

8 October 2019

Marlborough District Council

E-mail: Peter.Johnson@marlborough.govt.nz

Attention: Peter Johnson,  
Senior Resource Management Officer

#### **U190483 – NZ King Salmon Co Ltd – Further Information**

1. We refer to your request for further information dated 23 August 2019. We provide our response to your questions below, by reproducing your questions and answering each in turn.
2. You will see there are cross-references to information which is **enclosed** (i.e. attached to the email within which this letter is also attached) and **attached** in the appendices to this letter.

#### *Request for a Pre-Hearing Meeting*

3. The applicant requests the Council arrange a pre-hearing meeting, in accordance with s99 of the RMA. Section 99 provides the Council with a discretion to arrange a pre-hearing meeting. That could invite the attendance of the applicant and some or all of the submitters on the application. Section 99(2)(a) states that Council may invite attendance at a pre-hearing meeting at the request of one of more of the persons involved (i.e. the applicant and submitter(s)).
4. NZ King Salmon considers a pre-hearing meeting would be a constructive way to discuss its application with any submitters who would wish to be involved in that process. NZ King Salmon is aware of the volume of material which makes up its application and understands it may be beneficial for that material to be provided in succinct form at a pre-hearing meeting. NZ King Salmon is promoting a transparent information-sharing process as it wants to ensure the public understand the aspects of its application.
5. We consider that on the basis of public notification occurring around the end of next week (11 October 2019), the period for submissions would end in early November. On that basis, a pre-hearing meeting at the end of November or early December seems realistic.
6. In terms of possible dates, please note that we are out of the region the week of 9 December, and have the NZ King Salmon Waitata pens extension hearing from 26 to 27 November. Perhaps somewhere in the week beginning 16 December may be suitable?

#### *Continuing Consultation*

7. NZ King Salmon is committed to continuing consultation and meetings in the interim.
8. As part of the application, NZ King Salmon has supplied a comprehensive set of results from models designed to conservatively identify the effects of the application. As a result of discussions a further set of models is being commissioned. That modelling information will be used for purposes such as to identify the locations where monitoring will be undertaken

to assess the effects of the application. It is hoped that that information will be available to be provided at the pre-hearing meeting.

9. Furthermore, the conditions of consent rely on Management Plans. Those Management Plans are in the process of being drafted. The applicant anticipates being able to supply draft versions of the Management Plans at the pre-hearing meeting.
10. Please contact us if you require any clarification.

Yours faithfully  
**GASCOIGNE WICKS**



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## Assessment of Environmental Effects

*Question 1: Page 5 – Please provide a large scale plan drawing of the proposed Stage 1 structures (I'd suggest 1:4000 at A3 size). [See also item 20 below.]*

1. The exact structures have not yet been confirmed, and flexibility is sought so as to not limit NZ King Salmon to a particular type of structure, for reasons discussed in our response to Question 5 below.
2. However, we **enclose** an A0 size plan: Aqualine NZKS Grid Mooring 2 x 4 Planned Mooring System R01 (5 May 2019) showing the likely structures at Stage 1 based on current knowledge.

*Question 2: Page 6 – Please provide a plan drawing (I'd suggest 1:25,000 at A3 size) of the proposed structure location/s with respect to the green-grey coloured area referred to at the top of page 6. [See also item 20 below.]*

3. The “green-grey coloured area” was a reference to the site location overlaid with the Cawthron benthic habitat diagram, and Ecologically Significant Marine Sites and the Whale overlay Map from the proposed Marlborough Environment Plan (**enclosed** at **Appendix 2** to this response). This was inadvertently omitted from the application and should have formed part of Appendix A.
4. We have commissioned Russell Silcock of Draughting Plus to overlay OCEL’s site plan SK-051103-517 rev 1 with the “green-grey” plan. This overlaid plan is **enclosed**. This overlaid plan shows where the structures are currently proposed in relation to the “green-grey coloured area”, however please see our response to Question 4 below regarding the horse mussel beds.

*Question 3: Page 6 – Please clarify the maximum extent of development that resource consent is sought for in the current application. The AEE states that the current projection is that discharge of up to 40,000 tonnes is possible, whereas the landscape report identifies up to 4 stages totalling 80,000 tonnes.*

5. The consent conditions will define a framework within which NZ King Salmon will operate a sustainable salmon farm. A farm which is being operated within that framework ought to give everyone comfort.
6. The staged development is merely a further layer of comfort. NZ King Salmon’s experience is that where it specifies a maximum discharge of feed, this then becomes the focus. This is something which NZ King Salmon is keen to avoid as the focus should be on sustainability of the activity, which will be determined through operations and monitoring to ascertain the site’s capacity for this activity before environmental effects become unacceptable.
7. What also needs to be borne in mind is that NZ King Salmon’s operation needs to be balanced. The farm needs to be supplied with smolt from a hatchery. It needs to produce fish which is complimentary to production at its other sites. It needs to process that fish. In short, production at this site needs to be in step with the entire operation. As a consequence it will be some years before NZ King Salmon is contemplating moving to stage 2.
8. Consequently, the answer to your question is that NZ King Salmon does not intend to develop the site in an unsustainable manner. That in turn is defined in the various reports

submitted together with the application and those reports have been translated into a set of conditions. Those conditions are being further improved.

9. The maximum amount of feed which has been modelled/assessed in terms of the benthic, water column and landscape reports<sup>1</sup> is 80,000 tonnes (which equates to 40,000 tonnes of production). That is aspirational only, with current projections suggesting that 40,000t of feed is possible at this site. To clarify, 80,000 tonnes of feed was one of the models used by the scientists to gauge the potential effect of salmon farming on the site. That scenario is exaggerated because:
  - a. It uses 2,000 tonnes of feed per pen rather than 1,000 tonnes of feed per pen (which is likely to be how NZ King Salmon implements the consent); and
  - b. The footprint of each group of pens overlaps with other groups. Such a scenario will not occur in practice.
10. Despite that, the modelling results demonstrate that the maximum intensity of deposition on the seabed is less than that experienced at NZ King Salmon's inshore sites.
11. We reiterate that Stage 1 is to discharge up to 20,000t of feed, over two farms. This further shows the conservative initial phases of this development. We also reiterate that there is a process that is proposed to be required before progressing the farm operations<sup>2</sup>. The AEE summarises the approach as follows:<sup>3</sup>

Six months prior to additional feed going in the water, NZ King Salmon will need to update all of its scientific and technical reports with any new information gathered through monitoring and through other means. At the same time as those reports are rewritten, the Management Plans would be formally updated where appropriate to reflect whatever recommendations were made in those reports. All of that material would be provided to Council six months prior to any increase in feed discharge beyond 20,000 tonnes. Each time NZ King Salmon intends to increase the feed discharge by 20,000 tonnes, it would need to repeat this process. NZ King Salmon's current projection is that discharge at this site of up to 40,000 tonnes is possible.
12. That is reflected in proposed conditions 73 to 79 in the application.

*Question 4: Page 8 – please clarify on a map the whereabouts of any proposed structure exclusion areas. I ask this because the benthic report recommends that anchors are not installed in any horse mussel or brachiopod habitat. [See also item 20 below.]*

13. NZ King Salmon is not proposing any structure exclusion areas.
14. At Stage 1 the pens will be installed over sand and shell hash habitat, i.e. not over the biogenic habitat<sup>4</sup>. It may be possible for farming in subsequent stages to occur over the horse mussel or brachiopod habitat. The AEE explains that this might be because:<sup>5</sup>
  - a. There is a change in distribution of horse mussels and brachiopods caused by reasons unrelated to farming (for example due to natural cyclical changes, or commercial fishing); or

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<sup>1</sup> Marine mammals, seabirds, pelagic fish, biosecurity and navigation reports were not discharge level specific.

<sup>2</sup> Refer to conditions 73 to 79 at Appendix B of the application, and the AEE at p 6.

<sup>3</sup> AEE at p 6.

<sup>4</sup> As per the overlaid plan in **Appendix 1** of this document, as discussed above in our response to Question 1.

<sup>5</sup> AEE at p 6.

- b. It may be through the monitoring undertaken by NZ King Salmon that it is established that, in this location given these currents it can sustainably farm over horse mussels without having a significant adverse effect; or
  - c. Further extensive areas of horse mussels are discovered in North Marlborough more generally; or
  - d. A policy decision is made that such farming might be appropriate and consequently, the constraint placed around the initial location of the pens will not apply to subsequent positioning.
15. We can justify not imposing a structures exclusion zone *now* because:<sup>6</sup>
- a. Significant effects will be avoided (in terms of NZCPS policy 11(b)); and
  - b. Horse mussels are a commercially fished species. Even though we must consider the effects of salmon farming cumulatively with other effects, the farm may in fact provide some degree of protection, particularly from trawling.
  - c. The spatial distribution of horse mussels is not static.
  - d. Horse mussels and other sensitive habitat are present adjacent to NZ King Salmon's existing farm at Te Pangu. Those horse mussels will have been recruited into the area after the farm was present.<sup>7</sup>
16. Effects on horse mussels will be addressed through the Management Plans. It is not appropriate to take an exclusion approach, but it is appropriate to take a management approach which will occur with the Management Plans.

*Question 5: Page 8 – Please provide the maximum proposed dimensions (including height above water) of the likely and alternative farm structures and related anchoring systems that you seek consent for. While I acknowledge the intention to follow the Hudson Associates design guide, that guide appears to indicate preferences rather than provide a strict design envelope with dimensions.*

- 17. As referred to in our response to Question 1 above, the exact structures which will be used on the site have not yet been chosen. This is because NZ King Salmon is investigating the best possible structures for this site and engineering requirements. Another important reason for retaining flexibility in terms of structures is because of the pace of change internationally<sup>8</sup>. What is not viable now may be viable in 2020. NZ King Salmon needs the ability to apply learnings from overseas developments. For this reason trialling of new structures may occur at the site, hence the 1,792 hectares site sought, to explore various options. Another important reason for the size of the site is to allow separated farms to be installed and monitored, with that space being necessary for biosecurity reasons<sup>9</sup>.
- 18. Technological improvements may have environmental as well as operational benefits, for example a structure may be developed which would feature better ways to minimise seabird interactions with farm structures.
- 19. However, we consider the maximum possible dimensions below as we see them now, based on the largest structure type being considered by NZ King Salmon and based on current knowledge.

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<sup>6</sup> Refer AEE at pp 11 – 13.

<sup>7</sup> Horse mussels are known to survive up to 15 years. The farm has been present for longer than 15 years.

<sup>8</sup> As alluded to in the AEE at p 8.

<sup>9</sup> Refer to Biosecurity Report at 6. For example, to reduce the risk of transfer of any pest between farms.

20. From the various structures available at present, the Havfarm design has the largest dimensions. This structure would either be a maximum of 385 metres long by 59.5 metres wide, or 430 metres long by 54 metres wide. The height would be approximately 70 metres, but note this includes total height of the structure, of which most will be underwater. We estimate that approximately 20 metres would be above the water surface. This is the largest structure being considered by NZ King Salmon.
21. Another option is for the Ocean Farm 1 circular structure. This measures 68 metres in height, and has a diameter of 160 metres. Again, some of the structure would be underwater. We estimate that, while in normal production, about 25 metres would be above the water surface.
22. However, it is almost certain that the structures chosen will be circular structures, similar to the Huon Fortress Pen design shown in Appendix C of the application. Those structures vary in possible dimensions, from a circumference of 120 metres up to a circumference of 240 metres. The application<sup>10</sup> considers the likely structures for Stage 1, as being up to eight plastic circles of 200 metre circumference each per farm block, so totalling 16 plastic circles of 200 metres circumference on the 1,792 hectare site. There will also be two barges.
23. In terms of the barge dimensions, these are likely to be similar to the AKVA design built by Southern Ocean Solutions in Tasmania, Australia (AC 800 PV)<sup>11</sup>. This barge can be either 39.2 metres long by 12 metres wide, or 65.5 metres long by 12 metres wide (these are two similar designs (model AC 600PV and model AC 800PV), one has two bows and the other only one, hence those slight differences in dimensions of the two). The height will be approximately 12 to 13 metres for both designs (allowing for aerial, etc.).
24. The AEE discusses this<sup>12</sup> and the structures are to be chosen in accordance with the Design Guide contained in the Landscape Report<sup>13</sup>.
25. In terms of the anchoring systems, screw anchors might be used for plastic circle pens. Assuming the layout shown in OCEL diagram SK-051103-517 Rev:1, included at Appendix A to the application, there would be 36 anchors per block of pens, with 70 anchors total at the site. Each anchor will disturb approximately 2m<sup>2</sup> of seabed, or 144m<sup>2</sup> in total across the site. Another alternative is 1.7 metric tonne Danforth anchors and ground chain. A similar area of disturbances would occur if an alternative farming system was used. Ultimately the anchoring system will depend on the chosen structures and engineering advice.

*Question 6: Page 8 – Please specify the maximum surface area of net pen and related structures for which consent is sought at each stage of development up to and including the maximum extent of development.*

26. The surface area of the plastic circle structures (based on 20 on site and a 32m radius (200m circumference)) is 6.43 hectares total on the site at Stage 1. We have rounded that up to 8 hectares to allow for a slightly larger pen size.
27. For completeness (and by way of comparison):
  - a. The surface area of the Havfarm structure is 2.322 hectares per farm on the basis of one at the site (at its largest size based on current known dimensions). The site

<sup>10</sup> AEE, from page 5

<sup>11</sup> As referred to in the Landscape report at p 60.

<sup>12</sup> AEE, from page 5 to 8.

<sup>13</sup> At Appendix M of application.

- would fit two Havfarms, both with a substantial swing circle of at least its own length (up to 430m).
- b. The surface area of the Ocean Farm 1 structure (based on one 160m diameter structure at the site) is 2 hectares. Stage 1 would allow for up to two of these farms.
  - 28. Based on present information, the barges (based on the larger option, with two on site at Stage 1) are likely to be approximately 0.16 hectares in surface area (or 0.081 hectares per barge).
  - 29. Based on proposed condition 73, the maximum number of net pens is 20, with a maximum surface area of 8 hectares for Stage 1. Increases beyond Stage 1 must not be in increments greater than 20,000 tonnes of feed discharge per annum, with the maximum number of pens and maximum surface area of net pens to be increased pro rata from 8 hectares (refer proposed condition 74).
  - 30. NZ King Salmon suggests that the most appropriate way to manage this via conditions is a maximum height and net pen surface structures area, allowing for a margin of error to account for new technology in the future.<sup>14</sup>

*Question 7: Page 8 – Please specify the maximum number and maximum dimensions of the barges proposed at the site at each stage of development up to and including the maximum extent of development.*

- 31. As above, flexibility is sought in terms of the exact structures for the site, though the above response to question 5 is considered to provide an indication of the ‘worst case scenario’ in terms of the estimated maximum dimensions for structures on the site based on current technology.
- 32. There will be one stationary barge per farm on the site (i.e. two barges total on the site at Stage 1). The maximum dimensions are 65.5 metres by 12 metres, and a height of approximately 12 to 13 metres.
- 33. We note that John Hudson states that barges should have a maritime aesthetic.<sup>15</sup>

*Question 8: Page 8 – Please provide a description of the number and position(s) in the water column of the proposed underwater lights, and what amount of resulting light is likely to be visible at the water’s surface above each net pen.*

- 34. This is entirely dependent on the nature of the exact structures installed at the site. However, it is likely that nine lights per net pen will be appropriate.
- 35. Proposed condition 12 in the application provides that: “The consent holder shall ensure that the submerged artificial lighting set up in each net pen will not be comprised of any more than the luminance of nine 1000W metal halide equivalent underwater lights.”
- 36. Boffa Miskell undertook an assessment of the visual effects of night lighting of the Clay Point farm as part of the Board of Inquiry process. Those night-lighting photographs are available

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<sup>14</sup> Having said that, it's not appropriate to assume that the worst case. For example, just because up to 15% site coverage (MEP standard 3.2.1.11) is a permitted activity, with maximum building height of 10 metres (MEP standard 3.2.1.2) in a rural zone on a 1,000 ha lot, we don't assume the construction of a 150ha, 10 metre high barn.

<sup>15</sup> Landscape Report at [40].

on the EPA website.<sup>16</sup> The night-lighting at this site would be the equivalent or less than that night-lighting.

*Question 9: Page 8 – please describe what the proposed net cleaning devices comprise and what, if any, importance they have to an assessment of the effects of the proposal.*

37. This is mentioned in the Operations Report provided at Appendix Q of the lodged application<sup>17</sup>. The system NZ King Salmon uses at its existing farms comprises remotely operated high-pressure water jets to remove fouling from the nets and equipment. A similar system will be used at this site.
38. Cawthron has considered the effects of fouling organism drop-off onto the seabed from net cleaning in the benthic report.<sup>18</sup> Effects are unlikely to differ to any material extent between devices.
39. The biosecurity report refers to transfer of cleaning equipment between the farms (if relevant), and the benefits of cleaning on site, to ensure biofouling and sediment are released within the permitted area (i.e. the consented farm), and to help prevent the transfer of species between areas.<sup>19</sup>
40. The biosecurity report says that “some level of general biofouling control will be required” on the farms<sup>20</sup>. The overall effect is to remove fouling organisms from the farm that could prevent water flow and add unnecessary weight and drag on the structures. Removal of biofouling also reduces the risk of pests.
41. NZ King Salmon has internally updated aspects of its Operations Report since 2016, although a formal amended version has not yet been published. The relevant section of the Operations Report, with changes since 2016 shown in mark-up, provides<sup>21</sup>:

*“...regular net cleaning is a critical and significant part of New Zealand King Salmon’s operations.*

*The grower nets are not treated with antifouling products so need to be cleaned approximately once a month week, especially during the summer months.  
[...]*

*NZ King Salmon has developed an automated net cleaner and uses off the shelf remotely controlled equipment which cleans the grower nets in the water (in-situ). These cleaners use high pressure water directed through rotating discs. The ‘head’ which contains the discs slides up and down the sides of the net and blasts off the fouling organisms. The cleaning heads of the remotely controlled machines are controlled using feedback gained from in-water cameras. Not only is the in situ cleaning much quicker, it also reduces farm noise by minimising the use of water blasting equipment. In situ net cleaning is carried out with fish in the net pen.*

42. It is most likely that in situ net cleaning devices will be incorporated into the operations at this site. Predator nets will be cleaned in the same way as grower nets, at a similar

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<sup>16</sup> <https://www.epa.govt.nz/assets/FileAPI/proposal/NSP00002/Evidence/0dca21169d/Night-lighting-Photographs.pdf>

<sup>17</sup> Page 31 of the New Zealand King Salmon Operations Report (2016).

<sup>18</sup> Cawthron Benthic Report No. 3317 at Table 2, p 41.

<sup>19</sup> Cawthron Biosecurity Report No. 3222 at p 25.

<sup>20</sup> Cawthron Biosecurity Report No. 3222 at p 25.

<sup>21</sup> Page 31 of the New Zealand King Salmon Operations Report (2016).

frequency as dictated by the level of biofouling.

*Question 10: Page 9 – please clarify the area of exclusive occupation which is sought “to the extent necessary to undertake the activity and ensure the safety and security of the marine farm, all its structures, and staff working on the farm.” In this regard I note that a marine traffic exclusion area within the buoyed area has been recommended by OCEL in Appendix R. [See also item 20 below.]*

- 43. The conditions as drafted are consistent with NZ King Salmon’s existing conditions for its inshore sites. NZ King Salmon would prefer the same approach to be taken between its inshore and offshore sites.
- 44. The obvious difference between inshore and offshore sites is the amount of sea room available to navigate in. While navigation in close quarters with NZ King Salmon’s existing sites is inevitable in the Sounds, it is more a matter of choice in the open ocean.
- 45. NZ King Salmon’s current view is that the condition<sup>22</sup> as drafted is appropriate for occupation under the Resource Management Act. Whether Maritime New Zealand or the Harbour Master issues a direction under the Maritime Transport Act or other legislation is a matter for the relevant regulatory agency. The Navigational Risk Reduction Management Plan and the Structures Management Plan will include details specific to the structures that are installed on the site. Those Plans may assist Maritime New Zealand and the Harbour Master.
- 46. Below in our response to Question 12 we consider occupation in detail.

*Question 11: Related to 10 above, please clarify whether or not a fishing exclusion area (temporary or permanent) is proposed to be implemented around the proposed farm structures, and if so please provide a map showing such areas. [See also item 20 below.] I ask this because a) it is unclear whether fishing would “unreasonably interfere” with the operation or safety (eg. anchoring systems) of the farm, and b) the pelagic fish report seems to indicate a fishing exclusion area as a potential tool for studying and/or managing effects of the farm on wild fish stocks.*

- 47. We reiterate what is said above in our answer to question 10, in that NZ King Salmon is not seeking a vessel/fishing exclusion zone of any kind as part of this application. NZ King Salmon suggests that an advice note could be included in the consent to the effect that whilst an exclusion zone is not sought as part of this application, something to that effect could be imposed by the Harbour Master under the Maritime Transport Act, for example.
- 48. Provided that fishing does not damage or interfere with the mooring or safety systems, or does not unreasonably interfere with the operations of the farm, NZ King Salmon is of the view that it should not be impeded.

*Question 12: Please explain how the area and shape of the 1791 hectare farm site applied for is reasonably necessary for the operation of the proposed farm at its maximum extent of development, given that the RMA definition of occupy means “the activity of occupying any part of the coastal marine area where the occupation is reasonably necessary for another activity...”.*

- 49. We respond to this question in two parts. First, we outline for clarity the occupation NZ King Salmon seeks, and then we explain why this is reasonable considering the statutory context.

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<sup>22</sup> Condition 3 of the proposed conditions lodged with the application.

### What NZ King Salmon Seeks

50. The occupation NZ King Salmon seeks is physical occupation only to the extent of the physical space the structures will occupy, and legal occupation in the sense of seeking exclusive occupation of the 1,792 hectare site only to the extent reasonably necessary for the farms to be operated, i.e. for the activity for which consent is sought to be able to occur.
51. NZ King Salmon seeks exclusive occupation to the extent necessary as part of this application, per rule 35.4.2.7 of the MSRMP<sup>23</sup>.
52. The application states, for example<sup>24</sup>:
 

*"Exclusive occupation is sought for the physical space occupied by the surface structures (including any barge), the moorings and any anchoring systems. In addition, consent is sought to exclusively occupy the consent area, though only to the extent necessary to undertake the activity and ensure the safety and security of the marine farm, all its structures, and staff working on the farm."*
53. And, at page 46, for example:
 

*"This application proposes a limited space for exclusive occupation so that the farm if granted can be used and for health and safety reasons. No other effects on public access will occur. Access around the site will be maintained. The location has been deliberately sited to avoid main navigation routes."*
54. That highlights the physical occupation and the legal occupation sought. Both are limited and considered reasonable in the context for the activity for which consent is sought. The physical occupation is a practical physical occupation that occurs whenever any structure is sought to be placed within the coastal marine area/public space. In other words, it is acknowledged that any consent for structures in the coastal marine area carries with it inherent rights of occupation. That is considered reasonable occupation.
55. The legal occupation is only to enable the activity (if consent is granted) to actually occur per the consent. The reasons for seeking legal exclusive occupation are for public health and safety, and to enable NZ King Salmon to operate the farms at the site (i.e. to give effect to the consent). That is reasonable.

### The Statutory Context

56. Occupation of the coastal marine area ("CMA") is regulated under the RMA.<sup>25</sup> Occupation by one person is to the exclusion of others,<sup>26</sup> and the nature of the exclusion is as if that person has a lease or licence to occupy that part of the coastal marine area.<sup>27</sup> Occupation can be in a physical or legal sense,<sup>28</sup> and in this case is both (as discussed above).
57. Occupation of the CMA must be permitted by a rule in a regional coastal plan or in any proposed regional coastal plan, or a resource consent.<sup>29</sup> In this case, occupation is not

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<sup>23</sup> As per the AEE for example at p 9 and at p 10.

<sup>24</sup> AEE, at p 9.

<sup>25</sup> Section 12(2)(a).

<sup>26</sup> Section 2, "occupation" (b).

<sup>27</sup> Section 2, "occupation" (c).

<sup>28</sup> Section 2, "occupation" (b). See also *Minister of Conservation v Tasman District Council* unreported High Court, Nelson CIV-2003-485-1072, Ronald Young J, 9 December 1993 at [28]-[30].

<sup>29</sup> Section 12(2)(a).

permitted by the MSRMP<sup>30</sup> nor is it a permitted activity in the MEP<sup>31</sup>. Therefore, occupation must be authorised by a resource consent.<sup>32</sup>

58. Section 12 reads (relevantly):

*"(2) No person may, unless expressly allowed by a national environmental standard, a rule in a regional coastal plan or in any proposed regional coastal plan for the same region, or a resource consent,—*

*(a) occupy any part of the common marine and coastal area; [...]"*

59. The term "occupy" is defined in the RMA at s2, and reads:

*"occupy means the activity of occupying any part of the coastal marine area—*

*(a) where the occupation is reasonably necessary for another activity; and*

*(b) where it is to the exclusion of all or any class of persons who are not expressly allowed to occupy that part of the coastal marine area by a rule in a regional coastal plan and in any relevant proposed regional coastal plan or by a resource consent; and*

*(c) for a period of time and in a way that, but for a rule in the regional coastal plan and in any relevant proposed regional coastal plan or the holding of a resource consent under this Act, a lease or licence to occupy that part of the coastal marine area would be necessary to give effect to the exclusion of other persons, whether in a physical or legal sense."*

60. In summary, NZ King Salmon seeks occupation to the extent reasonably necessary to undertake the activity.
61. Not much turns on the meaning of "reasonably necessary". It is essential that the occupation is for "some additional purpose other than just *sitting there*".<sup>33</sup> In order for NZ King Salmon to farm salmon at this site, it would need the farm (i.e. the structures). The structures therefore serve a purpose beyond just "sitting there".
62. The meaning of "exclusion" in the definition<sup>34</sup> could include exclusion in the legal sense, as well as in the physical sense. In *Auckland Regional Council v Darroch*, the EnvC notes that the presence of a structure in the CMA "excludes [a person] from having access to an area of the bay in which he would be able and entitled to locate [a] lawful mooring."<sup>35</sup> In *Minister of Conservation v Tasman District Council*, the High Court acknowledged an Environment Court decision acknowledging that "legal occupation may not involve physical occupation".<sup>36</sup>
63. The fact that occupation must be authorised by a resource consent was considered by the Court of Appeal in *Hume v Auckland Regional Council*.<sup>37</sup> NZ King Salmon is not seeking to exclude the public from using the space around where the structures are located. All that

<sup>30</sup> Per rule 35.4.2.7.

<sup>31</sup> Per rule 16.1.23, as the farm is not a permitted activity in the MEP (aquaculture may not be a permitted activity: s 68A RMA).

<sup>32</sup> Section 12(2)(a). Occupation of the coastal marine area requires consent as a discretionary activity (rule 35.4.2.7 of the MSRMP).

<sup>33</sup> *Tasman District Council v Way* [2010] NZEnvC 349 at [58]

<sup>34</sup> Section 2 RMA.

<sup>35</sup> *Auckland Regional Council v Darroch* EnvC Auckland A037/2003, 12 March 2003 at [23].

<sup>36</sup> *Minister of Conservation v Tasman District Council* HC Nelson CIV-2003-485-1072, 9 December 2003 at [30].

<sup>37</sup> *Hume v Auckland Regional Council* [2002] 3 NZLR 363

NZ King Salmon is seeking to do is to define what reasonable means in this context. This is necessary to enable the consent sought for the activity (i.e. operating salmon farms at the site), as was discussed in *Hume*<sup>38</sup>:

*"There are thus two ways in which any form of coastal permit may give rights of exclusion of others from use and occupancy. The first is when the permit expressly provides for such rights of exclusion; they will then take effect according to their tenor. The second is when exclusion of others or a degree of exclusion is reasonably necessary to achieve the purpose of the permit. This is akin to saying that rights of exclusion may be implied to an appropriate extent when the purpose of the permit makes such implication reasonably necessary. The ability to make an implication of this kind is logically necessary to allow the coastal permit system to operate effectively. Parliament cannot have intended such operation to depend solely on express conditions of a permit. If there were no such conditions and no power of implication, some permits might then be unable to operate according to their purpose."*

64. In summary, the 1,792 hectare space is considered reasonable. The entirety of the site is not sought for exclusion occupation by NZ King Salmon. Instead, NZ King Salmon only seeks the physical occupation of the space to the extent needed for the structures to be installed, and of the 1,792 hectare site as legal occupation only to the extent reasonably necessary for farming to occur on the site.
65. As discussed above in our response to Question 5, the 1,792 hectare space accounts for flexibility in structures and the potential to trial new structures as technology and knowledge advances, and for biosecurity risk management reasons.

*Question 13: Page 19 – it is unclear what additional vessel traffic has been considered in the navigation report. Please describe the maximum number and size of support vessels and maximum number of vessel movements proposed to maintain and operate the farm at each stage of development up to and including the maximum extent of development.*

66. By “additional traffic”, we assume you mean traffic generated during the construction and operation of the farms. The number of vessels traveling to the site and the duration of each visit during the construction and operational phases will depend to a degree on the type of structures installed and commercial/practical decisions on how best to integrate the open ocean operation with NZ King Salmon’s existing operations.
67. The Navigatus report indicated that those details could be accounted for in a Navigation Risk Reduction Management Plan:<sup>39</sup>

*"While the final technology and detailed design will not have been determined at the time of the consent application, it is not possible to detail the full details of the navigational aspects of the construction, operation and removal phases. However, there is no reason to believe that there are any issues that cannot be managed under a suitable risk management plan. A Navigation Risk Reduction Management Plan (NRRMP) should therefore be developed. This should address the construction methodology and the effects of additional vessels during construction as well as normal operations and in due course the removal phase." (Emphasis added).*

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<sup>38</sup> *Hume* at [22].

<sup>39</sup> Navigatus Consulting, North Marlborough Farm Development Navigational Risk Assessment (26 July 2019) at p 16. See also p 34 under section 7.1.2, which indicates that operational limitations on operational or maintenance vessels can be imposed at a later date depending on the farm design.

68. In addition, Navigatus concluded:<sup>40</sup>

*"It is expected that any additional traffic generated from servicing the farms will form part of the generic traffic flow and not have a significant impact on the non-farm traffic."*

69. NZ King Salmon has since compiled a table summarising possible vessel movements, which is **enclosed**. The "duration" column in that table relates to duration for the construction phase, being the number of days each vessel will be out working on the farm. During the week the vessels may stay out in the outer Pelorus region but likely return to home port at the weekend. The relevant ports are indicative only.
70. At this point Stage 1 is likely to consist of 16 pens, in two blocks of eight. The intention of NZ King Salmon is to build "FARM 1"<sup>41</sup> first, which is likely to consist of eight circular pens of approximately up to 64 metres in diameter and one barge. A second identical farm ("FARM 2" in the table, referred to above, which is **enclosed**) will follow soon after, depending on the learnings from the first farm.
71. Precisely which vessels visit the site, how often and from which port will depend on what structures are installed at the site, and how this farm is integrated with NZ King Salmon's existing operations. As a broad indication, in terms of how frequently vessels are expected to visit the site based on what we know now, there will be a crew boat that will visit the site every week, all year round. It is likely to remain at the site for six to eight hours before returning to Port. This will carry anybody that needs to perform a function on the farm, such as electrical or engineering maintenance, diving inspections, net cleaning or repair.
72. Smolt delivery will occur over 16 days of individual deliveries to fill each farm. Steaming time between Lyttleton and the site is likely to be in the realm of 14 to 15 hours each way. The vessel would be on site only long enough to unload the smolt before returning to Lyttleton.
73. The feed barge is likely to receive a delivery of salmon food on a weekly basis. The most efficient way could be through Nelson or Picton if the feed supply is nearby.
74. At this stage NZ King Salmon expects that a net cleaning vessel will travel out to the farm at the start of the week, remain on the farm during the week and return to Port at the weekend.
75. A harvest vessel is likely to travel to the site Sunday to Thursday (based on current operations) or potentially Sunday, Tuesday, Thursday with larger volumes. Harvesting could occur for up to six months at a time). Due to the shallow channel at Havelock, ocean going vessels will not be able to berth there. As the processing facility is in Nelson, at this stage NZ King Salmon envisages that it will make sense to run the vessel out of Port Nelson, however other ports, such as Picton or Elaine Bay, could be used.
76. In summary, it is most likely that the farm crew will be based in the Marlborough Sounds, including service vessels, but that bulk deliveries may come from further afield. NZ King Salmon is still considering constructing a processing factory in Picton, but that is contingent upon its processing in the region increasing.

*Question 14: Page 25 – related to 13 above, please identify which ports/landing areas that personnel, equipment, stock and feed associated with the farm will be transported from/to and in what*

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<sup>40</sup> Navigatus Report at p 24.

<sup>41</sup> As referred to in the table at **Appendix 4**.

*proportions (eg. 60% Picton, 20% Havelock, 10% Nelson, 10% Elaine Bay), and identify the proposed vessel routes to and from the proposed salmon farm, with particular reference to the breeding seabird populations identified in the seabird report. [See also item 20 below.]*

77. Please refer to the table **enclosed** regarding details on vessel movements, including ports and landing areas. You will see that once the farm is installed, vessels for day-to-day operations will operate primarily out of Havelock and Nelson, but could also operate out of Picton. Details about the proportion of farm vessels using various ports are not known at this stage.
78. In terms of vessel routes with particular reference to the breeding seabird populations identified in the seabirds report, in a practical sense vessels are likely to take a route 200 metres from the coast where possible, to avoid having to reduce speed to 5 knots. That will avoid seabird colonies given the distance from shore/colonies. In her draft Seabirds Management Plan, Dr McClellan has stated:

*"King shag colonies should be passed at a distance of at least 100 metres at any time of year. Given the difficulty in determining where colonies are located in any year, all vessels travelling to and from a port should maintain a distance of at least 100 metres from coastlines, including islands [with the exception of the Havelock Channel and French Pass?]."*

79. Given the practical likelihood for vessels to be at least 200 metres from shore when travelling to and from the farm, it would not be an issue for vessels to maintain a distance of at least 100 metres from any colony, in particular a king shag colony.
80. NZ King Salmon has an existing King Shag Management Plan for its Waitata and Kopaua sites, which is currently being reviewed. Council will be provided with a copy of that updated Management Plan upon completion, pursuant to the conditions of those consents. That incorporates a 100 metre "buffer zone" around a possible King shag resting area, whereby no vessel movements associated with the farm operation shall occur.
81. Maintaining 100 metres between vessels and the shoreline is already part of NZ King Salmon's practice and will continue with the operation of the farms at this open ocean site. There are three exceptions to this, which Dr Rachel McClellan has addressed in her draft Seabirds Management Plan:<sup>42</sup>

*"Exceptions to this are Allen Strait (Forsyth Island), Havelock Channel and French Pass. A small (less than five nests) colony of spotted shags were present in the vicinity of Allen Strait during a shag survey in 2006 (Bell 2012), an area with vessel traffic moving to and from the Pelorus Sound on a semi regular basis. It is possible, given shag species often move colony locations over time, that this colony is no longer present. If still present, it is likely that vessels may be able to maintain sufficient distance from this colony to avoid disturbance as this species is less flighty than King shag. Colonies are not known from the other two locations. The same shag survey identified a pied shag colony on the coast along the Havelock channel. If still present, this particular colony is likely to be accustomed to vessel traffic, and is not considered vulnerable to disturbance."<sup>43</sup>*

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<sup>42</sup> Draft to be provided to Council in the near future.

<sup>43</sup> NB. A recent king shag colony survey (funded by MPI) did not identify any new King shag colonies, including in these areas where farm vessels might travel closer than 100m to the shore: Mike Bell, pers comm.

*[Question 15: Page 27 – please provide the evidence referred to in Clinton Duffy's email to you of 14 March 2019, if that evidence is something you wish Council to consider.*

82. We note that in his email of 14 March 2019 Mr Duffy states:

*"Nothing much has changed regarding research on shark-aquaculture interactions since the last time I gave evidence on this issue. [...] I have had a look at the map of the proposed marine farms you provided. The species most likely to be attracted to these farms and their responses to them are essentially the same as those described in my previous evidence."*

83. This is a reference to Clinton Duffy's expert evidence before the Board of Inquiry for the NZ King Salmon Plan Change. Mr Duffy confirmed then that his 2009 evidence was still reflective of his view on the effects of salmon farms on sharks.
84. We **enclose** a copy of that evidence referred to.
85. We also note the Marine Mammals and Shark Management Plan will, by its name, include measures to manage effects on sharks. This will cover the risks of effects Mr Duffy refers to in that evidence, particularly on the basis that the existing NZ King Salmon Marine Mammal and Shark Management Plan accounts for effects on sharks from salmon farms, which Mr Duffy confirms has not changed since the existing management plan was prepared.

*Question 16: Page 28 – please describe the proposed feeding methodology, how this will minimise the loss of feed from the net pens and how this will be monitored on an ongoing basis, with particular reference to the depth of the net pens and the current speeds experienced at the site.*

86. NZ King Salmon acknowledges that feed is one of its largest expenses, and therefore it has an incentive (alongside environmental considerations) to reduce the loss of feed and therefore get the most value from money spent on feed. The feeding methodology to be used at the site is likely (based on what we know at present) to be similar to that currently used at existing NZ King Salmon farms. There is some detail on this in the Operations Report<sup>44</sup>.
87. NZ King Salmon use cameras to determine when to apply feed. The basic philosophy is to feed the fish as efficiently as possible while at the same time keeping waste to an absolute minimum. Cameras can be located at any position within the pens to give visual feedback.
88. The Operations Report provides (with changes since 2016 again shown in mark-up):

*"On New Zealand King Salmon farms 'spinner' and 'Akva' systems are used to deliver the feed. These systems have been developed to minimise feed wastage ...*

*Feed pellets are delivered to the farm in large bags (~1mt) and stored in the barge until required.*

...

*[feed is] propelled from the feed silos in the barge through pipes by air to the individual net pens (Akva system).*

...

*Feed costs are the most expensive component of producing salmon, accounting for up to 60% of production costs. In addition, the high organic content of feed means*

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<sup>44</sup> At Appendix Q of the application. See from page 32.

*that an accidental deposit of waste feed on the seabed over time will have a greater environmental impact than the faecal matter that is deposited in the farm footprint. The minimisation of waste feed is therefore both a commercial and environmental objective of New Zealand King Salmon.*

...

*New Zealand King Salmon has addressed all the points above and continues to work to further reduce feed wastage."*

89. This year salmon farming equipment companies have signalled that they intend to return to water-based feed distribution systems rather than air-based feed distribution systems. One of the principal benefits of this is that significantly less power needs to be consumed in order to distribute the feed. It has been represented to NZ King Salmon that such a system will also further minimise feed loss.
90. The methods NZ King Salmon use to minimise feed loss are:
  - a. Maintaining up-to-date knowledge on the best feeding strategies focused on reducing waste.
  - b. Constantly monitoring pens via the installed underwater cameras to ensure feeding is stopped before any wastage will occur.
  - c. The system used to distribute food is kept away from the outside edges of the pens, and the speed of distribution can be adjusted (i.e. it can be slowed to account for when fish energetically move in the pens).
  - d. Feeding infrastructure is checked daily to ensure correct functioning. Regular audits of feeding infrastructure are also undertaken.
  - e. The infrastructure used for feeding is fit for purpose.
91. With that existing methodology to be utilised at this site, NZ King Salmon is confident that feed loss risk can be sufficiently managed.

### Benthic Report

*Question 17: Figures 3, 4, 7 and 14, and Appendix 10 – the figures used in the report to illustrate the various properties of the MBES study area and the depositional footprints of the various modelled scenarios are not clear at the scale provided. In particular, the modelled scenarios do not clearly show the extent of depositional overlap with the various habitats identified in Figure 7, or appear to show Stage 1 layout or subsequent stages. Please provide a folio of large scale maps (perhaps 1:30,000 on A3) of these figures with sufficient detail to illustrate the findings of the MBES survey and the results of the relevant deposition modelling which has been undertaken for the proposal. [See also item 20 below.]*

92. We **enclose** a folio of the high resolution modelled scenarios at scale 1:30,000.
93. In terms of how the modelled output corresponds with the various habitats identified in Figure 7 of the seabed report, it is clearer when Figures 7 and 14 are viewed together:

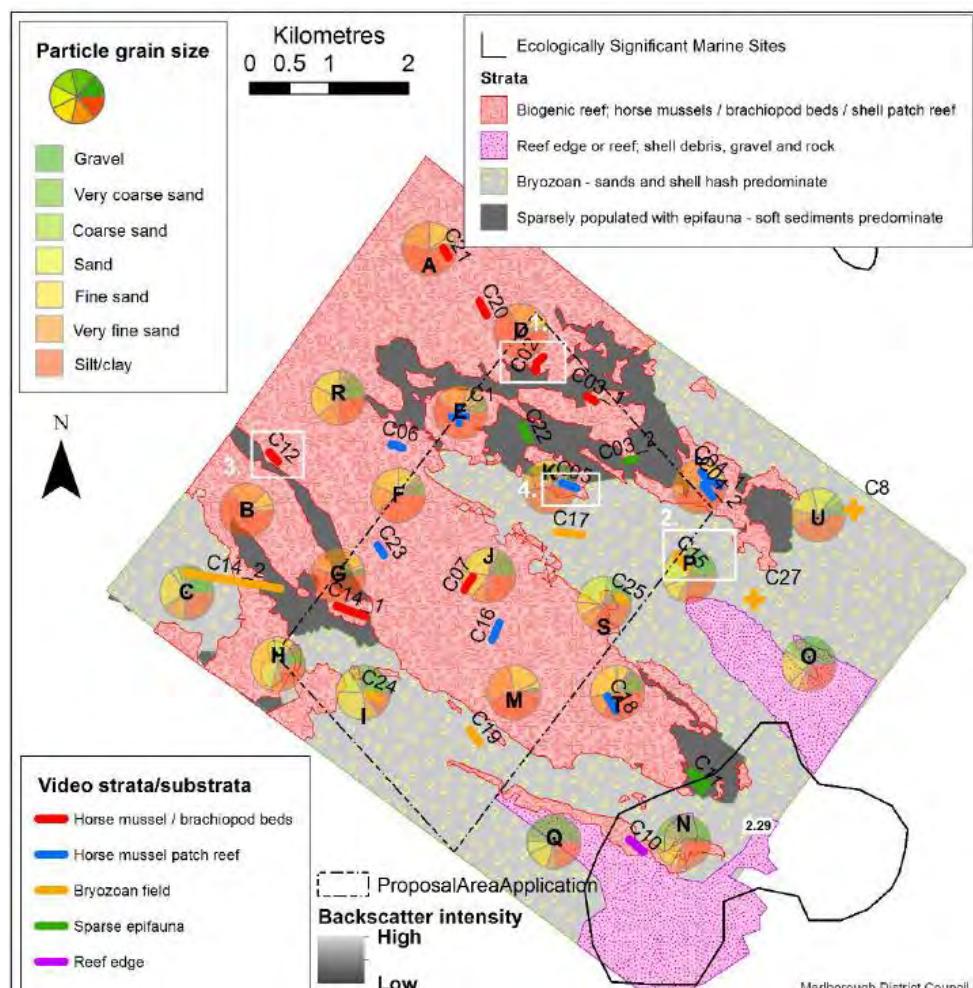
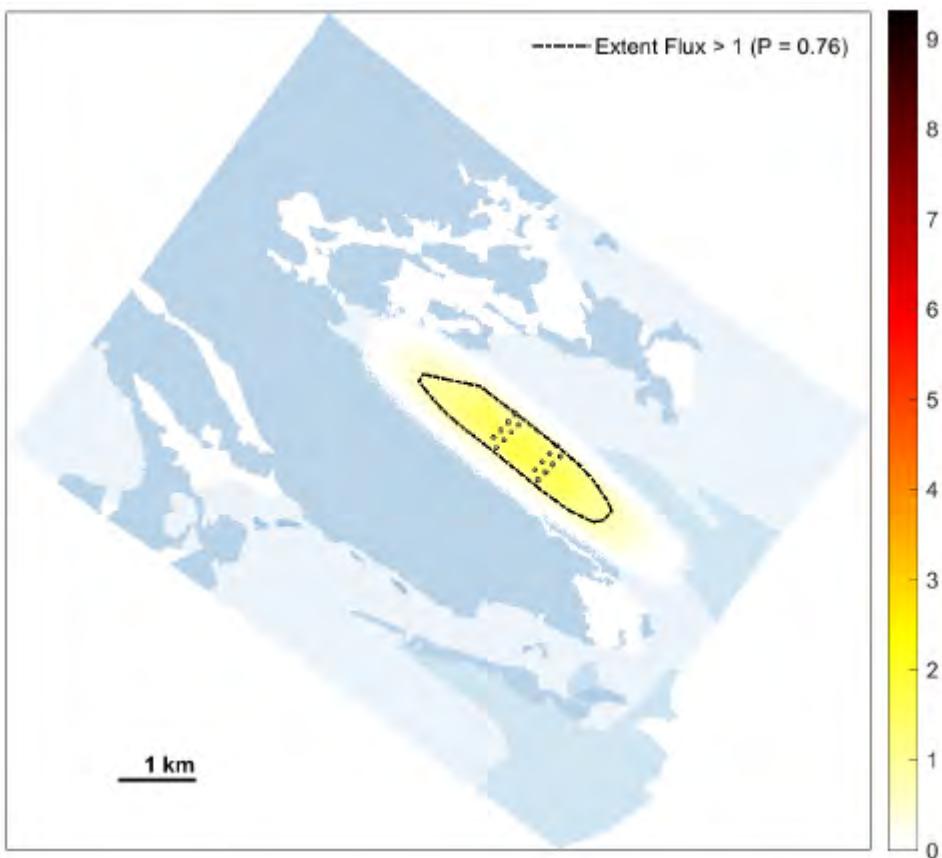


Figure 7



**Figure 14**

94. In summary:

Habitat	Figure 7	Figure 14
Biogenic Reef (horse mussels, brachiopod beds, shell patch reef)	Red	Darkest blue
Reef edge or reef; shell debris, gravel and rock	Pink/purple	Mid-blue
Bryozoan – sands and shell hash predominate	Light grey	Lightest blue
Soft sediments	Dark grey	White

95. The layout for subsequent phases beyond Stage 1 has not been determined. The various modelled scenarios at Appendix 10 of the benthic report provided with the application are designed to demonstrate effects from various pen arrangements, sizes and spacings.
96. Many of those simulations were designed to overlap deposition. Conservative assumptions were made. In practice, NZ King Salmon would site farms so that discharge between consecutive farm blocks do not overlap, where that is possible.
97. As part of preparation of the Management Plan, Cawthron is running additional modelling. Results will be provided to the Council once they are available.

*Question 18: Page 34 – the depositional modelling appears to have been carried out with the pens arranged perpendicular to the main flow axis, whereas page 5 of the AEE indicates the pens will be*

*arranged parallel with the current. If available, please provide the results of depositional modelling based on the proposed Stage 1 layout as described in the AEE, along with modelling for subsequent stages and layouts up to and including the maximum extent of development.*

98. The modelling was carried out with the pens arranged perpendicular to the current, whereas the proposal is for the pens to be arranged parallel to the current. Cawthron is undertaking additional modelling, which includes the proposed Stage 1 layout shown in site diagram OCEL SK-051103-517 rev 1. Results will be provided to the Council once they are available.

### **Management Plans**

*Question 19: Much of the application indicates that various management plans are to be employed as a key method for managing the potential adverse effects of the proposal. In some instances you have set out in Appendix B (conditions) the critical performance standards to be achieved by the management plans. In other instances the management plan conditions provide far less certainty. In order for Council to make an informed decision on the application, can I ask that you as far as possible provide all management plans referred to in the proposed conditions.*

99. NZ King Salmon has engaged its experts to assist with the preparation of proposed management plans for this site. The first stage being presently undertaken is for the experts to provide initial comments on the existing NZ King Salmon management plans on what they consider needs to be modified or added to these plans for this open ocean site.
100. To provide some guidance on this, we **enclose** the relevant existing NZ King Salmon management plans for its existing sites. These existing plans are providing the basis for the preparation of the new plans for this open ocean site. Given the different context the management plans for this application will be somewhat different. In addition the Structures Management Plan<sup>45</sup>, Benthic Management Plan, Wild Fish Management Plan, and the Seabirds Management Plan<sup>46</sup> will be new management plans altogether.
101. The following management plans are being prepared, as per the relevant proposed condition(s) at Appendix B of the lodged application:
- a. Navigation Risk Reduction and Management Plan (condition 27) (Note: this is likely to be incorporated into an overarching “Safety Management Plan”, which will encompass this, the Structures Management Plan, and NZ King Salmon’s general health and safety plan for this farm).
  - b. Benthic Management Plan (conditions 40 to 43)
  - c. Marine Mammal and Shark Management Plan (conditions 47 to 53)
  - d. Seabirds Management Plan (conditions 54 to 58)
  - e. Biosecurity Management Plan (conditions 59 to 63)
102. The following management plans are not being prepared yet for the reasons stated:
- a. Wild Fish Management Plan (conditions 64 to 67), pending outcome of consultation and submissions; and

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<sup>45</sup> Note that it may be that the Structures Management Plan is incorporated into an overarching “Safety Management Plan”, including Health and Safety and Navigation Risk Reduction management.

<sup>46</sup> Though NZ King Salmon has an existing King Shag Management Plan, Wildlife Nuisance Management Plan and a Birds Policy.

- b. The Structures Management Plan cannot be prepared yet given it depends on the exact structures/technology chosen. The proposed condition 15 at Appendix B provides an idea of the content to be included in the Structures Management Plan. Note per above, this Management Plan is likely to be incorporated into a “Safety Management Plan”.
- 103. The other management plan referred to in the conditions of Appendix B of the application is the Copper Management Plan. There is no need to prepare a Copper Management Plan at this stage as copper is not proposed to be used on site.
- 104. Water quality standards are specified in the proposed conditions (refer conditions 44 and 45). A Water Column Monitoring Plan (distinct from a management plan) will be prepared prior to structures installation, per condition 46.
- 105. We have received initial comments from a number of experts, and changes to the existing Management Plans/drafting of new Plans is now underway. We hope to have drafts during November 2019.
- 106. We will provide Council with these draft management plans as they become available. The management plans should be viewed as working documents: they will be updated and refined throughout the consenting and consultation process, and to that end they should be treated as indicative only at this stage.
- 107. The proposed consent conditions will be further refined as a result of the recommendations in the draft Management Plans.

#### **Digital Spatial Information**

*Question 20: Where I have above requested large scale maps or spatial information can I suggest that where possible you also provide the spatial information in a digital format compatible with ArcGIS software, eg. shapefiles. In addition, in order to inform Council's evaluation of the proposal and related management and monitoring regimes, can I ask that you provide all of the MBES survey results for the entire survey area in a digital format which is compatible with ArcGIS software. With your agreement this data could be added to Council's existing MBES data for Queen Charlotte Sound/Tōtaranui and Tory Channel and thereby enhance knowledge and management of the coastal marine area of the district by all resource users.*

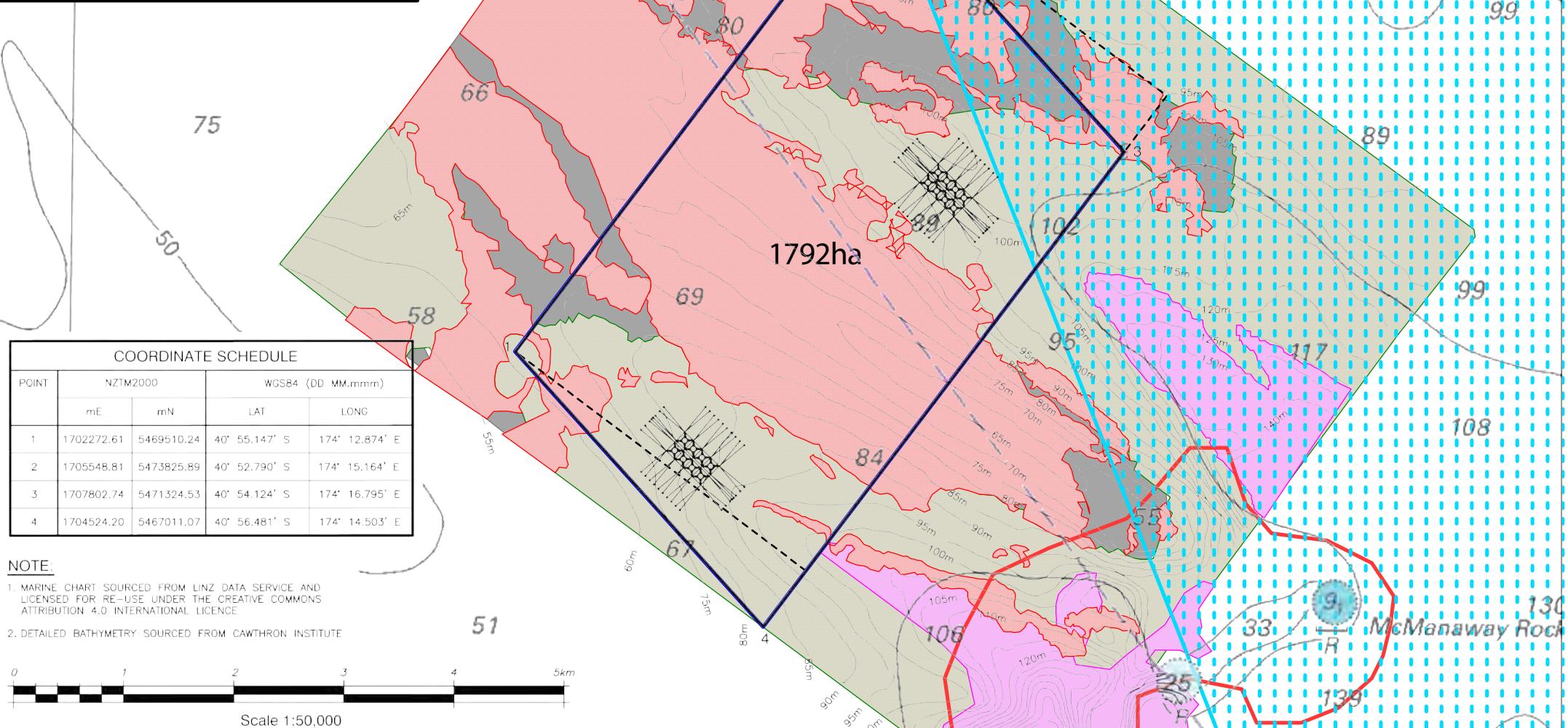
- 108. NZ King Salmon is happy to provide this data for Council's reference during the resource consent process. You can access this data at the following Sharefile link<sup>47</sup>:  
<https://gascoignewicks.sharefile.com/home/shared/fo610c27-b4da-4d7e-942a-25b1bc98666a>
- 109. NZ King Salmon is happy to provide its data for non-commercial purposes (that is, to assess the effects of this application or to contribute to some scientific work unrelated to another party engaged in aquaculture). Once it has been granted consent, and that consent has commenced in accordance with s 116A RMA, it would be prepared to release the information to Council on an unrestricted basis (that is, it could be used by other commercial operators).

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<sup>47</sup> We will add your email address to the access so that you can view.

## REFERENCE

- Biogenic Reef; horse mussel / brachiopod beds / shell patch reef
- Reef edge or reef; shell debris, gravel and rock
- Bryozoan - sands and shell hash predominate
- Sparsely populated with epifauna - soft sediments predominate
- McManaway Rocks (2.29)
- Whale Migration Corridor (7.15)
- Original Proposed Site (26 June 2018)
- Amended Proposed Site (9 May 2019)



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OFFSHORE AND COASTAL  
ENGINEERING LIMITED  
49 Crown Hill Street  
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
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NEW ZEALAND KING SALMON LIMITED  
PROPOSED OFFSHORE SITES  
OUTER MARLBOROUGH SOUNDS

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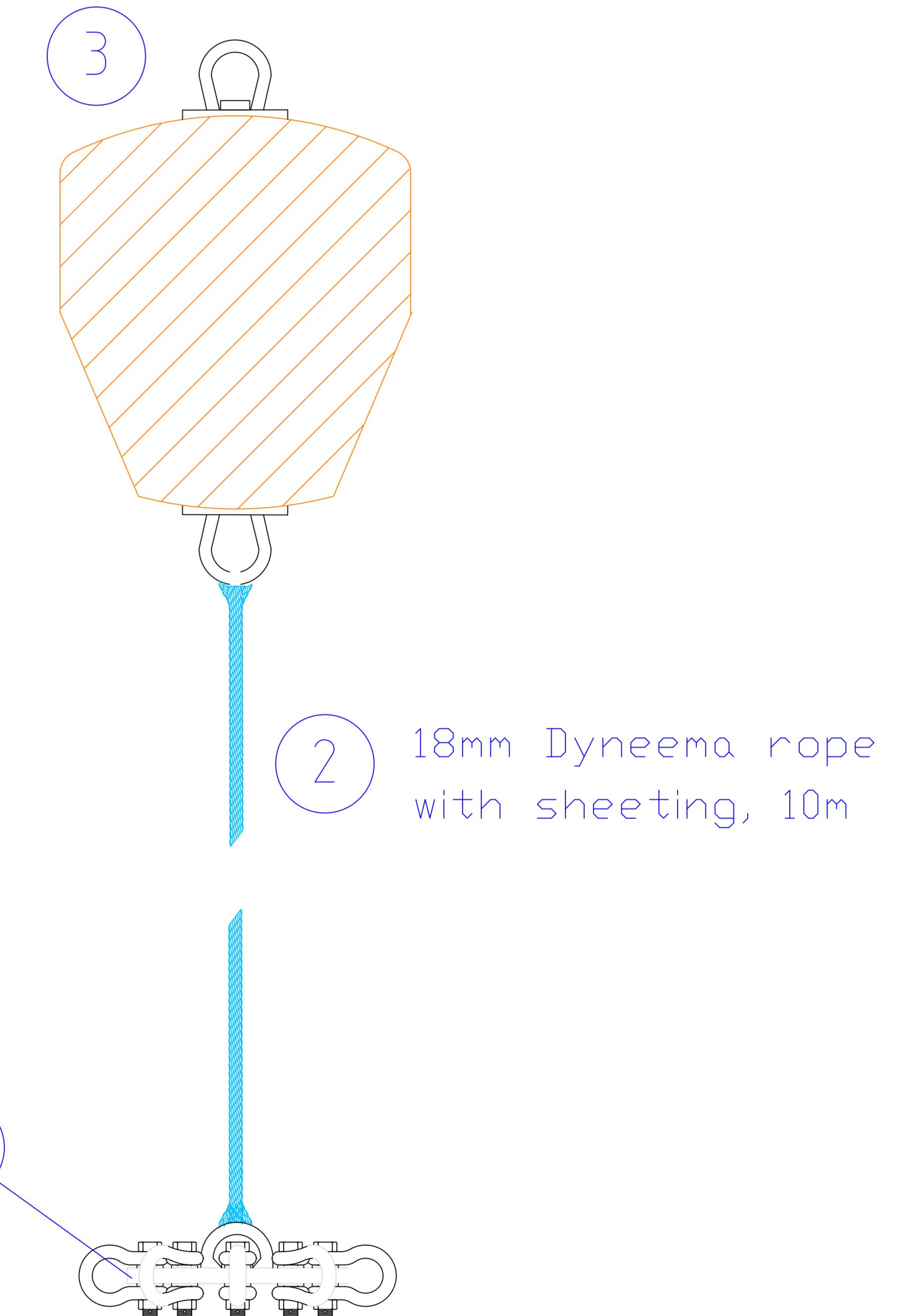
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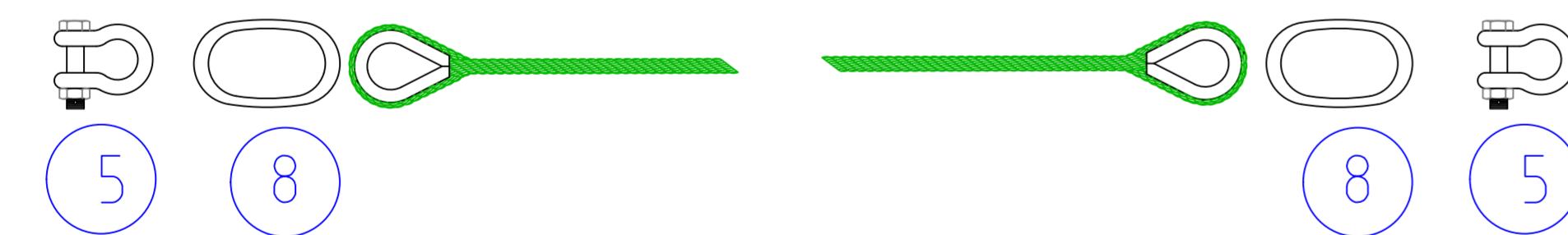
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NZKS  
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PLANNED MOORINGSYSTEM

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2	Buoy rope 18mm 10 meter Dyneema with sheeting	20
3	Buoys 4400 liter APB - K1, K6, K11, K16, K5, K10, K15, K20 2200 liter APB - K2, K3, K4, K17, K18, K19 1000 liter APB - K7, K8, K9, K12, K13, K14	8 6 6
4	Bridles 64mm 3-stranded Sinking Rope	
5	Mooring Shackle MBL 60t	
6	Mooring Shackle MBL 90t	
7	Masterlink galv. 40mm	
8	Masterlink galv 34mm	

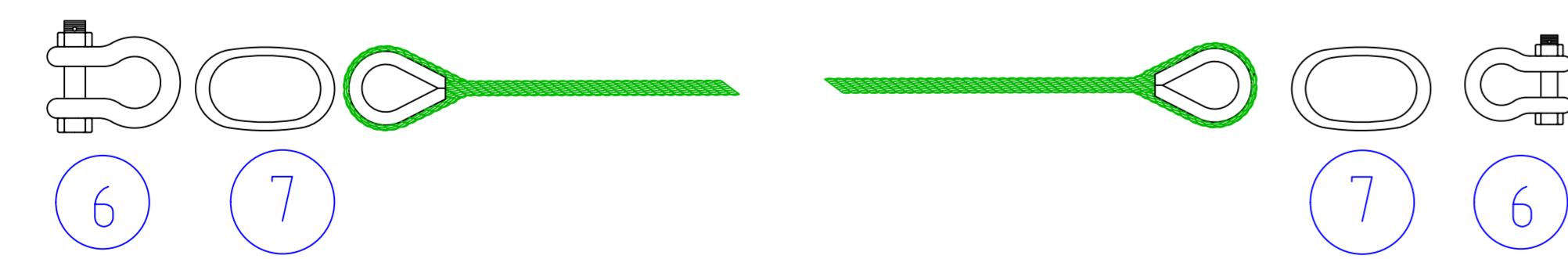
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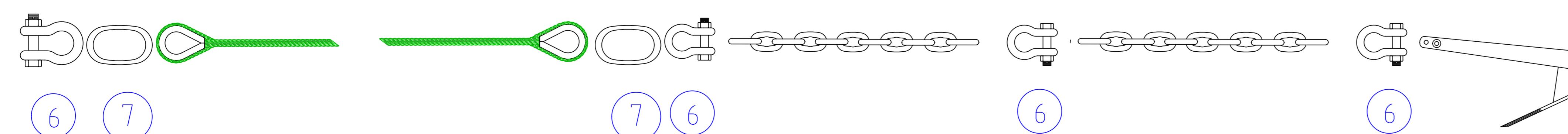
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Grid lines



Anchor lines



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## NW Marlborough - Vessel Movements

FARM 1	Activity	Vessel Type	Approx Length	Duration	Departing	Notes
<b>Farm Installation</b>  <b>8 x Pens</b>  <b>1 x Feed Barge</b>	Pen Tow	Tug	25m	8 Days	Picton	Vessels will most likely berth at Forsyth or Waihinau Bay overnight during installation phase  Return trips to Lyttleton
	Pen Mooring	Barge	22m	20 Days	Picton	
	Staff Run	Water Taxi	10m	40 Days	Havelock	
	Net Installation	Barge	30m	20 Days	Havelock	
	Electrical / Cameras	Workboat	10m	10 Days	Havelock	
	Feed Barge tow	Tug	25m	2 Days	Nelson	
	Feed Barge Mooring	Barge	22m	5 Days	Picton	
	Feed Lines & Power	Workboat	10m	10 Days	Havelock	
	Smolt Delivery	Wellboat	30m	16 Days	Lyttleton	

FARM 1	Activity	Vessel Type	Approx Length	Period	Departing	Notes
<b>Operations</b>	Crew Run	Workboat	15m	Weekdays	Havelock	Includes Divers  Not until at least 2022. Harvest period 2 months per year
	Net Cleaner	Offshore	25m	Weekdays	Waitata Reach	
	Feed Run	Offshore	25m	Weekly	Nelson	
	Harvest Vessel	Offshore	30m	Weekdays	Nelson	

FARM 2	Activity	Vessel Type	Approx Length	Duration	Departing	Notes
<b>Farm Installation</b> <b>8 x Pens</b> <b>1 x Feed Barge</b>	Pen Pow	Tug	25m	8 Days	Picton	Vessels will most likely berth at Forsyth or Waihinau Bay overnight during installation phase  Return trips to Lyttleton
	Pen Mooring	Barge	22m	20 Days	Picton	
	Staff Run	Water Taxi	10m	40 Days	Havelock	
	Net Installation	Barge	30m	20 Days	Havelock	
	Electrical / Cameras	Workboat	10m	10 Days	Havelock	
	Feed Barge tow	Tug	25m	2 Days	Nelson	
	Feed Barge Mooring	Barge	22m	5 Days	Picton	
	Feed Lines & Power	Workboat	10m	10 Days	Havelock	
	Smolt Delivery	Wellboat	30m	16 Days	Lyttleton	

FARM 2	Activity	Vessel Type	Approx Length	Period	Departing	Notes
<b>Operations</b>	Crew Run	Workboat	15m	Weekdays	Havelock	Same vessel used for both farms
	Net Cleaner	Offshore	25m	Weekdays	Waitata Reach	Same vessel used for both farms
	Feed Run	Offshore	25m	Weekly	Nelson	Same vessel used for both farms
	Harvest Vessel	Offshore	30m	Weekdays	Nelson	Same vessel used for both farms

# **'ATTACHMENT 1'**

**BEFORE THE ENVIRONMENT COURT  
AT CHRISTCHURCH**

**ENV 2009-CHC-152**

**UNDER** the Resource Management Act  
1991

**IN THE MATTER** of an appeal under s120 of the  
Act

**BETWEEN** **PELORUS WILDLIFE  
SANCTUARIES LIMITED**

Appellant

**AND** **MARLBOROUGH DISTRICT  
COUNCIL**

Respondent

**AND** **THE NEW ZEALAND KING  
SALMON COMPANY LIMITED**

Applicant

**BRIEF OF EVIDENCE OF CLINTON ANTHONY JOHN DUFFY**  
**the 29th day of June 2010**

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**GASCOIGNE WICKS**  
SOLICITORS  
BLENHEIM

Solicitor: Brian Anderson Fletcher

Applicant's solicitor  
79 High Street  
PO Box 2, BLENHEIM  
Tel 03 578 4229  
Fax 03 578 4080

Clinton Anthony John Duffy states:

- 1. Qualifications and Experience**
- 1.1 I have an M.Sc.(Hons) in Zoology from the University of Canterbury and am employed as a Scientific Officer (Marine Species - Fish) by the Marine Conservation Section, Department of Conservation.
- 1.2 I was employed by the Nelson/Marlborough Conservancy, Department of Conservation in July 1989 to lead a dive survey of shallow subtidal habitats in the Marlborough Sounds. I have subsequently worked as a technical support officer Marine, and Marine & Freshwater in Hawke's Bay, East Coast Hawke's Bay and Wanganui Conservancies from 1990-1999, and Scientific Officer (Marine Ecology) for the Department's Science & Research Unit from 1999-2008. My areas of expertise include marine survey and monitoring, marine classifications, biogeography of New Zealand reef fishes, identification of marine algae, invertebrates and fishes, and the conservation biology, taxonomy and behaviour of sharks and rays.
- 1.3 I am a member of the New Zealand Marine Sciences Society, Oceania Chondrichthyan Society (past secretary and founding council member), the American Elasmobranch Society (AES) and the IUCN Shark Specialist Group – Australia and Oceania. I have 30 scientific publications, including 17 that address aspects of elasmobranch taxonomy, distribution, parasitology, growth and maturity, movements and conservation status. My major research focus at present is the distribution and ecology of the great white shark (*Carcharodon carcharias*) in New Zealand waters. In a private capacity I research and report New Zealand shark attacks to the International Shark Attack File (administered by the AES). I have dived with 23 species of shark under a variety of conditions in New Zealand and internationally.
- 1.4 I have read the Code of Conduct for Expert Witnesses as set out in the practice note of the Environment Court. I have complied with that Code in preparing this brief of evidence and agree to comply with the Code in giving evidence before the Court.

## **2. Scope of evidence**

- 2.1 There are two aspects to my evidence:
- a. First I review the assessment of effects on sharks contained in the Resource Management Officer's report for the Council hearing, the application and supporting documents, as well as the limited scientific literature available on shark interactions with aquaculture,
  - b. I then consider if the proposed farm is likely to increase the risk of shark attack to other users of Waitata Reach.
- 2.2 I conclude that while it is difficult to draw any definitive scientific conclusions regarding specific effects of salmon farming on sharks:
- a. The most common cause of shark interactions with fish farms appears to be the presence of dead fish in the pens/rearing nets
  - b. The most serious potential direct impact on sharks is likely to be mortality of large pelagic species due to entanglement or confinement in the pens
  - c. These problems can be mitigated by good farm husbandry, including prompt removal of mortalities (dead fish) from the pens and the use of predator-exclusion nets
  - d. The applicant should develop contingencies for the live release of large pelagic sharks that manage to penetrate the predator-exclusion nets
  - e. The species of sharks reportedly attracted to existing farms occur naturally in Pelorus Sound
  - f. There is potential for temporary seasonal concentrations of sharks to occur around the proposed farm however the likelihood of this occurring can not be determined
  - g. Although some of the species likely to be attracted to the farm are classified as potentially dangerous shark attack is a rare phenomenon; as there have been no reported attacks at or near marine farms in New Zealand the risk of shark attack around marine farms appears to be no greater than elsewhere in the marine environment.

### **3. Effects on Sharks**

- 3.1 At least 14 species of shark are known to occur naturally in the Marlborough Sounds (Table 1). As both major sounds represent essentially marine habitats along their full length these shark species may be encountered almost anywhere within them. For example, bronze whaler (*Carcharhinus brachyurus*) and smooth hammerhead (*Sphyrna zygaena*) sharks have been taken near the entrance to Mahau Sound, inner Pelorus Sound, and bronze whalers have been seen by divers in Lochmara Bay, inner Queen Charlotte Sound. In addition, inner Pelorus Sound supports relatively large populations of bait fishes (*Engraulis australis*, *Sardinops sagax neopilchardus*, *Sprattus* spp.) and occasionally arrow squid (*Nototodarus* sp.) which are fed upon by a variety of pelagic predators including sharks. The occurrence of most sharks, including the smaller bottom-living species, in the Marlborough Sounds appears to be highly seasonal and is probably related to a variety of factors including reproduction and prey availability. Most large pelagic sharks are generally only observed in the region during late spring and summer. Great white sharks (*Carcharodon carcharias*) occur year round in the Cook Strait region. Although most historical records of this species from Marlborough Sounds have been made during autumn and winter (May – August) in association with commercial whaling operations recent satellite tracking data has shown that they are also present during summer.
- 3.2 I am unaware of any published research findings on the mechanisms by which sharks may be attracted to fish farms, or any aspect of their behaviour (e.g. residence times, activity patterns) around fish farms. Given sharks' acute senses it is reasonable to assume that they may be attracted to fish farms by a variety of stimuli arising from the living cultured fish, mortalities lying in rearing pens, the odour trail produced during feeding, noises generated by farm activities or structures, the physical structure of the farm itself and/or wild fish aggregating around the farm.

**Table 1.** Shark species known to occur in Marlborough Sounds, South Island, New Zealand.

Family	Species	Common name	Risk to humans
Hexanchidae	<i>Notorhynchus cepedianus</i>	Broadsnouted sevengill shark	Potentially dangerous
Squalidae	<i>Squalus acanthias</i>	Spotted spiny dogfish	Traumatogenic
	<i>Squalus griffini</i>	Northern spiny dogfish	Traumatogenic
Alopiidae	<i>Alopias vulpinus</i>	Common thresher shark	Traumatogenic
Cetorhinidae	<i>Cetorhinus maximus</i>	Basking shark	Traumatogenic
Lamnidae	<i>Carcharodon carcharias</i>	Great white shark	Potentially dangerous
	<i>Isurus oxyrinchus</i>	mako	Potentially dangerous
	<i>Lamna nasus</i>	Porbeagle	Potentially dangerous
Scyliorhinidae	<i>Cephaloscyllium isabella</i>	Carpet shark	harmless
Triakidae	<i>Galeorhinus galeus</i>	School shark	Traumatogenic
	<i>Mustelus lenticulatus</i>	Rig / spotted dogfish	harmless
Carcharhinidae	<i>Carcharhinus brachyurus</i>	Bronze whaler	Potentially dangerous
	<i>Prionace glauca</i>	Blue shark	Potentially dangerous
Sphyrnidae	<i>Sphyrna zygaena</i>	Smooth hammerhead	Potentially dangerous

**Definition of risk to humans:** Potentially dangerous = any shark species known to, or implicated in unprovoked injurious attacks on humans or vessels; Traumatogenic = species capable of inflicting serious injury if provoked or mistreated; Harmless = species unlikely to, or incapable of inflicting serious injury except in exceptional circumstances.

3.3 Interactions between a variety of large pelagic and small bottom-living shark species and marine fish farms have been reported. Depredation by large pelagic species can economically impact fish farming operations through damage to rearing nets/pens, loss of stock through predation and escapement, and depression of productivity due to

- increased stress suffered by fish subject to regular attack. Bottom-living sharks generally scavenge on uneaten food beneath farms, or on mortalities (dead fish) accumulating in pens. Despite the potential economic impact of shark depredation on fish farms there is an absence of empirical research shark-fish farm interactions. A review of the impacts of marine farming on wild fish populations in New Zealand by Cole (2002) mentioned only the possibility of in-breeding depression occurring if some commercial shark species were farmed.
- 3.4 Elsewhere mortality of sharks, including protected species such as the great white shark, has resulted from entanglement, confinement in nets/pens and culling. Some farm owners and managers consider it necessary for safety reasons to kill sharks before they are removed from pens however live release methods have been developed in South Australia (Murray-Jones 2004). In some circumstances commercial fishers have been used to reduce shark populations around fish farms during periods of high abundance (Murray-Jones 2004). To my knowledge culling of sharks in or around farms occurs infrequently, if at all in New Zealand. Anecdotal information also suggests mortality of sharks due to entanglement or confinement in marine farms is rare in New Zealand. I am not aware of the death of any great white sharks in fish farms in New Zealand.
- 3.5 At a workshop on shark interactions with aquaculture in South Australia farm owners and managers advised that shark interactions with farms were very limited, and varied according to site, season, stage of the farm cycle, and the species being cultured (Murray-Jones 2004). All agreed that the main cause of these interactions was mortalities left in pens. Kingfish (*Seriola lalandi*) farmers reported most interactions were with 'bronze whalers' (*Carcharhinus brachyrus* and *C. obscurus*). These interactions were highly seasonal, with most occurring after the females had pupped in October-December. The factor they considered to be the most important cause of shark interactions was the presence of freshly dead fish in the pens, not old mortalities. Consequently, dive teams were employed to clean the pens on a daily basis (Murray-Jones 2004). No information on shark interactions with salmon farms was presented at this workshop. Elements of best practice in terms of reducing shark interactions with fish farms that were identified by industry at this workshop were: (i) good farm husbandry as this minimises the number of fish dying in the

pens, (ii) prompt removal of mortalities from pens, and (iii) the use of predator exclusion nets or shark-resistant materials in the pen construction (Murray-Jones 2004).

- 3.6 Impacts on benthic sharks are likely to be similar to those experienced by other wild fish populations inhabiting the area. Some studies have indicated that wild fish species living around fish farms exhibit significantly more intense parasitic infections than wild fish inhabiting non-farm reference sites (e.g. Nowak et al. 2004), however as the parasites involved in these infestations are not necessarily the same as those infecting the farmed species the significance of these observations and the causes of the elevated infestations remain speculative. Relatively few parasitic species are common to both teleosts (bony fishes) and elasmobranchs (sharks and rays). To my knowledge the potential for bioaccumulation by elasmobranchs of heavy metals and other compounds contained in uneaten fish food and antifouling has not been studied in New Zealand or internationally.

#### **4. Risk to humans posed by sharks attracted to fish farms**

- 4.1 I note that the submission by Pelorus Wildlife expressed concern that the proposed farm would attract potentially dangerous sharks to the area, and the opinion that this is at odds with the use of the adjacent coastline for water-based recreation, including kayaking.
- 4.2 The risk to humans presented by sharks is generally overstated. The widespread fear of sharks owes much to the media coverage of infrequent attacks on humans, and inaccurate media portrayals of shark behaviour. While it is prudent to treat any shark greater than 1.8 m length as potentially dangerous, shark attack is a rare phenomenon and under most circumstances it is possible to safely undertake most aquatic activities in the presence of sharks. This includes situations where bait and/or chum (minced fish and fish oil) is used to attract sharks so divers can view them underwater, or where divers view sharks feeding on natural aggregations of bait fishes. In the context of this application, divers working on fish farms are potentially exposed to the greatest risk of attack due to their proximity to a feeding stimulus (i.e. the live fish and mortalities in the pens), and the frequency with which they are likely to encounter foraging sharks. Despite these risk factors I am not aware of any shark attacks occurring at or near fish

farms in New Zealand or South Australia (S. Murray-Jones, DEH, pers. com.). No attacks on divers or anyone recreating in the vicinity of a fish farm are recorded on the International Shark Attack File (R. Buch, ISAF, pers. com.).

- 4.3 Of the shark species reported by the applicant at the Waihinau Bay farm site both blue sharks (*Prionace glauca*) and bronze whalers (*Carcharhinus brachyurus*) have been positively identified or implicated in shark attacks on humans. Even so the risk presented by these species is low. Blue sharks, possibly the most abundant large shark occurring in New Zealand waters, frequently investigate floating objects by biting them and have been identified as the attacking shark species in several unprovoked non-fatal attacks on swimmers, divers and a life raft in New Zealand. The small number of these incidents relative to the species' abundance is probably due to the small size of individuals usually encountered in coastal waters and their non-aggressive disposition. Bronze whalers have been implicated in one fatal attack in New Zealand, and numerous injurious and several fatal attacks in Australia. The relatively large number of reported attacks and incidents involving bronze whalers in Australia is almost certainly due to misapplication of the name bronze whaler.
- 4.4 'Whaler' is the common name given to sharks of the genus *Carcharhinus* in Australia and New Zealand. The only species in this genus that commonly occurs around the North and northern South Islands is the bronze whaler (*C. brachyurus*), also known as the copper or narrow-tooth shark. It reaches at least 3.3 m total length (TL) and has relatively small, slender upper and lower teeth adapted to feeding on small fish and cephalopods. In contrast 20 *Carcharhinus* species are reported from Australian waters, many of which lack distinctive markings and require a detailed knowledge of shark taxonomy to positively identify them. In warm temperate and subtropical regions of Australia the dusky shark (*C. obscurus*) and sandbar shark (*C. plumbeus*) are the most common *Carcharhinus* species. Both are commonly referred to as 'bronze whalers' by fishers and divers in Australia. Dusky sharks are adapted to feeding on larger prey than the bronze whaler (*C. brachyurus*) and have large serrated triangular teeth in the upper jaw. They also reach a larger maximum size (3.5-4m TL) than the bronze whaler. Dusky sharks are

infrequently taken off the northeast North Island but have not been recorded south of Bay of Plenty.

- 4.5 Bronze whalers (*C. brachyurus*) are a common inshore species in northern New Zealand, and the opportunity to swim with aggregations of this species attracts recreational divers to the Poor Knights Islands during autumn and winter. Aggressive interactions between this species and humans, including New Zealand's last fatal shark attack, almost invariably involve spearfishing. Attacks on spearfishers may represent competitive behaviour rather than perception of the diver as prey. Aggressive behaviour appears to be triggered by the presence of the diver in close proximity to struggling or bleeding fish, and in most cases surrendering the fish to the shark results in abatement of aggression. Under other conditions bronze whalers are generally disinterested in or avoid divers. They have occasionally been reported to follow kayaks and dinghies but there have been no substantiated unprovoked attacks on kayaks or vessels of any other kind reported in New Zealand. Bronze whalers are regularly observed in close proximity to swimmers and surfers without incident in northern New Zealand.

## 5. **Conclusions**

- 5.1 I conclude that:
- a. the species of shark reported from the vicinity of salmon farms in Waitata and Tawhitinui Reaches occur naturally in Pelorus Sound
  - b. while fish farms do not attract sharks into a particular region they are likely to attract the attention of sharks inhabiting or passing through the area; depending on the species concerned this could result in temporary aggregation of sharks around farms
  - c. the nature of shark-farm interactions will vary depending upon a number of variables including the species of shark involved, site, season, marine farm size and management practices and the species being cultured
  - d. there is insufficient knowledge of shark-farm interactions and shark populations in Marlborough Sounds to draw any

- definitive conclusions regarding the potential effects of salmon farming on local shark populations
- e. notwithstanding this, mortality of large sharks in fish farms due to entanglement or confinement appears to be infrequent
  - f. it is unlikely that large pelagic sharks would linger around a farm for an extended period of time without receiving a food reward
  - g. the methods proposed by the applicant to reduce interactions with marine mammals should also be effective in reducing large pelagic shark interactions, however it is unlikely that the methods developed for handling marine mammals will be transferable to large sharks and some consideration should be given to the development of methods for the live release of these species
  - h. although blue sharks and bronze whaler sharks are classified as potentially dangerous they do not normally behave aggressively toward humans
  - i. while common sense and caution should always be exercised when interacting with sharks, the presence these species, particularly bronze whalers, does not represent an unacceptable risk to swimmers and divers and is not incompatible with most other forms of water-based recreation, particularly boating
  - j. the actual risk of shark attack does not appear to be any greater around fish farms than many other parts of New Zealand's marine environment (e.g. areas where schools of bait fish naturally aggregate, or in close proximity to seal colonies or pods of dolphins)

---

Clinton Anthony John Duffy

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# **The New Zealand King Salmon Limited**

**Ngamahau, Richmond and Waitata  
Marine Farms**

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## **Wildlife Nuisance Management Plan**

**17 July 2014**

<b>Prepared for</b>	New Zealand King Salmon Limited
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## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Statutory requirements .....	1
1.2	Management plan objectives .....	1
1.3	Potential wildlife nuisance concerns.....	3
<b>2</b>	<b>General protocol.....</b>	<b>4</b>
2.1	Compliance with the Marine Mammal Protection Act 1978 .....	4
2.2	Compliance with the Wildlife Act 1953 .....	4
2.3	Compliance with resource consent conditions .....	4
2.4	Compliance with NZKS policy .....	4
<b>3</b>	<b>Sharks.....</b>	<b>5</b>
3.1	Potential for interaction .....	6
3.2	Mitigation Measures.....	6
<b>4</b>	<b>Marine mammals .....</b>	<b>7</b>
4.1	Potential for interaction .....	7
4.2	Mitigation Measures.....	7
<b>5</b>	<b>Birds.....</b>	<b>9</b>
5.1	Potential for interaction .....	9
5.2	Mitigation Measures.....	10
<b>6</b>	<b>Company Response .....</b>	<b>10</b>
<b>7</b>	<b>References .....</b>	<b>11</b>

## List of Figures

Figure 1: Locations of NZKS farms in the Marlborough Sounds.....	2
Figure 2: A NZ fur seal hauling out onto a NZKS farm structure.....	8
Figure 3: An example of predator exclusion netting at a NZKS farm structure .....	8

## List of Tables

Table 1: Shark species known to occur in the Marlborough Sounds.....	5
Table 2: Bird species which frequent NZKS farms.....	9

# 1 Introduction

New Zealand King Salmon (NZKS) currently has five salmon farms (eight sites) in the Marlborough Sounds; located at Ruakaka Bay, Forsyth Bay, Waihinau Bay, Otanerau Bay, Te Pangu Bay, Clay Point, and two farms at Crail Bay. Resource consents for three new farms have recently been granted and the following farms will be established in due course: Waitata, Richmond and Ngamahau ([Figure 1](#)).

During the recent Board of Inquiry process a number of concerns were raised regarding the attraction of nuisance wildlife to the salmon farms and surrounding areas; and the associated adverse effects that these wildlife may have on local amenity values. NZKS recognises that the Coastal Marine Area of the Marlborough Sounds is a shared resource with exceptionally high amenity and recreation value. For this reason, NZKS has worked with neighbouring property owners to identify their concerns in relation to nuisance wildlife, and to develop mitigation measures to address these.

## 1.1 Statutory requirements

As the resource consent holder NZKS has overall responsibility for ensuring that all resource consent conditions are complied with. For all three new farms, the resource consent condition relating to nuisance wildlife is identical; hence, this management plan is directly relevant to all farms currently under establishment. This management plan will also be a useful guide to nuisance wildlife related issues at all existing farms as well.

The relevant consent condition for the three new farms states:

*The consent holder shall develop a Wildlife Nuisance Management Plan and provide it to the Council prior to the initial placement of the first structure(s) at the marine farm*

All NZKS operational activities must thereby comply with this Wildlife Nuisance Management Plan.

All appropriate New Zealand legislation shall also be complied with ([Section 2](#)).

## 1.2 Management plan objectives

The objective of this Wildlife Nuisance Management Plan is to minimise the risk of adjacent neighbours experiencing significant reductions in amenity values due to wildlife nuisances attributable to the marine farms.

In achieving this objective, which is specific to marine farm neighbours, potential wildlife nuisance issues on other marine users (i.e. tourism operators, recreational fishers, other recreational users etc.) are also addressed.

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Legend  
● Existing NZ King  
Salmon Farms  
■ Approved Farms

New Zealand King Salmon  
Approved Farm Site Map - Post Supreme Court Decision

Date: 1 May 2014

Plan prepared by Boffa Miskell Limited  
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**Figure 1: Locations of NZKS farms in the Marlborough Sounds**

## 1.3 Potential wildlife nuisance concerns

A number of concerns relating to wildlife nuisance have been identified.

Of primary concern is the occurrence of predators (seals and sharks) in areas surrounding salmon farms. Predators naturally associate large aggregations of fish as a potential source of prey; therefore, it is not uncommon for predators to aggregate at salmon farms (Forrest *et al.* 2007).

From a social impact perspective, the attraction of predators has a number of potential adverse effects which are summarised below and discussed in greater detail in Sections 3 - 5:

- An increased presence of sharks and seals could confer a potential greater risk to the safety of recreational users in the marine farm vicinity; in particular swimmers, divers and kayakers<sup>1</sup>;
- An increase in shark and seal numbers may reduce the local availability of wild fish populations for recreational fishers;
- An increase in seal numbers around the farms could lead to an increase in the number of shoreline haul out locations used by seals to rest. This shoreline presence can lead to reductions in amenity values for local residents and holiday home owners through the presence of the animals themselves, the presence of waste products (faeces and urine), and the associated unpleasant odours;
- Seals ashore also pose public health risks through the potential for seal bites and exposure to pathogens from live and dead animals and their waste products (faeces and urine).

Birds, particularly gulls, are also attracted to the marine farms as a potential location from which food can be opportunistically scavenged and as an area attractive for roosting during inclement weather. The attraction of birds has the following potential adverse effects:

- Large aggregations of gulls result in increased noise and what some perceive to be visual pollution;
- Birds roosting and defecating on property could reduce property value and cause building condition to deteriorate more rapidly. Other equipment may become fouled and unusable; and
- Increased concentrations of birds and faeces around the farms have the potential to pose some human health risks.

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<sup>1</sup> Although salmon farms may encourage sharks to aggregate in the area, fish farms should not serve to increase the overall number of sharks (Clinton Duffy & Paul Taylor, hearing evidence)

## 2 General protocol

This section sets out all general protocols that relate to nuisance wildlife issues.

### 2.1 Compliance with the Marine Mammal Protection Act 1978

All marine mammals in New Zealand waters are fully protected under the Marine Mammals Protection Act 1978 (MMPA).

All interactions with marine mammals shall occur in accordance with the NZKS permit (issued by the Department of Conservation) to 'take' marine mammals under the MMPA and in accordance with the 'NZ King Salmon Marine Mammals and Shark Management Plan'. Any individual involved in any action in respect of this "take" permit is responsible for their own actions within the terms and conditions of the permit and the MMPA.

It is company policy for all staff to strictly follow the guidelines of the permit. Any deviation from the conditions of the permit, regardless of their alleged merits, will not be accepted as 'best practice' by the company and will be considered serious misconduct.

It is also company policy that "no action of wilful harm or the setting of wilful potential hurt towards seals is allowed"<sup>2</sup>. Any contradiction of this principle may result in dismissal for serious misconduct.

### 2.2 Compliance with the Wildlife Act 1953

The Wildlife Act 1953 (the Wildlife Act) deals with the protection and control of wild animals within New Zealand.

All seabirds which could be construed as a nuisance at NZKS marine farms are protected by the Wildlife Act. It is illegal to kill or possess any bird or animal covered under the Wildlife Act unless a permit has been obtained, or in the case of black shags, little shags and pied shags, notification by the Minister has been given.

### 2.3 Compliance with resource consent conditions

The ongoing operations of NZKS are contingent on compliance with multiple resource consent conditions. The development of this Management Plan implements the resource consent conditions relating to wildlife nuisance.

### 2.4 Compliance with NZKS policy

It is company policy that all NZKS staff must comply with this Wildlife Nuisance Management Plan.

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<sup>2</sup> NZKS Sea-pen Manual

## 3 Sharks

At least 14 species of shark are known to occur in the Marlborough Sounds (Table 1). Their presence in the Marlborough Sounds is highly seasonal and is thought to be related to the distribution of prey and reproductive behaviours. Observations of most large pelagic sharks in the region usually occur only during late spring and summer, although great white sharks are present year round in the Cook Strait area. A number of bronze whalers are recorded seasonally in the Pelorus Sound and spiny dogfish are typically recorded in large numbers during autumn and spring<sup>3</sup>. Sharks are generally not seen around the salmon farms in Queen Charlotte Sound and Tory Channel<sup>4</sup>.

**Table 1: Shark species known to occur in the Marlborough Sounds**

Common Name	Scientific Name	Risk posed
Great white**	<i>Carcharodon carcharias</i>	Potentially dangerous – risk of unprovoked attacks
Bronze whaler*	<i>Carcharhinus brachyurus</i>	Potentially dangerous – risk of unprovoked attacks
Basking*	<i>Cetorhinus maximus</i>	Traumatogenic – could attack if provoked
Common thresher	<i>Alopias vulpinus</i>	Traumatogenic – could attack if provoked
Carpet	<i>Cephaloscyllium isabella</i>	Harmless
School	<i>Galeorhinus galeus</i>	Traumatogenic – could attack if provoked
Mako	<i>Isurus oxyrinchus</i>	Potentially dangerous – risk of unprovoked attacks
Porbeagle	<i>Lamna nasus</i>	Potentially dangerous – risk of unprovoked attacks
Broadsnouted sevengill	<i>Notorhynchus cepedianus</i>	Potentially dangerous – risk of unprovoked attacks
Blue	<i>Prionace glauca</i>	Potentially dangerous – risk of unprovoked attacks
Smooth hammerhead	<i>Sphyrna zygaena</i>	Potentially dangerous – risk of unprovoked attacks
Rig/Spotted dogfish	<i>Mustelus lenticulatus</i>	Harmless
Spotted spiny dogfish	<i>Squalus acanthias</i>	Traumatogenic – could attack if provoked
Northern spiny dogfish	<i>Squalus griffini</i>	Traumatogenic – could attack if provoked

\*\* fully protected species, \* species protected from commercial fishing

<sup>3</sup> Paul Taylor, hearing evidence

<sup>4</sup> Mark Preece, hearing evidence

### 3.1 Potential for interaction

Members of the public, holiday home owners and local residents use the waters of the Marlborough Sounds for a variety of recreational activities such as diving, swimming, kayaking and fishing. A number of tourism operators also conduct such activities within the Marlborough Sounds.

Aggregations of sharks in the vicinity of salmon farms have the potential to increase human/shark interactions in these areas.

It is acknowledged that the salmon livestock may attract predators and that in the past NZKS employees occasionally fed sharks from NZKS farm structures, possibly increasing attraction to the area. This practice ceased in 2008.

### 3.2 Mitigation Measures

The following mitigation measures have been put in place to reduce the likelihood of sharks being attracted to NZKS farms and the wider area;

- Appropriate predator exclusion nets made of predator resistant material and maintained appropriately surround all salmon pens;
- The use of predator exclusion nets will reduce the likelihood of sharks from entering NZKS farms and gaining access to livestock, thereby dissuading animals from associating the farm with an 'easy feed';
- Staff are not permitted to feed sharks from the workplace;
- Staff are not permitted to fish for sharks from the workplace; and
- Dead fish must be removed as soon as reasonably practical from the net pens.

With these mitigation measures in place the risk of a shark attack around the farms is thought to be no greater than the risk of shark attack elsewhere in the marine environment.

Further information on shark management can be found in the 'NZ King Salmon Marine Mammal and Shark Management Plan'.

## 4 Marine mammals

The New Zealand fur seal (*Arctophoca australis forsteri*) (hereafter referred to as 'seals') is the only marine mammal species considered to be a potential nuisance for other users in the vicinity of NZKS salmon farms.

Seals are relatively abundant in the Marlborough Sounds and are expanding in their geographic range. Seal presence varies but higher numbers are generally experienced in winter. Seals forage at sea and return to land where they come ashore (haul out) to rest and breed.

### 4.1 Potential for interaction

In addition to the natural foreshore, fur seals are often observed hauled out on manmade structures in the marine environment (Figure 2). While hauled out ashore, seals and their waste products (faeces and urine) are associated with unpleasant odours and visual pollution.

Seals ashore also pose public health risks through the potential for seal bites and exposure to pathogens from live and dead animals and their faeces. Some pathogens of marine mammals can transfer disease to humans (and potentially domestic animals; Cooke *et al.* 1999).

Seals are known to carry the following zoonotic pathogens: tuberculosis (*Mycobacterium spp.*) (Hunter *et al.* 1998), salmonella (Duignan, 2003), campylobacter (Duignan, 2003), leptospirosis (Mackereth *et al.* 2005) and seal finger<sup>5</sup> (*Mycoplasma spp.*) (Cawthron, 1994). Those persons directly handling seals are considered to be at the greatest risk of exposure as tuberculosis, campylobacter and seal finger; as pathogens are present in infected organs of dead and live fur seals and are typically not shed into the surrounding environment. Salmonella and leptospirosis, however, can be present in fur seal faeces and urine so contact with these pathogens is less specific and more widespread. Good personal hygiene must be practiced by those who come into contact with seal waste products to prevent infection. In defence of fur seals, it should be noted that salmonella infection among marine mammals is linked to contamination of their environment by human sewage (Duignan, 2003).

### 4.2 Mitigation Measures

The following mitigation measures have been put in place to reduce the likelihood of fur seals being attracted to NZKS farms, and to reduce associated adverse interactions:

- Appropriate predator exclusion nets made of predator resistant material and maintained appropriately surround all salmon pens (Figure 3);
- The use of predator exclusion nets reduces the likelihood of seals from entering NZKS farms and gaining access to livestock and structures, thereby dissuading animals from associating the farm with an 'easy feed' or a haul out location;
- No feeding of marine mammals is permitted at NZKS farms;
- Dead fish must be removed as soon as reasonably practical from the fish pens;
- Only trained staff are permitted to handle seals; and
- Good hygiene is imperative for those persons who come into direct contact with marine mammals or their waste products.

Refer to the Marine Mammal and Shark Management Plan for detailed information on predator exclusion nets and further marine mammal management.

<sup>5</sup> A bacterial infection commonly contracted by those who historically hunted seals



**Figure 2:** A NZ fur seal hauling out onto a NZKS farm structure



**Figure 3:** An example of predator exclusion netting at a NZKS farm structure

## 5 Birds

All NZKS farms have issues with birds. These include:

- Gulls and passerines (e.g. sparrows and starlings) scavenging for fish-feed at the marine farms;
- Gulls scavenging for mortalities at the marine farms;
- Birds, predominantly gulls using the farms as a roosting site during times of inclement weather in other areas such as Cook Strait; and
- Birds defecating in the water and on marine farm infrastructure and on neighbouring properties.

Bird species which frequent NZKS farms are summarised in Table 2.

**Table 2: Bird species which frequent NZKS farms**

Common Name	Scientific Name	Foraging strategy
Little pied shag	<i>Phalacrocorax melanoleucos brevirostris</i>	Predatory
Black shag	<i>Phalacrocorax carbo</i>	Predatory
Pied shag	<i>Phalacrocorax varius varius</i>	Predatory
Little black shag	<i>Phalacrocorax sulcirostris</i>	Predatory
New Zealand king shag	<i>Leucocarbo carunculatus</i>	Predatory
Spotted shag	<i>Stictocarbo punctatus</i>	Predatory
Australasian gannet	<i>Morus serrator</i>	Predatory
Southern black-backed gull	<i>Larus dominicanus dominicanus</i>	Scavenger
Red-billed gull	<i>Larus scopulinus</i>	Scavenger
Black-billed gull	<i>Larus bulleri</i>	Scavenger
House sparrow	<i>Passer domesticus domesticus</i>	Scavenger
Common starling	<i>Sturnus vulgaris vulgaris</i>	Scavenger

### 5.1 Potential for interaction

Birds attracted to the salmon farms aggregate around the farm and in the wider vicinity. Aggregations of birds create unpleasant odours (from their faeces) as well as visual and noise pollution. In extreme cases birds defecating on neighbouring property could reduce property value and cause buildings or equipment to deteriorate and become unusable.

Increased concentrations of birds and faeces around the farms have the potential to pose some human health risks. Birds carry a number of pathogens (bacterial, viral and fungal) that can be transferred to humans. The primary zoonotic risk from seabirds is via tick-borne diseases. Three tick species that are well known from New Zealand seabirds: *Ixodes uriae*, *Ixodes jacksoni* and *Carios capensis* (Heath 1987; Heath and Hardwicke 2011), having been recorded from Australasian gannets, red-billed gulls, spotted shags, little blue penguins and white-fronted terns (Austin 1978, 1984; Hoogstraal, 1967; Tompkins *et al.* 2013).

Although the potential exists for these ticks to cause health issues in humans (flaviviruses and an alphavirus) (Tompkins *et al.* 2013), no records of human-related

illness have been attributable to these species in NZ (Heath and Hardwicke 2011) and only those who directly handle seabirds are at risk of infection.

Passerine and gull species carry a range of diseases which are potentially transferable to humans. *Salmonella* is the most commonly contracted, and those who come into direct contact with infected birds or their faeces are most at risk. *Salmonella* typically presents as acute intestinal pain and diarrhoea and extra care to personal hygiene is warranted by those interacting with birds and their faeces. In New Zealand the majority of salmonella cases are related to foodborne transmission, however contact with bird faeces was the second largest risk factor (Wilson and Baker, 2009). No transmission through exposure to contaminated recreational water was documented (Wilson and Baker, 2009), although the possibility for this route of exposure certainly exists.

## 5.2 Mitigation Measures

Although the adverse effects of birds cannot be completely eliminated, the following mitigation measures are in place to prevent birds from entering NZKS farms and to deter birds from aggregating in the farms and surrounding areas:

- Covering all pens, raceways and ponds with netting to prevent access to pellets during feeding. Nets must be high enough above the water, and of sufficient tension, to prevent large numbers of birds from sitting on them and lowering them to a level where feed and fish can be eaten;
- Installing netting around rafters in utility sheds and out-buildings where applicable to prevent roosting;
- Covering all feed bins with secure lids;
- Sweeping-up spilt pellets from walkways, pontoons and floors; and
- Covering all mortality bins with secure lids.

## 6 Company Response

In the event there is an identified effect on local amenity values through wildlife nuisance as a result of the salmon farm; the company will meet with those directly affected and discuss options to minimise the wildlife nuisance and if agreed assist where possible with that minimisation.

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## 12 BIRDS POLICY

### 12.1 Introduction

All NZKS marine farms are located within the Marlborough Sounds, and the three freshwater farms are located near the coast or waterways (Takaka, Tentburn and Waiau).

All NZKS farms have problems with birds. These include:

- Seagulls scavenging for fish-feed and mortalities at the marine farms
- Shags predating smolt at the freshwater farms
- Seagulls defecating in the water and on marine farm infrastructure
- Passerines (e.g. sparrows and starlings) scavenging for fish-feed at the freshwater and marine farms
- Passerines defecating on freshwater and marine farm infrastructure

### 12.2 Impact of birds

The impacts of birds on NZKS are:

- An increase in feed conversion by feed being scavenged and fish being eaten
- A threat to fish health by parasites carried in bird faeces
- A threat to employee health by working in areas covered in bird faeces

### 12.3 Control measures

There are a number of control measures available to NZKS to prevent or minimise the impact of birds. In order of priority they are:

- Prevention and deterrence
- Controlled euthanasia

#### 12.3.1 Prevention and deterrence

This is the preferred control measure. Methods include:

- Covering all pens, raceways and ponds with netting to prevent access to the water and to pellets during feeding. Nets must be high enough above the water, and of sufficient tension, to prevent large numbers of birds from sitting on them and lowering them to a level where feed and fish can be eaten
- Installing netting around rafters in utility sheds and out-buildings to prevent roosting
- Covering all feed bins with secure lids
- Keeping all feed-store doors closed when not in use
- Sweeping-up spilt pellets from walkways, pontoons and floors
- Covering all mortality bins and pits with secure lids
- Installing bird scaring devices, such as bird alarm calls or non-lethal cannon

## 12.3.2 Controlled euthanasia

The controlled euthanasia of birds is an absolute last resort for NZKS and will only be permitted once all other measures have proved ineffective. Most bird species are fully protected by law, but under the Wildlife Act 1953 there are some species that may be euthanised. Of these, the following have an impact on NZKS and may be targeted (see: <http://nzbirdsonline.org.nz/>):

- Black-backed gull (*Larus dominicanus*). See photograph below.
- All exotic passerine species
- Shag species are protected and may not be euthanised without permission from the Minister for Conservation.
- The authority to grant permission to euthanised Black Shags is delegated to NZ Fish and Game Council.
- The use of bait stations (poison wheat) for passerine control is permitted if other control measures have proved ineffective or as a temporary measure until a more permanent physical barrier can be erected.



Black-backed gull (*Larus dominicanus*)

## 12.4 New Zealand King Shag Management Plan

NZKS has a Management Plan for the New Zealand King Shag (*Leucocarbo carunculatus*) part of the Board of Inquiry process. It was decided that a King Shag Management Plan (KSMP) for farms in the Waitata Reach would be required to ensure the establishment and operation of the marine farm does not result in a reduction in the population of King Shag in the Marlborough Sounds, with particular regard to the Duffers Reef Shag colony.

The KSMP can be found on the NZKS website: <http://www.kingsalmon.co.nz/>



New Zealand King Salmon

# **The New Zealand King Salmon Co. Limited**

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## **Navigation Risk Reduction & Safety Management Plan**

**20 June 2017**

<b>Prepared for</b>	<b>The New Zealand King Salmon Co. Ltd</b>
<b>Report prepared by</b>	<b>New Zealand King Salmon</b>
<b>Consultation with</b>	<b>MDC Harbourmaster</b>
<b>Reviewed by</b>	
<b>Version 1</b> <b>Version 2</b>	<b>8 March 2015</b> <b>20 June 2017</b>

DRAFT

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## Table of Contents

1. Introduction .....	3
2. Purpose.....	3
3. Objectives .....	3
4. Ferry Operators.....	4
5. Construction Plan.....	4
6. Review.....	4
Appendix 1 - Management Plans and Safety Systems.....	5
Appendix 2 - Summary of Consent Conditions checklist - Kopāua & Waitata.....	6
Appendix 3 - Summary of Consent Conditions checklist - Ngamahau.....	8
Appendix 4 - Summary of Consent Conditions checklist - Te Pangu .....	10
Appendix 5 - Summary of Consent Conditions checklist – Clay Point .....	11

## 1. Introduction

The New Zealand King Salmon Co. Ltd (NZ King Salmon) currently operates eight salmon farms (eleven sites) in the Marlborough Sounds, located at Ruakaka Bay and Otanerau Bay (Queen Charlotte Sound) Forsyth Bay, Waihinau Bay, Waitata, Kopāua (Richmond) and two sites at Crail Bay (Pelorus Sound) Te Pangu Bay, Clay Point, and Ngamahau (Tory Channel).



## 2. Purpose

This Risk Reduction and Safety Management Plan provides details of the risks and controls in relation to navigation and to safety. These are addressed in detail by documents already prepared by NZ King Salmon to confirm that the Risk Controls (design criteria, processes and procedures) are in place to operate the marine farms and minimise the potential for adverse navigational effects.

This Management Plan provides a summary of each document and shows consistency with the 'Guidelines for Aquaculture Management Areas and Marine farms in New Zealand' (summary attached as Appendix 1 - Management Plans and Safety Systems).

This Management Plan is applicable to all NZ King Salmon sites.

## 3. Objectives

The objective of the Navigation Risk Reduction and Safety Management Plan is to provide evidence that consent conditions have been satisfactorily addressed by the consent holder.

This management plan provides a succinct summary of NZ King Salmon documents detailing processes and procedures required to address navigational risk as a result of operating the salmon farm. It also includes a list of the documents to be supplied to the harbourmaster.

The Management Plan provides the following:

- Management plans and safety management systems as required by consent conditions;
  - 20-30 for Waitata and Kopāua
  - 18-30 for Ngamahau
  - 26 for Te Pangu
  - 23 for Clay Point
- Design and construction information (design criteria, processes and procedures)
- Maintenance records
- Control and compliance records
- Minimises the potential for adverse navigation effects including ferries

## 4. Ferry Operators

This management plan identifies processes and procedures to minimise the potential for adverse navigation effects in relation to ferry operators including:

- Managing the effects of the presence of ferries and ferry wash
- Avoidance of any activities that may interfere with the ferries
- A construction plan for planned work between the farm and the ferry tracks
- Communication with ferry operators to advise of maintenance that could affect them
- Identification and awareness of ferry transit schedules

## 5. Construction Plan

At times NZ King Salmon is required to carry out on water servicing of its marine farm structures and equipment. This is particularly relevant for farms in Tory Channel when activities are being carried out in the area between the farm and ferry track. This Plan (checklist) is provided to help ensure risks are avoided or mitigated.

1. A senior manager (e.g. Regional Manager) or designate will oversee any construction activity including pen movements.
2. Plan the activity
  - a. Assess the risks to and by ferry traffic
  - b. Consider ferry transit schedules
  - c. Plan timing and farm vessel/equipment movements
  - d. Mitigate risk such as allowing adequate time between ferry transits, minimising distance moved from farm, suitably qualified skippers and appropriate vessels.
  - e. Consider the effect of tidal flows
  - f. Have a written emergency plan
  - g. Consult with Harbourmaster and Ferry operators if it is considered there is potential risk to or by the ferry operators (e.g. pen tow)
3. Communicate clearly with the ferry operators and harbourmaster.
4. Arrive at an agreed plan of operation; must be confirmed by email or similar
5. In the event of an emergency – refer to the Emergency Procedures Contingency Plan.

## 6. Review

- The plan will be reviewed and updated to reflect change in circumstances and at not more than 5 yearly intervals.
- The review will be undertaken in consultation with the harbourmaster.

## Appendix 1 - Management Plans and Safety Systems

Taken from the 'Guidelines for Aquaculture Management Areas and Marine farms in New Zealand', (as recommended by the Marlborough Harbour Master)

CHECKLIST OF DOCUMENTS REQUIRED	Appendix No Waitata & Kopāua	Appendix No Ngamahau	Appendix No Te Pangu	Appendix No Clay Point
A design plan for the layout and structure of the farms	2	3	4	5
A maintenance plan for moorings, navigational lighting and associated equipment, together with a record system of all maintenance-available to Marlborough District Council	2	3	4	5
A mooring design plan that will be satisfactory for the size of the structure, especially in regards to depth, tides, currents sea and swell conditions-Proof of fit for purpose	2	3	4	5
AtonNs plan (Aids to navigation)	2	3	4	5
<b>DESIGN AND CONSTRUCTION</b>				
Regional Council to be satisfied mooring methods, design, materials and maintenance is satisfactory. May need to be approved by qualified engineer.	2	3	4	5
Ensure aid to navigation are visible between the hours of sunrise and sunset and at times of reduced visibility	2	3	4	5
Moorings are suitable for the purpose and farm is in the correct position	2	3	4	5
<b>MAINTENANCE</b>				
Maintenance records for moorings	2	3	4	5
Records on aids to navigation	2	3	4	5
Records of structural integrity, mooring lines, anchors system and underwater maintenance carried out.	2	3	4	5
Records of surveys and underwater checks	2	3	4	5
Records of checks on the position of the farm	2	3	4	5
Above Records available for audit to regional council	2	3	4	5
<b>CONTROL AND COMPLIANCE</b>				
The marine farm remains within the permitted area	2	3	4	5
Maintenance of farm kept up to satisfactory level	2	3	4	5
Aids to navigation and ongoing maintenance are kept to satisfactory level	2	3	4	5
Audit of above undertaken by regional council or competent person	2	3	4	5
Construction Plan to manage the effects of ferries				5

**Appendix 2 - Summary of Consent Conditions checklist - Kopāua & Waitata**

<b>Council to be Informed of Installation of Structures</b>	<b>Condition No.</b>	<b>HM report frequency</b>
The Council shall be notified that structures have been placed on the marine farm and provided with a plan showing the locations of those structures, within one month following the initial placement of the first structures at the marine farm, and within one month of the addition of further structures, and informed of the coordinates of the starting corner of the marine farm for the purposes of Condition 12	20	As structures are placed
<b>Marine Farm Navigational Lighting and Marking</b>		
The placement of marine farm navigational lighting and marking shall be approved by the Harbourmaster under his or her Maritime Delegation from the Director of Maritime Safety pursuant to section 200, 444(2) and 444(4) of the Maritime Transport Act 1994	21	Prior to structures being placed
<b>Structural Engineering Design, Installation and Maintenance</b>		
Design plan, including design loading for anchoring and warp systems specified by suitably qualified and experienced Chartered Professional Engineer (CPE) approved for the layout and structure of the farm	22	N/A
Design reports and plans provided to Manager, Resource Consents, Marlborough District Council	22	
A suitable qualified and experienced CPE shall supervise installation and certify installation in accordance with design report and plans.	22	On completion
During installation of anchoring and mooring warp system, a test pull out loading undertaken in accordance with the Engineering Feasibility Report dated September 2011.	23	During installation
A report describing the results of the test prepared by CPE specified in condition 20 and provided to the Council	23	On completion
The anchoring and mooring system to be monitored and maintained in accordance with a Marine farm Mooring Monitoring and Maintenance Schedule	24	In accordance with the Schedule and reported on annually
Reviewed by a CPE and provided to the MDC prior to initial placement of first structure	24	
Monitoring to include periodic monitoring of actual loads caused by hydrodynamic forces and design load is not exceeded. If exceeded the causes investigated and rectified	24	Quarterly
Mooring system designed and maintained that the maximum loading under all normal tidal and weather conditions on any mooring is the lesser of 20% of the anchor pullout capacity or 20% of the mooring line tension capacity after allowing for splices and ties.	25	Prior to installation
Structure and mooring system designed that the failure of a critical component under loading does not result in the progressive breakup of the structure or mooring system	26	
Beyond 20 metres from any surface structure, no mooring line shall be within 4 m of the surface of the water.	27	Quarterly Audits
Maintain all structures and fixtures to ensure that they are restrained, secure and in working order so as not to create a navigational hazard	28	Annually
<b>Navigational Information and Safety</b>		
One month prior to installation notify Harbour Master, Land Information New Zealand, Ngati Koata Trust Board that the structure are to be placed within the area and provide them with a copy of Farm Layout Plan in Figure 1 and copy as required	29	As per condition

in condition 20. Any additions or disestablishment of the structure shall be notified in a similar manner		
Following the initial placement of the first structure at the marine farm the consent holder shall:		
Ensure notification alerting mariners to the presence and of the location of the marine farm is broadcast on Marlborough Radio as directed by the Harbour master	30a	Notice to Mariners and Navigation warning issued by HM prior to installation commencing
Prepare and implement education strategy in conjunction with the Harbourmaster	30b	Ongoing
Prepare a Navigation and Risk Reduction and Management Plan (NRRMP) to provide details of the risk controls (design, criteria, processes and procedures) put in place in compliance with conditions 22-30 to minimise the potential for adverse effects due to operation of a marine farm	31	Prior to installation, current copy to be lodged with Harbour Master
The NRRMP requires a 5 yearly update	31	Revised draft to be submitted to Harbour Master prior to dissemination
The initial NRRMP preparation undertaken in consultation with the Harbourmaster.	31	Prior to installation

**Appendix 3 - Summary of Consent Conditions checklist - Ngamahau**

<b>Council to be Informed of Installation of Structures</b>	<b>Condition No.</b>	<b>HM report frequency</b>
The Council shall be notified that structures have been placed on the marine farm and provided with a plan showing the locations of those structures, within one month following the initial placement of the first structures at the marine farm and within one month of the addition of further structures, and informed of the coordinates of the starting corner of the marine farm for the purposes of Condition 10	18	As structures are placed
<b>Marine Farm Navigational Lighting and Marking</b>		
The placement of marine farm navigational lighting and marking shall be approved by the Harbourmaster under his or her Maritime Delegation from the Director of Maritime Safety pursuant to section 200,444(2) and 444(4) of the Maritime Transport Act 1994	19	Prior to structures being placed
<b>Structural Engineering Design, Installation and Maintenance</b>		
Design plan, including design loading for anchoring and warp systems specified by suitably qualified and experienced Chartered Professional Engineer approved for the layout and structure of the farm	20	
Design reports and plans provided to Manager, Resource Consents, Marlborough District Council	20	
A suitable qualified and experienced Chartered Professional Engineers (CPE) shall supervise installation and certify installation in accordance with design report and plans	20	On installation
During installation of anchoring and mooring warp system, a test pull out loading undertaken in accordance with the Engineering Feasibility Report dated September 2011.	21	During Installation
A report describing the results of the test prepared by CPE specified in condition 20 and provided to the Council	21	On completion
The anchoring and mooring system to be monitored and maintained in accordance with a Marine farm Mooring Monitoring and Maintenance Schedule	22	In accordance with the Schedule and reported on annually
Reviewed by a CPE and provided to the MDC prior to initial placement of first structure	22	
Monitoring to include periodic monitoring of actual loads caused by hydro dynamic forces and design load is not exceeded. If exceeded the causes investigated and rectified	22	Quarterly
Mooring system designed and maintained that the maximum loading under all normal tidal and weather conditions on any mooring is the lesser of 20% of the anchor pullout capacity or 20% of the mooring line tension capacity after allowing for splices and ties.	23	Prior to installation
Structure and mooring system designed that the failure of a critical component under loading does not result in the progressive breakup of the structure or mooring system	24	
Beyond 20 metres from any surface structure, no mooring line shall be within 4 m of the surface of the water.	25	Quarterly
Maintain all structures and fixtures to ensure that they are restrained, secure and in working order so as not to create a navigational hazard	26	Annually
<b>Navigational Information and Safety</b>		
One month prior to installation notify Harbour Master, Land Information New Zealand, Te Atiawa Manawhenua o Te Tau Ihu Trust (or mandated organisation)that the structure are to be placed within the area and provide them with a copy of Farm	27	As per condition

Layout Plan in Figure 1 and copy as required in condition 18. Any additions or disestablishment of the structure shall be notified in a similar manner		
Following the initial placement of the first structure at the marine farm the consent holder shall:		
Ensure notification alerting mariners to the presence and of the location of the marine farm is broadcast on Marlborough Radio as directed by the Harbour master	28a	Notice to Mariners and Navigation warning issued by HM prior to installation commencing
Prepare and implement education strategy in conjunction with the Harbourmaster	28b	Ongoing
Ngamahau to be fitted with GPS high precision monitoring system, with alarm and notification system in consultation with Harbourmaster.	29	Prior to installation
Development of Contingency Plan for earthquake, tsunami and vessel collision notification in the event of an emergency in consultation with Harbourmaster and Ferry Operators using Tory Channel	30	Reviewed annually
Prepare a Navigation and Risk Reduction and Management Plan (NRRMP) to provide details of the risk controls (design, criteria, processes and procedures) put in place in compliance with conditions 20-30 to minimise the potential for adverse effects due to operation of a marine farm	31	Prior to installation, current copy to be lodged with Harbour Master
The NRRMP requires a 5 yearly update	31	Revised draft to be submitted to Harbour Master prior to dissemination
The initial NRRMP preparation undertaken in consultation with the Harbourmaster.	31	Prior to installation

**Appendix 4 - Summary of Consent Conditions checklist - Te Pangu**

<b>Structural Engineering Design, Installation and Maintenance</b>		
Any mooring system used to secure the structures shall be designed and certified by a suitably qualified chartered professional engineer with appropriate expertise in marine engineering. An engineer's certificate shall be provided to the Compliance Manager, Marlborough District Council, at least 1 month prior to any significant changes being made to the design or operation of the mooring system	22	
The mooring system to be monitored and maintained in accordance with a Marine farm Mooring Monitoring and Maintenance Schedule	22	In accordance with the Schedule and reported on annually
Beyond 20 metres from any surface structure, no mooring line shall be within 4 m of the surface of the water.	23	
<b>Marine Farm Navigational Lighting and Marking</b>		
The placement of marine farm navigational lighting and marking shall be approved by the Harbourmaster under his or her Maritime Delegation from the Director of Maritime Safety pursuant to section 200,444(2) and 444(4) of the Maritime Transport Act 1994	24	Provided by the Harbourmaster
The net pens and barge shall carry the name of the consent holder and the site issued by MDC (#8408) displayed in such a manner that they can be clearly read from a distance of 10 metres	25	
<b>Navigational Information and Safety</b>		
Prepare a Safety Management Plan to provide details of the risk controls (design, criteria, processes and procedures) put in place in compliance with relevant conditions to minimise the potential for adverse effects due to operation of a marine farm	26	To be lodged with Harbour Master & Compliance Manager MDC
The Safety Management Plan is undertaken in consultation with the Harbourmaster.	26b	
A mooring design plan for the size of the structure and the position intended with respect to water depth, tides and currents, sea and swell conditions and seabed composition.	26c	

**Appendix 5 - Summary of Consent Conditions checklist – Clay Point**

<b>Structural Engineering Design, Installation and Maintenance</b>		
Any mooring system used to secure the structures shall be designed and certified by a suitably qualified chartered professional engineer with appropriate expertise in marine engineering. An engineer's certificate shall be provided to the Compliance Manager, Marlborough District Council, at least 1 month prior to any significant changes being made to the design or operation of the mooring system	18	
The mooring system to be monitored and maintained in accordance with a Marine farm Mooring Monitoring and Maintenance Schedule	18	In accordance with the Schedule and reported on annually
Beyond 20 metres from any surface structure, no mooring line shall be within 4 m of the surface of the water	19	
<b>Marine Farm Navigational Lighting and Marking</b>		
The placement of marine farm navigational lighting and marking shall be approved by the Harbourmaster under his or her Maritime Delegation from the Director of Maritime Safety pursuant to section 200,444(2) and 444(4) of the Maritime Transport Act 1994	20	Provided by the Harbourmaster
The net pens and barge shall carry the name of the consent holder and the site issued by MDC (#8407) displayed in such a manner that they can be clearly read from a distance of 10 metres	21	
<b>Navigational Information and Safety</b>		
Prepare a Safety Management Plan to provide details of the risk controls (design, criteria, processes and procedures) put in place in compliance with relevant conditions to minimise the potential for adverse effects due to operation of a marine farm	23	To be lodged with Harbour Master & Compliance Manager MDC
The Safety Management Plan is undertaken in consultation with the Harbourmaster.	23b	
A mooring design plan for the size of the structure and the position intended with respect to water depth, tides and currents, sea and swell conditions and seabed composition.	23c	
A construction plan to manage the effects of ferries and ferry wash, and avoid inference with navigation of ferries	23d	



New Zealand King Salmon

# The New Zealand King Salmon Company Ltd

## **Biosecurity Management Plan**

- Ruakaka Bay
- Otanerau
- Te Pangu
- Claypoint
- Ngamahau
- Wahinau
- Waitata
- Kopaua
- Forsyth
- Takaka
- Waiau
- Tentburn

30 Oct 2018

<b>Prepared for</b>	The New Zealand King Salmon Co. Limited
<b>Report prepared by</b>	NZ King Salmon
<b>Reviewed by</b>	Dr Peter V A Anderson BSc, DipSci, BVSc, MANZCVS.  Tangata Whenua Panel <ul style="list-style-type: none"><li>• Ngāti Kōata Trust</li><li>• Te Runanga o Ngāti Kuia Charitable Trust</li><li>• Te Ātiawa o Te Waka-a-Māui Trust</li></ul>
<b>Revision 30 October 2018 reviewed by</b>	Dr Peter V A Anderson BSc, DipSci, BVSc, MANZCVS.

## Prepared by:

NZ King Salmon

## Contents

1	Introduction .....	3
2	Consultation.....	4
3	Objectives.....	4
3.1	Control Zones.....	5
3.2	Predisposing Factors to Infectious Disease.....	5
3.3	Modes of Transmission .....	6
3.4	Principles of Control and Eradication.....	6
3.5	Critical Control Points .....	9
3.6	Virkon Dilution Rates .....	10
3.7	Health and Safety Precautions.....	10
3.8	Disposal of Virkon .....	10
4	Affected Parties.....	11
5	Review.....	11
6	Protocols .....	12
7	Key Biosecurity Areas.....	19
Table 1 – Organisms primarily affecting fish.....		8
Table 2 – Organisms affecting marine or freshwater environments .....		8
Appendix 1 - Cleaning and Disinfection Procedure .....		21
Appendix 2 - Signage for Status RED and GREEN.....		24
Appendix 3 - Control Zones.....		26
Appendix 4 - List of Potentially Affected Parties .....		28
Appendix 5 - Sample contractor letter for change in biosecurity status .....		31
Figure 1 – Unwanted Marine Pests.....		29
Figure 2 – Virkon – Dilution Rates.....		30

## 1 Introduction

New Zealand King Salmon (NZKS) currently has eight salmon farms (eleven sites) in the Marlborough Sounds. Located in the Pelorus Sound are; Waihinau Bay, Waitata, Kopāua, Forsyth Bay and two sites at Crail Bay which are currently fallowed. Sites in Queen Charlotte Sound and Tory Channel are; Ruakaka Bay, Otanerau Bay, Te Pangu Bay, Clay Point and Ngamahau.

This Biosecurity Management Plan has been developed in conjunction with on-farm management measures to prevent, control or contain biosecurity risks to the extent practicable.



This management Plan has been developed to minimise the risk of spreading marine pests and infectious disease agents because of the establishment and operation of the salmon farms.

This Biosecurity Management Plan has been reviewed by Dr Colin Johnston BVMS (Hons) MACVSc (Aquaculture Medicine) CertAqV, who is qualified in marine biosecurity and aquatic animal diseases. The 2018 review was completed by Dr Peter V A Anderson BSc, DipSci, BVSc, MANZCVS.

## 2 Consultation

This Biosecurity Management Plan has been developed in consultation with Ngāti Kōata Trust, Te Runanga o Ngāti Kuia Charitable Trust, the Tangata Whenua Panel in relation to Waitata and Kopāua and Te Ātiawa o Te Waka-a-Māui Trust in relation to Ngamahau.

This Biosecurity Management Plan has also been adopted by all existing NZKS sites.

## 3 Objectives

This Biosecurity Management Plan has been developed to minimise or prevent biosecurity risks from occurring and to facilitate a coordinated, well informed and timely response to the detection of biosecurity risks faced in NZKS operations, company wide.

It is designed to reduce the transmission of pathogens between or within control regions as well as develop a proactive ‘hygiene culture’ of on-farm, as well as vector-based, management measures to reduce the risk of spread, including:

1. Methods to manage vectors that could spread marine pests and disease agents to or from salmon farms;
2. Routine practices to manage fouling of nets and structures;
3. A passive surveillance regime to facilitate early detection of unusual or suspicious organisms associated with farm structures;
4. An effective disease surveillance regime for salmon stock;
5. The use of husbandry and harvesting methods consistent with best practice for the minimisation of disease risk;
6. On-farm management measures to prevent control or contain biosecurity risks to the extent practicable.
7. Specification of the parties to be notified should any new biosecurity risk from marine pests or disease agents be identified at the farm. These include the Tangata Whenua panel for Waitata and Kopāua and Te Ātiawa o Te Waka-a-Māui Trust for Ngamahau, land owners and tourism / recreation businesses within 1km of the farm. See Appendix 4 - List of Potentially Affected Parties.
8. This Management Plan is based on a two-tiered system of alert depending on the disease status of the company with changing actions and monitoring processes throughout the steps.

**Status Green** - A background (normal farming) phase of heightened hygiene awareness to disease risks within and between operational regions or zones. Causes of mortality are monitored to provide early warning and plans and equipment are kept updated ready to allow rapid response, therefore minimising risk. Communication, both on-farm and between regions / zones is critical in maintaining awareness.

**Status Red** – An alert phase where mitigation techniques are fully utilised, effectiveness monitored; and communication increased. Full cleaning and disinfection procedures are utilised by both the control zone containing the possible disease reservoir (control of outgoing pathogens) and regions naïve to the disease (control of incoming pathogen risk). This may lead to a phase of full damage control to a major infectious disease loss. All resources are utilised to produce a coordinated response to reduce fish fatality and control the associated problems of disease spread to stocks or other control zones. This is characterised by timely mitigation and mortality disposal and encompasses legislative requirements to notify government agencies.

### 3.1 Control Zones

For the purposes of this document, the following **CONTROL ZONES** are defined. Although protocols between pens, leases or farms are important in minimising disease risk, due to the external constraints placed on the company under the current resource consent process, the primary focus is management of risks between CONTROL zones see Appendix 3 - Control Zones

#### Farming Operations:

1. Tentburn
2. Takaka
3. Waiau
4. Tory Channel – Ruakaka Bay, Clay Point, Te Pangu Bay, Ngamahau
5. Otanerau Bay
6. Outer Pelorus Sounds - Waihinau Bay, Forsyth Bay, Waitata, Kopāua
7. Crail Bay
8. Picton service base

### 3.2 Predisposing Factors to Infectious Disease

Some of the major losses in salmonid culture are due to factors such as natural toxins, environmental events, and nutritional issues or systems failures. In recent years the incidence of mortalities due to algal and jellyfish events have been increasing; however, most global losses are caused by disease processes involving infectious agents. Aquaculture, like any other farming system, provides an environment in which disease-causing organisms can multiply leading to significant morbidity, mortality and loss of productivity. Infectious agents may be parasites, fungi, bacteria or viruses. However, it is important to understand that disease does not necessarily follow just from the presence of a pathogen. Fish are more predisposed to disease if stressed; therefore, farming activities should be conducted with minimal stress wherever possible. Predisposing factors to be considered are:

- *Smoltification:* A time of extreme physiological change which causes prolonged stress
- *Early or late transfer to seawater:* Osmotic shock causes immunosuppression and decreased stress tolerance.
- *Sexual Maturity/Spawning:* Changes in hormone levels cause fish to become stressed and susceptible to osmotic challenge as well as more susceptible to certain pathogens.
- *Elevated temperature:* High temperature is a major factor involved in susceptibility to disease. Disease organisms also tend to multiply more rapidly at higher temperature.
- *Poor water quality:* Sub lethal exposure to seabed out gassing, exposure to algal toxins, low flow or high stocking density. This risk can be minimised through sensible farming practices.
- *Oxygen levels:* Low oxygen or poor oxygen replenishment (poor water flow) causes respiratory distress and may induce stress response. Prolonged oxygen super saturation can also cause morbidity.
- *Physical damage to the skin, gills or protective mucus* from rough handling, predator strike, parasites, jellyfish, suspended particulates and algal blooms can

lead to infection. Good management practice is paramount in minimising damage to the stock.

- *Disease status:* Fish suffering from one health issue are already stressed and immune compromised, thus more susceptible to other diseases.
- *Behavioural Stresses* associated with social domination, crowding, unfavourable light conditions or the sudden appearance of predators within the visual range of the fish
- *Poor hygiene standards:* Failure to isolate stock from disease sources through improper cleaning and disinfection of equipment, presence of infected fish in the pen/farm /hatchery water supply (note the necessity to empty all fish from a pen before pumping more fish in), failure to remove dead or diseased fish, failure to clean divers and mort bags between pens/farms/year classes, personnel working on more than one farm, failure to clean/disinfect equipment between sites.

### **3.3 Modes of Transmission**

Marine pests and diseases are spread through recognised conveyors including:

- *Fish stock:* Fish do not need to display 'active disease' in order to spread it as individuals may be 'carriers'. The risk of spread is increased when stock are stressed. Diseased mortalities are highly infectious and should be removed frequently during active disease. Live fish should never be exposed to processing waste (including blood water). Year classes should be kept separate wherever practical.
- *Staff and Visitors:* Movement of staff between sites; contractors; visitors from other farming regions (national or international). This risk is best countered by signage and disinfection stations to clean gear between sites within a Control Region. Gumboots, wet weather gear and PPE should not be transferred between Control Regions. Visitors should sign into each facility declaring recent previous contact with farmed fish so that farm staff may manage the risk appropriately.
- *Equipment, vehicles and transportation – including contractors and other service suppliers:* Nets, pallets and bins, vessels, handling equipment, etc. Risk increases with porosity of the surface and lack of attention to hull cleanliness through antifoul.
- *Other aquatic life, birds and animals:* Can be implicated in disease spread, it is good practice to exclude or remove wild animals from pens. Predators may damage or stress stock.
- *The aquatic environment (water and sediments):* Transmission through water is best negated by distance between farm sites, though water movement within Control Regions inevitably links all farms within that region. Infectious agents can survive for long periods in wet or damp conditions that exist on equipment, vehicles and personal equipment. Sediments can harbour infective stages for variable periods, this risk is best minimised through fallowing practices where that is possible.

### **3.4 Principles of Control and Eradication**

- *Rapid Detection and Identification of disease:* Regular mortality removal (diving, mort airlifts) to establish mortality trend is essential in spotting the onset of a disease. As a guideline, diving/airlift should be carried out more regularly at higher loss levels. Due to rapid breakdown and increased pathogen production rates, mortality removal should be more frequent in summer than winter, and similarly more frequent in smolt than in growers. Behavioural observations,

including swimming behaviour, colour, feed response and clinical signs (external or internal pathology) also need to be recorded and communicated. Where disease is suspected, the company veterinarian should be consulted so that an investigation can be initiated as appropriate. Where there is an identification of a notifiable disease organism, an unwanted organism or an organism new to New Zealand (or suspicion of any of these) the MPI Hotline 0800 80 9966.

- *Staff awareness* of potential marine pests will enable rapid identification and notification to MPI. Samples should be taken and sent for formal identification. Confirmation of an unwanted organism should also be made to MDC. The suite of pest species that could affect the Marlborough Sounds is largely unknown and therefore management response cannot be clearly determined until the organism is identified. Where there is an identification of a notifiable marine pest, an unwanted marine pest or a new marine pest to New Zealand (or suspicion of any of these) the MPI Hotline 0800 80 9966.
- *Notifiable disease organisms* are listed in Table 1 – Organisms primarily affecting fish and unwanted organisms are listed in Table 2 – Organisms affecting marine or freshwater environments Table 2 – below.
- *Cleaning and Disinfection:* Decontamination of company and contractor / suppliers' equipment, materials, tanks and work areas by thorough cleaning before disinfection. See below Virkon dilution rates for details of disinfection methods and their indications. Disinfection stations should display signage to notify staff/visitors of hygiene procedures. See attached Appendix 1 - Cleaning and Disinfection Procedure
- *Quarantine and Movement:* The following practices must be considered when implementing control procedures:
  - Set up of 'quarantine areas' around infected pen, farm site or CONTROL zone
  - Live fish transportation between farms and/or between CONTROL zones
  - Fish harvesting and transportation to processing plants, discharge of harvesting effluent (blood water)
  - Movement of personnel, nets/equipment and vessels associated with the operation of the farms within and between CONTROL zones
  - Isolation of mortalities, mort bags, dive equipment and mort bins between or within CONTROL zones.
- *Disposal:* Disposal of mortalities or processing waste should be carried out regularly to an approved disposal site using approved mortality containment and transfer systems.
- *Notification:* Under sections of the Biosecurity Act (1993), any person who knows or has reason to believe there is an incidence of a notifiable disease must notify the Ministry for Primary Industries (MPI) New Zealand 0800 809966.
- *Fallowing:* Farm sites may require full fallowing (3-6 months) following significant loss from infectious disease. This may be requested by the MPI or applied internally by NZKS Management on a case by case basis.
- *Destruction:* Killing and disposal of infected animals to prevent spread of disease, usually under supervision of MPI.
- *Emergency harvest:* the removal of market size fish from the farm ahead of schedule may be considered to reduce biomass and fish numbers on a site undergoing a bio-security issue, where there is no risk to human health and fish quality is maintained.

- Advice will be received on potential management and control options for any identified unwanted marine pest and action taken accordingly.

**Table 1 – Organisms primarily affecting fish<sup>1</sup>**

Scientific name	Common name
<i>Aeromonas salmonicida</i>	Furunculosis
<i>Aphanomyces invadans</i>	Epizootic ulcerative syndrome
Epizootic haematopoietic necrosis virus	Epizootic haematopoietic necrosis
<i>Gyrodactylus salaris</i>	Gyrodactylosis
Infectious haematopoietic necrosis virus	Infectious haematopoietic necrosis
Infectious pancreatic necrosis virus (exotic strains)	Infectious pancreatic necrosis
Infectious salmon anaemia virus	Infectious salmon anaemia
Koi herpesvirus	Koi herpes virus disease
<i>Myxobolus cerebralis</i>	Whirling disease
Oncorhynchus masou virus	Oncorhynchus masou virus disease
Red sea bream iridovirus	Red sea bream iridovirus disease
<i>Renibacterium salmoninarum</i>	Bacterial kidney disease
Spring viraemia of carp virus	Spring viraemia of carp
Viral haemorrhagic septicaemia virus	Viral haemorrhagic septicaemia
<i>Yersinia ruckeri</i> (exotic strains)	Enteric red mouth disease

**Table 2 – Organisms affecting marine or freshwater environments<sup>2</sup>**

Scientific name	Common name
<i>Asterias amurensis</i>	Northern Pacific seastar
<i>Carcinus maenas</i>	European shore crab; green crab
<i>Caulerpa taxifolia</i>	A green seaweed
<i>Cherax quadricarinatus</i>	Red claw
<i>Cherax tenuimanus</i>	A marron
<i>Eriocheir sinensis</i>	Chinese mitten crab
<i>Haliotis rufescens</i>	Red abalone
<i>Ictalurus punctatus</i>	Channel catfish
<i>Penaeus orientalis</i> ( <i>P. chinensis</i> )	Chinese prawn
<i>Potamocorbula amurensis</i>	Asian clam
<i>Sabella spallanzanii</i>	Mediterranean fanworm

Photographs of six unwanted marine organisms listed above are attached on Figure 1 – Unwanted Marine Pests.

Other organisms such as *Styela clava* may be included given their potential threat to aquaculture.

<sup>1</sup> Schedule of notifiable organisms 2016

<sup>2</sup> Schedule of notifiable organisms 2016

### 3.5 Critical Control Points

Critical Control Points are points on the farm where actions can be taken to reduce the risk of disease introduction and / or spread.

Disease may result from exposure to pathogens such as viruses and bacteria. Disease can spread through recognised conveyors such as fish stock, staff (including contractors) and visitors, equipment, vehicles and transportation, other aquatic life, birds and animals, and the aquatic environment.

Biosecurity involves the exclusion of disease-causing organisms from the environment. It is achieved using external and internal biosecurity barriers:

- External Barriers - blocking the spread of disease onto and off a fish farm.
- Internal Barriers - blocking the spread of disease within the fish farm.
- The correct use of cleaning and disinfectants is very important and ensures that pathogen challenge is minimised. This in turn will dramatically reduce the potential for disease and increased mortality.

Pathogen reduction can occur at the following locations:

Site security	Footbaths and alcohol hand washes on wharfs, cages and feed and accommodation barges as well as all major entrances to a site. Site specific protective clothing for visitors where relevant.
Personnel hygiene	Dive suits and equipment, hand hygiene, PPE, boots, other personal equipment
Equipment disinfection	Hand nets, harvesting equipment, weighing equipment, fish pumps and grading equipment, working nets etc
Floating structures	Regular removal of fouling organisms on floating structures, grower and predator nets.
Surface disinfection	Tables, floors, walls, barge decks
Rodent control	Pest Management

Prior to leaving a site for a different control zone, every item of equipment should be treated as though it is contaminated, and the cleaning and disinfection procedure should be followed accordingly.

- The disinfection of personnel and equipment between sites requires a level of dedication and consistency to ensure pathogens are removed and destroyed adequately. Disinfection is not a suitable form of pathogen control on its own as it relies on a partnership with thorough cleaning. Disinfectants are not effective when there is a build up of dirt and other organic matter on the surfaces, so this needs to be removed prior to their use using appropriate detergents and freshwater. Depending upon the disinfectant used there is a degree of contact time required to allow sufficient pathogen removal and destruction.
- With all disinfectants it is important to use the correct concentrations and allow adequate contact time to be an effective pathogen control.

To simplify the disinfection, NZKS disinfection procedures will involve the use of **VIRKON**, except in situations where freshwater isn't available, in which case a quaternary ammonium compound will be used.

## 3.6 Virkon Dilution Rates

Dilution Rate Required

2%	1%	0.50%	
Quantity of Virkon Required			Quantity of Solution Required
20g	10g	5g	1 Litre
100g	50g	25g	5 Litres
200g	100g	50g	10 Litres
500g	250g	125g	25 Litres

1. Select the quantity of disinfectant solution required.
2. Choose appropriate dilution rate as per **Figure 2 – Virkon – Dilution Rates**.
3. Measure out the amount of **VIRKON®** indicated using the graduated measuring scoop provided.
4. Add **VIRKON®** to fresh water and stir.

There is a 20% loss of activity of 1% solution of **VIRKON®** after 14 days in 350 ppm hard water. There is a 2.1% loss of activity of the powder after 26 weeks at 20°C.

## 3.7 Health and Safety Precautions

- FIRE HAZARD: Non-flammable
- Keep out of reach of children.
- Powder irritating to eyes, skin and mucous membranes and may be harmful if swallowed or inhaled.
- Do not get powder in eyes.
- Avoid contact of powder with skin.
- Handle in such a way as to minimize dust release.
- Do not mix with other chemicals.
- When mixing the solution, goggles, chemical-resistant gloves, and a mask must be worn.

## 3.8 Disposal of Virkon

- Virkon is to be disposed into the Blackwater tank.

## 4 Affected Parties

List of affected parties to be contacted in the event of any new biosecurity risk from marine pests or disease agents identified at the farm is attached in Appendix 4 - List of Potentially Affected Parties.

## 5 Review

The Biosecurity Management Plan shall be reviewed annually by NZ King Salmon to ensure best practice and that the management practices specified in the plan are consistent with condition 51, and 52 for Waitata, Kopāua and Ngamahau.

Any revisions to the Plan shall be provided to the Marlborough District Council within one month following completion of the revisions.

## 6 Protocols

### Status Green - Normal Farming Practice:

Action	Aim	Method
<b>Site access</b>	To reduce the risk of disease and marine pest transfer by personnel, visitors and vehicles	<ul style="list-style-type: none"> <li>No access allowed for personnel who have been on a status red site that day.</li> <li>No access for personnel who have been on non NZKS farms, aquariums or similar facilities that day without first receiving permission of the farm manager who will instruct regarding appropriate disinfection and attire.</li> <li>All visitors and arriving staff to use footbaths as they enter the site and wash hands before handling fish or equipment.</li> </ul>
<b>Clothing and equipment</b>	To reduce the risk of disease and marine pest transfer by clothing and equipment	<ul style="list-style-type: none"> <li>All NZKS-issued work clothing and personal protective equipment must remain on site and not be moved between sites without permission from the site manager</li> <li>All NZKS-issued personal protective equipment that is removed from site must be disinfected each time it leaves the site.</li> <li>All non-work personal equipment that comes into contact with the water (eg. fishing rods, kayaks etc) to be allowed on site only at managers discretion, and must be disinfected each time it comes onto site</li> </ul>
<b>Disease awareness</b>	To create an understanding of disease and marine pest status and risks for each control zone.	<ul style="list-style-type: none"> <li>Brief all staff and transport contractors as to potential inter and intra – regional diseases threats and required biosecurity procedures to manage risk of infection.</li> <li>Each farm to display a map/document detailing the current status of all other NZKS farming sites.</li> </ul>
<b>Contact List</b>	Current contact details for all suppliers and service providers (see emergency response protocol)	<p>Update Tel/Mob/Email for:</p> <ul style="list-style-type: none"> <li>Key NZKS personnel</li> <li>All NZKS farms</li> <li>Vet services</li> <li>MPI</li> <li>Any non NZKS fish farms in the region</li> <li>Mortality cartage/tipping</li> </ul>
<b>Cleaning and Disinfection</b>	Minimise the risk of spreading disease and marine pest transfer to other sites or control zones.	<ul style="list-style-type: none"> <li>Clean and disinfect all equipment and personnel moving between control zones – Appendix 1</li> <li>Clean all equipment that is transferred within a control zone Appendix 1 - Cleaning and Disinfection Procedure</li> </ul>

Action	Aim	Method
<b>Signage</b>	To maintain staff awareness of local alert level.	<ul style="list-style-type: none"> <li>Place notice of alert level at main entry point of farm / site, including the alert level of all other control zones. Refer to Appendix 2 - Signage for Status RED and GREEN</li> </ul>
<b>Stock and Egg Transfer</b>	To minimise risk of disease and marine pest transfer within control zones.	<ul style="list-style-type: none"> <li>Smolt transfer equipment to be disinfected directly before smolt transfers and also between hatcheries. The disinfection is to occur between each group of transfers not each individual transfer.</li> <li>Green and Eyed egg transfer equipment to be disinfected before each transfer between hatcheries</li> <li>Smolt production facilities will monitor the health of their fish and any unexplained health issues shall be referred to the company veterinarian for investigation</li> <li>Smolt should be physically inspected before transport. There must not be movement of smolt from the site where fish are displaying clinical signs of disease.</li> </ul>
<b>Diving</b>	To minimise risk of disease and marine pest transfer to stock within control zones while gathering information on mortality trends, symptoms and behaviour.	<ul style="list-style-type: none"> <li>Smolt or younger stock must be dived first during normal diving duties or by a separate diver.</li> <li>Mortalities removed from pen should be transferred to a “mort coffin” immediately</li> <li>Wash down and disinfection of equipment and diver must occur between control zones.</li> </ul>
<b>Mortality Investigation</b>	To improve detection of disease	<ul style="list-style-type: none"> <li>All fresh mortalities are to be checked for obvious signs of disease</li> </ul>
<b>Mortality Disposal</b>	To minimize risk of disease and marine pest transfer to other stock between or within control zones.	<ul style="list-style-type: none"> <li>Mortalities to be stored in non-leaking bins or coffins with sealable lids.</li> <li>Mortality removal equipment on farm to be cleaned and disinfected each day</li> <li>Mortality cartage contractors to clean and disinfect “mort bins / coffins” if they are changing control zones</li> </ul>
<b>Biomass Assessments</b>	To minimise risk of disease and marine pest transfer to stock through Biomass assessment procedures and gear between and within control zones.	<ul style="list-style-type: none"> <li>Biomass assessment gear should be cleaned &amp; disinfected before being moved between control zones.</li> </ul>

## RESPONSIBILITIES

	<b>Description</b>	<b>Person Responsible</b>
<b>Foot Bath Maintenance</b>	Ensuring the footbaths are in the correct location at entry/ies to farm Ensuring the footbaths contain clean and active disinfectant (replaced twice per week) Ensuring that records are kept of recent Virkon re-fills	Regional Manager / Hatchery Manager
<b>Stock Movement</b>	Site stocking Inter-site stock movement Year class separation (where possible)	Production Manager Freshwater Manager Production Manager
<b>Mortality Storage</b>	Ensuring the mortality bins are in the correct location Ensuring the mortality bins are structurally sound Ensuring that the mortality bins are not over filled, and that the mortality bin area is kept clean	Regional Manager / Hatchery Manager
<b>Field Team Boat Hygiene</b>	Cleaning of the field team boat Disinfection of dive and other equipment	Field Team Manager
<b>Contractor Vessel Hygiene - (other company vessels)</b>	Hull Maintenance	Contractor / Regional Manager
<b>Reporting Stock Losses</b>		Regional Manager / Hatchery Manager
<b>Preliminary Disease Investigation</b>	Collection of appropriate pathology samples Submission of pathology samples to IDC Reporting of results	Regional Manager / Hatchery Manager Fish Health Manager
<b>Annual Audit</b>	Ensure compliance with the Biosecurity Management Plan	Sustainability Manager / Fish Health Manager
<b>Pest Control</b>	Maintenance of Baits on Farm Maintenance of Baits in Food Warehouses Disposal of carcasses	Regional Manager / Hatchery Manager Third party managers
<b>Visitor Gear</b>	Ensure visitor gear is available Ensure visitor gear is maintained in an acceptable fashion	Regional Manager / Hatchery Manager

## Status Red – Widespread Mortality to Confirmed or Suspected Infectious Disease

Diseases would include notifiable diseases such as furunculosis, rickettsia, VHS, IHN and IPN. High mortalities resulting from an unknown cause may also be included in this category. Widespread Mortality is defined as:

- Disease has spread or is spreading rapidly through a farm.
- Loss in excess of an average 0.3% per day over 2 consecutive weeks

Action	Aim	Method
<b>Site Access</b>	To reduce the risk of disease and marine pest transfer by personnel, visitors and vehicles	<ul style="list-style-type: none"> <li>• All non-essential visits are to be halted</li> <li>• No visitors or personnel may visit a non-Status Red site, following a visit to a Status Red site on the same day.</li> <li>• All visitors must wear site specific gear</li> <li>• All vehicles including delivery vehicles must park in a specifically designated car park (Freshwater sites)</li> </ul>
<b>Clothing and Equipment</b>	To reduce the risk of disease and marine pest transfer by clothing and equipment	<ul style="list-style-type: none"> <li>• No clothing, personal protective equipment or non-work personal equipment that comes into contact with water is allowed on site.</li> </ul>
<b>Communication</b>	To inform all stake holders about current disease and marine pest status	<ul style="list-style-type: none"> <li>• Inform all control zones, relevant authorities, local staff and local contractors about the change in disease and marine pest status and the required procedures.</li> <li>• Notify legislative authorities of losses due to notifiable disease or identification of marine pests</li> </ul>
<b>Increased Observations</b>	To raise awareness of increased mortality trends, mortality types and disease symptoms and observations of marine pests.	<ul style="list-style-type: none"> <li>• As described in 'status green' observations section</li> <li>• Ensure that dive frequency is adequate to follow mortality trends (min. daily mortality removal for each pen).</li> <li>• Ensure suitable samples are subject to analysis for diagnosis/identification. This may include submitting samples to IDC for confirmation of an infectious disease agent or to MITS for marine pests where an unwanted/notifiable organism is suspected or where cause of elevated mortalities or moribund fish cannot be ascertained from urgent routine diagnostic testing and an infectious agent cannot be ruled out.</li> </ul>
<b>Cleaning and Disinfection</b>	Minimise the risk of spreading disease and marine pests to Stock, sites or control zones.	<ul style="list-style-type: none"> <li>• Movement of equipment or PPE out of areas under STATUS RED to be halted unless deemed to be of the highest urgency and approved by Fish Health Manager</li> <li>• All equipment leaving the STATUS RED zone must be thoroughly cleaned and disinfected before transportation.</li> <li>• Refer to Appendix 1 - Cleaning and Disinfection Procedure.</li> </ul>

Action	Aim	Method
<b>Smolt and Egg Input</b>	To minimise risk of disease transfer to stock	<ul style="list-style-type: none"> <li>Smolt inputs must be immediately halted into or from control regions under STATUS RED.</li> <li>Movement can only recommence with authorization from the Chief Operating Officer under advice from the company veterinarian.</li> <li>Eggs and equipment to be disinfected before transfer between hatcheries and control zones.</li> </ul>
<b>Diving</b>	To remove mortality from stocked units to prevent shedding of infective organisms: to gather information on mortality trends, symptoms and behaviour. To identify marine pests.	<ul style="list-style-type: none"> <li>Youngest stock must be dived first during normal diving duties or as a separate dive by a separate diver.</li> <li>Fish that are experiencing high/irregular pathogen loads or disease associated mortalities must be dived last during normal diving duties or as a separate dive by a separate diver.</li> <li>Wash down and disinfection of equipment and diver must occur between diving different pens within a control zone</li> <li>Personal dive gear should not be transferred between control zones.</li> </ul>
<b>Mortality / Marine Pest Investigation</b>	To improve monitoring for the disease	<ul style="list-style-type: none"> <li>All fresh mortalities are to be checked for signs of disease and marine pests monitored.</li> </ul>
<b>Mortality Handling</b>	To minimise risk of disease and marine pest transfer between and within control zones.	<ul style="list-style-type: none"> <li>Separate mort bags must be used for fish of differing year classes, species.</li> <li>"Mort bags and ropes are to be cleaned of physical debris and disinfected between pens</li> <li>If used, Crane, hooks and Barge areas are to be cleaned and disinfected after mortalities have been unloaded.</li> </ul>
<b>Biomass Assessments</b>	To minimise risk of disease and marine pest transfer through biomass assessment procedures and gear between and within control zones.	<ul style="list-style-type: none"> <li>All weight checking procedures to cease in Status red zones.</li> <li>Biomass assessments can only continue with authorization from the Fish Health Manager</li> </ul>
<b>Harvests</b>	To reduce the risk of blood borne pathogen transfer.	<ul style="list-style-type: none"> <li>Harvest fish should not leave areas under STATUS RED without the consent of the Chief Operating Officer in consultation with legislative authorities.</li> <li>All attempts must be made to contain Blood water from STATUS RED fish.</li> </ul>
<b>Destruction</b>	Killing and disposal of infected animals and marine pests to prevent spread.	<ul style="list-style-type: none"> <li>This may be directed by MPI and may come under legislative requirements; otherwise all mortalities should be subject either to disposal via land-fill or rendering at <math>\geq 80^{\circ}\text{C}</math> for 20 minutes.</li> <li>Marine pests to be disposed of under guidance from MPI.</li> </ul>

## RESPONSIBILITIES

	Description	Person Responsible
<b>Foot Bath Maintenance</b>	Ensuring the footbaths are in the correct location Ensuring the footbaths contain clean and active disinfectant (replaced twice per week) Ensuring that records are kept of recent Virkon re-fills	Regional Manager / Hatchery Manager
<b>Mortality Storage</b>	Ensuring the mortality bins are in the correct location Ensuring the mortality bins are structurally sound Ensuring that the mortality bins are not over filled Ensuring that the mortality bin area is kept clean	Regional Manager / Hatchery Manager
<b>Field Team Boat Hygiene</b>	Cleaning of the field team boat including hull maintenance	Field Team Manager
<b>Contractor Vessels – other company vessels</b>	Cleaning of the vessel including hull maintenance	Contractor / Regional Manager
<b>Reporting suspected disease outbreak or identification of marine pest</b>		Regional Manager / Hatchery Manager
<b>Preliminary Disease Investigation</b>	Immediate discussion with company veterinarian Collection of appropriate pathology samples Submission of pathology samples	Regional Manager Hatchery Manager Fish Health Manager
<b>On-going Disease or Marine Pest Investigation</b>		Veterinarian / MPI / Fish Health Manager
<b>Medication</b>	Ordering of medication from a veterinary wholesaler Organizing medicated feed Issuing prescriptions Arranging RMA consent Arranging importation if required	Veterinarian Fish Health Manager Veterinarian Sustainability Manager Logistics Manager
<b>Liaising with MPI/IDC</b>	As part of this process MPI will investigate where necessary including the potential for spread of the disease or marine pest.	Chief Operating Officer / Fish Health Manager

	Description	Person Responsible
Stock, Boat & Staff Movement Control		Chief Operating Officer / Regional Manager / Hatchery Manager
Emergency Harvesting Schedule		Chief Operating Officer
Farm Quarantine		Chief Operating Officer / MPI

## 7 Key Biosecurity Areas

(source: <http://www.antecint.co.uk/main/virkaquause.htm>)

BROODSTOCK / HATCHERY	FRESHWATER PRODUCTION	SEA WATER PRODUCTION	PROCESSING	Key Biosecurity Task	Critical Control Point	Application	Frequency
	•	•		Work boats and other vessels	Deck Equipment Harvesting	Clean thoroughly and rinse with clean water then disinfect with Virkon or Quaternary Ammonium Compound	Daily or as required
					Protective clothing	Rinse with clean water immerse in Virkon or Quaternary Ammonium Compound for 10 mins and hang to dry	Daily or as required
					Foot dips	Fill with freshwater solution of Virkon at a dilution rate of 1:100 (1%) or Quaternary Ammonium Compound	Replenish every 4 days or when heavily soiled
	•	•		Diving Teams	Diving suit Equipment "Mort Bags"	Remove any organic debris by brushing then immerse all items in Virkon or Quaternary Ammonium Compound for 20 mins then rinse with clean water. Record the treatment in the vessel logbook, stating what was cleaned, when it was cleaned and who did it. This must be signed off by the supervisor. Each diver should add a comment in their logbook if their dive gear has been disinfected.	On completion of operation
		•	•	Harvesting	Plant Equipment Bins and lids Stacker Boxes	Clean thoroughly and rinse with clean water then disinfect with Virkon or Quaternary Ammonium Compound. Record the treatment on the daily harvest report, stating what was cleaned, when it was cleaned and who did it and sign off by the supervisor.	Daily or as required
			•	Surfaces	Tables / Floors/ Walls	Clean thoroughly and rinse with clean water then disinfect with Virkon or Quaternary Ammonium Compound	Between production breaks
			•	Processing equipment and utensils	Gutting machines, knives	Clean thoroughly and rinse with clean water then disinfect with Virkon or Quaternary Ammonium Compound	Between production breaks or as required
			•	Effluent	Blood water	Treat blood in holding tank with a 1% Virkon solution, added to tank, leave for 10 minutes and then release to waste. Cover spillage with Virkon S powder. Leave until the liquid is absorbed. Scrape powder/spillage mixture into receptacle for disposal. Rinse and disinfect the affected area with 1% Virkon	As required

## Routine Biosecurity Tasks

(source: <http://www.antecint.co.uk/main/virkaquause.htm>)

BROODSTOCK/ HATCHERY	FRESHWATER PRODUCTION	SEA WATER PRODUCTION	Critical Control Point	Product	Dilute Rate	Application Rate	Frequency
<b>VEHICLE BIOSECURITY</b>							
•	•	•	Vehicles	Virkon	1:100	All vehicles entering site should pass through a wheel dip or be sprayed with solution of Virkon – this includes the bulk tankers for harvest and smolt haul trucks	On arrival
<b>PERSONAL BIOSECURITY</b>							
•	•	•	Foot dips	Virkon	1:100	Place footbaths at all entrances, wharves and cages. Fill with a freshwater solution of Virkon at a dilution rate of 1:100 (1%)	On passing through area
•	•	•	Skin hygiene	Hand sanitizer	-	Hands should be washed and sanitised between areas using a hand cleanser	On passing through area
•	•	•	Protective clothing	Virkon	1:200	Rinse with clean water immerse in Virkon for 10 mins and hang to dry	After each period of use
<b>EQUIPMENT</b>							
•	•	•	Transport tanks & equipment	Virkon	1:200	Visibly clean	After each period of use
•	•		Carry bins, hand nets, weighing equipment	Virkon	1:200	Visibly clean	After each period of use
	•		Dip nets & tank brushes	Virkon	1:200	Immersion	After daily use
•	•	•	Grading equipment	Cleaning: Biosolve Disinfection: Virkon	1:200 1:200	Clean and disinfect thoroughly with Virkon solution	Daily after use
•	•	•	Tanks	Cleaning: Biosolve Disinfection: Virkon	1:200 1:200	Clean and disinfect thoroughly with Virkon	When empty
<b>WASTE DISPOSALS</b>							
•	•	•	Waste disposal area including skips and bins	Cleaning: Biosolve Disinfection: Virkon	1:200	Rinse with clean water immerse in Virkon for 10 mins to dry and hang to dry	Daily

## Appendix 1 - Cleaning and Disinfection Procedure

### **Large Equipment (eq. Vessels, Grade/Harvest Gear, Nets, Pens, Vehicles)**

1. Position equipment in cleaning and disinfection area to contain runoff and solids.
2. Spray with either a hose to remove any dirt, scales, mucus from the surfaces.
3. Using a stiff broom or scrubbing brush with soap/detergent scrub all surfaces thoroughly and systematically to ensure all surfaces and grooves are cleaned appropriately. All solids are to be disposed of to a licensed landfill and no spillage to occur.
4. Mix up disinfectant in a spray bottle and spray down all surfaces and allow to stand for recommended time.
5. Spray down with freshwater to remove all chemicals and allow to dry.
6. Tag cleaned equipment with date, site and name of cleaner.
7. Place equipment in designated hygiene area.
8. Where reasonably practicable, prior to movement between zones, efforts will be made to clean net pens, flotation structures and other large inwater structures to reduce the level of biofouling.

### **Small Equipment (eq. PPE, Dive Gear, Dip Nets, Assessment Gear, Rope Etc.)**

1. Cold water pressure wash all equipment to remove organic debris.
2. Immerse all equipment in Virkon for 10 minutes.
3. Rinse thoroughly in freshwater.
4. Rinse in fresh water and dry in a well-ventilated area.

The setting up of a large container (harvest bin) with pre-mixed disinfectant in it will allow for an easier application across the farm site. It will become habit to dip equipment into the solution as required because it is there and doesn't require mixing up solutions each time. It is important to ensure that this solution is changed regularly to allow for degradation of the chemicals.

**In A Situation Where Virkon And Quaternary Ammonium Compounds Are Not Available, The Following Table Provides A Guide To Other Disinfection Methods:**

Process	Indications	Method of Use	Comments	Brand Names
Soaps and Detergents	Bacteria and viruses All solid non-porous surfaces	Use as required in conjunction with drying of equipment in sunlight	Only suitable for larger viruses	
Sodium hypochlorite 100-1000mg/L in freshwater. Chlorine based	Bacteria and viruses on all clean surfaces and in water. Nets, Boots, Wet Weathers, Hands, Fish Handling Equipment	Mix up a solution of 100-1000mg/L. Dip all equipment in a freshwater solution for 30 mins. Ensure all surfaces are cleaned pre-treatment	Becomes inactive by salt water and over time. Need to regularly replace shelf stock. A good broad-spectrum disinfectant.	Chlorofoam Virkon
Quaternary ammonia 10mg/litre for one minute 2mg/litre for 15 minutes	Viruses, bacteria, hands, plastic surfaces.	Spray or dip equipment into solution for 1-5 minutes depending upon concentration.	A good agent for pre-disinfection cleaning.	Quadhygeline Diverfoam Farmquat
Iodophor 100-200mg/L	Bacteria & Viruses Hands, Smooth Surfaces, wetsuits, porous objects	Mix up solution of 100mg/L allowing 10 mins contact time. 200mg/L 10 seconds contact time.	Contact time is important to allow maximum effectiveness. Nets, ropes and other absorbant material should be soaked for 20 mins.	Betadine Vetadine Povidone
Chloramine-T 2% by weight for 10 minutes	Bacteria and fish pathogens Wetsuits, ropes, nets,	Mix up solution in freshwater and dip all equipment in it.	Requires freshwater to maintain effectiveness. Change solution regularly	Halamid Halasept
<b>Formic Acid:</b> pH<3.9 for 24 hours	Ensilage of mortalities Processing waste, blood water	Not currently recommended	Not currently recommended	Not currently recommended
<b>Sodium hydroxide</b> Mixture of 100g Sodium Hydroxide, 10g. Teepol, 500g Calcium hydroxide in 10 litres of water.	Fish pathogens on solid surfaces with cracks. Cleans and breaks down animal greases.	Spray on cleaned surfaces and leave for 48 hours.	A very active disinfectant and stains the cleaned surfaces. Ideal for porous objects, slabs, waste pits, "mort bins" Do not use on Aluminium	Caustic Soda Washing Soda.

Process	Indications	Method of Use	Comments	Brand Names
<b>Heat</b>  >55°C for at least 5 mins	Fish Pathogens in Transportation tanks.	Use a blow torch or steam cleaner on objects to raise temperature for a period of time		
<b>Ozone</b>  8mg/L for 4 mins	Fish Pathogens  Sterilisation of water	Requires ozonation equipment	A costly method	
<b>UV irradiation</b>  130mJ/cm <sup>2</sup>  Physical desiccation by sunlight.	Fish pathogens on equipment	Dry for 3 months above 18°C	Can be shortened when used with chemical disinfection	

The use of all chemical agents will require following label directions and supplied Material Safety Data Sheets (MSDS). OH&S approval may be required to ensure that safety procedures are followed when handling disinfection chemicals during use.

## Appendix 2 - Signage for Status **RED** and **GREEN**

The following standard signage is to be displayed by each site during Status Red.



STRICTLY NO ACCESS WITHOUT      PERMISSION  
PHONE \_\_\_\_\_ TO GAIN ACCESS

PLEASE RESPECT OUR FARM BIOSECURITY AND HELP  
PROTECT THE HEALTH OF OUR FISH

The following standard signage is to be displayed by each site during Status Green.



1. IF YOU HAVE BEEN AT ANOTHER FISH FARM IN THE LAST 7 DAYS,  
STOP AND SEEK PERMISSION FOR ACCESS FROM THE FARM  
MANAGER
2. DIP YOUR SHOES IN THE FOOTBATH AND SIGN THE REGISTER
3. DISINFECT ALL EQUIPMENT THAT HAS BEEN IN CONTACT WITH  
WATER

CURRENT BIOSECURITY STATUS OF OTHER NZKS FISH FARMS:

## Appendix 3 - Control Zones

### Sea farm sites



### Zones:

1. **Tory Channel** – Ruakaka Bay, Clay Point, Te Pangu Bay, Ngamahau
2. **Otanerau Bay**
3. **Outer Pelorus Sounds** - Waihinau Bay, Forsyth Bay, Kopāua, Waitata
4. **Picton service base**

## Freshwater Farms



1. Takaka
2. Waiau
3. Tentburn

## Additional Control Zones within freshwater farms

- All hatchery / spawning buildings and facilities are considered a control zone
- The family area at Takaka is considered a control zone

## Appendix 4 - List of Potentially Affected Parties

Ministry of Primary Industries	Pests and Diseases Hotline	0800 80 99 66
Marine Farmers Assn	MFA Environmental Hotline	0800 433 27 47
	Debbie Stone	03 578 5044
Marlborough District Council	Compliance Officer	03 520 7400
	<a href="mailto:biosecurity@marlborough.govt.nz">biosecurity@marlborough.govt.nz</a>	
Aquaculture New Zealand	Dave Taylor	021 677119

### Tourism - Pelorus

Pelorus Mail Boat	Jim & Amanda Baillie	03 574 1088
Pelorus Boating Club	Mike Connolly (Commodore)	03 3515824 / 027 4732677
Bulwer Lodge	Mark Pengelly	09 4208459 / 021 2690117
Tui Nature Reserve	Brian Plaisier	0800107077 / 0274483447

### Tourism – Tory Channel

Waikawa Boating Club	03 5736798
Water Taxi operators	

### Tangata Whenua Panel

• Ngāti Kōata Trust <a href="mailto:projects@koata.iwi.nz">projects@koata.iwi.nz</a>	03 548 1639
• Te Runanga o Ngāti Kuia Charitable Trust <a href="mailto:raymond@ngatikuia.iwi.nz">raymond@ngatikuia.iwi.nz</a>	03 546 7556 027 2535043

### Te Ātiawa o Te Waka-a-Māui Trust

RM@teatiawatrust.co.nz 03 573 5170

### Waitata

### Kopāua

### Ngamahau

Martin & Claire Pinders

Tristen Moran

A list of private neighbours for Waitata, Kopāua and Ngamahau is available from the NZKS Farm Regional Managers.

Figure 1 – Unwanted Marine Pests

## SIX INTERNATIONAL MARINE PESTS THAT COULD CAUSE SERIOUS PROBLEMS HERE

These pests are already established close to or in New Zealand and could flourish in our waters. If you think you have seen any of these, note the location, grab a sample if you can, and call us on **0800 80 99 66**.

**ASTERIAS AMURENSIS – NORTHERN PACIFIC SEA STAR**



**LOOK OUT FOR:** Five rays or arms with upturned tips. Yellow, orange or red with purple markings on top. These starfish can measure up to 50 cm across.

**CAULERPA TAXIFOLIA – A MARINE AQUARIUM WEED**



**LOOK OUT FOR:** Bright green seaweed with horizontal runners up to 9 metres. Fronds are flattened with a smooth distinct midrib.

**SABELLA SPALLANZANII – MEDITERRANEAN FANWORM**



**LOOK OUT FOR:** A single spiral fan that is white and banded with orange/brown, in a parchment-like tube up to 40 cm tall. The fanworm is present in Lyttelton and Auckland. Let us know if you see it elsewhere.

**CARCINUS MAENAS – EUROPEAN SHORE CRAB**



**LOOK OUT FOR:** Greenish body shell (sometimes with reddish/orange tint) about 8 cm wide. Three spines between eyes. Five sharp spines behind each eye on side edge of body shell. Has no paddles on hind legs.

**ERIOCHEIR SINENSIS – CHINESE MITTEN CRAB**



**LOOK OUT FOR:** White tipped hairy front claws and a deep notch between the eyes.

**POTOMOCORBULA AMURENSIS – ASIAN CLAM**



**LOOK OUT FOR:** A dirty white, yellow or tan clam with very visible overbite (two shell halves different sizes), 2–3 cms across.

Freephone **0800 80 99 66**

[www.biosecurity.govt.nz/pests/salt-freshwater/saltwater](http://www.biosecurity.govt.nz/pests/salt-freshwater/saltwater)

Figure 2 – Virkon – Dilution Rates

ONE POINT LESSON						
Theme	<b>Virkon™ mixing for spray disinfection of equipment</b>					Ref: 001 Area: Aquaculture Date: 22.03.16 Version: 1
Classification	<input checked="" type="checkbox"/>	Basic Knowledge		Improvement		Health & Safety
<b>RE: Procedure for mixing Virkon™</b>						
<p><u>Storage:</u></p> <ul style="list-style-type: none"> <li>Store Virkon™ in a dry area away from combustible goods.</li> </ul> <p><u>Wear correct PPE:</u></p> <ul style="list-style-type: none"> <li>Gloves, eye-wear, dust mask and overalls are required for handling.</li> </ul> <p><u>Mixing (1:200 or 0.5% for tanker and vehicles):</u></p> <ul style="list-style-type: none"> <li>Put 15 litres of freshwater into the knapsack sprayer</li> <li>Add 75ml of Virkon™ powder (about half the small cup) to the sprayer and shake</li> </ul> 						
<p><u>Disinfecting equipment:</u></p> <ul style="list-style-type: none"> <li>Remove organic matter from the equipment to be disinfected</li> <li>Apply a light spray of Virkon™ over the equipment to be disinfected</li> <li>Ensure at least 10 minutes soak time before the equipment is moved outside the 'infected zone'</li> </ul>						
Training given to:	Sig: _____	_____ Name: _____	_____ Sig: _____	_____ Name: _____	_____ Sig: _____	_____ Name: _____
Prepared by:	Mark Preese		Department:	Aquaculture		

ONE POINT LESSON						
Theme	<b>Virkon mixing for footbaths</b>					Ref: 001 Area: Aquaculture Date: 23.06.16 Version: 3
Classification	<input checked="" type="checkbox"/>	Basic Knowledge		Improvement		Health & Safety
<b>RE: Procedure for mixing Virkon™ for footbaths</b>						
<p><u>Storage:</u></p> <ul style="list-style-type: none"> <li>Store Virkon™ in a dry area away from combustible goods.</li> </ul> <p><u>Wear correct PPE:</u></p> <ul style="list-style-type: none"> <li>Gloves, eye-wear, dust mask and overalls are required for handling.</li> </ul> <p><u>Mixing (1:100 or 1% for footbaths):</u></p> <ul style="list-style-type: none"> <li>Put 5 litres of freshwater into a bucket (half a bucket)</li> <li>Add 50ml of Virkon™ powder to the bucket and mix</li> <li>Add the mixture to the footbath</li> </ul> 						
<p><u>Disposing of old footbath material:</u></p> <ul style="list-style-type: none"> <li>The footbath should be changed when Virkon™ discolors and depending on use, at least twice a week</li> <li>Transfer old footbath water into a bucket</li> <li>Tip the bucket into the black water system (down the toilet/bund on the barges) as we don't have consent to discharge it to sea</li> </ul>						
Training given to:	Sig: _____	_____ Name: _____	_____ Sig: _____	_____ Name: _____	_____ Sig: _____	_____ Name: _____
Prepared by:	Mark Preese		Department:	Aquaculture		

## Appendix 5 - Sample contractor letter for change in biosecurity status

date

Addressee

Name of Company

PO Box / Street Address

Suburb

City

Country



Dear CONTRACTOR

### **Re: Change in bio-security status at FARM**

We have changed the status of bio-security at FARM to 'status red' until further testing confirms we are 'pathogen-free'. During this time we would ask that you:

- Continue using the footbaths
- Ensure that you do not visit a 'green' farm on the same day after visiting a 'red farm'
- All vehicle wheels are disinfected by spray or wheel dipping (forklifts and trucks) after visiting a 'red farm'
- After discharging the mortalities from a red farm the deck of the barge is rinsed with Virkon™
- After visiting a red farm the barge deck is disinfected with Virkon™
- Minimise the number of people entering and exiting the farm
- Treat this letter in confidence, as we tend to react to trigger these responses to ensure a precautionary approach to protecting the marine environment.

If you have any queries regarding the contents of this letter, please don't hesitate to give me a call.

We will advise you when we change back to 'status green'.

Regards

.....  
PERSON'S NAME

.....  
CELLPHONE NUMBER

# **The New Zealand King Salmon Company Ltd**

**Ngamahau, Kopāua and Waitata Marine Farms**

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## **Solid Waste Management Plan**

**25 Feb 2019**

<b>Prepared for</b>	The New Zealand King Salmon Company Ltd
<b>Report prepared by</b>	NZKS team
<b>Reviewed by</b>	Helen McConnell (REM)

## Prepared by:

NZ King Salmon

## Contents

1	Introduction .....	3
2	Statutory .....	3
3	Objectives.....	4
4	Potential Concerns.....	4
5	General Protocol .....	4
6	Waste Containment .....	4
7	Recycling .....	5
8	Waste Disposal Plan.....	5
9	Beach Clean-ups.....	5
10	Seabed Solid Waste.....	5
11	Audit Requirements .....	5
	Appendix 1 - (Beach Debris Report Form) .....	7

## 1 Introduction

New Zealand King Salmon (NZKS) currently has eight salmon farms (fourteen sites) in the Marlborough Sounds; located at Ruakaka, Forsyth, Waihinau, Kopāua, Waitata, Otanerau, Te Pangu, Clay Point, Ngamahau, and two farms at Crail Bay.



This Management Plan has been developed to minimise the risk of accumulation of farm waste on the foreshore and seabed.

## 2 Statutory

Discharge of any waste is prohibited under the Resource Management Act 1991 (RMA).

## 3 Objectives

The objective of this Management Plan is to minimise the risk of reductions in neighbouring amenity values caused by the accumulation of solid waste debris along the shoreline and seabed resulting from the marine farm.

This Management Plan will ensure the accidental disposal of waste to the environment surrounding the marine farm is minimised and that all solid waste is collected on the farm and disposed of appropriately to avoid the accumulation of waste on the foreshore and seabed.

The Plan also addresses routine clean-ups of solid waste (from all sources) on the foreshore by NZKS staff, and associated reporting requirements.

## 4 Potential Concerns

Potential concerns exist in relation to the amount of waste that may be inadvertently discharged from a marine farm. This waste may be plastic bulk feed bags, pieces of netting and rope, plastic bags, bottles, paper and equipment. The marine farms are situated in an environment where weather conditions can be extreme with severe wind gusts being relatively common. These winds have the potential to uplift and discharge waste to sea.

## 5 General Protocol

It is company policy that all NZKS staff must comply with this Residential Amenity Management Plan.

## 6 Waste Containment

All waste must be stored in secure containment prior to collection and disposal in onshore public refuse systems. Kitchen rubbish is to be placed directly to a bin within the kitchen area, subsequently it may be placed into a used bulk feed bag and securely tied prior to sending to shore for disposal. All other waste such as small pieces of netting and rope is similarly contained.

Care shall be taken to ensure pieces of rope, twine and netting and other miscellaneous pieces of waste cannot fall in to the water. Windy days increase the risk of waste discharge to sea and care must be taken at such times.

All the marine farms are surrounded by a predator net that extends above the height of the walkways, this assists in retaining loose rubbish within the confines of the farm.

All sewage is contained within the sewerage tanks in the barges. These tanks are sealed, and bunded (i.e. the blackwater tank is a stand-alone tank within the barge hull). Sewage is pumped out to holding tanks after feed deliveries and transported to Picton where it is disposed of in the municipal sewerage system.

Greywater is discharged from the farms. The volume permitted to be discharged on a single day shall not exceed 1m<sup>3</sup>. Any adverse environmental effects of the discharge are monitored during standard water column and benthic monitoring.

## 7 Recycling

A waste recycling process is incorporated where possible. Waste feed bags are unable to be recycled back to the feed manufacturer because of biosecurity issues. However, they are sometimes sought after by other parties and all efforts should be made to recycle these.

### Waste Disposal Plan

(Excerpt from Section 15.3 of the Seapen Manual dated 31/10/2012)

"There are a number of systems involved in the disposal of wastes from the seapen sites which endeavour to ensure complete containment of all sources of waste.

Household Rubbish – All household refuse from the sea-farms should be contained in a plastic rubbish bag inside a flameproof rubbish bin. When full, the bag is tied up and placed in the bulk bag of farm rubbish which is stored inside the feed shed until the next feed run (within two weeks maximum). Before the bulk bag of rubbish is dispatched on the feed barge it must be checked that it is tied securely to avoid any wind dispersal of the contents. The bulk bags are removed from the jetty to the Marlborough Waste Refuse Centre (Community Dump). Old farm equipment is disposed of in a similar manner.

Where possible recyclable waste is separated from the refuse and taken to the recycling centre.

All bulk feed bags which are not otherwise re-used should be emptied, rolled up and stowed in a separate bulk bag which is also removed by the feed barge and recycled. "

Mortalities are dived or airlifted from pens regularly and immediately placed in sealed aluminium containers. These sealed containers are stored adjacent to the farm on the license until collected and the dead fish are primarily used for composting. Should this option not be available them they may be sent to rendering or landfill.

All oils from mechanical repairs will be taken off the farm immediately and brought to land for appropriate disposal.

## 8 Beach Clean-ups

Each marine farm will carry out and record routine beach clean-ups, and additionally the company is party to an industry coordinated Sounds-wide beach clean-up programme. The results of these clean-ups are recorded onto a 'Beach Debris Report Form' (Appendix 1) and submitted to the Marine Farming Association.

## 9 Seabed Solid Waste

Occasional dives and video of the seabed may show debris that has accidentally fallen from the net pens such as net weights, tools and rope. The depth profile is such that diving beneath most farms is beyond the depth dived by general farm divers. Suitably qualified and experienced divers are used to recover the equipment back to the farm compliant with the 'International Diving Code of Practice (AS/NZS 2299.1:2007)'.

## 10 Audit Requirements

Each marine farm is annually audited for waste management by Best Aquaculture Practices (BAP) independent auditor.



**Appendix 1 - (Beach Debris Report Form)**



<p>Area: _____</p> <p>Date: _____</p> <p>Number of people: _____ Number of hours (on beach): _____ = Total hours _____ (personnel)</p> <p>Vessel Time: _____ (Vessel steaming and down time)</p>	
<p><b>Marine Farming Debris</b></p> <p>Estimated Percentage _____ /100%</p> <p>Estimated total Kg _____ Kg</p> <p>Details of debris</p> <p>Ropes/Ties/Lashings _____ Kg (1 supermarket bag = 1.5kg)</p> <p>Mussel Floats _____ (number &amp; ID)</p> <p><b>Other (note details below)</b></p> <hr/> <hr/> <hr/>	<p><b>Other (non marine farming) Debris</b></p> <p>Estimated Percentage _____ /100%</p> <p>Estimated total Kg _____ Kg</p> <p>Details of debris</p> <p>Plastic bags/bottles _____ Kg</p> <p><b>Other (note details below)</b></p> <hr/> <hr/> <hr/>
<p>Most interesting Find??</p> <hr/> <p>Please send in any photos of debris above, or your most interesting find for the MFA records and for use in upcoming newsletters.</p>	
<p>This form completed and submitted by</p> <p>Name: _____</p> <p>Company: _____</p> <p>Contact Phone: _____</p>	

Marine Farming Association Inc  
P O Box 86, Blenheim  
PH: 03 578 5044 Fax: 03 578 5046  
E-mail: [info@marinefarming.co.nz](mailto:info@marinefarming.co.nz)

# 16 Marine Mammal and Shark Management Plan

**April 2019**

<b>Prepared for</b>	The New Zealand King Salmon Co. Limited
<b>Report prepared by</b>	Helen McConnell and Nicole Pannell (REM)
<b>Version</b>	2
<b>Reviewed by</b>	Craig Welsh (REM), Stephen Calder (REM), Mark Preece (NZ King Salmon), Andrew Baxter (Department of Conservation) Tangata Whenua Panel <ul style="list-style-type: none"><li>• Te Runanga o Ngāti Kuia</li><li>• Ngāti Kōata Trust BoardTe Ātiawa o Te Waka-a-Māui Trust</li></ul>

## **Prepared by:**

---

### **Resource and Environmental Management Limited**

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Phone 03 548 4019  
Fax 03 548 9997  
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Web site [www.remltd.co.nz](http://www.remltd.co.nz)

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>4</b>
1.1	Statutory Requirements .....	4
1.2	Management Plan Objectives .....	4
1.3	Potential effects on marine mammals and sharks.....	6
1.4	Salmon farm configuration .....	6
<b>2</b>	<b>General protocol.....</b>	<b>8</b>
2.1	Compliance with the Marine Mammal Protection Act 1978 .....	8
2.2	Compliance with resource consent conditions .....	8
2.3	Compliance with NZKS policy .....	8
<b>3</b>	<b>Predator exclusion .....</b>	<b>9</b>
3.1	Predator resistant materials .....	9
3.2	Predator exclusion nets .....	9
3.2.1	Net specifications and configuration .....	9
3.2.2	Maintenance.....	10
3.2.3	Opening and closing predator exclusion nets .....	11
3.2.4	Visual surface marine mammal surveys.....	12
<b>4</b>	<b>Mitigating against entanglement.....</b>	<b>13</b>
4.1	Predator exclusion netting .....	13
4.2	Loose lines .....	13
4.3	Anchor warps .....	13
4.4	Nets .....	13
4.5	Lifting lines .....	13
4.6	Debris .....	14
<b>5</b>	<b>Marine mammals .....</b>	<b>15</b>
5.1	Overview .....	15
5.1.1	New Zealand fur seal .....	16
5.1.2	Dolphins .....	17
5.1.3	Whales .....	17
5.2	Audit procedures .....	17
5.3	Capture and release .....	18
5.3.1	Required training .....	18
5.3.2	Guidelines for handling seals.....	18
5.3.3	Passive dissuasion.....	21
5.3.4	Reporting .....	21
5.4	Dead marine mammals .....	21
5.4.1	Notification.....	22
5.4.2	Reporting .....	22
5.4.3	Disposal.....	22
<b>6</b>	<b>Sharks .....</b>	<b>23</b>
6.1	Overview .....	23
6.2	Shark attack prevention .....	25

6.3	Shark release .....	25
6.3.1	Required training .....	26
6.3.2	Guidelines for releasing sharks.....	26
6.4	Dead protected sharks .....	26
6.4.1	Notification.....	26
6.4.2	Reporting .....	27
6.4.3	Disposal.....	27
6.5	Seal handling.....	28
6.6	Shark identification.....	29
6.7	Dolphin identification .....	29
<b>7</b>	<b>Reporting .....</b>	<b>30</b>
7.1	Standard incident reporting .....	30
7.1.1	Marine mammals and protected sharks .....	30
7.2	Annual reporting .....	30
7.3	Media .....	31
<b>8</b>	<b>References .....</b>	<b>32</b>

## Appendices

Appendix 1 - Resource Consent Conditions.....	34
Appendix 2 - Summary of Key Management Actions .....	36
Appendix 3 - NZKS Permit to 'Take' Marine Mammals .....	38
Appendix 4 – Incident Reporting Spreadsheet .....	41
Appendix 5 - Disposal Sites: Marine Mammals and Protected Sharks.....	43

## List of Figures

Figure 1: Locations of NZKS farms in the Marlborough Sounds.....	5
Figure 2: Diagram of the configuration of a typical NZKS salmon farm .....	7
Figure 3: A fur seal attempting to gain access to a NZKS salmon farm .....	17
Figure 4: A seal in a NZKS seal trap after capture .....	20
Figure 5: A NZKS diver working in close proximity to a seal.....	21

## List of Tables

Table 1: Tangata Whenua Iwi for each recently consented salmon farm .....	4
Table 2: Standards and scheduling for predator exclusion net maintenance .....	11
Table 3: Marine mammal species in the Marlborough Sounds.....	15
Table 4: Shark species known to occur in the Marlborough Sounds.....	23
Table 5: Marine mammal and shark training requirements for NZKS team members ....	28

## 1 Introduction

The New Zealand King Salmon Company Co. Ltd (NZKS) currently has eight salmon farms (eight sites) in the Marlborough Sounds; Ruakaka Bay, Forsyth Bay, Waihinau Bay, Otanerau Bay, Te Pangu Bay, Clay Point, Kopāua, Ngamahau and two farms at Crail Bay. [Figure 1](#).

### 1.1 Statutory Requirements

NZKS as the resource consent holder for all of the farms listed above has overall responsibility for ensuring that all statutory requirements of the resource consent conditions are complied with and that all activities carried out at the farms occurs in accordance with this Marine Mammal and Shark Management Plan (Management Plan). The resource consent conditions relevant to this Management Plan and the methods of compliance are shown in [Appendix 1](#).

### 1.2 Management Plan Objectives

The resource consent conditions relating to marine mammals and sharks are identical; hence, this Management Plan is directly relevant to all salmon farms currently under establishment. This Management Plan will also be adopted for all existing salmon farms.

The objectives of this Management Plan shall be to:

- Minimise the adverse effects on marine mammals and protected sharks from the operation of the marine farm;
- Minimise the interaction of sharks with the salmon farms;
- Determine how the operation of the salmon farm will be managed adaptively to avoid, remedy and mitigate adverse effects on marine mammals and sharks;
- Ensure that the best practicable option is adopted to avoid entanglement or entrapment of marine mammals and sharks, having regard to best international practice, ongoing research and allowing for technological improvement in net design and construction;
- Establish a monitoring programme to assess the effectiveness of the Marine Mammal and Shark Management Plan; and
- Establish reporting and response procedures in the event of marine mammal and protected shark entrapment, entanglement, injury or death.

This Management Plan has been prepared in consultation with the Department of Conservation (DOC) and the iwi as outlined in Table 1.

Key management actions are highlighted in yellow throughout this Management Plan and a summary of these key management actions is provided in [Appendix 2](#).

**Table 1: Tangata Whenua Iwi for each recently consented salmon farm**

Salmon Farm	Relevant iwi
Ngamahau	Te Ātiawa o Te Waka-a-Māui Trust
Kopāua and Waitata	Tangata Whenua Panel as established by Ngāti Kōata Trust Board Te Runanga o Ngāti Kuia

Figure 1: Locations of NZKS farms in the Marlborough Sounds



## 1.3 Potential effects on marine mammals and sharks

It is not uncommon for marine predators to aggregate at salmon farms, as they naturally associate large aggregations of fish as a potential source of prey. The mechanisms of attraction are likely to include the salmon livestock, dead fish at the bottom of pens, farm feeding operations, farm noises, farm structures, and wild fish aggregating around the farm.

Adverse effects from finfish farms on marine mammals and sharks can be either direct or indirect. The direct effects are:

- 1) The potential for entanglement and entrapment (fatal or non-fatal); and
- 2) The potential for displacement from important habitat.

Indirect effects include effects from increased vessel traffic in areas where finfish farms occur (underwater noise disturbance and increased potential for ship strike) and possible flow on effects from changes in local trophic chains.

Several studies describe both the direct and indirect adverse effects from finfish farms on marine mammals as listed here du Fresne, 2008; Clement, 2013; Wursig & Gailey 2002; Kemper et al. 2003; Wright, 2008.

Finfish farms may also confer some positive effects on marine mammals and sharks, principally through the aggregation of wild finfish under marine farm pens, which in turn provide increased prey potential for larger predators (Forrest *et al.* 2007). On an international scale, direct interactions between marine mammals and finfish farms are relatively common in places where a marine mammal distribution overlaps spatially with finfish aquaculture (e.g. Kemper and Gibbs, 2001; Kemper *et al.* 2003).

To date, such interactions in New Zealand have been relatively minor on account of the limited scale of finfish aquaculture occurring here (Clement, 2013). However, NZKS has extensive experience with regards to dealing with marine mammals and sharks in respect to its existing finfish operations.

With regard to direct effects on protected species, the most serious would be mortality from entanglement of marine mammals and sharks. Dolphin and seal entanglement mortalities have occurred at NZKS farms in the past and occasional entanglements are predicted to continue into the future. Accordingly, this Management Plan thoroughly addresses this issue.

The potential for the displacement of protected species by NZKS salmon farms exists. However, as the farms occupy such a small proportion of the Marlborough Sounds in total, adverse effects from displacement and loss of habitat are considered to be negligible<sup>1</sup> and are not discussed further in this Management Plan. Likewise, the cumulative effect of additional underwater noise resulting from NZKS's operations is predicted to have no more than a minor additional effect on marine mammals and sharks relative to other existing noise sources in the Marlborough Sounds<sup>2</sup>, hence this too is not considered further.

## 1.4 Salmon farm configuration

Each NZKS salmon farm typically consists of a series of pens anchored in place within an area boundary. Two different configurations are typically used by NZKS: circular plastic pens and rectangular steel pens.

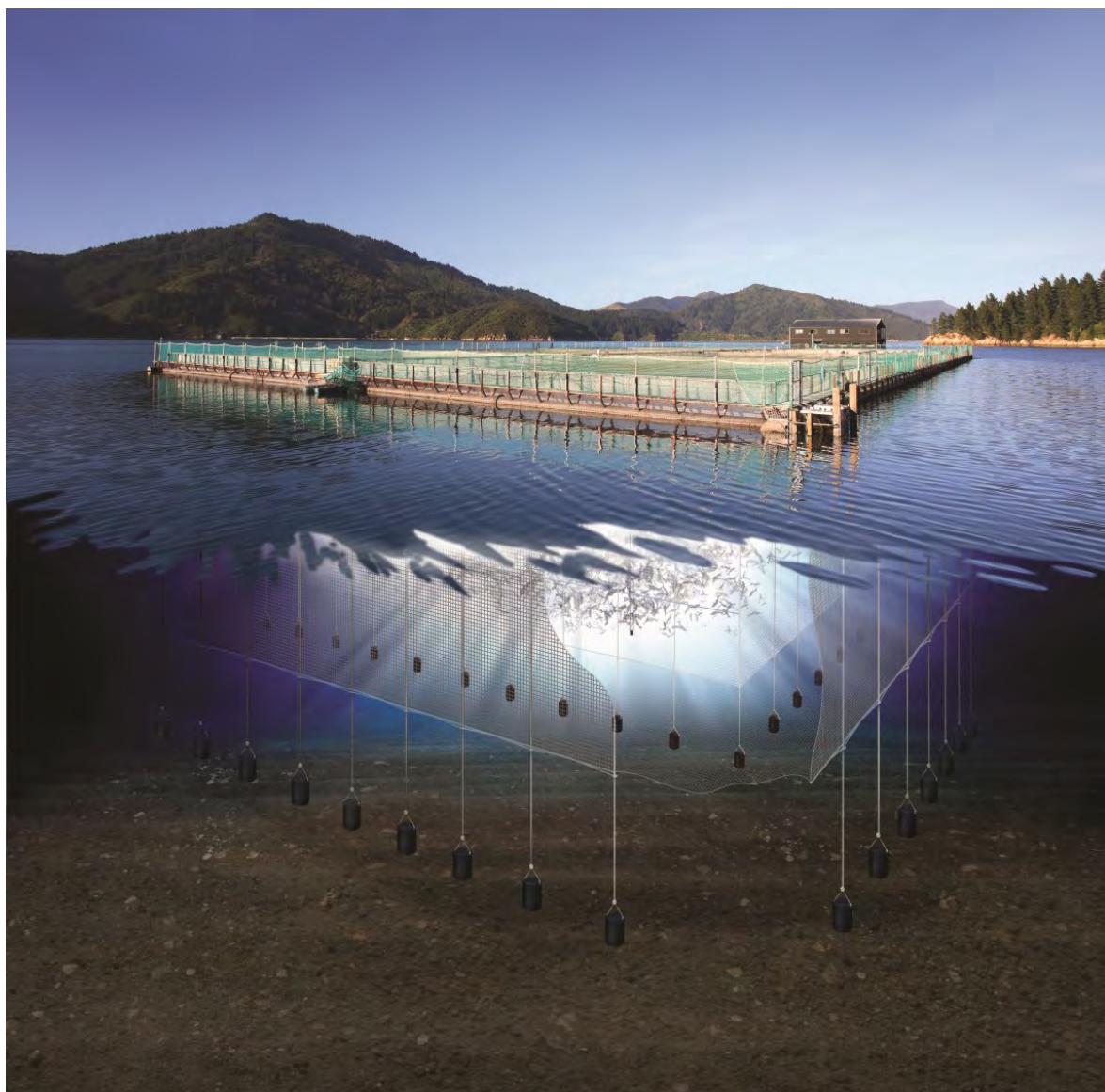
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<sup>1</sup> M. Cawthron, hearing evidence

<sup>2</sup> A. Baxter, hearing evidence

Predator exclusion nets are a standard component of all salmon farms in the Marlborough Sounds. These nets are necessary to minimise damage to, and losses of, farmed fish from sharks and marine mammals. Well-constructed, tensioned and maintained nets also function to reduce the incidence of entanglement and entrapment of sharks and marine mammals at salmon farms. In addition, bird-nets are used on all NZKS salmon farms in the Marlborough Sounds to cover the pens and may provide additional protection from entry of the New Zealand fur seal (hereafter referred to as fur seal) entry.

The configuration of the predator exclusion nets in relation to the pens varies dependant on the type of pen structure. The majority of pens are rectangular as illustrated in Figure 2. The construction and maintenance of predator exclusion nets is an integral part of this Management Plan.



**Figure 2: Diagram of the configuration of a typical NZKS salmon farm**

## 2 General protocol

This section sets out all general protocols that relate to marine mammals and sharks.

### 2.1 Compliance with the Marine Mammal Protection Act 1978

All marine mammals in New Zealand waters are fully protected under the Marine Mammals Protection Act 1978. It is an offence to 'take' a marine mammal without a permit. 'Take' is defined as:

- To take, catch, kill, injure, attract, poison, tranquillise, herd, harass, disturb or possess;
- To brand, tag, mark, or do any similar thing; and
- To flense, render down, or separate any part from a carcass.

All interactions with marine mammals shall occur in accordance with the NZKS permit (issued by DOC) to 'take' marine mammals under the Marine Mammal Protection Act 1978 [Appendix 3](#). Any individual involved in any action in respect of this permit is responsible for their own actions within the terms and conditions of the permit and the Marine Mammals Protection Act 1978. NZKS is responsible for ensuring its permit is up to date and will apply to DOC for renewals and amendments as required.

It is company policy for all NZKS team members to strictly follow the requirements of the NZKS permit to 'take' marine mammals as issued by DOC. Any deviation from the conditions of the permit, regardless of their alleged merits, will not be accepted as 'best practice' by the company and will be considered serious misconduct.

It is also company policy that no action of wilful harm or potential hurt towards seals is allowed. Any contradiction of this principle may result in dismissal for serious misconduct and possibly render the individual and company liable to further legal sanction under the Marine Mammals Protection Act 1978.

**It is company policy for all team members and contractors to strictly follow the requirements of the NZKS permit to 'take' marine mammals as issued by DOC on 20 June 2014 (and any subsequent renewals and amendments)**

### 2.2 Compliance with resource consent conditions

The ongoing operations of NZKS salmon farms in the Marlborough Sounds are contingent on compliance with multiple resource consent conditions. Relevant conditions are outlined in [Appendix 1](#) and are addressed throughout the specific sections of this Management Plan.

### 2.3 Compliance with NZKS policy

All NZKS team members must comply with this Marine Mammal and Shark Management Plan.

**It is company policy for all NZKS team members and contractors to strictly follow the guidelines of this Marine Mammal and Shark Management Plan**

### 3 Predator exclusion

This section sets out all protocols that relate to the use of predator exclusion nets.

The potential for sharks and marine mammals to enter the marine farm is to be minimised through:

- The use of predator resistant materials;
- The use of predator exclusion nets; and
- Regular inspection and maintenance of predator nets and tensioning systems.

All practicable steps are to be taken by NZKS team members to reduce the risk of marine predators entering the pens. In addition to the protection measures outlined in Sections 3.1 and 3.2 below, the following general guidelines should be adhered to which will assist in preventing access from marine predators entering the pens:

- Bird nets should be tightly fitted over the pens;
- Grower nets are to be lifted under the walkways;
- Gates should, wherever practical, be installed on walkways to prevent access by fur seals; and
- Appropriate weighting systems should be used to ensure exclusion nets are maintained under sufficient tension at all times.

**Predator exclusion nets must be used to minimise the potential for sharks and marine mammals to enter NZKS marine farms**

#### 3.1 Predator resistant materials

Predator resistant materials will be used in predator exclusion net construction. Recommended materials include:

- Light weight, ultra-strong net materials, such as Nylon, Polyester and Dyneema® (Cawthorn, 2011);
- Pemberton *et al.* (1991) suggested using nets of polyethylene net construction with a minimum twine gauge of 4 mm. With a preference for wire netting where possible (e.g. Boral Cyclone, pig mesh); and
- A steel product called MarineMesh® is recommended to prevent shark entry into marine farms in Australia (Hawkins, 2004).

**The construction of predator exclusion nets from thick, soft 'Rochelle' netting is a current requirement under the NZKS permit to take marine mammals but may be superseded as better options become available.**

#### 3.2 Predator exclusion nets

##### 3.2.1 Net specifications and configuration

Marine predator exclusion nets should completely enclose all salmon farm structures and should extend sufficiently high above the sea surface to exclude marine predators, but no higher.

The appropriate height of marine predator exclusion nets for salmon farms in the Marlborough Sounds, is deemed to be 2–3m above the sea surface (Cawthorn, 2011).

Marine predator exclusion nets should be installed in such a way that they are adequately separated from the grower nets with spatial separation of ideally 2–3m and no less than 1m.

The maximum mesh size of marine predator exclusion netting on all new salmon farms shall be limited to 200mm. This is the internal measurement when the net is stretched in the long diagonal direction. Several existing NZKS farms currently use larger mesh for their predator exclusion nets<sup>3</sup>; however, these farms will be transitioned out as part of the repairs and maintenance programme, to meet the 200mm standard<sup>4</sup>.

To reduce the likelihood of marine mammal entanglement with NZKS predator exclusion netting, the minimum gauge (twine diameter) of the predator exclusion net mesh should be 3.5mm. It is difficult to assess whether all dolphin species can acoustically detect net mesh of this gauge, however international studies of captive bottlenose dolphins and harbour porpoises suggest that minimum detection distances for monofilament fishing net is 3–55m depending on the species (Kastelein *et al.* 2000). The nets used in NZKS farms vary in that they are heavier gauge than monofilament fishing nets, and that they do not occur in isolation (i.e. have other farm structure and a density of fish livestock associated with them); hence nets used in salmon farms should be more easily detectable by dolphins acoustically and visually.

New net materials are constantly being investigated by NZKS, hence net specifications and configuration are likely to change through time in keeping with best practice.

**The maximum mesh size of predator exclusion net is 200mm.  
The minimum gauge of the mesh twine should be 3.5mm.  
Predator exclusion nets should be 2–3m in height above the sea surface.**

### 3.2.2 Maintenance

To reduce entanglements of marine mammals and sharks it is critical that predator exclusion nets are maintained at tension; during standard farm operations the nets (both above and below water) should be kept taut<sup>5</sup>.

Marine mammal entanglements often occur when predator nets are not sufficiently tensioned. A lack of tension can occur:

- During periods of improper maintenance;
- During installation/removal; and
- During scheduled maintenance of predator exclusion netting.

Extra vigilance for potential marine mammal entanglements is required at all times. In particular:

- A visual surface marine mammal survey must be conducted prior to major net maintenance work, see [Section 3.2.4](#);
- Predator exclusion nets must not be opened, removed or shifted if dolphins are observed within 2km of the marine farm; and
- It is recommended that if reasonably possible changing of predator exclusion nets should coincide with periods when fur seal numbers are low.

Maintenance of predator exclusion nets is required. Daily checks should identify and remedy immediate problems which are detectable above water. Full maintenance assessments (including underwater assessments) should occur on a monthly basis. The protocols for both daily and monthly checks are outlined in Table 2.

<sup>3</sup> 204 mm and 240 mm are still in use

<sup>4</sup> In response to juvenile fur seal entanglement mortalities

<sup>5</sup> This is typically more difficult to achieve on the circular plastic type farms

It is advisable that the rope which is used to repair predator exclusion nets is colour matched to the predator exclusion net, as seals can detect colour changes which they associate with weak points in the nets (Hawkins, 2004).

Remote net cleaning occurs throughout the farm on a near constant cleaning rotation. The net cleaning device is equipped with a camera and is another means by which sections of net requiring maintenance can be brought to the attention of farm team members.

**Table 2: Standards and scheduling for predator exclusion net maintenance**

<b>Daily assessment requirements (above-water)</b>	
1. Make a visual assessment of the net tension	➤ Slack sections to be re-tensioned as soon as reasonably possible
2. Identify any holes and tears	➤ All holes and tears must be repaired as soon as reasonably possible
3. Identify any potential entrapment pockets	➤ All potential entrapment concerns must be remedied as soon as reasonably possible
<b>Monthly assessment requirements (below water)</b>	
1. Make a visual assessment of the net tension	➤ Slack sections must be re-tensioned as soon as reasonably possible
2. Identify any holes and tears	➤ All holes and tears must be repaired as soon as reasonably possible
3. Identify any potential entrapment pockets	➤ All potential entrapment concerns must be remedied as soon as reasonably possible
4. Identify any sections that require in-water cleaning due to marine biofouling (as required to maintain cleanliness)	➤ Make arrangements for in-water cleaning to occur

**Predator exclusion nets should be kept taut at all times.  
Regular maintenance is critical and should follow the schedule in Table 2.**

### **3.2.3 Opening and closing predator exclusion nets**

It is recognised that the predator exclusion nets will need to be opened periodically in the following circumstances:

- To release an entrapped marine mammal or shark;
- During installation and removal<sup>6</sup>; and
- During some maintenance operations (e.g. re-tensioning sections of net and remedying potential entrapment pockets).

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<sup>6</sup> Pre In-water cleaning negates the need for predator nets to be changed out frequently

Prior to major net maintenance work visual surface marine mammal surveys must be conducted, see Section 3.2.4 to ensure that no dolphins are present within 2km of the farm.

During periods when the predator nets are open, extra vigilance for marine mammals and sharks must be maintained by operational team members. In addition, the duration for which the nets are left open must be minimised, and all reasonable efforts will be made to ensure predator exclusion nets are not left open overnight.

**The duration for which the nets are left open must be minimised and nets shall not be left open overnight.**

#### **3.2.4 Visual surface marine mammal surveys**

These surveys must occur prior to major net maintenance work to ensure that dolphins are not present within 2km of the marine farm (for the area within the line of sight).

To conduct a visual surface marine mammal survey, the following steps shall be taken:

1. Immediately prior to the survey work commencing an observer should proceed to the best vantage point on the salmon farm;
2. The observer shall make a visual observation in the line of site up to 2km zone around the salmon farm;
3. The 2km radius can be estimated by the use of predefined terrestrial land marks in enclosed bays or proportions of a waterway for larger marine areas within the Marlborough Sounds.
4. During the observation period the observer should focus on dolphin detection. Signs to look for which will indicate dolphin presence are:
  - a. Dorsal fin/s visible when individual dolphins surface to breathe;
  - b. Splashes and aerial behaviours;
5. If dolphins are detected within 2km of the farm immediately prior to scheduled net maintenance, then the start of the maintenance operation must be delayed until such time that the dolphins have moved outside the 2km radius surrounding the farm.
6. During the maintenance a watch should be maintained to ensure dolphins are not within the area.

**Prior to major net maintenance, visual surveys for marine mammals must be conducted. Work shall not commence until dolphins have moved outside of the 2km radius surrounding the salmon farm.**

## 4 Mitigating against entanglement

This section sets out all protocols that relate to measures designed to mitigate against entanglement of sharks and marine mammals within farm infrastructure.

The potential for sharks and marine mammals to become entangled in salmon farm infrastructure is to be minimised through appropriate management of predator exclusion nets, loose lines, anchor warps, nets and debris.

### 4.1 Predator exclusion netting

In addition to the exclusion of predators, the appropriate management of predator exclusion netting, as described in Section 3, also serves to reduce the incidence of entanglement by eliminating loose sections of netting which pose an entanglement risk to marine mammals and sharks.

### 4.2 Loose lines

Loose lines/ropes increase the chances of marine mammal entanglement (particularly large whales). For this reason:

- All lines associated with NZKS salmon farms must be secured at all times;
- All loose lines must be secured and/or retrieved promptly; and
- For loose lines that must remain in the water, buoying off by way of a header float is required to ensure that the length of line through the water column remains as taut and vertical as possible, with the minimum amount of slack line.

**Unsecured lines must not be present within the marine farm**

### 4.3 Anchor warps

Anchor warps must be maintained under sufficient tension to prevent possible entanglement of cetaceans and large sharks.

The anchoring and mooring warp system shall be monitored and maintained in accordance with a 'Salmon Farm Mooring Monitoring and Maintenance Schedule'.

**Anchor warps must be maintained under sufficient tension**

### 4.4 Nets

All nets except those in use must be lifted clear of the water or removed. Raised nets may not remain unattended (visually observed) for more than 4 months and should be inspected following any significant storm. If the period of non-attendance is predicted to exceed 4 months the nets should be removed.

**All submerged nets, except those in use, must be lifted or removed**

### 4.5 Lifting lines

The frequency of lifting lines will ensure that when the predator net is lifted, the base is as flat as possible with minimal pockets. All lifting lines are to be clearly marked with a coloured tag, and a schematic to be drawn and held by the site team. Lifting the predator net is the last job prior to the operation and dropping the predator net is the first job after the operation is completed. A checklist system will be used to ensure all lift lines are released.

**Minimise the time that the predator net is lifted**

## 4.6 Debris

All net and cordage debris, plastic strapping and other salmon farm, domestic or other non-biodegradable waste must be collected, retained and disposed of at an approved solid waste facility onshore.

If any loose debris does enter the water around NZKS salmon farms, it must be promptly retrieved from the seabed, water column or foreshore.

## 5 Marine mammals

### 5.1 Overview

The Marlborough Sounds provide coastal habitat for a variety of marine mammal species. **Table 3** lists species known to frequent the sheltered waterways of the Marlborough Sounds, and those that visit the area less frequently.

**Table 3: Marine mammal species in the Marlborough Sounds**

Species	Scientific name	NZ threat status (Baker et al. 2010)	Frequency of sightings within the sounds
<u>Pinnipeds</u>			
NZ fur seal	( <i>Arctophoca australis forsteri</i> )	Not threatened	Resident – seen in all seasons (Baird, 2011)
<u>Dolphins</u>			
Killer whales	( <i>Orcinus orca</i> )	Nationally critical	Regular visitors - year round (Visser, 2007)
Hector's dolphins	( <i>Cephalorhynchus hectori</i> )	Nationally endangered	Commonly seen, particularly in summer (Mackenzie & Clement, 2014)
Dusky dolphins	( <i>Lagenorhynchus obscurus</i> )	Not threatened	Commonly seen in autumn, and winter (Wursig et al. 2007)
Bottlenose dolphins	( <i>Tursiops truncatus</i> )	Nationally endangered	Semi resident - seen in all seasons (Merriman, 2007)
Common dolphins	( <i>Delphinus delphis</i> )	Not threatened	Regular visitors - year round (Merriman, 2007)
<u>Whales</u>			
Humpback whales	( <i>Megaptera novaeangliae</i> )	Migrant	Occasional visitor in winter months (Gibbs & Childerhouse, 2000)
Southern right whales	( <i>Eubalaena australis</i> )	Nationally endangered	Occasional visitor in winter months (Patenaude, 2003)

Seals and dolphins are the most likely marine mammals to interact with salmon farms in the Marlborough Sounds, although interactions with large whales are also possible. Potential interactions with marine mammals include:

- Entanglement;
- Entrapment;
- Mortality;
- Damage to nets;
- Increased stress to livestock from presence of predators; and

- Damage to or loss of livestock.

The measures outlined in this Management Plan are intended to minimise interactions with marine mammals; however, both NZKS and DOC realise that the elimination of interactions with all individual animals is unrealistic. Hence, protocols for addressing such interactions are necessary. Population level effects from interactions are unlikely, but any human-induced mortality on threatened species (e.g. killer whales, Hector's dolphins, bottlenose dolphins and southern right whales) is of primary concern.

A key component of this Management Plan is the requirement for constant vigilance on the part of NZKS salmon farm workers to quickly identify potential threats to marine mammals and to immediately take steps to mitigate the threat identified.

**No feeding of marine mammals is permitted at salmon farms. All fish mortalities shall be collected and disposed at an approved land-based site.**

#### **5.1.1 New Zealand fur seal**

Fur seals are relatively abundant in the Marlborough Sounds and are expanding in their geographic range.

Fur seal attempts to gain access to salmon can lead to net damage, loss of stock through escape, stress and/or physical damage to individual fish<sup>7</sup>. The use of predator exclusion nets has been relatively successful in reducing these effects on livestock. However, as described by Cawthorn (2011), seals will patrol farms looking for points of weakness in the predator exclusion nets Figure 3. Once inside the farm they tend to either climb onto the net pen superstructure to enter the grower pens, or they will harass fish in pens causing them to school tightly before pushing the slack netting inward and biting passing fish.

NZKS has the following overriding policy on fur seals:

*"While the natural instinct of the New Zealand fur seal is predatory towards the salmon livestock we must act with empathy and integrity in managing the incursions of seals so as to ensure their welfare is not endangered or harmed by any action of our operations or people."*



<sup>7</sup> M. Cawthorn, hearing evidence

### Figure 3: A fur seal attempting to gain access to a NZKS salmon farm

#### 5.1.2 *Dolphins*

Five dolphin species utilise the Marlborough Sounds at various times through the year. With regards to potential interactions with salmon farms, Hector's dolphins and bottlenose dolphins are of particular concern given their 'nationally endangered' threat status.

Historically a number of entanglement incidents have involved dusky dolphins at NZKS salmon farms. Single entanglements of a bottlenose dolphin and what was likely to be a Hector's dolphin have also been recorded. The primary contributing factors to these events are thought to be the process of removing/installing predator exclusion nets for cleaning and maintenance, and insufficient tension of predator exclusion nets<sup>8</sup>. In response to these incidents, NZKS changed its standard operating practice in these two areas by adopting a set protocol for changing predator nets, in-water cleaning of nets and predator exclusion nets are now maintained at tension.

#### 5.1.3 *Whales*

Humpback whales migrate through Cook Strait in the winter months (Gibbs and Childerhouse, 2000) and occasionally venture into the sounds. Southern right whales also occasionally enter the sounds during winter months when they are present in temperate waters for breeding (Patenaude, 2003). Other whales that are observed in Cook Strait include sperm whales, blue whales, beaked whales and pilot whales.

Large whales could potentially interact with NZKS salmon farms. Loose ropes and buoy lines are a particular concern for these species as their size and curiosity mean that they easily become entangled in loose lines.

## 5.2 Audit procedures

Following a marine mammal gaining access into a salmon farm, and where necessary being removed from within a predator exclusion net, the steps outlined below must be followed to ensure the salmon farm is properly secured.

1. It is important to identify how the marine mammal gained access into the salmon farm, e.g. tear in predator exclusion net, via a walkway, grower net hanging loosely under the walkway etc.;
2. If the entry point of the marine mammal is known then audit activities should immediately focus to:
  - a. Identify any holes and tears;
  - b. Repair any holes or tears immediately;
  - c. Make a visual assessment of the net tension;
  - d. Re-tension slack sections immediately;
  - e. Take other actions as appropriate (e.g. install gate on walkway, pull up netting under walkways etc.); and
  - f. Monitor this section of the farm carefully over the subsequent days to minimise the reoccurrence of any problems.

If the entry point of the marine mammal is unknown, then:

- a. A full above-water assessment of the predator exclusion net must occur as described in Table 2;

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<sup>8</sup> M. Cawthorn, hearing evidence

- b. Appropriate repairs and/or re-tensioning must occur as soon as reasonably possible;
- c. In the event that the above-water assessment fails to identify the problem, then a below-water assessment must occur as described in Table 2 and
- d. Appropriate repairs and/or re-tensioning must occur as soon as reasonably possible.

**All practical steps must be taken as soon as possible to correct any salmon farm security issues identified following a marine mammal gaining access inside a salmon farm predator exclusion net.**

## 5.3 Capture and release

Procedures for capture and release of any entrapped or entangled marine mammal inside a salmon farm are provided below.

### 5.3.1 Required training

Only team members who have completed the "Demonstrate knowledge of the handling of seals on a finfish farm" see Section 0 are permitted to 'take' seals under the NZKS permit. New untrained team members may handle seals only if directly supervised by another team member who holds the appropriate unit standard. For the purpose of the NZKS permit, 'take' is defined as:

- Catch and release seals that have entered salmon pens;
- Harass seals while attempting to deter them from entering salmon pens; and
- Injure, attract, herd, disturb and possess seals in association with the above actions.

Seals are to be handled in accordance with the "Guidelines for Handling Seals" listed below.

**Only trained team members are permitted to handle seals.**

### 5.3.2 Guidelines for handling seals

Seals that are found inside the predator exclusion net or grower nets can be herded with a snatch net or bird net. These nets should only be used to catch seals when it is possible to release them from the farm immediately.

If a seal gains entry to the farm, the following guidelines are to be followed.

#### 5.3.2.1 General guidelines:

- Keep the animals calm - wherever possible cover the head with a soft cloth;
- Keep quiet - extra noise can frighten seals which can then become aggressive;
- Be quick and confident - fumbling makes seals uncertain and apprehensive;
- Do not attempt to move the seal by pushing it in the chest;
- Do not injure seals - take special care not to injure the seal's eyes and ensure flippers are tucked back in their natural orientation;
- Return seals to the open water as soon as possible;
- Take every precaution to avoid being bitten;
- Seek medical assistance if bitten or scratched by a seal (seals carry tuberculosis (TB) and other diseases that are transferrable to humans);
- Wear personal protective equipment (PPE) i.e. disposable rubber gloves when handling seals; and a facemask to prevent transfer of respiratory disease (if a seal coughs or sneezes during handling).

**Take every precaution to avoid being bitten. Seek medical advice if bitten.  
Wear gloves and other PPE when handling seals.**

**5.3.2.2 Handling seals on the walkways and pontoons:**

- Seals can be herded or chased over the top section of the predator exclusion net (top net) using dip nets and/or boat hooks;
- Lower the top net and herd the seal out of the farm by shouting or by pushing it with a blunt object using low to moderate force;
- It is important to ensure that lowering the top net does not allow more seals to enter the farm; and
- Ensure that you return the top net to its original position and tension once finished.

**5.3.2.3 Handling seals inside the predator exclusion nets**

- NZKS has two seal traps that are used to catch and release seals unharmed Figure 4;
- Set the trap with a fresh salmon;
- After capture, and when the seal has moved to the holding area at the rear of the trap, the trap can be re-set; a maximum of four seals can be caught in one trap;
- Seals should be released as soon as possible to minimise potential stress to the animal; but if provided with appropriate conditions such as in the shade and out of the water seals can be held for up to three days;
- When holding seals in temporary captivity, ensure that the holding area of the trap is above water - all seals must be able to sit down with their heads out of water and they must not be forced to keep swimming;
- Organise a boat with a hi-ab (e.g. Lana, JBS) to remove the seal trap from the farm and release the seal(s) into the wild;
- If a trap is not available: observe where the seal hauls out on the pontoons within the predator exclusion net; and
- When a haul out site has been identified; detach the top netting section from the main predator exclusion net to create an opening at the haul out site. When the seal has exited through the opening, return the nets to their original position.



**Figure 4: A seal in a NZKS seal trap after capture**

#### **5.3.2.4 Handling seals inside grower nets**

- Once a seal enters a grower net the focus should be to remove it as soon as possible;
- Lower the dive ladder to allow the seal to climb onto the walkway, and then herd it to the predator exclusion net and lower the top net so it can escape from the farm;
- The bird netting can be dropped (it may have to be weighted) and returned to its original position once the seal swims over. The seal can then be herded (in a similar fashion to moving fish in a snatch) to the side of the net. It can either be allowed to climb out of the net (when pens are not predator protected) or rolled up in the bird net and dragged to the edge of the farm before being set free outside the predator exclusion net;
- Drop panels may be unstitched and opened allowing the seal to be caught inside them while attempting to find its way out. The part of the drop panel containing the seal can be lifted over the handrail, so the seal may be freed outside the pen. If the pens are predator protected the top net should be lowered first; and
- The side of the grower net can be lowered to the water level to allow the seal to exit into the predator exclusion net. Then the process of removing the seal from the predator exclusion net can be followed. This method can be risky as there is the potential for fish to be lost over the side of the net.

#### **5.3.2.5 Dealing with seals while diving with them**

- It is not uncommon for NZKS divers to encounter seals underwater Figure 5.
- If a seal is acting aggressively towards you, you should exit the water, do not attempt to make physical contact with the seal - terminate the dive;
- Log a seal incident on the 'Marine Mammal and Protected Shark Incident Report' spreadsheet [Appendix 4](#); and
- Inform the farm manager and shift supervisor of the incident.

**Dives should be terminated if aggressive seals are encountered**



**Figure 5: A NZKS diver working in close proximity to a seal**

#### **5.3.2.6 Dealing with live entangled marine mammals**

In the event of a live animal becoming entangled in a predator exclusion net; take action to set the animal free – however, all operations must take place from the surface and on no account should anyone enter the water to attempt to free an entangled animal.

**No person shall enter the water with a live entangled marine mammal.**

#### **5.3.3 Passive dissuasion**

Passive dissuasion of any seal may only take place within the area defined in the NZKS permit.

Passive dissuasion means any of the following; herding by boat, slapping sea water adjacent to the seals, shining lights in the eyes of the seals, shouting by farm team members, herding and capturing with a snatch or bird net and prodding<sup>9</sup> with a boat hook or dip net. Any boats or equipment used to herd seals must not be used in any way that might result in injury to seals.

#### **5.3.4 Reporting**

See Section 7 for reporting requirements.

### **5.4 Dead marine mammals**

Procedures for the disposal of dead marine mammals are outlined below.

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<sup>9</sup> It is important to use a blunt instrument that is not likely to break the skin or injure the seal.

#### **5.4.1    *Notification***

If any marine mammal mortality occurs, or if any dead marine mammal is discovered on a salmon farm, the first action must be to contact the farm's Regional Manager who in turn will make telephone contact to the Seawater Operations Manager.

Formal species identification is important as for some species DOC may require a necropsy.

**For all Marine Mammal mortalities, DOC must be contacted by phone before the animal is moved.**

#### **5.4.2    *Reporting***

Before disposal occurs, log the fatality on the 'Marine Mammal and Protected Shark Fatality Incident Report' spreadsheet [Appendix 4](#); and also complete a 'Marine Mammal Fatality' form see [Section 7](#) that is then scanned and emailed to the [wildlifeincident@kingsalmon.co.nz](mailto:wildlifeincident@kingsalmon.co.nz) email address (which has DoC and relevant NZKS managers in its distribution list).

Logging the fatality on the 'Marine Mammal and Protected Shark Incident Report' spreadsheet will ensure that the event is logged for inclusion in the annual report.

#### **5.4.3    *Disposal***

Disposal must not occur until reporting is complete and permission for disposal has been granted. In some circumstances (e.g. dolphin mortalities) DOC may require a necropsy to be conducted and arrangements for transport to an appropriate necropsy facility will be determined in consultation with DOC on a case by case basis.

Once disposal permission has been granted then the carcass should be disposed of by towing to the shore and pulling up onto the beach above the mean high water mark to decompose at the designated disposal site [Appendix 5](#).

The Conservation Protocol between DOC as allowed for under the Deed of Settlement with the Crown, will ensure that relevant iwi will be notified of, consulted upon the disposal of, the potential harvest of cultural material from deceased marine mammals.

## 6 Sharks

### 6.1 Overview

At least 14 species of shark are known to occur in the Marlborough Sounds [Table 4](#). Their presence in the Sounds is highly seasonal and is thought to be related to the distribution of prey and reproductive behaviours. Observations of most large pelagic sharks in the region usually occur only during late spring and summer, although great white sharks are present year round in the Cook Strait area. A number of bronze whalers in particular are recorded seasonally in the Pelorus Sound and spiny dogfish are typically recorded in large numbers during autumn and spring<sup>10</sup>.

**Table 4: Shark species known to occur in the Marlborough Sounds**

Common Name	Scientific Name	Risk posed
Great white**	<i>Carcharodon carcharias</i>	Potentially dangerous – risk of unprovoked attacks
Bronze whaler*	<i>Carcharhinus brachyurus</i>	Potentially dangerous – risk of unprovoked attacks
Basking*	<i>Cetorhinus maximus</i>	Traumatogenic – could attack if provoked
Common thresher	<i>Alopias vulpinus</i>	Traumatogenic – could attack if provoked
Carpet	<i>Cephaloscyllium isabella</i>	Harmless
School	<i>Galeorhinus galeus</i>	Traumatogenic – could attack if provoked
Mako	<i>Isurus oxyrinchus</i>	Potentially dangerous – risk of unprovoked attacks
Porbeagle	<i>Lamna nasus</i>	Potentially dangerous – risk of unprovoked attacks
Broadsnouted sevengill	<i>Notorhynchus cepedianus</i>	Potentially dangerous – risk of unprovoked attacks
Blue	<i>Prionace glauca</i>	Potentially dangerous – risk of unprovoked attacks
Smooth hammerhead	<i>Sphyrna zygaena</i>	Potentially dangerous – risk of unprovoked attacks
Rig/Spotted dogfish	<i>Mustelus lenticulatus</i>	Harmless
Spotted spiny dogfish	<i>Squalus acanthias</i>	Traumatogenic – could attack if provoked
Northern spiny dogfish	<i>Squalus griffini</i>	Traumatogenic – could attack if provoked

\* Species protected from commercial fishing

\*\* Fully protected species

<sup>10</sup> Paul Taylor, hearing evidence

The Fisheries Protocol covered under the Deed of Settlement allows identification to Taonga shark species such as School, Blue and rig/Spotted dogfish for some iwi.

The following potential interactions between sharks and salmon farms include:

- Entanglement;
- Entrapment;
- Mortality;
- Damage to nets;
- Damage to or loss of livestock;
- Increased stress to livestock from presence of predators; and
- Shark attack on team members.

## 6.2 Shark attack prevention

NZKS farming operations frequently involve divers for net maintenance, checking structures/moorings and recovering salmon mortalities. By their nature these operations carry the risk of divers being subject to attack by sharks. The presence of dead fish may exacerbate this issue. However, NZKS has had no shark attacks through its salmon farming operational history.

Members of the public, local residents and ecotourism operators have voiced their concerns in the past that salmon farms attract sharks into the area. The following policies have been put in place to reduce the likelihood of sharks being attracted to NZKS salmon farms and to ensure diver safety:

- Team members are not permitted to feed sharks from the workplace<sup>11</sup>;
- Team members are not permitted to fish for sharks from the workplace; and
- Dead fish must be removed as soon as reasonably practical from the fish pens and disposed of at an approved land-based site or rendered<sup>12</sup>.

With these mitigations in place the risk of a shark attack around the farms is thought to be no greater than the risk of shark attack elsewhere in the marine environment; and although salmon farms may encourage sharks to aggregate in the area, fish farms should not serve to increase the overall number of sharks in the Sounds<sup>13</sup>.

**No feeding of sharks or fishing for sharks is permitted on salmon farms. Dead salmon must be promptly removed from the farm and disposed of at an approved land-based site or rendered.**

## 6.3 Shark release

Procedures for the release of any entrapped or entangled shark within a salmon farm are provided below. The capture of protected sharks is not permitted so is not discussed here.

Any shark by-catch located in the grower pens during the harvest period is returned alive to the wild. With the exception of this, any shark interaction must be approved by the shift supervisor.

**The shift supervisor will approve any shark related operation.**

<sup>11</sup> The practice of feeding sharks at NZKS farms was stopped in 2008; a decline in shark numbers followed

<sup>12</sup> By airlift or divers before disposal by landfill or rendering

<sup>13</sup> Clinton Duffy & Paul Taylor, hearing evidence

### 6.3.1 Required training

No formal training is available, but because of the potential danger involved in a shark release operation, an experienced team members member must oversee any release attempt, and the plan for release must be discussed with the Farm Regional Manager beforehand.

### 6.3.2 Guidelines for releasing sharks

In circumstances when large sharks manage to gain entry beyond the predator exclusion net, the following release techniques should be attempted. These techniques are listed in order of preference below:

- Technique 1: Drop the top net and use a crowder net to guide the shark out over the submerged section of predator exclusion netting; or
- Technique 2: Cut a section of the predator exclusion netting in an attempt to release the shark:
  - a. A pruning hook can be used to place a vertical cut in the predator exclusion net;
  - b. The sides of the cut can then be pulled apart using a boat hook on either side creating a hole for the shark to swim through;
  - c. A crowder net can be used to guide the shark to the opening;
  - d. Once the shark has been released and no further sightings have occurred in the vicinity of the farm, the predator exclusion netting must be repaired, or the damaged section must be replaced as soon as reasonably possible in consultation with the shift supervisor; and
  - e. During the re-establishment of the predator-exclusion net, a scout must remain above water to watch for any sign of shark activity. This person must be able to communicate quickly and effectively to any divers in the event that they are required to leave the water on account of further shark presence in the area.

**No person shall enter the water with a live entangled shark.**

An example of the successful use of Technique 2 occurred when a white shark was trapped in a tuna cage off Port Lincoln, Australia in June 2003. During this occurrence a 9 m vertical cut was made in the cage netting and ropes were attached to each side of the cut. When lateral pressure was put on the ropes an opening was created which allowed the shark to swim free (De Maddalena & Heim, 2012).

## 6.4 Dead protected sharks

Procedures for the disposal of dead protected sharks are outlined below.

### 6.4.1 Notification

If any protected shark mortality occurs, or if any dead protected shark is discovered on the farm, the first action must be to contact the Farm Regional Manager who in turn will make telephone contact the Seafarm Operations Manager.

Formal species identification is important as for some species DOC may require a necropsy.

#### 6.4.2 Reporting

Before disposal occurs, log the fatality on the 'Marine Mammal and Protected Shark Incident Report' spreadsheet [Appendix 4](#); and also complete protected shark incident form [Section 7](#) that is scanned and emailed to the DOC Program Manager and the NZKS Seafarm Operations Manager.

Logging the fatality on the 'Marine Mammal and Protected Shark Incident Report' spreadsheet will ensure that the event is logged for inclusion in the annual report.

**For all protected shark mortalities, DOC must be notified through the submission of a protected shark incident form.**

#### 6.4.3 Disposal

Disposal must not occur until reporting is complete and permission for disposal has been granted. In some circumstances DOC may require a necropsy to be conducted and arrangements for transport to an appropriate necropsy facility will be determined in consultation with DOC on a case by case basis.

Once disposal permission has been granted then the carcass should be disposed of by towing to the shore and pulling up onto the beach above the mean high water mark to decompose at the designated disposal sites [Appendix 5](#).

### Team members Training

The following training is required before NZKS team members are permitted to become involved with marine mammal and shark operations at NZKS salmon farms in the Marlborough Sounds:

- Seal handing unit standard.
- Protected shark identification training.
- Dolphin identification training.

Training should occur according to the schedule outlined in Table 5, and each component is described in greater detail in Sections 6.6, 6.6, and 6.6 below.

**Table 5: Marine mammal and shark training requirements for NZKS team members**

<b>Status of team members member</b>	<b>Training requirements</b>	
	<b>Seal Handling</b>	<b>Dolphin &amp; Shark Identification</b>
New team members member	Completion of this course is mandatory at induction	Provision of training is mandatory at induction
Existing team members member	Completion of this course must occur on an annual basis	No formal requirements

**Only trained team members are permitted to handle seals. All team members must be trained in the identification of dolphin and protected shark species**

## 6.5 Seal handling

Under the NZKS permit to 'take' fur seals, NZKS is required to undertake annual training courses for its farm team members on the handling and management of seals at its salmon farms.

To address this requirement NZKS have developed the following qualification:

*Qualification Demonstrate knowledge of the handling of seals on a fish farm*

*Level 3 Credits 7*

This qualification is a unit standard provided by the New Zealand Industry Training Organisation which is a recognised training provider of the NZ Qualifications Authority. The following elements are integral to this training course:

- Describe the legislative requirements for the protection and handling of seals on a fin fish farm;
- Describe measures to take to prevent seals from entering fin fish farms;
- Describe humane seal handling techniques;
- Describe measures to take to prevent injury when handling seals; and
- Take action to remove seals that have entered the fin fish farm.

Only team members who have undertaken seal handling training and hold an equivalent unit standard are permitted to 'take' seals under the NZKS permit. Any seal handling training or equivalent unit standards must be current. To be current, the training is to have occurred in the past 12 months.

## 6.6 Shark identification

The resource consent conditions require that the identification of protected shark species is included in team members training.

See: <https://www.mpi.govt.nz/dmsdocument/3642/loggedIn> for protected shark species and [https://fs.fish.govt.nz/Doc/22896/AEBR\\_69.pdf.ashx](https://fs.fish.govt.nz/Doc/22896/AEBR_69.pdf.ashx) for an identification guide.

## 6.7 Dolphin identification

The resource consent conditions require that the identification of dolphin species is included in team members training. See: <https://www.doc.govt.nz/nature/native-animals/marine-mammals/dolphins/> for dolphin identification.

## 7 Reporting

### 7.1 Standard incident reporting

Reporting and record keeping in relation to marine mammal and protected shark incidents is important with regard to accuracy of annual reports, compliance with resource consent conditions and compliance with permit requirements under the Marine Mammal Protection Act 1978.

#### 7.1.1 Marine mammals and protected sharks

After any interaction with a marine mammal (including all seal interactions) or a protected shark on a salmon farm, the individual team members involved is responsible for logging the incident into the 'Marine Mammal and Protected Shark Incident Report' spreadsheet, and where necessary (fatality) completing the appropriate reporting forms see Appendix 4.

Every six months the 'Marine Mammal and Protected Shark Incident Report' spreadsheet is emailed to the following parties:

- The Department of Conservation (DOC) Program Manager [dpalmer@doc.govt.nz](mailto:dpalmer@doc.govt.nz)
- The NZKS Picton Office, Seafarm Operations Manager
- The NZKS Sustainability Manager
- The Marlborough District Council, Attention: [gina.ferguson@marlborough.govt.nz](mailto:gina.ferguson@marlborough.govt.nz)
- The Ngāti Kōata Trust Office, [projects@koata.iwi.nz](mailto:projects@koata.iwi.nz)
- Te Runanga o Ngāti Kuia, [raymond@ngatikuia.iwi.nz](mailto:raymond@ngatikuia.iwi.nz)
- Te Ātiawa o Te Waka-a-Māui Trust, [rm@teatiawatrust.co.nz](mailto:rm@teatiawatrust.co.nz)
- Any other iwi which have expressed interest in receiving these forms.

For incidents where a marine mammal or protected shark is injured or killed reporting to the above parties must occur within 24 hours of the incident.

Reporting must occur within one week for incidents where actions were undertaken to remedy any unforeseen events such as a marine mammal or protected shark becoming entrapped or entangled at a marine farm.

**Logging all incidents on the 'Marine Mammal and Protected Shark Incident Form' must be completed for every marine mammal and protected shark interaction. Where an animal is injured or killed this reporting must occur within 24 hours.**

### 7.2 Annual reporting

Each NZKS farm is required to prepare an annual summary report of all incidents involving marine mammals and protected sharks becoming entangled or entrapped at a marine farm.

The annual report will be provided to all parties listed in Section 7.1.1 above. The provision of the annual report (and the associated incident reports) addresses one of the objectives of this management plan, which is to:

*"Establish a monitoring programme to assess the effectiveness of the Marine Mammal and Shark Management Plan".*

**An annual report must be prepared for each farm to summarise marine mammal and protected shark incidents.**

## 7.3 Media

Any media releases regarding NZKS's interactions with marine mammals are to be made in conjunction with the Chief Executive Officer of NZKS.

In the event that the media wish to gather further information in respect of any marine mammal or protected shark which has had to have been killed, this shall be done only through DOC.

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## **Appendix 1 - Resource Consent Conditions**

<b>Condition (50) Marine Mammal and Shark Management Plan for Waitata, Richmond and Ngamahau</b>	<b>Addressed by</b>
A. Minimising the potential for sharks and marine mammals to enter the marine farm net pens through the use of predator-resistant materials in net pen construction and predator exclusion nets enclosing the marine farm net pen structures and extending sufficiently high above the water around the marine farm to exclude such predators, but no higher;	Section 3
B. Limiting the maximum mesh size of any predator netting to 200 mm (the internal measurement when the net is stretched in the direction of the long diagonal of the meshes);	Section 3.2.1
C. Ensuring predator nets are sufficiently tensioned and maintained at that tension at all times so as to avoid entanglement of marine mammals and large sharks;	Section 3.2.2
D. Ensuring the twine diameter of the predator net is of a sufficient gauge to: <ol style="list-style-type: none"> <li>be detected acoustically by dolphins; and</li> <li>avoid the entanglement of marine mammals or large sharks;</li> </ol>	Section 3.2.1
E. Predator net maintenance requirements, including: <ol style="list-style-type: none"> <li>standards and scheduling;</li> <li>repairing holes and tears immediately;</li> <li>avoiding predator nets being left open over night or for extended periods of time;</li> <li>avoiding forming entrapment pockets in predator nets;</li> </ol>	Section 3.2.2
F. Procedures for auditing marine farm security following any marine mammal gaining access beyond a predator net, and taking all practical steps to correct any faults found;	Section 5.2
G. Procedures to ensure visual surface marine mammal surveys are conducted prior to major net maintenance work and that nets are not opened, removed or shifted if dolphins are observed within 2km of the marine farm;	Section 3.2.4
H. Procedures for capture and release of any entrapped or entangled marine mammal and protected shark species;	Section 5.3 & 6.3
I. Procedures for the retrieval, storage and transport of dead marine mammals and protected shark species for formal identification and autopsy purposes;	Section 5.4 & 6.4
J. Team members training requirements, including identification of protected shark and dolphin species;	Section 7
K. Ensuring there is no feeding of marine mammals and sharks;	Section 5.1 & 6.2
L. Ensuring dead fish are removed promptly from the fish pens;	Section 6.2
M. Ensuring anchor warps are maintained under sufficient tension to prevent possible entanglement	Section 4.3

of cetaceans and large sharks;	
N. Ensuring all lines associated with the marine farm are secured at all times, and that any loose lines are secured and/or retrieved promptly;	Section 4.2
O. Ensuring that all nets are removed from marine farm structures that are left fallow, untended or are abandoned;	Section 4.4
P. Ensuring all net and cordage debris, plastic strapping and other marine farm, domestic or other non-biodegradable waste is collected, retained and disposed of at an approved solid waste facility onshore, and that if any loose debris does enter the water around the marine farm, it is retrieved from the seabed, water column or foreshore promptly;	Section 4.5
Q. Reporting requirements to the Marlborough District Council and the Department of Conservation, and in particular: <ul style="list-style-type: none"> <li>I. a minimum of annual summary reports of all incidents involving marine mammals and protected sharks becoming entangled or entrapped at a marine farm;</li> <li>II. immediate reporting (within 24 hours) of any incident where a marine mammal or protected shark may be injured or killed;</li> <li>III. reporting (within one week) of actions undertaken to remedy any unforeseen events such as a marine mammal or protected shark becoming entrapped or entangled at a marine farm.</li> </ul>	Section 8

## Appendix 2 - Summary of Key Management Actions

### General Protocol:

- It is company policy for all NZKS team members to strictly follow the guidelines of the NZKS permit to 'take' marine mammals as issued by DOC dated 20 June 2014.
- It is company policy for all NZKS team members to strictly follow the guidelines of this Marine Mammal and Shark Management Plan.

### Predator Exclusion:

- Predator exclusion nets must be used to minimise the potential for sharks and marine mammals to enter NZKS marine farms.
- The construction of predator exclusion nets from thick, soft 'Rochelle' netting is a current requirement under the NZKS permit to take marine mammals.
- The maximum mesh size of predator exclusion net is 200 mm, the minimum gauge of the mesh twine should be 3.5 mm, and predator exclusion nets should be 2 – 3m in height above the sea surface.
- Predator exclusion nets should be kept taut at all times. Regular maintenance is critical and should follow the prescribed schedule.
- The duration for which the nets are left open must be minimised and nets shall not be left open overnight.
- Prior to major net maintenance, visual surveys for marine mammals must be conducted. Work shall not commence until dolphins have moved outside of the 2km radius surrounding the NZKS marine farm.

### Mitigating Against Entanglement:

- Unsecured lines must not be present within the marine farm.
- Anchor warps must be maintained under sufficient tension.
- All submerged nets, except those in use, must be lifted or removed.

### Marine Mammals:

- No feeding of marine mammals is permitted at NZKS farms.
- All practical steps must be taken to correct any farm security issues identified following a marine mammal gaining access.
- Only trained team members are permitted to handle seals.
- Take every precaution to avoid being bitten whilst handling seals. Seek medical advice if bitten. Wear gloves when handling seals.
- Dives should be terminated if aggressive seals are encountered.
- No person shall enter the water with an entangled marine mammal.
- For all marine mammal mortalities, DOC must be contacted by phone before the animal is moved.
- A Marine Mammal Fatality form must be completed for any mortalities.

**Sharks:**

- No feeding of sharks or fishing for sharks is permitted at NZKS farms. Dead salmon must be promptly removed from the farm.
- The NZKS shift supervisor will approve any shark related operation.
- No person shall enter the water with an entangled shark.
- For all protected shark mortalities, DOC must be contacted by phone before the animal is moved.
- A Protected Shark Fatality form must be completed for any mortalities.

**Training:**

- Only trained team members are permitted to handle seals.
- All team members must be trained in the identification of protected shark and dolphin species.

**Reporting:**

- The 'Marine Mammal and Protected Shark Incident Report' spreadsheet must be updated for every incident including protected sharks interaction.
- An Incident Form must be completed for every marine mammal or protected shark mortality. This reporting must occur within 24 hours of the event.
- The 'Marine Mammal and Protected Shark Incident Report' spreadsheet is required to be sent to DOC every six months.
- An annual report must be prepared for each farm to summarise marine mammal and protected shark incidents.

## Appendix 3 - NZKS Permit to 'Take' Marine Mammals



28133-MAR

### MARINE MAMMALS PROTECTION ACT 1978

#### PERMIT TO TAKE MARINE MAMMALS

PURSUANT TO Sections 5, 6 and 7 of the Marine Mammals Protection Act 1978:

The New Zealand King Salmon Company Limited (hereinafter called the  
permittee)

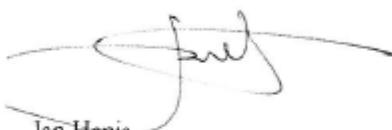
is hereby authorised to take New Zealand fur seals at its salmon farms in the Marlborough Sounds subject to the following conditions:

1. This permit is restricted to waters within 200m of the following Marlborough marine farms:  
8274 Ruakaka Bay, Queen Charlotte Sound  
8396 Otanerua Bay, Queen Charlotte Sound  
8408 Te Pangu Bay, Tory Channel  
8407 Clay Point (Ngāruhu Bay), Tory Channel  
8110 Forsyth Bay, Pelorus Sound  
8085 Waihinu Bay, Pelorus Sound  
8515 Crail Bay, Pelorus Sound  
8513 Crail Bay, Pelorus Sound  
8632 Waitata, Pelorus Sound  
8633 Richmond, Pelorus Sound  
8634 Ngamahau, Tory Channel
2. For the purposes of this permit, "take" means: catch and release seals which have entered salmon cages; harass seals while attempting to deter them from entering salmon cages; and injure, attract, herd, disturb and possess seals in association with the above actions.
3. Killing of any seal is not authorised.
4. All action undertaken under the authority of this permit shall be carried out in accordance with the seal handling protocol outlined in Schedule 1 attached to this permit. Boats shall be used to herd seals; they shall not be used in any way that might result in injury to seals.
5. The permittee will be subject to usual cost recovery provisions in respect of any costs incurred by the Department in respect of this permit.
6. The use of acoustic seal scatters, tuna bombs or seal bombs are not authorised by this permit unless provided for by way of a review under Condition 11 of this permit.

Christchurch Shared Service Centre  
Private Bag 4715, Christchurch Mail Centre, Christchurch 8140, New Zealand  
Telephone 03-371 3700, Fax 03-365 1388

7. For each salmon farm, the permittee shall monitor and report in a register all incidents involving the taking of seals. Each incident shall be reported to the Department as it occurs (in accordance with Schedule 1 Condition 7.3), and a summary report shall be prepared annually and forwarded to the Sounds Area Manager, Department of Conservation, Picton and Te Atiawa, Waikawa.
8. The permittee shall take all practicable steps to minimise the risk of seals entering salmon cages, including regular maintenance of security measures.
9. The permittee shall carry out an audit of marine farm security following any seal gaining access to a salmon cage, and shall take all practicable steps to correct any faults found.
10. The permittee shall ensure all staff handling seals are trained to Unit Standard 19850 "Demonstrate knowledge of the handling of seals on a finfish farm" or another course acceptable to the Director, Conservation Partnerships, North & Western South Island Region.
11. The permit NM-28133-MAR issued on 15<sup>th</sup> March 2011 is hereby revoked.
12. This permit is valid for the balance of a period of 15 years from 15 March 2011 unless sooner revoked, and may be reviewed or revoked at any time by the Conservator.

Dated at Nelson this 20<sup>th</sup> day of June 2014



Jan Hania

Director, Conservation Partnerships, North & Western South Island Region  
Acting pursuant to delegated authority for the Director-General of Conservation

## SCHEDULE 1

### Seal Handling Protocol

1. Responsibility for action undertaken within the terms and conditions of the Permit will be that of the Farm Manager (or nominated person) at the site where the event occurred.
2. Only staff who have completed the "Demonstrate knowledge of the handling of seals on a finfish farm" are permitted to take seals under the terms and conditions of the permit. New untrained staff may handle seals only if directly supervised by another staff member who holds the above Unit Standard, 19850.
3. Passive dissuasion of seals may only take place within the area defined in the permit.
4. Passive dissuasion means any non-contact involvement with seals within the area defined in the permit excluding the cage structures. Methods used to passively dissuade seal include:-
  - 4.1. Herding by boat
  - 4.2. Slapping of seawater adjacent to the seal
  - 4.3. Shining lights into the eyes of seals
  - 4.4. Shouting by farm staff
  - 4.5. Guiding with sticks
5. The New Zealand King Salmon Co. Ltd. will make every effort to ensure that seal protection measures are put in place to limit the access of seals onto the sea cages. Such measures include:-
  - 5.1. Bird nets fitted tightly over each salmon cage
  - 5.2. Heavy net weighting system
  - 5.3. Nets to be made of thick soft (Rochelle) netting
  - 5.4. Predator netting around the sea-farm.
  - 5.5. Predator net management programme that includes predator net checks and timely repairs should seals gain entry.
6. Seals will not be handled unless specific permission is granted by the Sounds Area Manager. Seals found inside the sea-farms will be herded to a point where they may be allowed to exit the sea-farm. Seals between the sea-cages and the predator nets may be trapped in a cage trap and released outside the farm.
7. Action to be taken in the event of a seal entering a sea cage:-
  - 7.1. On discovery staff member to inform Farm Manager or Shift Supervisor.
  - 7.2. Encourage the seal(s) to leave the farm using approved passive methods.
  - 7.3. Report the incident to the company office and the Sounds Area Manager using the approved form and outline any required checks or fixes necessary and when they will be implemented.
  - 7.4. If the Farm Manager feels that a seal needs to be physically handled or euthanised for any reason, a request shall be made to the Sounds Area Manager. Any decision about terminating the life of a seal rests solely with the Department of Conservation.
  - 7.5. Killing of any seal shall only be undertaken by, or under the supervision of, a Department of Conservation officer.
8. Following any seal mortality, the seal carcass shall be disposed of in a manner agreed between the Farm Manager (or nominated person) and the Department representative in accordance with the Regional Coastal Plan.
9. In the event that the media wish to gather further information in respect of any seal which has had to have been killed, this shall be done only through the Department of Conservation.

## **Appendix 4 – Incident Reporting Spreadsheet**

### **Marine Mammal / Protected Shark FATALITY INCIDENT FORM**

Fax DoC: Dan Palmer      03 520 3003	E-mail DoC & NZKS: <a href="mailto:wildlifeincident@kingsalmon.co.nz">wildlifeincident@kingsalmon.co.nz</a>
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#### **Salmon Farm Location:**

Date:	Reported By:
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**Species: Seal / Dolphin / Protected Shark / Other:**

**Identification of Species:**

Time of first observation:		Time taken to rectify:	
Describe where on farm:	Tag #:		

**Description of problem:**

In Grower Pen	In Pred.Net	Other (explain below)
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**Actions taken to rectify problem:**


**Actions to be taken to stop problem re-occurring:**


**Manager's comments:**


Manager's Signature:		Date:
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The **Marine Mammal and Protected Shark Incident Report** spreadsheet can be found on the NZKS network:

P:\DEP Aquaculture\Marine Mammals and Seabirds\NZKS Seafarms Marine Mammal and Protected Shark Incident Report for DoC

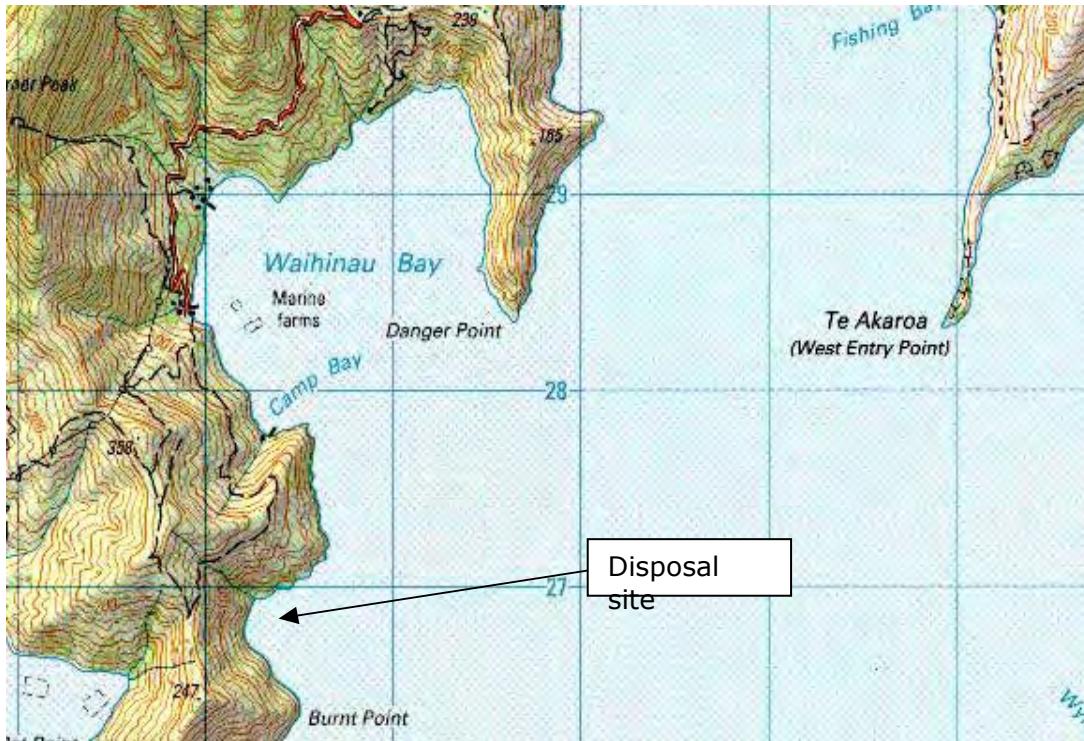
**NZKS Marine Mammal and Protected Shark Incident Report.**



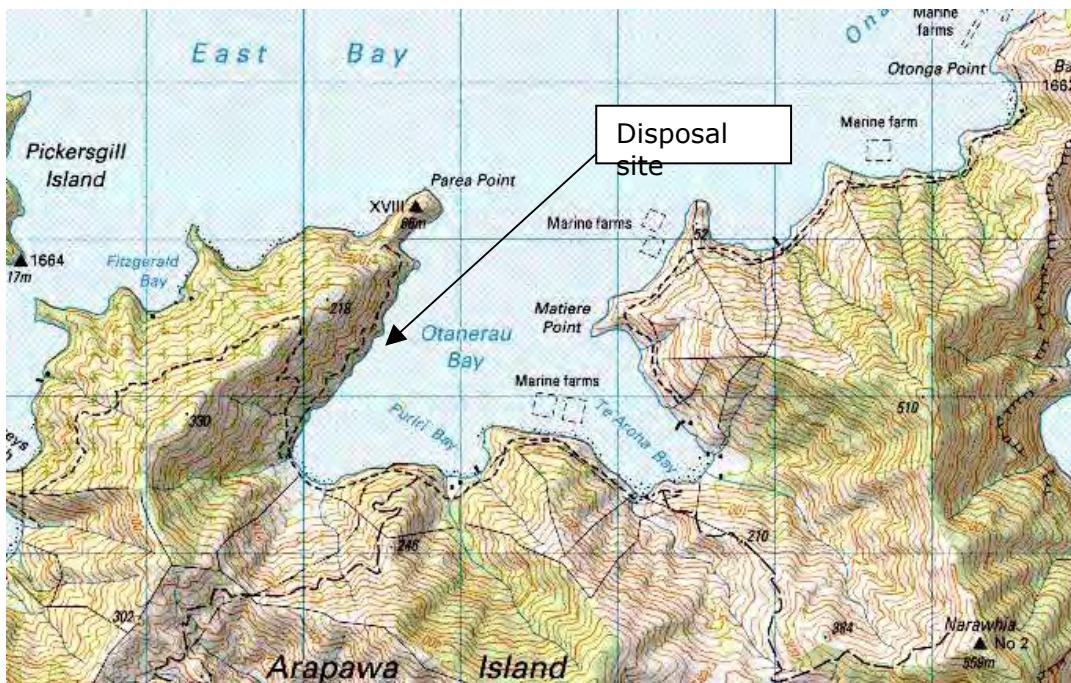
Date	Seafarm	Type of Incident	Action take	Outcome	Report to DoC	Recommendation & Notes
3 August 2014	Ruakaka	Seal inside predator net	Found & repaired a seal size hole next to the valley	Released	No	
6 August 2014	Ruakaka	Other	Abort task in the area	Other (recommendation)	No	Seals harassing divers working in predator nets. H&S fo
24 August 2014	Ruakaka	Seal in pen	Remove seal from M14C loading the jump fence and let o	Removed	No	Follow up for reentering. Though is the enter was jumping
1 September 2014	Wahinau	Seal inside predator net	Seal climbed out over bridge	Released	No	Jump fence checks done -FT due soon also
31 August 2014	Te Pangu	Seal in pen	Removed from the farm	Removed	No	Reported to FT. Jump fence checks completed
2 September 2014	Te Pangu	Seal in pen	Removed from the farm	Removed	No	Reported to FT. Jump fence checks completed
3 September 2014	Te Pangu	Seal in pen	Removed from the farm	Removed	No	Reported to FT. Jump fence checks completed
11 September 2014	Te Pangu	Seal in pen	Removed from the farm	Removed	No	Reported to FT. Jump fence checks completed
17 September 2014	Te Pangu	Seal in pen	Moved from the farm. Contact Field Team.	Removed	No	Reported to FT. Jump fence checks completed
15 September 2014	Clay Point	Dead Seal	Photograph on Net Cleaner monitor,	Disposal	Yes	Removed from the net by Field team. Taken to the Tory Cl
10 October 2014	Te Pangu	Seal in pen	Removed from the farm. Contact Field Team.	Removed	No	Reported to FT. Jump fence checks completed
12 October 2014	Te Pangu	Seal in pen	Removed from the farm. Contact Field Team.	Removed	No	Reported to FT. Jump fence checks completed
14 October 2014	Te Pangu	Seal in pen	Removed the 2 seals from the farm. Contact Field Team.	Removed	No	Reported to FT. Jump fence checks completed
15 October 2014	Te Pangu	Seal in pen	Removed from the farm. Contact Field Team.	Removed	No	Reported to FT. Jump fence checks completed

## Appendix 5 - Disposal Sites: Marine Mammals and Protected Sharks

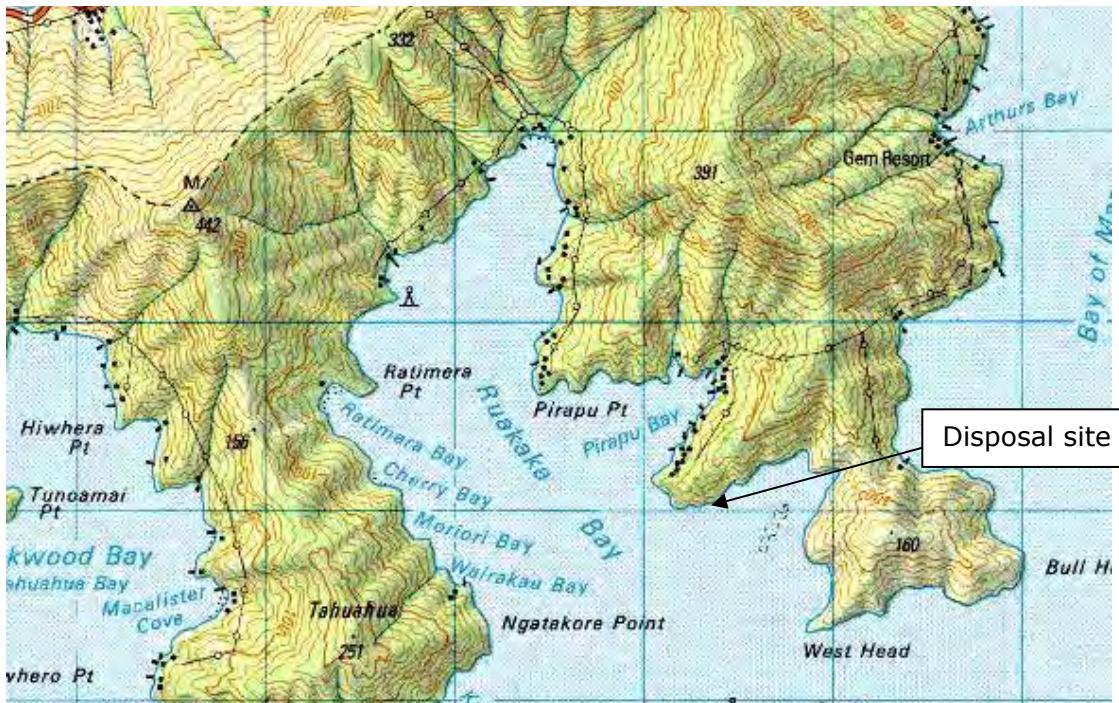
- Waihinau Bay / Waitata / Richmond



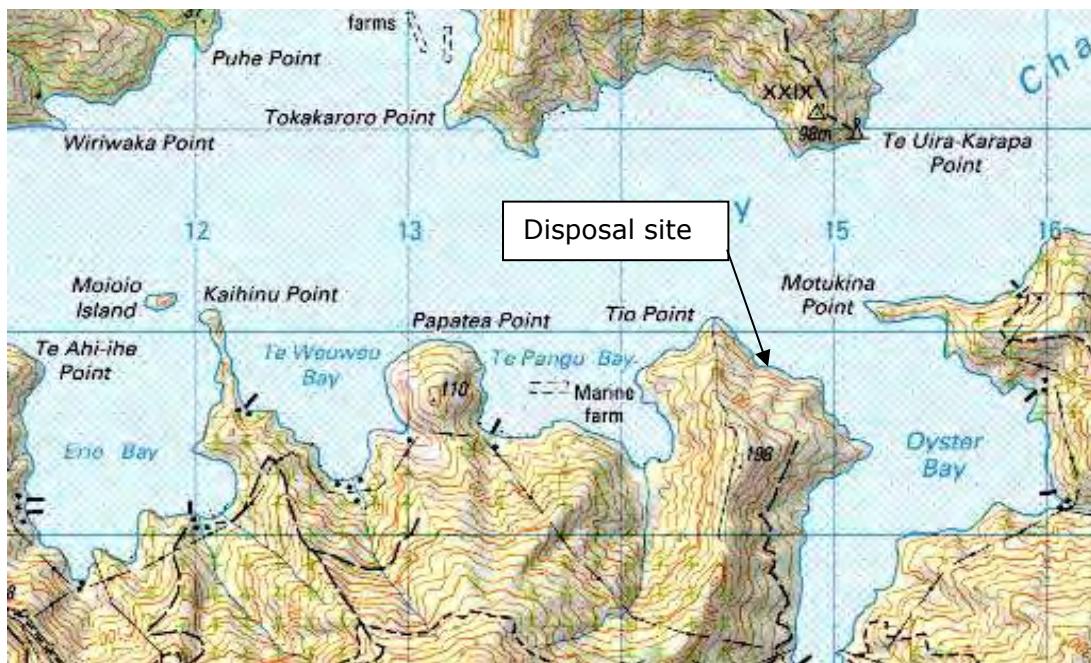
- Otanerau Bay



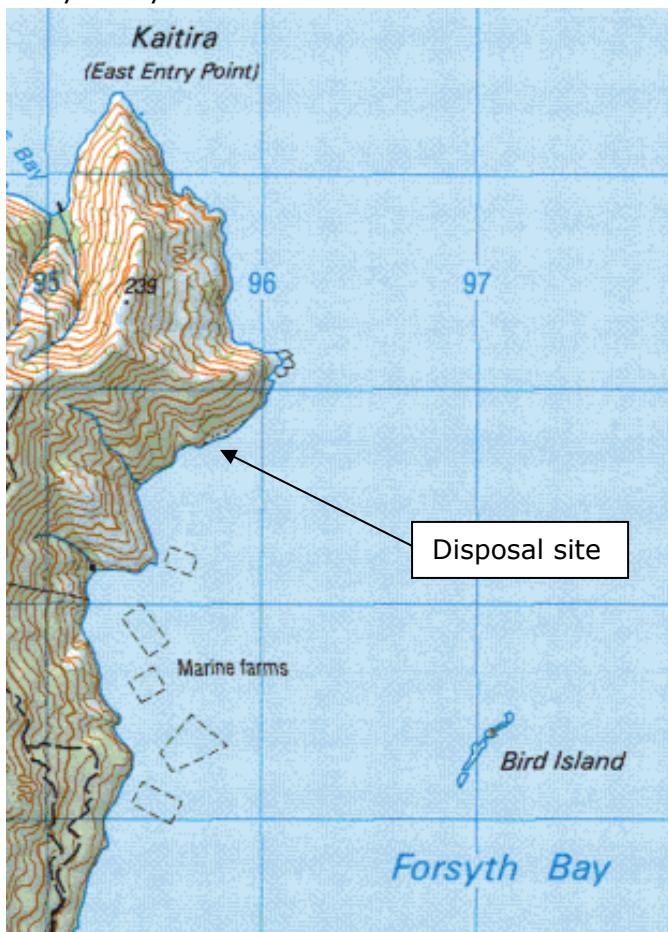
- Ruakaka Bay



- Te Pango / Clay Point / Ngamahau

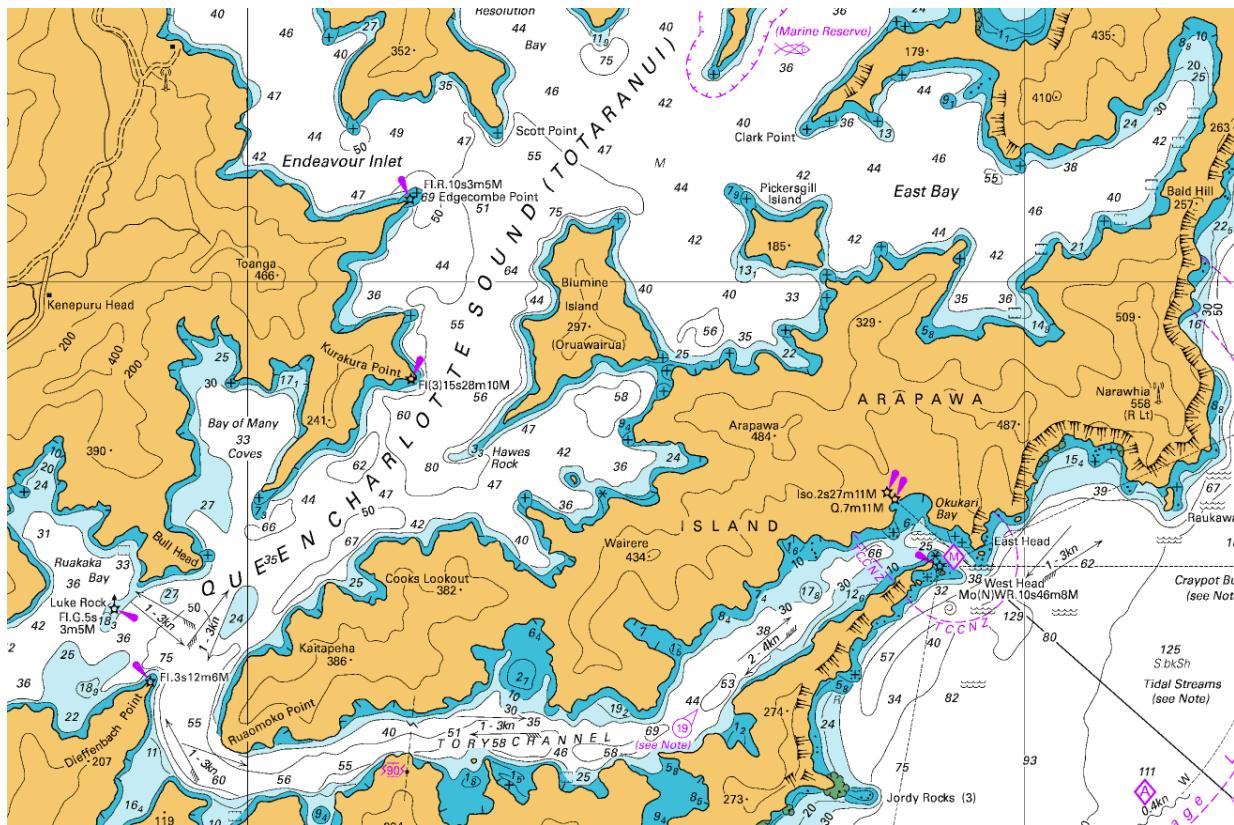


- Forsyth Bay



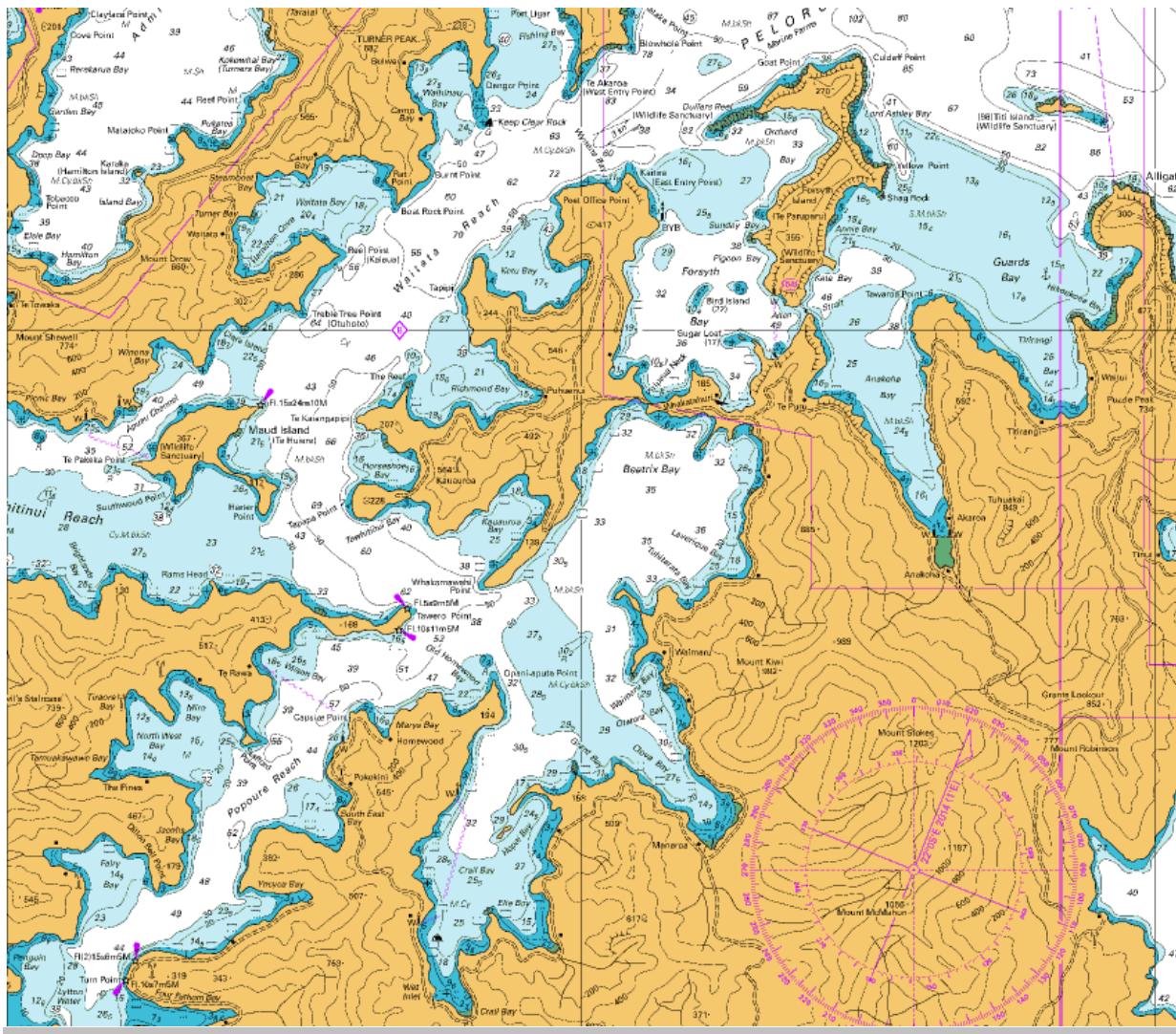
- **Craill Bay**

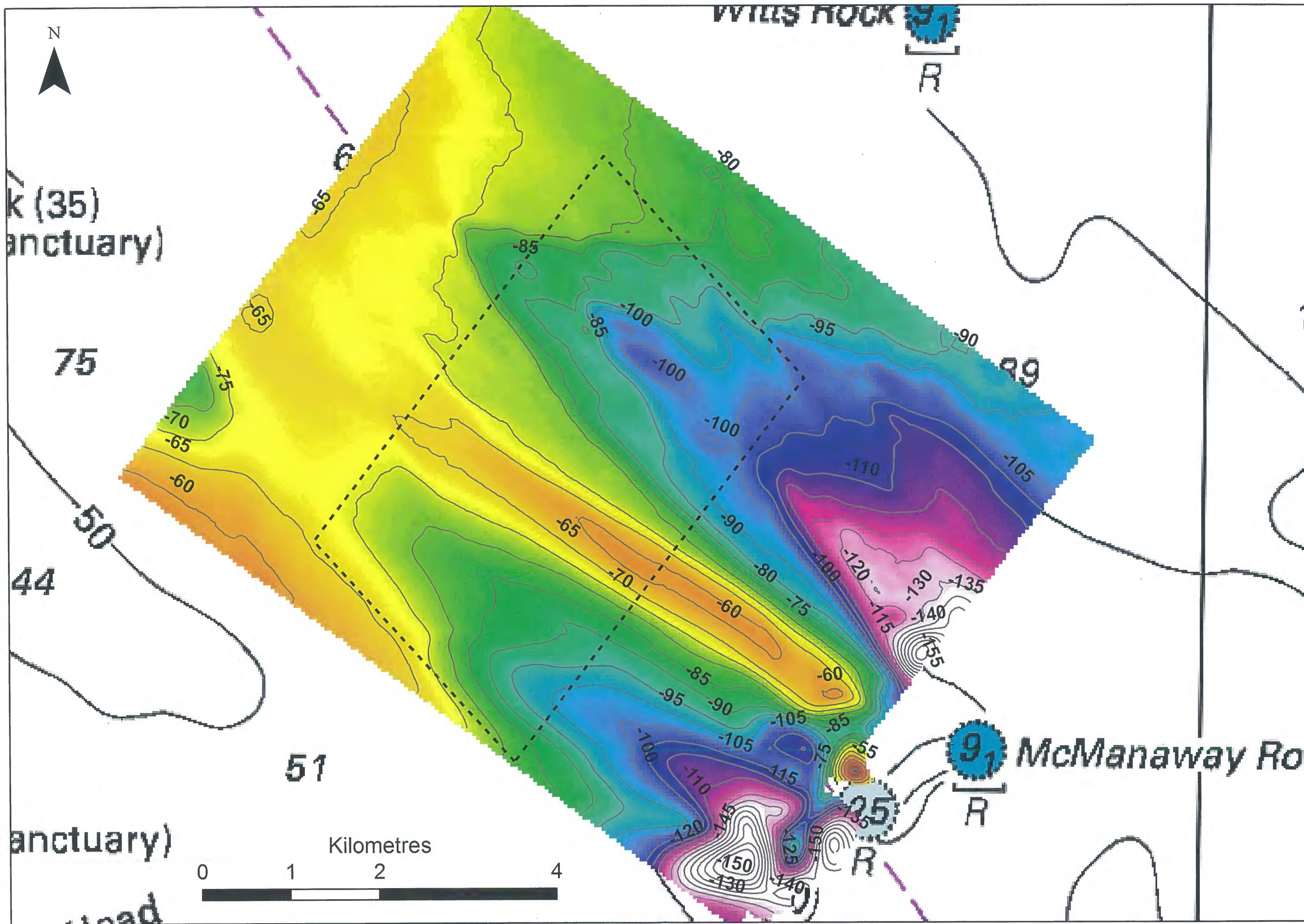


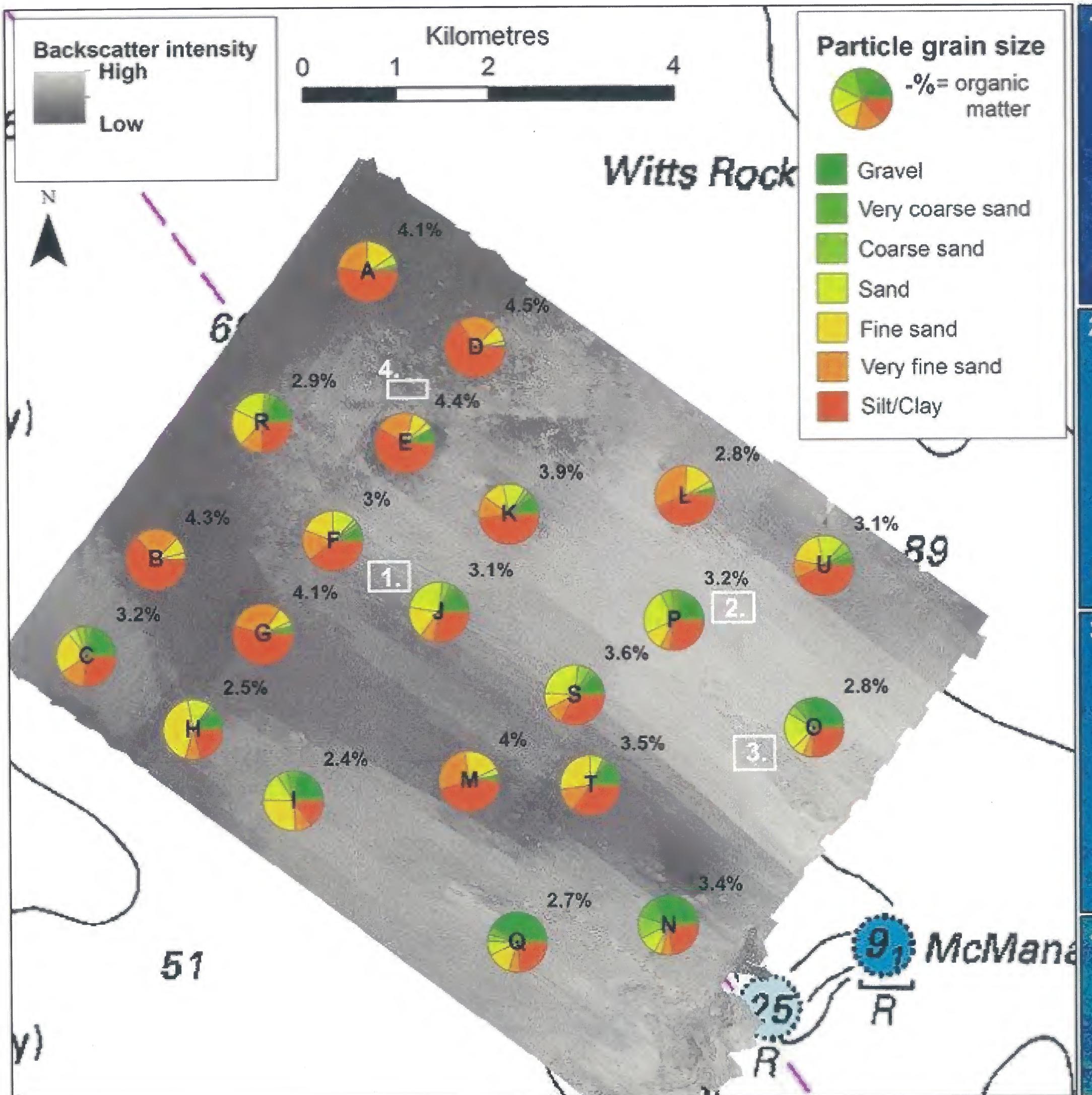




# NEW ZEALAND KING SALMON MARINE MAMMAL AND PROTECTED SHARK MANAGEMENT PLAN







## Particle grain size



- Gravel
- Very coarse sand
- Coarse sand
- Sand
- Fine sand
- Very fine sand
- Silt/clay

Kilometres  
0 0.5 1 2

## Ecologically Significant Marine Sites

### Strata

- Biogenic reef; horse mussels / brachiopod beds / shell patch reef
- Reef edge or reef; shell debris, gravel and rock
- Bryozoan - sands and shell hash predominate
- Sparsely populated with epifauna - soft sediments predominate

N



## Video strata/substrata

- Horse mussel / brachiopod beds
- Horse mussel patch reef
- Bryozoan field
- Sparse epifauna
- Reef edge

ProposalAreaApplication

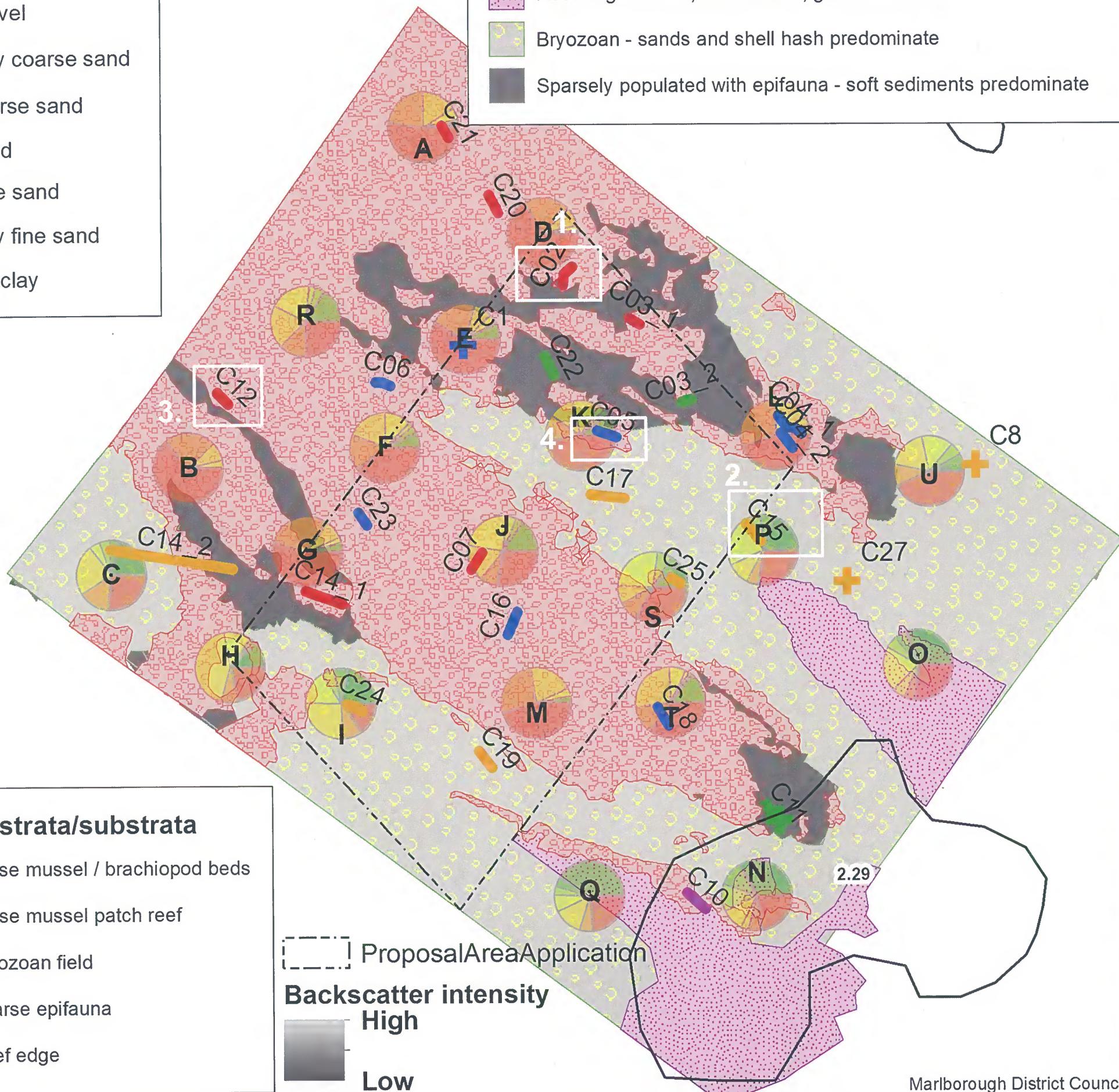
## Backscatter intensity



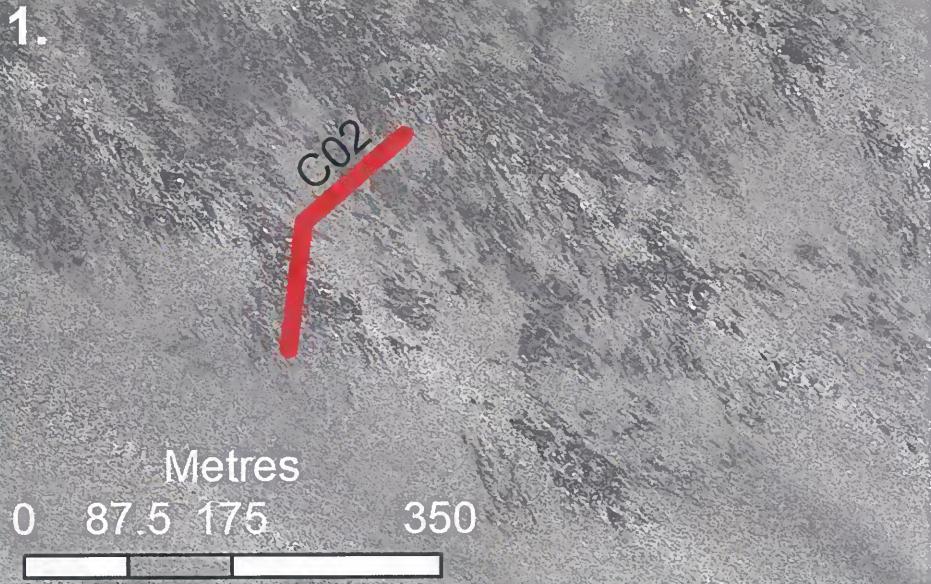
High

Low

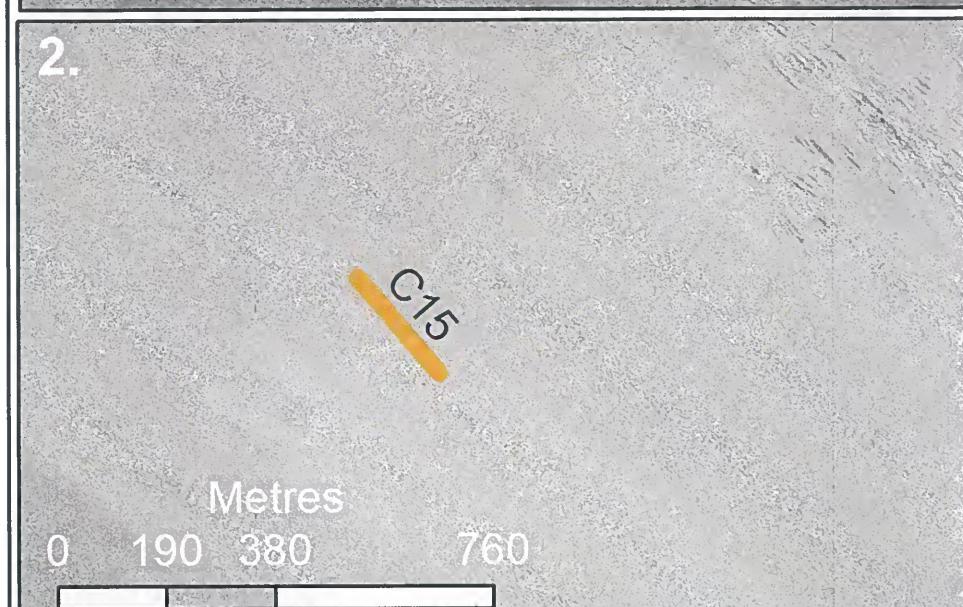
Marlborough District Council



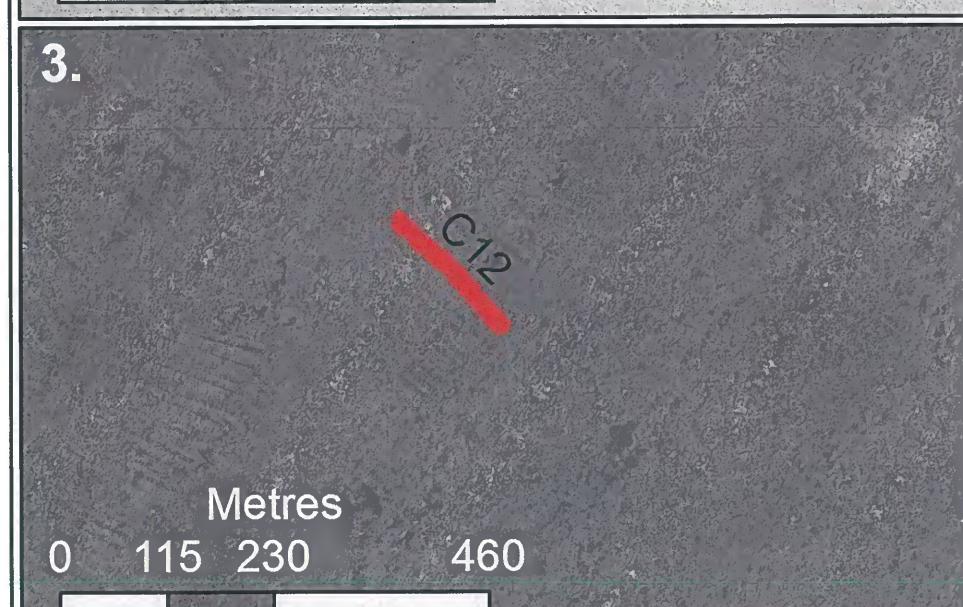
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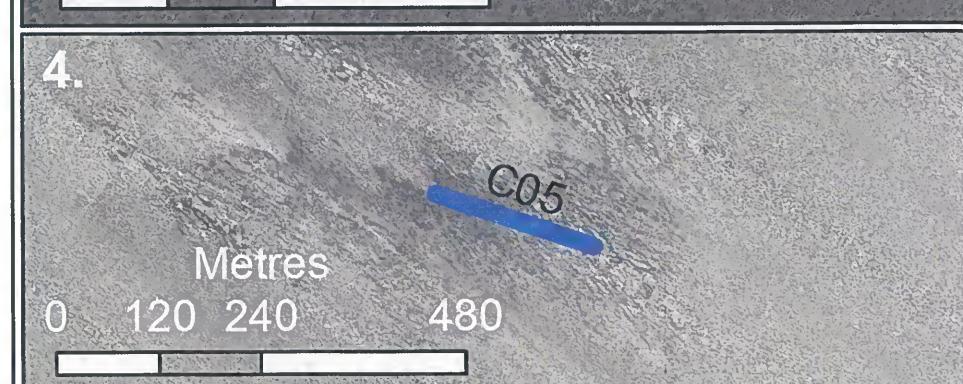
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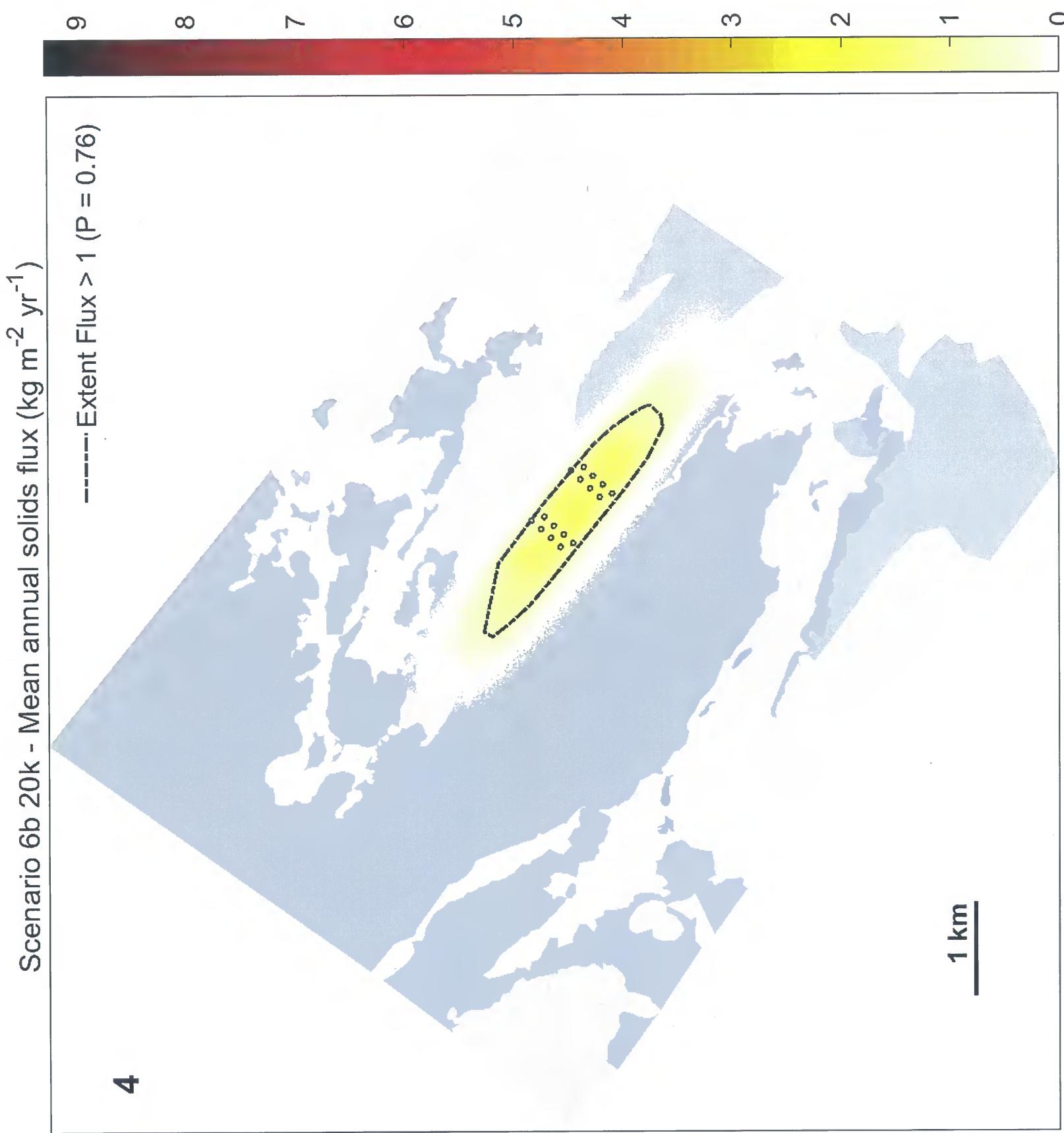


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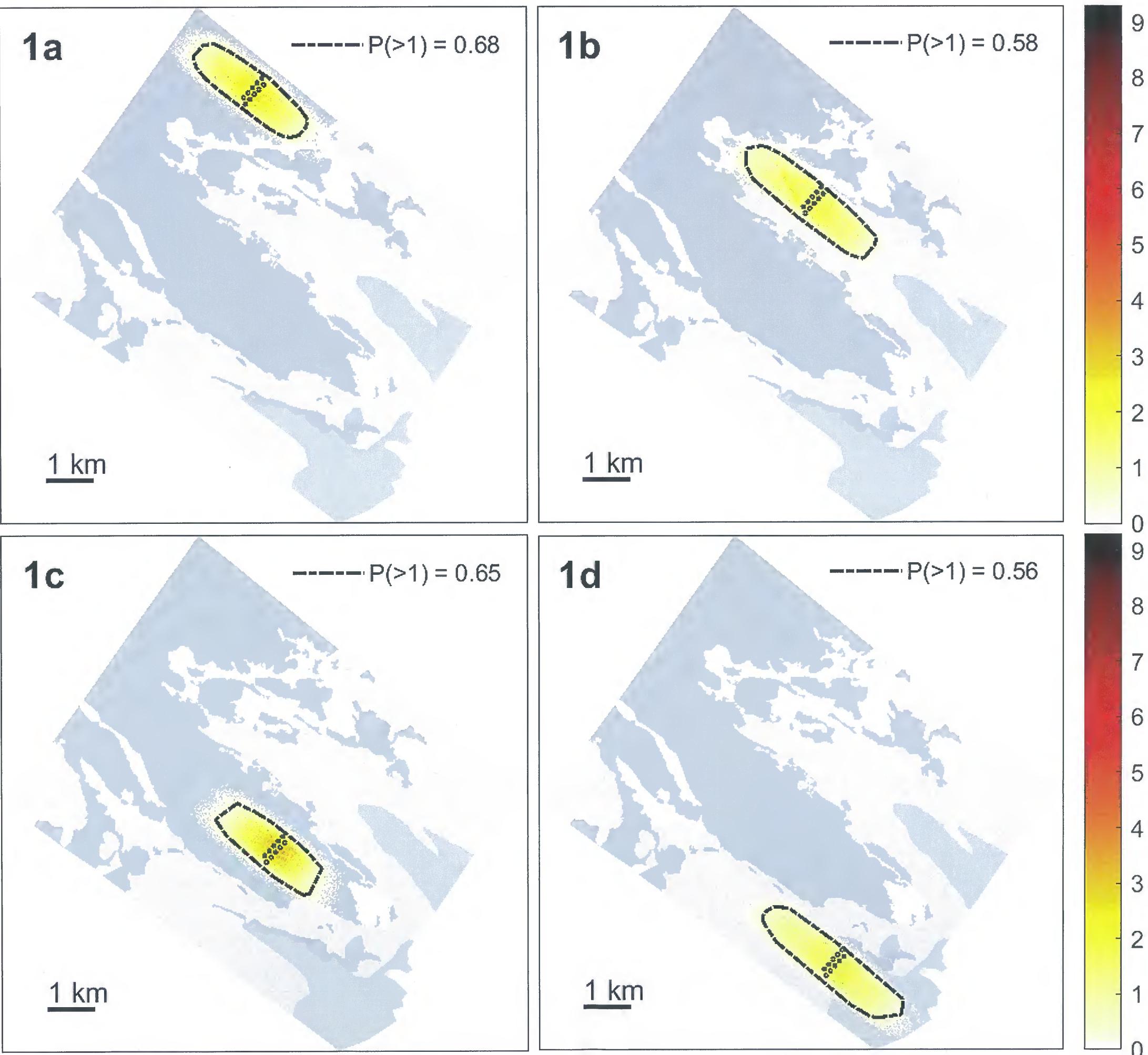


4.

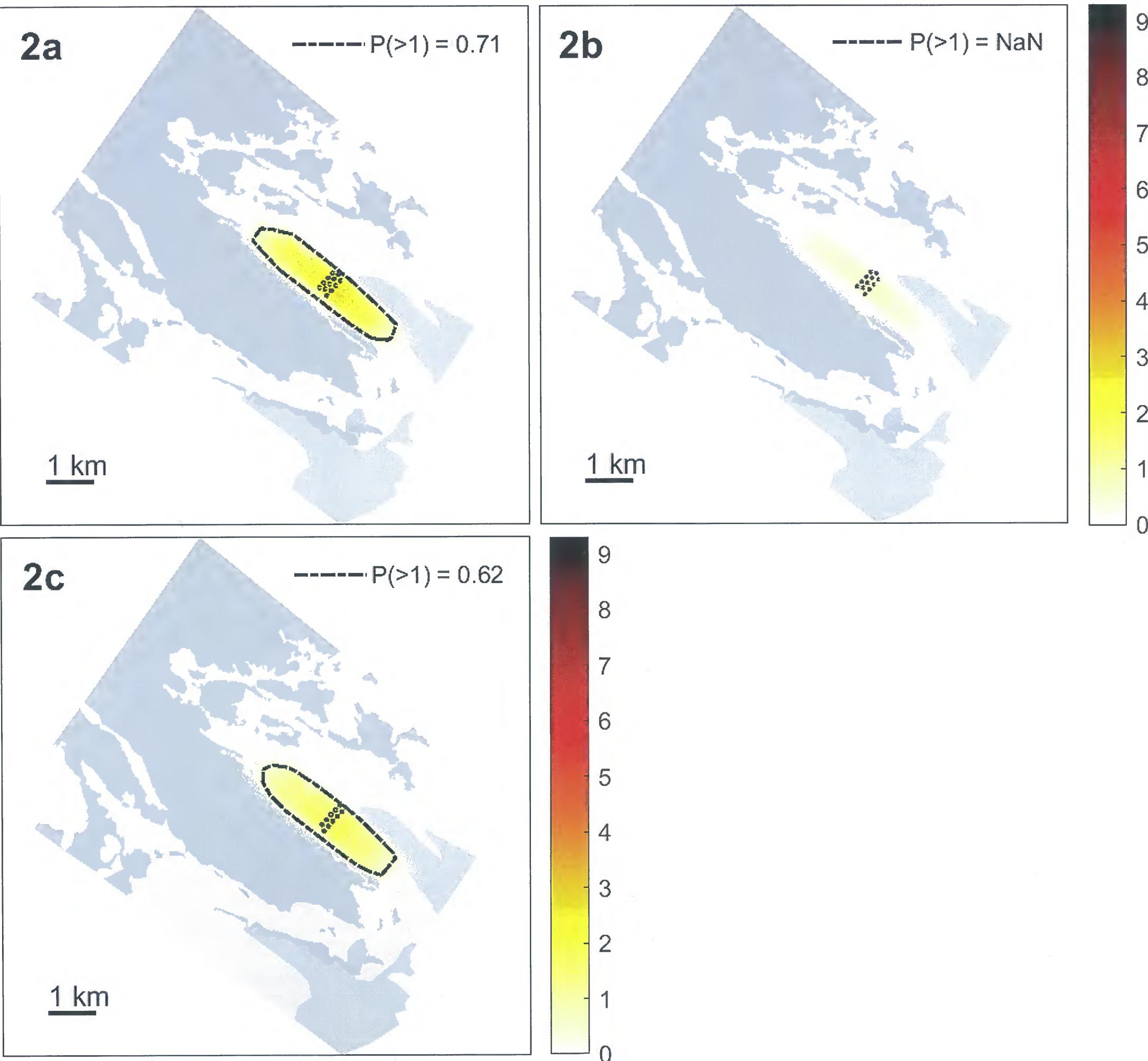




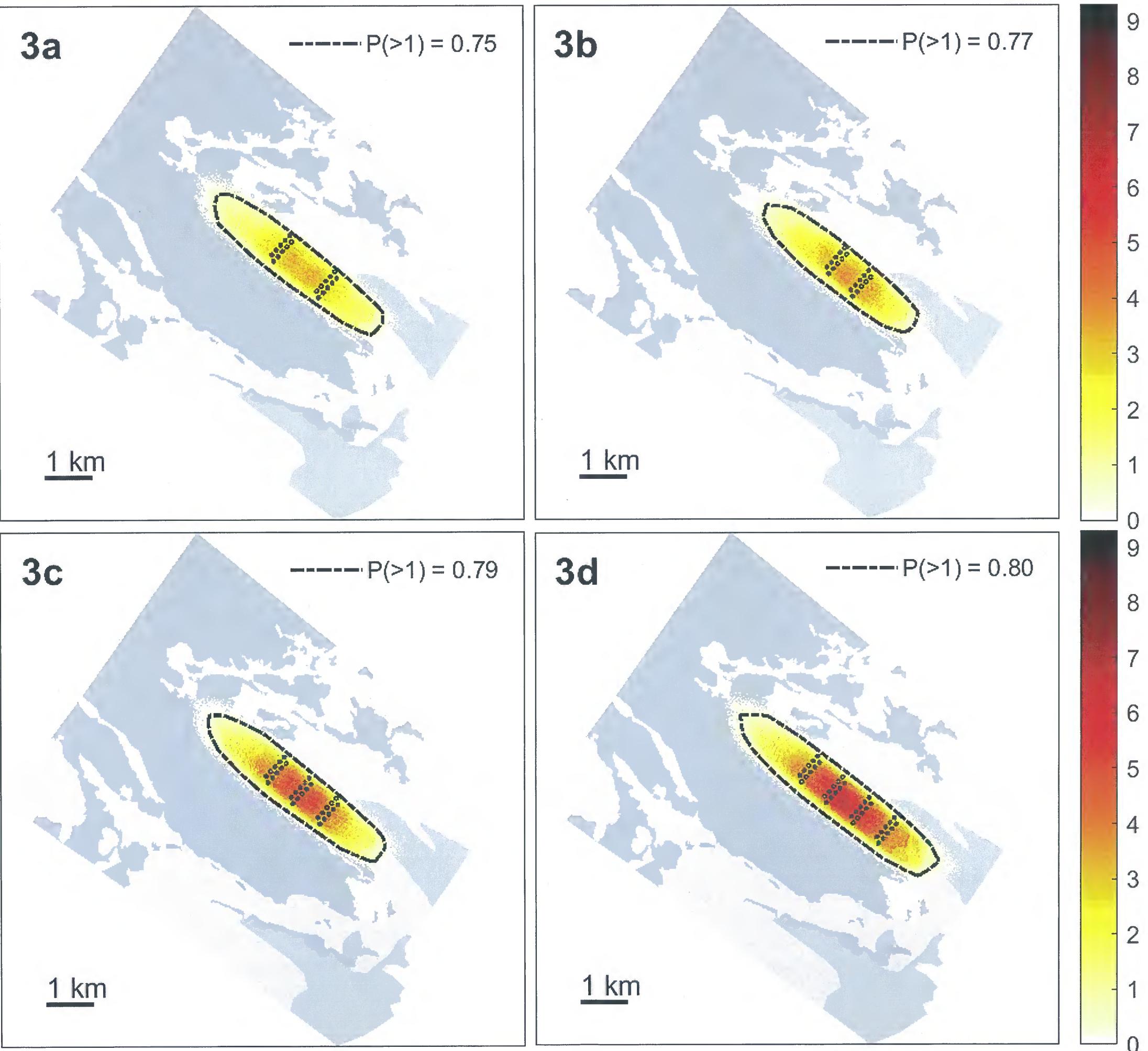
Scenario 1 - Mean annual solids flux ( $\text{kg m}^{-2} \text{ yr}^{-1}$ )



Scenario 2 - Mean annual solids flux ( $\text{kg m}^{-2} \text{ yr}^{-1}$ )



Scenario 3 - Mean annual solids flux ( $\text{kg m}^{-2} \text{ yr}^{-1}$ )



To: Marlborough District Council  
PO Box 443  
Blenheim 7240



ISO 9001:2008  
Document Number:  
RAF0010-CI1921

## SUBMISSION ON APPLICATION FOR A RESOURCE CONSENT

### 1. Submitter Details

Name of Submitter(s) in full \_\_\_\_\_

Electronic Address for Service (*email address*) \_\_\_\_\_

Postal Address for Service (*or alternative method of service under section 352 of the Act*)  
\_\_\_\_\_  
\_\_\_\_\_

Primary Address for Service (*must tick one*)

Electronic Address (*email, as above*)  or, Postal Address (*as above*)

Telephone (day) \_\_\_\_\_ Mobile \_\_\_\_\_ Facsimile \_\_\_\_\_

Contact Person (*name and designation, if applicable*)  
\_\_\_\_\_  
\_\_\_\_\_

### 2. Application Details

Application Number U \_\_\_\_\_

Name of Applicant (*state full name*) \_\_\_\_\_

Application Site Address \_\_\_\_\_

Description of Proposal \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 3. Submission Details (*please tick one*)

I/we support all or part of the application

I/we oppose all or part of the application

I/we are neutral to all or part of the application

- I am a trade competitor for the purposes of section 308B of the Resource Management Act 1991
- I am directly affected by an effect of the subject matter of the submission that:
- a) adversely affects the environment; and
  - b) does not relate to trade competition or the effects of trade competition
- I am NOT directly affected by an effect of the subject matter of the submission that:
- a) adversely affects the environment; and
  - b) does not relate to trade competition or the effects of trade competition
- I am NOT a trade competitor for the purposes of section 308B of the Resource Management Act 1991

The specific parts of the application that my/our submission relates to are (*give details, using additional pages if required*)

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The reasons for my/our submission are (*use additional pages if required*)

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The decision I/we would like the Council to make is (*give details including, if relevant, the parts of the application you wish to have amended and the general nature of any conditions sought. Use additional pages if required*)

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#### **4. Heard in Support of Submission at the Hearing**

I/we wish to speak in support of my/our submission

I/we do not wish to speak in support of my/our submission

OPTIONAL: Pursuant to section 100A of the Resource Management Act 1991 I/we request that the Council delegate its functions, powers, and duties required to hear and decide the application to one or more hearings commissioners who are not members of the Council. (*Please note that if you make such a request you may be liable to meet or contribute to the costs of commissioner(s). Requests can also be made separately in writing no later than 5 working days after the close of submissions.*)

---

## **5. Signature**

Signature ..... Date .....

Signature ..... Date .....

---

## **6. Important Information**

- Council must receive this completed submission before the closing date and time for receiving submissions for this application. The completed submission may be emailed to [mdc@marlborough.govt.nz](mailto:mdc@marlborough.govt.nz).
- The closing date for serving submissions on the consent authority is the 20th working day after the date on which public or limited notification is given. If the application is subject to limited notification, the consent authority may adopt an earlier closing date for submissions once the consent authority receives responses from all affected persons.
- You must serve a copy of your submission on the applicant as soon as is reasonably practicable after you have served your submission on the consent authority.
- Only those submitters who indicate that they wish to speak at the hearing will be sent a copy of the section 42A hearing report.
- If you are making a submission to the Environmental Protection Authority, you should use form 16B.
- If you are a trade competitor, your right to make a submission may be limited by the trade competition provisions in Part 11A of the Resource Management Act 1991.
- If you make a request under section 100A of the Resource Management Act 1991, you must do so in writing no later than 5 working days after the close of submissions and you may be liable to meet or contribute to the costs of the hearings commissioner or commissioners. You may not make a request under section 100A of the Resource Management Act 1991 in relation to an application for a coastal permit to carry out an activity that a regional coastal plan describes as a restricted coastal activity.
- Please note that your submission (or part of your submission) may be struck out if the authority is satisfied that at least 1 of the following applies to the submission (or part of the submission):
  - it is frivolous or vexatious;
  - it discloses no reasonable or relevant case;
  - it would be an abuse of the hearing process to allow the submission (or the part) to be taken further;
  - it contains offensive language;
  - it is supported only by material that purports to be independent expert evidence, but has been prepared by a person who is not independent or who does not have sufficient specialised knowledge or skill to give expert advice on the matter.

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## **7. Privacy Information**

The information you have provided on this form is required so that your submission can be processed under the Resource Management Act 1991. The information will be stored on a public file held by Council. The details may also be available to the public on Council's website. If you wish to request access to, or correction of, your details, please contact Council.