Managing and controlling the risk posed to the marine environment from biofouling on arriving vessels

MAF Biosecurity New Zealand consultation paper 10/04

ISBN 978-0-478-36330-2

ISSN 1179-5867

May 2010

Ministry of Agriculture and Forestry
Te Manatū Ahuwhenua, Ngāherehere

Disclaimer

Every effort has been made to ensure the information in this document is accurate.

The Ministry of Agriculture and Forestry (MAF) does not accept any responsibility or liability whatsoever for any error of fact, omission, interpretation or opinion that may be present, however it may have occurred.

The proposals in this paper are for consultation purposes and do not necessarily represent agreed Government policy.

Requests for further copies should be directed to:

MAF Biosecurity New Zealand

PO Box 2526

WELLINGTON

Attention: Liz Jones

Or email it to: liz.jones@maf.govt.nz

Table of contents

Managing and controlling the risk posed to the marine environment from biofouling on arriving vessels

MAF Biosecurity New Zealand Consultation Paper May 2010

1. This paper provides information on the risk to New Zealand's environmental, economic, cultural and social values posed by non-indigenous marine species introduced as biofouling, and discusses the need for proposed measures to reduce this risk.
2. The Ministry of Agriculture and Forestry's biosecurity agency, MAF Biosecurity New Zealand (MAFBNZ) would like to hear your views on the assessment of the risks posed by biofouling; the need for proposed measures to reduce this risk; and the enclosed draft Import Health Standard for Vessel Biofouling, pursuant to section 22 (6) of the Biosecurity Act.
3. An Import Health Standard stipulates the specific requirements to be met in order to bring risk goods to New Zealand. In this case, the fouling matter on the submerged surfaces of a vessel is deemed to constitute a risk good.
4. Your response will help MAFBNZ finalise practical border measures for vessel biofouling to minimise the risk of introducing non-indigenous marine species to New Zealand.
5. We value your views and any information that you may be able to provide. Questions are posed throughout this paper to ensure feedback is received on key issues around the assessment and management of the biosecurity risk from vessel biofouling. If you would like to base your submission around these questions, a template for making a submission can be found at: http://www.biosecurity.govt.nz/files/biosec/consult/draft-bnz-std-biofoul-template.pdf
6. You can post a submission to:

   Liz Jones

   Biosecurity Standards

   MAF Biosecurity New Zealand

   PO Box 2526

   WELLINGTON

   Or email it to: standards@maf.govt.nz
7. The closing date for any submissions is close of business 10 June 2010.
8. When responding, please state whether you are providing information as an individual or representing the views of an organisation. If responding on behalf of an organisation, please let us know who the organisation represents.
9. Comments provided on this consultation paper will be subject to the Official Information Act (OIA) 1982. The OIA requires information to be made available unless there is good reason, pursuant to the Act, to withhold the information, and that good reason outweighs the public interest in making the information available. If you want information that you provide to be treated as confidential, please clearly identify the material and why you wish the information to be withheld.
10. This consultation paper is also available on the MAF Biosecurity New Zealand website at: www.biosecurity.govt.nz/biosec/consult/draft-ihs-bnz-std-biofoul

Biofouling background

11. Biofouling is the process where organisms accumulate on any surface that has been immersed in sea water. In the initial stages of the biofouling process, organic material sticks to a surface and is rapidly colonised by bacteria, microalgae and cyanobacteria, forming what's known as a biofilm or colloquially, a slime layer. Biofilms in turn are colonised by macrofouling - multicellular organisms such as macroalgae (where light permits), barnacles, bryozoans and tubeworms, thus creating a more complex fouling cover. Over time, as the physical complexity of macrofouling increases, habitat is created for other organisms, including mobile species, such as, isopods and crabs.

12. Until recently, ballast water was considered the major means of transport of non-indigenous aquatic species. Ongoing species introductions in places such as North America's Laurentian Great Lakes, the Black Sea and the Baltic Sea were the catalyst for the development and implementation of international ballast water regulations. With ballast water management measures in place, the biosecurity risks associated with vessel biofouling have become more apparent.

13. An increasing amount of evidence indicates that vessel biofouling is an important means of transport of non-indigenous marine species. For example, biofouling has been identified as a potential means of transfer for 83 percent of New Zealand's non-indigenous marine species. And more than 65 percent of non-indigenous marine species in the waters of Hawaii (USA), and Port Phillip Bay (Australia) were likely transferred as biofouling. Changes in shipping patterns and volumes have proven to be important factors in the transfer of non-indigenous species via vessel biofouling:

    - Increased shipping volumes from international trade mean there is an increase in the volume of non-indigenous species entering New Zealand;
    - The opening of new trade routes to New Zealand means there is the prospect for biofouling organisms, not previously encountered, to enter and establish in New Zealand;
    - Commercial vessels have become faster, which means that biofouling organisms face shorter periods of time exposed to the stressful conditions that occur during a journey (e.g., shear forces, temperature changes). Shorter periods of environmental stress can lead to increased arrivals of viable non-indigenous species.

Research into biofouling on vessels arriving in New Zealand

14. To better understand and manage vessel biofouling risks in the New Zealand context, MAFBNZ commissioned a multi-year research survey of international vessels arriving in New Zealand. The objectives of the study were to determine the following:

    - Identity (species), origin (native, non-indigenous, unknown) and extent of biofouling occurrence on vessels;
    - Relationship between the presence of non-indigenous species and the amount/extent of biofouling on a vessel; and
    - Factors that influence the presence of non-indigenous species and the amount of biofouling on vessels (e.g., vessel maintenance regime, voyage history).

15. Findings from the MAFBNZ research programme demonstrated that:

- All major vessel types analysed (recreational, passenger, fishing and merchant) are likely to have some associated biofouling;
- Of 187 species identified in the study, over 65 percent were non-indigenous to New Zealand; of these species, 73 percent had not yet established in New Zealand;
- The greater the amount of biofouling on a vessel, the higher the number of non-indigenous species present;
- Biofouling organisms encountered were predominantly arthropods (mostly barnacles), tube-forming marine worms, bryozoans, bivalve molluscs and macroalgae;
- Biofouling organisms generally accumulated in niche areas[1], where biofouling prevention is difficult, or not considered as operationally important by the vessel owner/operator;
- Despite accounting for a relatively small proportion of the hull, niche areas (including sea chests and internal seawater systems) pose a substantial biosecurity risk due to the abundance and diversity of fouling accumulated on them;
- Although most vessels surveyed did carry out biofouling management activities, the large variation in the predictability of fouling occurrence indicates significant variability in the quality of biofouling management;
- The risk factors associated with the presence of non-indigenous species biofouling differ among vessel types:
  - For commercial vessels (merchant, passenger and fishing), the longer the time since last dry-dock, the older the vessel, and the greater the average number of days in port, the more likely that non-indigenous species will be present;
  - For recreational vessels, the greater the average number of days spent in port, the longer the lay-up period, and the longer the dry-dock interval, the more likely that non-indigenous species will be present.

Risk analysis of vessel biofouling

16. These and other findings from the vessel biofouling research programme were used to underpin MAFBNZ's risk analysis of vessel biofouling. A draft of the full risk analysis report can be found at: http://www.biosecurity.govt.nz/files/biosec/consult/draft-bnz-std-biofoul-ra.pdf

17. Key conclusions of the risk analysis are that:

- Twelve broad groups of organisms (including barnacles, bivalves, and sea squirts) present risks to New Zealand's core values[2], and indicate the need for risk management measures;

---

1 Niche areas are places on a vessel's hull where protection from anti-fouling paint degrades quickly, areas that are not coated in anti-fouling paint, and recesses that are protected from the drag created by the boat moving through the water. Niche areas include propellers, rudder shafts, bow thrusters, sea chests and dry-docking support strips.

2 Social, economic, environmental, and cultural well-being.

- A common feature among all of these groups is that they are all macrofouling organisms with the potential to either significantly modify ecosystem structure and function, or to have an economic impact;
- Given the association between vessel biofouling and the introduction of non-indigenous species, the presence of macrofouling organisms is considered a biosecurity risk which needs to be managed.

Impacts of non-indigenous biofouling species

18. Although not all non-indigenous biofouling species will necessarily pose a threat to New Zealand's core values, it is extremely difficult to predict the identity of future invasive species and their impacts. In many international examples of high-impact species introductions, the actual impacts were unexpected, as the species in question had no previous history of invasive behaviour.

19. Worldwide, non-indigenous species have had far-ranging impacts on the marine environment and the people reliant upon it. For example:

- The non-indigenous tubeworm *Ficopomatus enigmaticus* can encrust in high densities on man-made structures. To avoid persistent and heavy fouling of cooling water intakes by this tubeworm, the Otahuhu Power Station (Tamaki Estuary, Auckland) has altered its cooling water intake processes;
- Non-indigenous sea squirts (also known as tunicates or ascidians) have become significant fouling pests of shellfish aquaculture, competing with stock for food and space, and increasing labour and processing costs. New Zealand faces ongoing impacts from non-indigenous sea squirts, including *Didemnum vexillum* which fouls commercial mussel lines in the Marlborough Sounds, costing growers an estimated NZ$2.2 million per year in production losses. In addition, *Eudistoma elongatum* is a conspicuous and unsightly nuisance fouler of beaches and oyster farms in Northland;
- The non-indigenous bryozoan, *Membranipora membranacea,* can form colonies on indigenous kelp fronds, causing them to become brittle and break, reducing the extent of kelp forest habitat;
- Non-indigenous bivalves, such as Asian green mussels (*Perna viridis*), brown mussels (*Perna perna*) and black-striped mussels (*Mytilopsis sallei*), can form dense populations that foul water intakes and maritime structures and can also out-compete aquaculture stock and native species for food and space;
- Commercial fisheries can be affected by flow-on effects from non-indigenous species introductions. The Asian clam *Corbula amurensis*[3], introduced to San Francisco Bay, consumes large amounts of plankton, and has altered the food chain to a point where commercially harvested anchovies no longer occur in local waters. In addition, the introduction of the slipper limpet *Crepidula fornicata*[4] (a gastropod mollusc) to France has been linked with declines of juvenile sole (commercially harvested *Solea solea*) in nursery habitats;

[3] Introductions of this species have occurred via ballast water. Although not currently known as a vessel biofouling species, the environmental impacts of this organism are representative of the potential risks posed by other bivalve species.

[4] Introductions of this species have occurred via the movements of aquaculture stock.

- Introduced macroalgae can cover the seafloor in dense beds, decreasing the aesthetic value of underwater habitats and reducing tourism and scuba diving activities. In the State of Hawaii, the island of Maui contends with a US$20 million yearly loss of tourism revenue due to non-indigenous algae fouling of beaches;
- Recreational fisheries are also vulnerable to non-indigenous species. For example, the introduction of the clam *Ruditapes philippinarum*[3] to Venice, Italy, has been linked to reduced fishing catch rates, and fishers in turn have changed their angling habits.

Marine values at risk from vessel biofouling

20. The ongoing risks posed by vessel biofouling are of immediate concern to MAFBNZ, given that the marine environment is a key part of many of New Zealand's economic, environmental, and social and cultural values. For instance:
    - New Zealand's marine ecosystems and species are highly diverse, and it is estimated that as much as 80 percent of the country's native biodiversity occurs in the sea. Species found only in New Zealand account for 44 percent of our marine biodiversity, a very high number that distinguishes New Zealand as a global marine biodiversity hotspot. This large number of unique species is due to New Zealand's isolation from other landmasses for at least 83 million years, and many species that have evolved in this context are especially vulnerable to introduced organisms;
    - The commercial value of New Zealand's wild and farmed fisheries is $1.2–1.5 billion annually;
    - The majority of New Zealanders live within 50 kilometres of the coastline, and our coastal waters provide a medium for many forms of recreational activities;
    - Māori have a close cultural relationship with the ocean. It is regarded as a tāonga that is integral to their culture and identity. The sea is important to tangata whenua as a source of food, and the mana of hapu and iwi is still closely linked to their ability to provide hospitality to visitors through plentiful kaimoana. The sea is also an important part of Māori spirituality and mythology.
21. New Zealand's coastal environment is more likely to be impacted upon by non-indigenous marine species than the deeper water environment. The New Zealand environment contains a diverse range of habitats from sheltered estuaries and harbours to exposed rocky coasts, and therefore provides a range of suitable habitats for invasive species. Activities that have the potential to introduce non-indigenous marine species are centred on coastal areas (e.g., shipping and boating). In addition, human impacts on the coastal environment (e.g., pollution and sedimentation) can create conditions that favour the establishment of non-indigenous marine species.

Dealing with non-indigenous species in the marine environment

22. In the marine environment, it is often difficult to detect the arrival of new non-indigenous species early enough to make eradication feasible. Tools for detecting, eradicating or managing an established species are limited, difficult to perform, and expensive. For example, in New Zealand the incursion responses to the sea squirt *Styela clava* and the Mediterranean fanworm (*Sabella spallanzanii*) have cost $2.2 million and $1 million, respectively. In Australia, the eradication of the black striped mussel from three marinas in

the Northern Territory cost in excess of $AU2.2 million, and required the use of a biocide to kill all life in the marinas[5].

23. Given the ongoing costs associated with response and control activities, and the irreversible impacts that non-indigenous species can have on New Zealand's core values, preventing the arrival of new non-indigenous marine species is a priority for MAFBNZ. Accordingly, MAFBNZ is proposing that a preventative approach be taken to control and manage the biosecurity risk from biofouling on arriving vessels so that harmful organisms do not arrive, or are intercepted on arrival before they can establish and cause unwanted damage to New Zealand's natural resources.

Question:

Do the ongoing risks posed by vessel biofouling to New Zealand's economic, environmental, and social and cultural values justify MAFBNZ taking a preventative approach to controlling and managing biofouling on arriving vessels?

Other countries' response to the vessel biofouling issue

24. Globally there are currently few requirements or guidelines in place to control the biosecurity risk from biofouling on arriving vessels. This issue is, however, beginning to be addressed:

International Maritime Organisation: Voluntary guidelines are being developed by the Organisation to provide guidance to international shipping and recreational boating on measures that can be taken to minimise the transfer of invasive aquatic species through biofouling. The guidelines are likely to be completed within the next two years. Mandatory measures may follow, depending on the effectiveness of the guidelines.

Australia: Voluntary requirements are in place for recreational vessels arriving in Australia, and best practice guidelines have been published for all vessel types to manage biofouling risks in Australian waters. A risk analysis is underway as a precursor to mandatory requirements for vessels arriving in Australia.

USA: The State of California has passed legislation requiring vessels that visit Californian ports to maintain records of dry-docking, in-water cleaning of the submerged portions of the vessel, and antifouling paint applications. Further, the State Lands Commission is required to develop and adopt regulations governing the management of hull fouling on vessels arriving at Californian ports by January 2012.

Options for New Zealand

25. Three options for managing the biosecurity risk from biofouling on vessels arriving in New Zealand have been considered by MAFBNZ. These are:

- Await an international solution;
- Voluntary measures for arriving vessels;
- Mandatory requirements for arriving vessels.

26. These options were assessed using the following criteria:

5 http://www.nt.gov.au/d/Fisheries/index.cfm?header=Aquatic%20Pest%20Eradications

- Feasibility – is the option feasible and what is the probability of success?
- Resources – what resources, skills and capabilities are required?
- Opportunities/Barriers – are there other opportunities or barriers to success, such as timing or the factors that cause public concern (coercion, equity, fear, etc.)?
- Net benefit – what is the overall net benefit of the option including costs, benefits and their likelihoods?
- Strategic fit – how well does the option fit with the Government's strategies and MAF's Statement of Intent and/or strategies that reflect wider Government strategies?

Await an international solution

27. New Zealand could wait for international regulations to be developed by the International Maritime Organisation to minimise the transfer of invasive aquatic species by international shipping and recreational boating through biofouling. These regulations could then be implemented through New Zealand's domestic legislation. This would result in our measures being consistent with those of other countries that adopt the international regulations, and as such, the measures would be familiar to international vessel owners and operators arriving here.
28. It is, however, far from certain that international regulations will be developed by the International Maritime Organisation. The biofouling guidelines currently being developed by the Organisation are likely to be in force for at least three years before their effectiveness is reviewed to determine if changes are required. This may, or may not include the development of mandatory measures.
29. In the meantime, non-indigenous marine species are likely to arrive in New Zealand at an even greater rate due to the increasing number of visiting vessels of different types, changes in voyage itineraries and/or changes in status of key trading ports. It is also probable that some of these species may pose more serious consequences than those that have arrived to date.

Analysis of option

- This option would be feasible to implement, and the eventual regulation of biofouling on arriving vessels could be expected to successfully mitigate the arrival of non-indigenous marine species in the long term. However, in the meantime, the lack of biofouling measures leaves a major gap in our protection of marine resources, including resources of economic and cultural value to Māori. The key resources required to implement any international regulations will primarily be for carrying out maritime inspections and enforcement. These are capabilities that are currently available within MAFBNZ and other government agencies.
- New Zealand has taken a lead role in addressing the biofouling issue internationally (by placing the issue on the International Maritime Organisation's work programme, and leading the organisation's work on the issue), consistent with a MAFBNZ priority during 2007-2012 to: Lead and seek international support for the management of ballast water and biofouling. By waiting for international regulations to be developed, New Zealand is likely to lose the opportunity to provide other countries with an example to follow in addressing the biofouling issue.

- The overall net benefit of this option is considered to be negative, in that any longer-term benefit is outweighed by uncertainty regarding the adoption of any international regulations by the International Maritime Organisation and consequences in the short- to medium-term due to the ongoing lack of biofouling measures.
- Preventing harmful organisms from crossing New Zealand's borders and establishing is a key biosecurity system outcome that MAFBNZ has responsibility to deliver. The eventual regulation of biofouling on arriving vessels could be expected to meet this outcome in the longer-term, but in the short-to-medium-term this option is unlikely to prevent harmful organisms from arriving or being intercepted before they can establish or cause unwanted damage to marine resources in New Zealand.

Voluntary measures for arriving vessels

30. This option would effectively be an extension of the status quo. For several years, New Zealand has run a small-scale education campaign encouraging arriving recreational vessels to be clean on arrival, or to go to a cleaning facility with appropriate treatment of discharges shortly after arrival. This campaign could be strengthened and its scope extended to other vessel types to encourage the adoption of effective biofouling management practices. It is not, however, anticipated to go as far as the voluntary regime in Australia where a percentage of recreational vessels and some other vessel types are inspected for biofouling and "haul-out" for cleaning is recommended where the fouling is above a set threshold level.
31. For voluntary measures to be effective, vessel operators would need to be motivated and well informed to protect New Zealand's environment from non-indigenous marine species and so take personal responsibility for managing the biofouling risk posed by their vessel. However, other influences or barriers to voluntary compliance, such as the cost of carrying out regular cleaning (particularly where the cleaning does not improve fuel efficiency or reduce gas emissions), may limit the up-take of voluntary measures. Where vessel operators have no desire to comply voluntarily, or have significant (real or perceived) barriers to compliance, it may be difficult to change their behaviour without the use of incentives or consequences. Furthermore, without some form of compliance monitoring, the level of compliance will be unknown, and there can be no certainty that the arrival of non-indigenous marine species is being addressed.

Analysis of option

- This option would be feasible to implement, being an extension of the status quo. More resources than are currently deployed would be needed for a significant communication/marketing programme and on-going outreach activities to improve the up-take of voluntary measures. This would be needed on an ongoing basis.
- While this option would be consistent with the voluntary approach being adopted by the International Maritime Organisation to minimising the transfer of invasive aquatic species through biofouling, it would not provide a "level playing field" for voluntarily complying shipping companies, which may be competitively disadvantaged by the cost of compliance compared with those who choose not to comply.
- The overall net benefit of this option is considered to be negative, given that the level of compliance will be unknown, and the uncertainty that the arrival of non-indigenous marine species is definitely being addressed.

- This option would not be considered to be sufficiently effective in meeting the biosecurity system outcome that harmful organisms are prevented from crossing New Zealand's borders and establishing, especially where compliance costs and barriers limit the up-take of voluntary measures.

Mandatory requirements for arriving vessels

32. Under the Biosecurity Act 1993, mandatory requirements can be put in place for risk goods[6] seeking entry into New Zealand, by way of an Import Health Standard. Under an Import Health Standard for Vessel Biofouling, a vessel owner/operator would be responsible for ensuring an arriving vessel complies with the requirements of the standard.

33. The primary requirement for vessels arriving in New Zealand would be to have a 'clean' hull. Clean meaning no visible aquatic organisms, other than a slime layer. Operators would also need to be able to provide MAFBNZ inspectors with proof and details of the biofouling management actions undertaken.

34. To meet the requirements of the standard, vessels would need to be maintaining their antifouling systems to a high standard, such as in a manner that will be consistent with the guidelines being developed by the International Maritime Organisation. These recommend the installation/application of antifouling systems appropriate to the ship's operating profile, the regular maintenance of these systems, and the keeping of records of biofouling management.

35. A Guidance Document for vessel operators accompanying the Import Health Standard would provide details of the declarations and evidence to be supplied to quarantine inspectors, physical inspection methods, and mitigation measures for various vessel types for those vessels that fail physical inspection (where these have been developed).

36. MAFBNZ accepts that initially any risk mitigation action to deal with biofouling on non-compliant ships (and other large craft) would be limited. For example, it is not currently feasible to dry-dock large ships in New Zealand. However, putting mandatory requirements in place for all vessels to have clean hulls and taking action on those that present a serious biosecurity risk is still a worthwhile move in preventing the arrival of harmful organisms, particularly since the mandatory requirements would encourage preventative measures by ships. The phasing-in of further mitigation actions to deal with ships will depend on the development of new technologies and strategies to deal with biofouling.

Analysis of option

- The enforceable nature of mandatory requirements is likely to result in a more rapid change in behaviour regarding hull maintenance than a voluntary approach. Vessel owners and operators would be aware of the incentives to comply with the standard (in particular, speed of clearance into New Zealand and the consequences of non-compliance) and inspectors would be able to take action on non-compliance following a consistent and transparent process.
- This option creates the "level playing field" required for shipping companies.
- The installation/application of an appropriate antifouling system and necessary hull maintenance to meet the requirement for a 'clean' hull can feasibly be achieved by vessel

6 'Risk goods' under the Biosecurity Act 1993 means organisms or matter containing organisms that may cause unwanted harm to New Zealand resources, and does apply to biofouling

owners and operators. Some vessel owners and operators may, however, incur extra costs associated with more frequent hull and niche area cleaning.

- The resources required to implement an Import Health Standard for Vessel Biofouling will primarily be the quarantine inspection and enforcement capabilities currently available within MAFBNZ. As well, more resources than are currently deployed would be needed at the time the Standard comes into force for an education/communication campaign to notify vessel operators of the changed border rules and activities to ensure up-take of the measures.
- New Zealand has led the development of international measures to address the biofouling issue, and this option provides the opportunity to proactively support these measures, and provide other jurisdictions with an example to follow in addressing the biofouling issue. Australia and California are likely to follow a similar course;
- The overall net benefit of this option is considered to be positive for New Zealand as it would make earlier and more significant progress towards filling the major gap in the biosecurity system's protection for marine resources.
- This option is considered to be the most effective in meeting the biosecurity system outcome that harmful organisms are prevented from crossing New Zealand's borders and establishing. Making a start now with mandatory requirements will close this gap in our biosecurity system at the earliest possible time.

Preferred option for New Zealand

37. The option of implementing mandatory requirements for biofouling on vessels arriving in New Zealand, by way of an Import Health Standard made under the Biosecurity Act, is considered to deliver the highest overall net benefit for New Zealand. The alternative options are not considered to adequately make progress towards the biosecurity system outcome of preventing harmful organisms from crossing New Zealand's borders and establishing in the short-to-medium-term.

38. Implementing an IHS for Vessel Biofouling would enable MAFBNZ to take a preventative approach to the biosecurity risks from biofouling on arriving vessels earlier, and make more significant progress towards filling a major gap in the biosecurity system's protection for marine resources.

Questions:

Three options for managing the biosecurity risk from biofouling on vessels arriving in New Zealand have been considered by MAFBNZ. Are there any other options that could be considered?

The option of implementing mandatory requirements for biofouling on vessels arriving in New Zealand, by way of an Import Health Standard made under the Biosecurity Act, is considered by MAFBNZ to deliver the highest overall net benefit for New Zealand. Do you agree or disagree, and why?

Proposed biofouling management regime

Proposed Import Health Standard for Vessel Biofouling

39. The principal biosecurity requirement of the proposed standard is that the hull of any vessel arriving into New Zealand from 1 October 2010 would be 'clean'. Clean meaning no visible aquatic organisms, except for a slime layer. The draft Import Health Standard for Vessel Biofouling is attached.

40. MAFBNZ expects that vessels operating a best practice hull maintenance regime will meet the proposed standard (i.e., appropriate installation/application and maintenance of an antifouling system that will be adequate to maintain biofouling accumulation to no more than a slime layer).

41. MAFBNZ intends to publish specific guidelines on methods for biofouling management for recreational vessel operators. In the meantime, and for larger commercial shipping, guidance on good practice for hull maintenance is available in the Australian guidelines[7] for various vessel types, and will subsequently be in the International Maritime Organisation guidelines that are being developed.

42. For instance, the International Maritime Organisation guidelines are expected to recommend:

- Regular installation/application of an antifouling system that is suitable for the vessel and its intended voyages/use;
- Installation/application of antifouling systems to be as per technical specifications;
- Maintenance of antifouling systems to be as per any technical specifications;
- The use of specific types of antifouling systems appropriate for the treatment of sea chests and internal seawater systems.

43. The draft Import Health Standard also includes information requirements. To meet these, owners/operators will need to:

- Make a declaration (via a MAFBNZ-approved biofouling declaration form) as to when the vessel was last dry-docked or hauled out, when the antifouling system was applied/installed, and whether there has been any interim cleaning of the hull. Further, the owner/operator should present the recent voyage history of the vessel, including periods of time when the vessel has been laid up/inactive and if any diver inspections have taken place; and
- Be able to provide inspectors with documented evidence of the hull maintenance undertaken – for example log book records, boat yard receipts, survey documentation.

44. The draft International Maritime Organisation guidelines contain a format for the keeping of records of hull maintenance activities. MAFBNZ will encourage the keeping of records in this format.

45. Communication of MAFBNZ guidelines and/or guidelines of other agencies on good biofouling management practice would be an important part of New Zealand's ongoing

7 http://www.marinepests.gov.au/marine_pests/publications

biofouling management regime and would be used to promote the International Maritime Organisation format of record keeping.

46. The format of the draft Import Health Standard provides for more specific requirements to be added to the standard in future. It is envisaged that these requirements would be more stringent than the general requirements discussed above, and might apply to a specific type of vessel or vessels intending to engage in a specific type of activity that warrants a higher level of biosecurity protection.

47. The inclusion of specific requirements in the standard would require a formal amendment of the standard, which would include consultation with interested parties.

48. The proposed biofouling management regime does not include specific penalties, but the offence provisions of the Biosecurity Act 1993 would apply to withholding or giving false information in declarations, interfering with an inspection, and failing to comply with a direction given by an inspector (such as a direction to deal with biofouling as specified by the inspector). It is also expected that possible delays and disruption of schedules resulting from any need to take action due to non-compliance with the standard will act as an incentive for compliance.

49. MAFBNZ also intends to include incentives for biofouling compliance under the new vessel clearance regime. Under this new regime, a regularly visiting vessel that is deemed to be well maintained and operating under good practice (based on all biosecurity risks posed by the vessel, including biofouling) can be awarded 'inspection dispensation'. This means that for future visits the vessel would receive a 'green light' from MAFBNZ through the border clearance while this inspection status is retained. Such vessels will be subject to random audits to confirm their compliance status.

Questions:

Do you agree with the basic premise of the proposed controls?

Is it feasible for a vessel to maintain a clean hull (as defined) by using appropriate antifouling management practices? If not, what should the standard be?

Are the proposed information requirements reasonable for all vessel types?

Implementing the standard – Verification of compliance with the standard and measures for vessels with non-compliant biofouling

50. A guidance document for vessel operators is to accompany the Import Health Standard to provide details of the declarations and evidence to be supplied to MAFBNZ inspectors, physical hull inspections, and mitigation measures for vessels of various types that fail inspection (where these have been developed). See attached draft Guidance Document and Annex on recreational vessels.

51. The first step in the border clearance process with respect to biofouling on vessels is expected to consist of an assessment of each arriving vessel's biofouling risk, based on information provided in the declaration on biofouling. This will be followed by a physical inspection of vessels as deemed necessary. A physical inspection to determine the nature of the fouling may include: inspection from the surface, use of a submersible camera, the deployment of divers, or haul-out for inspection. It is not considered practical to physically inspect the hull of every arriving vessel.

52. Where it can be shown that a vessel has been or is using an appropriate antifouling system and adequate accompanying maintenance practices (such as those included in guidelines), it is likely the vessel would not be considered as requiring physical inspection. Where a physical inspection is not required, a vessel would normally receive border clearance for its biofouling on arrival.

53. Where an inspector is not satisfied that the biofouling on the vessel is compliant following physical inspection, they will take appropriate action which may include directing[8] the vessel owner/operator to undertake a management action, such as, operational restrictions, containment or isolation of the hull and/or a direction to an approved treatment facility and/or process or direction regarding movements of the vessel.

54. It is proposed that an inspector would direct non-compliant recreational vessels to be treated at a MAFBNZ approved Transitional Facility for Hull Cleaning as soon as practicable (or possibly within a defined time, such as 24 hours). This will be a haul-out or boat yard that has been approved based on their biosecure capability, including the filtering, capture and disposal of all fouling material removed (both solids and wastewater).

55. For all other non-compliant vessels, further quarantine intervention, at the vessel owner's expense, would be decided on a case by case basis. Non-compliant vessels may be directed by an inspector to be managed in a manner appropriate to the level of biofouling and/or the species present. Such management measures would be developed in liaison with the operator/owner and would take into account factors such as feasibility and business impacts.

56. For all vessels, management measures may involve any of the following (where feasible):

    - Direction to be decontaminated by an approved method in a MAFBNZ approved Transitional Facility for Hull Cleaning;
    - Prohibition to enter territorial sea[9];
    - Direction to leave New Zealand's jurisdiction within a specified time;
    - Direction to not enter a specified area of New Zealand.

57. The options for quarantine intervention to deal with non-compliant ships regarding their biofouling are currently limited. However for those that are regular visitors, inspectors could be expected to take an escalating approach where there is unsatisfactory improvement in the ship's biofouling management regime. Non-compliant ships could initially receive education on hull maintenance, with measures escalating through to the removal of 'inspection dispensation' (where applicable) and those management measures previously discussed.

Special inspection and treatment processes

58. Further special inspection and treatment processes are expected to be phased-in over time for specific vessel types or vessels intending to engage in a specific type of activity. The following vessel types are likely to be considered for special inspection and treatment processes in the near future:

8 Under section 33 of the Biosecurity Act, an inspector may direct the master of a vessel that has risk goods (i.e. biofouling) on board to deal with it in a specified manner, to destroy it, or to move the vessel outside New Zealand waters.

9 Under section 25 of the Biosecurity Act, no risk goods may be imported without the permission of an inspector. Where a vessel has been inspected offshore and failed inspection, it could be prohibited from entering New Zealand waters.

- Vessels arriving to stay permanently or for more than a number of months in New Zealand. These will have similar requirements to recreational vessels.
- Vessels (such as small eco-cruise ships) arriving to visit areas with high values (e.g., areas with special protection status such as the Sub Antarctic Islands) and often staying for extended periods in the New Zealand waters.
- Vessels (such as large cruise ships) arriving to visit specified places in addition to designated ports. These often visit Fiordland (limited to a specific route), Opua, and other areas with high to medium values.
- Slow moving vessels, such as, barges and rigs. These types of vessels are not usually maintained to the same standard as international cargo ships and can accumulate extensive biofouling, which can remain intact during their slow voyages to New Zealand. Ideally, these types of vessels should be prepared before deployment to New Zealand waters, preferably by dry-docking and complete removal of biofouling from hulls, pontoons, but may require development and approval of a specific risk mitigation plan if dry docking is not feasible.

59. In developing further special inspection and treatment processes, 'fit for purpose' measures would be explored with the relevant parties. Such measures may include:
    - Inspection and cleaning by accredited providers overseas prior to departure for New Zealand;
    - Using enclosures and dosing with chemicals to kill the biofouling organisms;
    - Haul out, air drying, and removal of biofouling layer on board a heavy-lift vessel;
    - Biofouling inspection by divers with a risk assessment of identified species.
60. Further special inspection and treatment processes would be put in place as a new annex to the Guidance Document that accompanies the Import Health Standard and would be developed with input from the relevant stakeholders.

Equivalence

61. Where a vessel cannot comply with the requirement to have a clean hull, or it has failed inspection on arrival and the owner/operator is unable to carry out the directed hull treatment, there is an option to achieve the outcome sought by the Import Health Standard (i.e., that the likelihood of risk organisms being introduced as biofouling into New Zealand's territorial waters is minimised) by an equivalent method. Any person or organisation could request MAFBNZ to approve a method, system or process provided that it can be shown to achieve the biosecurity requirements of the standard. An alternative method, system or process, would need to be approved by MAFBNZ prior to being used.

Questions:

A method of identifying risk vessels based on their antifouling system, maintenance history, and voyage history is proposed. Do you have any suggestions for a better way of identifying which vessels are likely to be carrying risk biofouling organisms?

Is it, in fact, impractical to physically inspect all vessels for biofouling? Please comment on how this could be done? Or other technology or systems you are aware of/know about?

Currently there are no methods for dealing with ships (and larger vessels) that fail to comply with a clean hull, other than directing them to leave New Zealand in as short a time as possible. Can you suggest other possible options for dealing with fouled ships?

A phased approach is proposed to introducing special inspection and treatment processes. Do you agree with this proposal?

Are there any practical problems with the proposal for recreational vessels arriving with risk biofouling to be hauled out within 24 hours and cleaned in a facility that has been approved by MAFBNZ as a Transitional Facility for Hull Cleaning?

Are there any additional implications for the shipping and boating sectors generally with the proposed biofouling controls that need to be taken into account?