



Guidance Document

Guidance Document for the Craft Risk Management Standard - Biofouling on Vessels Arriving to New Zealand

Accompanying Information for the Craft Risk Management Standard for Biofouling on Vessels Arriving to New Zealand. This Guidance Document is intended for use once the CRMS comes into force in 2018.

Title

Guidance Document for the Craft Risk Management Standard - Biofouling on Vessels Arriving to New Zealand

About this document

This document contains guidance material to be read with the Craft Risk Management Standard for Biofouling on Vessels Arriving to New Zealand (the CRMS) which comes into force in 2018.

Related Requirements

This guidance relates to the requirements of the CRMS.

The CRMS applies to vessels coming into New Zealand territory from the point when they enter the seaward boundary of the territorial sea (12 nautical miles from the coastal baseline), and for all the time they remain in the territory including in the internal waters.

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1 Purpose

This document contains guidance material to be read with the Craft Risk Management Standard for Biofouling on Vessels Arriving to New Zealand (the CRMS) which comes into force in 2018. The CRMS is a standard under the Biosecurity Act 1993 with which an operator or person in charge of a craft must (according to section 24J of the Act) comply.

2 Background

The CRMS is intended to ensure the risk of harmful organisms being introduced into New Zealand by the biofouling pathway is managed.

The spread outside their natural ranges of aquatic organisms, particularly adventive species, through transfer as vessel biofouling is an internationally recognised issue. Under the Convention for Biological Diversity, the issue has been named as one of the major concerns for ocean environments and the UN International Maritime Organisation (IMO) has been charged with finding solutions that international shipping can agree to. Under the IMO a resolution has been agreed to encourage vessel operators to manage this risk and for member states to expedite uptake of IMO Guidelines. This standard aligns with the IMO Guidelines for biofouling management¹ and is intended to contribute towards global management of this pathway as well protecting New Zealand from further introductions of marine pest species.

3 Definitions

All definitions are as given in the CRMS.

4 The 'clean hull' requirement and how to meet it

The CRMS requires vessels to arrive into New Zealand territory with a 'clean hull'. This is the approach used in the CRMS to meet the desired outcome of 'minimising entry of harmful organisms arriving as biofouling'.

The CRMS gives a definition of 'clean hull' that includes thresholds for allowance of some biofouling for the two categories of vessel – 1) short-stay and 2) long-stay vessels (see Table 1 and 2 of the CRMS). Appendix 2 below gives an explanation of the allowances and illustrations to assist understanding and identification of compliant and non compliant levels of fouling for a vessel.

There are three options given in the CRMS of measures that are acceptable to be used to arrive with a 'clean hull':

- a) Vessels can be readied for an arrival to New Zealand by cleaning the hull; or

¹ Guidelines can be read on MPI's website here www.biosecurity.govt.nz/files/biosec/policy-laws/intl/2011-imo-guidelines.pdf

- b) The operator may continually maintain and manage the hull, to prevent the accumulation of biofouling beyond the allowance. Also a vessel is deemed to meet the requirements under the CRMS if the hull is being managed in alignment with the IMO Guidelines; or
- c) The biofouling organisms can be deactivated by using an approved treatment.

Note that instead of meeting the CRMS a vessel operator can submit an alternative management approach that is equivalent to complying with the CRMS. This may include providing information to show the species present on the vessel would not be harmful to New Zealand or would have low likelihood of establishing in New Zealand as a result of the visit of the vessel. This must be submitted to MPI as a Craft Risk Management Plan. The following gives more detail on these options.

4.1 Meeting the 'clean hull' requirement by cleaning in preparation for visit to New Zealand

Cleaning means the removal of all biofouling from all hull areas – the hull areas are defined in the CRMS and include niche areas that are susceptible to fouling. Under the CRMS, the cleaning is required, to be carried out less than 30 days before arrival to New Zealand. To ensure clearance at the border, cleaning should be carried out by an approved provider. An approved provider will provide a report or certificate to certify the hull as 'clean' and the date of the cleaning. This can be made available, if requested, to MPI for verification of declared measures taken.

Particular care should be taken to clean or treat sea-water inlet pipes, sieves and gratings, areas around the rudder, areas susceptible to paint wear, projections and recesses. Sea water systems should be treated using methods, such as flushing with detergents or chemicals (e.g. bleach). In the case of sea-chests which are usually part of sea-water systems on larger vessels, removal of the outer grating and water-blasting the inside is recommended. Care should be taken to clean the entire hull to ensure that invisible microscopic stages of biofouling species are also removed.

If the intention is to meet the CRMS by cleaning the vessel on arrival in New Zealand, the CRMS requires this to be carried out in an approved hull cleaning facility or by using an approved in-water cleaning system, within 24 hours of arrival. MPI will seek evidence that the vessel has been booked in to have the cleaning carried out within this timeframe. If it is not practically feasible to meet this timeframe, a request can be made for an extension of time and will be granted if the intent is to remove the biofouling risk from the vessel, or the vessel from the sea, as quickly as possible.

For information on the following go to www.biosecurity.govt.nz:

- Becoming an approved provider of inspection and/or hull cleaning and/or treatment
- A list of current approved providers and where relevant, their approved systems
- Application for approval of a biofouling treatment/ in-water cleaning system
- Application for approval of a hull cleaning facility
- A list of approved treatments for general use

4.2 Meeting the 'clean hull' requirement by continual maintenance

Continual maintenance means meeting the CRMS by operating an ongoing maintenance regime for biofouling prevention by utilising current best practices. A best practice regime is described below. Adherence to the IMO Guidelines is considered best practice for ships, particularly commercial shipping that is at sea for the majority of time and is mainly travelling at moderate to high speed and not 'slow steaming'.

Best current practice in continual biofouling maintenance includes:

- Antifouling coatings are applied to all immersed surfaces, are appropriate to the particular hull areas and are guaranteed as 'effective for the expected operations of the vessel'². Effectiveness includes that the types of coating and the application (such as thickness of coatings) are reasonably expected to perform for
 - the vessel's particular operating profile including percentage time at sea versus in port, average speed of the vessel, any expected lay-up periods, and operating conditions (e.g. coastal or oceanic; temperate, tropical or polar); and
 - a specific stated duration which may be reliant on stated maintenance such as wiping off slime etc after periods of inactivity (such as required for some foul-release coatings).
- If a replacement interval longer than 5 years is planned, the coating's long effective life properties should be evidenced in the vessel's on-board documentation, or, if the coating's life is being extended beyond its effective age, the planned increased cleaning regime to ensure management of biofouling when antifouling is becoming depleted should be evidenced in the vessel's procedures and/or biofouling management plan. (Antifouling coatings are mostly effective for the usual dry-docking and antifoul replacement period of 5 years³.)
- Antifouling coatings are within their reasonably expected effective service life for duration of the vessel's visit to New Zealand.
- Niche areas, which are areas more susceptible to biofouling growth, are protected from biofouling growth by use of coatings suitable for the conditions such as low water flow exposure, cavitation, high wear or abrasion, and/or by marine growth prevention systems (MGPSs) such as chemical dosing of sea-water systems, electrolytic production of chemical biocide, heat treatment, etc.
- The vessel operates according to a plan specific to the vessel (preferably a biofouling management plan based on the IMO template - see Appendix 1), that ensures antifouling coatings are well maintained and that the biofouling state of the hull including the niche areas is monitored.
- In-water inspections are undertaken when biofouling growth is suspected or at any opportunity such as when diver or camera inspections are being undertaken, and the plan sets a frequency to be achieved that is appropriate to the vessel's known rate of biofouling accumulation.
- All hull maintenance or cleaning actions, marine growth prevention system operations and hull inspections are recorded and records are kept on board at least from the date of last full antifouling application, preferably in the form of the IMO template – see Appendix 1.
- Hull cleaning is undertaken when excessive biofouling⁴ has been detected.
- Hull inspection reports following cleaning and re-inspection are retained on-board.

² 'Effective' means prevents biofouling developing on the hull

³ Most vessels required to comply with SOLAS (Convention for the Safety of Life at Sea) are required to have a dry-dock inspection twice in every 5 years but many vessels obtain exemption to allow alternate inspections to be in-water inspections.

⁴ Excessive biofouling means above the applicable allowance – see Table 1 and 2 of the CRMS.

4.3 Meeting the 'clean hull' requirement by using approved treatments

Vessel operators are also given the option of using approved treatments. Treatments will be considered for approval on application. Application details are on the website www.biosecurity.govt.nz. Treatment means an action that renders the organisms non-viable. Treatments must be approved by MPI before use. They must achieve a reduction in risk equivalent to that achieved by arriving with a 'clean hull', and this would need to be demonstrated to MPI such as by providing a report of results from evaluation and testing against the CRMS.

Treatments may include, but are not limited to, such methods as: - enclosing the hull (while in-water) in a close fitting impermeable wrapping material; application of chemicals; heat treatment; or ultrasonic treatment.

These must be approved prior to use, and prior to arrival of the vessel to New Zealand. Once approved, treatments become 'approved treatments'. Any application made to MPI for the approval of a treatment must:

- provide documented proof of effectiveness of the proposed means of meeting the outcome of this CRMS; and
- be made by application in the prescribed form available at www.biosecurity.govt.nz.

A treatment may be approved to be used in respect of a specific vessel or it may be approved to be used in respect of any vessel or a class of vessels, in which case it will be added to a list of approved treatments available from MPI.

The list of currently approved treatments can be found on the MPI website.
<http://www.biosecurity.govt.nz/border/transitional-facilities/bnz-std-abtrt>

5 Craft risk management plans

A craft risk management plan (CRMP) under section 24K of the Biosecurity Act 1993 (the Act) can be submitted for approval by MPI where an operator of a vessel /vessels or a floating drill rig wishes to use alternative measures to ensuring a clean hull (or pontoons) on arrival. A plan may be chosen as the way of achieving clearance for the following circumstances:

- Where an alternative way is used to show the vessel is minimising the risk of introduction of harmful organisms, such as where the species in the biofouling can be shown as unlikely to be harmful in New Zealand or unlikely to establish here
- Where the proposed process for ensuring freedom from harmful organisms is complex. For example the process may involve a number of combined measures such as an offshore inspection and removal of biofouling to the extent practical, followed by another inspection on arrival with identification and removal of any remaining organisms that are considered a risk to New Zealand, and possibly ongoing monitoring for appearance of any further harmful organisms once the vessel/rig is deployed in New Zealand.

MPI can assist with advice on development of a CRMP.

Under section 24K of the Act a CRMP must include the steps that will be taken to mitigate the biofouling risk and these must be approved by MPI. It should also include the dates of the arrival or duration of the plan if it is to cover more than one arrival, and include the details of the vessel or vessels covered. A template that can be used for developing a CRMP is given in Appendix 3.

Operations under a CRMP will be subject to occasional audit inspections by MPI to verify that the mitigation steps have been taken as per the plan.

If intending to use a CRMP, contact MPI early in the planning stage at: Standards@mpi.govt.nz. MPI can assist you with your development of a plan.

6 Acceptable Evidence

The following specifies acceptable proof that measures have been implemented or other requirements of the CRMS met.

6.1 For vessels achieving compliance by cleaning before or on arrival

Where an approved provider is used to clean a vessel hull shortly before entering New Zealand territory, a report or certificate from the approved provider should be provided to show the date of cleaning did not exceed 30 days before arrival in New Zealand. The list of approved providers is on the MPI website or can be requested by contacting Standards@mpi.govt.nz. Alternatively vessels operators can supply other evidence that cleaning has occurred. Acceptable evidence includes

- Recent 'Clean hull' certificate or report provided by an approved provider of hull inspection following inspection
- Log book showing dates of haul-out or in-water inspections, hull cleaning, antifouling application with evidence of dates and actions such as electronically dated images or video.
- Receipts from hull cleaning, antifouling paint purchase, use of a haul-out facility

Where it is intended that in-water cleaning will be undertaken within 24 hours of arrival, proof of a definite arrangement with an approved provider must be supplied along with evidence that the activity is permitted at the proposed cleaning location, or the provider has a consent, under the Resource Management Act 1991. In the case of long-stay vessels, submission, before arrival, of copies of evidence of cleaning and re-inspection may be requested.

If removal of the vessel or the biofouling risk from the water within 24 hours is expected to be practically not feasible, MPI may grant an extension of time on application.

6.2 For vessels relying on continual maintenance to comply

- Recent 'Clean hull' certificate or reports of in-water inspections between dry-docking biofouling inspections and removal.
- International Anti-fouling Certificate for proof of date of application or most recent re-application of antifouling for a vessel
- Biofouling Management Plan (BMP) tailored to the vessel carried on board for view by an inspector
- Record Book carried on board showing records of actions taken under the BCP.

7 Verification, inspection, direction of non-compliant vessels and costs

Vessels are expected to carry evidence on board for the purpose of demonstrating compliance to an inspector. Any vessel may be subject to verification activity at the border. This may include sighting the evidence above, inspection of the hull, and sampling and/or photography of the biofouling.

Vessels that do not comply with the requirements of the CRMS may be directed by an inspector, under sections 32 or 33 of the Act, to undertake mitigation measures. Refer to measures for mitigation of the risk of non compliant vessels in section 9 below.

An inspector may direct the operator or person in charge of a vessel to: -

- d) deal with biofouling as the inspector specifies, if the vessel will remain in New Zealand territory, or
- e) if there is no available approved facility or in-water system for managing the biofouling risk, to move the vessel from New Zealand territory and possibly proceed outside the Exclusive Economic Zone, within a period of 24 hours or as otherwise specified by the inspector.

For recreational vessels, an underwater viewing scope may be used where inspectors suspect, based on documented information, that the hull is fouled.

Underwater inspection may be carried out for vessel classes other than recreational vessels if a vessel operator disagrees that there is a likely presence of biofouling above the applicable threshold of the CRMS. In such cases the vessel operator may obtain an underwater survey from to confirm lack of risk. This survey would need to be carried out by an MPI approved provider within 24 hours or as soon as feasible and would be carried out at the vessel operator's expense.

Border clearance of arriving vessels is funded by the Crown. However MPI will recover cost at an hourly rate⁵ for time spent dealing with the risk of non-complaint vessels.

Hull maintenance and any actions for non-compliant vessels directed by MPI such as haul-out and/or cleaning in-water are at the expense of the vessel owner or operator. Also MPI is not liable for cost of delay or disruption of cargo or passenger travel itineraries or loading schedules resulting from actions directed by an inspector.

8 Measures that MPI may direct vessels to undertake if non-compliant

Arriving with a non compliant vessel does not usually incur a penalty but is likely to cause delays to loading, unloading and travel itineraries and, for commercial vessels, may result in rescheduling of subsequent port calls and the possibility of being directed by an inspector to leave New Zealand without completing loading orders.

MPI policy is to remove the biosecurity risk from the water within 24 hours or as soon as feasible.

The following are the only current options for dealing with the risk of non-compliant vessels at this date:

- Haul-out: If an approved facility (transitional facility under section 37 of the Act) is available in the vicinity, the vessel can be directed to be hauled out within 24 hours (with cleaning permitted to be carried out beyond this time frame). This option is expected be used for recreational vessels and

⁵ Rate is as per Biosecurity (Costs) Regulations 2010

possibly for other vessels that can be accommodated on slips at boat yards, depending on availability of facilities that have been approved as Transitional Facilities under the Act.

- Spot clean: If the biofouling is restricted to one or a few particular hull areas that can be cleaned in-water by removal of organisms by hand without release of material into the water, this method can be used. The removal must be carried out by an approved provider and be carried out within 24 hours or as soon as feasible. The vessel will be directed to remain at the port of arrival until it has received clearance. The inspector may require evidence from the provider that the hull is clean, such as photographic evidence.
- Restrict vessel to travel directly between ports designated as places of first arrival (POFAs) under the Act. (If a vessel arrives with the intention to be fully cleared for free access to all areas of New Zealand or to access any places other than POFAs, and the biofouling is found to be above the threshold⁶ for long-stay but within the allowance for short-stay vessels, the inspector may restrict the vessel to only visiting POFAs and only allow direct travel between those POFAs.)
- If no other options are available the vessel will be directed to leave New Zealand within 24 hours or as soon as feasible. The vessel will receive advice that it will not gain clearance at a subsequent visit to New Zealand unless the hull has been cleaned and evidence is presented to verify that the vessel now meets the requirements of the CRMS.

9 Expediting clearance

The following are ways for vessel operators to gain better certainty of biofouling clearance without delay.

- (1) Craft Risk Management Plan approved by the Director General (DG) –The section above discusses these plans and when one may be useful
- (2) Becoming a low risk vessel – MPI operates a system that assesses a vessel at every visit to New Zealand. A vessel with a good record of compliance can become a low risk vessel and is not subject to inspection at every visit but will be subject to occasional audit inspections by MPI
- (3) Endorsement by MPI of codes of practice – These can be developed by a vessel sector or industry to guide their members as to practical and acceptable ways of meeting the CRMS. Codes of practice may be endorsed by MPI as aligning with the CRMS
- (4) Providing clear evidence – Refer to section 6 above on Acceptable Evidence.

10 Additional guidance for classes of vessels

10.1 Commercial shipping

It is expected that most cargo and passenger vessels that are short-stay⁷ will rely on continual maintenance of the hull to meet the CRMS requirements. MPI will use evidence such as last international anti-fouling certificate to verify whether the vessel is within date for the usual 5 yearly dry docking and reapplication of antifouling

⁶ Thresholds and explanation of the vessel categories are in the CRMS section 2.3

⁷ Vessels calling for a short time at ports in New Zealand designated under the Act as Places of First Arrival

coatings and may look at the vessel's records to check there have been hull inspections and maintenance of any biofouling between dry dockings, as this is part of a best practice biofouling management regime. Vessels that operate a hull coating reapplication regime other than 5 yearly may be asked to explain what reapplication and other maintenance regime they have and the reasons this is effective beyond 5 years. Information on coating type and manufacturer should be available on-board as inspectors may require this detail.

If vessels have been stationary for an extended period this must be declared in the arrival documentation as it is an indicator that the vessel could have biofouling over the allowance.

Giving false information such as falsification of a declaration or a certificate is an offence under the Act.

Cruise vessels that have obtained special permission to visit places that are not Ports of First Arrival, or that have become fully cleared to cruise freely in New Zealand, will be required to meet the more stringent threshold of no biofouling apart from slime and goose barnacles. (Slime is the first stage of biofouling and cannot be avoided and goose barnacles are oceanic species of no risk to New Zealand coastal resources). This will probably require cleaning of the hull in preparation to come to New Zealand. If the vessel is operating in New Zealand waters for a few months it is recommended that it is also antifouled shortly before starting its New Zealand operations.

10.2 Slow movers

Slow moving vessels such as tugs, barges or floating exploration drill rigs, and some vessels that are on delivery voyages to New Zealand, such as newly chartered inshore fishing vessels, are often very fouled due to lack of fast movement or wave action to activate the antifouling protection. These vessels should be cleaned (and preferably re-antifouled) in preparation for their transfer to New Zealand. It is recommended that those planning to transfer such a vessel contact MPI as early as possible to discuss how they intend meeting the biofouling requirements. Email: Standards@mpi.govt.nz

10.3 Recreational vessels

Recreational vessels such as yachts often arrive to New Zealand after a long cruise from across the world and have had little opportunity to renew their antifouling on the way. In the past these have arrived to New Zealand with a high level of biofouling and the intent to rest up and defoul the vessel in New Zealand. For several years New Zealand has sent out advice that these vessels should remove biofouling before they set out for the last leg of their voyage to New Zealand. Despite this, some vessels still do not have clean hulls on arrival. MPI utilises underwater scopes to inspect hulls of recreational vessels. Inspectors will direct vessels that have biofouling above the applicable threshold to be hauled out and cleaned in a hull cleaning facility that has MPI approval⁸. Most major arrival ports for yachts will have such a facility. It will probably be a facility that is used by the public but will have quarantine procedures in place for dealing with vessels under a biosecurity direction. After cleaning to the satisfaction of the inspector the vessel will receive a biosecurity clearance certificate and be released to cruise anywhere. Haul out, hard stand use and cleaning will be carried out at the expense of the vessel operator.

Some recreational vessels cleaning at their last destination before New Zealand may not be able to find approved providers to supply 'clean hull' certificate. In this case, other evidence can be presented such as dated photographs of the cleaning taking place or of the clean hull afterwards and/or receipts from purchase of antifouling paint.

⁸ under the MPI Standard for Transitional Facilities (under section 39 of the Act)

11 Information for providers and facility operators

Procedures and forms are available for application for the following:

- Becoming an approved provider of inspection or cleaning/treatments, or
- Becoming an operator of an approved facility or
- Approval of a facility as a transitional facility for hull cleaning

They can be found on the MPI Biosecurity website www.biosecurity.govt.nz or you can contact MPI for assistance by emailing Standards@mpi.govt.nz.

12 Available approved treatments, approved cleaning facilities and their operators, approved inspection providers

The following are listed on the MPI Biosecurity website www.biosecurity.govt.nz

- Approved providers of inspections/ treatments both offshore and in New Zealand.
- Hull cleaning facilities approved as transitional facilities under the Act.
- Treatments that have been approved and become Approved Treatments for use generally or by specified classes of vessels under the CRMS.

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Appendix 1 IMO Guideline templates for Biofouling Management Plan and Record Book

Biofouling Management Plan

The purpose of the Plan is to outline measures for the control and management of this vessel's biofouling to minimize the transfer of invasive aquatic species.

Ship's name	Xxx
Flag	Xxx
Port of registry	Xxx
Gross tonnage	Xxx
IMO number	Xxx
Length	Xxx
Beam	Xxx
Ship type	Xxx
Call sign	Xxx

Document reference: Xxx

Document date: Xxx

Created by: Xxx

1 Introduction

This Biofouling Management Plan is specific and unique for this vessel, as identified at the front page.

The Plan is following the outline given in the IMO guideline, [MEPC.207\(62\)](#), dated 15 July 2011, entitled *2011 guidelines for the control and management of ship's biofouling to minimize the transfer of invasive aquatic species*.

The Plan shall be readily available to any port State authority for viewing on request.

Annex 1 of this plan includes a sample of the Record Book, where this vessel's crew document activities performed for biofouling maintenance.

Biofouling means the accumulation of aquatic organisms such as micro-organisms, plants, and animals on surfaces and structures immersed in or exposed to the aquatic environment. Biofouling can include microfouling (microscopic organisms including bacteria and diatoms and the slimy substances that they produce) and macrofouling (e.g. barnacles, tubeworms, or fronds of algae).

In the adoption of the 2004 Ballast Water Management (BWM) Convention, Member States of the IMO made a clear commitment to minimizing the transfer of invasive aquatic species by shipping. Biofouling management is not required by the BWM Convention since it is not part of the scope.

However, studies have shown that biofouling can also be a significant vector for the transfer of invasive aquatic species. Biofouling on ships entering the waters of States may result in the establishment of invasive aquatic species which may pose threats to human, animal and plant life, economic and cultural activities and the aquatic environment.

The 2001 Anti-Fouling Systems (AFS) Convention addresses anti-fouling systems on ships and the focus is on the prevention of adverse impacts from the use of anti-fouling systems and the biocides they may contain. The AFS Convention does not address preventing the transfer of invasive aquatic species.

All ships have some degree of biofouling, even those which may have been recently cleaned or had a new application of an anti-fouling coating system. The biofouling that may be found on a ship is influenced by a range of factors, such as follows:

- 1) Design and construction, particularly the number, location and design of niche areas.
- 2) Specific operating profile, including factors such as operating speeds, ratio of time underway compared with time alongside, moored or at anchor.
- 3) Places visited and trading routes.
- 4) Maintenance history, including: the type, age and condition of any anti-fouling coating system, installation and operation of anti-fouling systems and dry-docking/slipping and hull cleaning practices.

2 Purpose of the plan

The purpose of the Plan is to outline measures for the control and management of this vessel's biofouling to minimize the transfer of invasive aquatic species.

3 Description of the anti-fouling system

The following anti-fouling system(s) are used on this vessel	Applied / installed where	Manufacturer & product name	System specification*

(*) anti-fouling system specifications (including dry film thickness for coatings, dosing and frequency for MGPSs, etc.) together with the expected effective life, operating conditions required for coatings to be effective, cleaning requirements and any other specifications relevant for paint performance.

This vessel carries the following certificates and/or other documents of the anti-fouling system(s):

Document	Reference / ID
AFS certificate	
AFS statement of compliance	
other documents	

4 Description of operating profile

This vessel has the following operating profile, which has influenced the specifications of the ship's anti-fouling systems and operational practices.

Factor	Vessel's operating profile
Typical operating speed:	Xxx
Periods underway at sea compared with periods berthed, anchored or moored:	Xxx
Typical operating areas or trading routes:	Xxx
Planned duration between dry-dockings:	Xxx

5 Description of areas on the ship susceptible to biofouling

The following table gives an overview of this vessel's hull areas, niche areas and seawater cooling systems on the ship that are particularly susceptible to biofouling. The table also gives the management actions required for each area.

Table 1 - Biofouling management action plan for this vessel

Areas particularly susceptible to biofouling	Management actions required for each area (e.g., inspections, cleaning, repairs and maintenance)	Management actions to be undertaken if ship operates outside its usual operating profile
External hull surfaces:		
- Vertical sides	Xxx e.g. This area is inspected at each dry docking and cleaned as found necessary.	Yyy e.g. Additional inspection as found necessary.
- Flats	Xxx	Yyy
- Boottop	Xxx	Yyy
- Bow dome	Xxx	Yyy
- Transom	Xxx	Yyy
Hull appendages and fittings:		
- Bilge keels	Xxx (if applicable) e.g. This area is inspected at each dry docking and cleaned as found necessary.	Yyy (if applicable) e.g. Additional inspection as found necessary.
- A-brackets	Xxx (if applicable)	Yyy (if applicable)
- Stabilizer fins	Xxx (if applicable)	Yyy (if applicable)
- CP anodes	Xxx (if applicable)	Yyy (if applicable)

Areas particularly susceptible to biofouling	Management actions required for each area (e.g., inspections, cleaning, repairs and maintenance)	Management actions to be undertaken if ship operates outside its usual operating profile
Steering and propulsion:		
- Propeller	Xxx	Yyy
- Propeller shaft	Xxx	Yyy
- Stern tube seal	Xxx	Yyy
- Anchor chain	Xxx (be specific)	Yyy (be specific)
- Chain locker	Xxx	Yyy
- Rope guard	Xxx (if applicable)	Yyy (if applicable)
- Rudder	Xxx e.g. This area is inspected at each dry docking and cleaned as found necessary.	Yyy (if applicable) e.g. Additional inspection as found necessary.
- Bow/Stern thrusters - Propeller - Thruster body - Tunnel	Xxx (if applicable)	Yyy (if applicable)
- Tunnel grates	Xxx (if applicable)	Yyy (if applicable)

Areas particularly susceptible to biofouling	Management actions required for each area (e.g., inspections, cleaning, repairs and maintenance)	Management actions to be undertaken if ship operates outside its usual operating profile
Seawater intakes and internal seawater cooling systems:		
- Engine cooling system	Xxx e.g. Opened up at regular intervals to inspect growth, cleaned as found necessary.	Yyy
- Sea chests (identify number and position)	Xxx (include details of each sea chest and its position)	Yyy (include details of each sea chest and its position)
- Sea chest grate	Xxx	Yyy
- Internal pipework and heat exchanger	Xxx	Yyy
- Fire-fighting system	Xxx	Yyy
- Ballast uptake system	Xxx	Yyy
- Auxiliary services system	Xxx	Yyy

6 Diagram – Location of areas particularly susceptible to biofouling

(insert a diagram that identifies the locations of areas, or use the below sketch to indicate such areas)

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7 Operation and maintenance of the anti-fouling system

The anti-fouling system(s) used for this vessel is outlined previously in this Plan. This section contains a description of the operation and maintenance of the anti-fouling system(s) used, including schedule(s) of activities and operational procedures.

7.1 Timing of operational and maintenance activities

For this vessel, the schedule of planned inspections, repairs, maintenance and renewal of the anti-fouling system(s) are the following:

Xxx

Xxx

7.2 In-water cleaning and maintenance procedures

This section should set out planned maintenance procedures (other than for on board treatment processes) that need to be completed between dry-docking events to minimize biofouling. This should include routine cleaning or other treatments. Details should be provided on the treatment/cleaning to be conducted, the specification of any equipment required, details of the areas to which each specific treatment/cleaning is to be applied, step-by-step operational procedures where relevant and any other details relevant to the processes (e.g., chemicals required for treatment, any discharge standards).

Xxx

Xxx

7.3 Operation of onboard treatment processes

This section should provide specific advice about Marine Growth Prevention System (MGPS) fitted, internal seawater cooling systems covered by the system and any not covered, and the associated maintenance and inspection schedule and procedures. This would include information such as when each MGPS is run, for how long and any cleaning/maintenance requirements of the system once use is finished. This section should also include advice for ship operators on procedures for biofouling management if the MGPS is temporarily out of operation.

Xxx

Xxx

8 Safety procedures for the ship and the crew

This vessel's safety procedures for the ship and the crew are following the manufacturer's recommendation. In general, any work with the anti-fouling systems, inspections and cleaning processes should follow this vessel's safety policy.

Table 7.1 below is a summary of the anti-fouling system(s) present on-board, the risks they pose and simple instructions for the precautions to be taken when working, inspecting and cleaning the anti-fouling system(s).

The safety procedures for the ship and the crew are detailed in the following document provided by the manufacturer of the anti-fouling system(s):

<include reference to the section or page in the maker's manual dealing with safety procedures>

Table 7.1 Risks and precautions concerning the anti-fouling system(s)

Type	Applied / installed where	Manufacturer & product name	System specification	Associated risks	Precautions to be made

9 Disposal of biological waste

If the crew of this vessel is cleaning the vessel from biofouling, the biological waste is taken care of and disposed in accordance with the local requirements that apply.

10 Recording requirements

This vessel is maintaining a Record Book for the details of all inspections and biofouling management measures undertaken on the ship. The recordings include the following:

- 1) Biofouling management measures undertaken after each dry-docking
- 2) When the hull area, fittings, niches and voids below the waterline have been inspected by divers.
- 3) When the hull area, fittings, niches and voids below the waterline have been cleaned by divers.
- 4) When the internal seawater cooling systems have been inspected and cleaned or treated.
- 5) Maintenance and repairs of the MGPS.
- 6) Periods of time when the ship was laid up/inactive for an extended period of time.
- 7) Periods of time when the ship was operating outside its normal operating profile.
- 8) Details of official inspection or review of the ship's biofouling risk.
- 9) Any additional observations and general remarks.

11 Crew training and familiarisation

For this vessel appropriate training is given in the application of biofouling management and treatment procedures, based upon the information contained in this Plan. Training and familiarisation include the following:

- Maintenance of the Record Book.
- Impacts of invasive aquatic species from ships' biofouling.
- Benefits to the ship of managing biofouling and the threats posed by not applying management procedures
- Biofouling management measures and associated safety procedures.
- Relevant health and safety issues.

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Record Book – biofouling management actions

This page is a sample of this vessel's Record Book for biofouling management actions. The page is used for recording details of all inspections and biofouling management measures undertaken on the ship. The records are kept in the vessel's deck office in a ringbinder marked Record Book – Biofouling.

The following activities are applicable for recording:

- 1) After each dry-docking to document hull cleaning and maintenance.
- 2) When the hull area, fittings, niches and voids below the waterline have been inspected by divers.
- 3) When the hull area, fittings, niches and voids below the waterline have been cleaned by divers.
- 4) When the internal seawater cooling systems have been inspected and cleaned or treated.
- 5) Maintenance and repairs of the MGPS.
- 6) Periods of time when the ship was laid up/inactive for an extended period of time.
- 7) Periods of time when the ship was operating outside its normal operating profile.
- 8) Details of official inspection or review of the ship's biofouling risk.
- 9) Any additional observations and general remarks.

Name of ship:

IMO number:

Date	Item (number)	Record of management actions	Signature of officers in charge

Signature of Master:

Appendix 2 Description and illustrative examples of the biofouling allowances in Tables 1 and 2 of the CRMS (to be applied after CRMS comes into force in 2018)

1 Explanation

From the MAFBNZ commissioned research on vessel biofouling, it was demonstrated that, as the amount and coverage of biofouling on a vessel increases, the number of non-indigenous species present also increases (Inglis et al. 2008⁹).

Both slime and goose barnacles are allowed for all vessel types under the thresholds used in the definition of 'clean hull'. Even when cleaned immediately prior to leaving last destination before arrival in New Zealand, vessel hulls will accumulate a slime layer. Goose barnacles are ubiquitous oceanic organisms.

For short-stay vessels a further allowance is included due to the lower likelihood of introductions from vessels staying for a short time. The allowance is restricted to early stage biofouling to minimise the introduction of non-indigenous species.

Barnacles, bryozoans or tubeworms are usually the first organisms to colonise a hull following the formation of a slime layer. Therefore, early stage biofouling tends to be made up of one of these species. The short-stay threshold allows 1% cover of one of these species (or species that appear to be the same) on the hull area, occurring as isolated individuals or small clusters.

On the niche areas a slightly higher threshold is allowed due to the greater susceptibility of these areas to biofouling. For these areas the short-stay threshold is increased to 5% cover of one species (or species that appear to be the same) plus 1% cover of a second species. The 5% cover may occur as either widely spaced individuals or infrequent patchy clusters.

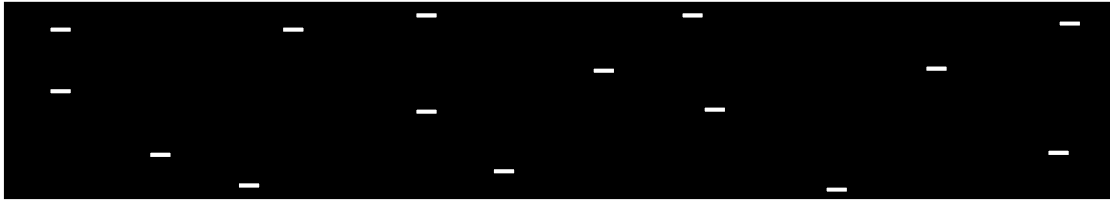
Algae may also be present as early stage biofouling. The amount of coverage for algae on the wind and water line area is unrestricted, however, on the hull and niche areas algal coverage is restricted to continuous patches no more than 50 mm in width. Brown and red algae less than 4 mm in length are allowed on all areas. Green algae less than 4 mm in length are allowed on hull areas and niche areas, however, for the wind and water line area, green algae up to 50 mm strand length are allowed.

Overgrowth of the early stage biofouling by algae is an indication that the biofouling is more established than 'early-stage'. Therefore, no algal overgrowth is permitted on hull areas or niche areas.

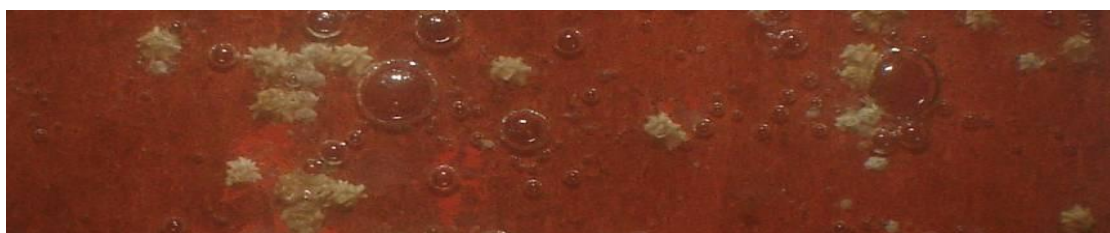
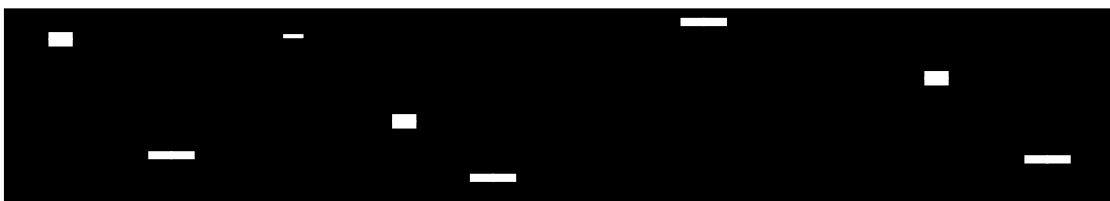
⁹ Inglis, G; Ponder-Sutton, A; Unwin, M; Floerl, O (2008) *Vessel biofouling as a vector for the introduction of non-indigenous marine species to New Zealand: Management Tools*. Final report for MAF Biosecurity New Zealand Research Project

2 Illustrations

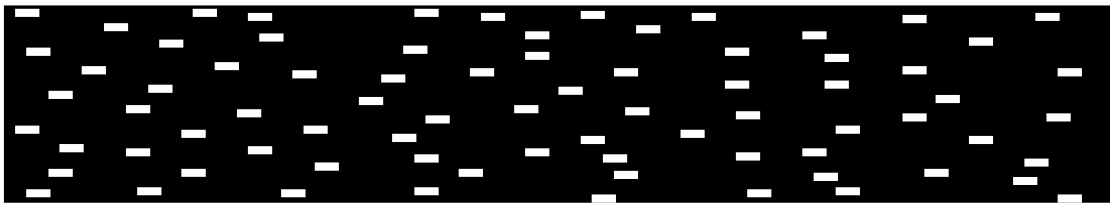
Example of 1% single species biofouling – isolated individuals on hull area



Example of 1% single species biofouling – small clusters on hull area



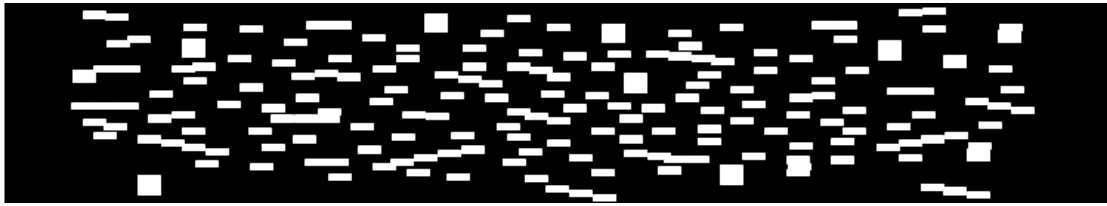
Example of 5% single species – widely spaced individuals in niche areas



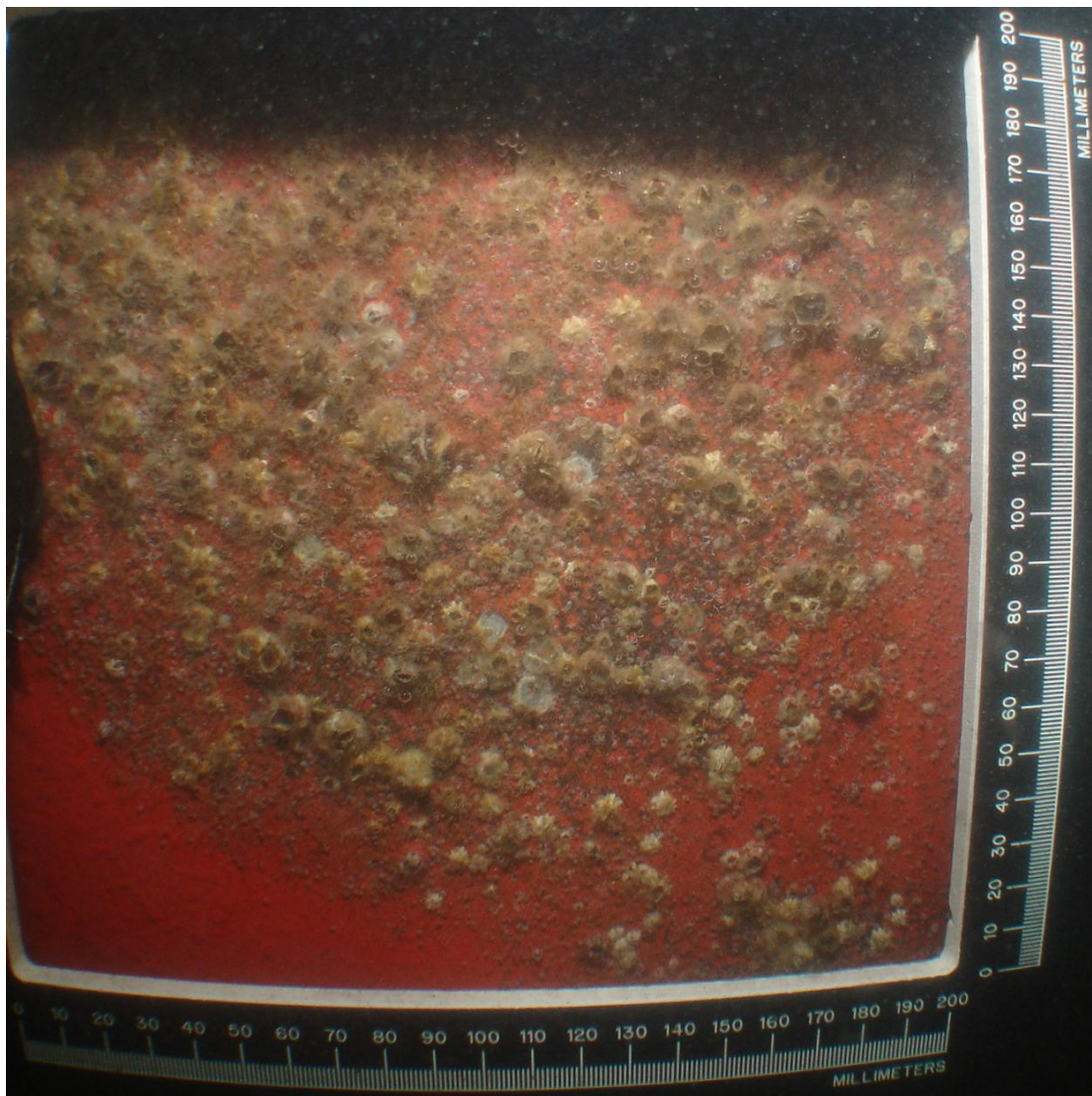
Example of 5% species – infrequent, patchy clusters in niche areas



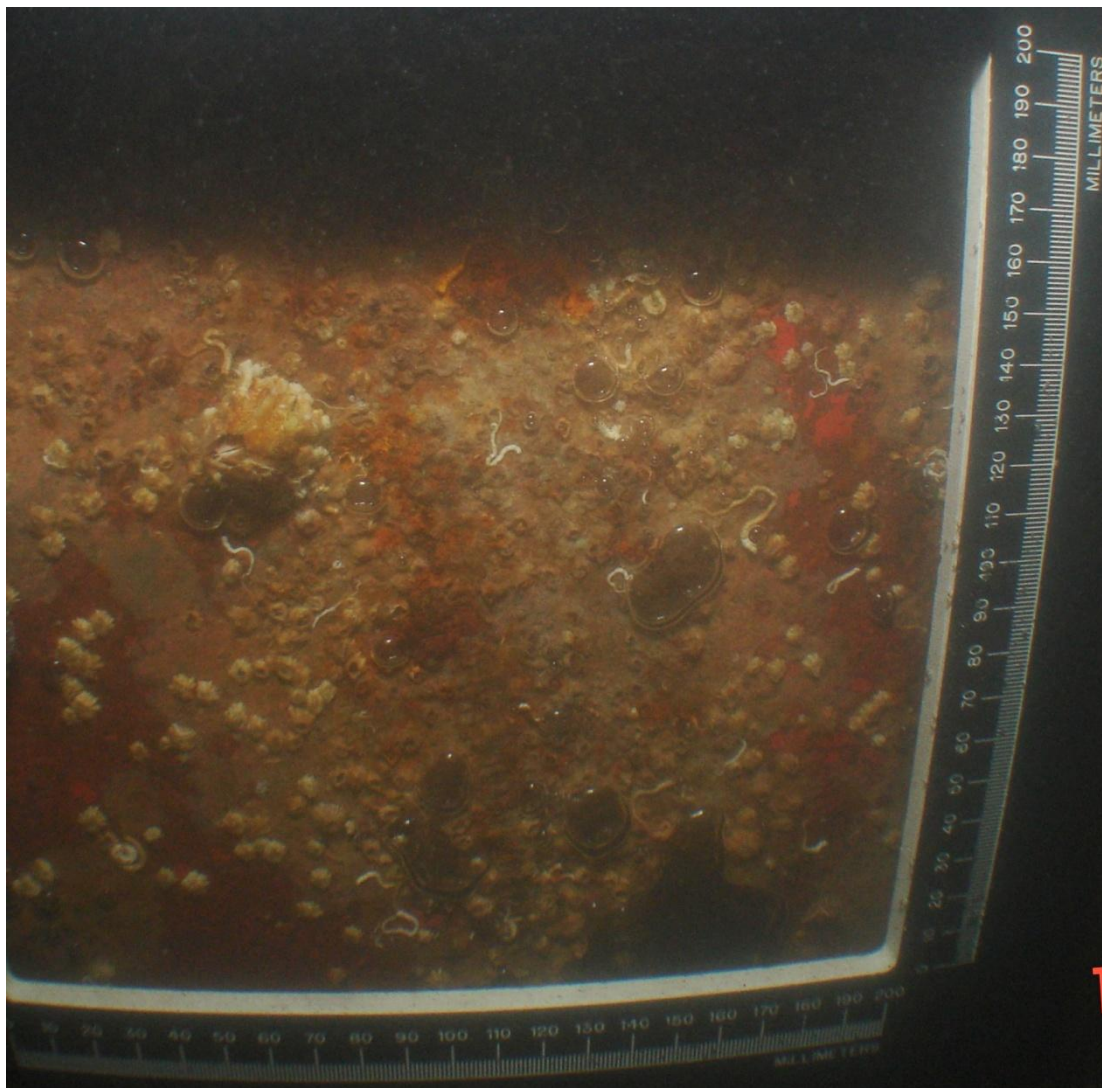
Illustrations of biofouling above thresholds for niches – These would fail inspection



Example of biofouling above thresholds for niches – barnacles cover exceeds 5% through the area. Also there is a patchy 1% cover of algal turf also and 1% cover of bryozoans. This would fail inspection.



Example of biofouling above thresholds for niches – barnacles cover exceeds 5% cover through the area. Also there is a 1% presence of individual tubeworms. This would fail inspection



Appendix 3 Template for a Craft Risk Management Plan

To be developed

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