay				√			
High	Tauranga Harbour	Den Place							√
High	Tauranga Harbour	Sanford Fisheries						√	
High	Tauranga Harbour	Moana Fisheries						√	
Medium	Tauranga Harbour	Tauranga CBD				√			
Medium	Tauranga Harbour	Salisbury						√	
Medium	Tūhua (Mayor Island)	South East Bay				√			
Medium	Tauranga Harbour	Pio's Beach						√	
Medium	Tauranga Harbour	Anzac Bay						√	
Medium	Tauranga Harbour	Omokoroa Point					√	√	
Medium	Tauranga Harbour	Entrance to Hunters Creek						√	

Medium	Tauranga Harbour	Pani Pani Point				√		√	
Medium	Tauranga Harbour	Te Puna Estuary (2)				√			
Medium	Whakatane/Ohiwa	Whakatane River mouth				√	√	√	
Medium	Whakatane/Ohiwa	Port Ohope				√		√	
Medium	Whakatane/Ohiwa	Ohope Spit					√		
Medium	Whakatane/Ohiwa	Ohiwa Harbour			√				
Low	Tauranga Harbour	Trinity						√	
Low	Tauranga Harbour	Harbourside Café						√	
Low	Tauranga Harbour	Fisherman's Wharf						√	
Low	Tauranga Harbour	Kauri Point						√	
Low	Tauranga Harbour	Mangawhai Bay						√	
Low	Tauranga Harbour	Opureora						√	
Low	Tauranga Harbour	Shelly Bay				√			
Low	Tauranga Harbour	Tanners Point				√			
Low	Tauranga Harbour	Pahoia Beach Road				√			
Low	Tauranga Harbour	Opureora					√		
Low	Tauranga Harbour	Tilby Point					√		
Low	Tauranga Harbour	Pani Pani Point					√		
Low	Maketu	Kaituna River				√		√	
Low	Maketu	Maketu Estuary				√		√	
Low	Maketu	Waihi Estuary (3)				√		√	
Low	Whakatane/Ohiwa	Pataua Island						√	
Low	Whakatane/Ohiwa	Ohiwa Loop Road				√	√		
Low	White island					√	√		

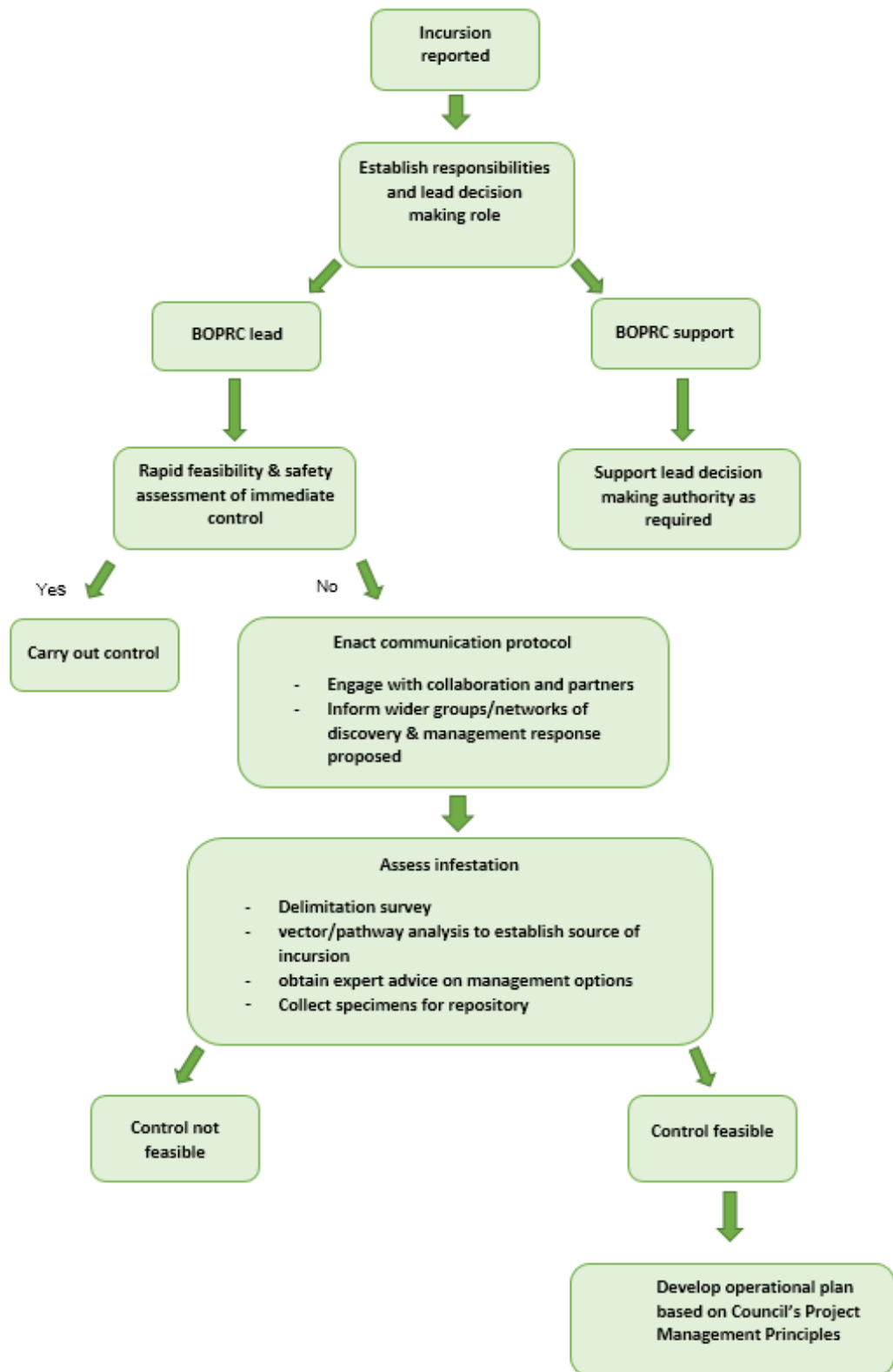


Figure 1 IncurSION Response Plan decision tree.

Part 5: Project risks

Project risks are identified below.

Risks are evaluated/rated as a means of directing project resources toward key risks.

Any emerging risk can be added as the strategy is developed and implemented.

Changes in the risk profile can be monitored and reported as an objective assessment of progress.

Table 4 Project risk matrix.

Event	Likelihood	Impact	Risk rating	Mitigation
Iwi are unable to contribute due to lack of capacity.	High - 5 Known issue for iwi in the region.	High - 5 Unable to meet statutory requirements for consultation. Process may be slowed or halted.	25	Ensure timely reporting to Maori Committees on the issue and seek early guidance on engagement.
Plan process stalls due to concerns over potential implementation costs.	Moderate - 3 Some costs are unknown.	Moderate - 2 Process may be slowed.	6	Identify rough order cost and priorities for all actions and refine as strategy development rolls out.
Stakeholders fail to participate.	Moderate - 3 Some key stakeholders have statutory obligations to meet. Others may not have capacity. Project resources are limited.	Moderate - 3 Effectiveness reduced without collaboration.	9	Develop an engagement plan that differentiates stakeholders on the basis of influence on end results and target resources accordingly.
Surveillance fails to detect populations of marine pests that are present.	Moderate - 3	Moderate - 3	9	Obtain advice from NIWA, UoW & MPI, on survey methodologies to ensure surveillance is robust.
Surveillance does not detect the present of pests until it is well established.	Moderate - 3	High – 5	15	Obtain advice from NIWA, UoW & MPI, to determine whether the pest population can be contained.
Delimiting surveys do not detect all pests present.	Moderate - 3	High - 5 Likely that an attempted eradication will fail.	15	Obtain advice from NIWA, UoW & MPI, on survey methodologies to ensure surveillance is robust.

Event	Likelihood	Impact	Risk rating	Mitigation
Local based vessels infested with pests are not in port during surveillance.	Low - 2	Moderate - 3	6	Record any vacant berths or moorings and risk profile resident vessel or inspect once back at berth.
Weather/Water conditions prevent or inhibit surveys.	Low - 2	Low - 1	2	Incorporate contingency for time into project timelines.
Attempted eradication fails.	Moderate - 3	High - 4	12	Obtain advice from NIWA, UoW & MPI, on control methodologies. Carry out robust risk analysis of every specific operation so chance of failure is well understood.
Surveillance or control timeframes slip due to lack of skilled staff/contractors.	Moderate – 3	Moderate – 3	9	Work with MPI and other regions to build capability and capacity.
Health and Safety while diving.	Low – 2	High - 5	10	Ensure all boating and dive operations are performed using BOPRC dive and boating protocols as the minimum standard.
Information Management – poor recording of operational data results in poorly informed control programmes.	Low – 2	Moderate - 4	8	Ensure information management protocols are followed.

Part 6: Estimated costs for implementation

6.1 Factors influencing resource allocation

The costs associated with the implementation of this plan will be influenced by a number of factors which will determine the required resourcing. For this reason, the figures outlined below are estimates and will be reviewed annually to ensure they are still accurate. Factors which could influence resource requirements and allocation include:

- 1 Initial costs for development of activities:
 - Initial costs in developing stakeholder groups, engagement plans, and communication channels will require adequate resourcing during the early stages of this plan. These costs should reduce over time as these activities develop.
- 2 Level of stakeholder engagement:
 - Low level of engagement will not require significant resourcing, but conversely if detailed engagement is required then resourcing would be similarly high.
 - Requirements from stakeholders through the engagement process may influence resourcing.
 - Highly engaged stakeholders may allow more efficient allocation of resources.
- 3 Results from surveillance activities:
 - The discovery of individuals or populations will require an incursion response and have significant resourcing implications. Resource requirements will depend on the type and size of the incursion.
 - Discovery of individuals or populations may trigger additional surveillance activities.
- 4 Level of investment from partners:
 - Financial investment from partners may allow additional actions/activities to be undertaken, or the redirection of BOPRC funding.

Due to these and a number of other variables, the resources allocated to this plan will need to be reviewed, and potentially adjusted on an annual basis.

6.2 Estimated resource requirements

The Council's costs¹⁰ of administering and implementing the Marine Biosecurity Management Plan are incurred through the activities outlined in this plan. Estimates have been made as to the likely resource requirements. Some can be accurately predicted while others, such as the Incursion Response activity, will be specific to the nature of a particular incursion.

The following costs have been developed and will be reviewed regularly to ensure they are accurate and an efficient use of resource allocation.

¹⁰ Costs are indicative only, based on marine incursions carried out in the Bay of Plenty recently for Mediterranean fan worm.

Activity: Management Plan Administration

Task	Cost
1 Project management resourcing	\$1,500.00
2 Annual review of the management plan	\$1,500.00
TOTAL	\$3,000.00

Activity: Stakeholder Engagement Plan/Advocacy

Task	Cost
1 Short-term contract to develop and implement Stakeholder Engagement/Advocacy Plan	\$40,000.00
2 Maintenance or development of new of Stakeholder relationships	\$5,000.00
TOTAL	\$45,000.00

Activity: Surveillance monitoring

Task	Cost
1 Development and planning of surveillance activities	\$1,500.00
2 Targeted surveillance activities	\$80,000.00
3 Implementation of Communication Protocol	\$1,000.00
4 Materials and maintenance of equipment	\$2,500.00
TOTAL	\$85,000.00

Activity: Incursion response

The costs associated with an incursion response are unable to be accurately predicted as it will be dependent on the scale and location of the find. Post-discovery and an assessment on the feasibility of control, a paper will be presented to Council for consideration which will outline the preferred management option and associated costs.

TOTAL

Task	Cost
1 Management Plan Administration	\$3,000.00
2 Stakeholder Engagement Plan/Advocacy	\$45,000.00
3 Surveillance Monitoring	\$85,000.00
4 Incursion Response	To be determined
TOTAL	\$133,000.00

Appendices

Appendix 1 – High risk marine organisms

These organisms are declared to be pests under the Biosecurity Act 1993 and are on MPI's most unwanted list. These pests have the potential to establish in the region and are capable of causing adverse effects. The intention is to prevent the pests in this category from entering and/or establishing in the Bay of Plenty region.

Pests not currently found in New Zealand

Asian clam

(*Potamocorbula amurensis*)

Legal Status: Unwanted organism

Asian clam is not known to be in New Zealand. It is a shellfish with a distinctive uneven overbite and is found in estuaries and brackish waters. The shell is 2-3 cm across and is a dirty white, yellow or tan colour. Asian clam can live in fresh and saltwater and forms dense mats displacing native species and changing seafloor/riverbed conditions. It consumes large amounts of phyto and zooplankton, so can substantially change any marine community. Asian clam can proliferate rapidly and reach extremely high densities, dominating benthic habitat.

It is native to Japan, Korea and China, though has now invaded parts of the west coast of the United States. Young clams can be caught up in ships' ballast water while adults can attach to fishing equipment. Asian clam is thought to be responsible for the collapse of some commercial fisheries in addition to the decline in the diversity and abundance of many benthic species in California.

Caulerpa seaweed

(*Caulerpa taxifolia*)

Legal Status: No status

Caulerpa taxifolia is not known to be in New Zealand, although there are native species that look similar. The aquarium strain of *Caulerpa* is a rapidly growing saltwater weed that can cause major ecological and economic damage. This strain is particularly invasive, and can grow in a wide range of water temperatures, depths and substrates including rock, mud and sand. It is a bright green seaweed with feather-like fronds and has long horizontal runners (up to 9 m) supporting many upright fronds. Fronds are flattened-looking with a smooth and distinct midrib.

Caulerpa can form dense fields that can prevent the establishment of native seaweeds and exclude indigenous marine life. It can cause the reduction of fishing catches due to the elimination of fish habitat. The most likely way of *Caulerpa* arriving into New Zealand is through importation for use in aquariums and subsequent release into the marine environment.

Chinese mitten crab

(Eriocheir sinensis)

Legal Status: Unwanted organism

Chinese mitten crab is light brown with a body width up to 8 cm. Adults have dense patches of hairs on the claws. It has a round body shape and a distinctive notch between the eyes. Its legs are twice as long as its body width. Post-larval stages settle in saltwater then migrate to freshwater to grow and develop. Adults migrate to the sea to reproduce and die.

Chinese mitten crab could cause significant damage through burrowing activity, which can undermine the integrity of stream banks. It is an opportunistic feeder with a wide diet and can adversely affect biodiversity (both freshwater and marine) through predation upon and competition with indigenous species. It also has the potential to affect human health as it can carry a parasitic lung fluke which can be passed to humans.

Chinese mitten crab is not known to be in New Zealand. Arrival is possible through ships' ballast water, either salt or freshwater, water intakes or among other marine fouling on the outside of ships or yachts. The mitten crab is considered a delicacy in some parts of the world and live crabs have been imported illegally in other countries.

European shore crab (also known as European green crab)

(Carcinus maenas)

Legal Status: Unwanted organism

European shore crab has a broad diet and can survive in a wide range of environments. The crab is medium-sized with a body width up to about 9 cm. It has five distinctive spines on either side of the eyes on the front end of the body. The upper body is mottled dark brown to dark green, with small yellow patches. The underside varies in colour from green to orange or red.

It is a voracious predator and can cause the decline of other crab and bi-valve species. The crab has the potential to negatively impact shellfish populations important for commercial and recreational fisheries and as a source of kaimoana.

European shore crab is not known to be in New Zealand. Arrival is possible through ships' ballast water, water intakes or among other marine fouling on the outside of ships or yachts.

Northern Pacific seastar

(Asterias amurensis)

Legal Status: Unwanted organism

Northern Pacific seastar can reach 40 cm in diameter and has distinctive upturned tips to its five pointed arms. The arms join onto a central disc and are covered by numerous small spines with sharp edges. It is mainly yellow in colour and often has purple or red detail on its upper surface. This seastar is normally found in shallow water but can be found as deep as 200 m. It is most likely to be found in coastal areas protected from wave action, on soft bottoms, rocks and man-made surfaces.

Northern Pacific seastar is a prolific breeder and voracious feeder preferring mussels, scallops and clams but will also prey upon a wide variety of other marine life. It can survive and breed in a wide range of habitats. It could also adversely affect biodiversity, kaimoana resources and recreational seafood harvest given its predatory behaviour and prolific breeding rate.

The Northern Pacific seastar is not known to be in New Zealand. Arrival is possible through ships' ballast water, water intakes or among other marine fouling on the outside of ships or yachts.

Pests found in New Zealand but not in the Bay of Plenty

Asian paddle crab

(Charybdis japonica)

Legal Status: No status

The Asian paddle crab is a swimming crab native to South East Asia. It is typically found in estuaries where there is firm sand or muddy fine sand. It is a relatively large crab with paddle-like hind legs. Adults have a shell width of around 12 cm. The adults also have six distinct spines or spikes on each side of the eyes. The crabs range in colour from pale green through olive green, to a deep chestnut brown with purplish markings on the carapace (shell).

Adult paddle crabs can produce hundreds of thousands of offspring. The larvae can float in the water for three to four weeks, during which time they can be moved large distances by tides and currents. Adults are also very capable of swimming large distances. These crabs are very aggressive and have the potential to compete with native crabs for space and food, including the commercially fished native paddle crab. These crabs can also impact upon biodiversity, aquaculture and shellfish resources through predation.

Asian paddle crab is present in Northland and Auckland.

Australian tunicate

(Eudistoma elongatum)

Legal Status: No status

Eudistoma is a colonial sea squirt. It forms clusters of white coloured tubes, which contain many small individual organisms. It is generally found in muddy bottomed tidal habitats and on man-made structures such as wharf piles and aquaculture equipment. It is generally submerged just below the waterline, but can often be seen at low tide. *Eudistoma* reduces in volume during the winter months, but once water temperatures lift it reappears in large volumes, usually over the summer.

Eudistoma is an Australian species and was first reported in New Zealand in 2005. It has been reported on several marine farms on Northland's east coast, Houhora and Pārengarenga Harbours, the Bay of Islands and Whāngārei Harbour.

Pests detected in the Bay of Plenty

Mediterranean fan worm

(*Sabella spallanzanii*)

Legal Status: Unwanted organism

The Mediterranean fan worm is a marine bristle worm that is typically found in estuaries or sheltered sites, at depths of anywhere between one to 30 m. It consists of a tube, up to 40 cm tall, which is always anchored to a hard surface, topped with a single spiral fan (radiole). The tube is tough and flexible and often muddy in appearance. It can often have other organisms growing on the surface.

The Mediterranean fan worm can form dense groups that could affect native species by competing for food and space. Recent studies have indicated some impact on the establishment of new generations of some species, and on nutrient flow. There is potential that dense beds could become a nuisance to recreational and commercial fishers through the clogging of dredges and fouling of other fishing gear.

The Mediterranean fan worm has been detected in Lyttelton and Auckland. Recently *Sabella* has been detected in Whangarei Harbour where the Northland Regional Council is attempting to eliminate it. Several individuals were detected in Tauranga Harbour in 2013 and an incursion response programme was developed and lead by BOPRC. Fan worms spread by growing on dirty vessels and equipment and then being relocated. They can also travel growing in enclosed wet areas on ships, or with other fouling organisms as larvae in ballast water.

Styela sea squirt

(*Styela clava*)

Legal Status: Unwanted organism

Styela is a large, solitary sea squirt that is native to the Northwest Pacific. This sea squirt has a long, club-shaped body and each individual has its own stalk and adheres separately to a substrate. The sea squirt is usually brown in colour and underwater often appears fuzzy with secondary growth coating it. It grows attached to hard natural and artificial surfaces and is frequently transported as bio-fouling on vessels and other mobile marine structures.

Styela poses a threat to biodiversity values through its smothering behaviour. It can multiply rapidly in suitable sites and compete with other filter feeders for food and space. As a result it can disrupt native ecosystems. It can also add significant maintenance costs to marine structures and vessels through its fouling behaviour. *Styela* is established in Northland at Marsden Cove and Ōpua Marinas and in the Auckland region.

Styela was detected in Tauranga Harbour in 2013 as part of the *Sabella* incursion response that was developed and lead by BOPRC.

Pests established in the Bay of Plenty and not under active management

Didemnum sea squirt

(Didemnum vexillum)

Legal Status: No status

Didemnum is a leathery or spongy textured, light mustard coloured sea squirt which often looks like yellowish wax dripping over a structure such as a rope or mussel lines. Its surface has raised leaf-like veins without pores. Colonies of *Didemnum* can reproduce sexually by releasing tailed larvae that are carried in water currents. It can also reproduce asexually by budding, hence fragments can break off and grow into new colonies.

This sea squirt readily occupies hard surfaces including ship hulls, wharf structures and floats, piling, mooring and ropes, rock outcrops, and gravel seabed. *Didemnum*'s smothering capabilities choke off bottom dwellers such as shellfish, and may cover grounds needed by fish to lay eggs. *Didemnum* is not known to be in Northland, but is becoming quite widespread on the east coast of the North Island and the top of the South Island.

Undaria seaweed

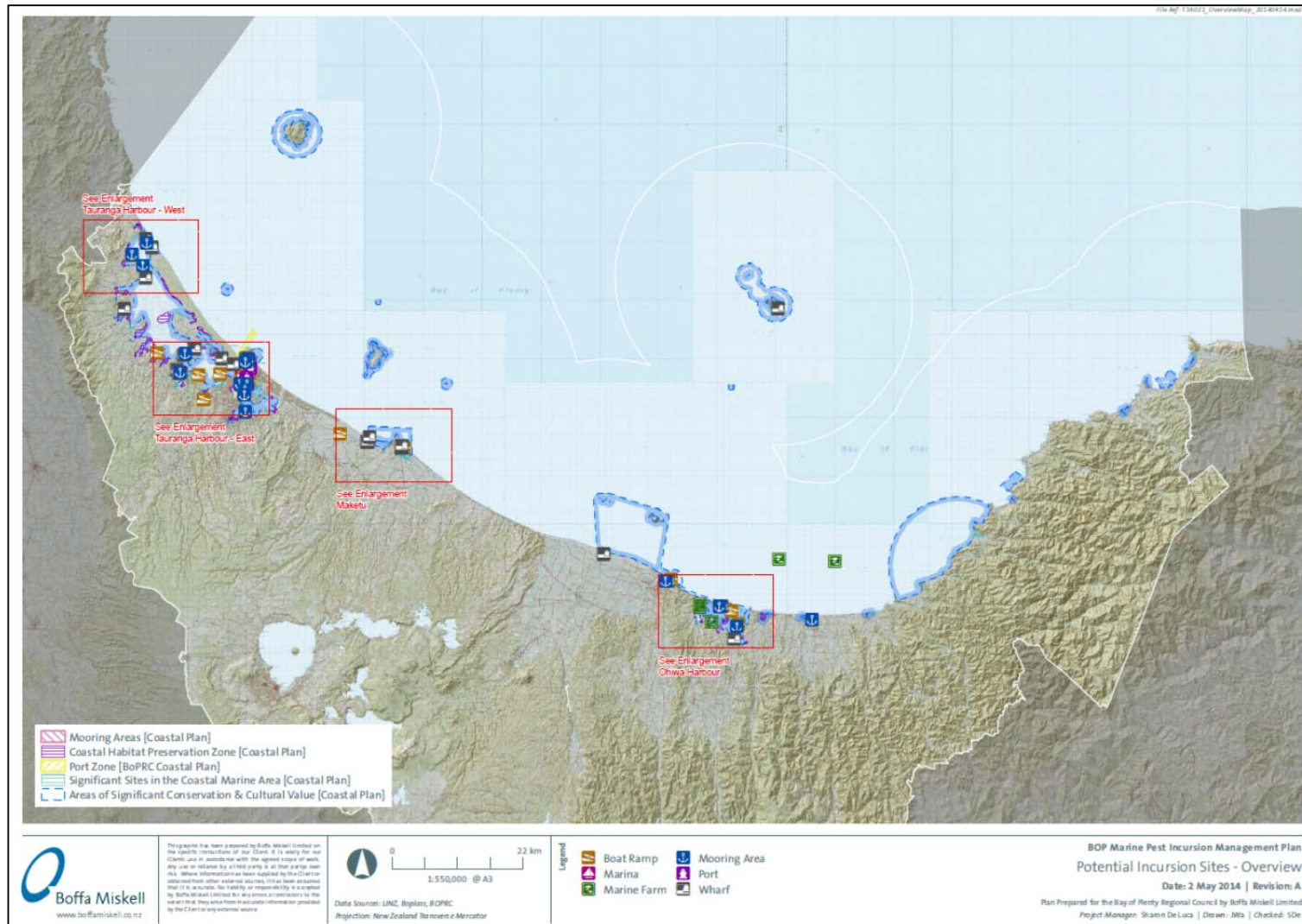
(Undaria pinnatifida)

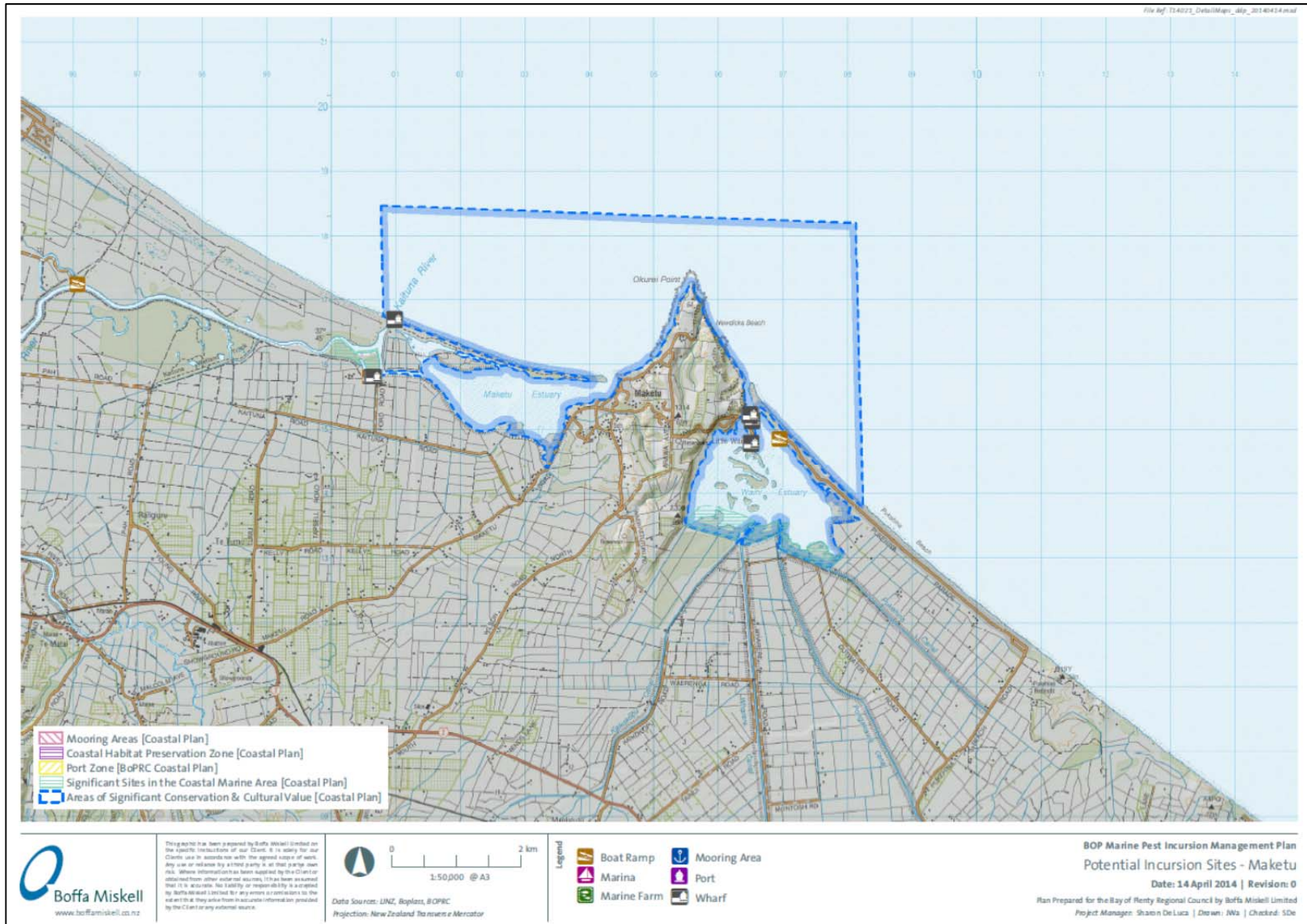
Legal Status: Unwanted organism

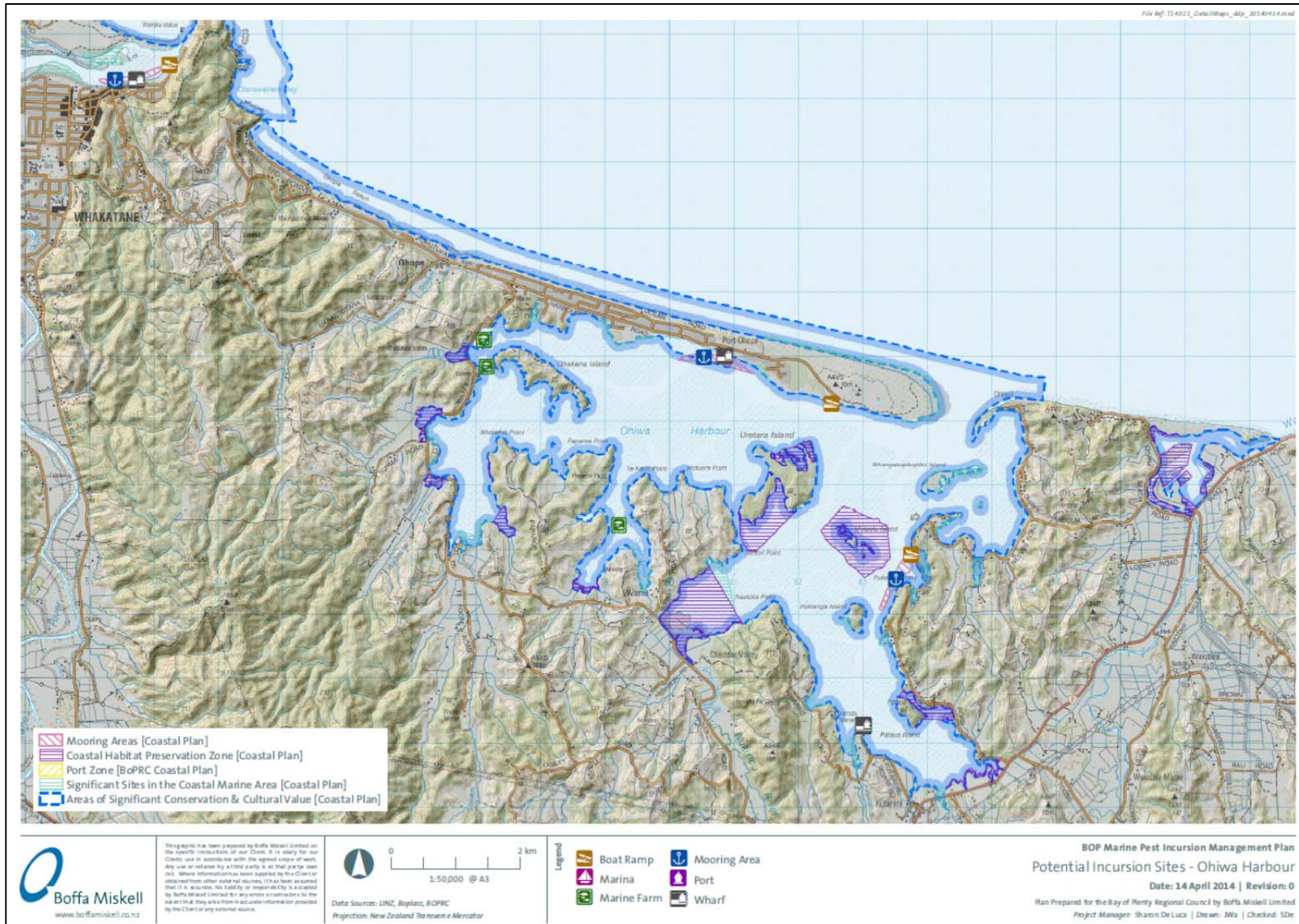
Undaria is a highly invasive and opportunistic seaweed which spreads mainly by fouling on boat hulls. It is harvested in Japan as a food source. Mature plants are a brown/green/yellow colour and grow to 1-2 m. Juvenile *Undaria* plants have a holdfast and stem and an undivided blade (they appear as a single leaf). The distinctive midrib starts becoming apparent once the plant grows over 5 cm.

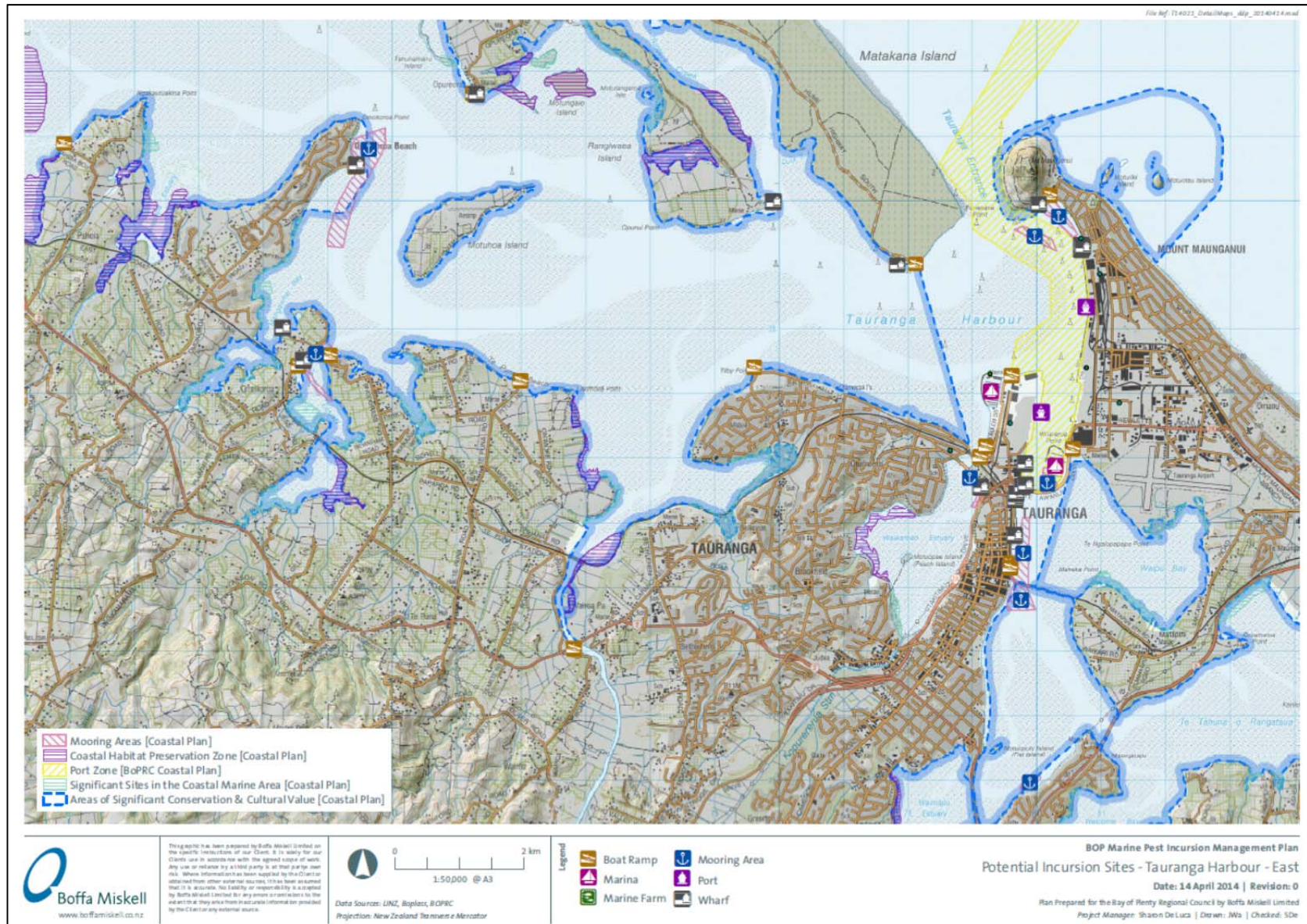
Undaria is not known to be in Northland, but is present in many harbours and ports around New Zealand. *Undaria* can form dense stands underwater which may lead to the exclusion or displacement of native plant and animal species and can change the structure of ecosystems, especially in areas where native seaweeds are absent.

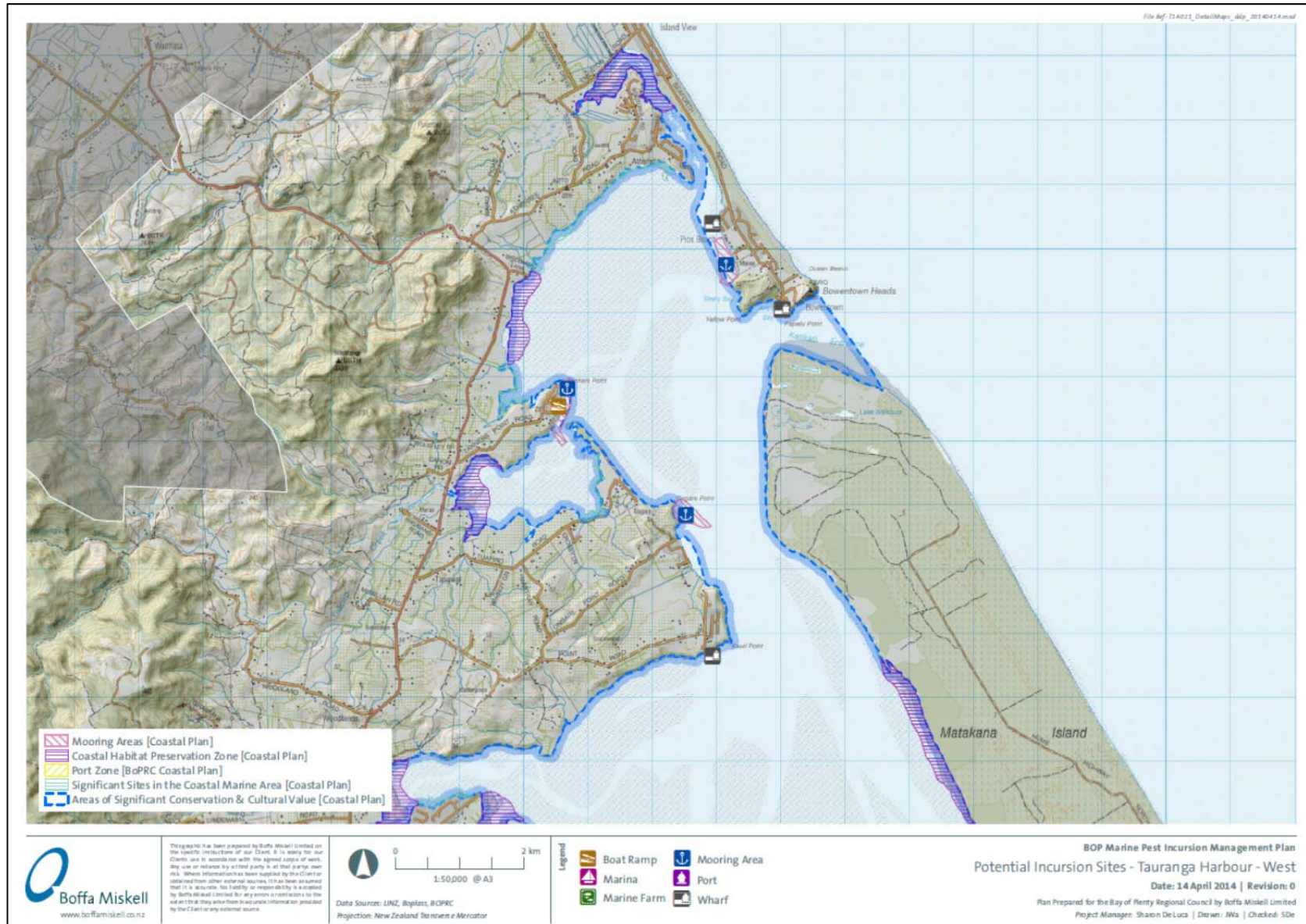
Appendix 2 – Potential incursion sites











Appendix 3 – Marine structure data source

Table 5 Marine structure type and data source.

Point ID	Type	Source
1	Marina	nztopo50
2	Marina	nztopo50
3	Boat Ramp	nztopo50
4	Boat Ramp	nztopo50
5	Boat Ramp	nztopo50
6	Boat Ramp	nztopo50
7	Boat Ramp	nztopo50
8	Boat Ramp	nztopo50
9	Boat Ramp	nztopo50
10	Boat Ramp	nztopo50
11	Boat Ramp	nztopo50
12	Boat Ramp	nztopo50
13	Boat Ramp	nztopo50
14	Boat Ramp	nztopo50
15	Boat Ramp	nztopo50
16	Boat Ramp	nztopo50
17	Boat Ramp	nztopo50
18	Boat Ramp	nztopo50
19	Boat Ramp	nztopo50
20	Boat Ramp	nztopo50
21	Boat Ramp	nztopo50
22	Boat Ramp	nztopo50
23	Boat Ramp	nztopo50
24	Boat Ramp	nztopo50
25	Marine Farm	nztopo50
26	Marine Farm	nztopo50
27	Wharf	nztopo50
28	Wharf	nztopo50
29	Wharf	nztopo50
30	Wharf	nztopo50
31	Wharf	nztopo50
32	Wharf	nztopo50
33	Wharf	nztopo50
34	Wharf	nztopo50
35	Wharf	nztopo50

Point ID	Type	Source
36	Wharf	nztopo50
37	Wharf	nztopo50
38	Wharf	nztopo50
39	Wharf	nztopo50
40	Wharf	nztopo50
41	Wharf	nztopo50
42	Wharf	nztopo50
43	Wharf	nztopo50
44	Wharf	nztopo50
45	Wharf	nztopo50
46	Wharf	nztopo50
47	Wharf	nztopo50
48	Wharf	nztopo50
49	Wharf	nztopo50
50	Wharf	nztopo50
51	Wharf	nztopo50
52	Wharf	nztopo50
53	Wharf	nztopo50
54	Wharf	nztopo50
55	Wharf	nztopo50
56	Wharf	nztopo50
57	Wharf	nztopo50
58	Wharf	tcc_aerial
59	Wharf	tcc_aerial
60	Boat Ramp	tcc_aerial
61	Boat Ramp	tcc_aerial
62	Port	cp
63	Port	cp
64	Mooring Area	BOPRC
65	Mooring Area	BOPRC
66	Mooring Area	BOPRC
67	Mooring Area	BOPRC
68	Mooring Area	BOPRC
69	Mooring Area	BOPRC
70	Mooring Area	BOPRC
71	Mooring Area	BOPRC
72	Mooring Area	BOPRC
73	Mooring Area	BOPRC
74	Mooring Area	BOPRC

Point ID	Type	Source
75	Mooring Area	BOPRC
76	Mooring Area	BOPRC
77	Mooring Area	BOPRC
78	Mooring Area	BOPRC
79	Mooring Area	BOPRC
80	Marine Farm	BOPRC