

19/RC/64



The Hearing Panel

**16 September 2019
9.30 am**

Section 42A Officer's Report
Hearing of Application – APP 20181316
- Zane Smith & Jim Maass Barrett
Compiled by Andrew MacLennan, Resource Management Consultant

- Hearing:** The hearing is scheduled to commence at 9.30 am on Monday, 16 September 2019 in the Southland Council Chambers, corner of Price Street and North Road, Waikiwi, Invercargill.
- Application:** Zane Smith and Jim Maass Barrett have applied to:
- discharge shell, sediment and organic material on the seabed;
 - discharge water associated with the harvesting of shellfish;
 - establish permanent structures in the Coastal Marine Area;
 - allow exclusive and preferential occupation for a marine farm within Big Glory Bay, Stewart Island.
- Notification:** The application was publicly notified on 7 February 2019. Five submissions were received on the application within the submission period, one late submission was received on 5 April 2019, 20 working days after the close of submissions. Four submissions in opposition, zero in support and two neutral.
- Recommendation:** I recommend that the application is granted, subject to conditions.

Executive Summary

Zane Smith and Jim Maass Barrett (the applicants) have applied for a coastal permit to establish three new marine farming sites for shellfish at Big Glory Bay, Stewart Island.

The application seeks to establish three marine farms in Big Glory Bay, one of 6 hectares and two of 5 hectares, and the marine farming activity required to manage and operate them. The applicant proposes to farm the following species:

- Green lipped mussels;
- Blue mussels;
- Ribbed mussels;
- Scallops;
- Oysters¹.

The structure of the farming system will be based on a conventional long-line system on each site. Ropes and/or baskets/trays will be suspended from standard double back bone lines of 24, 28 or 32 mm diameter polypropylene rope that will be moored to the seabed with either screw anchors or large concrete blocks, coupled to large steel Danforth style anchors. The water depth at the three sites is approximately 26 metres and most of the culture is grown in the top 10 to 12 metres of water. The lines are generally laid in an east west direction in Big Glory Bay in order to align with the prevailing wind.

Shellfish will either be grown on ropes or in trays/baskets suspended from the backbone. While mussels are best grown on ropes, scallops are grown in baskets in order to contain them. The harvesting activity requires a barge and vessel to be on the site. When harvesting the mussels, sediment and pseudo faeces can be temporarily suspended in the water column causing some discolouration in the immediate vicinity but this effect is very minor and short-lived.

The applicants are seeking a term of consent to expire on 1 January 2040.

Following public notification of the application, five submissions were received, two opposed to the proposal, two opposed the proposal in part, and one was neutral.

The key issues addressed by this report are:

- exclusive² or preferential occupation³ of the Coastal Marine Area;
- potential effects on water quality;
- potential effect on the benthic environment;
- potential biosecurity risk associated with marine farming in Big Glory Bay.

¹ The original application sought to farm Bluff (flat) oysters. However, an email from the applicant's consultant on 11 July 2019 (attached in Appendix 5) formally advised that the applicant wished to amend their application removing oysters from the species to be farmed.

² The Coastal Plan defines 'exclusive occupation' as follows: where no one is allowed access to an area other than the person with the right to occupy.

³ The Coastal Plan defines 'preferential occupation' as follows: allows the use of an area by the general public except in circumstances where the person with the occupation right wants to use the area.

As an example, in the introduction to Chapter 9 – Occupation, the Coastal Plan states that the caged area of a salmon farm may be an example of exclusive occupation while a whitebait stand is an example of preferential occupation.

1. Introduction

1.1 About the author

My name is Andrew MacLennan. I am a Senior Resource Management Consultant with Incite (Chch) Limited.

I hold a Bachelor of Science in Land Planning and Development from Otago University and am currently studying towards a Masters of Resource Management at Massey University. I am an Associate Member of the New Zealand Planning Institute and a member of the Resource Management Law Association. I have eight years' planning experience working in both local government and the private sector. My experience includes both regional and district council resource consent processing.

I have been contracted by Southland Regional Council (trading as Environment Southland) as the processing officer for this application.

1.2 Purpose of this report

This report is prepared under the provisions of Section 42A of the Resource Management Act 1991 (RMA). This section of the RMA allows a council officer to provide a report to a decision-maker on a resource consent application made to the Council and allows the decision-maker to consider the report at the hearing. Section 41(4) of the RMA allows the decision-maker to request and receive from any person who makes a report under Section 42A *"any information or advice that is relevant and reasonably necessary to determine the application."*

This report will provide the decision-maker with information and advice related to:

- the background to the application;
- details of the notification of the application and submissions received;
- an outline of the relevant legal and planning provisions;
 - Resource Management Act 1991 (RMA);
 - New Zealand Coastal Policy Statement 2010 (NZCPS);
 - Southland Regional Policy Statement 2017 (RPS);
 - Regional Coastal Plan for Southland 2013 (RCP);
 - Te Tangi a Tauira, Ngāi Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan 2008 (IMP);
- comments on the assessment of environmental effects provided;
- comments in relation to the matters specified in Part 2 of the RMA;
- comments on the decision to be made by the decision-maker including:
 - comments on whether the application can be granted or should be declined;
 - if the application is to be granted what measures are required to avoid, remedy or mitigate any adverse effects and what monitoring could be undertaken.

It should be emphasised any conclusions reached, or recommendations made, are not binding on the decision-maker. It should not be assumed the decision-maker will reach the same conclusion or decision having considered all the evidence to be brought before it by the applicant and submitters.

2. The proposal

2.1 Background

Zane Smith and Jim Maass Barrett applied for a coastal permit to establish three new marine farming sites for shellfish at Big Glory Bay, Stewart Island on 3 May 2018.

On 25 May 2018, the applicants agreed to provide a timeframe extension of five working days to enable a technical review of the assessment of environmental effects to be carried out. The technical review was undertaken by Rob Davidson from Davidson Environmental Limited.

On 1 June 2018 the applicants agreed to an additional timeframe extension of five working days to enable the draft technical review to be reviewed before a final version is submitted.

On 5 June 2018 Environment Southland requested further information under Section 92(1) of the Resource Management Act 1991 (RMA). The further information request sought further information on a range of issues including the description of the activity, the general description of effects, biosecurity, carrying capacity, water column effects, benthic effects, discharges, codes of practice, wildlife and habitat effects, hazardous substances, biosecurity, maintenance and draft conditions. The further information request also included comments from Mr Davidson of Davidson Environmental Limited who had carried out a technical review of the application.

On 17 August 2018 the applicants responded to the request for further information and submitted an amended plan for the location of each of the proposed sites.

On 8 November 2018 the Council responded to the further information provided on August 2018. The response noted that Rob Davidson from Davidson Environmental Limited and Emma Newcombe from the Cawthorn Institute have reviewed the further information provided and a number of questions had arisen from this review.

On 12 December 2018 the applicants responded to the request for further information.

On 7 February 2019 the application was publicly notified in the Southland Times and on the Environment Southland website. Submissions closed on 8 March 2019. Five valid submissions were received on the application, with submitters and details of the submissions summarised in Table 1 below.

The applicants did not pay the deposit for the hearing cost until 29 April 2019. The processing of the application was placed on hold under Section 36AAB(2) until the deposit was paid.

The processing timeframes were extended under Section 37A of the RMA from 9 July 2019 to 2 August 2019 at the request of the applicant.

3. Notification and submissions

3.1 Lodgement

The application was lodged with Environment Southland on 3 May 2018. Environment Southland sent the applicants a letter confirming the applications had been accepted as complete under s88 of the RMA on 16 May 2018.

3.2 Reason for notification

The consent authority decided in accordance with Section 95D, that the activity will have, or is likely to have, adverse effects on the environment that are more than minor. I recommended that the application be processed on a publicly-notified basis. This was because:

- the application is seeking to establish three new marine farms totalling 16 hectares within Big Glory Bay, which will have potentially more than minor adverse effects on navigation and public access as the application will reduce the ability for an individual to enter, pass and recreate within the marine farm boundaries;
- Section 11(2) of the Marine and Coastal Area (Takutai Moana) Act 2011 states that:

“Neither the Crown nor any other person owns, or is capable of owning, the common marine and coastal area, as in existence from time to time after the commencement of this Act.”

Given this, it is considered that public notification is required to ensure that any persons who use directly or enjoy from a distance the application site have an opportunity to have their say on the proposed use of the application site.

The application was publicly notified on 7 February 2019.

3.2 Submissions received

Five valid submissions were received on the application within the submission period, with submitters and details of the submissions summarised in Table 1 below.

One late submission was received on 5 April 2019, 20 working days after the close of submissions. The submitter, and details of their submissions summarised in Table 2 below.

Table 1: Submissions summary

Submitter	Position	To be heard	Trade Competitor
Sanford Limited Contact: Alison Undorf-Lay	Oppose	Yes	No
	<p>Sanford opposes these applications on the basis that the location of the proposed farms has the potential to:</p> <ul style="list-style-type: none"> adversely affect safe navigation into, around and out of Big Glory Bay; and alter hydrodynamic processes, particularly water circulation patterns and phytoplankton distributions, in Big Glory Bay. Those changes have the potential to adversely affect the performance of Sanford’s existing aquaculture activities. <p>Unless resource consent conditions can be imposed that address these concerns Sanford seeks that the applications be declined. Sanford would welcome the opportunity for further discussions with the applicant and council as to how these matters might be potentially resolved</p>		
Department of Conservation (DoC) Contact: Nardia Yozin	Oppose in part	Yes, but have since withdrawn right to be heard	No
	<ul style="list-style-type: none"> DoC not opposed to farming shellfish in Big Glory Bay (BGB) provided adverse effects are appropriately managed. DoC is concerned with: <ul style="list-style-type: none"> potential cumulative effects of the proposed activity – particularly the reference to the ‘Big Glory Bay Monitoring Programme’; the design of the benthic survey undertaken by the applicant – particularly sampling methods and the utility of the control sites for monitoring; the proposed monitoring and if it will adequately detect effects. DoC notes that the NZCPS requires a precautionary approach in particular circumstances and the protection of indigenous biological diversity. DoC does not consider that enough assessment has occurred relating to the effects on habitat to provide enough certainty or understanding of the potential effects. DoC seeks that conditions be imposed to address their concerns or that the application be declined. 		
Ministry for Primary Industries (MPI) Contact: Simon Lamping	Neutral	The Ministry is able to make further oral submission at a hearing if required	No
	<ul style="list-style-type: none"> MPI considers it would be appropriate that the application describes measures that reduce biosecurity risk associated with farming oysters given Big Glory Bay was the only location in Stewart Island where <i>Bonamia ostreae</i> was detected. MPI notes that the current application does not identify the need under the Fisheries Act 1996 for a marine farm to register themselves and the species the coastal permit allows them to farm. They request that an advice note be added to the consent advising the applicants of their obligations to register as fish farmers. 		

Submitter	Position	To be heard	Trade Competitor
EEC Ltd Contact: Helen Cave	Oppose in part	Yes, but have since withdrawn right to be heard	No
	<ul style="list-style-type: none"> EEC Ltd notes that in 1994 an application was made for the marine farming sites now owned and operated by EEC Ltd. They note that the application was restrained by concerns regarding the biomass able to be supported in the bay. They state that an agreement was reached for the development of 5 sites. Site "R" was to be a "reserve" site in case one of the other sites was proved unsuitable location-wise. Site 1 in the current application is located in the same location as former site "R". As site 1 was not able to be used as part of a former application, EEC Ltd are seeking justification as to why it is now available in the current application. EEC does not have an opposition to the approval of Sites 2 and 3 of the application. 		
Te Rūnanga o Ngāi Tahu and Te Rūnanga o Awarua Contact Stevie-Rae Blair	Oppose	Yes, but have since withdrawn right to be heard	No
	<ul style="list-style-type: none"> Ngāi Tahu has concerns about the application because of the recent detection of <i>Bonamia ostreae</i> in Big Glory Bay. They are concerned about the potential environment impacts from the proposed activity. This poses a huge risk to the wild oysters in Foveaux Strait and believes that granting a consent for this activity would undermine the response that was undertaken. Ngāi Tahu seeks that the applicant removes oysters from the application or if the consent authority is of a mind to grant this application, they seek appropriate mitigation conditions be imposed. Ngāi Tahu wishes to participate in the development of appropriate consent conditions. 		

Table 2: Late submission summary

Submitter	Position	To be heard	Trade Competitor
Graeme Stuart Wright (Bluff Oyster Management Company Ltd) Contact: Graeme Stuart Wright	Neutral	No	No
	Bluff Oyster Management Company Ltd (BOMC) is the stakeholder group representing all OYUS commercial quota owners. In principle, BOMC supports the proposal, except for the inclusion of "Ostrea Chilensis" as a permitted species to be farmed. BOMC believe "Ostrea Chilensis" should be specifically excluded from this consent.		

4. Legal and Planning matters

4.1 Status of application

Resource consent is required in accordance with the following rules of the Regional Coastal Plan (RCP):

- Rule 5.4.3.2 states that, the deliberate introduction of exotic fauna and indigenous fauna not sourced from the Southland region into the coastal waters of Stewart Island (as shown on Figure 5.4.3.1) and the coastal marine area of Fiordland, and offshore islands, is a non-complying activity, except as provided for in Rules 15.1.1 to 15.1.4:
 - Rule 15.1.1 states that the growth of new or additional marine species for aquacultural purposes within areas that are covered by an existing right of occupation, is a discretionary activity;
 - Rules 15.1.2 to 15.1.4 state that marine farming in certain parts of the coastal marine area are prohibited;
 - as the current application is for a new marine farm area (not covered by an existing right of occupation), in the coastal waters of Stewart Island, and the spat will only be sourced from Kaitaia off 90 Mile Beach, the application is a **non-comply activity**.
- Rule 9.1.1 states that the exclusive occupation or preferential occupation of part of the CMA is a **discretionary activity**.
- Rule 9.1.2(1) states that any activity involving occupation of the coastal marine area which would exclude or effectively exclude public access from areas of the coastal marine area over 10 hectares (except where such exclusion is required in commercial port areas for reasons of public safety or security) is a **discretionary activity**.
- Rule 9.1.4 sets out the coastal occupation charges that are relevant for coastal permits for occupations issued under the RMA.
- Rule 9.1.6 allows for the occupation by suspended cables, aerial wires, power and telephone lines as a **discretionary activity**.
- Rule 9.1.7 allows for the occupation by submarine lines or cables as a **restricted discretionary activity**.
- Rule 10.2.2 states that the deposition of less than 50,000 cubic metres of any material on the foreshore in one site in any one year is a **discretionary activity**.
- Rule 11.2.6(2) states that the erection of temporary or permanent structures in the coastal marine area in those parts of the coastal marine area not referred to in 11.2.6 (1)(a) or (b) is a **discretionary activity**.
- Rule 15.1.7 states that marine farming in areas other than those referred to in Rules 15.1.2 - 15.1.6 is a **discretionary activity**.

The various components of the proposal for which consent is required are considered to be closely related and to have overlapping effects. The application should therefore be “bundled” and considered in terms of the most restrictive activity status. As a result, the application is considered to be an overall **non-complying activity**.

Note: The notification report incorrectly assessed this application as a discretionary activity as Rule 5.4.3.2 was overlooked in the initial planning assessment.

5. Description of the environment

The existing environment

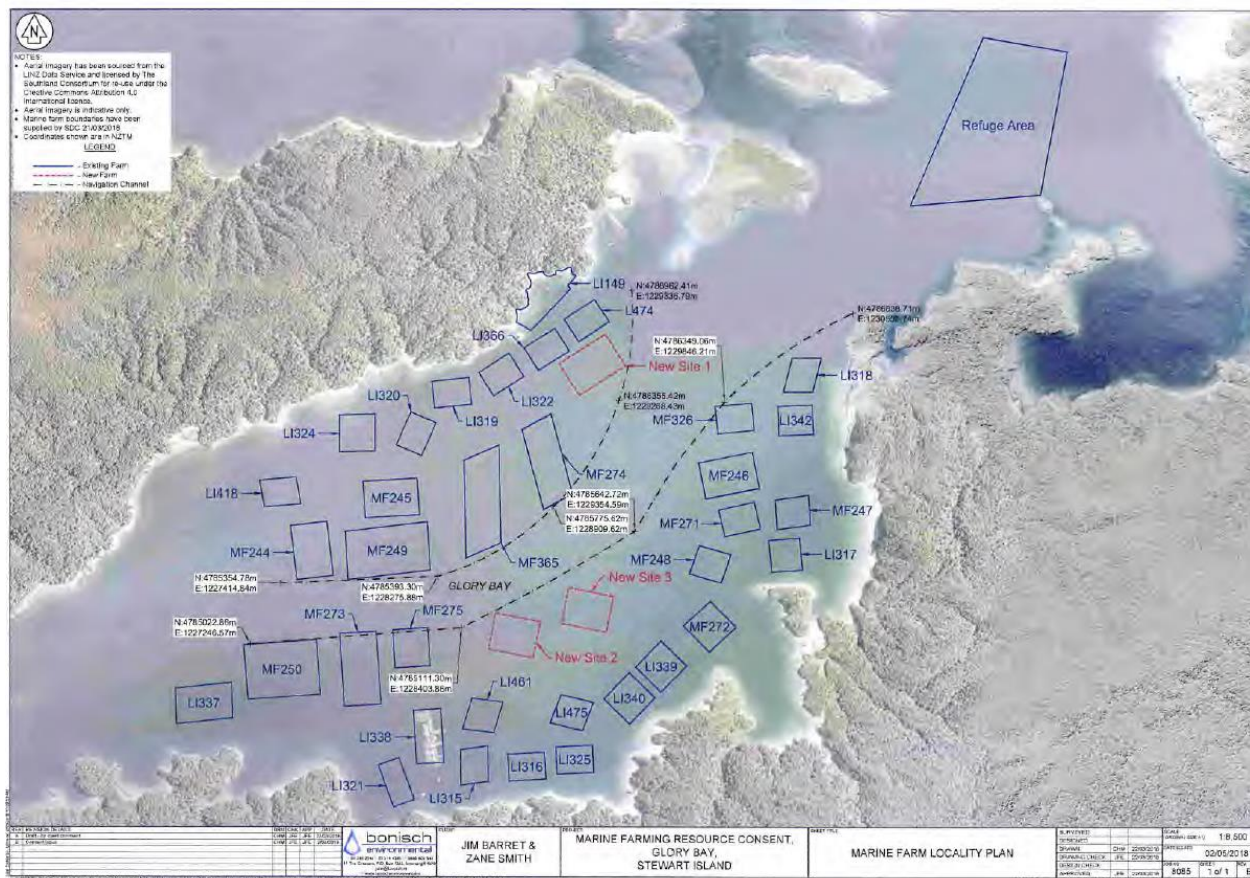
The application, additional reports and further information provided by the applicants describe the existing environment well. I adopt this description and summarise some points here.

The application seeks to establish three new marine farming sites for shellfish at Big Glory Bay, Stewart Island. There are 35 marine farms site currently within Big Glory Bay. By area, the greatest proportion is in mussel farming but there is a significant area available for salmon farming. Big Glory Bay is a semi-enclosed arm of Paterson Inlet, located in its south east corner, and has a surface area of approximately 12 km². The bathymetry of Big Glory Bay is relatively flat and the Bay has an average depth of approximately 20 metres. There are shallow rocky reefs along the northern and southern sides of the bay.

A 2017 landscape study of Stewart Island undertaken by Boffa Miskell⁴ has determined that Big Glory Bay is not an outstanding natural landscape or an outstanding natural character area. There are no archaeological sites located within the vicinity of the proposed marine farming sites.

The three proposed marine farm sites are shown in red in Map 1 below.

Map 1: Location of proposed marine farm sites



Source: APP 20181316 resource consent application

⁴ Stewart Island - Landscape and Coastal Natural Character Study, Prepared for Environment Southland, 30 October 2017.

6. Assessment of actual and potential effects

Section 15 (Marine Farming) of the RCP, lists the adverse effects that may result from marine farming. These will be used as guidance in assessing the actual and potential effects of the proposal.

Rob Davidson, a marine biologist from Davidson Environmental Limited, and Emma Newcombe, a marine ecologist from the Cawthron Institute, have provided technical comment on the water quality and benthic environment aspects of the application. Both Mr Davidson and Ms Newcombe's comments have been taken into account in the assessment below, and their comments are attached to this report.

6.1 Occupation

Sanford Limited in its submission has opposed this application on the basis that the location of the proposed farms has the potential to adversely affect safe navigation into, around and out of Big Glory Bay. No specifics were provided as to how the proposal will adversely affect navigation. This may be expanded on by the submitter through the hearing process. When considering the potential effects of occupation, the application notes that vessels can, with care, navigate between the mussel lines on the farms as the application does not seek exclusive occupation of the sites. The application also notes that farms do inhibit full public access to all areas of Big Glory Bay, but, for the most part, the public can navigate safely through the farms.

While it is acknowledged that the access will not be completely restricted by the application, it is noted that the application is seeking to establish three new marine farms totalling 16 hectares within Big Glory Bay, which will have a considerable effect on public access to this part of the coastal marine area as the proposed activity will reduce the ability for an individual to enter, pass and recreate within the marine farm boundaries. It is also noted that a reasonable proportion of the proposed application site will require exclusive occupation of the coastal marine area for structures such as:

- mooring blocks located on the seabed;
- ropes and buoys;
- suspended ropes, baskets and trays attached to the backbone.

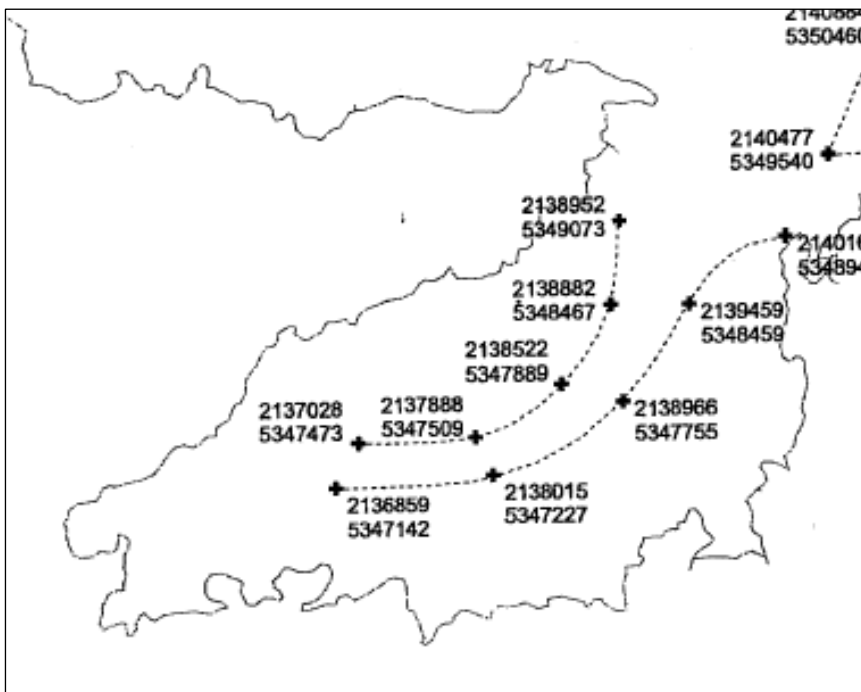
When considering Sanford Limited's submission that the location of the proposed farms has the potential to adversely affect safe navigation into, around and out of Big Glory Bay, it is noted that Rule 11.8.1 of the Coastal Plan ensures navigation safety within Big Glory Bay by prohibiting the exclusive or preferential occupation of the Big Glory Bay fairway marked on Map 12a within the Coastal Plan (Shown in Map 2 below). The explanation to Rule 11.8.1 states that purpose of this rule is to provide a fairway for ships in and out of Big Glory Bay. The proposed sites are not located within the fairway, nor are they located in a position that will prevent safe navigation into, around, and out of Big Glory Bay. The application states that Big Glory Bay is known to be a marine farming area and users of the area know that extra care needs to be taken to navigate through it. The application also notes that all sites must comply with the navigation and safety requirements of the regional Harbourmaster. Marking of sites is based on the "Guidelines for Aquaculture Management Areas and Marine Forms" booklet produced by Maritime New Zealand, the latest version of which is dated December 2005. The applicants agree to comply with these requirements.

Environment Southland's Harbourmaster has reviewed the application from a navigational safety perspective. He has advised that the application will not result in adverse navigational safety effects.

The application was also sent to Maritime New Zealand for comment in accordance with Section 89A of the RMA. No response was received.

It is considered that the exclusive and preferential occupation of 16 hectares of CMA sought by the application has the ability to effect public access and enjoyment of the area. However, only one submission was received through notification that raised concerns that the proposed activity will adversely affect safe navigation. This submission raised concerns in the context of a marine farming interest ensuring that safe access to their farms is not compromised. No recreational users of the area have raised concerns that the proposed application will adversely affect public access and enjoyment of the area. Accordingly, I consider that, provided that conditions of consent ensure that the marine farm is marked in accordance with the "Guidelines for Aquaculture Management Areas and Marine Farms" booklet produced by Maritime New Zealand, the potential adverse effects of navigation will be mitigated.

Map 2: Big Glory Bay Fairway



Source: APP 20181316 resource consent application

EEC Limited has also submitted on the application. Within its submission it notes that in 1994 an application was made for the marine farming sites now owned and operated by EEC Limited. It notes that the application was restrained by concerns regarding the biomass able to be supported in the bay. It states that an agreement was reached for the development of five sites. Site "R" was to be a "reserve" site in case one of the other sites was proved unsuitable location-wise. Site 1 in the current application is located in the same location as former site "R". As site 1 was not able to be used as part of a former application, EEC Limited is seeking justification as to why it is now available in the current application. It states that if it had been aware that marine farming could occur on Site 1 it would have reapplied for consent to farm there. EEC Limited does not have an opposition to the approval of Sites 2 and 3 of the application.

When considering the merits of this submission, I have first considered whether the nature of the submission would be considered "trade competition" under the RMA. Section 104 states that when

making a decision on an application for resource consent, the consent authority must not have regard to trade competition or the effects of trade competition. I understand the intent of the disregarding trade competition is to prevent trade competitors frustrating legitimate activities, purely for the purpose of preventing commercial competition. While I acknowledge that part of the EEC Limited submission may be partly a trade competitor frustrating the consenting process, my interpretation of the submission is that it is concerned with the effect of the proposal on level of biomass that Big Glory Bay is able to support, and a plan integrity argument, as Site 1 was a site not able to be farmed as part of its application but is now available in the current application. I consider both to be valid arguments which do not need to be disregarded on the grounds of trade competition.

In relation to the effect of the proposal on the level of biomass that Big Glory Bay is able to support, this is discussed at length in Section 6.3 – Ecological Carrying Capacity below. In relation to the plan integrity argument, I consider it is important to first note that the provisions in Chapter 15 of the Regional Coastal Plan for Southland (Marine Farming) were approved by Council on 10 September 2008 and became fully operative on 16 March 2013. As such, any consent application made by the submitter in 1994 was made under a different planning regime. In addition, when considering and application for a resource consent it is the role of the consent authority to have regard to the matters listed in Section 104 of the RMA. The fact that an application had been declined 25 years ago in the same location is not substantially relevant to the current application, as there could have been any number of reasons why that application in this location was not appropriate. Each resource consent application is to be considered on its merits, and through the consent process the actual and potential effects of this application have been considered at length to determine the result of this application.

6.2 Landscape and visual amenity and natural character

When considering the potential landscape and visual effects associated with the application, I note that Environment Southland commissioned Boffa Miskell to undertake an assessment on Stewart Island in 2018. While I acknowledge that this landscape assessment does not form part of the provisions of the Coastal Plan (or a proposed plan), I consider that the Boffa Miskell report would be considered information that is relevant and reasonably necessary to determine the application under Section 104(1)(c). As such, I have had regard to the findings within this report. A copy of this report is attached as Appendix 1.

The report notes that marine farming "*... has modified the central coastal waters of Big Glory Bay, however the costal interface area adjacent to the land retains generally very high levels of naturalness due to the lack of modifications*". In describing Paterson Inlet, the report states that despite "*... the modification (which is centred on only a few parts of the Marine Area the majority is relatively untouched, supporting an overwhelming sense of naturalness, notably within the more sheltered ports of the inlet.*"

The areas of Big Glory Bay, Halfmoon Bay and Horseshoe Bay are excluded from the area considered to be an Outstanding Natural Landscape because of the level of existing development. Similarly, while much of Paterson Inlet is deemed to have outstanding natural character, Big Glory Bay does not due to the presence of the marine farms.

The application notes that given that there are a significant number of existing marine farms in Big Glory Bay at present, the addition of three further mussel farms will only have a cumulative effect. It notes that the new farms will not detract significantly from these values any further because they will not be any different in nature to what is already present.

The application notes that aquaculture has been present in Big Glory Bay since the 1980s, and the current number of sites has not changed for over 10-15 years. Marine farms are confined to this area and are an expected sight when visiting Big Glory Bay. The application acknowledges that the addition of three more farms to the 35 existing ones will have a cumulative effect, but they have considered this to be no more than minor.

When considering the actual and potential landscape effects associated with the proposal, I have placed considerable weight on the findings of the Boffa Miskell landscape study of Stewart Island. As part of the assessment this report states:

“For Stewart Island, there was very little debate about the extent of the ONC mapping, indeed, for Stewart Island, the main question was, what isn’t outstanding? Only the areas that contained the most concentrated modification were excluded, which included parts of Oban and Big Glory Bay.”

It is clear from the assessment in this report that the existing level of marine farm development within Big Glory Bay has modified the natural character of the area. Given that the proposal seeks to establish an additional three marine farms in this environment, I agree with the applicants that the application will not present any new landscape effects, nor will it significantly detract from the natural values of the area, other than adding to the cumulative effects of marine farms in Big Glory Bay.

When considering the cumulative landscape effects associated with introducing three new marine farms into Big Glory Bay, I note that the structures associated with mussel farms are most prominent when looking over the water surface from a vessel in reasonably close proximity. The buoys are a recessive dark colour, which are unobtrusive, making them difficult to notice from a distance. The application notes that each line of the mussel farm has an orange buoy at its ends, but despite that brighter colour, they are not conspicuous from a distance. The application also states that visual effects of the proposed farms will be consistent with other shellfish sites, as they will be similar in the materials used and the way they will be laid out. I consider that the addition of 16 hectares of new marine farms will have some cumulative landscape effect on the natural character of the area. However, given the vast nature of Big Glory Bay, I do not consider this additional cumulative effect will present a “tipping point” that would detrimentally affect the landscape values of the receiving environment.

6.3 Ecological carrying capacity

Within the application the applicants have stated that there is sufficient carrying capacity in the bay for the additional mussel farms. This assessment is based on the lack of any detectable impact from the existing shellfish farming on either the ecology of the bay away from the farm sites, or on mussel production on those existing sites. As part of the processing of this resource consent application, Mr Davidson has reviewed the technical aspects of the application. In his review, he noted that the three marine farm applications are in offshore, deep locations in a sheltered semi-enclosed bay with other shellfish and salmon farms. He also noted that the data collected and presented in the NIWA study⁵ prepared as part of the application, described the biological communities within each site and the authors raised no issues that would preclude these sites from

⁵ Stenton-Dozey, J. (2017) Baseline benthic survey of three proposed mussel farm sites in Big Glory Bay, Stewart Island. National Institute of Water & Atmospheric Research Ltd. Christchurch, New Zealand.

consideration for marine farming activities. Mr Davidson review of the application is attached in Appendix 2.

As part of the processing of this resource consent application, Emma Newcombe has reviewed the water quality aspects of the application. Ms Newcombe's review is attached in Appendix 3. In her review she states:

“Enrichment effects of shellfish farms dominate discussion of water column effects in the application (page 12). This includes some apparent uncertainty regarding whether shellfish are net producers or consumers of nitrogen. The uncertainty apparently stems from interpretation of a nitrogen model for Big Glory Bay developed in the 1990s. I have not studied the details of this model, but I have the impression that some error in interpretation has occurred, or that its finding should be applied only to the seabed, not the water column.”

Ms Newcombe then goes on to state that:

“Nitrogen additions to the environment from shellfish farming are minor; no feed is added to the system to farm shellfish, therefore spat seeding is the only point at which nitrogen can potentially be introduced to the system. As shellfish are harvested, nitrogen that constitutes part of their bodies and shells is removed, which constitutes a loss of nitrogen from the system (see e.g., Bricker et al. 2017). Moreover, mussel farming has the potential to increase denitrification in sediments beneath farms in well-oxygenated environments (Kaspar 1985, Christensen et al. 2003). An increase in denitrification further reduces the total nitrogen in the system. Accordingly, shellfish farms cause a net loss of nitrogen.”

Given the above comments it is considered that the proposed application will not result in an enrichment of nitrogen within Big Glory Bay.

In her review, Ms Newcombe also noted that:

“Generally, the principal concern for the water column from mussel farming is the depletion of phytoplankton communities (MPI 2013), commonly represented by the concentration of chlorophyll-a2. Depletion is not considered for the individual farms in the water column section of the application, but is partially considered in the ‘carrying capacity’ section (see below). Section 2 of the RFI response requests ‘an overview of the general impacts of the shellfish farming, including references and relevant supporting extracts’. The response also lacks robust reference to depletion effects, however we note that this issue is again considered to some extent in the ‘carrying capacity’ section of the RFI response, where the authors mention that mussel farms may mitigate the effects of salmon farms by consuming phytoplankton.”

Ms Newcombe notes in her review that although depletion effects of the three proposed farms alone are likely to be minor, the total amount of mussel farming in the bay is unclear from the application. It is possible that the mussel farms cumulatively could have an adverse effect on phytoplankton communities and other filter-feeding organisms that rely on phytoplankton as a food source.

In the second RFI response, dated 12 December 2018, the applicants noted that historically within Big Glory Bay high levels of mussel farming would have occurred from the early 2000s until about 2011 when Sanford Limited shifted its salmon cages (the main grower farm) from Site 320 to Site 249

out into the middle of the bay. The applicants state that 24 hectares of marine farms previously used for mussels farming is now either holding salmon or is being fallowed. The application states that this alone should allow for the 16 hectares of current application sites for mussels to proceed, as the applicants note that there has been no indication that the historic levels of mussel production was too high i.e. causing phytoplankton depletion effects in the bay or affecting production on other sites.

Overall, given the above assessment from both Mr Davidson and also Ms Newcombe, and the further information provided by the applicants, it is considered that the proposed application will have a less than minor effect on the ecological carrying capacity of the receiving environment.

6.4 Wildlife

The application notes that Big Glory Bay is host to a range of marine wildlife. It notes that species of conservation interest include seals, sea lions, cetaceans, sharks and seabirds, all of which are found around most of the coastline of Stewart Island. The application states that the most common wildlife interactions within Big Glory Bay are with seals (mainly fur seals), sea lions (the New Zealand sea lion), dolphins (bottlenose), sharks (White Pointer, Broadnose Sevensgill and the Porbeagle) and seabirds. The application also states that seabirds are common within Big Glory Bay, including various species of shag, penguins and gulls, some of which are classified as vulnerable and, in the case of the yellow-eyed penguin and the black billed gull, endangered. Mussel farms are visited by penguins and, for the shags and gulls, are places to roost on. The application states that no issues have been noted with entanglement in mussel lines.

As part of the further information provided by the applicants, additional information was provided on wildlife interactions, focusing on entanglement and displacement. The application states that there have not been many studies on wildlife interactions with marine farms in Big Glory Bay. However, they did refer to a Cawthron Institute report that reviewed the ecological effects of farming shellfish that was referred to in the original application, and also the observations from Mr Maass-Barrett. This further information noted that mussel farms can have a positive on wildlife as they can create habitat for fish species through a different sort of foraging habitat, food source, breeding habitat and refuge from predators. It also noted that the structures associated with aquaculture may provide benefits, including additional perching and feeding opportunities for seabirds.

The further information also noted that marine farms may potentially affect seabirds by altering their food resources, causing physical disturbances (e.g. noise) and a possible entanglement risk.

In relation to interaction with marine mammals, the further information notes that issues such as habitat exclusion, underwater noise and entanglement appear to be minor for New Zealand mussel farming, although the potential for adverse effects still exists with continued growth in both marine mammal populations and the marine farming industry. Mr Maass-Barrett's experience farming in Big Glory Bay is that he has never had a problem with any wildlife interactions. He states that he is unaware of any entanglement issues from birds or marine mammals.

Based on the information provided I agree with the conclusions reached in the application and further information. Overall, I agree that that the adverse effects associated with potential wildlife interactions will be no more than minor.

6.5 Water quality

When considering the current water quality within Big Glory Bay the application has stated that the most recent annual monitoring report (April 2016 to April 2017) for Big Glory Bay states that the water quality survey indicates there are no detectable adverse water quality issues within Big Glory Bay⁶. The application also states that dissolved oxygen (DO) levels were above 6 mg/l during all sampling periods and at all depths and that there was no indication that marine farming was impacting DO levels in Big Glory Bay. Some thermal stratification was observed during the warmer months, but this effect is related to climate rather than marine farming.

When considering the potential effects on water quality of the proposed activity, the application states that the addition of three new shellfish farm sites can impact directly on water quality through the release of nutrients and/or indirectly by restricting water movement and wave action in the bay. When considering the discharges associated with the proposed activity the application states that the nature, volume, contents and frequency of the discharges will vary depending on what tasks are being performed. The discharge could be as simple as a quick washdown of the deck after a day of tying on floats, to a full mussel harvest of about 20 tonnes over a period of three to four hours. This latter discharge would contain all the wash water required to wash the crop being harvested.

The application states that the tasks that would cause the maximum discharge, using the applicants' current vessel that takes and discharges approximately 500 litres/minute, would be harvest of seed for intermediate re-seeding, and harvest of seed for final re-seed. The effect of the discharge is that it creates an area around the harvest vessel of increased turbidity that dissipates reasonably quickly after harvesting ceases because all of the material, including the pseudofaeces, settles relatively quickly.

As part of the further information provided by the applicants, the applicants have referred to a report on bay-wide monitoring of the water column and seabed, produced by NIWA. The report states that:

“As concluded in the previous surveys, at most farm sites, there is no evidence that the depositional effects from the mussel farming activity have caused significant changes to the epifaunal community apart from an increase in mussel densities.”

The application notes that if there were any significant effects beyond the immediate farm boundaries, they would show up directly beneath the sites, which is where the sampling is done, and so would feature in the report. The annual monitoring reports support the statement that mussel farming has not caused any significant changes to either water quality or the marine benthos in the bay outside of the boundary of each site.

When considering the level to which the proposed activity will restrict water movement and wave action within Big Glory Bay, the application notes that restrictions on water movement simply recognises that structures in the water will exert a drag on water movement, particularly tidal currents. The amount of water coming in and out of the bay does not change but the marine farm structures will deflect water around them and create eddies in the tidal current. The application has referred to a report by Aquatic Environmental Sciences (AES)⁷ which concluded that the tidal current

⁶ Page 11 of the original resource consent application

⁷ Assessment of ecological effects of expanding salmon farming in Big Glory Bay, Stewart Island – Aquatic Environmental Sciences (AES), ADS & Pisces Consulting Ltd - 26 April 2018. It includes Part 1 - Description of aquatic ecology, and Part 2 -

in Big Glory Bay is weak even without the marine farms present. This report also states that marine farms will have an effect on how the water flows around Big Glory Bay, but they will not impact on the overall flushing time. The application states that the generation of eddies may assist mixing within the water column, but the overall impact is considered to be no more than minor.

As part of Ms Newcombe’s review, she has stated that”

“To my knowledge, no negative environmental effects have occurred as a result of effects on waves and currents of mussel farms in New Zealand, although overall reductions in current speed are possible (Plew 2011). Habitats most likely to be affected would be near-shore, where faster currents could scour shallower areas, or change conditions for reef-dwelling organisms. In the application under consideration, the proposed farms are positioned towards the middle of the bay, i.e., further offshore than existing farms. It seems to me that any effects on waves and currents near the new farms are therefore unlikely to be greater than those already caused by existing farms.”

Based on the information provided I agree with the conclusions reached in the application, the technical review and further information provided as part of the application. Overall, given the above assessment it is considered that the effects on the water quality generated by this proposal will be no more than minor.

6.6 Benthic environment and indigenous biodiversity

In its submission, the Department of Conservation (DOC) notes that the NZCPS requires a precautionary approach (Policy 3) where effects are uncertain, unknown or little understood but potentially significantly adverse. It also notes that Policy 11 seeks to protect indigenous biological diversity through avoiding adverse effects on specific values, avoiding significant effects and avoiding, remedying or mitigating effects on other values. DOC does not consider that enough assessment has occurred relating to the effects on habitat to provide enough certainty or understanding of the potential effects.

In relation to the potential benthic effects of the proposed activity, the NIWA study⁸ prepared as part of the application notes that:

“Brachiopods were present at the proposed farm sites and are represented elsewhere in the bay. This group has been identified as being sensitive to disturbance but live specimens have been found under operating mussel farms. Even though benthic deposition is greater in a mussel farm (an element of disturbance), the shell hash may provide an attractive attachment surface for brachiopods.

In the bay-wide monitoring programme for marine farms in Big Glory Bay, the seabed environmental condition is evaluated against two non-farmed areas (control sites) to assess whether there are any undue adverse effects (Section 17, Resource Management Act, 1991). Thus, it is accepted by regulators (Environment Southland) that the reference

Assessment of effects. A copy of this report is not included but it is available with the Sanford application. If necessary, a copy can be provided to support this application.

⁸ Stenton-Dozey, J. (2017) Baseline benthic survey of three proposed mussel farm sites in Big Glory Bay, Stewart Island. National Institute of Water & Atmospheric Research Ltd. Christchurch, New Zealand.

sites are representative benthic areas that are healthy biogeochemical environments with integrated and functional faunal communities.

In this study, the three proposed mussel farming sites align with the reference sites (CM and CH) as assessed by the suite of prescribed environment indicators. The areas are environmentally healthy and have complex community structures that accommodate predator-prey relationship.”

Within the further information provided with the application, the applicant has provided an assessment of Policy 11(a) on the NZCPS on page 20 and Policy 11(b) on pages 21 and 22. In relation to Policy 11(a) of the NZCPS the applicants noted that:

“The benthic survey, and surveys carried out as part of the annual monitoring programme, have not identified any specific species that are listed as threatened or at risk. Brachiopods have been identified as a sensitive species, but the particular variety that is on the New Zealand Threat Classification list has not been identified in the bay. Tubeworm mounds are present towards the mouth of the bay but they are not close to these proposed sites.

A specific expert report on marine mammals in the bay has not been sought because the risk of any impact on threatened or at risk species is considered to be very low. Farmers have worked with the Department of Conservation on occasions and during resource consent processes, and at no time has any concern been raised about marine mammals.

Certain species, including at risk species, may visit the bay but it is not believed to be critical habitat for them.”

In relation to Policy 11(b) of the NZCPS, the applicants noted that:

“For the most part, significant adverse effects on the matters relevant to this policy are avoided because they are not relevant to it. The potential for any significant impact is low, to the extent that these type of habitat issues do not appear to have attracted any scientific study. The work required to carry such studies is considered to be beyond the scope of an application of this scale and significance.”

Mr Davidson has reviewed the further information provided and is comfortable with the conclusions reached. Given this, it appears that the receiving environment does not contain indigenous biological diversity or habitats listed in Policy 11 of the NZCPS.

The further information provided by the applicants has also noted that the potential benthic effects of mussel farming are generally related to deposition on the seabed of the products of shellfish farming, and the effects this will have on the composition of the sediments, as well as the fauna and infauna associated with those sediments. The main products deposited are the solid matter of shellfish and fouling organisms released at harvest time, and the constant gentle rain of faeces and pseudofaeces that is expelled during the feeding processes of the shell fish and many of the fouling organisms.

Within the second response to the further information request dated 12 December 2018, the applicants have stated that if the presence of mussel farms over this soft bottom has any effect on existing brachiopod numbers, it can only be minor, and could in fact provide more habitat in the form

of hard surfaces for future settlement. Mr Davidson has reviewed the further information provided and is comfortable with the conclusions reached.

In relation to the DOC submission, I am unclear which potential effects of the proposed application are uncertain or unknown but potentially significantly adverse, that would warrant the need for a precautionary approach. Based on the information provided by the applicant and the review from Mr Davidson, I am comfortable that the proposed activity will not adversely affect the benthic environment or the indigenous biodiversity of the receiving environment.

Overall, given the receiving environment is considered not sensitive to the presence of mussel farming, it is considered that any potential benthic effects generated by this proposal will be no more than minor.

6.7 Cultural values

The proposed marine farms will be located within Rakiura/Te Ara A Kiwa (Stewart Island/Foveaux Strait) coastal marine area, which is identified as a Statutory Acknowledgment Area under Schedule 104 of the Ngāi Tahu Claims Settlement Act 1998. There are no heritage or archaeological sites within the vicinity of the application site.

I have reviewed the relevant policies of the Te Tangi a Tauria Iwi Management Plan as part of my assessment. I note that Section 3.6.11 includes a number of policies related to the establishment of marine farms. Of particular relevance to this application is Policies 3 and 4 within Section 3.6.11, which state that Ngāi Tahu is to have an active involvement in the consent process for aquaculture and marine farming applications, including involvement in the ongoing management, setting of consent conditions and monitoring and compliance programmes. Policy 7 then requires that aquaculture does not have adverse effects on customary fishing and practices, fishing resources or fisheries. This includes maintaining access to sources of abundant local kaimoana, kaimātaiai and mahinga kai populations.

I note that the application has been sent to Te Rūnanga o Ngāi Tahu as part of the processing of the application, and Te Rūnanga o Ngāi Tahu was considered an affected party to this application. Through the publicly notified process, Te Rūnanga o Ngāi Tahu and Te Rūnanga o Awarua put forward a joint submission in opposition of the application. Their submission raised biosecurity concerns in relation to the recent detection of *Bonamia ostreae*. The management of *Bonamia ostreae* is considered in Section 6.8 Biosecurity below.

When considering the cultural effects associated with the application, it is noted that Ngāi Tahu has been provided an opportunity to have an active involvement in the consent process. Given the only concern raised to date with the application relates to biosecurity risks, provided the biosecurity risks can be adequately mitigated, I considered that the effects on cultural values will be no more than minor.

6.8 Biosecurity

Within their submissions the Ministry for Primary Industries (MPI), Ngāi Tahu and Bluff Oyster Management Company Limited have raised concerns about the application because of the recent detection of *Bonamia ostreae* in Big Glory Bay. Both Ngāi Tahu and Bluff Oyster Management Company Limited seek that the applicants remove “*Ostrea Chilensis*” from the application. MPI seeks that the application describes measures that reduce biodiversity risks associated with

farming oysters, given Big Glory Bay was the only location in Stewart Island where *Bonamia ostreae* was detected.

As part of the application the applicants have acknowledged that there is a risk of introducing or providing habitat for invasive marine species with marine farming activities. They considered that these risks can be minimised by adopting best management practices for sourcing and introducing mussel spat onto the site and carrying out the appropriate level of monitoring. The application also notes that they are familiar with the information published by both Environment Southland and the NZ Mussel Industry Association (NZMIA), which includes a voluntary industry code of practice that includes transfer protocols for spat transfers. The application states that they will be guided by this document. The applicants are also familiar with the standard conditions relating to biosecurity matters on consents for this activity.

The original application acknowledged that oysters cannot currently be farmed in Big Glory Bay due to the *B. ostreae* outbreak that was detected in Big Glory Bay, but if the problem was resolved, the applicants wanted the ability to farm Bluff (flat) oysters as part of this consent application. However, an email from the applicant's consultant on 11 July 2019 (attached in Appendix 5) formally advised that the applicant wished to amend their application removing oysters from the species to be farmed.

When assessing the potential biosecurity risk associated with the application, I have been in contact with an advisor from MPI who has provided me with information on controlled area notice that MPI has declared under the Biosecurity Act 1993 for all of Stewart Island (the controlled area notice also includes a larger area in the Marlborough District, the southern half of the South Island, and the Chatham Islands). The controlled area notice seeks to limit the spread of *B. ostreae* and minimise the damage caused to wild and farmed flat oyster population by *B. ostreae*. This controlled area notice will not affect the updated consent application as applicant has removed oysters from the species to be farmed.

The biosecurity effects assessed as part of this application seek to supplement the controls within the Biosecurity Act 1993 by ensuring that the proposed activity does not create additional biosecurity risk. I consider that the biosecurity risks associated with the application could be adequately mitigated through the development of a biodiversity management plan. As such, further information was requested by Environment Southland on 11 June 2019. The further information sought that the applicants provide a biosecurity management plan setting out the potential biosecurity hazards and management methods proposed to protect the proposed facility and the surrounding environment from the introduction, exacerbation or spread of pathogens, parasites and pests. It listed a range of matters that the management plan should cover and also referred the applicant to a number of resources created by MPI to help marine farmers with the development of biosecurity management plans.

Given the late notice of the further information request it is unlikely that this proposed biosecurity management plan will be completed prior to this report being published. However, it is expected that this management plan will be completed prior to the hearing, which will allow the content of the plan to be discussed by submitters as part of the hearing process.

Provided a robust biosecurity management plan is developed and implemented, I consider that the potential biosecurity risk associated with the application can be adequately managed.

6.9 Benthic survey and monitoring

Within its submission DOC raised concerns about the potential cumulative effects of the proposed activity, with particular reference to the “Big Glory Bay Monitoring Programme”. Based on its assessment of the application, it is concerned that the application does not provide further detail on this monitoring programme, its methodology or how this monitoring assesses cumulative effects within BGB. It has also raised concerns with the design of the benthic survey undertaken by the applicants, particularly sampling methods and the utility of the control sites for monitoring, and whether the proposed monitoring will adequately detect effects.

In relation to the potential cumulative effects of the proposed activity, it is not clear which cumulative effects DOC is concerned with. The above assessment has considered that the potential adverse effects associated with occupation, landscape, water quality, ecological carrying capacity, wildlife, benthic environment and indigenous biodiversity, cultural values, biosecurity are less than minor, or can be mitigated through conditions of consent. Based on the above assessment I consider the proposal will not result in cumulative effects that are more than minor.

In relation to the design of the benthic survey undertaken by the applicant, DOC has not raised any specific issues with this survey other than suggesting that it has concerns with the sampling methods and the utility of the control sites for monitoring. Mr Davidson has reviewed the application and supporting documents further information provided and is comfortable with the conclusions reached.

6.10 Summary

After considering the above, overall it is my view that the potential adverse effects of the proposal can be adequately mitigated, provided that the recommended conditions of consent are imposed.

7. Objectives and Policies

In accordance with Section 104(1)(b), the consent authority must have regard to:

- b. *any relevant provisions of—*
 - i. *a national environmental standard:*
 - ii. *other regulations:*
 - iii. *a national policy statement:*
 - iv. *a New Zealand coastal policy statement:*
 - v. *a regional policy statement or proposed regional policy statement:*
 - vi. *a plan or proposed plan; and*
- c. *any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

The relevant provisions have been set out in the following sections in the same order as that provided above.

There are no national environmental standards, other regulations or national policy statements outside the NZCPS that are considered relevant to the application.

7.1 New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement took effect on 3 December 2010. Its purpose is to state policies in order to achieve the purpose of the RMA in relation to the coastal environment of New Zealand. The New Zealand Coastal Policy Statement is a relevant consideration under Section 104(1)(b)(iv) of the RMA and an assessment of the relevant objectives and policies is provided below.

Objectives		
Objective 1	Safeguard the integrity, form, functioning and resilience of the coastal environment	<i>Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Objective 2	Preserve the natural character of the coastal environment, and protect natural features and landscape values	<i>This application will be occurring within the BGB environment, given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape, it is considered that the proposed application will have a less than minor effect on the visual amenity and landscape values of the receiving environment.</i>
Objective 3	Take account of the principles of the Treaty of Waitangi	<i>The effects on cultural values have been assessed in Section 6.7, and the relevant IMP discussed in Section 7.4</i>
Objective 4	Maintain and enhance the public open space qualities and recreation opportunities of the coastal environment	<i>While it is noted that the proposal will result in a reduction in the level of public access as a result of this application, it is also noted that marine farm activities have a functional need for the location within the CMA and BGB has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Objective 6	Enable people and communities to provide for social, economic and cultural wellbeing and their health and safety	<i>The applicant is a provider of economic benefits for the Stewart Island and wider Southland community.</i>
Policies		
Policy 2	The Treaty of Waitangi, tangata whenua and Māori heritage	<i>The effects on cultural values have been assessed in Section 6.7, and the relevant IMP discussed in Section 7.4</i>
Policy 3	Adopt a precautionary approach where effects are uncertain, unknown or little understood but potentially significantly adverse	<i>Based on the advice provided within the technical review of the application, the effects of the proposed application are unlikely to be significantly adverse.</i>
Policy 4	Integrated management of natural and physical resources	<i>Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>

Policy 6	Activities in the coastal environment	<i>The proposal provides social and economic benefits to the Stewart Island and Southland communities. Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Policy 8	Aquaculture	<i>The application and report has taken into account the social and economic benefits of aquaculture.</i>
Policy 13	Preservation of natural character	<i>Given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape or outstanding natural character area, it is considered that the proposed application will not have a significant effect on the visual amenity and landscape values of the receiving environment.</i>
Policy 15	Natural features and natural landscapes	
Policy 18	Public open space	<i>While it is noted that the proposal will result in a reduction in the level of public access as a result of this application, it is also noted that marine farm activities have a functional need for the location within the CMA and Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Policy 21	Enhancement of water quality	<i>Based on the advice provided within the technical review of the application, the effects of the proposed application on water quality are expected to be less than minor and consistent with this policy direction.</i>
Policy 23	Discharge of contaminants	<i>Based on the advice provided within the technical review of the application, the effects of the proposed discharge of contaminants are expected to be less than minor and consistent with this policy direction.</i>

Overall, it is considered the proposed application is consistent with the direction set out within the NZCPS.

7.2 Southland Regional Policy Statement

The Southland Regional Policy Statement took effect on 9 October 2017. The Policy Statement guides resource management policy and practice in the region, and includes measures to indicate whether objectives have been achieved. The Southland Regional Policy Statement is a relevant consideration under Section 104(1)(b)(v) of the RMA and an assessment of the relevant objectives and policies is provided below.

Chapter 3 – Tangata Whenua		
Objective TW.1	Decision making and partnerships with tangata whenua	<i>Rakiura/Foveaux Strait Coastal Marine Area is a Statutory Acknowledgement Area. Rūnanga have submitted on the application during the notification period. Sections 6.7 and 7.4 discuss cultural values and the IMP.</i>
Objective TW.2	Provision for iwi management plans	
Objective TW.3	Tangata whenua spiritual values and customary resources	
Policy TW.1	Treaty of Waitangi	
Policy TW.2	Partnerships and relationship agreements	
Policy TW.3	Iwi management plans	
Policy TW.4	Decision making	
Chapter 7 – Coast		
Objective COAST.1	Direction on activities within the coastal environment	<i>Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Objective COAST.2	Activities in the coastal environment	<i>It is considered that the aquaculture development proposed is appropriate and the actual and potential adverse effects have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Objective COAST.3	Coastal water quality and ecosystems	<i>Based on the advice provided within the technical review of the application, it is considered that coastal water quality and ecosystems within the receiving environment will be maintained.</i>
Objective COAST.4	Natural character	<i>Given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape, it is considered that the proposed application will not have a significant effect on the visual amenity and landscape values of the receiving environment.</i>
Objective COAST.5	Aquaculture	<i>The application and report recognises the contribution of aquaculture to the well-being of people and communities. It is considered BGB is an appropriate location for aquaculture set out in the effect assessment in Section 6.</i>
Policy COAST.1	Direction on locations for activities	<i>Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts elsewhere. It is considered that marine farming is an appropriate activity in the bay.</i>
Policy COAST.2	Management of activities in the coastal environment	<i>This application will be occurring within the Big Glory Bay environment, given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape, it is considered that the proposed application will have a less than minor effect on the visual amenity and landscape values of the receiving environment. The receiving</i>

		<i>environment. Actual and potential adverse effects have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Policy COAST.3	Protection of the coastal environment	<i>This application will be occurring within the Big Glory Bay environment. The Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape or an outstanding natural character area. As such part (a) of this policy is not applicable. When considering the requirement of part (b) it is noted that the proposed application will have a less than minor effect on the visual amenity and landscape values of the receiving environment. Actual and potential adverse effects have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Policy COAST.4	Infrastructure, port, aquaculture, mineral extraction and energy projects	<i>Big Glory Bay has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Policy COAST.5	Management of effects on coastal water quality and ecosystems	<i>Based on the advice provided within the technical review of the application, the effects of the proposed application on coastal water quality and its ecosystems are expected to be less than minor and consistent with this policy direction.</i>
Policy COAST.6	Natural character	<i>The Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural character area using the attributes outlined in Policy 13(2) of the NZCPS.</i>
Policy COAST.7	Management of activities in the coastal marine area	<i>The applicant is a provider of economic benefits for the Stewart Island and wider Southland community, with one submitter acknowledging the benefits the applicant provides through their marine farming operation. Actual and potential adverse have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>

Note: The Boffa Miskell report landscape assessment does not form part of the provisions of the Coastal Plan (or a proposed plan). However, I consider that the Boffa Miskell report would be considered information that is relevant and reasonably necessary to determine the application under Section 104(1)(c). As such, I have had regard to the findings within this report.

Overall, it is considered the proposed application is consistent with the direction set out within the RPS.

7.3 Regional Coastal Plan for Southland

The Regional Coastal Plan for Southland became fully operative on 16 March 2013. The relevant objectives and policies in the Chapters on fundamental principles, general matters, coastal water and marine farming and are discussed below. The Regional Coastal Plan for Southland is a relevant consideration under Section 104(1)(b)(vi) of the RMA and an assessment of the relevant objectives and policies is provided below.

Chapter 3.14 lists the coastal values of Stewart Island, and has been referred to previously in this report, with the principal issues in Section 3.14.11 listed as:

1. preservation of natural character, heritage sites and amenity values;
2. preservation of water quality;
3. effects of increasing tourism;
4. potential impact of increased marine farming;
5. lack of local non-marine sources of sand and shingle.

Chapter 4 – Fundamental principles		
Objective 4.1.1	Adverse effects	<i>Actual and potential adverse have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Objective 4.1.2	Significant conservation values	<i>BGB has previously been designated as an aquaculture area and has been excluded from classifications of Stewart Island as an area containing significant conservation values.</i>
Objective 4.2.1	Need for coastal location	<i>Marine farming on the scale proposed by the applicant is only really possible in the CMA, and BGB has previously been designated as an aquaculture area and allows for marine farms to be concentrated in a single area, minimising impacts on public use elsewhere.</i>
Policy 4.2.1	Justifying coastal location	
Policy 4.2.2	Consideration of alternatives	<i>In accordance with Schedule 4 of the RMA, alternatives to the proposal have been considered in Section 9.2, but are either not practicable, or environmentally and commercially inefficient when compared to the proposed application.</i>
Objective 4.4.1	Need to justify exclusive or preferential occupation of coastal marine area	<i>As discussed in Section 6.1, this activity does require exclusive and preferential occupation of 16 hectares of CMA. Given the nature of marine farming it is considered exclusive or preferential occupation of the coastal marine area is necessary.</i>
Policy 4.4.1	Need for exclusive occupation	
Objective 4.5.1	Value of the coastal marine area to the public	<i>It is considered that value of the CMA will be maintained. No recreational users of the area have raised concerns that the proposed application will adversely affect public access an enjoyment of the area.</i>
Objective 4.6.1	Concentrating use and development	<i>Big Glory Bay is currently used for several marine farming operations. It is considered the effects of the proposed application can be avoided, remedied or mitigate. The use of BGB for marine farming is considered preferable to using undeveloped areas in the coastal marine area.</i>
Policy 4.6.1	Concentrate compatible activities	

Objective 4.7.1	Avoid, remedy or mitigate cumulative adverse effects	<i>Actual and potential adverse effects have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Objective 4.7.2	Obtain an appropriate level of use in the coastal marine area	<i>Based on the advice provided within the technical review of the application, it is considered the addition of the proposed marine farm will not affect the 'carrying capacity' of BGB.</i>
Policy 4.7.1	Avoid, remedy or mitigate adverse cumulative effects	<i>Based on the advice provided within the technical review of the application, it is considered the actual and potential cumulative effects of the application can be mitigated through conditions of consent.</i>
Objective 4.8.1	Distinguish between commercial and non-commercial surface water activities	<i>The applicant seeks to establish a commercial operation within Big Glory Bay. Based on the advice provided within the technical review of the application, it is considered the actual and potential cumulative effects of the application can be mitigated through conditions of consent.</i>
Policy 4.8.1	Commercial activities in the coastal marine area	
Objective 4.9.1	Consultation with territorial authorities, iwi and government agencies	<i>Through the public notification, all interested parties have had an opportunity to submit on the application.</i>
Objective 4.9.2	Consultation with the community	
Chapter 5 – General Matters		
Objective 5.1.1	Preserve natural character	<i>Given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape or outstanding natural character area, it is considered that the proposed application will not have a significant effect on the natural character of BGB.</i>
Policy 5.1.1	Adopt NZCPS policies	<i>Discussed in Section 7.1.</i>
Objective 5.2.1	Protect outstanding natural features and landscapes	<i>The explanation associated with Policy 5.2.1 notes that: 'Stewart Island is a largely natural landscape with extraordinary landform and coastal diversity.' There is not specific discussion on the values of big glory bay within the explanation to this policy. Given the existing level of marine farm development within Big Glory Bay, and the fact that Boffa Miskell landscape study did not identify Big Glory Bay as an outstanding natural landscape or outstanding natural character area, it is considered that the proposed application will not have a significant effect on the natural features and landscapes of BGB.</i>
Policy 5.2.1	Identify and protect natural features and landscapes	
Policy 5.2.3	Importance of landscape and natural features to tangata whenua	<i>Stewart Island is a Statutory Acknowledgement Area, with Rūnanga submitting on the application during the notification period. Section 6.7 and 7.4 discuss cultural values and the IMP.</i>
Objective 5.3.1	Protection of amenity values	<i>While BGB is not identified as an outstanding natural landscape or outstanding natural character area, BGB does contain natural and</i>
Policy 5.3.1	Protection of amenity values	

Policy 5.3.2	Maintain and enhance open space values	<i>physical qualities and characteristics of an area that contribute to people's appreciation of the environment. The proposed marine farm will introduce a number of additional man-made structures into the BGB environment which will reduce the naturalness of the environment. However, it is noted that there are a number of other marine farms in BGB, and this area designated in the coastal plan as an aquaculture area. This concentration of marine farms in a single area, minimising impacts on amenity open space values elsewhere in the CMA.</i>
Objective 5.4.3.1	Introduction of exotic fauna	<i>As part of the application it is proposed the spat will only be sourced from Kaitaia off 90 Mile Beach. As part of the processing of this application the Council has requested that the applicant develop a biosecurity management plan which address the biosecurity risks associated introducing species from outside the region. This management plan can be reviewed by the Council, submitters and the commissioner through the hearing process to ensure that the biosecurity risks associated with application can be adequately mitigated, and the application will not result in adverse environmental effects. While it is acknowledged that Policy 5.4.3.2 seeks that there is a preference for indigenous fauna species sourced from the Southland region when repopulating or population enhancement however this does not appear to include to marine farming.</i>
Policy 5.4.3.1	Prevent the introduction of exotic species of fauna	
Policy 5.4.3.2	Preference for indigenous fauna species	
Objective 5.6.1	Recognise values of Ngai Tahu	<i>Stewart Island is a Statutory Acknowledgement Area, with Rūnanga submitting on the application during the notification period. Section 6 and 7.4 discuss cultural values and the IMP.</i>
Objective 5.6.2	Consultation with tangata whenua	
Policy 5.6.1	Kaitiakitaka	
Objective 5.8.1	Efficient use and development of natural and physical resources	<i>The application will result in further intensification of marine farming within BGB, which may result in a more efficient use of the resources in BGB. Conditions of consent will ensure the potential adverse effects are able to be avoided, remedied or mitigated.</i>
Policy 5.8.1	Efficient use and development of natural and physical resources	
Objective 5.10.1	Social, cultural and economic reliance on the coastal marine area	<i>The applicant is a provider of economic benefits for the Stewart Island and wider Southland community, with one submitter acknowledging the benefits the applicant provides through their marine farming operation.</i>
Policy 5.10.1	Recognising the social, cultural and economic reliance on the coastal marine area	
Chapter 7 – Coastal Water		
Objective 7.2.2.1	Maintenance of coastal water quality	<i>As discussed in Section 6, based on the advice provided within the technical review of the application, the effects of the proposed application on coastal water quality are expected to be less than minor.</i>
Policy 7.2.2.1	Importance of fresh water	
Policy 7.2.2.3	Water quality standards in areas not in Natural State	
Chapter 11 – Structures		
Objective 11.2.1	Location of structures	<i>Actual and potential adverse of the location of the proposed marine farm have been discussed in</i>
Policy 11.2.1	New structures and extensions to	

	existing structures	<i>Section 6 of this report. The structures associated with the proposed marine farm are located out of the BGB fairway and located in a position that will not prevent safe navigation into, around, and out of Big Glory Bay.</i>
Chapter 15 – Marine Farming		
Objective 15.1.1	Avoid, remedy or mitigate any adverse effects	<i>Actual and potential adverse have been discussed in Section 6 of this report, alongside discussion of proposed mitigation through conditions.</i>
Policy 15.1.1	Resource consents required	<i>Resource consent is required as a non-complying activity.</i>
Policy 15.1.4	Monitoring the effects of marine farming	<i>The existing consents already require annual monitoring and the provision of these results, with additional monitoring proposed under this proposal.</i>

7.4 Te Tangi a Tauria

Te Tangi a Tauria is the Natural Resource and Environmental Iwi Management Plan (IMP) for Ngāi Tahu ki Murihiku, and includes the rohe of the following Papatipu Rūnanga:

- Te Rūnanga o Awarua;
- Te Rūnanga of Oraka/Aparima;
- Te Rūnanga o Hokonui; and
- Te Rūnanga o Waihopai.

The IMP reflects the attitudes and values of the four Rūnanga Papatipu o Murihiku, and provides information on the indigenous understanding of the environment, which can be used to help address issues faced by Rūnanga with regards to environmental management.

Chapter 3.6.1 – General Policy for Southland’s Coastal Environment		
Policy 1	Ensure the land, water and biodiversity at the interface of Southland’s coastal environment are managed in an integrated way through careful planning and policy Instruments.	<i>Activities in the CMA, including aquaculture are provided for through the RPS and RCP, which will have been discussed in sections 7.2 and 7.3. BGB has previously been designated as an aquaculture area and has been excluded from classifications of Stewart Island as an area containing significant conservation values.</i>
Policy 2	Recognise that the degree of connection between the coastal and inland environments is inherent when developing robust systems to address areas of degradation and mitigate for future and potential environmental effects.	
Policy 3	Promote communication and collaboration between groups with an interest in or have links with the coastal environment and its management.	<i>The applicant has advised of positive interactions with local Rūnanga, and the Stewart Island and Southland communities, with one submitter acknowledging the benefits the applicant provides through their marine farming operation.</i>
Chapter 3.6.3 – Structures in the Coastal Marine Area		
Policy 1	Any activity within, adjacent to or that may potentially impact on	<i>Stewart Island is a Statutory Acknowledgement Area, with Rūnanga submitting on the application</i>

	Statutory Acknowledgment areas will require consultation with both Te Rūnanga o Ngāi Tahu, Ngāi Tahu ki Murihiku and Tangata Tiaki gazetted under the South Island Customary Fishing Regulations.	<i>during the notification period.</i>
Policy 2	Promote awareness among coastal users that the coastal marine area is a finite resource and the number of suitable sites for some structures is limited, therefore the utilisation of coastal space must be efficient and sustainable.	<i>It is considered the proposed activity will be an efficient and sustainable use of coastal space.</i>
Policy 3	Promote a precautionary approach toward new proposals.	<i>It is considered the proposed activity will not have significant adverse effects. Furthermore, it is considered the proposed structures will be soundly constructed. The structures proposed will be similar in construction to other marine farms in the area. The dark coloured buoys are considered to be visually unobtrusive, and difficult to see from a distance.</i>
Policy 4	Avoid the placement of structures in the coastal marine environment that will have significant effects.	
Policy 5	Ensure that structures in the coastal environment are soundly constructed, are compatible with the natural character of the surrounding coastal environment and adjacent lands and do not have adverse effects on other people using the coast area.	
Policy 6	Ensure that structures located in the coastal marine area justify the functional necessity for that location and do not impact on the coastal environment when an alternative location may be more readily suited for that type of development.	<i>Actual and potential adverse of the location of the proposed marine farm have been discussed in Section 6 of this report. The structures associated with the proposed marine farm are located out of the BGB fairway, and are located in a position that not will prevent safe navigation into, around, and out of Big Glory Bay.</i>
Chapter 3.6.11 – Aquaculture and marine farms		
Policy 1	Ensure that aquaculture activities recognise and provide for pre-existing customary rights and commercial fishing rights provided by the Māori Fisheries Settlement in 1992.	<i>Aquaculture is provided for through the RPS and RCP, which have been discussed in sections 7.2 and 7.3.</i>
Policy 2	Establish a process with local government agencies to identify suitable areas for aquaculture and the allocation of coastal space to ensure Ngāi Tahu ki Murihiku rights are protected.	<i>Big Glory Bay has previously been identified as the only area for commercial aquaculture on Stewart Island.</i>
Policy 3	Have active involvement in the consent process for aquaculture and marine farming. Operations should include information on waste disposal and provisions for reducing effects on existing local species.	<i>Rūnanga have submitted on the application through the public notification process, and wish to be heard.</i>

Policy 5	Ensure participation into research of the impacts of marine farms on natural character and visual amenities.	<i>The reporting undertaken as part of existing and proposed conditions will be submitted to SRC, and be available to the public on request.</i>
Policy 6	Ensure participation into research that investigates increased sediment dispersal, and the effects of such on seabed habitats under and around marine farms.	
Policy 7	Ensure that aquaculture does not have adverse effects on customary fishing and practices, fishing resources or fisheries. This includes maintaining access to sources of abundant local kaimoana, kaimātaitai and mahinga kai populations.	<i>The marine farm locations are outside the mataitai areas on Stewart Island. Furthermore, Rūnanga have submitted on the application during the notification period. Sections 6.7 and 7.4 discuss cultural values and the IMP.</i>
Policy 9	To ensure that the potential introduction of unwanted organisms is monitored to ensure impacts on existing biodiversity is limited.	<i>As noted in Section 6.8 above, if a robust biosecurity management plan is developed and implemented, it is considered that the potential biosecurity risk associated with the application can be adequately managed.</i>

8. Part 2 of the Resource Management Act

Under s104(1) of the RMA, the consent authority must consider applications for resource consent subject to Part 2 of the RMA. Part 2 is made up of 4 sections, as discussed below.

8.1 Section 5 (Purpose of the RMA)

1. *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
2. *In this Act, **sustainable management** means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while—*
 - a. *sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - b. *safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - c. *avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

The framework set out in the NZCPS, RPS and RCP address the sustainable management of the coastal marine area. I consider the application is generally consistent with the relevant objectives and policies in these documents, as discussed in Sections 7.1 to 7.3 of this report. Given this, I consider the purpose of the RMA will be achieved by this application.

8.2 Section 6 (Matters of National Importance)

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- a. the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- b. the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- c. the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- d. the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- e. the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*
- f. the protection of historic heritage from inappropriate subdivision, use, and development:*
- g. the protection of protected customary rights:*
- h. the management of significant risks from natural hazards.*

I consider the following sections are of particular relevance to this application:

- **Section 6(a)**

In relation to Section 6(a), while Big Glory Bay is not identified as an outstanding natural character area, it does contain natural characteristics of an area that contribute to people's appreciation of the environment. The proposed marine farm will introduce a number of additional man-made structures into the bay environment, which will reduce the naturalness of the environment. However, it is noted that there are a number of other marine farms in Big Glory Bay, and this area designated in the coastal plan as an aquaculture area. This concentration of marine farms in a single area minimises impacts on amenity and open space values elsewhere in the CMA.

- **Sections 6(b) and (c)**

In relation to Sections 6(b) and (c) as noted in the effects assessment above, Big Glory Bay is not considered an outstanding natural landscape, nor are there areas of significant indigenous vegetation or significant habitats of indigenous fauna located within the receiving environment.

- **Section 6(d)**

In relation to Section 6(d), it is considered that the exclusive and preferential occupation of 16 hectares of CMA sought by the application has the ability to affect public access and enjoyment of the area. However, no recreational users of the area have raised concerns that the proposed application will adversely affect public access and enjoyment of the area. It is noted that Big Glory Bay is a reasonably isolated part of the coastal marine area which contains a significant level of existing development. As such, it appears that public access to this part of the coastal marine area is not a significant issue.

- **Sections 6(e) and (g)**

In relation to Sections 6(e) and (g), it is noted that the proposed marine farms will be located within the Rakiura/Te Ara A Kiwa (Stewart Island/Foveaux Strait) coastal marine area, which is identified as a Statutory Acknowledgment Area under Schedule 104 of the Ngāi Tahu Claims Settlement Act 1998. There are no heritage or archaeological sites within the vicinity of the application site. As part of the application process local Rūnanga have submitted on the application and will be providing evidence at the hearing. Within their submission, the only concern raised to date with the application relates to biosecurity risks. As such, provided the biosecurity risks can be adequately mitigated, it is considered the proposed application will not adversely affect the relationship of Maori and their culture and traditions with their ancestral lands, nor will it affect customary rights.

8.3 Section 7 (Other Matters)

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—

- a. *kaitiakitanga:*
 - aa. *the ethic of stewardship:*
 - b. *the efficient use and development of natural and physical resources:*
 - ba. *the efficiency of the end use of energy:*
 - c. *the maintenance and enhancement of amenity values:*
 - d. *intrinsic values of ecosystems:*
 - e. *[Repealed]*
 - f. *maintenance and enhancement of the quality of the environment:*
 - g. *any finite characteristics of natural and physical resources:*
 - h. *the protection of the habitat of trout and salmon:*
 - i. *the effects of climate change:*
 - j. *the benefits to be derived from the use and development of renewable energy.*

I consider Sections (aa), (b), and (c) to (f) are of particular relevance to this application. Given the reliance of the proposal on a healthy natural environment in order to sustain the marine farms, and the previous discussion regarding actual and potential effects, and proposed mitigations, I consider the proposal will ensure the value of the natural environment is maintained.

8.4 Section 8 (Principles of the Treaty of Waitangi)

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the [Treaty of Waitangi](#) (Te Tiriti o Waitangi).

As discussed, local Rūnanga have submitted on the application through the hearing and will be providing evidence at the hearing. I have used the guidance of the IMP, and do not consider the application contravenes the principles of the Treaty of Waitangi.

9. Other matters considered relevant

9.1 Restriction on discharges

Section 107 of the RMA restricts the grant of discharge and coastal permits, as set out below:

1. *Except as provided in subsection (2), a consent authority shall not grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A allowing—*
 - a. *the discharge of a contaminant or water into water; or*
 - b. *a discharge of a contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water; or*
 - ba. *the dumping in the coastal marine area from any ship, aircraft, or offshore installation of any waste or other matter that is a contaminant,—*
if, after reasonable mixing, the contaminant or water discharged (either by itself or in combination with the same, similar, or other contaminants or water), is likely to give rise to all or any of the following effects in the receiving waters:
 - c. *the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;*
 - d. *any conspicuous change in the colour or visual clarity;*
 - e. *any emission of objectionable odour;*
 - f. *the rendering of fresh water unsuitable for consumption by farm animals;*
 - g. *any significant adverse effects on aquatic life.*
2. *A consent authority may grant a discharge permit or a coastal permit to do something that would otherwise contravene section 15 or section 15A that may allow any of the effects described in subsection (1) if it is satisfied—*
 - a. *that exceptional circumstances justify the granting of the permit; or*
 - b. *that the discharge is of a temporary nature; or*
 - c. *that the discharge is associated with necessary maintenance work—*
and that it is consistent with the purpose of this Act to do so.
3. *In addition to any other conditions imposed under this Act, a discharge permit or coastal permit may include conditions requiring the holder of the permit to undertake such works in such stages throughout the term of the permit as will ensure that upon the expiry of the permit the holder can meet the requirements of subsection (1) and of any relevant regional rules.*

The proposal will result in the discharge of a contaminant to the coastal marine environment, but I consider that it is unlikely to result in any of the effects listed in Section 1(c) to (g), as discussed in Section 6 of this report. As such, Section 107 of the RMA does not restrict the granting of this application.

9.2 Consideration of alternatives

As per Schedule 4(6)(1)(d) of the RMA, where an activity includes the discharge of any contaminant, the application must include a description of:

- i. the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- ii. any possible alternative methods of discharge, including discharge into any other receiving environment:*

For applications for discharge permits or coastal permits that contravene Section 15, Section 105 of the RMA requires that the consent authority have regard to:

- a. the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- b. the applicant's reasons for the proposed choice; and*
- c. any possible alternative methods of discharge, including discharge into any other receiving environment.*

There are two aspects to the consideration of alternative sites. The first is the general area in which to establish the farms, and the second is the actual sites in that general area.

Big Glory Bay has been selected by the applicants because the activity of marine farming can be a discretionary activity, rather than prohibited as it is for many other areas, and it is an established marine farming area. The applicants note that the location within Big Glory Bay is also close enough to an urban area from which the farm can be serviced. Alternatives include Port Adventure and the open coastal waters around Stewart Island, and areas along the southern coast of Southland. The application notes that Port Adventure is an area with high natural values and obtaining resource consents for a new marine farm area would be challenging. The applicants also considered the possibility of locating within the open coastal waters. However, by their very nature these areas are exposed and difficult to farm which would make it difficult to establish a viable farm. Big Glory Bay was therefore considered to be the best option, if not the only option.

When considering the marine farm locations within Big Glory Bay, the applicants note that these locations were selected because there is sufficient depth and current to have viable farms, and they will not interfere with existing farms. The sites are also out of the fairway that is a prohibited area under the Coastal Plan. It is possible to move the sites, but the scope is limited, and potential adverse effects will be the same or similar. The sites have also been subject to an ecological survey and they have shown that they are not located above any sensitive environments.

I consider the applicants have provided a sufficient discussion of the alternatives to the current proposal and agree that establishing in the locations proposed within Big Glory Bay is the most feasible option currently available.

10. Duration

The applicants are seeking a term of consent to expire on 1 January 2040. They are aware that other consents in the bay have a common expiry date of 1 January 2025 and have assumed that any replacement consents would be granted for a further 15 year term. The 2025 expiry date is close

and, if applied, would be too short a term to provide security for a new development, particularly given that it will take some time to get the sites set up and seeded with mussels. The applicants require sufficient time to establish farming on all sites, gather information associated with their farming activity, and to get a reasonable return on the investment required for the proposed development.

The RMA and relevant plans provide the following guidance on duration:

- Section 123A of the RMA limits the duration of coastal permits for aquaculture activities to at least 20 years unless a shorter period is requested by the applicant or is required to ensure adverse effects on the environment are adequately managed, and no more than 35 years;
- the CPS, RPS and RCP do not provide any specific guidance on duration for aquaculture consents;
- the Te Tangi a Tauria IMP provides guidance that durations over 25 years are essentially making decisions for the next generation, and consents should not be granted where it is not known what the effects may be over the long-term.

Based on the policy direction above, and the remaining uncertainty about the level of effects and management thereof, particularly on the benthic environment, I recommend a 20 year duration, should the consents be granted.

11. Recommendation

11.1 Consideration of application

Section 104 of the RMA states:

- 1. When considering an application for a resource consent and any submissions received, the consent authority must, subject to [Part 2](#), have regard to—*
 - a. any actual and potential effects on the environment of allowing the activity; and*
 - ab. any measure proposed or agreed to by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity; and*
 - b. any relevant provisions of—*
 - i. a national environmental standard;*
 - ii. other regulations;*
 - iii. a national policy statement;*
 - iv. a New Zealand coastal policy statement;*
 - v. a regional policy statement or proposed regional policy statement;*
 - vi. a plan or proposed plan; and*
 - c. any other matter the consent authority considers relevant and reasonably necessary to determine the application.*
- 2. When forming an opinion for the purposes of subsection (1)(a), a consent authority may disregard an adverse effect of the activity on the environment if a national environmental standard or the plan permits an activity with that effect.*

- 2A. *When considering an application affected by section 124 or 165ZH(1)(c), the consent authority must have regard to the value of the investment of the existing consent holder.*
- 2B. *When considering a resource consent application for an activity in an area within the scope of a planning document prepared by a customary marine title group under section 85 of the Marine and Coastal Area (Takutai Moana) Act 2011, a consent authority must have regard to any resource management matters set out in that planning document.*
- 2C. *Subsection (2B) applies until such time as the regional council, in the case of a consent authority that is a regional council, has completed its obligations in relation to its regional planning documents under section 93 of the Marine and Coastal Area (Takutai Moana) Act 2011.*
3. *A consent authority must not, —*
- a. *when considering an application, have regard to—*
 - i. *trade competition or the effects of trade competition; or*
 - ii. *any effect on a person who has given written approval to the application:*
 - b. *[Repealed]*
 - c. *grant a resource consent contrary to—*
 - i. *section 107, 107A, or 217:*
 - ii. *an Order in Council in force under section 152:*
 - iii. *any regulations:*
 - iv. *wāhi tapu conditions included in a customary marine title order or agreement:*
 - v. *section 55(2) of the Marine and Coastal Area (Takutai Moana) Act 2011:*
 - d. *grant a resource consent if the application should have been notified and was not.*
4. *A consent authority considering an application must ignore subsection (3)(a)(ii) if the person withdraws the approval in a written notice received by the consent authority before the date of the hearing, if there is one, or, if there is not, before the application is determined.*
5. *A consent authority may grant a resource consent on the basis that the activity is a controlled activity, a restricted discretionary activity, a discretionary activity, or a non-complying activity, regardless of what type of activity the application was expressed to be for.*
6. *A consent authority may decline an application for a resource consent on the grounds that it has inadequate information to determine the application.*
7. *In making an assessment on the adequacy of the information, the consent authority must have regard to whether any request made of the applicant for further information or reports resulted in further information or any report being available.*

Subsection 1 has been assessed in Sections 6 and 7 of this report. Section 6 conclude that effects are less than minor and the proposed conditions will ensure that any actual or potential effects on the

environment are able to be mitigated. Section 7 concluded that the proposal is generally consistent with the relevant objectives and policies

Subsections 2 and 2A are not relevant for this application.

Subsections 2B and 2C are not relevant as no marine titles are in place. For completeness, several customary marine title applications have been lodged covering Big Glory Bay by Te Rūnanga o Ngāi Tahu, the New Zealand Maori Council, and Customary Marine Title for all Maori. The applicants notified these parties, but have not advised Environment Southland whether any response has been received.

In accordance with subsection 3, trade competition has not been taken into consideration, and no parties have provided their written approval, the application is not contrary to any of the documents set out in sub-paragraph c.

Subsection 4 is not relevant for this application.

In accordance with subsection 5, the application has been assessed as a non-complying activity.

In accordance with subsections 6 and 7, information inadequacies have been dealt with through formal requests for further information.

11.2 Determination of application

The application is to be treated as a **non-complying** activity.

Section 104D of the RMA states:

1. *Despite any decision made for the purpose of notification in relation to adverse effects, a consent authority may grant a resource consent for a non-complying activity only if it is satisfied that either—*
 - a. *the adverse effects of the activity on the environment (other than any effect to which section 104(3)(a)(ii) applies) will be minor; or*
 - b. *the application is for an activity that will not be contrary to the objectives and policies of—*
 - i. *the relevant plan, if there is a plan but no proposed plan in respect of the activity; or*
 - ii. *the relevant proposed plan, if there is a proposed plan but no relevant plan in respect of the activity; or*
 - iii. *both the relevant plan and the relevant proposed plan, if there is both a plan and a proposed plan in respect of the activity.*
2. *To avoid doubt, section 104(2) applies to the determination of an application for a non-complying activity.*

As discussed above I have concluded that the adverse effects from the proposed activity will be minor and as such the first gateway test in section 104D of the RMA relating to adverse effects on the environment in accordance with Section 104D(1)(a) will met.


For the purposes of the second gateway test within Section 104D(1)(b), it needs to be determined whether or not the proposal is not contrary to objectives and policies in the Coastal Plan. As

discussed above, I have undertaken an assessment of the objectives and policies that are relevant to the proposed activity. On assessment of these provisions I have concluded that the proposal will not be contrary to the objectives and policies of the Plan.

The application satisfies both gateway tests in Section 104D. Therefore, Council is not precluded from granting resource consent under this section.

11.3 Grant or refuse

Taking into consideration the submissions received, assessment of actual and potential effects, proposed mitigations through the most recent set of conditions and relevant policy documents, I consider that the application can be approved, with appropriate conditions. Should the Commissioner also consider the applications can be approved, I have attached recommended conditions as Appendix 4.

Signed: 
Name: Andrew MacLennan Date: 13 June 2019 (Updated 13 August 2019)

Reviewed By:

Signed: 
Name: Dani Korevaar Date: 17 June 2019

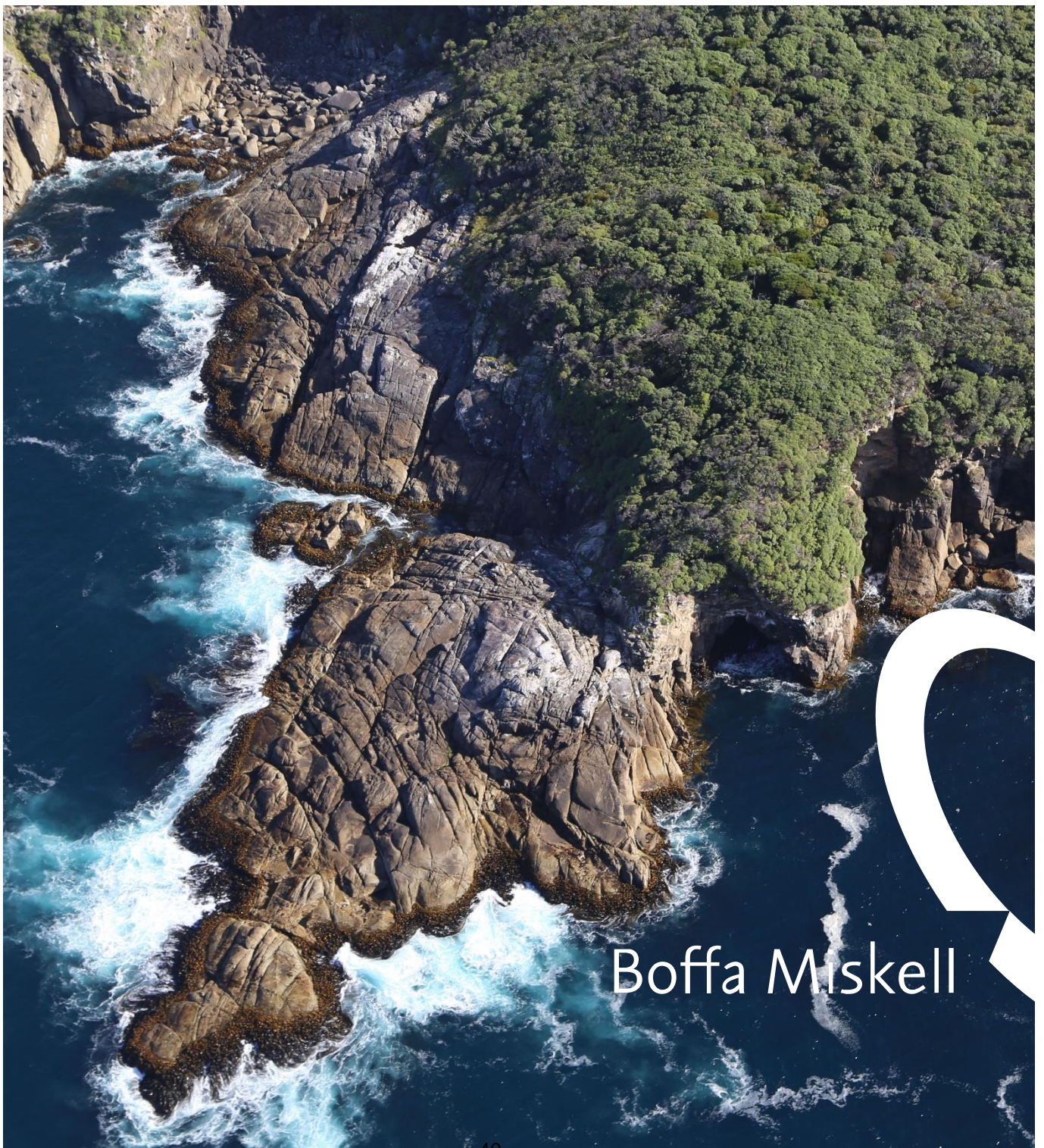
Reviewed By:

Signed: 
Name: Aurora Grant Date: 3 July 2019

Stewart Island

Landscape and Coastal Natural Character Study
Prepared for Environment Southland

30 October 2017



Boffa Miskell

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1.0 Introduction

1.1 Background

Environment Southland (ES) appointed Boffa Miskell Ltd (BML) in January 2017 to assist with an assessment of the landscape and coast of Stewart Island, referred to as the Stewart Island Landscape/ Coastal Study. This will inform ES about the sensitivities and values, as well as existing modifications found along the Stewart Island coastline, seascape and inland landscapes. BML has previously assisted ES with the preparation of the Southland Coastal Landscape Study (2006).

The study has been undertaken as an independent technical assessment. The preparation of the assessment required collaborative work with ES's technical staff from their coastal team as well as from the Department of Conservation to collate information about the coastal environment, in particular in relation to the marine aspects.

A regional landscape assessment, prepared by Boffa Miskell in 1997 identified Stewart Island as an Outstanding Landscape, and stated:

“Stewart Island is a largely natural landscape with extraordinary landform and coastal diversity. The land/water interface is of particular importance due to the indented coastline and numerous islands, islets and rock stacks. The beauty of the bush/water connection, the clarity of the water, the abundance of wildlife, and the rich history of human endeavour all give Rakiura an exceptionally strong sense of place”.

“The island is a dominant focal point when viewed from many parts of southern Southland and Foveaux Strait”.

“Halfmoon Bay and Oban township are the only development nodes of any size. They have their own distinctive character and quality reflecting a relaxed lifestyle and close links with surrounding natural features. While it would not be appropriate to include these areas in an outstanding natural landscape, their exceptional characteristics and qualities and their relationship to the surrounding island are such that special attention should be given to their future development”.

A brief Natural Character Study of the Stewart Island Coastline was prepared in 1994 by Alan Petrie for the Department of Conservation. This high-level assessment forms part of the Regional Coastal Plan for Southland (2005). The document was reviewed and relevant findings incorporated into this assessment.

The requirement of this study was to identify the Outstanding Natural Features and Landscapes (ONF/Ls) (under section 6a and 6b of the RMA) of Stewart Island. In addition to the assessment of the landscape values, the council has also engaged BML to assess the natural character values of the Coastal Environment, partly in response to the release of the New Zealand Coastal Policy Statement (NZCPS 2010).

The scope of works for the landscape and coastal assessment included the following:

1. Desktop study of existing ecological and landscape information, covering both the terrestrial and marine environments.
2. Site visit by plane over the island to establish aerial photo record
3. Definition of character areas and the extent of the coastal environment

4. Assessment of landscape values for the entire island (terrestrial area both within and outside the Coastal Environment), including seascapes. Spatially identify areas of Outstanding Natural Features/ Landscapes and provide brief landscape value descriptions for each character area.
5. Assessment of natural character of the terrestrial area within the Coastal Environment, coastal interface and CMA as three separate sections. Spatially identify areas of high, very high and outstanding natural character and provide character descriptions for specific units



Image: Dramatic rocky coastal environment along the island's eastern coast

2.0 Methodology

2.1 Scoping and Familiarisation

As a basis for the landscape character assessment, the study team undertook a detailed desktop analysis of the existing information relating to Stewart Island's landscape, including a literature review of online and hard copy material outlined in the reference section of this report. A series of Geographic Information System (GIS) maps were prepared highlighting different landscape layers, such as vegetation, landuse and geology. The focus of the GIS and desktop studies was to enable a clearer understanding of overall landscape prior to undertaking on-site investigations. It is noted that this background research included reference to *Te Tangi a Tauira*¹ for information on sites and values of cultural significance to Ngāi Tahu.

The team undertook an aerial visit of the island, in a high-winged plane, which assisted determine landscape and natural character aspects of the island. Images from the aerial visit have been used within this report.

2.2 Landscape Character Area Identification and Analysis

Landscape characterisation provides a descriptive and analytical basis for the understanding of landscape diversity, attributes and change. Landscape characterisation provides a context for the evaluation of special landscapes (i.e. Outstanding Natural Landscapes) and provides justification for their management. Therefore, the purpose of the characterisation is to provide a largely descriptive and objective foundation for the evaluative assessment (which involves value judgements) and which will later inform the selection of appropriate management mechanisms.

The focus of this study is on developing full character and value descriptions for all landscape character areas and features (see **Section 4 and 5** of this report). The level of information on landscape values included in this study required a significant component of professional judgement by the study team, informed by case law and an understanding of what is perceived as natural. The characterisation included in this landscape study aims to provide consistent descriptions across the natural landscapes within the city. It highlights the landscape attributes that have subsequently been assessed in the evaluation.

Character areas are generally based on definable landform differences between various parts of an investigation area, which display similar attributes in terms of their geomorphological and land cover attributes. The character areas are generally perceived to be of homogenous appearance. A distinction was made between the eight Coastal Character Areas, which fall within the Coastal Environment (as defined by the NZCPS 2010) and the two inland character areas.

¹ Ngai Tahu ki Murihiku Natural Resource and Environmental Iwi Management Plan - Te Tangi a Tauira. 2008

The ten character areas identified in the study are:

Coastal Character Areas:

1. Eastern Bays
2. Breaksea
3. South East Coast
4. Port Pegasus
5. South West Coast
6. Mason Doughboy Bay
7. Ruggedy
8. North Coast

Inland Character Areas:

9. Freshwater Inland Basin
10. Southern Inland Ranges

Each of the identified character areas has been described in terms of the following landscape aspects:

- Location and boundaries
- Landform
- Landcover
- Occupation, cultural and heritage aspects
- Land use and recreation

The descriptions of the landscape character form the basis for evaluation of the landscape values for each character area, which will in turn provide the explanation for Outstanding Natural Feature and Landscape (ONF/L or ONL) identification. As part of the evaluation stage an aerial site visit was undertaken (February 2017) to assist with the mapping of ONLs. Photographs and overview maps have been included in the study report to illustrate findings (**refer to Appendix 1**).

Since an assessment of natural character of the Coastal Marine Area (CMA) around Stewart Island forms part of the brief, an area of 12 nautical miles was identified around the island and divided into the four marine character areas, which also serve as seascape character areas.

Marine Character Areas:

- A. Western Marine Area
- B. Eastern Marine Area
- C. Paterson Inlet Marine Area
- D. Port Pegasus Marine Area

2.3 Landscape Evaluation

The landscape evaluation was concerned with identifying the values and quality of Stewart Island's landscapes and features. While the landscape characterisation classified the landscape into character areas, the evaluative study identifies the character areas' different landscape values including the identification of landscapes in accordance with the following Sections of the RMA 1991:

- Coastal 'natural character' landscapes (section 6(a))
- Outstanding natural features and landscapes (section 6(b))

Landscape is a multi-dimensional concept and includes natural science, heritage, cultural, aesthetic and a number of other values. Landscapes are valued differently by different people for a range of reasons. Our world views, upbringing and education will all influence our response to particular landscapes. Maori understanding of, and attitudes to, landscape can be significantly different from those of non -Maori. For most of us our connection to the landscapes around us is deep-rooted. It is likely to involve culture, heritage, memories and much more. Therefore, it is essential that the process of valuation adopted by this study, and the use of its evaluation outcomes, are as transparent as possible.

2.4 Landscape Assessment Criteria

As mentioned previously, there are various different ways in which landscapes may be appreciated and thresholds for quality determined. The range of criteria that the Environment Court has reinforced for landscape practitioners to consider when valuing landscapes is referred to as the Amended Pigeon Bay criteria or factors. The criteria or factors include (but are not limited to):

1. the natural science factors - the geological, topographical, ecological and dynamic components of the landscape;
2. its aesthetic values including memorability and naturalness;
3. its expressiveness (legibility): how obviously the landscape demonstrates the formative processes leading to it;
4. transient values: occasional presence of wildlife; or its values at certain times of the day or of the year;
5. whether the values are shared and recognised;
6. its value to tangata whenua; and
7. its historical associations.

There is now a level of acceptance in the use of these criteria as an assessment framework. However, it is also increasingly recognised by practitioners that while they are useful, they also have certain limitations. While they were not intended to form a definitive or 'complete' list of landscape values, this is how they have often been used by assessors. Many of the criteria actually overlap and some could be more usefully seen as subsets of one another rather than as separate value categories. This can be confusing and lead to some values being given more weight than others, or 'double-counting'.

A recent review by the New Zealand Institute of Landscape Architects (NZILA) has reordered the Pigeon Bay criteria into three categories, focusing on the landscapes' broad Biophysical, Sensory and Associative values. Condensing the Pigeon Bay criteria or factors into these three broad categories reduces the risk of emphasising some criteria at the cost of others and enables assessors to interpret the landscape values with validity and reliability.

The key aspects covered under each one of these attributes can be summarised as follows:

1. Biophysical features, patterns and processes may be natural and/or cultural in origin, and range from the geology and landform that shape a landscape to the physical artefacts such as roads that mark human settlement and livelihood.
2. Sensory qualities are landscape phenomena as directly perceived and experienced by humans, such as the view of a scenic landscape, or the distinctive smell and sound of the foreshore.
3. Associative meanings are spiritual, cultural or social associations with particular landscape elements, features, or areas, such as pā, kāinga, tūpuna awa, mahinga kai and waahi tapu, or other sites of historic events or heritage. Associative activities are

patterns of social activity that occur in particular parts of a landscape, for example, popular walking routes or fishing spots.

For each character area the values are outlined in format, and the study is explicit about the rating of these values and why they have led to an identification as an ONF/L. The level of detail included in the descriptions depended to some extent on the information available for each of the character areas.

A natural landscape has a predominance of unchanged landforms, functioning water, drainage and soil processes and tree, plant and animal patterns, compared to human developments such as buildings, earthworks, vegetation modification, fencing, roads, quarries, reclamations or subdivision. Under the RMA a landscape does not have to be unmodified to be natural, just relatively unmodified. Landscape assessments in New Zealand generally ascribe higher landscape values to unmodified areas, but this does not imply that anything less than pristine is devoid of natural values, just that they are of lesser value. The Mackenzie Basin 'Plan Change 13 Interim Decision' discusses the degree of naturalness necessary for a landscape to be an outstanding natural landscape. It states that the criteria of 'naturalness' usually include:

- relatively unmodified and legible physical landform and relief;
- the landscape being uncluttered by structures and/or obvious human influence;
- the presence of water (lake, river, sea);
- the presence of vegetation (especially native vegetation) and other ecological patterns.

The landscape of Stewart Island is highly natural in most areas with few, but distinctive nodes of current and historical human modification. Some of these developments over the past centuries had detrimental effects on its naturalness. However, the human influence is generally quite confined in the landscape, with large areas of untouched nature which is valued by residents and visitors alike. All landscapes have values, therefore the level of information on landscape values required a significant component of judgment by the study team.

2.5 Mapping of Outstanding Natural Features/ Landscapes

Following the landscape evaluation, the next step the study team undertook was to determine the spatial extent of the ONF/Ls. The study team was able to delineate areas that displayed notably high qualities of a range of biophysical, sensory and associative values based on a number of GIS layers that informed the study and aerial photographs. The GIS layers used for the assessment are detailed in **Appendix 2** of this report.

ONF/Ls have been mapped on a topographical map at a scale 1:50,000. Depending on the specific values identified for a landscape or feature, a number of different mapping techniques were used in this study to identify boundaries:

1. Land use Approach: This approach was particularly important for the identification of ONFs around settlements, where the land use/ cover changed substantially in the immediate surroundings of the landscape/ feature.
2. Landscape Feature Approach: This approach identified the specific landscape feature, such as a river catchment, mountain range of island.

3.0 Coastal Environment and Natural Character Assessment

The natural character assessment undertaken for this report considers the areas within the coastal environment. As outlined in the previous section, Stewart Island was divided into Coastal Character Areas. Eight of these Coastal Character areas fall within the terrestrial component of the Coastal Environment and four fall within the marine component of the Coastal Environment. The assessment of natural character of the terrestrial area was limited to the landscape within the Coastal Environment. The coastal interface, which comprises the area near Mean High Water Spring (MHWS), and the CMA were assessed separately to the terrestrial areas within the coastal environment. Based on the assessment, areas of high, very high and outstanding natural character were spatially identified.

When the New Zealand Coastal Policy Statement 2010 (NZCPS) was released in December 2010, local authorities were tasked under Policy 13 to map or otherwise identify (at least) areas of high natural character in the coastal environment.

3.1 Defining the Coastal Environment

The RMA 1991 does not define 'coastal environment'. However, to respond to Policy 1 of the NZCPS 2010: 'Extent and Characteristics of the Coastal Environment' it was necessary to adopt a definition. Policy 1 recognises that the extent and characteristics of the coastal environment will vary from location to location and identifies nine characteristics which may be included in the coastal environment:

- a) *The coastal marine area;*
- b) *Islands within the coastal marine area;*
- c) *Areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, salt marshes, coastal wetlands, and the margins of these; (Study Team emphasis)*
- d) *Areas at risk from coastal hazards;*
- e) *Coastal vegetation and the habitat of indigenous coastal species including migratory birds;*
- f) *Elements and features that contribute to the natural character, landscape, visual qualities or amenity values;*
- g) *Items of cultural and historic heritage in the coastal marine area or on the coast;*
- h) *Inter-related coastal marine and terrestrial systems, including the intertidal zone; and*
- i) *Physical resources and built facilities, including infrastructure, that have modified the coastal environment.*

The above list of characteristics is a helpful reminder in establishing what is included within the coastal environment; however, the list does not provide an answer in how to define this environment.

Through the development of a methodology to determine the extent of the coastal environment, BML were guided by all of the identified characteristics, although gave particular consideration to item (c) of Policy 1(2) of the NZCPS 2010 'where coastal processes, influences or qualities are significant'. This, along with the relationship to the accompanying natural character study provided helpful guidance. All other characteristics of the coastal environment were also addressed in the methodology.

The term 'significant' is not defined in the NZCPS 2010. Within the context of the RMA 1991 the word is used to address Section 6(c) matters. In the context of Policy 1(2)(c) of the NZCPS 2010, the study team have interpreted the term 'significant' to mean 'sufficiently great or important to be worthy of attention; noteworthy', as outlined within the Oxford English Dictionary.

The seaward extent of the coastal environment extends 12 nautical miles from MHWS and is administered by Environment Southland, which includes the numerous islands and islets around Stewart Island. The Stewart Island coastline is, for the majority of its length, quite diverse with a variety of beaches, rocky cliffs and inlets. Specific attention was given to more complex inlet areas of Paterson Inlet and Port Pegasus.

A general rule of thumb is that the inland extent of the coastal environment extends to the first [proximate] significant ridgeline inland of the coast, although for flat areas, the boundaries are determined more by landscape character and where coastal elements, patterns and processes are still sufficiently significant. For Stewart Island it was, in many instances, difficult to determine a distinctive line due to the undulating landform and continuous unmodified bush cover. Where possible the ridge defining the river catchment draining towards the coast was used to determine the extent of the Coastal Environment, in particular along the western and northern coast.

Fundamental to this assessment of the Coastal Environment is the relevant and accessible data available to inform judgements. The use of professional knowledge of the study team in relation to the elements outlined within Policy 1 of the NZCPS 2010 was also an essential source of information. Few components listed under Policy 1 have been excluded, which include cultural and historical aspects and specific benthic/ bathymetry studies, since limited information was available.

3.1.1 Mapping Information

The scale of the natural character study is critical to the validity of the end results. As outlined earlier, natural character assessment is scale related and determined by the study brief and to varying extents by the mapping scale of the information used to determine the outcomes of the project. The mapping and assessment scale for this task is at a district-level due to the size of the island.

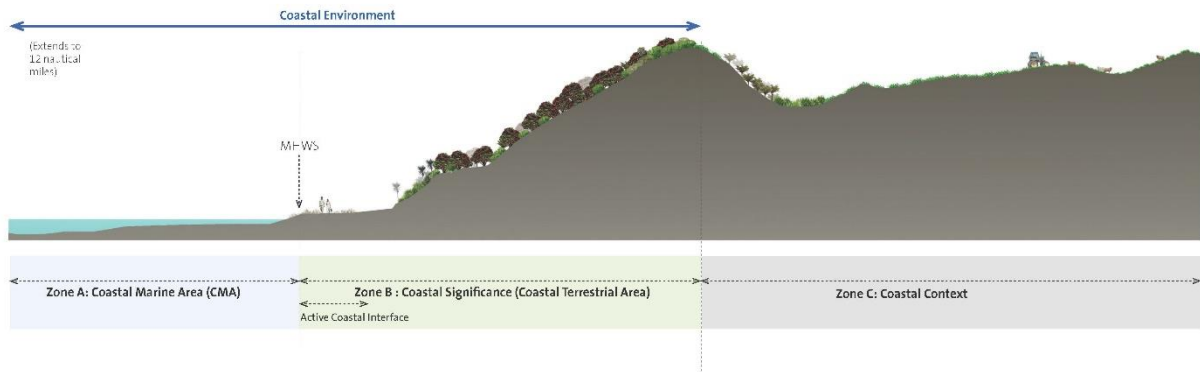
While the study team are generally familiar with Stewart Island, the assessment was primarily based on a desktop study and an aerial survey with no ground-truthing due to the difficulty in access to large parts of the island. GIS has been used to systematically map the extent of the Coastal Environment and to map coastal areas. The mapping scale undertaken for this project is 1:50,000. It is acknowledged that the majority of the data used for this study is at scales greater than 1:50,000. The mapping has been undertaken on high resolution aerial images, although presented in this report on 1:50,000 topographical maps. Where more intricate sections of the coastline exist, these have been mapped at a finer scale, in particular around Paterson Inlet. At these finer scales, GIS allows the viewer to zoom in and assess the exact location of the coastal environment. For a list of GIS information refer to **Appendix 2**.

3.1.2 The Coastal Environment – Zones of Significance

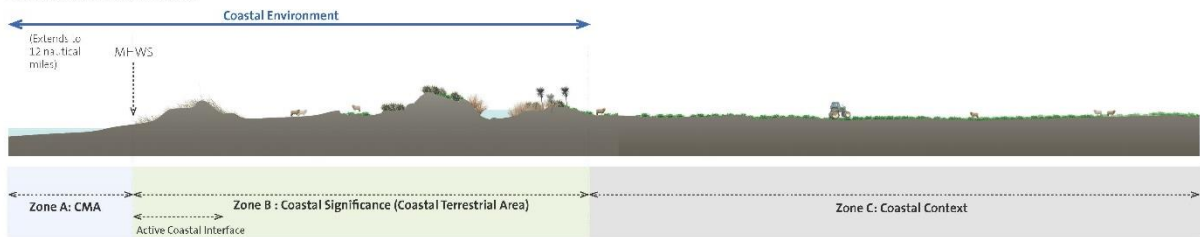
BML has developed the following model which has been applied to the Stewart Island coastline in order to determine the Coastal Environment, as interpreted under Policy 1 of the NZCPS 2010. Essentially the Coastal Environment contains two zones of significance, with a third zone, outside of the Coastal Environment, called the Coastal Context Zone. The two Coastal Environment

Zones are referred to as the Coastal Marine Area and the Coastal Significance Zone. The following diagrams assist to interpret this.

COASTAL LANDSCAPE: HILL COUNTRY

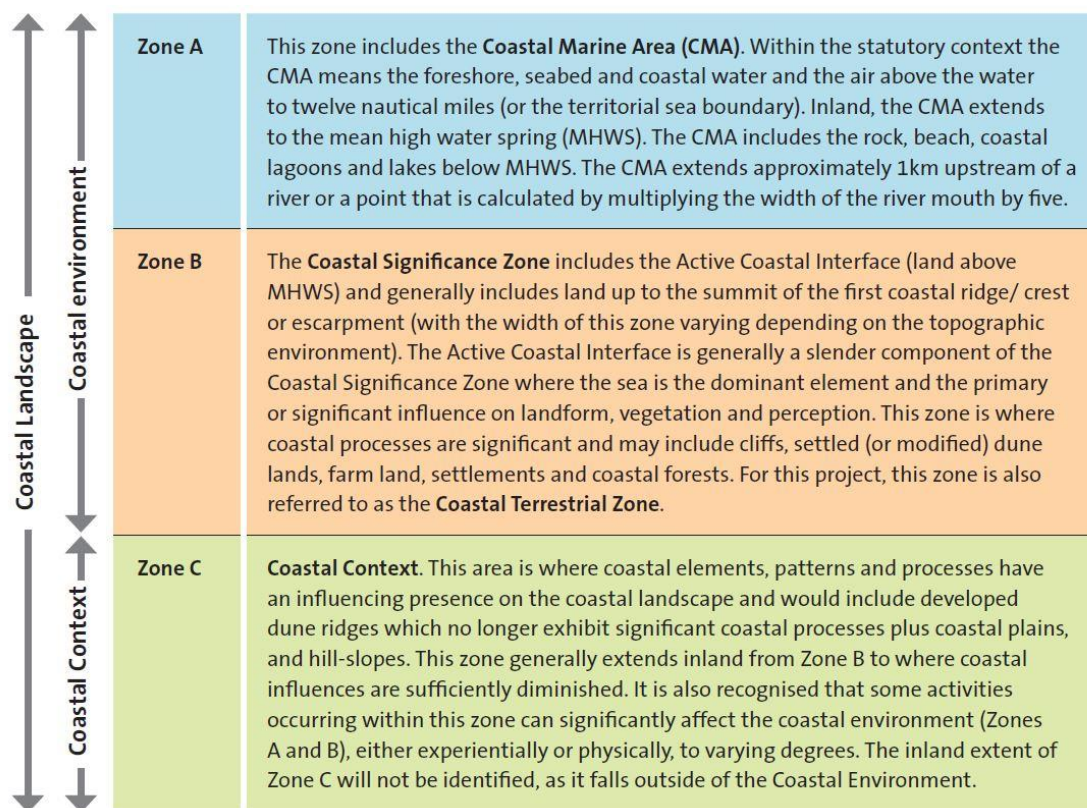


COASTAL LANDSCAPE: PLAINS



The Coastal Environment and the Coastal Context Zone can collectively be referred to as The Coastal Landscape. The diagrams above illustrates the extent of the Coastal Environment and the three zones in two very different types of coastal areas: one a steep coastal area and the second a flat coastal area. The diagrams illustrate that the coastal environment is determined by a variety of factors and changes from one coastal area to another.

Within our diagram, Zone A extends up to the Mean High Water Springs (MHWS) mark. The Coastal Significance Zone, Zone B, includes the landward side of the MHWS mark. Within this zone is a small sub-zone referred to as the Active Coastal Interface. Further descriptions of these zones are provided in the table below, however, under the National Parks Act, the 'foreshore' puts the landward boundary of a National Park at the Mean Low Water Springs (MLWS) mark. This small difference therefore creates a small 'overlap' of jurisdictions between the RMA and the NPA.



3.2 Coastal Natural Character

The environments with the greatest natural character are those with comparatively low levels of human modification and are, therefore, composed of natural elements appearing in natural patterns and underpinned by natural processes.

Natural character is not defined in the RMA or in the NZCPS 2010. Assessing natural character is not new and the methodology developed draws on the considerable experience gained from evaluating coastal landscapes over the past 20 years and on case law. The NZCPS under Policy 13 confirms that natural character is not the same as natural features and landscapes or amenity values. The policy also lists a number of matters that may be included in natural character. The methodology developed for this study incorporates these matters in line with best practice.

These matters (under Policy 13) include (but are not limited to):

- “(a) *natural elements, processes and patterns;*
- “(b) *biophysical, ecological, geological and geomorphological aspects;*
- “(c) *natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks;*
- “(d) *the natural movement of water and sediment;*
- “(e) *the natural darkness of the night sky;*
- “(f) *places or areas that are wild or scenic;*
- “(g) *a range of natural character from pristine to modified;*
- “(h) *experiential attributes, including the sounds and smell of the sea; and their context or setting.*”

3.3 Evaluation of Natural Character

The natural character can be assessed on a continuum of modification that describes the expression of natural elements, patterns and processes (or the 'naturalness') in a coastal landscape/ ecosystem where the degree of 'naturalness' depends on:

- The extent to which natural elements, patterns and processes occur and are legible;
- The nature and extent of human modifications to the landscape, seascape and ecosystems;
- The fact that the highest degree of natural character (greatest naturalness) occurs where there is least modification/ uncluttered by obvious or disruptive human influence; and
- Recognition that the degree of natural character is context-dependent and can change over time.

For the purposes of the study, the coastal environment has been divided up into eight Coastal Character Areas. These Coastal Character Areas were based on landscape character and fall onto the seaward side of the coastal environment line. Further analysis has occurred for the coastal interface in the vicinity of MHWS, and for the four marine character areas within the open coastal marine area.

A number of key attributes needs to be considered when assessing the natural character of the coastal environment. Through BML's experience, including the interpretation of the NZCPS 2010, the list of attributes outlined in the following table has been identified as a systematic way to consider the different aspects of the natural patterns, processes and elements of the coastal environment and the degree of modification present. An overall value judgement as to the degree of natural character is made for areas within the Coastal Environment.

The methodology rates natural character on a seven-point scale from Very High (lowest amount of modification) to Very Low (greatest amount of modification).



Unlike many other places in New Zealand, the majority of the Stewart Island coastline is largely unmodified, with small nodes of human modification, some of which has occurred in the early nineteenth century. The matters included within Policy 13 of the NZCPS have been simplified and reordered into three broader attributes, namely abiotic, biotic and experiential aspects.

In this report the areas of high, very high and outstanding natural character are listed in tables within each of the character areas, where their spatial extent is briefly described.

The following tables outlines the characteristics covered under each of the attributes used for natural character assessment for Terrestrial and Marine Areas

Coastal Marine Areas – Zone A

Attributes	Descriptors	Spectrum of naturalness*
Abiotic Systems	<p>Physical processes including tidal action (and range), currents, waves (e.g. surf breaks), water temperature, salinity, sedimentation, turbidity and climate (e.g. wind);</p> <ul style="list-style-type: none"> - Geomorphology, topography and landform including headlands, bays, channels, coastal formations (e.g. rocks, reefs, stacks), bathymetry, seabed character (e.g. mud, sand, gravels, cobbles/ boulders, bedrock), aspect and exposure; - Erosion and depositional processes - Water Quality; - River mouth processes. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which physical modifications (e.g. trawling and dredging, major port structures, port dredging and dumping, reclamation, jetties, sea defences, groynes, aquaculture and land-derived sedimentation) affect this abiotic attribute;
Marine Biotic systems	<ul style="list-style-type: none"> - The natural distribution and abundance of species, communities and habitats, including ecological processes; - The diversity and continuity of species, communities and habitats intertidally and subtidally (e.g. biotic patterns) including all marine biotia, reef and soft sediment communities, estuaries/ wetlands, marine mammals and sea birds; - The expression/ appearance of ecological features and processes. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which modifications (e.g. trawling, dredging, aquaculture, reclamation, stopbanks, sedimentation, sewage and other discharges, exotic species, and infrastructure such as ports, marinas, jetties and moorings) affect this biotic attribute;
Experiential	<ul style="list-style-type: none"> - The experience in seeing, feeling and perceiving the natural environment of the Coastal Marine Area; - Aromas, visual, auditory, sense of wildness, remoteness, isolation, natural darkness of the night sky and its scenic values; - Access and recreational activities; - Ephemeral biotic activity (e.g. presence of pods of dolphins, flocks of birds, schools of fish) and their associated sounds - Ephemeral abiotic activity (e.g. Natural movement of water and sediment); - Underwater experiences when swimming, diving and snorkelling; - Note heritage elements do not contribute directly to the naturalness experience. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which biotic and abiotic factors and their intactness (or conversely modification) are experienced - Experiential values may be influenced by factors such as structures (e.g. ports, marinas, jetties, moorings, aquaculture), exotic species, and the presence of human activity including recreational pursuits (e.g. diving, swimming, boating, jet skis) and commercial operations (e.g. commercial fishing vessels and servicing boats); - Note different people experience naturalness differently; - Cultural values have not been included.

Coastal Terrestrial Areas – Zone B		
Attributes	Descriptors	Spectrum of naturalness*
Abiotic Systems	<ul style="list-style-type: none"> - Climatic influences (wind, rain, exposure); - Geomorphology and identification of different types of landforms (e.g. peninsulas, cliffs, dunes, wetlands; freshwater springs); - Terrestrial coastal processes, including erosion, river mouth processes including sedimentation (within the terrestrial zone); - Freshwater processes. 	<p>The evident intactness of the abiotic systems. The degree (very high to very low) to which physical modifications such as built structures, road cuts, earthworks and reclamation works affect this abiotic attribute.</p>
Terrestrial Biotic systems	<ul style="list-style-type: none"> - The margins of estuaries, wetlands and terrestrial areas in Zone B including the intactness of their natural ecological processes, patterns and elements; - Extent of freshwater communities; - Land cover and associated land use, including the composition, distribution, and condition of land cover, and the presence of indigenous/exotic species; - Presence of indigenous fauna. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which modifications affect this biotic attribute. Influences include the presence of exotic species on native communities, physical structures such as infrastructure, housing, roading, tracking, reclaimed land, stop banks, as well as commercial forestry, agricultural and viticulture land use that reduce the naturalness of the biota; - This attribute also includes modifications to freshwater systems, including channelizing watercourses, stop banks, culverts, dams etc. which affect freshwater biota.
Experiential	<ul style="list-style-type: none"> - The experience in seeing, feeling, hearing and perceiving the Coastal Significance and Active Coastal Interface; - Aromas, visual and scenic, auditory, sense of wildness, remoteness, isolation, natural darkness of the night sky; - Ephemeral abiotic activity (e.g. the natural movement of water and sediment) - Ephemeral human activity affecting the naturalness (such as recreation, commercial activities); - Note, this attribute does not include heritage elements. 	<ul style="list-style-type: none"> - The degree (very high to very low) to which abiotic and biotic modifications affect the perceived naturalness experienced. The highest degree of experiential naturalness is where there is least modification. - Influences reducing naturalness include the presence of physical structures including ports, reclaimed land, infrastructure, roading, lighting, industrial noises, and non-natural aromas; - Presence of exotic species also reduces naturalness; - Presence of humans, including recreational activities (driving, walking, camping, settlements) also reduces naturalness; - Note, different people experience naturalness differently, - Cultural values have not been included.

* Each Coastal Marine Area is measured on the spectrum of naturalness (degree of human modifications) to each attribute from Very High to Very Low, then an overall judgement is made. The degree of physical and experiential naturalness is related to the location's context.

The King Salmon decision of the Supreme Court clarified the importance of policies (in this case the NZCPS), particularly in relation to directive policies that require the avoidance of effects². The essence of the decision clearly provides strong direction to avoid adverse effects on Outstanding Natural Character and Outstanding Natural Landscapes in the Coastal Environment. The decision states that where policy direction states 'avoid', essentially this is what should occur. The implications of this decision have yet to be fully determined and further guidance on this will develop over time.

To meet the requirement outlined within Policy 13 (1)(c) of the NZCPS 2010 that '*at least areas of high natural character*' are mapped, areas containing high, very high or outstanding³ levels of natural character have been outlined. Policy 13 (1)(a) requires avoidance of adverse effects of activities on natural character in the coastal environment with outstanding natural character. For all other areas in the coastal environment Policy 13 (1) (b) requires that significant adverse effects are avoided, remedied or mitigated. Areas identified on the map are more likely to have particular policy mechanisms applied to them.

3.3.1 Outstanding Natural Character

Areas of Outstanding Natural Character have been identified through a detailed assessment process and mapped on **Map 9** of this study. Under RMA s6(a) it is necessary to determine the existing attributes and extent of natural character and assess how these may be affected by a specific planning regime or proposal. This approach is also required under the NZCPS 2010. Policy 13 of the NZCPS 2010 also specifically requires that an evaluation is made as to whether the natural character in the existing coastal environment contains outstanding natural character:

“(1) To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development:

(a) avoid adverse effects of activities on natural character in areas of the coastal environment with outstanding natural character; and

(b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on natural character in all other areas of the coastal environment; ...”

An area with outstanding natural character may be an area within the coastal environment that is considered to have high or very high levels of natural character, although it is important to note that the high or very high ratings do not in themselves equate to 'outstanding', as clarified by the following Boffa Miskell definition:

‘Outstanding’ is a comparative evaluative term meaning; to stand out, exceptional, pre-eminent’.

It was determined by the study team that outstanding natural character should be assessed separately from the main assessment which determines areas holding very low to very high levels of natural character. This decision to separate out this assessment from the main natural character study required a re-evaluation of the highest rated areas (e.g. high and very high). The re-evaluation of the high and very high areas means that only the highest rated areas of natural character will be considered. This approach is also consistent with studies identifying outstanding

² Environmental Defence Society Inc v New Zealand King Salmon Company Ltd [2014] NZSC 38.

³ 'Outstanding' is a comparative evaluative term meaning 'to stand out, exceptional, pre-eminent'. Under the methodology, an area of outstanding natural character must exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (the 'clutter' factor) and other modifications compared to other areas in the Southland Region.

natural landscapes (e.g. a landscape or feature must be of sufficient naturalness to be considered outstanding).



It was also determined that outstanding natural character should combine both terrestrial and marine components so that important sequences of ecological naturalness (such as from the top of a ridge above sea level to the bottom of the adjacent sea and interconnected systems) are considered.

Under the methodology, an area of outstanding natural character must:

‘exhibit a combination of natural elements, patterns and processes that are exceptional in their extent, intactness, integrity and lack of built structures (the ‘clutter’ factor) and other modifications compared to other areas in the Southland Region’. (Boffa Miskell)

For Stewart Island, there was very little debate about the extent of the ONC mapping, indeed, for Stewart Island, the main question was, what isn’t outstanding? Only the areas that contained the most concentrated modification were excluded, which included parts of Oban and Big Glory Bay.



Image: The Outstanding Natural Character of much of the island is bought about by the lack of modifications apparent.

4.0 Broad Stewart Island Description

4.1 Landscape

Being the third largest island of New Zealand, Stewart Island/ Rakiura is located 30 kilometres south of Bluff, across the Foveaux Strait within the southern ocean. Holding a land area of approximately 1,680km², the island and its many smaller islands are renowned for their wild and remote setting, very high levels of naturalness and very high heritage values. With approximately 85% of the island contained in National Park status, much of the original vegetation has remained intact. Human modification is limited to discrete parts of the island, such as Halfmoon Bay where the principal small settlement of Oban is located. Throughout the remainder of the island, modification is limited.

Having geological links to the granite geology of Fiordland, Stewart Island/ Rakiura contains a range impressive landforms, from the granite and schist ridges of the southern inland ranges to the broad inland freshwater basin and bogs in the north. Numerous large indented inlets, including Paterson Inlet on the east coast and Port Pegasus on the southern coast harbour quieter, more settled waters, whilst the remaining coastline is rugged and rocky, however broad sandy beaches are evident, most significantly at Mason Bay on the west coast. There are also a number of geological features listed within the New Zealand Geopreservation Index that are rated as either nationally or regionally significant and include the following (nationally significant features are underlined):

1. Bald Cone exfoliation dome, Port Pegasus/Pikihatiti - regionally significant
2. Big Hellfire Beach sand pass - regionally significant
3. Ernest Islands sand tombolo (Mason Bay) - nationally significant
4. Gog and Magog exfoliation domes, Port Pegasus – nationally significant
5. Granite Knob and Lees Knob exfoliation domes, Tin Range – regionally significant
6. Harrold Bay spheroidal weathering – regionally significant
7. Mason Bay sand passes and parabolic dunes – nationally significant
8. Mt Anglem/Hananui cirque and tarns – regionally significant
9. Ruggedy Flats/Freshwater Valley – regionally significant
10. Tin Range schist and associated tin workings – nationally significant.
11. Port William dikes – regionally significant
12. Horseshoe Bay hornblende hornfels– regionally significant
13. Ringaringa intrusives – nationally important
14. Cow and Calf Point gabbro intrusion– regionally significant
15. Ackers stone house, Harrold Bay –regionally significant
16. Paterson Inlet – nationally significant
17. The Neck multiple tombolos – nationally significant
18. Port Pegasus – nationally significant

19. Smoky Beach climbing dunes – regionally significant
20. Ruggest Point coastal features – regionally significant
21. Freshwater River estuary, Paterson Inlet – regionally significant

Of the numerous offshore islands that pepper the nearshore marine area, Codfish Island is the largest and located off the north-western coast. The remaining islands range in size from sea-washed rock stacks to islands containing substantial forests, such as Pearl Island in Port Pegasus. Two large groups of many islands are found off the eastern coast around Paterson Inlet and off the south-western shores, and are collectively referred to as Titi/ Muttonbird Islands.

The Anglem massif and the Ruggedy Mountains rise steeply from the coastline and dominate the northern part of the Island. They rise to 980m and 510m respectively and assist in defining the edges to the low lying and boggy inland wetland area associated with the Freshwater River catchment. To the south is the Tin Range, where Mt. Allen rises to 750m above sea level.

In terms of vegetation, Stewart Island/ Rakiura retains a relatively diverse number of habitats, ranging from indigenous forests and shrublands to wetlands, sand/ dune communities and alpine ecosystems. Podocarp-hardwood forest, comprising principally rimu, kamahi and southern rata dominate the majority of the island, with an extensive sub-canopy of broadleaves, such as griselinia, lancewood and tree ferns. Many of these species are affected by possum and deer browsing. The ground and shrub tiers of the forest are often sparse with very few young hardwood trees.

Within the lowlands, extensive wetlands and rivers and streams drain the basins, notably the northern part of island, where the Freshwater River catchment at the head of Paterson Inlet has created numerous ecosystem supporting a number of endemic species.

There are a number of animals, including the Stewart Island brown kiwi/tokoeka, the weka, southern NZ dotterel, Stewart Island robin and Stewart Island fernbird that predominate the mainland, with critically endangered kakapo existing only on Codfish Island.

Stewart Island/ Rakiura is unique in that many of the pests found elsewhere in NZ have not established. This includes mice, mustelids, rabbits, hares, pigs, magpies and pest fish. Goats have been eradicated. Some of the off shore islands are totally pest free. Exotic weed species are also predominately confined to the area around half moon bay and mason bay.

These absences are reflected in the more natural ecological make-up of the islands flora and fauna.

In terms of the seascape or the marine environment, Stewart Island/ Rakiura is located within the Southern Ocean, at one of the world's great oceanic boundaries – the subtropical convergence, where the prevailing westerly wind and currents from the Tasman Sea moderate the temperatures protecting the island from the cooler subantarctic waters further south. Foveaux Strait separates these islands from the South Island, and in good weather extensive seascape vistas over the Strait are obtained of both tracts of land. An array of marine life lives within the sheltered and more exposed waters off Stewart Island/Rakiura including fur seals, sea lions and yellow-eyed penguins. The marine environment of Stewart Island is one of the largest areas of unmodified marine habitats in New Zealand. It is the southern extreme of many mainland species and communities.

There is only one marine reserve close to Stewart Island/ Rakiura and that's the Ulva Island/ Te Wharawhara Marine Reserve, which covers approximately 1075 hectares of water or about 15% of Paterson Inlet. The marine reserve enables full protection of all marine life and is best experienced by diving or via sea kayaking. The marine reserve is surrounded by Te Whaka a Te Wera/ Paterson Inlet Mataitai Reserve. The Mataitai reserve prohibits commercial fishing and

manages fisheries levels to ensure the sustainability of this important Maori fishing and food gathering area.

With Stewart Island/ Rakiura sharing two names, one English and the other Maori, both are officially recognised and are often used interchangeably. For Maori, Raikiura is translated as 'The Island of Glowing Skies', a reference to the long sunsets and the nocturnal sky-displays of the Southern Lights or Aurora Australis. Rakiura is also an abbreviation of Te Rakiura a Te Rakitamau, which refers to the blushing embarrassment of a young man, Te Rakitanmau, when he was refused the hand in marriage of both daughters of a chief of the island. Suffice to say that the island is very important to Maori, especially as the Raikura is also referred to a Te Puka a te Waka a Maui 'The Anchor of Maui's Canoe'.

From a European perspective, the island also takes its name from William Stewart, a first officer of sealing vessel 'The Pegasus', which sailed into the southern harbour in 1809.

It is understood that people first stepped shore on Stewart Island/ Rakiura around 700 years ago, arriving via canoes. There are numerous middens, burial areas and canoe-landing sites that have been identified that support this. Fish and other marine life was the source of food for these early people, along with muttonbirds.

During the late 1700s and early 1800s, sealing and whaling activities became an important activity for European adventurers and many stations were established throughout the island during this time. Captain James Cook sailed past Stewart Island/ Rakiura in March 1770 and determined that it was a cape, rather than an island.

In 1850 Captain Stokes of the Acheron wrote:

"...The lack of human interest concentrates the writer's attention upon the somewhat monotonous nature of the scenery and the climate". "Nought but rock, rock, rock, rock, forest and rain, rain, rain and always rain".

The botanist Cockayne in the early 1900's had a different perspective commenting that:

"It is hard to speak of the scenery of Stewart Island without using a super abundance of superlatives".

For anyone visiting Stewart Island/ Rakiura, the first impression is one of naturalness and remoteness. Away from the township the naturalness is all embracing and in stark contrast to what exists elsewhere in New Zealand. It is easy to imagine parts of the Island to be true wilderness. It has been described as one of the world's last surviving areas of "primitive nature". *"It is an actual piece of the primeval world"*⁴.

Access to the island is via the Foveaux Strait by boat or flying. The National Park is one of the principal attractions, with over 245km of walking tracks and many huts. The three day Rakiura track or the 10 day north-west circuit offer opportunities for people to experience the serenity and remoteness of the island, with numerous other tracks offering even more isolated experiences. Deer hunting, fishing and diving is also enjoyed on or immediately around the island.

4.2 Natural Character

Due to the relatively isolated location of Stewart Island and its low levels of modification to both the terrestrial and marine environments, the natural character is amongst the highest rated in the whole country.

⁴ Hall-Jones J (1998): Stewart Island Explored

4.2.1 Abiotic aspects

The rugged and exposed landscape of Stewart Island/ Rakiura has been formed by tectonic and erosional forces that have assisted to sculpt and develop the landform of this unique island. The eroded granite peaks and shallow broad basins have been sculpted over millions of years are particular types of landform that have dictated notable habitat types.

Stewart Island/Rakiura geologically can essentially be divided in two, with the northern part of the island comprising predominantly schist rocks and the southern part of the island comprising predominantly granite rocks. These two broad rock groups form part of the overall Paleozoic-Mesozoic rocks, that extend from the southern part of the South Island.

There are within the southern granite rocks, areas of schist/ sedimentary rock that are evident within the south-eastern coast at Port Pegasus and Table Hill. Minerals including those found on the Tin Range contribute the diversity of the rock formations in part of the island. Striking tors and bare steep-sided domes (i.e. those of Gog and Magog) have developed on the granite ridge west and north of Port Pegasus.

Within the northern part of the island, the geology is associated with the Paterson Formation, which comprises predominantly schist and crushed sedimentary rocks. Occasionally granite appears, notably around the Ruggedy Range, which has resulted in the sheared granite exposures at the ridge's eastern end.

The soil types of Stewart Island/ Rakiura are dictated heavily by the altitudinal and latitudinal sequences of soils that have formed on the various types of underlying rock. The altitudinal and latitudinal sequences both produce arrays of soils ranging from southern podzolised yellow-brown earths, through intergrades between these and organic soils, to organic soils. In the altitudinal sequence the organic soils are subalpine blanket peats, whereas in the latitudinal sequence they are more similar to subantarctic blanket peats [M L Leamy].

The climate of Stewart Island/ Rakiura is typically oceanic with cool-temperate and mild temperatures. The prevailing moist westerly airstreams mean that the western and southern parts of the island receive more rainfall than those parts to the east. Halfmoon Bay in the east typically received 1600mm of rainfall a year, compared to more than 5000mm in the south. The wettest months are typically mid-winter, around May and June.

Temperatures are generally mild and moist, with mean daily temperatures of 16.6°C in summer and 9.9°C in winter. Strong winds originating from the south west are not uncommon. Occasionally snow may be evident on the tops of the Anglem Mountains during winter and early spring.

4.2.2 Biotic aspects (Terrestrial)

Material referenced for this section of the report has used primarily the '*Stewart Island/Rakiura Conservation Management Strategy and Rakiura National Park Management Plan, DOC, March 2012*'

There is very limited land based modification on Stewart Island/Rakiura, with principal areas of modification occurring around Oban/ Halfmoon Bay. As a consequence, Stewart Island/Rakiura includes many different ecological habitats, ranging from coastal habitats (including dunes and wetlands), forests and alpine areas. These ecosystems are amongst the most intact in the country containing a large number of locally endemic plants.

In terms of forests on the Island, the principal species make-up is Podocarp-hardwood forest. These areas comprise mainly rimu (*Dacrydium cupressinum*), kamahi (*Weinmannia racemosa*) and southern rata (*Metrosideros umbellata*), which are the dominant forest ecosystems on Stewart Island/Rakiura. Beech forest (*Nothofagus* spp.) is notably absent. Coastal forests comprise a mixed podocarp-hardwood canopy consisting mainly of rimu and mirō (*Prumnopitys ferruginea*), southern rata and kamahi. An extensive sub-canopy within these areas includes a variety of hardwood trees such as broadleaf (*Griselinia littoralis*), haumakaroa (*Pseudopanax simplex*), lancewood (*P. crassifolius*), marbleleaf (*Carpodetus serratus*) as well as tree fern (*Dicksonia* spp.). The southernmost kahikatea forest in New Zealand can be found in the Freshwater River valley. Extensive manuka shrublands (some fire-induced) are also present on Island Hill and within the Rakeahua Valley. Similar induced shrubland is found in the Robertson River catchment at the south end of the Tin Range at Port Pegasus/Pikihaiti. [CMS]

Coastal teteaweka (*Olearia oporina*) and muttonbird scrub (*Brachyglottis rotundifolia*) are found on the more exposed headlands around the coast. Due to the extent of the intactness of the different ecosystems, the ecological linkages between the forests and the alpine, coastal, and freshwater ecosystems is an important aspect of the biodiversity sequence which is now rare in the New Zealand context. [CMS]

Stewart Island/Rakiura receives moderate to high rainfall throughout the year and due to the diverse relief and variable soil types, a variety of stream types are commonplace. They range from short and steep coastal streams in the northwest to meandering lowland rivers such as the Freshwater and Rakeahua rivers. The catchments are generally stable and the lithology is hard rock, hence sediment loadings in streams are low. Streams on Stewart Island/Rakiura tend to have brown, tannin-stained waters and many are notable for their rich riparian vegetation including thick moss and lichen carpets. [CMS]

There are numerous types of wetland communities present within Stewart Island/Rakiura which include subalpine bogs, cushion-fields and shrublands (including manuka), tussocklands, sedgeland, rushlands (including wire rush (*Empodisma minus*)), tarns, bog ponds, lakes, streams, swamps and saltmarshes. [CMS]

These wetlands have very diverse communities, although they are mainly nutrient-poor, with lowland flax (*Phorium tenax*) and pukio/sedge (*Carex secta*) confined to only the most nutrient-rich sites. The mudflats are important for shorebirds, especially the southern New Zealand dotterel (*Charadrius obscurus*). Three species of plants are restricted to this area of Stewart Island/Rakiura: native broom (*Carmichaelia virgata*), *Oreomyrrhis ramosa* and *Schizeilema trifoliolatum*. Other notable species include lowland ribbonwood (*Plagiatanthus regius*) and kahikatea (*Dacrycarpus dacrydioides*). The Rakeahua and Toi Toi rivers are among other catchments with nationally rare valley sequences of levee, marsh, bogs and tarns. [CMS]

Of these wetlands, the Freshwater and Rakeahua valleys are important habitats for juvenile and adult fish. They contain large stocks of giant kōkopu (*Galaxias argenteus*), banded kōkopu (*Galaxias fasciatus*) and longfin eel (*Anguilla dieffenbachia*). Secretive in the waters are two native fish found only in Southland. These are Gollum galaxias (*Galaxias gollumoides*) and a fish yet to be formally named southern flathead galaxias (*Galaxias* sp. 'southern'). The freshwater fauna of the entire Stewart Island/Rakiura CMS area is also nationally unique due to the absence of any salmonid or any other introduced fish species. The rivers also contain many other species that are found on the mainland of New Zealand, such as red-finned bully (*Gobiomorphus huttoni*), giant bully (*G. gobioides*), lamprey (*Geotria australis*) and banded kōkopu.

The only impacts to the wetlands have been from some historical drainage attempts, past fires, deer browsing, and predation by rats (*Rattus* spp.) and cats. [CMS]

Stewart Island/Rakiura's dune systems are internationally and nationally significant and some of the finest examples remaining in New Zealand. The Mason Bay dune system has been recognised as internationally significant due to its size and natural patterning of flora and fauna. Mason Bay and a few other beaches contain a number of threatened species including the creeping herb (*Gunnera hamiltonii*) and the sand spurge (*Euphorbia glauca*). Dune systems are found at Smoky Beach, Little Hellfire, Big Hellfire, West and East Ruggedy, Mason Bay and Doughboy Bay. [CMS]

Other threatened or rare species reliant on dune systems include the sand tussock, pingao, the South Island lily and tutu (*Coriaria* spp 'sandy coast'). The pimelea moths *Meterana* n. sp. and *Notoreas* n. sp. are also found in dune systems. Exotic marram was introduced to these systems as a tool to stabilise sand movement. However since its introduction marram has invaded some of these dune systems and it is the greatest threat to other species, particularly the native sandbinding sedge, pingao. Department of Conservation are doing significant works to eradicate Marram and large areas have successfully been restored. [CMS]

Alpine ecosystems are found on the Mt Anglem/Hananui massif, Mt Rakeahua and the Tin Range. They comprise dense, low and often wind-affected shrublands and herb moors, which have been referred to as 'tundra-like' communities because of their waterlogged nature and often ponded appearance. Herb bogs and cushion-fields are two distinctive expressions of 'tundra-like' communities. The subalpine and alpine ecosystems of the Stewart Island/Rakiura CMS area have a number of characteristics making them unique in a national context. In the far southern latitude these systems are at a lower altitude than other subalpine and alpine ecosystems in mainland New Zealand and are significant in that a number of common mainland alpine plants are not present or have endemic local varieties. [CMS]

There are a number of animal species considered to be at risk because they are declining or uncommon and found only on Stewart Island/Rakiura. These include the Stewart Island fernbird, (*Bowdleria punctata stewartiana*), weka (*Gallirallus australis scotti*), robin (*Petroica australis rakiura*) and Stewart Island brown kiwi/tokoeka (*Apteryx australis lawryi*). Stewart Island brown kiwi/tokoeka are still present in good numbers. Until the recent translocation to the Ackers Point area, Stewart Island weka were all but lost from Stewart Island, existing mainly on offshore islands. The critically endangered kākāpo species (*Strigops habroptilus*) exist now only on Codfish Island/Whenua Hou and a few other managed sites. The Stewart Island/Rakiura CMS area also has nationally significant populations of:

- sooty shearwater (*Puttinus griseus*) – a national stronghold with hundreds of thousands of birds which are culturally important to Māori for traditional harvest
- red-crowned parakeet (*Cyanoramphus novaezelandiae novaezelandiae*) - common on Stewart Island/Rakiura, while rare or absent on mainland New Zealand
- South Island saddleback (*Philesturnus carunculatus carunculatus*) – all South Island saddleback populations originate from birds from Stewart Island/Rakiura area. [CMS]

4.2.3 Biotic aspects (Marine)

Material referenced for this section of the report has used primarily the '*Stewart Island/Rakiura Conservation Management Strategy and Rakiura National Park Management Plan, DOC, March 2012*'

The marine environment of New Zealand is recognised internationally for its diverse habitats and its home to over 15,000 known species. Stewart Island/Rakiura is no exception, containing some of the largest areas of near pristine marine habitat in New Zealand. The inlets of the eastern coast (Paterson Inlet/Whaka a Te Wera, Port Adventure, Lords River/Tūtaekawetoweto and Port Pegasus/Pikihatiti) are some of only a few remaining shallow embayments in New Zealand that retain a naturally vegetated catchment. These highly natural catchments retain many unique features, such as the black coral (*Antipathes* spp) with colonies found on the sheltered, soft bottom areas in Port Pegasus/Pikihatiti along with the richest shallow water brachiopod habitats in the world (found in Paterson Inlet/Whaka a Te Wera). High water clarity allows algae to grow to great depths and large beds of bladder kelp (*Macrocystis* spp.) are common. Shore communities are recognised for their wealth of red seaweed diversity. New species within coastal environments continue to be discovered.

The marine ecology of the Eastern Marine, North Coast, Eastern Bays and Paterson Inlet Areas are perhaps better studied than other marine parts of Rakiura. This is due to several reasons, for example the significance of the Foveaux Strait dredge oyster fishery, rocky reef studies by Shears & Babcock 2007 (p75-81), several Paterson Inlet studies, and the proximity to Oban.

The north-facing coastline of Stewart Island/Rakiura is also unique due to its habitats, topographical features and a large number of important communities and populations otherwise absent or rare south of Banks Peninsula. The strong currents and rich nutrient water flowing through Foveaux Strait provide for a diverse and spectacular array of benthic habitats. Traditionally, those undredged coastal waters of Foveaux Strait would have supported biogenic reefs with a rich associated fauna of oysters, fragile lace corals, sponges and other invertebrates. These habitats are well-recognised as important nursery areas for fish species and foraging grounds for seabirds. Rocky outer shore and near-shore reef environments have been commercially fished, especially for paua, crayfish and blue cod. Soft outer shore (sand and mud) and shelf environments to the north have been affected by oyster dredging and changes to the composition of the seabed biota will have occurred, particularly in regards to the diverse biogenic reef communities once reported to have occurred in Foveaux Strait. These changes, while difficult to quantify, are likely to have been substantial.

There are a wide variety of protected marine mammal and bird species, including the internationally protected great white shark. Notable species include the New Zealand Hooker's sea lions (*Phocarcos hookeri*), New Zealand fur seals (*Artocephalus forsteri*), southern right whales (*Eubalaena australis*), great white sharks (*Carcharodon carcharias*), sooty shearwaters/tītī, South Georgian diving petrels (*Pelecanoides georgicus* 'Codfish Island'), and Cook's petrels (*Pterodroma cookii*). There are no marine mammal sanctuaries within the Stewart Island/Rakiura coastal marine area. There are, however, many islands, such as Bench Island and Whero Rock, which have significant rookeries and breeding grounds for seals. Port Pegasus/Pikihatiti is also used as a haul-out and breeding site for New Zealand sea lions and it appears that it is becoming more important as a breeding and/or nursing site for this species. A number of migratory whale species also visit the coasts and occasionally the inlets of Stewart Island/Rakiura. Common dolphin (*Delphinus delphis*) and bottlenose dolphins (*Tursiops truncatus*) are regular visitors to the coast and Paterson Inlet.

There are also areas of marine farming (restricted solely to Big Glory Bay) within the more sheltered waters of Stewart Island/Rakiura. Marine farming⁵ has modified the central coastal waters of Big Glory Bay, however the coastal interface area adjacent to the land retains generally very high levels of naturalness due to the lack of modifications.

4.2.4 Experiential aspects

The experiential characteristics of the coastal environment of Stewart Island vary around the island, although share commonalities such as remoteness, isolation, beauty and high degrees of naturalness. Despite the majority of modifications being around Halfmoon Bay and the outer parts of Paterson Inlet, which are the most popular for human-based activities, the vast majority of the remainder of the island receives very little, if any visitors. Ultimately, the way people experience the waters and terrestrial environment of Stewart Island will depend on their accessibility to the coast.

Whilst fishing, boating and some diving is popular within the marine environment, tramping and hunting is popular on the land, with large numbers of people visiting the island for a sense of remoteness, 'getting-away-from-it-all', and getting back to nature.

Much of the island is accessible by boat, where the numerous embayments offer shelter from the strong, often wild currents that originate from the Southern Ocean. The sheltered bays, including parts of Port Pegasus and Paterson Inlet enable people to experience greater senses of calmness, quietness and remoteness. Stewart Island is also the easiest place in New Zealand in which to spot kiwis during the day. The rugged and open coastline of the South East and South West Coasts offer different experiences, where the ferocity of the weather and currents creates a wilder experience.

People's enjoyment is also affected by transient and sensory factors. In intertidal areas, pebble and sandy beaches, for instance, the ebb and flow of the water create different moods. The aroma of the sea and sound of the lapping or crashing waves is often associated with moods and feelings. Seasons affect experiential values, where fish and pods of dolphins or whales can be sighted, or types of visiting birds and seasonal blooms. The highest areas of natural character are the least modified, and since the vast majority of Stewart Island offers this, it can be said that the island as a whole, is within the national and international psyche as a remote and virtually untouched part of New Zealand.

⁵ All marine farms are a permitted activity and consented with conditions. All farms are due to be re-consented by 2025.



Image: Sandy beach at the head of Broad Bay, within Character Area 5: South West Coast and Coastal Marine Area A: Western Marine Area.

5.0 Landscape Character Areas

Eight Coastal Character Areas have been determined, along with **two** inland Character Areas and **four** Marine Areas. The Coastal Environment divides the Coastal Character Areas from the Inland Character Areas.

Eight Coastal Character Areas:

- Character Area 1- Eastern Bays
- Character Area 2- Breaksea
- Character Area 3- South East Coast
- Character Area 4- Port Pegasus
- Character Area 5- South West Coast
- Character Area 6- Mason Doughboy Bay
- Character Area 7- Ruggedy
- Character Area 8- North Coast

Two Inland Character Areas:

- Character Area 9- Freshwater Inland Basin
- Character Area 10- Southern Inland Ranges

Four Marine Character Areas:

- Character Area A- Western Marine Area
- Character Area B- Eastern Marine Area
- Character Area C- Paterson Inlet Marine Area
- Character Area D- Port Pegasus Marine Area

The following section of this report details the qualities, values and characteristics of each of these Character Areas and evaluates whether they meet the high threshold of being an Outstanding Natural Landscape and/ or retaining Outstanding Natural Character.

Character Area 1- Eastern Bays and offshore Islands

General Character Description

The Eastern Bays and offshore Islands Character Area is located on the eastern side of Stewart Island. This Character Area encompasses the land associated with Paterson Inlet as well as the numerous offshore islands associated with Titi Island, Bench Island and Ulva Island. The principal town on the island is Oban and this is located within Halfmoon Bay within the northern part of this Character Area. Modification is principally centred around this part of this Character Area and comprises the main wharf and ferry/ cargo terminal, buildings, roads, powerlines, airport and jetties. The built up area of Oban stretches over onto Paterson Inlet with a busy jetty at Golden Bay servicing cruise ships and vessels to Ulva Island. The remaining land in this Character Area is National Park. The land is highly indented and rises gradually from the coastal edge. The majority of the northern part of this Character Area is relatively low-lying associated with the river mouth of Freshwater River and other smaller watercourses. The southern part of this Character Area is steeper with shorter watercourses draining the land. The highest point is Mt. Rakeahua at 681masl. Of the islands, Ulva Island is predator free and is a sanctuary for bird life. Paterson Inlet retains a rich history associated with European and tangata whenua.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>The north-facing coastline (north of about Oban) is unique for the southern region of New Zealand. It contains habitats, topographical features and a large number of important communities and populations absent or rare south of Banks Peninsula</p> <p>Ulva Island is the last refuge for the South Island Saddleback (<i>Philesturnus carunculatus</i>).</p> <p>Cow and Calf Point gabbro intrusion, Port William dikes Harrold Bay spheroidal weathering, The Neck multiple tombolos and Horseshoe Bay hornblende hornfels are all regionally significant geographic feature</p> <p>Ringaringa intrusives are nationally important geographic features</p> <p>Part of this Character Area retains Outstanding Natural Character values.</p> <p>Ulva Island is an important stronghold of the endangered native Kākāpō</p>		<p>Range of naturalness from the more modified areas around Oban in the north, more untouched areas to the south.</p> <p>Melodious bird song of bellbird, tui and grey warbler are numerous around the township and generally about the island. Also hear kaka and weka, and Kiwi at night from some areas of town.</p> <p>Popular short and scenic walks include Ackers Point and Observation Rock, as well as the open sanctuary on Ulva Island in Paterson Inlet/ Whaka a Te Wera.</p> <p>Ackers point has a breeding Titi and penguin colony – popular spot for locals and visitors - e.g. sight of titi landing (crashing) through bush and ‘smell’ of bird colony.</p>		<p>In particular, the scenic values of Ulva Island were recognised and this island became one of the first scenic reserves in New Zealand.</p> <p>Ulva Island is a Tourism/Nature reserve.</p> <p>Historic settlement in Port William/Potirepo.</p> <p>Permanent Maori settlement occurred on the eastern side of Rakiura, from the Kaik near the Neck, south to Tikotaitahi (or Tikotatahi) Bay.</p> <p>Sawmilling and logging sites in Maori Beach</p> <p>Buildings and historic sites in vicinity of settlements in Halfmoon, Horseshoe and Golden Bay</p> <p>Ulva Island boatshed used by former Norwegian whaling company to launch boats</p> <p>Shore-based whaling occurred from Port William/Potirepo</p> <p>Gold was found at Port William/Potirepo.</p>	

Biophysical Landscape Attributes	Sensory Landscape Attributes	Associative Landscape Attributes
<p>Pest proof sanctuary – Dancing Star</p> <p>Outlet of the large freshwater wetlands</p>		<p>The first timber mills were established around 1861 in Kaipipi Inlet.</p> <p>There was development of a ship building industry in Paterson Inlet/Whaka a Te Wera.</p> <p>Popular short and scenic walks include Ackers Point and Observation Rock, as well as the open sanctuary on Ulva Island in Paterson Inlet/ Whaka a Te Wera and the 3-day Rakiura Track.</p> <p>Regular visits by cruise ships in the Paterson Inlet and Halfmoon Bay areas. Local fishing and recreational vessels also use this character area. Muttonbirders use the outlying islands during the season and vessels are used to transport them to the islands.</p> <p>Substantial commitment by the local community to protect and restore Ackers point.</p> <p>Titi/ Muttonbird Islands carry Statutory Acknowledgements and Deeds of Recognition status</p>
<p>Outstanding Natural Landscape:</p> <p>Based on these values, it is concluded that the least modified parts of this Character meet the high threshold for being an Outstanding Natural Landscape, containing predominantly very high biophysical, sensory and associative values. The only area of exclusion would be the more modified area around Oban and Halfmoon Bay and part of the eastern extent of Paterson Inlet. The remaining part of this Character Area is contained within National Park status. For people arriving to Stewart Island, this is the principal arrival point, either by sea or by air. The Rakiura 3-day walk also offers people a taste of the remoteness and very high naturalness the island offers.</p>		

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>In the north of this Character Area there are a series of unmodified crescent shaped bays, containing golden sand beaches.</p> <p>The landforms of the eastern Stewart Island/Rakiura CMS area are historic drowned river valleys</p> <p>A series of coastal ridgelines and "arms" define the bays and lowlands.</p> <p>The Rakeahua River flows into its South West Arm and the Freshwater River near North Arm.</p> <p>The entrance to Paterson Inlet, with its prominent horizontal coastal features such as peninsulas, gravel bars and numerous islands appear unmodified.</p>	<p>The strong presence of regenerating native vegetation around Oban township helps to integrate the settlement with the mainly natural and undeveloped backdrop of the Podocarp forest.</p> <p>Strong populations of native song birds and South Island Kaka and kiwi on Ulva Island, and are common around the residential areas and Halfmoon Bay.</p> <p>Titi Islands are pest free.</p> <p>Some of the least modified habitats on the planet.</p> <p>Bench Island and Whero Rock are very significant as refuges for threatened species. They are used for ecological restoration programmes, are sources of birds and plants for translocation to other parts of New Zealand.</p>	<p>Oban is a settlement contained within a natural context of sea, coastline and bush-clad hills. The "pockets" of settlement are broken up by the surrounding terrain and coastline.</p> <p>Much of the coastline away from Oban has a high degree of naturalness, caused by limited modification.</p> <p>A sense of remoteness and isolation is apparent within the inner parts of Paterson Inlet.</p>	<p>Much of the coastal interface is rocky, with native vegetation extending to the CMA. The mouth of the Freshwater River is typically alluvial and dominates the head of Paterson Inlet. Several small sandy beaches, such as Sawdust Bay, Wooding Bay and Port William Bay are present in enclosed areas, sheltered from the prevailing winds. Modification to the coastal edge is limited to around the Oban/ Halfmoon Bay area, where a number of jetties and wharves are present. The remainder the coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea.</p>

Outstanding Natural Character:

Based on these characteristics, it is considered that much of this Character Area retains Outstanding Natural Character, notably where there is least or no modification.

Additional Comments:

There are a number of areas where the natural elements, patterns and processes have been modified. These are principally around the settlement of Oban, and within the eastern parts of Paterson Inlet. There are others settlements to the south along Ringaringa Point, Thule and Golden Bays and to the north within Horseshoe Bay area. There are also huts on The Neck.

Council gardens and reserves are being cleared of exotic vegetation and planted with native species - bringing the natural character of the surrounding bush closer into town.

Prices Inlet has the rusting remnants of a 1920s Norwegian whaling station, and recently awarded Heritage New Zealand status

30km of roads in and around the settlement of Oban.

Hunting huts found adjacent South West Arm and Abrahams Bay.

DOC huts are located in association with the Rakiura Track and the first section of the Southern Circuit track (Fred's Camp Hut).

Moorings and jetties/Wharfs in many of the bays of Paterson Inlet.

- Golden and Thule bays are peppered with boat houses, jetties and slipways associated with fishing and recreation boating activities.
- Oban and Halfmoon Bays have regenerating podocarp forest, as well as a number of small patches of original forest in areas that did not undergo milling activity.
- Halfmoon Bay and Lonneckers Beach has existing rockwalls along the shore front for coastal protection. Braggs, Thule and Leask bays are undergoing riprap construction for coastal protection purposes.
- Underground pipes/cables to discharge sediment to water and to occupy the CMA with underground ducting is present at Butterfields and Bathing beaches.
- Placement of sewer mains in the CMA at Butterfields Beach as part of the Oban wastewater treatment system.
- Horseshoe Bay has a fish processing factory and wharf in the Northern reach of the bay.
- The well-defined public open spaces along Oban's foreshore.
- Mutton birders huts and sheds among shrublands of Titi/Muttonbird Islands

Character Area 2- Breaksea

General Character Description

The Breaksea Character Area comprises the eastern extent of Stewart Island. This Character Area is characterised by its many sheltered bays and rocky promontories which form an intricate indented coastline and its uniformly covered native bush. Beyond the shoreline, the land is undulating in character, containing numerous small river systems and streams. To the south, Lords River/Estuary drains the southern part of this Character Area and supports rich flora and fauna. This Character Area is unique in ownership to the majority of Stewart Island, in the fact that the ownership is of private (Rakiura Maori Land Trust) or Conservation Stewardship. This remote area has little modification other than a selection of campsites and occasional huts located to service muttonbirders (on Muttonbird Islands), hunters or wilderness trampers. Access is principally by boat. Native scrubby vegetation is thick, uniform and forms a continuous cover from the coastline, inland where virgin Podocarp forest exists. The inland boundary of this Character Area follows an undefined ridge between watercourse catchments, rising to 266masl at Adventure Hill.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>An intricate, fractured section of coastline, with low relief headlands and "arms" separated by inlets and river mouths.</p> <p>Being on the leeward side of the island, the vegetation is less affected by prevailing westerly winds. Southerly and southeasterly gales are the main sources and on their own can be damaging.</p> <p>Landform is clearly expressive of its formative processes</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>The strong feeling of containment and enclosure which contrasts markedly with the surrounding "big open" seas.</p> <p>Very high levels of naturalness with a highly natural coastline.</p>		<p>Sheltered waters provide a safe anchorage for boats sailing further south.</p> <p>All areas of Breaksea are Freehold or Conservation Stewardship land ownerships.</p> <p>A pā was established at Port Adventure</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events. Muttonbirders use the outlying islands during the season and vessels are used to transport them to the islands.</p>	

Outstanding Natural Landscape:

Despite much of the land within this Character Area being in private ownership, there is very little modification to the natural landform and land cover, containing predominantly very high biophysical, sensory and associative values. The land is clearly expressive of its formative processes and retains very high levels of naturalness. As a consequence, it is considered that all of this Character Area meets the high threshold for being outstanding.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>An intricate section of coastline, with low relief headlands and "arms" separated by inlets and river mouths.</p> <p>Numerous small unmodified islands close to the river mouths.</p> <p>South from Port Adventure The ocean coast is largely rocky with occasional beaches with sheltered rivers and indented margins, e.g. Lords River.</p> <p>Behind the shoreline, the land is undulating in character, containing numerous small river systems and streams.</p> <p>The exposed coastal sections are dominated by muttonbird scrub (puheretaiko), which undergoes a transition into virgin podocarp forest approximately 500 metres back from the coast.</p>	<p>Close contact between coastal vegetation and water's edge.</p>	<p>These sheltered waters provide a safe anchorage for boats sailing further south.</p> <p>Clear sense of remoteness within a high natural and unmodified environment.</p> <p>Numerous forest-clad islands provide a greater sense of enclosure to Port Adventure and Tikotatahi Bay.</p>	<p>Much of the coastal interface is rocky, with native vegetation extending to the CMA. Several small sandy beaches are present within Port Adventure and Tikotatahi Bay., Modification to the coastal edge is very limited with only a few huts present. The remainder the coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea.</p> <p>Old kiaka on isthmus at south side of Port Adventure.</p>
<p>Outstanding Natural Character:</p> <p>Based on these characteristics, it is considered that all of this Character Area retains Outstanding Natural Character.</p>			
<p>Additional Comments:</p> <p>The natural elements, patterns and processes within this Character Area are very much intact, with very limited modification. Of the modification that is present, these comprise principally of four Hunting huts located in various bays between East Cape and Owens head. These are only accessible from boats or wilderness walking.</p> <p>There is also a scattering of pre-European and European historic sites, however much has been vegetated over with native bush.</p>			

Character Area 3- South East Coast

General Character Description

This South East Coast Character Area is of low-lying, rugged, exposed lands with bluffs along much of its coastline. Rising moderately toward the Southern Inland Character Area the land is densely clad in mutton bird scrub which has been sculpted by the strong, salt laden southerly and south-easterly gales of this exposed coast. Scrub gives way to mixed coastal forest with broadleaf understorey further inland. This Character Area is very remote and retains very limited modification.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>A series of low relief headlands, ending in rugged bluffs.</p> <p>Small islands and reefs follow the mainland.</p> <p>An open and exposed section of coastline between sheltered anchorages.</p> <p>Landform is clearly expressive of its formative processes</p> <p>Mouth of numerous watercourses extending from the inland ranges drain into the sea.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>Very remote part of Stewart Island, with limited or no land access.</p> <p>Virtually no modification with very high levels of naturalness.</p>		<p>Westernmost part of this Character Area is within National Park status.</p> <p>The Kōpeka River and the sea fishery ensured a sound base for permanent and semi-permanent Maori settlements.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.</p>	

Outstanding Natural Landscape:

Despite much of the land within this Character Area being in private ownership, there is very little modification to the natural landform and land cover, containing predominantly very high biophysical, sensory and associative values. The land is clearly expressive of its formative processes and retains very high levels of naturalness. As a consequence, it is considered that all of this Character Area meets the high threshold for being outstanding.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>A series of low relief headlands, ending in rugged bluffs.</p> <p>An open and exposed section of coastline with fewer dramatic coastal features compared with other parts of the eastern coast.</p> <p>Principally rocky shore with very limited beaches.</p>	<p>The stunted coastal shrublands buffer the mixed forest from the salt laden winds.</p>	<p>Clear sense of remoteness within a high natural and unmodified environment.</p>	<p>Small islands and reefs follow the mainland.</p> <p>An open and exposed section of coastline with occasional sheltered anchorages.</p> <p>The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea.</p>
<p>Outstanding Natural Character:</p> <p>Based on these characteristics, it is considered that all of this Character Area retains Outstanding Natural Character.</p>			
<p>Additional Comments:</p> <p>The eastern part of this Character Area is contained within Freehold land, with the central section contained within 'Other Conservation Land'. Despite this, there is limited or no modification evident within this Character Area.</p>			

Character Area 4- Port Pegasus

General Character Description

The Port Pegasus Character Area comprises the land surrounding the two broad arms of the Port Pegasus inlet, North Arm and South Arm and the numerous small sheltered bays, coves and islands within these areas. Located close to the southernmost part of Stewart Island this area retains a rich European and iwi history associated with ship building and fishing, principally due to the sheltered waters. This Character Area is remote and rugged with extensive regenerating manuka shrubland cover, which has all but covered-up any sense of previous habitation of the area. Numerous streams flow into the many intricate bays and coves with some streams forming waterfalls (such as Belltopper Falls on Pegasus Creek) as it cuts through the granite bedrock. Bald Cone is a regionally significant geographical feature of this Character Area. There are numerous large forest-clad islands that further protect Port Pegasus from the prevailing winds which provide a sense of enclosure.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>Around Bald Cone and Cook Arm bare granite domes protrude from the landscape and dominate the immediate skyline.</p> <p>An intricate, bush-clad stretch of coastline with numerous sheltered bays, arms and coves</p> <p>Wind swept shrub lands and mixed coastal forest predominate.</p> <p>The seamless transition close contact between the forest's edge and water, in some places the vegetation overhangs the coastal margin.</p> <p>Extensive fire induced manuka shrublands fire occur.</p> <p>Bald Cone exfoliation dome is a regionally significant geographic feature.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p> <p>Pigeonhouse Bay within Port Pegasus Character area is an important nesting habitat for Nationally Vulnerable Yellow-eyed penguins (hoiho, <i>Megadyptes antipodes</i>).</p>		<p>The strong feeling of containment and enclosure due to the sheltered bays and coves.</p> <p>A traditional safe anchorage being on the leeward side of the island</p> <p>Remote and isolated with very high levels of naturalness present.</p> <p>Impressive Belltopper Falls.</p>		<p>The entire land area is within National Park status.</p> <p>Rich settlement and land use history</p> <p>Pitsawing for ship building in the 1820s, was located close to the entrance to Cook Arm, where a shipyard and clusters of dwellings was established, with very little remains now.</p> <p>Mining in Tin Range for rare tin with rush for claims in 1889, soon proving profit-less. In 1912 another short-lived attempt was made in this area with a tramway. Historic sites remain.</p> <p>Fishing history- First freezer plant in North Arm of Port Pegasus (wharf, station and freezer on west side of arm near Belltopper Falls where electricity generated)</p> <p>Gold was found at Port Pegasus/Pikihatiti.</p> <p>A permanent Ngāi Tahu settlement was located at Port Pegasus where numerous middens and cave dwellings remain.</p> <p>An area used for overnight shelter by fishing vessels and as</p>	

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
				<p>an emergency anchorage by other vessels during extreme weather events.</p> <p>Two blocks of freehold land are located at the head of the North Arm, one being an old hotel site.</p> <p>Is valued by iwi, the Stewart Island/Rakiura community, hunters, yachties, divers, kayakers and some trampers as a destination.</p>	

Outstanding Natural Landscape:

Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The enclosed waters surrounded by native regeneration and untouched bush provide a very high level of naturalness, coupled by the dramatic and extremely expressive Bald Cone mountain. The rich European and tangata whenua history associated with this area, coupled by the lack of other modification further amplifies the historic endurance provided by the first settlers.

The Stewart Island/ Rakiura Conservation Strategy and Rakiura National Park Management Plan [DOC, 2012] states the following about Port Pegasus (paragraph 8.5.6, p240):

‘Port Pegasus/Pikihatiti distils the essence of remote Stewart Island/Rakiura. It represents the final rugged hinterland on Stewart Island/Rakiura, largely accessed by sea. It is an outpost on the edge of the Southern Ocean and the last safe anchorage. Its landscape is of unique natural character. Natural quiet prevails and night-time skies are naturally dark. It is a safe haven for flora and fauna and an important site for nature and heritage conservation. The cultural values of Port Pegasus/Pikihatiti are of considerable significance to iwi and are cherished and protected.

Port Pegasus/Pikihatiti is a Place where people have once lived and it echoes of the past, but it is also a Place where nature seems to win out in the end. People visit on nature’s terms and gain a sense of being explorers connecting with the natural environment, discovering the outstanding natural landscape and marine environment. People who visit Port Pegasus/ Pikihatiti gain a remote experience of Stewart Island/Rakiura’.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>Numerous islets dot the coastal margin.</p> <p>Gog and Magog are exfoliation domes and are nationally significant geographic features.</p> <p>Low rounded coastal hills, with granite domes forming an impressive backdrop, including Bald Cone.</p> <p>Conical Hills</p> <p>An intricate stretch of coastline with numerous sheltered bays, arms and coves</p>	<p>Numerous islets dot the coastal margin.</p> <p>Continuous relatively intact natural vegetation cover extends down to the shoreline</p> <p>Mixed coastal forest, with wind-swept shrublands covering the conical hills.</p> <p>Numerous wetland, heathland, turf, rock veneer and cushion communities are present intact.</p> <p>Kiwi, yellow-eyed penguins, Southern New Zealand dotterels, Stewart Island weka, tītī/sooty shearwater (<i>Puffinus griseus</i>) and numerous species of seabird nest in the area.</p> <p>Pearl Island is the largest of the islands in Port Pegasus/ Pikihatiti and has been used in the past as a temporary home for kākāpo.</p>	<p>A traditional safe anchorage being on the leeward side of the island.</p> <p>The strong feeling of containment and enclosure.</p> <p>Strong sense of remoteness and wildness.</p>	<p>Numerous islets dot the coastal margin.</p> <p>An intricate stretch of coastline with numerous sheltered bays, arms and coves.</p> <p>The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea.</p> <p>Remote and intact landscape.</p>

Outstanding Natural Character:

Despite some of the area being disturbed historically, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.

Additional Comments:

In terms of modification, all are associated with early signs of European occupation, e.g. fish processing plant.

There are two hunters huts present, one at North Arm (North Pegasus Hunters Hut) and the other at Cook Arm/South Pegasus. Recreational hunters therefore a user of the area. Often hunters have dinghys for transport within Port Pegasus.

There are also remnants of freezing works West Port Pegasus and remnants of historic tin mining and a railway around the Tin Range.

Some areas surrounding the coast have been modified by activities associated with human settlement, such as fire.

Character Area 5- South West Coast

General Character Description

The South West Coast Character Area is located at the Southernmost tip of Stewart Island. This area encompasses Titi/ Mutton Birding Islands of Big Moggy Island /Mokinui, Big South Cape Island/ Taukihepa and numerous smaller, rugged, steep Island clusters. Dominated and moulded by the influences of exposure and salt spray, the vegetation has a sculpted 'wind pruned' appearance and is generally low in habit. The land is moderately indented and rises steeply from the rocky coastal edge. This wild, steep, rugged Character Area is punctuated with nationally significant geographic features of exfoliated granite cones of Magog (282masl) and Gog (407masl) which provide distinctive silhouettes and reference points. Modification is limited to historic and temporary hunting base camps.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>Indented coastline, with high rugged coastal bluffs.</p> <p>Numerous offshore island</p> <p>Gog and Magog exfoliation domes are nationally significant geographic features</p> <p>Intact vegetation throughout</p> <p>Strong muttonbird colony.</p> <p>Three-legged Woodhen Bay retains a dune system of national importance.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>Being the most southern tip of New Zealand makes it a very important landmark, dominated by the "big open" seas.</p> <p>Titi Islands are remote and continually exposed to the natural elements e.g. Salt laden winds.</p> <p>Spectacular views of southern Stewart Island from Gog and Magog</p> <p>Remote and isolated with very high levels of naturalness present.</p>		<p>This entire Character Area is of National Park status (apart from the Muttonbird Islands).</p> <p>Titi Islands house a national stronghold with hundreds of thousands of birds which are culturally important to Māori for traditional harvest</p> <p>Titi gathered from Titi Islands were and still area a major food source of food for local iwi.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events. Muttonbirders use the outlying islands during the season and vessels are used to transport them to the islands</p>	

Outstanding Natural Landscape:

Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The exposure presented by the orientated of this part of Stewart Island against the prevailing maritime currents, coupled with the numerous islands native vegetation provide a very high level of naturalness.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>Indented coastline, with high rugged coastal bluffs around South Cape/Puhiwaero.</p> <p>Low coastal hills with towering granite domes in the background.</p> <p>The rounded granite domes contrast with the strong horizontal lines of the coastal bluffs.</p> <p>Three-legged Woodhen Bay retains a dune system of national importance.</p> <p>Titi Islands surround the main Island, with sheer rocky cliffs and continual large ocean swells access is difficult.</p>	<p>The "wind pruned" vegetation that follows the shape of the surrounding landform.</p> <p>Big South Cape Island contains substantial forests, scrublands and coastal ecosystems.</p> <p>Coastal teteaweke (<i>Olearia oporina</i>) and muttonbird scrub (<i>Brachyglottis rotundifolia</i>) are found on the more exposed headlands around the coast.</p> <p>Nationally significant populations of sooty shearwater (<i>Puttinus griseus</i>).</p> <p>Muttonbird Islands are of national importance for their species conservation.</p>	<p>Contains outstanding wilderness qualities.</p> <p>Remote.</p> <p>Being the most southern tip of New Zealand makes it a very important landmark, dominated by the "big open" seas.</p> <p>The coastline exposure to south-westerly gales is reflected in the salt-burn and die-back of the shrublands.</p>	<p>Indented coastline, with high rugged coastal bluffs.</p> <p>The rounded granite domes contrast with the strong horizontal lines of the coastal bluffs.</p> <p>The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea</p>
<p>Outstanding Natural Character:</p> <p>With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.</p>			
<p>Additional Comments:</p> <p>There are signs of early European occupation e.g. sealers base camps. There are also small huts located on some of the Muttonbird Islands.</p>			

Character Area 6- Mason Doughboy Bay

General Character Description

The Mason Doughboy Bay Character area encompasses the distinctive, open sandy beach and dune structures of Mason Bay and the smaller enclosed bay and sandy beach of Doughboy Bay. The southern part of this Character Area features rocky, steep, coastline and small bays and the north western aspect enclosed bay of Doughboy Bay and associated Doughboy Bay dunes. The craggy, Ernest Islands protrude from the mainland south of Masons Bay protecting in some part Mason Bay from the prevailing winds of the south and west. Both Masons Bay and Doughboy Bay sand dunes are nationally important for scientific and educational value. The majority of the northern part of this Character Area is relatively low-lying associated with the Duck Creek and Freshwater Basin river catchments. Vegetation is predominantly regenerating indigenous Podocarp forest. Areas of the sandy dunes sustain established, notable Pīngau (*Ficinia spiralis*) populations as well as invasive marrom grass.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>The Mason Bay and Doughboy Bay dune systems are recognised as internationally significant due their size and natural patterning of flora and fauna, some of which are threatened species.</p> <p>Mason Bay clearly demonstrates its formative processes.</p> <p>Kiwi frequent Mason Bay dunes during the day and night to feed on invertebrates.</p> <p>Regenerating indigenous native podocarp forest cloaks large swathes of Mason and Doughboy Bays.</p> <p>Nationally important soils are also found around Mason Bay and in the Rakeahua Valley. Mason Bay sand passes and parabolic dunes are nationally significant geographic features</p> <p>Ernest Islands sand tombolo (Masons Bay) are a regionally significant geographic feature.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>There is a strong visual contrast between the fine textured sand country and the adjoining rugged coastal elements.</p> <p>Internationally significant Mason Bay, with its visually alluring long curving sandy beach.</p> <p>Big Sandhill, at 186masl offers spectacular views across Masons Bay.</p> <p>Impressive views from near the Gutter on the Ernest Islands of Masons Bay and sculpted Rock and wind-battered vegetation.</p> <p>Remote and isolated with very high levels of naturalness present.</p> <p>People come to spend the night and hear/see kiwi</p>		<p>This entire Character Area is of National Park status.</p> <p>Island Hill Homestead where sheep and later cattle farming was attempted on pastoral run between 1879 and 1987.</p> <p>The confluence of walking tracks (the North West Circuit and the Southern Circuit Track) at Duck Creek.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.</p>	

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
Outstanding Natural Landscape:					
<p>Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The broad waters of Mason Bay and the rocky coastline of Doughboy Bay where native regeneration and untouched bush provide a very high level of naturalness. The back dunes of Mason Bay retain an array of ecological and historical significance and are visually alluring. The rich European and tangata whenua history associated with this area, coupled by the lack of other modification further amplifies the historic endurance provided by the first settlers.</p>					
Additional Comments:					
<p>Much of the dune system is covered with marram grass. Significant restoration work is being carried out to remove the marram from these dunes.</p>					

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
Mason Bay contains stable dunelands, dissected by a meandering brackish stream.	<p>Since its introduction marram (<i>Ammophila arenaria</i>) has invaded some of these dune systems and it is the greatest threat to other species, particularly the native sandbinding-sedge, pingao.</p> <p>Inland sand country colonised by sand binding plants and narrow-leaved shrubs. Masons bay has low coastal hills clad with stunted shrublands.</p> <p>Threatened <i>Gunnera hamiltonii</i> present.</p> <p>Reverting shrublands on headlands and Ernest Islands.</p> <p>Doughboy Bay is surrounded by coastal hummocks clad with stunted shrubs.</p>	<p>The enclosed character of Doughboy Bay.</p> <p>Exposure to the severity of the westerly currents around the rugged Ernest Islands and southern coast.</p>	<p>Wild and scenic seascape</p> <p>Robust western coastline with arching gold sand beach</p> <p>Fragile dune systems</p> <p>The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea</p>

Outstanding Natural Character:

With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.

Additional Comments:

There are very few modifications in this area, with many being relics from early pastoral farming including the old homestead (Island Hill Run homestead) and some shelter planting of exotic species.

There is a DOC hut at the confluence of the South West circuit track and North West circuit track at the centre point of Masons Bay. There is also a hut at Doughboy Bay located in the northern end of the bay.

Any grazing on the lands administered by DOC ceased in 1995 with the removal of sheep from the Kilbride lease at Mason Bay.

There are some hunting huts/ campsites located at Martins Creek and the south end of Masons Bay and Masons Bay beach is used periodically as an airstrip to bring people to Mason bay hut.

There is some ongoing management of marram grass within Masons Bay sand dunes.

Area where the southern/northern tracks join with lot day trips – area with the most visitors outside of Oban

Character Area 7- Ruggedy

General Character Description

The Ruggedy Character Area is located in the north-eastern side of Stewart Island. This Character Area encompasses Cod Fish/Whenua Hou Island and other smaller Islands, including the Rugged Island. Modification is low, with the Northern Circuit Track traversing this coastline and a scattering of huts for trampers and hunters. The Ruggedy Character Area is entirely of National Park status. In the southern and central parts of this character area, the land is moderately indented and rises steeply from the coastline toward the Ruggedy Mountain range and Red Head Peak (510masl). The northern part of this character Area is moderately steep with Podocarp forest vegetation and less influence of the strong coastal winds. Of the islands, Codfish Island is now predator free and is a sanctuary for native bird life, historically it was a settlement for sealers. As the name suggests, this part of Stewart Island is rugged, wild and exposed to the prevailing westerly winds.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>Both Rugged and Codfish Islands are included within this unit.</p> <p>Codfish Island/Whenua Hou is an important predator free stronghold of the recovery efforts for the endangered native Kākāpō</p> <p>Big and Little Hellfire Beach's dune systems are regionally significant and some of the finest examples remaining in New Zealand.</p> <p>East and West Ruggedy Beaches retains dune systems of national importance.</p> <p>Ruggedy Point coastal features is a regionally significant geopreservation site.</p> <p>Small golden sandy beaches, anchored by headlands.</p> <p>High narrow ridgelines with precipitous rocky outcrops.</p> <p>Coastline is characterised by a series of short headlands with jagged margins.</p> <p>Clad with "leathery" native shrubs, distorted by gale-force winds.</p>		<p>Overpowering impression of wildness.</p> <p>Remote and isolated with very high levels of naturalness present.</p> <p>Spectacular sawtooth spine of the Ruggedy Range.</p> <p>Impressive form of the Rugged Islands.</p>		<p>This entire Character Area is of National Park status.</p> <p>Big Hellfire Beach sand pass, Ruggedy Flats/Freshwater Valley are both regionally significant geographic features.</p> <p>Sealers Bay on Codfish Island/Whenua Hou (c.1800-50) was established by sealers who lived with local Māori women</p> <p>Cod Fish Island/Whenua Hou carry's Statutory Acknowledgements and Deeds of Recognition status.</p> <p>Ngāi Tahu connect with Whenua Hou spiritually, culturally and physically.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.</p> <p>Whenua Hou is closed to casual visitors and unauthorised landings are prohibited, so as to manage the Kapapo recovery programme.</p>	

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
All of this Character Area retains Outstanding Natural Character values.					
<p>Outstanding Natural Landscape:</p> <p>Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. This north-western part of Stewart Island, including Codfish Island retains very high level of naturalness.</p>					

Natural Character

Abiotic Character Attributes	Natural Character Attributes	Biotic Character Attributes	Natural Character Attributes	Experiential Character Attributes	Natural Character Attributes	Coastal Description	Interface
Dune systems at West and East Ruggedy Bay. Small golden sandy beaches, anchored by headlands. Inland dominated with high narrow ridgelines with precipitous rocky outcrops. Big Hellfire Beach sand pass is regionally significant The Ruggedy Mountains line the north-west coast. Orange-brown bluffs and crags protrude from the coastal forest.	Clad with "leathery" native shrubs, distorted by gale-force winds. Lot of kiwi around this area of the coast Codfish Island/Whenua Hou contains substantial forests, scrublands and coastal ecosystems– kakapo/ snipe. Cod Fish Island/Whenua Hou is an important nesting habitat for Nationally Vulnerable Yellow-eyed penguins (hoiho, <i>Megadyptes antipodes</i>).			Whenua Hou Nature Reserve/Codfish Island is an extremely important tūrangawaewae to Ngāi Tahu Whānui.		Indented coastline, with high rugged coastal bluffs. The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea	
<p>Outstanding Natural Character:</p> <p>With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.</p>							
<p>Additional Comments:</p> <p>There are public huts present at East Ruggedy Beach/headland and Big Hellfire Beach which are aligned along the route of the North West Circuit Track</p> <p>Many of the Podocarp-hardwood species are affected by possum and deer browsing.</p>							

Character Area 8- North Coast

General Character Description

The North Coast Character Area is characterised by its sheltered, relatively gentle coastline with numerous sand and gravel beaches. In the south of this Character Area the land is steep and undulating, densely clad in mixed coastal forest. To the north of this Character Area, the forest clad land rises moderately steeply toward the regionally significant Mt Anglem (980masl) and Little Mt Anglem (738masl) mountains. Popular tramping routes follow the coastline of this Character Area with little modification other than a selection of campsites and occasional huts located to service the trampers. The entirety of this Character Area is National Park.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>The north-facing coastline (north of about Oban) is unique for the southern region of New Zealand. It contains habitats, topographical features and a large number of important communities and populations absent or rare south of Banks Peninsula</p> <p>Steep and in some places moderate coastal hills and ridgelines.</p> <p>Hinterland dominated by impressive Mt Anglem/Hananui.</p> <p>Regular sheltered bays with a mixture of sandy and gravel beaches.</p> <p>The small eared skink (<i>Oligosoma stenotis</i>) is unique to Stewart Island and is found around the Anglem massif</p> <p>Mt Anglem/Hananui cirque and tarns are regionally significant geographical features.</p> <p>Smoky beach climbing dunes are a regionally significant geopreservation site</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>Remote and isolated with very high levels of naturalness present.</p> <p>In comparison with other parts of Stewart Island, this Character Area is less visually dramatic in appearance.</p> <p>Steep bush clad foothills of Mt. Anglem/ Hananui collide with the coast.</p>		<p>This entire Character Area is of National Park status.</p> <p>The North West Circuit track extend through this Character Area, with various huts (such as Christmas Village Hut at the base of Mt. Anglem/ Hananui.</p> <p>Mt Anglem carry's Statutory Acknowledgements and Deeds of Recognition status.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.</p>	

Outstanding Natural Landscape:

Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The land is clearly expressive of its formative processes and retains very high levels of naturalness. As a

consequence, it is considered that all of this Character Area meets the high threshold for being outstanding.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes	Coastal Interface Description
<p>Gentle coastal hills and ridgelines. In comparison with the other sides of Stewart Island, this unit is less dramatic in appearance.</p> <p>Hinterland dominated by Mt Anglem.</p> <p>Regular sheltered bays with a mixture of sandy and gravel beaches.</p> <p>There is a variety of stream types they range from short and steep coastal streams in the northwest to meandering lowland including Freshwater Rivers. The catchments are generally stable and the lithology is hard rock, hence sediment loadings in streams are low. Streams on Stewart Island/Rakiura tend to have brown, tannin-stained waters and many are notable for their rich riparian vegetation including thick moss and lichen carpets.</p>	<p>Coastal shrublands create a buffer for the mixed forest.</p> <p>Vegetation is less buffeted and deformed by salt laden gales than other parts of the Island.</p> <p>Wetlands and peat bogs on Mt. Anglem.</p>	<p>Sheltered anchorage's for fishing boats and large ships.</p>	<p>Indented coastline, with high rugged coastal bluffs.</p> <p>The coastal interface is free of modification, allowing for uninterrupted ecological sequences to occur between land and sea</p>

Outstanding Natural Character:

With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.

Additional Comments:

There are numerous Hunting huts/campsites associated with the North West Circuit Track, which extends through this area.

Christmas Village has a popular spot for water taxi.

Character Area 9- Freshwater Inland Basin

General Character Description

The Freshwater Inland Basin Character Area is centred on the Freshwater River catchment. This is a unique part of the island where extensive and significant wetlands dominate the lower elevations. The basin is framed by steep, forest clad hills that extend in elevation sufficiently to support alpine vegetation on the catchments ridges. This Character is framed by the Thompson Ridge, The Paps and Mt Anglem to the north and east and the Ruggedy Mountains to the north east. The north West and Southern Circuits traverse this Character Area where a number of huts, such as Freshwater Hut provide basic accommodation.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>Freshwater valley wetlands are within New Zealand's largest and most intact.</p> <p>Tin and tungsten mineralisation occurs on the crest of the Tin Range.</p> <p>Mount Anglem has 300 million year old diorite and gabbro rock types present and represents the highest peak on the island.</p> <p>Ruggedy Flat and Freshwater landing areas area important ecological areas.</p> <p>Ruggedy Flats freshwater valley is a regionally significant geopreservation site.</p> <p>The southernmost kahikatea forest in New Zealand is in the Freshwater River valley.</p> <p>Extensive manuka shrublands (some fire-induced) also occur on Island Hill and in Rakeahua Valley areas.</p> <p>Mt. Anglem cirque and tarns are regionally significant geopreservation sites.</p> <p>This Character Are contains a mosaic of wetland types including acid bog, pools, infertile sand ridges, manuka/wire rush peatlands, manuka shrubland, red tussock areas, podocarp forest,</p>		<p>Remote and isolated with very high levels of naturalness present.</p> <p>Freshwater River catchment contains over 75 square kilometres of spectacularly patterned natural wetlands</p> <p>Spectacular sawtooth spine of the Ruggedy Range.</p> <p>Sound fernbirds and wetland plants (orchids etc) – track through wetland provides different experience to elsewhere on the island</p>		<p>This entire Character Area is of National Park status.</p>	

Biophysical Attributes	Landscape Attributes	Sensory Attributes	Landscape Attributes	Associative Attributes	Landscape Attributes
<p>oligotrophic wetlands and tidal mudflats (Rance, 1992).</p> <p>The freshwater mudflats are important for shorebirds, especially the southern New Zealand dotterel (<i>Charadrius obscurus</i>).</p> <p>Three species of plants are restricted to this area of Stewart Island/Rakiura: native broom (<i>Carmichaelia virgata</i>), <i>Oreomyrrhis ramosa</i> and <i>Schizeilema trifoliolatum</i>. Other notable species include lowland ribbonwood (<i>Plagiatanthus regius</i>) and kahikatea (<i>Dacrycarpus dacrydioides</i>).</p> <p>The lowland components of the Freshwater Rivers is an outstanding example of a freshwater system and is important as reference system.</p> <p>These wetlands, in particular the Freshwater and Rakeahua valleys, are important habitat for juvenile and adult fish. They contain large stocks of giant kōkopu (<i>Galaxias argenteus</i>), banded kōkopu (<i>Galaxias fasciatus</i>) and longfin eel (<i>Anguilla dieffenbachia</i>). Secretive in the waters are two native fish found only in Southland. These are Gollum galaxias (<i>Galaxias gollumoides</i>) and a fish yet to be formally named southern flathead galaxias (<i>Galaxias</i> sp. 'southern').</p> <p>The freshwater fauna of the entire Stewart Island/Rakiura CMS area is also nationally unique due to the absence of any salmonid or any other introduced fish species.</p>					

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
Outstanding Natural Landscape:					
<p>Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The highly natural and unmodified landscape of this northern part of Stewart Island is spectacular, notably its association with the Freshwater River catchment. This Outstanding Natural Landscape extends and connects with the adjacent Coastal Character Areas to form one large Outstanding Natural Landscape.</p>					
Additional Comments:					
<p>In terms of modifications, there are some huts at the confluence of Freshwater River.</p> <p>Impacts to the Freshwater river basin wetlands have been from some historical drainage attempts, past fires, deer browsing, and predation by rats (<i>Rattus</i> spp.) and cats.</p> <p>There is a jetty at Freshwater hut.</p>					

Character Area 10- Southern Inland Ranges

General Character Description

This rugged inland Character Area occupies the bulk of the southern part of Stewart Island and includes a range of landscapes, including the granite rocks, areas of schist/ sedimentary rock that are evident within the southeastern coast at Port Pegasus and Table Hill. Minerals including those found on the Tin Range contribute the diversity of the rock formations in part of the island. Striking tors and bare steep-sided domes (i.e. those of Gog and Magog) have developed on the granite ridge west and north of Port Pegasus. Dense vegetative cover of predominantly forest, covers this area as do numerous watercourses that drain this inland landscape. With most of this area being in National Park status, part of the Southern Circuit walking track extends through this Character Area along the Rakeahua River. This area is remote with very little accessibility.

Landscape

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>Granite Knob and Lees Knob exfoliation domes, of the Tin Range are regionally significant geographic features.</p> <p>Tin Range schist and associated tin workings are nationally significant geographic features</p> <p>The nationally unique Alpine and sub alpine eco systems dense, low and often wind-affected shrublands and herb moors, which have been referred to as 'tundra-like' communities because of their waterlogged nature and often ponded appearance.</p> <p>Extensive fire induced manuka shrublands fire occur in the Robertson River catchment at the south end of the Tin Range.</p> <p>Around Tin Ridge bare granite domes protrude from the landscape and tundra surrounding with Granite Knob and Lees Knob exfoliation domes being regionally important geopreservation sites.</p> <p>The Rakeahua river is among other catchments with nationally rare valley sequences of levee, marsh, bogs and tarns.</p> <p>NZ Southern Dotterel (<i>Charadrius obscurus obscurus</i>) nest amongst the dwarf</p>		<p>Remote and isolated with very high levels of naturalness present.</p> <p>Spectacular views from the top of Mt. Rakeahua</p>		<p>Most of this area is National Park, some is 'other conservation land i.e Iwi land.</p> <p>Tin mining was short lived venture in the 1880's around Tin Range.</p> <p>Part of the Southern Circuit walking track extends through this Character Area</p> <p>Toi Toi Flat carry Statutory Acknowledgements and Deeds of Recognition status.</p>	

Biophysical Attributes	Landscape	Sensory Attributes	Landscape	Associative Attributes	Landscape
<p>cushiony shrubs of Tin Range, Table Hill and Rocky Mountain.</p> <p>Harlequin gecko (<i>Tukutuku rakiurae</i>) and the small eared skink (<i>Oligosoma stenotis</i>) are unique to the Tin Range area.</p> <p>Toi Toi river is among other catchments with nationally rare valley sequences of levee, marsh, bogs and tarns.</p> <p>The subalpine and alpine ecosystems of the Stewart Island/Rakiura CMS area have a number of characteristics making them unique in a national context. In the far southern latitude these systems are at a lower altitude than other subalpine and alpine ecosystems in mainland New Zealand and are significant in that a number of common mainland alpine plants are not present or have endemic local varieties.</p>					
<p>Outstanding Natural Landscape:</p> <p>Based on these values, it is concluded that the entire Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The highly natural and unmodified landscape of this part of Stewart Island is spectacular, notably for the range of varying landforms. This Outstanding Natural Landscape extends and connects with the adjacent Coastal Character Areas to form one large Outstanding Natural Landscape.</p>					
<p>Additional Comments:</p> <p>Very minimal modifications, including some tracks and huts. There are some historic tin mining sites along the Tin Range.</p>					

Character Area A- Western Marine Area

General Character Description

The exposed and open Western Marine Area includes the marine area extending from Foveaux Strait through to the Southern Ocean. This Marine Area also includes the numerous islands located immediately offshore. This marine area contains habitats, topographical features and a large number of important communities and populations absent or rare south of Banks Peninsula. The strong currents and rich nutrient water flowing through Foveaux Strait provide for a diverse and spectacular array of benthic habitats. Iwi own and manage the islands in this area for the customary harvest of tītī/ muttonbirds.

Seascape

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>Westerly winds prevail</p> <p>Numerous offshore islets and exposed reefs, surrounded by surging white water.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>		<p>Broad and expansive views over the Southern Ocean from coastal tracks.</p> <p>Numerous islands and rocky outcrops punctuate this exposed marine area.</p> <p>Exceptional characteristics that are clearly linked to the exposure to the sea.</p> <p>Rugged and exposed appearance</p> <p>Lack of artificial noise</p>	<p>Many of the islands within this area are owned and managed by iwi for the customary harvest of tītī/ muttonbird by Rakiura Māori. This seasonal harvest has been carried out for centuries.</p> <p>Foveaux Strait carry's Statutory Acknowledgements and Deeds of Recognition status.</p> <p>Extensively used by the fishing fleet mainly and passenger vessels to transit through on their way to the Sub-Antarctic Islands</p>	

Outstanding Natural Seascape:

Based on these values, it is concluded that the entire Character Seascape Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The extent of no modification, coupled with the rugged coast and abundant of marine life, makes this a highly natural part of the Island.

Additional Comments:

A shipwreck is present approximately 18.5 km off Richards Point.

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes
<p>A series of short headlands with jagged margins extend into the open ocean</p> <p>Numerous offshore islets and exposed reefs, surrounded by surging white water.</p> <p>High currents.</p>	<p>Bounds the Subtropical Convergence. The Tasman Sea water masses moderate the climate and protect it from the cooler subantarctic water from the south.</p>	<p>Wild and scenic, open seascape</p> <p>Rugged and treacherous due to exposure to prevailing currents</p> <p>Remote and rugged character.</p> <p>Dominant forces of the waves tides and winds, contribute to wildness and isolation.</p> <p>Sunset opportunities.</p>
<p>Outstanding Natural Character:</p> <p>With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.</p>		
<p>Additional Comments:</p> <p>The rocky outer shore and near-shore reef environments have been commercially fished, especially for paua, crayfish and blue cod.</p> <p>The soft outer shore (sand and mud) and shelf environments to the north have been affected by oyster dredging and changes to the composition of the seabed biota will have occurred, particularly in regards to the diverse biogenic reef communities once reported to have occurred in Foveaux Strait.</p>		

Character Area B- Eastern Marine Area

General Character Description

The exposed and open Eastern Marine Area includes the marine area extending from Foveaux Strait through to the Southern Ocean. This Marine Area also includes the numerous more sheltered bays along the south-east coast, south of Paterson Inlet as well as the numerous islands located immediately offshore. This marine area contains habitats, topographical features and a large number of important communities and populations absent or rare south of Banks Peninsula. The strong currents and rich nutrient water flowing through Foveaux Strait provide for a diverse and spectacular array of benthic habitats. Iwi own and manage the islands in this area for the customary harvest of tītī/ muttonbirds.

Seascape

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>Numerous small islands close to the river mouths about Breaksea landscape area.</p> <p>The marine environment of the Stewart Island/Rakiura CMS area contains some of the largest areas of near pristine marine habitat in New Zealand. The inlets of the eastern coast (Port Adventure and Lords River/Tūtaekawetoweto – amongst others) are some of only a few remaining shallow embayments in New Zealand that retain a naturally vegetated catchment and hence rate highly in natural character.</p> <p>The north-facing coastline (north of about Oban) is also unique for the southern region of New Zealand. It contains habitats, topographical features and a large number of important communities and populations absent or rare south of Banks Peninsula. The strong currents and rich nutrient water flowing through Foveaux Strait provide for a diverse and spectacular array of benthic habitats. Traditionally, those undredged coastal waters of Foveaux Strait would have supported biogenic reefs with a rich associated fauna of oysters, fragile lace corals, sponges and other invertebrates. These habitats</p>		<p>Lack of artificial noise.</p> <p>Broad and expansive views over the Southern Ocean and Foveaux Strait from coastal tracks.</p> <p>Very high sense of naturalness.</p>	<p>Islands within this area are owned and managed by iwi for the customary harvest of tītī/ muttonbird by Rakiura Māori. This seasonal harvest has been carried out for centuries.</p> <p>Recreational boating occurs within the more sheltered inlets</p> <p>Foveaux Strait carry's Statutory Acknowledgements and Deeds of Recognition status.</p> <p>Extensively used by the fishing fleet mainly and passenger vessels to transit through on their way to the Sub-Antarctic Islands</p>	

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>are well-recognised as important nursery areas for fish species and foraging grounds for seabirds.</p> <p>High water clarity.</p> <p>Many islands, such as Bench Island and Whero Rock, have significant rookeries and breeding grounds for seals. A number of migratory whale species visit the coasts and occasionally the inlets of Stewart Island/Rakiura.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>			<p>Outstanding Natural Seascape</p> <p>Based on these values, it is concluded that the entire Character Seascape Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The extent of no modification, coupled with the rugged coast and abundant of marine life, makes this a highly natural part of the Island.</p>	
<p>Additional Comments:</p> <p>A shipwreck is present approximately 2.8km off of East Cape</p>				

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes
<p>North facing unmodified coast is unique in southern New Zealand (closest is Banks Peninsula).</p> <p>Strong currents and big waves dominate the character of this marine area.</p>	<p>Known as an active area for the internationally protected Great White Shark.</p> <p>Extremely high (globally) diversity of rocky reef species</p> <p>High diversity of macroalgal species</p>	<p>Remote, open and rugged character.</p> <p>Dominant forces of the waves tides and winds, contribute to wildness and isolation.</p> <p>Very high degree of naturalness due to no or very limited human activity.</p>
<p>Outstanding Natural Character:</p> <p>With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.</p>		
<p>Additional Comments:</p> <p>The rocky outer shore and near-shore reef environments have been commercially fished, especially for paua, crayfish and blue cod.</p> <p>The soft outer shore (sand and mud) and shelf environments to the north have been affected by oyster dredging and changes to the composition of the seabed biota will have occurred, particularly in regards to the diverse biogenic reef communities once reported to have occurred in Foveaux Strait.</p>		

Character Area C- Paterson Inlet Marine Area

General Character Description

This Seascape Character is the largest coastal inlet on the Island, and is reasonably sheltered from the prevailing westerly winds. It also retains the island's most modification, with Big Glory Bay harbouring the majority of Southland's aquaculture. Despite the modification (which is centred on only a few parts of the Marine Area) the majority is relatively untouched, supporting an overwhelming sense of naturalness, notably within the more sheltered parts of the Inlet. There is a marine reserve within this Marine Area located between the Mainland and Ulva Island, which supports an array of endemic species. Boating, fishing and diving also occur more frequently within this Marine Area than others around the island.

Seascape

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>Paterson Inlet (Whaka a Te Wera) is one of the richest shallow water brachiopod habitats in the world.</p> <p>Paterson Inlet is a nationally important geopreservation site.</p> <p>The Freshwater Estuary is a regionally important geopreservation site (818ha pristine tidal river plus intertidal delta estuary).</p> <p>Paterson Inlet/Whaka ā Te Wera A 8,900-hectare inlet with 188 kilometres of coastline, formed by post-glaciation flooding 12,000 to 16,000 years ago.</p> <p>The inlets of the eastern coast and Paterson Inlet/Whaka a Te Wera are some of only a few remaining shallow embayments in New Zealand that retain a naturally vegetated catchment and hence rate highly in natural character and high water clarity.</p> <p>The 1075-hectare Ulva Island/Te Wharawhara Marine Reserve in Paterson Inlet/Whaka a Te Wera was established in 2004. The reserve protects all indigenous marine life within its boundaries from fishing and mining, providing a safe haven and nursery for underwater life.</p>		<p>Overwhelming sense of arrival by boat to a remote part of the country when travelling from the South Island.</p> <p>Calm and serene enclosed waters and embayments which is in contrast to the more exposed open water.</p> <p>Overwhelming sense of naturalness within the more sheltered parts of the Inlet.</p>	<p>Many of the islands within this area are owned and managed by iwi for the customary harvest of tītī/ muttonbird by Rakiura Māori. This seasonal harvest has been carried out for centuries.</p> <p>Regular visits by cruise ships in the Patterson Inlet Marine Area during the cruise season. Local fishing and recreational vessels also use this character area all year round.</p> <p>The southern and western shores are quite different in character to the northern and eastern shores of the inlet. Although easily accessible by boat and in some places via the Island's track network, they have backcountry values and there has been less human impact than on the northern shores.</p> <p>Closed to commercial fishing.</p> <p>Recreational fishing is controlled both through the existence of a mataitai and a number of local regulations such as a ban on set and drift netting. The taking of scallops and other shellfish in parts of the Inlet is also controlled.</p>	

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
The Ulva Island/Te Wharawhara marine reserve is surrounded by Te Whaka a Te Wera/Paterson Inlet mātaītai reserve.				
Much of this Character Area retains Outstanding Natural Character values.				
Outstanding Natural Seascape				
Based on these values, it is concluded that the majority of this Seascape Character Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. There are areas that have been excluded from this overlay, which include the more modified embayments of Big Glory Bay, Halfmoon Bay and Horseshoe Bay.				
Additional Comments:				
Within the mātaītai reserve commercial fishing is prohibited and recreational fisheries levels are managed to ensure the sustainability of important traditional Māori fishing and food-gathering areas.				

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes
<p>Intricate coastline and estuarine environment.</p> <p>Numerous islands and intertidal flats with shell banks surrounded by forest that often overhangs the water.</p> <p>Large inlet containing a wide diversity of habitats e.g. exposed and sheltered waters, coasts and beaches, tidal flats and estuaries and associated diversity of species and communities.</p> <p>Benthic sediments ranging from sand to mud.</p> <p>Rocky reef and moderately steep walls.</p> <p>Low sediment inputs.</p> <p>Apart from isolated areas in channel between Ulva Island and The Neck, all of inlet is <25 m depth.</p>	<p>Marine reserve within Paterson Inlet between the Mainland and Ulva Island.</p> <p>Richest shallow water brachiopod habitats in the world.</p> <p>Unique biogenic reefs (for example, serpulid tubeworm reefs, bryozoan reefs).</p> <p>Extensive beds of red algae and the highest diversity of algal species in New Zealand (inlets and adjacent Stewart Island).</p> <p>Extensive kelp forests (e.g. giant kelp <i>Macrocystis pyrifera</i>).</p> <p>Extensive saltmarsh and eelgrass beds on tidal flats.</p> <p>Used by the internationally protected great white shark.</p> <p>Used by NZ sea lions and NZ fur seals, common dolphins, bottlenose dolphins.</p> <p>Intertidal area is a significant habitat for wading birds, in</p>	<p>First impressions of visitors are of “an island swathed in naturalness, with forest descending to the shoreline”</p> <p>Remote character.</p>

<p>Strong tidal currents in some areas.</p> <p>The tidal reaches entering Paterson Inlet form part of a near pristine freshwater system now rare in New Zealand.</p> <p>Brackish waterways e.g. tidal influence extends 5km upstream from estuary in Freshwater River</p> <p>A range of beach habitats from exposed, well sorted sandy beaches near the entrance, through the sheltered beaches located near the head of the inlet.</p> <p>Paterson Inlet and Port Pegasus are the southern-most temperate inlets in New Zealand.</p>	<p>particular the Southern New Zealand dotterel.</p> <p>Nesting and foraging area for many seabirds, including Sooty shearwater, Stewart Island shag, variable and pied oystercatcher, banded dotterel, bar tailed godwit, black fronted tern.</p> <p>Southern-most feeding areas reached by northern hemisphere migrant waders e.g. godwit, golden plover, turnstone.</p> <p>Freshwater fish, including whitebait, eels, and bullies migrate through the inlet and/or utilize tidal habitats.</p> <p>Important nesting and foraging habitat for Nationally Vulnerable Yellow-eyed penguins (<i>hoiho</i>, <i>Megadyptes antipodes</i>).</p>	
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Outstanding Natural Character:

With very little areas of modification apparent, including a marine reserve, it is considered that the inner parts of Paterson Inlet and the waters around outer islands retain exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present. It is considered that the remaining areas retain high levels of natural character apart from parts of Big Glory Bay where numerous forms of aquaculture are present.

Additional Comments:

Big Glory Bay has a considerable quantity (36 farms covering 161.74 ha of the total area of 1,157ha of Big Glory Bay) of Marine Farms present. To the northern side of Big Glory Bay there are some dredging consent areas too. One Commercial Salmon Farm (1.5ha) in Big Glory Bay.

Boating including cruise ships are most frequent within this Character Area and includes the ferry route to the Bluff.

Character Area D- Port Pegasus Marine Area

General Character Description

Port Pegasus is the southernmost inlet on Stewart Island, and the most isolated and remote. It retains a highly indented shoreline with two broad 'arms' – North Arm and South Arm. The inlet has been used for many years by seafarers as an area of refuge from the rough Southern Ocean. Numerous historical associations are associated with this inlet, although today much of the infrastructure has either been removed or succumbed to the forces of nature. This Character Area retains very high levels of naturalness, through the lack of modification apparent. Freshwater quality is very high. A number of endemic species can be found in this area, including the Nationally Vulnerable Yellow-eyed penguins (hoiho, *Megadyptes antipodes*), sea-lions and a high abundance of small fish.

Seascape

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>The very high clarity of water in the sandy embayments.</p> <p>The seamless transition and close contact between the forest's edge and water, in some places the vegetation overhangs the coastal margin.</p> <p>The inlets of the eastern coast, including Port Pegasus are some of only a few remaining shallow embayments in New Zealand that retain a naturally vegetated catchment and hence rate highly in natural character and high water clarity.</p> <p>Low abundances of protected black coral (<i>Antipathes spp</i>) colonies found within Port Pegasus/Pikihatiti.</p> <p>High water clarity.</p> <p>Port Pegasus is itself a nationally significant geopreservation site</p> <p>Port Pegasus/Pikihatiti is particularly important as it contains significant landscape and ecological values, is relatively large and free from structures, and border largely unmodified terrestrial landscapes.</p> <p>Port Pegasus/Pikihatiti is also the southernmost inlet in New</p>		<p>Serene and sheltered experience within Port Pegasus which is very different from the open Southern Ocean beyond.</p> <p>Isolated with high degree of remoteness and wildness.</p> <p>High degree of coherence with limited modification.</p>	<p>Port Pegasus/Pikihatiti is significant as the last southern place that most vessels can sail to before entering sub-Antarctic waters</p> <p>The harbour is noted in the 1825 journal of Thomas Shepard and noted for is beautiful appearance.</p> <p>There is limited recreational fishing and no commercial fishery or fishing within Port Pegasus; however, trawling and potting occur just outside the Port and Whale Passage is used to store craypots on occasion.</p> <p>An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.</p> <p>Ecological studies have used Port Pegasus as a place that characterises a healthy marine environment compared to other places in NZ.</p>	

Biophysical Attributes	Seascape	Sensory Seascape Attributes	Associative Attributes	Seascape
<p>Zealand that contains marine species and communities with mainland affinities or characteristics and it is one of few inlets nationally that is still relatively pristine.</p> <p>Port Pegasus (both North and South Arms) hold high ecological value and contains some of the largest areas of near pristine marine habitat surrounded by catchments of native vegetation in New Zealand.</p> <p>All of this Character Area retains Outstanding Natural Character values.</p>				
<p>Outstanding Natural Seascape</p>				
<p>Based on these values, it is concluded that the entire Character Seascape Area meets the high threshold for being an Outstanding Natural Landscape, containing very high biophysical, sensory and associative values. The extent of no modification, coupled with the rugged coast and abundant of marine life, makes this a highly natural part of the Island.</p>				
<p>Additional Comments:</p>				
<p>The Stewart Island/ Rakiura Conservation Strategy and Rakiura National Park Management Plan [DOC, 2012] states the following about Port Pegasus (paragraph 8.5.6, p240):</p> <p><i>'Port Pegasus/Pikihatiti distils the essence of remote Stewart Island/Rakiura. It represents the final rugged hinterland on Stewart Island/Rakiura, largely accessed by sea. It is an outpost on the edge of the Southern Ocean and the last safe anchorage. Its landscape is of unique natural character. Natural quiet prevails and night-time skies are naturally dark. It is a safe haven for flora and fauna and an important site for nature and heritage conservation. The cultural values of Port Pegasus/Pikihatiti are of considerable significance to iwi and are cherished and protected.</i></p> <p><i>Port Pegasus/Pikihatiti is a Place where people have once lived and it echoes of the past, but it is also a Place where nature seems to win out in the end. People visit on nature's terms and gain a sense of being explorers connecting with the natural environment, discovering the outstanding natural landscape and marine environment. People who visit Port Pegasus/ Pikihatiti gain a remote experience of Stewart Island/Rakiura'.</i></p>				

Natural Character

Abiotic Natural Character Attributes	Biotic Natural Character Attributes	Experiential Natural Character Attributes
<p>The clarity of water in the sandy bays.</p> <p>High freshwater input and the naturally vegetated catchment leads to tannin-laden water in the harbour creating a unique environment, akin to some parts of Fiordland, evidenced by the presence of shallow-water black coral in both places.</p> <p>Contains some of the largest areas of near pristine marine habitat surrounded by catchments of native vegetation in New Zealand.</p> <p>Large inlet of two 'arms' containing a wide diversity of habitats e.g. exposed and sheltered waters, coasts and beaches, wetlands and associated diversity of species and communities.</p> <p>Has an intact ecosystem extending from the tops of the granite peaks to the floor of the seabed.</p> <p>Brackish waterways e.g. tidal influence extends in rivers.</p> <p>The tidal reaches entering the Inlet form part of a near pristine freshwater system now rare in New Zealand.</p> <p>Low sediment inputs.</p>	<p>Important foraging habitat for Nationally Vulnerable Yellow-eyed penguins (hoiho, <i>Megadyptes antipodes</i>).</p> <p>Nesting and foraging habitat for little blue penguins.</p> <p>High natural state and functional integrity of benthic communities.</p> <p>Very high and stable seaweed diversity with limited presence of opportunistic species.</p> <p>Black coral (<i>Antipathes sp</i>) colonies Thought to be free of invasive marine pests.</p> <p>High abundance of small fish, including juveniles that may be indicative of high quality nursery habitat.</p> <p>NZ sea lion creche and adult haul-out site.</p> <p>Presence of brachiopod.</p> <p>Aggregations of upright colonial ascidians, some of which may be unique to Port Pegasus.</p> <p>Freshwater fish, including whitebait, eels, smelts, bullies migrate through the inlet and/or utilize tidal habitats.</p>	<p>The strong feeling of containment and enclosure due to the sheltered bays and coves.</p> <p>Remote character.</p> <p>Dominant forces of the waves tides and winds, contribute to wildness and isolation.</p> <p>Sea-kaykers and recreational fishing utilise Port Pegasus as shelter primarily for its remote and very high naturalness.</p>
<p>Outstanding Natural Character:</p> <p>With very little areas of modification apparent, it is considered that the entire area retains exceptional abiotic, biotic and experiential characteristics that deem it to be outstanding in a natural character sense. The lack of modification collectively is overwhelming and positively contributes to the outstanding levels of naturalness present.</p>		

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Appendix 1: Photographs and Plans

List of Photographs:

Character Areas 1-10 and A-D

List of Plans:

Map 1: Location Map

Map 2: Geology Map

Map 3: Elevation Map

Map 4: Geopreservation Map

Map 5: Landcover Map

Map 6: Land Management Map

Map 7: Recorded Cultural History Map

Map 8: Coastal Character Areas

Map 9: Outstanding Natural Features and Landscape Map

Map 10: Natural Character Map



Titi Muttonbird Islands, Edwards Island in foreground, far left Bunker Islands, Center Herekopare Island (Te Marama) and Jacky Lee Island middle right.



Oban Township.



Small inlets and bays in the inner Harbour of Paterson Inlet.



Ringaringa Point, south of Oban and Halfmoon Bay.



Virgin Podocarp forest



Misery Bay at centre of image, South Coast Character Areas Tutaepawhati Bay to the left of image.

STEWART ISLAND LANDSCAPE & NATURAL CHARACTER STUDY - PHOTOGRAPHS

Character Area 2: Breaksea

Date: October 2017

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: James.Bentley@boffamiskell.co.nz | Drawn: HBI | Checked: JBe 110

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View NE over Deep Bay and Lords River catchment



Tikotatahi Bay left of image



View looking South toward Big Kauri Bay (left of image) with the Tin Range at rear.



Kuri Point bluffs



Typical South East Coast Character, bush clad gently rising land, rocky shoreline. White Rock in foreground.



View looking North along the South East Coast coastline.



View looking South with Pearl Island left mid ground, Albion Inlet centre, and Twilight Bay Right.



View North over Islet Cove and Cook Arm with Magog Dome in distance



View looking North looking into Disappointment Cove (front right), Bald Cone centre right and Exfoliated Granite domes of the Southern Inland Range Character Area Gog and Magog in distance.



View looking South West from above the Tin Range. Looking over north Arm and Pearl Island.



View looking West along the Southern extreme of Stewart Island. South Cape outcrop foreground of picture, Murphy Island centre left.



View looking NW toward Big South Cape Island. South West Cape and Flour Cask bay in foreground.

STEWART ISLAND LANDSCAPE & NATURAL CHARACTER STUDY - PHOTOGRAPHS

Character Area 5: South West Coast

Date: October 2017

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: James.Bentley@boffamiskell.co.nz | Drawn: HBI | Checked: JBe 116

PAGE 10



View looking NE up the South West Coast Character Area.



South Head Point bluffs.



Doughboy Bay sand dune centre. Table Hill, Blaikies Hill and Mount Allen in rear distance.



Earnest Island group



Masons Bay sandy beach and minor dune features



Regionally Significant Geographic feature Mason Bay Sand Dune. Vegetated in Pingau.



Richards Point center foreground. View looking north up the rugged Coast toward Ruggedy Mountains and Redhead Peak.



View of Southern end of Codfish Island/Whenau hou.



East Ruggedy Beach.



Forest Clad Hills on the norther side of Ruggedy Character Area.



Smoky Beach sanddunes, Podocarp forest clad hills and Mt Anglem Ridgeline at rear



Podocarp forest clad gentle hills, gently elevate toward Mt Anglem (980 masl) (right rear) White Rock Point centre left.



View looking south along the Northern Coast Character Area . Christmas Village Bay center left and Little Mt Anglem (738 masl) rear right.



Established Podocarp forest of Rimu (*Dacrydium cupressinum*) and Miro (*Prumnopitys ferruginea*) trees.



Fresh Water River snakes its way through the Fresh Water catchment.



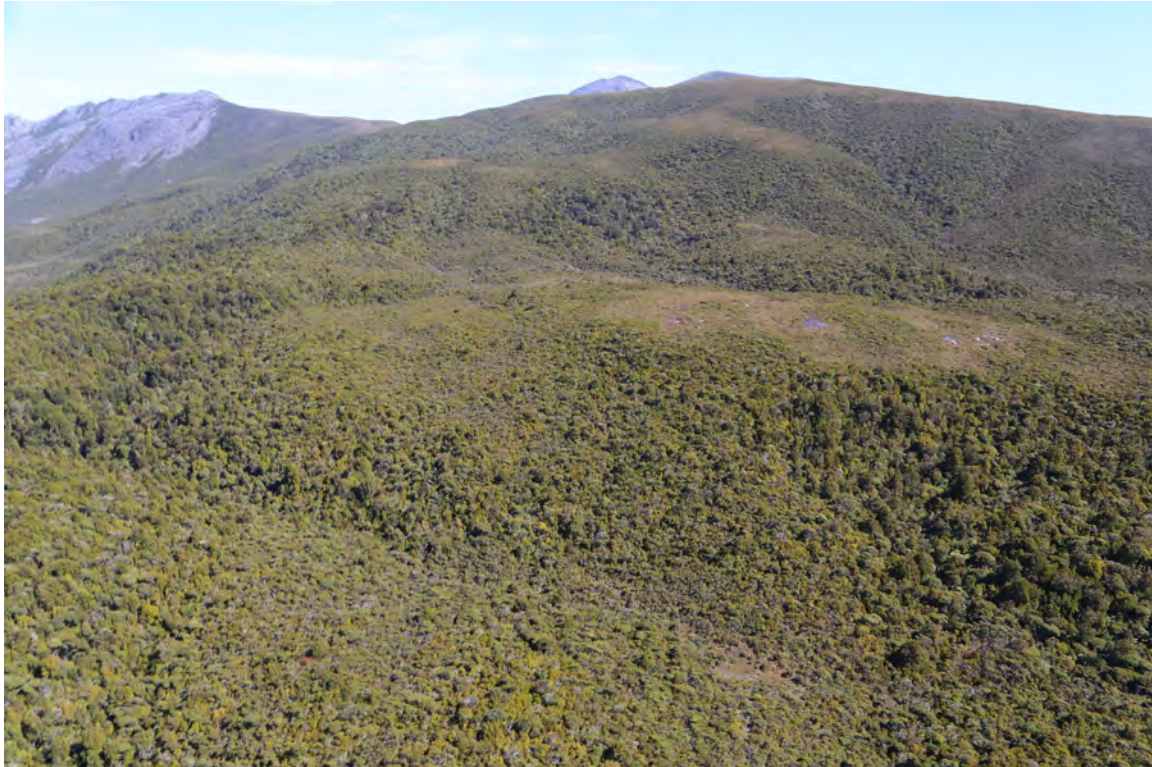
Wetland Character of Fresh Water Basin.



Freshwater Basin surrounded large ridgelines. View looking East toward The Pass mountain (619masl).



Established Podocarp forest of Rimu (*Dacrydium cupressinum*) and Miro (*Prumnopitys ferruginea*) trees. View looking west, Mason Bay at rear of photo.



Podocarp forest clad slope. View looking SE toward the Tin Range

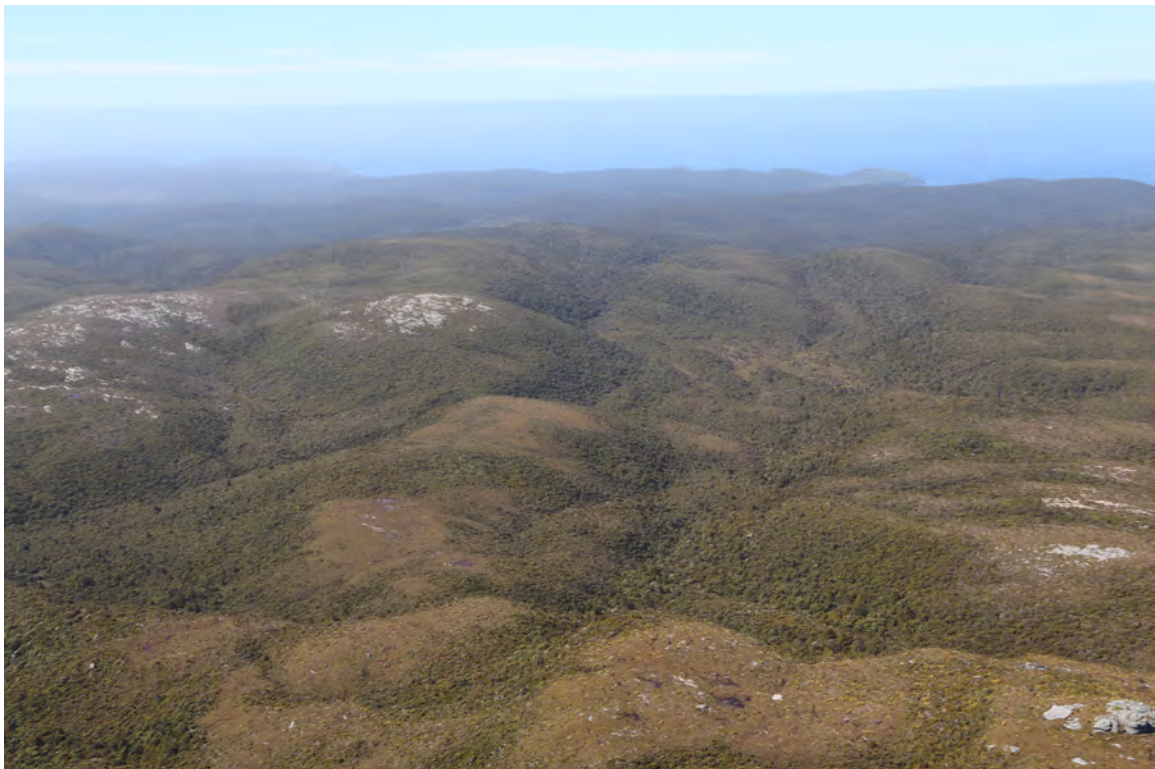


Image looking SE over the bush clad gentle inland hills and tundra habitat,exfoliated projections of the Southern Inland Character area.



Gog and Magog



View looking west Tin Range in foreground and the exposed granite benches of the underlying rock type of the range.



Titi/Muttonbird Islands within the South of the Western Marine Character Area.



Sheer cliffs elude to the nature of the oceans forces within this part of the Marine Environment.



Titi Muttonbird Islands off the East Coast of mainland Stewart Island. Image shows North Island, Womens Island, Motuni/Edwards Island, Jacky Lee Island/Pukeokaoka and Bunker Islands.



The Southern extreme of the Eastern Marine Character area is exposed to the forces of the Southern Ocean currents and wind systems.



Multiple and varied Inlets and bays of Patersons Inlet.



Big Glory Bay Marine Farms peppered throughout the bay.



Multiple and varied inlets and bays of Port Pegasus Marine Character Area. Various Island clusters shelter the Port entrance.



The sheltered cove of the South Arm area of Port Pegasus as well as the many and varied bays. Bald Cone in the rear of the photo.

Legend

- State Highway
- Regional Council Boundary (2014)

Data Sources:
 Topo maps sourced from LINZ topo 303 map series.
Projection: NZGD 2000 New Zealand Transverse Mercator



0 30 km



1:1,500,000 @ A4

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS

Map 1: Southland Region

Date: 18 April 2017 | Revision: 1

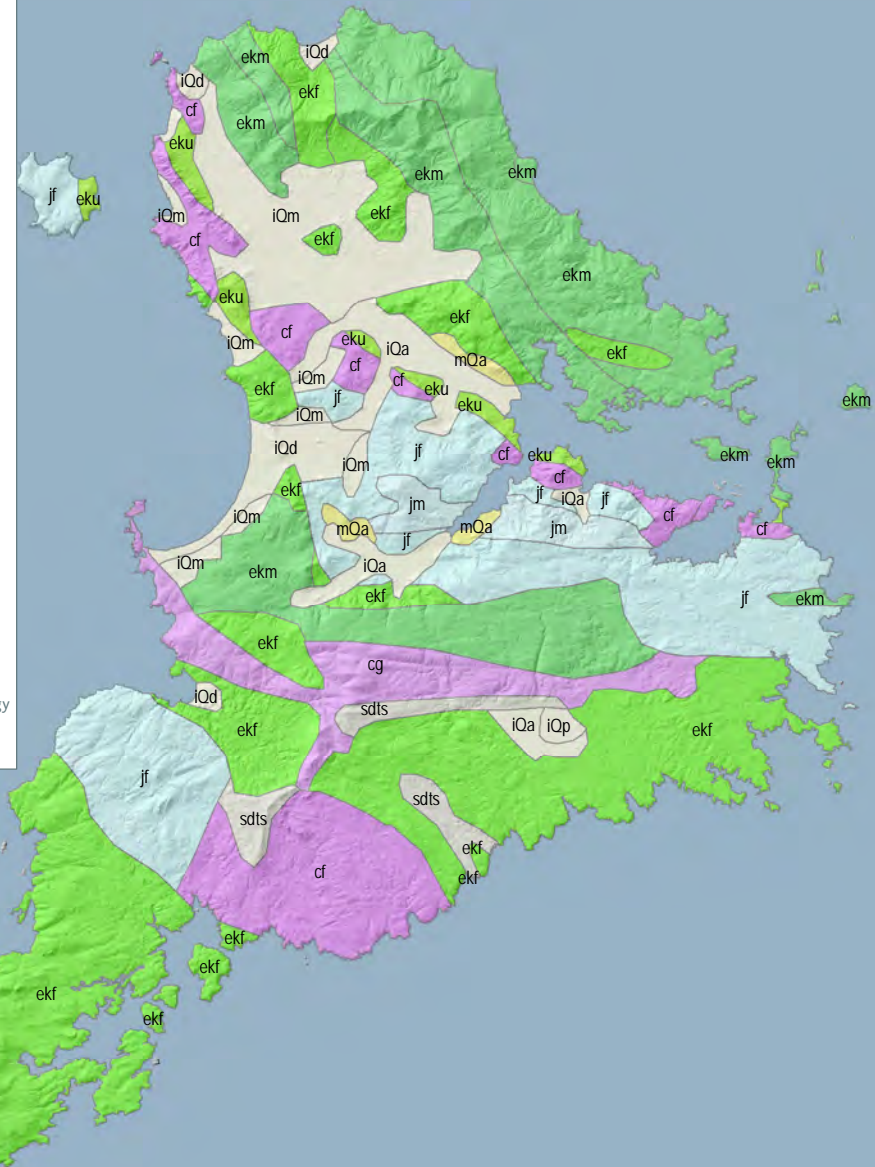
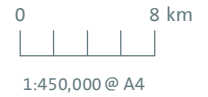
Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend
Geology

- cf** Variably foliated biotite granite, leucogranite, granodiorite and tonalite. / Variably foliated granite, granodiorite, diorite / Variably foliated granite, granodiorite, diorite and quartz monzonite with minor syenogranite.
- cg** Variably foliated biotite granodiorite orthogneiss.
- ekf** Granite, granodiorite and tonalite with subordinate leucogranite, quartz diorite and monzodiorite; locally foliated to gneissic. / Massive and variably foliated granite, granodiorite and tonalite with subordinate diorite and gabbro.
- ekm** Gabbro, gabbro, gabbro, diorite and leucogabbro with minor anorthositic gabbro, quartz diorite, tonalite and ultramafic rocks; commonly foliated to gneissic. / Variably foliated diorite and monzodiorite with subordinate gabbro, tonalite, granodiorite and granite.
- eku** Variably foliated, greenschist to amphibolite facies volcaniclastic sandstone, tuff, breccia and conglomerate; local andesitic and dacitic lavas.
- iQa** Unconsolidated to poorly consolidated mud, sand, gravel and peat of alluvial and colluvial origin.
- iQd** Sand in mobile and fixed dunes of the coast and rivers.
- iQm** Beach sand, gravel, shell and boulder banks of the modern coastal plain; marine gravel, sand and mud beneath low coastal terraces.
- iQp** Unconsolidated to poorly consolidated mud, silt, sand and peat of swamp origin.
- jf** Biotite granite and granodiorite.
- jm** Biotite granodiorite, granite and leucogranite Gabbro, gabbro, anorthosite, diorite, monzodiorite and minor granite.
- mQa** Weathered gravel, sand, silt and mud of alluvial and colluvial origin.
- sdts** Amphibolite facies pelitic and psammitic schist, quartzite, calc-silicate and amphibolite with pegmatite dikes.

Data Sources:
1:1,000,000 Geological units digitised from <http://data.gns.cri.nz/geology>
Projection: NZGD 2000 New Zealand Transverse Mercator



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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS
Map 2: Geology Map

Date: 28 February 2017 | Revision: 0

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Legend

Geopreservation Site

- Internationally Significant (0)
- Nationally Significant (8)
- Regionally Significant (13)

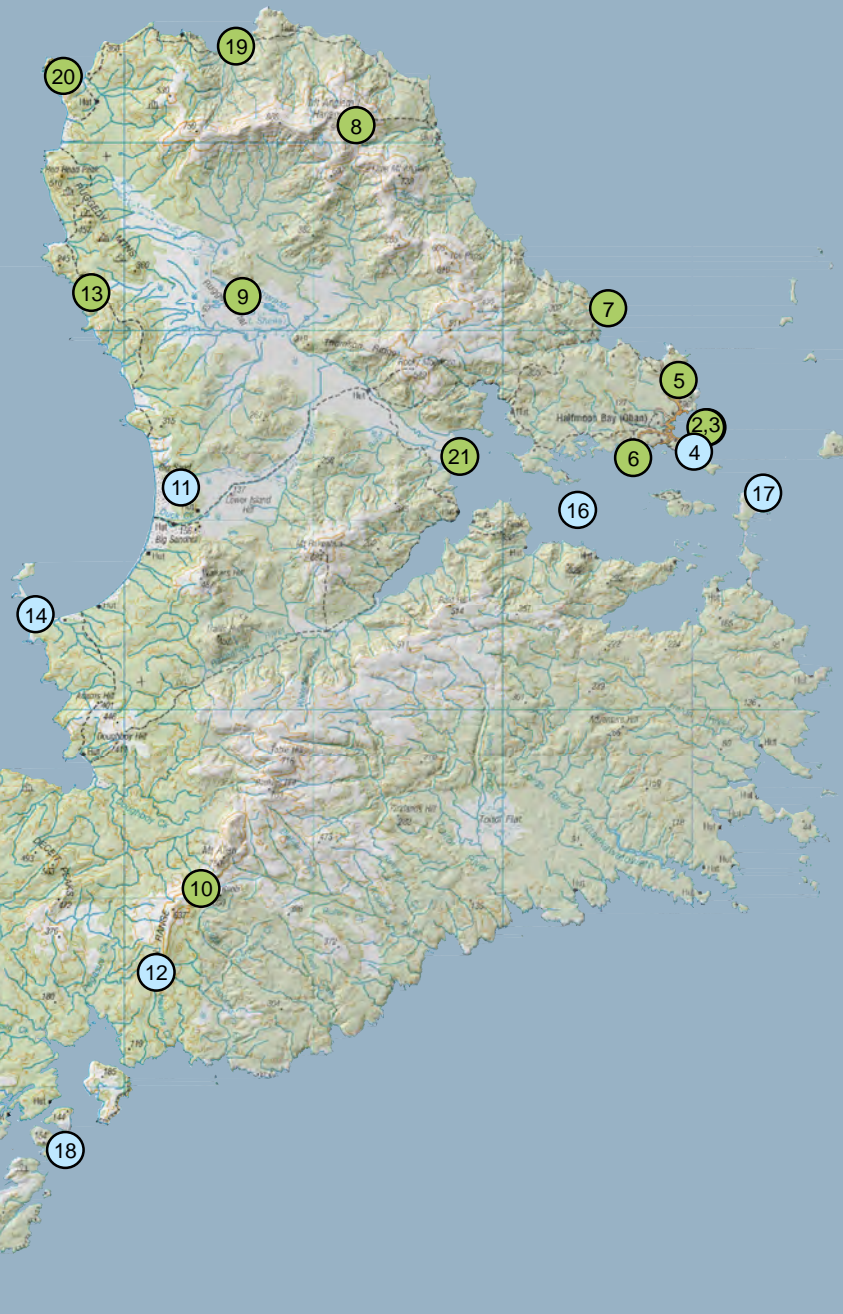
Site Index

- 01 Gog and Magog exfoliation domes
- 02 Harrold Bay spheroidal weathering
- 03 Ackers stone house, Harrold Bay
- 04 Ringaringa intrusives
- 05 Horseshoe Bay hornblende hornfels
- 06 Cow and Calf Point gabbro intrusion
- 07 Port William dikes
- 08 Mt Anglem cirque and tarns
- 09 Ruggedy Flats freshwater valley
- 10 Granite Knob and Lees Knob exfoliation domes
- 11 Mason Bay sand passes and dunes
- 12 Tin Range schist and tin workings
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- 14 Earnest Islands tombolo
- 15 Bald Cone exfoliation dome
- 16 Paterson Inlet
- 17 The Neck multiple tombolos
- 18 Port Pegasus
- 19 Smoky Beach climbing dunes
- 20 Rugged Point coastal features
- 21 Freshwater River estuary, Paterson Inlet

Data Sources:

NZ Geopreservation website <http://www.geomarine.org.nz/>
 Topo maps sourced from LINZ topo 250 map series

Projection: NZGD 2000 New Zealand Transverse Mercator



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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS
Map 4: Geopreservation Sites

Date: 28 February 2017 | Revision: 0

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Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

— Bluffs

Elevation (m)

- 0 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 601 - 700
- 701 - 800
- 801 - 900
- 901 - 1,000

Data Sources:
Elevation map derived from Geographix 8m terrain model

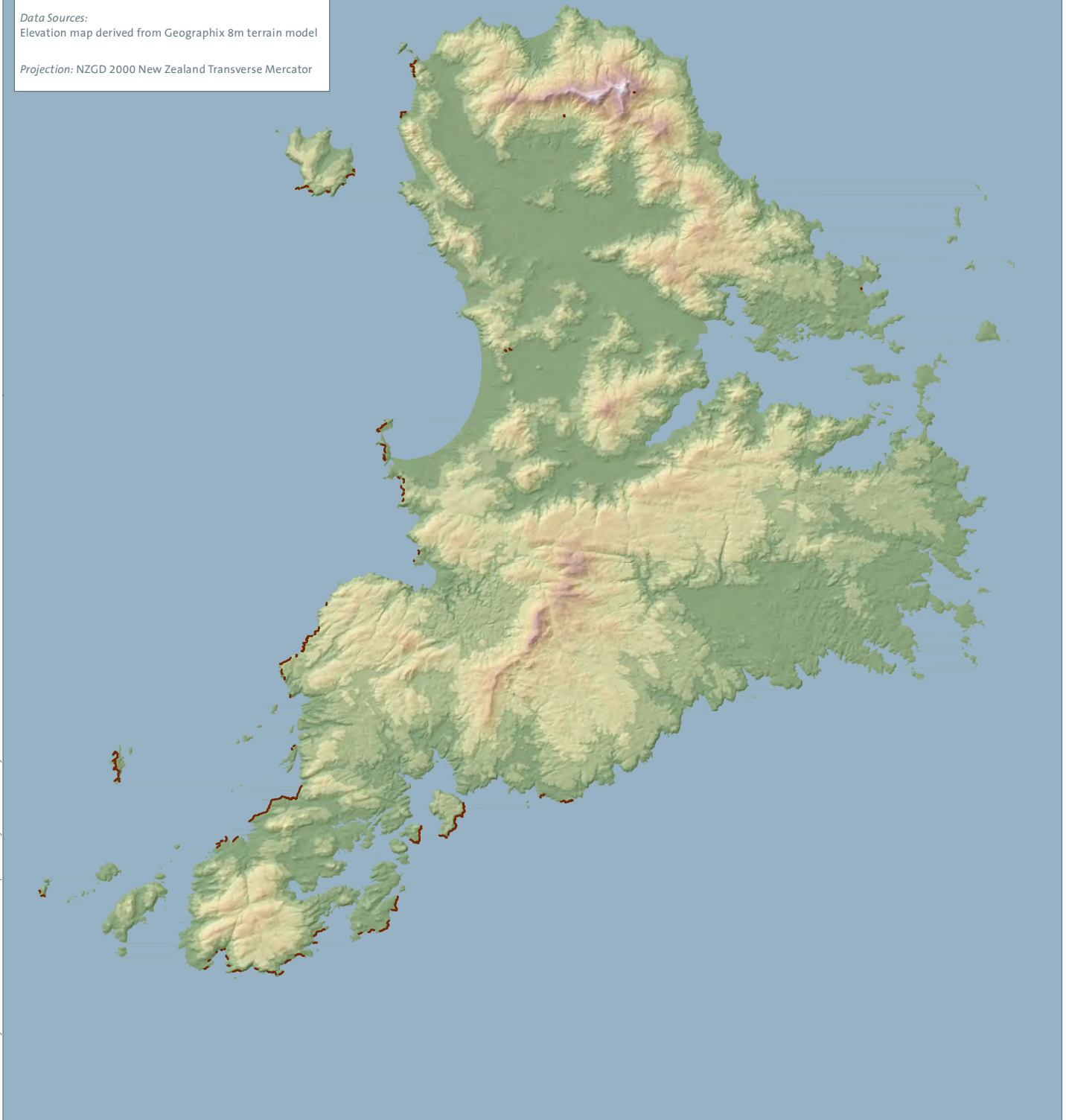
Projection: NZGD 2000 New Zealand Transverse Mercator



0 8 km

1:400,000 @ A4

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS

Map 3: Elevation Map

Date: 28 February 2017 | Revision: 0

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Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

- Marine Farm

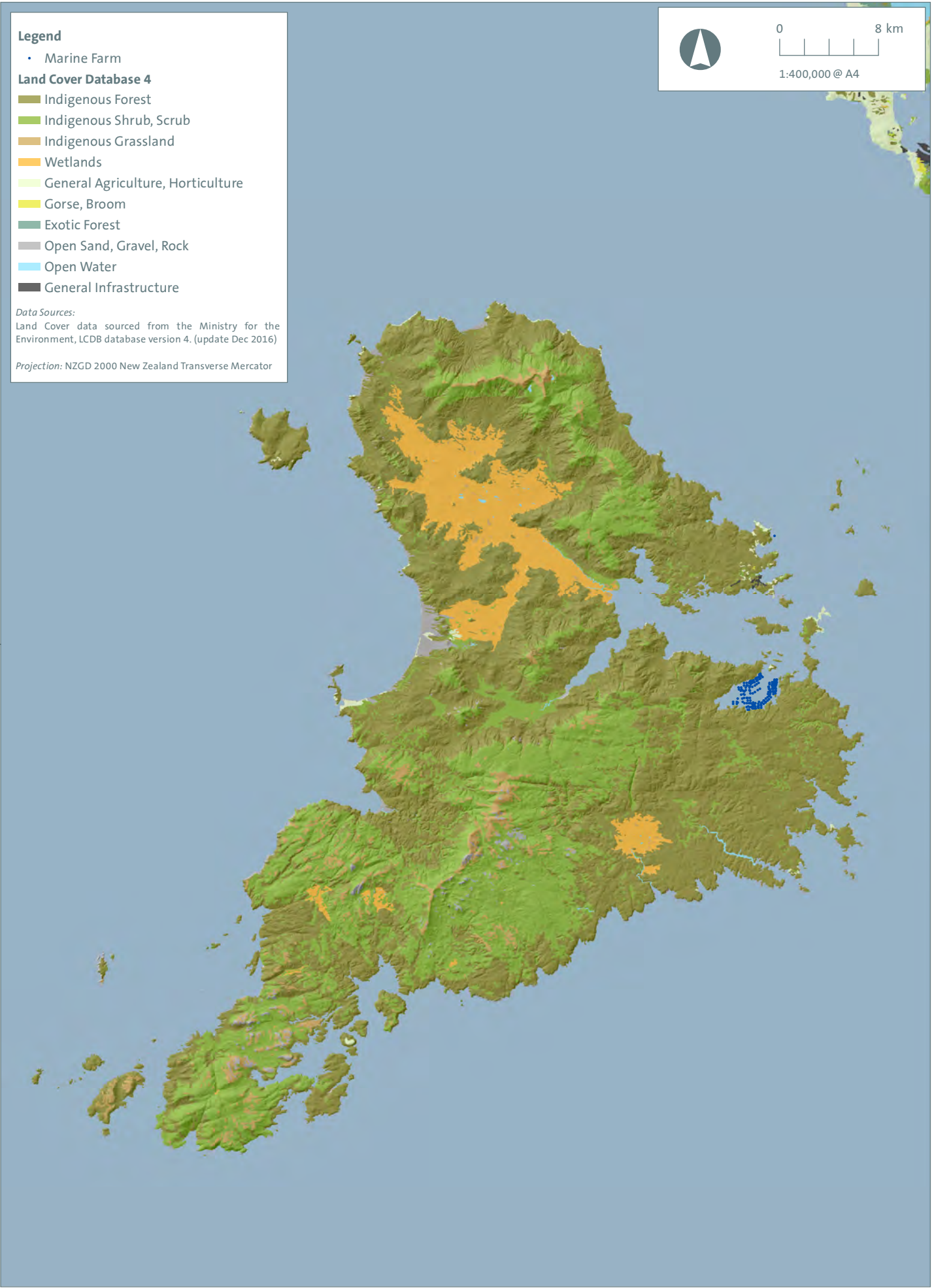
Land Cover Database 4

- Indigenous Forest
- Indigenous Shrub, Scrub
- Indigenous Grassland
- Wetlands
- General Agriculture, Horticulture
- Gorse, Broom
- Exotic Forest
- Open Sand, Gravel, Rock
- Open Water
- General Infrastructure

Data Sources:
 Land Cover data sourced from the Ministry for the Environment, LCDB database version 4. (update Dec 2016)

Projection: NZGD 2000 New Zealand Transverse Mercator

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS

Map 5: Landcover Map

Date: 28 February 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

- QEII Covenants
- Conservation Unit
- National Park
- DOC Marine Reserve

Data Sources:

Topo maps sourced from LINZ topo 250 map series
 Conservation Unit and National Park sourced from DOC
 QEII Covenants sourced from The QEII National Trust

Projection: NZGD 2000 New Zealand Transverse Mercator

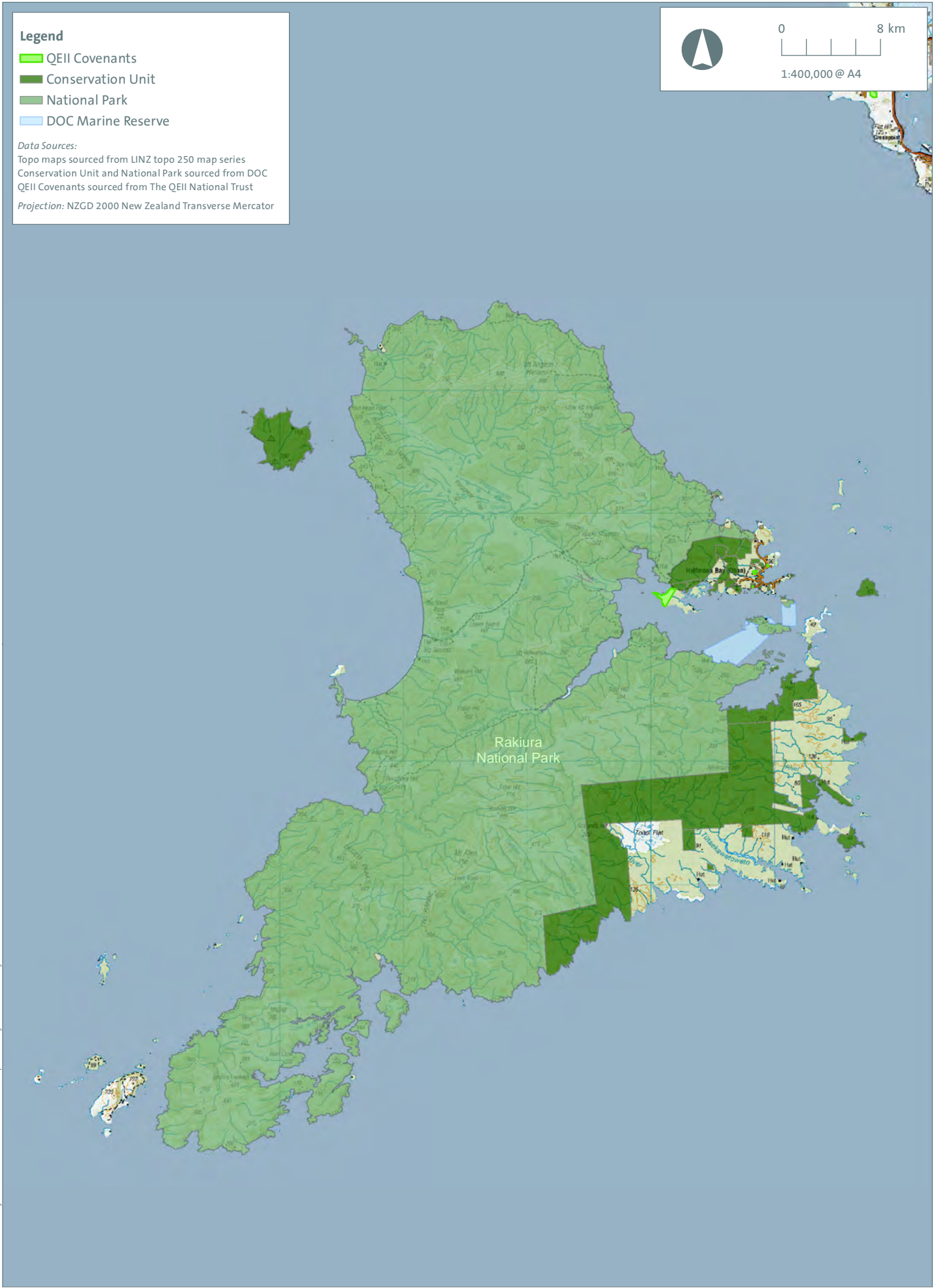


0 8 km



1:400,000 @ A4

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS

Map 6: Land Management Map

Date: 28 February 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

- Combined Archaeological Site
- Maori Archaeological Site
- European Archaeological Site
- Historic Places Trust

Data Sources:

NZ Archaeological Association
 NZ Historic Places Trust
 Topo maps sourced from LINZ topo 250 map series

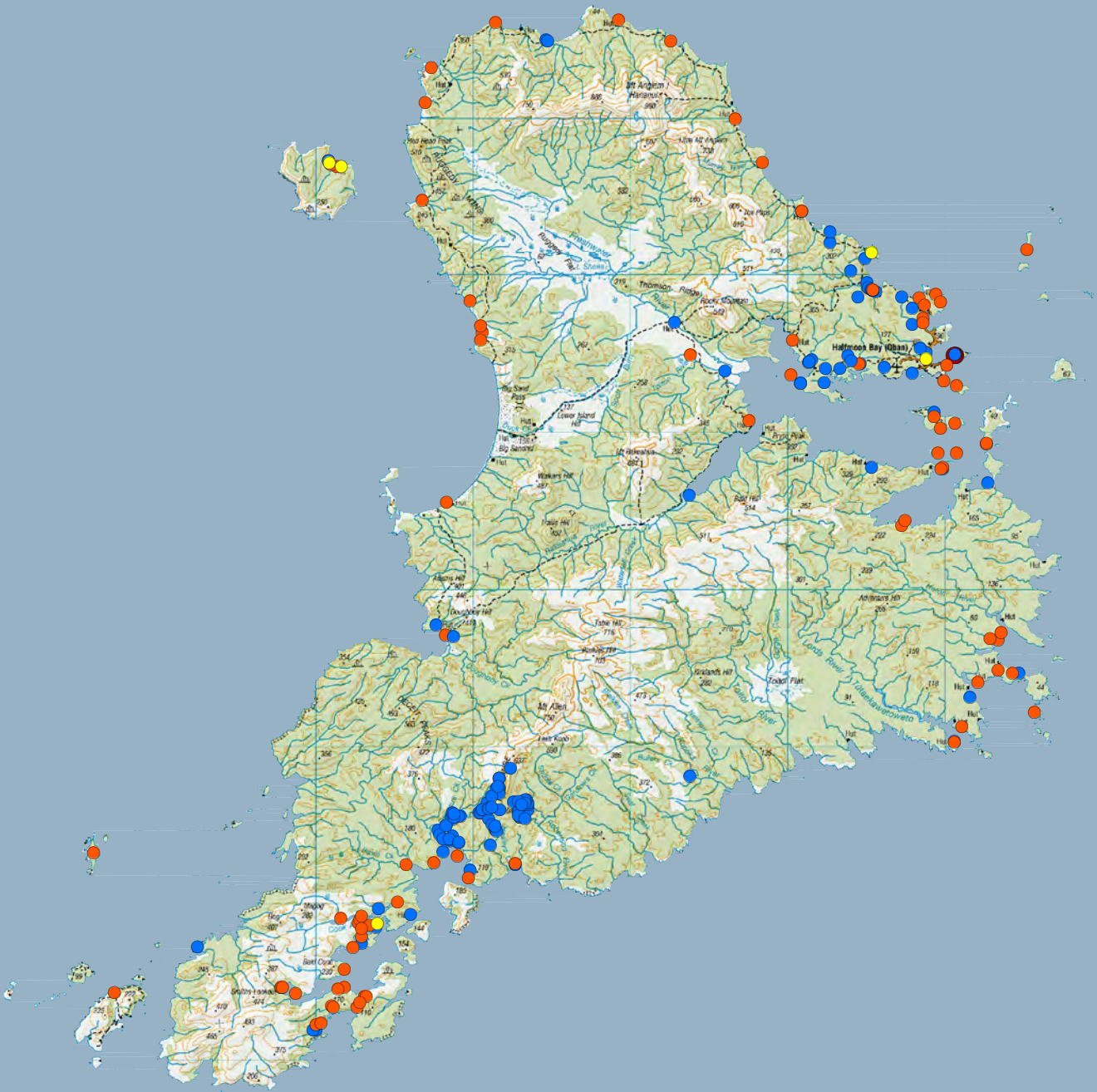
Projection: NZGD 2000 New Zealand Transverse Mercator



0 8 km

1:400,000 @ A4

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Legend

Marine Character Area (MCA)

- Eastern Marine
- Paterson Inlet Marine
- Port Pegasus Marine
- Western Marine

Terrestrial Character Area (TCA)

- Breaksea
- Eastern Bays
- Freshwater Inland Basin
- Mason Doughboy Bay
- North Coast
- Port Pegasus
- Ruggedy
- South East Coast
- South West Coast
- Southern Inland Ranges



0 8 km

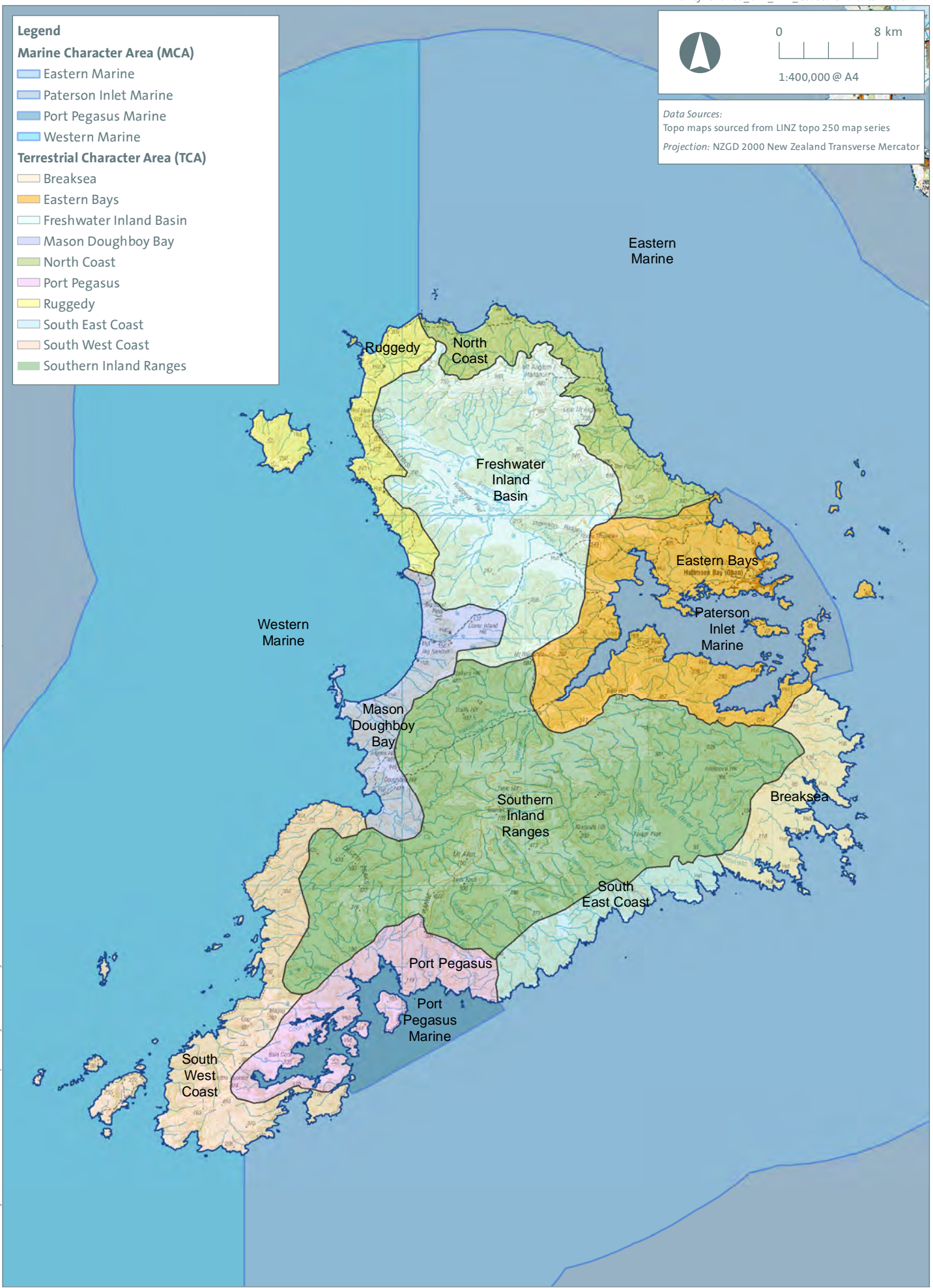
1:400,000 @ A4

Data Sources:

Topo maps sourced from LINZ topo 250 map series

Projection: NZGD 2000 New Zealand Transverse Mercator

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS

Map 8: Coastal Character Areas

Date: 18 April 2017 | Revision: 1

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

Marine Character Area (MCA)

- Eastern Marine
- Paterson Inlet Marine
- Port Pegasus Marine
- Western Marine

Terrestrial Character Area (TCA)

- Breaksea
- Eastern Bays
- Freshwater Inland Basin
- Mason Doughboy Bay
- North Coast
- Port Pegasus
- Ruggedy
- South East Coast
- South West Coast
- Southern Inland Ranges

Data Sources:
 Topo maps sourced from LINZ topo 303 map series
 Projection: NZGD 2000 New Zealand Transverse Mercator

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS
Map 8a: Coastal Character Areas

Date: 18 April 2017 | Revision: 1

Legend

- Coastal Environment
- ▨ Outstanding Natural Character

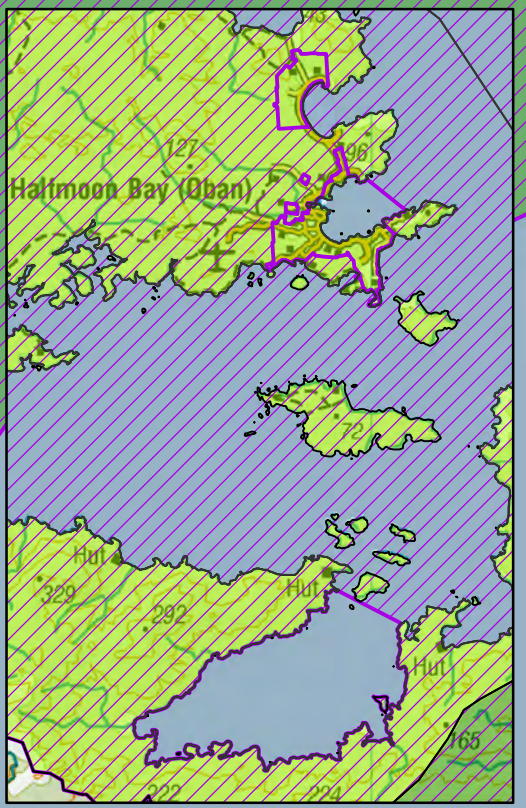
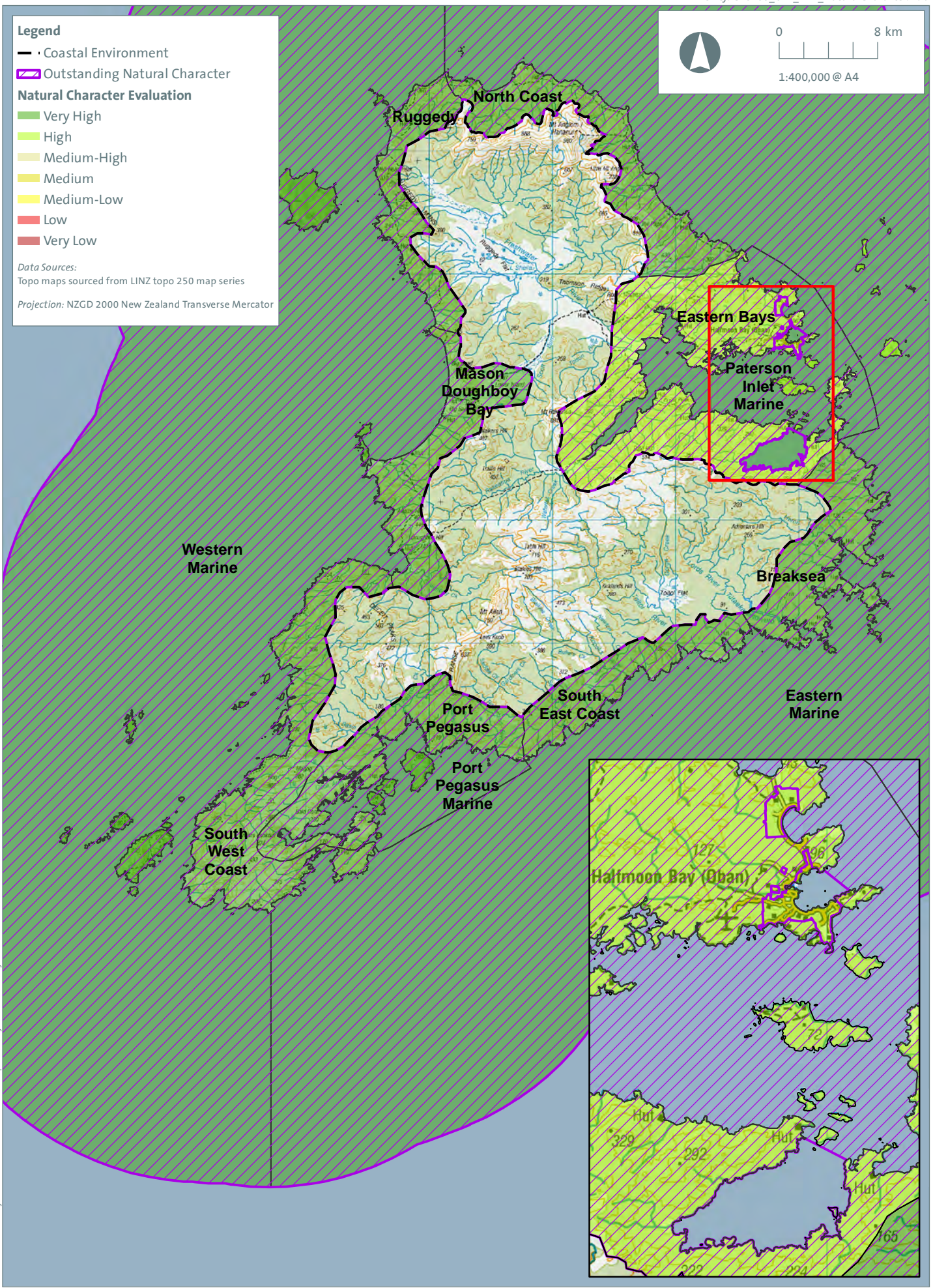
Natural Character Evaluation

- Very High
- High
- Medium-High
- Medium
- Medium-Low
- Low
- Very Low

Data Sources:
Topo maps sourced from LINZ topo 250 map series

Projection: NZGD 2000 New Zealand Transverse Mercator

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STEWART ISLAND COASTAL LANDSCAPE ANALYSIS
Map 9: Natural Character Map

Date: 18 April 2017 | Revision: 1

Plan prepared for Environment Southland by Boffa Miskell Limited
 Project Manager: yvonne.pfluger@boffamiskell.co.nz | Drawn: BMc | Checked: JBe

Legend

 Outstanding Natural Landscape

Data Sources:
Topo maps sourced from LINZ topo 250 map series

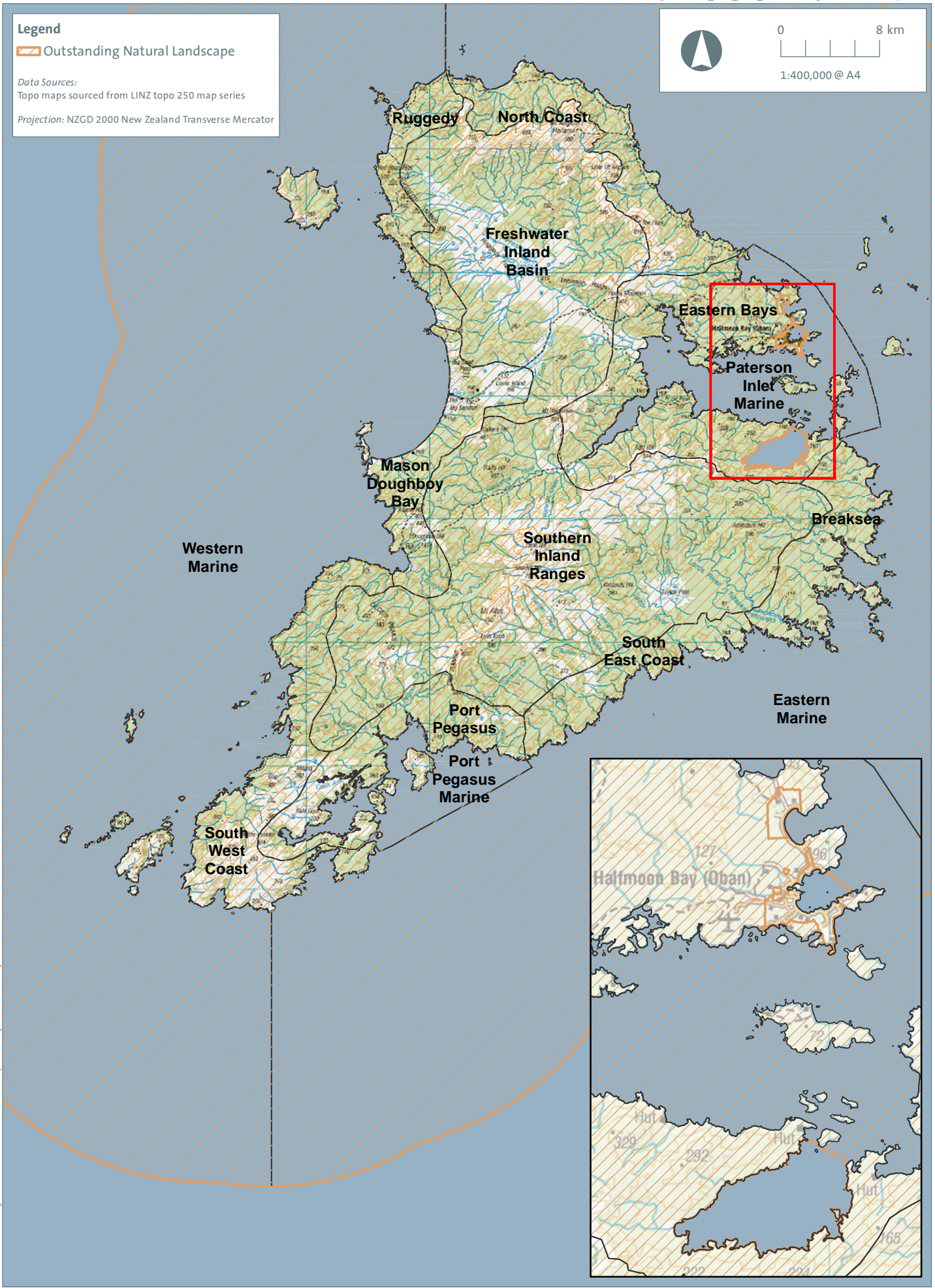
Projection: NZGD 2000 New Zealand Transverse Mercator



0 8 km

1:400,000 @ A4

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Appendix 2: List of GIS related data

The following GIS related data was used for this study:

LINZ:	Road centrelines
Statistics NZ:	Regional Council Boundary (2014)
GNS:	QMAP at 1:1,000,000
Geomarine:	Geopreservation Sites
MFE:	LCDB4
Southland District:	Marine Farm (Southland District Consents)
DOC:	Conservation Unit, Marine Reserve and National Park
QEII National Trust:	QEII Covenants
NZ Archaeological Association:	Archaeological Sites
NZ Historic Places Trust:	Historic Places

8m DEM	Geographix
8m Hillshade	Geographix

Topographic 250 map series
Topographic 303 map series



Review of the Assessment of Environmental Effects and technical information relating to a resource consent application for three new marine farms in Big Glory Bay

**Prepared by Davidson Environmental Limited for:
Environment Southland
Corner of North Road and Price Street
Waikiwi, Invercargill 9810
Southland**

May 2018

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Summary

The three marine farm applications are in offshore, deep locations in a sheltered semi enclosed bay with other shellfish and salmon farms.

Data collected and presented in the NIWA study describe the biological communities within each site and the authors raise no issues that they say would preclude these sites from consideration for marine farming activities.

The present assessment by Davidson Environmental Ltd. outlines several aspects where improvements could be made to the AEE and NIWA report. These suggestions are aimed at assisting decision makers.

These improvements could be done as a desk-top exercise. Improvements fall into two main topics.

1. Hydrodynamics and productivity. It is suggested that a NIWA water column expert provide additional comment on particular aspects (waves, water flow, and productivity).
2. Epibenthic communities. It is suggested that a NIWA benthic expert provide additional comment on epibenthic communities at these sites and how they compare to other areas in Big Glory Bay and Paterson Inlet.

Brief comments on monitoring conclude the assessment.

1.0 Introduction

Zane Smith & Tim Maass-Barrett submitted an application to Environment Southland to establish three marine farms in Big Glory Bay, Stewart Island. Sites 2 and 3 have been previously consented to Tim Maass-Barrett (April 1997), but these sites did not get Fisheries Permits and subsequently lapsed? Site 1 was identified as a potential marine farm site but has not been previously applied for due to the circumstances surrounding sites 2 and 3.

2.0 Job brief

Environment Southland asked Davidson Environmental Limited to review the water and benthic aspects of the AEE submitted with the application.

3.0 Scope of the assessment

The assessment by Davidson Environmental is limited to information presented in the Assessment of Environmental Effects (AEE). For the purposes of the present assessment the AEE has been split into two parts: (1) information provided by the resource management planner, and (2) technical information provided by NIWA.

The aim of the assessment was to provide positive comment on the document and identify aspects that require further work or clarification. Comments in this assessment are therefore aimed to ultimately at assisting Council and the Hearings Panel during its decision-making role.

4.0 Assessment

4.1 Resource Management planner

The AEE provides an outline of the proposed application, background, species, activities to be consented including structures and farming devices, site details, requested term, description of receiving environment, landscape, water quality, environmental effects, ecological carrying capacity, interactions with marine mammals, noise, safety and navigation, high value areas, heritage, and amenity values. The AEE also discusses positive effects should the applications be approved regarding nutrients and the local economy.

Assessment

Page 9 (para 1) the AEE states “In Big Glory Bay, no monitoring has detected any wider bay impacts that extend significantly beyond the boundaries of each site, including the finfish sites.”

Comment: this statement should be backed up with a reference from the relevant monitoring studies and inclusion of relevant extracts that support this statement. Apart from acknowledging fish and shellfish impacts are different, this section should be restricted to shellfish impacts.

Page 9 (para 2) – It is suggested in the AEE that the MAF model that was used as grounds not to Permit Sites 2 and 3 has been disputed and has been shown to be flawed. Note: a recent document investigating nitrogen budgets has been produced by Sanford.

Comment: Statements of this type need to be backed up by references and inclusion of relevant statements and/or conclusions from their source or sources. If the Sanford document is publicly available, it is suggested that this be included in the assessment.

Page 9 (para 3). The AEE states in Paragraph 2 “but research since that time has also shown that some of the assumptions used in the nitrogen model were flawed. However, an updated model is not available.” The AEE goes on to state in para 3 “Notwithstanding the lack of a working model, the assessment is that there is sufficient carrying capacity in the bay for the additional mussel farms. This assessment is based on the lack of any detectable impact from the existing farming on either the ecology of the bay away from the farm sites, or on mussel production on those existing sites”

Comment: the AEE draws conclusions from a source report or document/s that shows there is, in fact, additional carrying capacity in the Bay. This is an important issue. It is therefore important that the source and reasons for the planner’s conclusions be included and discussed in more detail in the AEE. At present the AEE statements are not well supported by the literature.

Overall, the assessment of water hydrodynamics and productivity issues requires inclusion of more data and statements from existing reports collected from Big Glory Bay to back up statements made in the AEE.

Page 11 (Para 1)

Comment: A brief summary of existing shellfish farm monitoring to date in Big Glory Bay would assist the reader but is not vital. A summary table outlining what has been conducted and where and the overall finding e.g. no impact outside consent boundaries, low levels of nutrient enrichment under farms?

Page 11 (Para 5) The AEE mentions water column issues such as nutrients, inhibition of water flow and wave attenuation (sentence 1). Other water quality impacts have also been mentioned previously e.g. dissolved oxygen.

Comment: The AEE raises several water quality issues but relies heavily on statements made in the 2009 Cawthron report to address these issues in Big Glory

Bay. The Cawthron report discusses impacts in a generic sense using examples of studies from around New Zealand. In addition, and where possible, the AEE should provide more data or assessment information from work conducted in Big Glory Bay and apply this to the application sites. If this is not possible it is suggested NIWA ask a water column expert to provide comments.

For example:

- **findings such as wave energy at these sites is unlikely (or likely) to be important based on fetch length and oceanic exposure;**
- **Studies have found that water friction through a farm may result in 5 to 60% reduction in flows (Hartstein 2003, Plew *et al.*, 2005 and Stevens *et al.*, 2008). Based on the size and scale of these sites they are likely (or not) to influence the farms immediately adjacent (downstream) or not.**
- **Consumption of phytoplankton at these sites are unlikely (or likely) to influence the farms themselves but return (or not) back to background levels soon after water leaves the sites.**

Page 12 (para 4). “Residence time can be from 5 to 14 days, and the water movement is the most significant towards the mouth of the bay close to Paterson Inlet.”

Comment: reference needed here.

Page 12 (last paragraph).

Comment: Do farmers adhere to the Industry Code of Environmental Conduct? If they do, it is suggested that this is stated.

Page 13 (Benthic Effects).

Comment: This section discusses monitoring and benthic conditions relating to the proposed site. This is based on the NIWA report. A brief overview of the potential benthic impacts at the beginning of this section would assist the reader.

Page 13 (Paragraph 2).

Comment: “the benthic environment under the existing farms is affected not affect”

Page 13 (Para 3). Copper concentrations are discussed beneath farm leases 338 and 339.

Comment: Copper is relevant to sites historically used for salmon farming. One of the present application sites was used to store fish cages. A comment on whether this is relevant to the present application would assist. Clarification on why copper is not an issue for shellfish farms would also help the reader.

Much of this section is not relevant to shellfish farming and instead associated with the impact of salmon farming. We suggest the impact of salmon farming be kept separate and used only to compare the level of impact between shellfish and fish. This would avoid confusion over the impact that would be expected at the application sites.

A description of the general impact of shellfish farms may assist the reader (references required).

Page 15 (wildlife)

Comment: There exists considerable literature on the interaction of marine farms and marine mammals in NZ and internationally (see reference list below for examples). Issues largely fall into (1) entanglement and (2) displacement. Discussion of the findings from these studies in relation to shellfish farms would assist the reader to determine if the present proposals are a concern.

Page 17 (Para 5) state “Indigenous fauna are present but no specific habitat areas, such as breeding grounds, are impacted by the existing or proposed sites.”

Comment: reference the report that shows no habitats of importance are present.

4.2 NIWA report

The NIWA survey of the three application sites sampled sediment (grain size, particulate organic carbon, depth of oxygenated layer, redox depth), as well as infaunal and epifaunal invertebrates (species presence absence, abundance). The authors state “The sampling design for this assessment was agreed upon between NIWA and ES in May 2017; sampling design was based on the bay-wide compliance environmental monitoring programme for marine farming established in 2012 (ES consent # 2072561).

At each application site NIWA collected: four benthic drop camera photographs (although only 3 for each site are presented in Appendix E) and two grab samples (2 sediment replicates from each grab, 1 infaunal replicate per grab, 3 D.O. per grab). No sonar or video work was conducted. Data collected from the application sites were compared with control (reference sites) established in previous studies Stenton-Dozey *et al.* (2012) and Stenton-Dozey and Cairney (2013). These latter studies were not produced in the AEE, but some data (e.g. photographs), are included in the AEE.

Comments:

All three sites are in relatively deep offshore positions. It is therefore unlikely rocky habitat is located within the three applications. It is suggested the authors comment to reassure the reader these sites are dominated by soft bottom substrata. This is important as no sonar or video sled tows of the seabed were collected to confirm the entire area of the applications was composed of soft substratum.

Descriptions of species present from within and on top of the sediment are provided for each application. It is suggested that comment is provided on their representativeness for (1) the application sites and (2) the wider Big Glory Bay. Questions such as: (A) are these application sites likely to be characterised by the soft-sediment dwelling communities found at the sample stations or could other substrates or species possibly be present? (B) are these habitats representative of the wider bay, inner bay or outer bay. There have been a number of studies describing the wider Paterson Inlet subtidal environment. These studies would be useful when placing the applications sites into perspective (e.g. Richardson 1981b, Willan 1981, Grange and McKnight 1987, Costello and Hare 1991, Department of Conservation 1991, Hare 1992, Elliot 1995a, 1995b, Davidson 2002). It is suggested these studies are utilized and those aspects are made clearer in the NIWA report.

The number of replicates used to survey the benthos in the proposed sites were low and there is a possibility epibenthic features present within each site have been missed. However, based on each application sites offshore position, depth and data available from other studies, it is possible the NIWA description applies to the total area of the application sites. It is suggested, however, that NIWA provide some discussion and draw on other studies to justify the accuracy of their study considering their low number of epibenthic samples and lack of data from wider ranging sample techniques such as video sleds or more drop camera stations.

It is unclear where sample stations were located within each application site. A Figure showing the sample stations would assist the reader.

Based on NIWA and other data presented in the present report, there appears to be a biological pattern from inner to outer Big Glory Bay. This trend appears to influence grain size as well as surface and within sediment dwelling invertebrates? An overview of bay-wide patterns based on a variety of reports and data would be helpful. Questions such as: are the application sites like inner low diversity epifaunal sites or more like higher diversity epifaunal sites in the outer bay?

Of note is the presence of *Neothyris lenticularis* (giant lampshell). This species is negatively impacted by mussel farming activities (Davidson and Richards, 2014). This species is however, widespread over many areas in Paterson Inlet (Richardson 1981; Davidson, 2002). Some discussion about the relevance of adversely impacting this species should the farms be approved is suggested (i.e. how does their decline in abundance under the farms relate to the bigger picture of Big Glory Bay and Paterson Inlet). Would the loss be regarded as significant to this species in the Inlet or are they so common and widespread it would represent a small or minor loss?

It would be helpful to know how far the *Galeolaria* tubeworm beds in Big Glory Bay are from the application sites. A brief comment on whether these farms if approved would impact that tubeworm feature would be helpful.

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Appendix 1. Details of the assessment author.

Education

My full name is Robert James Davidson. I am a marine biologist and hold the qualification of Master of Science in Zoology (First Class Hons) obtained from Canterbury University (1986). I have worked for the Ministry of Fisheries (1986-87), and Department of Conservation (1987-95). During my time at DOC, I was based at Nelson and employed as the coordinator of marine biological surveys throughout the Nelson Marlborough Conservancy. I was the principal author of several large-scale ecological reports and biological resource documents for marine areas in the DOC Nelson-Marlborough Conservancy. While at DOC I also coordinated resource inventory reports used by the Marlborough District Council, Nelson City Council, Tasman District Council and Canterbury Regional Council, outlining ecologically important marine areas for inclusion in their respective coastal plans (Davidson et al. 1993; 1995).

Private consultancy and experience

In 1995, I left the Department and established my own practice, “Davidson Environmental Limited”, which specializes in ecological research, survey and monitoring. To date I have produced 840 reports most of which have been associated with Resource Consent applications. Most of these RMA related reports have been for marine farm applications, farm impact assessments, farm revalidations and renewals and also marine farm monitoring.

I have also coordinated up to 27 consecutive years of monitoring for each of three Marine Reserves in the top of the South Island. Another long-term monitoring programme was the impact monitoring of ferries travelling through the Marlborough Sounds including Tory Channel (1995-2015). Recently I have coordinated a three-year programme updating and reassessing the biological value of sites in the Marlborough Sounds (Davidson et al. 2011). This programme has been extended with sites being revisited and new data collected to confirm their location and biological values (Davidson and Richards, 2015).

I have also been involved in several reviews and advisory roles including the Ecological Advisory Group for reviewing monitoring of the Tasman Bay Marine Farm Ring Road development, as a member of the MDC marine focus group, Top of the South Biosecurity Partnership, MAF Undaria Expert Advisory Group, and Mapua FCC contaminant clean-up programme.

I am the author or co-author of 18 conference papers in New Zealand and overseas. I have published 12 papers in internationally peer reviewed scientific journals including papers on marine reserves, subtidal soft bottom and reef communities.

Based on a wide range of long term studies combined with over 4000 working dives in the Marlborough Sounds, I have a very good understanding of subtidal environment of the Marlborough Sounds.

Summary of experience

- Working in Marlborough Sounds: 1988-2018 (30 years)

- Working dives: >4000
- Long term monitoring programmes: 26 years
- Resource Consent reports: 840
- Published papers: 12
- Conference presentations: 19
- Boating: SRL skippers ticket, 28 years navigating in the Marlborough Sounds
- Conflict of interest declarations

I am part owner of several marine farm consent areas in the Marlborough Sounds. I am also part owner in three research based marine farm sites located at Treble Tree Point, Waitata Reach, Pelorus Sound. Apart from the research sites, water space is leased out or is managed by a variety of marine farming companies including Aroma on contract. I have no shareholding or other beneficial interest in the present marine farm application.

I conduct contract work for a variety of organisations some of whom regularly submit or are involved with the process of marine farm applications (e.g. DOC, MDC, MFE, MPI, Marine Farming Association). I contract to the Marlborough District Council where I manage an ecological database and coordinate two ongoing monitoring studies (i.e. marine farm recovery study in East Bay and a ferry impact study in Queen Charlotte Sound and Tory Channel).

I take care to ensure that my business interest in marine farms and my role as a consultant for a variety of clients does not influence my role as an independent consultant. My relationship with clients and standing as an expert witness has been based on my responsibilities as a scientist, my expertise and my experience. My evidence today is therefore consistent with the best principles of scientific inquiry and any opinions and conclusions are based on my experience and understanding of biological theory, integrated with data collected during field work at and near the application sites.



Review of the response by the applicant
in relation to Environment Southlands
(ES) request for more information
relating to a resource consent
application for three new marine farms
in Big Glory Bay

**Prepared by Davidson Environmental Limited for:
Environment Southland
Corner of North Road and Price Street
Waikiwi, Invercargill 9810
Southland**

August 2018

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1.0 Background to the application

Zane Smith & Tim Maass-Barrett applied to Environment Southland to establish three marine farms in Big Glory Bay, Stewart Island. Sites 2 and 3 have been previously consented to Tim Maass-Barrett (April 1997), but these sites did not get Fisheries Permits and subsequently lapsed. Site 1 was identified as a potential marine farm site but has not been previously applied for due to the circumstances surrounding sites 2 and 3.

2.0 Job brief

Environment Southland asked Davidson Environmental Limited to review the response to their request for more information sent to the applicant on 5th June 2018. The ES request for more information included a series of comments generated by Davidson Environmental as part of a review of the science aspects of the application review.

3.0 Scope of the assessment

The assessment by Davidson Environmental is limited to information presented in the Assessment of Environmental Effects (AEE) and the response from John Engel of Bonisch Environmental Limited (response document). For the purposes of the present assessment, the order of subjects follows the same presented in the response document. The response document presents comments related to (A) the ES request for more information and (B) the earlier review by Davidson Environmental Limited.

The aim of this assessment was to provide positive comment on the response and identify any aspects that may require further clarification at the hearing or to ES. Comments in the present assessment are therefore aimed at assisting Council and the Hearings Panel during decision-making.

Comments are restricted to biological aspects. Water column aspects are not discussed within this assessment.

4.0 Review of the response document

4.1 Farm coordinates (Page 1)

Source: Response document

Comments:

The response document outlines a coordinate correction to the original AEE (Map in Appendix 2). In relation to the biological data presented for the application site, there is no doubt that NIWA surveyed the correct application sites (Figure 1). The six stations sampled by NIWA are located within the farm boundaries (apart from the control site).
Opinion: No further clarification required in relation to biological work.

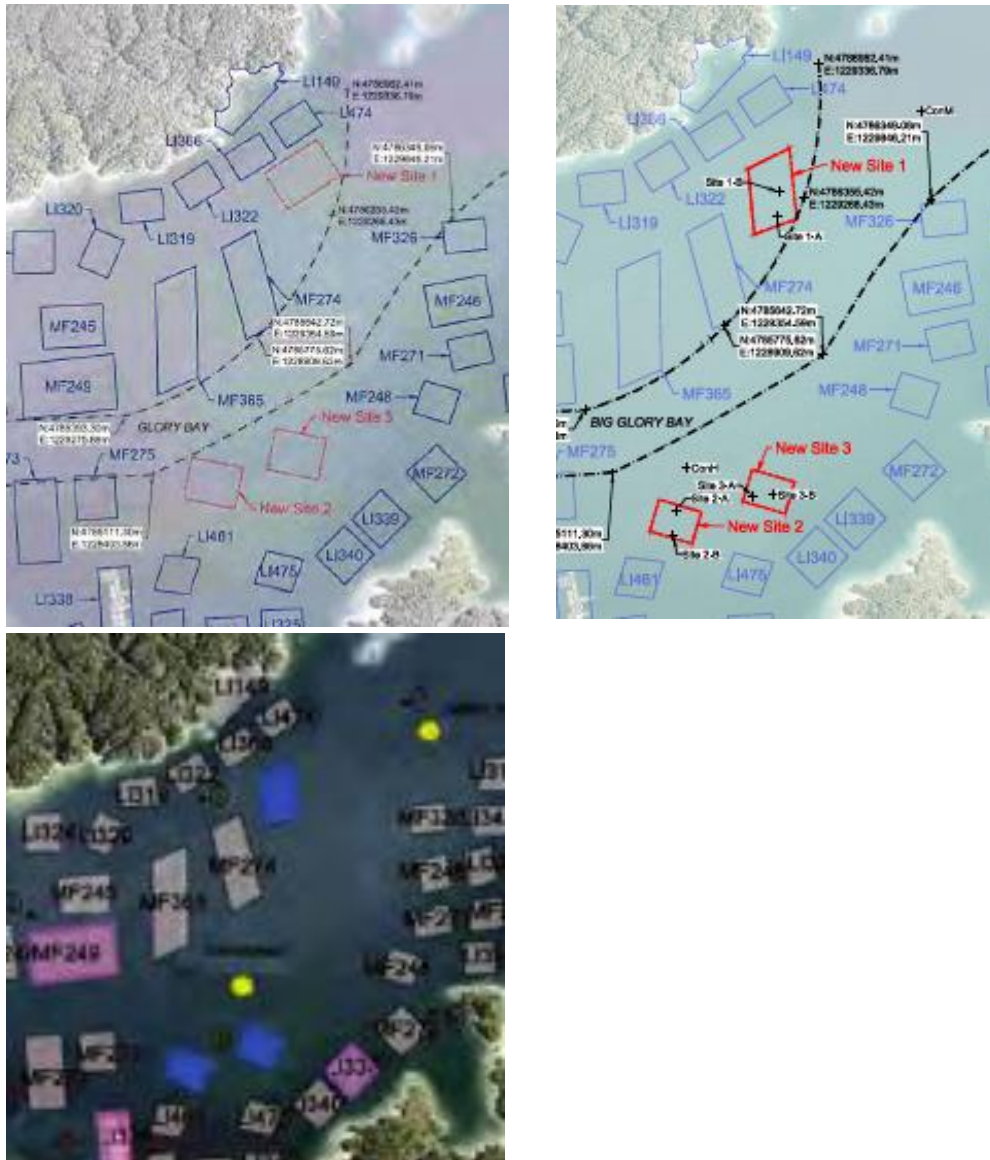


Figure 1. Location of AEE farms (red in top left aerial), corrected locations in response document (red in top right aerial) and NIWA report.

4.2 Description of the activity (Page 2)

ES Number 1: “In order to establish the full nature and extent of the proposed marine farming activities, please confirm the likely density of shellfish to be grown on each proposed marine farming site”

Comments:

The response provides a good outline of the proposed activities occurring at the three sites. This is a combination of spat holding, growing of secondary seed and final seeding (production farming). These activities likely vary from year to year depending on logistical and business constraints. I see no reason to regulate this aspect of the activity unless benthic areas are shown to support important benthic values (i.e. final production farming has the greatest benthic impact of the three activities). If one site or a part of one site was found to support benthic communities considered unsuitable for

production farming, an option would be to undertake only spat holding at that location (i.e. low impact activity).

Opinion: no further clarification required.

4.3 General description of effects (Page 2)

ES Number 2 “Please provide an overview of the general impacts of the shellfish farming, including references and relevant supporting extracts”

Comments:

The response outlines where a general description of effects was produced in the NIWA report and the AEE. These descriptions are based on (A) the literature, and (B) the applications. There is considerable literature on the impacts of mussel farms operating in a variety of environmental regimes. The key question is whether these sites will behave according to the literature of effects and if so is this going to threaten any biological values?

Opinion:

It is likely these sites would conform to the expected impact for sheltered and semi enclosed bays. It is also probable that the applications will exhibit impacts recorded from other mussel farms in the bay.

ES Number 3 “Page 9 of the AEE outlines that monitoring has not detected adverse effects of marine farming that extend significantly beyond the boundaries of each site. Please include a reference from the relevant monitoring reports within BGB, including relevant supporting extracts, and restricting the commentary to shellfish sites”

Comments:

The response document relies heavily on the statement extracted from the 13th Annual monitoring report, “As concluded in the previous surveys, at most farm sites, there is no evidence that the depositional effects from the mussel farming activity have caused significant changes to the epifaunal community apart from an increase in mussel densities.”

The monitoring report has not been reviewed as part of the original review or the present review. It is noted, however, that the statement used the words “at most farm sites”.

Opinion: The extent of mussel farm impacts away from production droppers is generally accepted in the literature to be approximately <30 m distance. This can mean impacts from shell debris and sediment extend outside the consent. This is not usually regarded as an issue provided there are no biological features of importance in this zone. Little or no data has been presented on the benthic attributes other than the six NIWA sample stations. It is probable that these sites are representative of the whole application sites as depths are consistent. **It is suggested that the science provider provide comment**

on this aspect to assure decision makers that results are likely to be representative of the wider application sites.

ES Number 4 “Please provide a brief summary of existing shellfish farm monitoring to date in BGB. The summary should take the form of a table outlining what monitoring has been conducted, where the monitoring has been conducted, and the overall finding for each instance of monitoring. This is requested to assist the reader to obtain an overall view of water quality and the benthic environment in BGB”

Comments:

The Table provided in the response document provides a brief summary of monitoring since 1997. This fulfills the request for a “brief summary” of what monitoring activity has occurred. It does not outline “the where” and “an overall finding summary” as requested by ES. **It would be useful to the applicant to provide a brief outline of where monitoring has occurred since 1997 and outline a summary of findings.** This information would assist with addressing the question of whether farms in the Bay conform to impacts described for mussel farms in the literature.

Note: it is not necessary to outline every instance of monitoring, rather a summary of findings sufficient to establish the impacts of mussel farms in the Bay. It is also noted that bacterial mats are related to salmon farm impacts and need not be included in this summary.

4.4 Biosecurity (Page 6)

Comments: The response document answers the question posed by ES confirming that no materials new to the Bay will be introduced.

4.5 Carrying capacity (Page 6)

Not covered in this review.

4.6 Benthic effects (Page 11)

ES Point 9 “page 13 of the application discusses benthic effects. Please provide an overview of the potential benthic impacts of shellfish farming, including references and relevant supporting extracts”

Comments:

See comments at Number 2 above. Mussel farm impacts are well documented. The key question is how farms in the Bay conform to the literature and whether the applications are expected to also conform. **Based on the data provided, it is probable they will conform, however, this can also be commented on by the applicant’s science provider.**

Points 10, 11 and 12 (Pages 11 and 12):

Source ES letter

Comments:

Zinc and copper data have been collected from other sites in the Bay. The original source of these metals is related to salmon farming activities. Mussel farms are unlikely to result in increased sediment metal concentrations. No data is available on the applications, however, data from recent monitoring of other farms has been provided showing levels are not high (Table on page 12).

Opinion:

The response provides some historical use information in relation to the present sites. It is therefore probable these sites will conform to data from other sites in the bay. Levels will not increase if the applicant farms shellfish.

4.7 Discharges (Page 13)

ES Number 13 “in order to clarify the nature and extent of the proposed activity, please describe the discharge to water outlined on page 3 of the AEE in more detail, including:

- (a) a description of the nature, volume, contents and frequency or rate of the proposed discharge;
- (b) a description of the procedure for discharge;
- (c) a description of the presence of biological matter (for example pseudofaeces, shell fragments and other biological debris); and
- (d) a description of the procedure for preventing the discharge of inorganic materials (for example ties, fragments of mussel ropes, baskets, and trays)”

Comments:

The response document describes the standard process of harvesting and the associated discharges. This description outlines the activities and the discharges.

The impacts associated with mussel farms include the impacts from biological material washed back into the environment from which it came. Organic material discharged during harvests has an impact on the environment. The impact forms part of the overall impact on the environment that has been described by several authors (see Keeley *et al.*, 2009 for review). It is probable that the harvesting discharge results in the single largest impact event over the crop cycle, however, I am not aware of any study that has attempted to separate the impact of harvesting from other farming activity (e.g. farm floating, float cleaning, backbone cleaning, seeding).

ES Number 14 “with regard to discharges arising from the proposed activities, please provide comment on:

- (a) the sensitivity of the receiving environment;
- (b) the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment and the risks if that concentration of contaminants is exceeded; and

- (c) the capacity of the receiving environment to assimilate the contaminants; and:
- (d) avoiding significant adverse effects on ecosystems and habitats after reasonable mixing;
- (e) using the smallest mixing zone necessary to achieve the required water quality in the receiving environment; and
- (f) minimising adverse effects on the life-supporting capacity of water within a mixing zone.”

ES asked for comment on six points and stated that information was “required by Policy 23(1) of the NZCPS, and also feeds into our consideration of Section 105 and 107 of the RMA”

The response document addressed the points on pages 15-17.

I consider the following to be key points in the response document:

- (a) the sensitivity of the receiving environment;

Response document = “shellfish farming generally is at the low end of the impact scale in regard to effects on water quality and the benthic environment”

Comments:

Mussel farming detectable impacts are usually limited to <30 m distance of the growing structures. Impacts in this area are in the range of ES (environmental score) 3-4, where ES1 is pristine and ES8 is grossly polluted. Salmon farms can reach ES 7 and waters close to human cities are often ES 3-4. The response document is correct when it states shellfish impacts are at the lower end of the impact spectrum. Mussel farms result in some enrichment, small increases in sulphide, redox layer moving closer to surface, mussel shell debris and elevated fine sediment. Some species will decline in abundance, some will increase, and some will remain unchanged. The key issue is therefore to ensure the applications are not placed over an important natural feature that would be adversely impacted (e.g. biogenic reef, dense horse mussel bed, rhodolith bed). If they are placed on habitats and communities that are common and widespread in the area, the impacts are usually regarded by coastal managers as acceptable.

- (b) the nature of the contaminants to be discharged, the particular concentration of contaminants needed to achieve the required water quality in the receiving environment and the risks if that concentration of contaminants is exceeded;

Response document = “In regard to suspended solids, the relevant provision is that visual clarity must not be diminished by more than 20% beyond a reasonable mixing zone. As the currents are not strong within the bay, wind is often the main cause of a

plume being formed but, based on experience on existing sites, such plumes are not significant and the suspended material settles within a short time.”

Comments:

Organic material is removed from the water at various stages of the crop cycle, the mussels are separated and retained, and the remaining material including a variety of organisms are returned to the water. This usually creates a plume of sediment that originates from accumulated fine sediment on the mussel crop. This sediment has originated from the water column and has been concentrated by mussels during the production of pseudofaeces. All organic material that returns to the water has come from the water. Heavy biological material such as shell, crabs, tubeworms etc fall quickly to the seafloor. Sediment is lighter and can travel hundreds of metres before it reaches the benthos. The detectable impact on the benthos from fine material is generally limited to < 30 m distance.

It could be argued that a reasonable visual mixing zone for the fine sediment should be relatively large based on the organic composition of the material, its source being concentrated from the natural environment and its physical properties (i.e. lightness).

The response document states the applicant will abide by the Industry Code of practice regarding inorganic material (e.g. ties, lashings).

(c) the capacity of the receiving environment to assimilate the contaminants;

Response = “The concentration of stock causes a concentration of faeces and pseudofaeces in one place but not to the extent it creates a toxic environment, either in and around the lines or on the seabed, that will not continue to support marine life.”

Comments:

As discussed above, shellfish farms usually have an impact between ES 3-4. This is well below an enriched state where species become dominated with pollution-indicating organisms. Big Glory Bay is sheltered and therefore likely to be at the sensitive end of the spectrum compared to high energy sites where impacts would likely be difficult to detect. Even in low energy mud-dominated environments, mussel farm impacts usually remain below ES 4, suggesting these environments can assimilate the continuation of shellfish farming activities.

(d) avoiding significant adverse effects on ecosystems and habitats after reasonable mixing;

Comments:

This has not been well addressed in the response document. The following comments provide some guidance. Shellfish farms result in a detectable impact within 30 m of growing structures. Although it is detectable, it is not usually regarded by biologists as adverse. Adverse is usually reserved for use in situations where detected impacts are at

a level that leads to serious or intense change. It can also be used when the impact occurs on a “special” habitat or community type that is sensitive, vulnerable or rare. **It is suggested that the applicant’s scientist confirms that (a) the literature shows shellfish farms in this type of environment do not lead to adverse impacts and (b) “special” or significant habitats or communities are not present under the application sites.**

- (e) using the smallest mixing zone necessary to achieve the required water quality in the receiving environment;

See comments in (b) above. Note: the mixing zone related to discolouration would likely be based on visual attributes and not impacts on benthic habitats or communities. It is probable that mussel farms act to improve water clarity by filtering sediment from the water in BGB. In this way, they act to improve water quality for most of their lifespan apart from the harvest events.

- (f) minimising adverse effects on the life-supporting capacity of water within a mixing zone.

Comments:

This has not been well addressed in the response document. The following comments provide some guidance. In Marlborough, there has been considerable debate about the cumulative effect of mussel farms on food supplies (i.e. seston) for other species. The need for scientific study was recognised as early as 1995 but little work has occurred. In BGB, there are lower numbers of shellfish farms compared to the Marlborough Sounds and there are several salmon farms that produce nitrogen that drives the production of phytoplankton. This question is best answered at an industry level rather than imposing an expectation that each farmer embark on a long-term study. **Further reassurance could be obtained from the calculation of CT (clearance time) / RT (retention time) ratio.**

4.8 Codes of Practice (Page 17)

Response = “Yes to Aquaculture NZ, Marine Farmers Association for mussels and oysters, and Maritime New Zealand.”

Comment: question answered.

4.9 Wildlife and habitats (Page 17)

Response = “There does not appear to be any specific studies carried out in Big Glory Bay so the overview in the Cawthron report is the most rigorous assessment that is

available to the applicants. No formal study or report on this aspect within Big Glory Bay is available.

Some anecdotal information is provided in the response.”

Comments:

This aspect of the application has not been specifically dealt with, however, the literature has been cited.

The following comments provide some guidance but are based on general data and not data specific to BGB.

For wildlife (birds and marine mammals), the main issues are (a) exclusion and (b) entanglement. Provided the farmers minimise the escape of inorganic rubbish, this should not be an issue.

Entanglement (marine mammals):

There are two reported incidences of dolphin entanglement and death at a salmon farm in New Zealand, both from the Marlborough Sounds (M. Aviss, MDC). In one, an unidentified dolphin species became trapped while a predator net was being replaced, and in the other case, a Hector's dolphin became trapped under a predator net. Internationally, fatal entanglements of dolphins in predator nets on finfish farms have been reported from Australia (Gibbs and Kemper, 2000; Kemper and Gibbs, 2001; Kemper *et al.*, 2003) and Italy (Díaz López and Bernal Shirai, 2007). This may reflect attraction of dolphins to a food source (Kemper and Gibbs, 2001) although such interactions between finfish farms and cetaceans have not been proven (Kemper *et al.*, 2003).

There is also one record of a marine mammal becoming trapped or tangled in a mussel farm (i.e. a Bryde's whale) (Wursig and Gailey, 2002). The low incidence of mussel farm entanglements is probably related warps and backbones being under tension thereby reducing the chance of entanglement. This is in stark contrast to lobster pots that have a single line to the surface. This line is usually under little or no tension. Whales migrating up the east coast of the South Island pass hundreds of lobster lines that present a serious entanglement threat. A humpback whale first spotted by DOC staff near Banks Peninsula with a cray pot buoy line tangled around its tail stock and flukes then became entangled in mussel floats when it swam alongside a farm in Tory Channel several days later. This animal was cut free from the cray pot lines by a mussel farmer (Scott Madsen) and was released alive. Wursig and Gailey (2002) stated that entanglements by larger whales in aquaculture facilities are relatively rare events.

Displacement (marine mammals):

For dusky and common dolphins, mussel farms represent an area lost as foraging habitat (Clement and Halliday, 2014). It is unknown if this loss is important to these species. Some species, such as NZ fur seals, may be attracted to mussel farms as hauling out locations (Clement and Halliday, 2014; Davidson and Richards, 2017). Farm structures may also attract bottlenose dolphin, and possibly killer whales, due to these species' curious natures and the associated aggregations of possible prey species under and near

farms. Bottlenose dolphins have been frequently recorded ‘sweeping’ through mussel farms within the greater Admiralty Bay region (D. Clement, pers. comm).

Entanglement (birds):

Global entanglement of birds in inorganic pollution is significant. Provided the applicants adhere to the mussel industry Code, the risk of entanglement is minimised.

Exclusion (birds):

Many seabirds roost on mussel farm floats while some species feed within farms. In Marlborough, considerable contention exists over the potential exclusion of king shags by mussel farms. This question remains unanswered; however, recent Environment Court decisions have erred on the side of caution. The Stewart Island (Otago) shag and Foveaux shag are closely related but these populations are considerably larger than the king shag and the colonies more widespread.

If it exists, foraging data on these species would be helpful to determine if overlap exists between BGB farms and the foraging habitats of these species. This information may be available from DOC.

Final comment on wildlife:

Based on the literature, species of concern would be exclusion of area to dusky and common dolphin if they relied on BGB for foraging. Similarly, if Stewart Island (Otago shag) and/or Foveaux shags used BGB heavily, some comment on the effect of farms would be useful.

ES Number 17 (Page 19) “page 17 states that no specific habitat areas will be impacted by the proposed sites. Please provide a reference, including supporting extracts, that supports this”

Response = The survey identified those species for which the sites are considered to be their habitat and, for the most part, the species found are representative of what is found in the wider bay. Brachiopods were present and are regarded as sensitive to disturbance but they have also been found under mussel lines. Monitoring in the bay, as is stated in Section 4.4 of the application, has shown that the mussel sites have retained “... a moderately high species richness and diversity”. However, changes will occur whereby some species will move out and other opportunist species will move in to make use of conditions that are better suited for them.

Comments:

The NIWA study sampled the biota at the three applications using drop camera (n=4 per site) and grab sampler (2 per site). As depths were relatively consistent at each site, it is assumed their samples are representative of the species and substratum over the wider site. Some species of brachiopods are of scientific interest and are a group known to be impacted by mussel farming activities (Davidson and Richards, 2014). The giant lampshell (*Neothyris*) was recorded from two of the applications and also CM13-A and CM 13-B (control mouth stations). In their discussion (Page 27), the authors state this species is “common around Stewart Island, especially Paterson Inlet where they are protected in the local marine reserve.” The authors also state they can be found under

mussel farms where they can be more abundant than adjacent dredge areas. Davidson and Richards (2014) also recorded giant lampshell under a retired mussel farm in the Marlborough Sounds, however, their abundance under droppers was lower compared to control areas suggesting they were impacted to some degree.

The key issue in this instance is their distribution in Paterson Inlet. NIWA state they are common around the Island and especially so in Paterson Inlet. It is presumed they are suggesting a reduction in their abundance at the present site would therefore represent a small loss.

It is not clear if the abundance recorded at the application sites are above or below densities known from the wider Bay. **A comment from NIWA in this regard would be useful.**

ES Number 18 (Page 20) “in order to address the effects of the proposal on indigenous biological diversity, please provide an assessment of the adverse effects on the matters listed in Policy 11(a)(i)-(vi) of the New Zealand Coastal Policy Statement 2010 (NCPS), in particular whether these effects are ‘avoided’ as required by the policy”

Response = “data collected deals with marine invertebrates. Marine mammal aspects rely on accumulated knowledge collected during years of use of BGB by marine farmers.

- (i) no indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists have been identified on any of the sites;
- (ii) none identified. Bottle nose dolphins are known to visit the area but hectors dolphins have not been reported. Even if they were to visit the area, the risk of mussel farming causing any impact is very low;
- (iii) none identified on the sites proposed;
- (iv) none identified on the sites proposed;
- (v) none identified on the sites proposed;
- (vi) no such areas exist within the bay but there is a marine reserve in Paterson Inlet, just outside Big Glory Bay.”

Comments:

- (i) Do nationally vulnerable Foveaux shag (*L. stewarti*) use BGB for foraging?
- (ii) Bottlenose dolphins in Marlborough **do not** appear to be excluded from mussel farming water space. It is probable this applies to BGB.

ES Point 19 (page 21) “in order to address the effects of the proposal on indigenous biological diversity, please provide an assessment of the adverse effects on the matters listed in Policy 11(b)(i)-(vi) of the New Zealand Coastal Policy Statement 2010 (NCPS), in particular whether significant adverse effects are ‘avoided’; and whether other adverse effects are avoided, remedied or mitigated; as required by the policy; “

Response: = “A response for each of the six matters was provided.”

(v) Some comment on the use of the area by Stewart Island and Foveaux shag would be helpful to address relevant aspects of the NZCP.

4.10 Hazardous substances (page 22)

Response is acceptable.

4.11 Biosecurity (page 23)

Comments: Confirmation the applicant would abide by any restrictions imposed by regulatory authorities should be included as a condition in any granted consent. The applicant's willingness to advise authorities of issues is commendable.

4.12 Maintenance (page 24)

ES asked for a maintenance schedule.

Comments:

I do not believe this is feasible as farmers traditionally replace equipment on a case by case basis as equipment shows signs of wear. Line breakages can occur (e.g. tsunami) but these are rare and will snap even the best maintained lines. A common-sense approach to maintenance is suggested. Navigational aids do however, require a checking schedule (e.g. every three months).

4.13 Draft conditions (page 24)

Response: "The applicant advises they wish the standard conditions for the marine farms in BGB be applied. In regard to shellfish farming, the emphasis was on site selection, farming densities and "housekeeping" to control and limit potential adverse effects."

Comments:

In general, the literature and monitoring in BGB has shown that mussel farms do not result in adverse benthic impacts. Adverse impacts can occur if farms are placed in water space of sensitive species. The important aspect of this is whether that is considered acceptable or not acceptable. This review has identified a small number of aspects that need further clarification (i.e. giant lampshell, Stewart Island and Foveaux shag foraging) in order that the latter question can be better addressed.

4.14 Technical review (page 25)

The following section outlines the questions asked by Davidson Environmental in a science review and comments on the aspects that I consider still require comment from a science expert with experience in BGB.

Comments:

Most of the requests for more information have been outlined in the planner's response and the helpful statement from the applicants. There remain, however, biological aspects that required a response from a science expert (see below). These do not require additional field work, instead comments based on the literature and the expert's experience are likely sufficient.

The Davidson review stated

“Of note is the presence of *Neothyris lenticularis* (giant lampshell). In Marlborough this species is negatively impacted by mussel farming activities (Davidson and Richards, 2014). This species is however, widespread over many areas in Paterson Inlet (Richardson 1981; Davidson, 2002). Some discussion about the relevance of adversely impacting this species should the farms be approved is suggested (i.e. how does their decline in abundance under the farms relate to the bigger picture of Big Glory Bay and Paterson Inlet). Would the loss be regarded as significant to this species in the Inlet or are they so common and widespread it would represent a small or minor loss?”

“Based on NIWA and other data presented or mentioned in the application, there appears to be a biological pattern from inner to outer Big Glory Bay. This trend appears to influence grain size as well as surface and within sediment dwelling invertebrates? A brief overview of bay-wide patterns based on a variety of reports and data would be helpful. Questions such as: are the application sites similar to inner, low diversity epifaunal sites or more similar to higher diversity epifaunal sites in the outer bay?”

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29 October 2018

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ID:1840

Dear Michael and Lacey,

A review of water column aspects of a resource consent application for three shellfish farms in Big Glory Bay, Stewart Island

I have completed a review of the application for shellfish farms in Big Glory Bay (APP-20181316 – Zane Smith & Jim Maass Barrett). In doing so, I have not accessed a number of materials referenced in the application. I don't consider that these are essential for a review of the applications, however if you would prefer that Cawthron undertake more thorough review, including source materials, we would be happy to do so.

Scope

Environment Southland requested that Cawthron review water column aspects of a resource consent application for three shellfish farms in Big Glory Bay, Stewart Island.

Documents for review are:

1. the original consent application, submitted by Bonisch Environmental on 2 May 2018 (this document will be referred to below as 'the application')
2. a response for a request for further information, submitted by Bonisch Environmental on 17 August 2018 (this document will be referred to below as 'the RFI response')

Cawthron was asked to provide:

- a review of water column components of the application and the RFI response.
- a high-level assessment of the likely effects of mussel farming on the basis of farm size and location.
- recommendations regarding field surveys, depletion modelling, or monitoring requirements.

Below I consider the application and the RFI response with regard to:

- enrichment and depletion
 - cumulative effects/carrying capacity
- waves and currents.

I then consider the need for monitoring.

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Enrichment and depletion in the water column

Enrichment effects of shellfish farms dominate discussion of water column effects in the application (page 12). This includes some apparent uncertainty regarding whether shellfish are net producers or consumers of nitrogen. The uncertainty apparently stems from interpretation of a nitrogen model for Big Glory Bay developed in the 1990s. I have not studied the details of this model, but I have the impression that some error in interpretation has occurred, or that its finding should be applied only to the seabed, not the water column. For clarity, I summarise the principal water column nutrient dynamics related to shellfish farming below.

Nitrogen is the nutrient that is most likely to limit growth in marine systems, and is therefore the most likely to cause enrichment if excess amounts become available. Nitrogen additions to the environment from shellfish farming are minor; no feed is added to the system to farm shellfish, therefore spat seeding is the only point at which nitrogen can potentially be introduced to the system. As shellfish are harvested, nitrogen that constitutes part of their bodies and shells is removed, which constitutes a loss of nitrogen from the system (see e.g., Bricker et al. 2017). Moreover, mussel farming has the potential to increase denitrification¹ in sediments beneath farms in well-oxygenated environments (Kaspar 1985, Christensen et al. 2003). An increase in denitrification further reduces the total nitrogen in the system. Accordingly, shellfish farms cause a net loss of nitrogen.

The water column in the farm does receive inorganic forms of nitrogen that are excreted by the shellfish. This nitrogen source can be used for growth by primary producers such as phytoplankton. New growth of phytoplankton can therefore increase in the water that passes through the farm. Nonetheless, all nitrogen excreted by shellfish has originally been taken from the water column (in a form of organic nitrogen, for example, when the shellfish consumed phytoplankton or other seston). While the nitrogen excreted by the shellfish may be used for the growth of phytoplankton (or other algae) in or near the farm, there is still a net loss of water column nitrogen because the shellfish incorporate a proportion of the total nitrogen in their tissues as they grow. The uncertainty communicated in the application, regarding the likelihood of shellfish in Big Glory Bay contributing nitrogen to the water column, is in my opinion unwarranted.

While shellfish farms cause a net loss of nitrogen from the wider environment, it is possible that some localised enrichment can occur. Filter-feeding shellfish (and other organisms that may settle on farm structures) capture nitrogen (and other elements) as they filter food particles from the water that passes through the farm. As a result, high biomass communities can grow on farm structures. Organic matter is deposited on the seabed via faeces, pseudo-faeces, fallen shellfish, and fallen or discarded fouling organisms. This deposition can cause a localised area of seabed enrichment. Seabed enrichment is beyond the scope of this review, and is dealt with in the review by Davidson. Potential water column implications of localised enrichment are lowering of dissolved oxygen levels and potential for mineralisation of organic bound nutrients that can result in some increases of dissolved nutrients (e.g. nitrate) in waters around a farm. The application states that “there is no indication that

¹ The production of N₂ (nitrogen gas) from other forms of nitrogen.

marine farming was impacting on DO levels in the bay". A modelled example where shellfish farming is recognised as contributing to low DO (hypoxia) events has been described for lagoons in France associated with oyster farming (e.g. Chappelle et al. 2000). I have not read the monitoring report for Big Glory Bay, but I do not know of New Zealand relevant examples where shellfish farming has produced sufficient seabed enrichment to have a large effect on either water column DO, or dissolved nutrients.

Generally, the principal concern for the water column from mussel farming is the depletion of phytoplankton communities (MPI 2013), commonly represented by the concentration of chlorophyll- a^2 . Depletion is not considered for the individual farms in the water column section of the application, but is partially considered in the 'carrying capacity' section (see below). Section 2 of the RFI response requests 'an overview of the general impacts of the shellfish farming, including references and relevant supporting extracts'. The response also lacks robust reference to depletion effects, however we note that this issue is again considered to some extent in the 'carrying capacity' section of the RFI response, where the authors mention that mussel farms may mitigate the effects of salmon farms by consuming phytoplankton.

Depletion of phytoplankton has been measured in some mussel farming areas. However, as summarised in the MPI-commissioned review of effects of aquaculture on the marine environment, "Typically, small New Zealand mussel farms have relatively little influence on the overall concentration of phytoplankton in the water column, particularly within the context of the wider spatial area surrounding the farms" (MPI 2013). The proposed farms are relatively small to medium in size (5 and 6 ha), although Big Glory Bay is a more enclosed space, with slower flushing times, than many mussel farming areas in New Zealand. Even if individual farms do not cause phytoplankton depletion effects that are environmentally significant, or measurable, it is possible that cumulative effects of all farms in Big Glory Bay may occur.

Cumulative effects/carrying capacity

Although depletion effects of the three proposed farms alone are likely to be minor, the total amount of mussel farming in the bay is unclear from the application. It is possible that the mussel farms cumulatively could have an adverse effect on phytoplankton communities and other filter-feeding organisms that rely on phytoplankton as a food source. The section on ecological carrying capacity addresses this to some extent, in that the authors state that 'Mussel production is consistent, and there does not appear to be any "competition" between the sites for ... food supply' (page 9). In the RFI response, the authors state that 'there is an obvious reduction in sites originally growing mussels' as a result of conversions of mussel farming areas to salmon farms. No detail is provided regarding this change. Confirmation of a reduction in bay-wide mussel farming intensity could resolve any concerns about the cumulative effects of depletion of the three proposed farms in addition to the existing farms.

² Chlorophyll-a is a light-harvesting pigment common to phytoplankton, it is typically used as a proxy for phytoplankton abundance as it can be measured relatively easily in the water column.

The issue of mussel farming as a nitrogen source is also revisited in section 6 of the 'Carrying Capacity' section of the RFI response. They refer to the conservative nitrogen model developed in the 1990s under which consent was given (now lapsed) for two of the three farms in the current application. They also provide further detail on the ways in which the model was highly conservative, given for example high production rates and not accounting for nitrogen loss at harvest. Once again, I am unsure why there is more attention to potential enrichment effects rather than depletion, although it may be that this section is directly concerned with the seabed rather than the water column.

An additional consideration noted in the RFI response is that shellfish farms may mitigate enrichment effects from salmon farms in Big Glory Bay. Given the reported results of past monitoring, it appears that mitigation is not necessary at this stage. Nonetheless, shellfish harvest is considered a possible mitigator of enrichment (e.g., Reitsma et al. 2017), and there is a case to be made for shellfish farming mitigating increased phytoplankton growth in the vicinity of feed-added aquaculture such as salmon farms. The relatively long flushing times given for Big Glory Bay would make this perhaps a more relevant consideration than in some other areas. Water is retained within the bay for between 5 and 14 days (page 10, RFI response). This is long enough for phytoplankton to have a growth response to additional nutrients from salmon farming, as phytoplankton typically have a doubling time of 1–3 days. This suggests that salmon farm nutrients could cause increased phytoplankton growth during periods of nutrient limitation in the bay (typically the summer period).

Waves and currents

Section 7 of the RFI response addressed the request for local information relevant to the effects of aquaculture on nutrients, restrictions on water movement, and wave attenuation. Issues regarding nutrients have been addressed above, so in this section I consider the hydrodynamic issues.

The authors of the RFI response state that there are several potential effects of mussel farming that are raised in Keeley et al. 2009³ (referred to as "the Cawthron Report" in the RFI response), that they do not directly address. In the RFI response, the authors state that there are 'gaps in our understanding of some of the processes that occur in and around farms, but filling those gaps is beyond the capacity of this one application'. I agree with the authors on this count. They go on to say 'nor is it considered necessary to do so in order to understand the significance of the potential adverse effects'. I assume that the latter statement is indicating that the knowledge gaps refer to effects that are likely to be very minor, and that the effects that are potentially adverse are better understood. In which case, I would also tentatively agree.

It is not unusual for mussel farming applications to be undertaken in the absence of information on environmental effects such as wave attenuation and effects on currents. To my knowledge, no negative environmental effects have occurred as a result of effects on waves and currents of mussel farms in New Zealand, although overall reductions in current

³ Note that the Literature Review of Ecological Effects of Aquaculture series published by MPI in 2013 is a more current piece of work which has a similar purpose to Keeley et al. (2013).

speed are possible (Plew 2011). Habitats most likely to be affected would be near-shore, where faster currents could scour shallower areas, or change conditions for reef-dwelling organisms. In the application under consideration, the proposed farms are positioned towards the middle of the bay, i.e., further offshore than existing farms. It seems to me that any effects on waves and currents near the new farms are therefore unlikely to be greater than those already caused by existing farms.

Cumulative effects are also possible with hydrodynamic effects. In the RFI response the authors state that 'The farms will have an effect on how the water flows around the bay but they will not impact on the overall flushing time'. The rationale for this statement is unclear. I would suggest that the positions of the proposed farms are such that they could conceivably contribute to a slowing of currents in Big Glory Bay, as is demonstrated in Plew (2011).

Monitoring

Water quality has not been monitored within farms at any point in the monitoring programme in Big Glory Bay (Table 2, Section 4 of the RFI response). Without getting into the details of the other farming operations in the bay, it is difficult to comment on ways in which the proposed farms might be incorporated, or the extent to which within-farm measurements would be appropriate. It is clear, however, that single-farm monitoring of the three proposed farms is likely to have limited ability to identify environmental effects of shellfish farming on the water column. Integrated monitoring in Big Glory Bay seems to be an appropriate approach, particularly with respect to mussel farming, as each farm is relatively small, and cumulative effects would be of more concern than single-farm effects. Modelling may supplement integrated monitoring, and could potentially replace some aspects of a physical monitoring programme.

Conclusions

The three shellfish farms applied for under 'APP-20181316 – Zane Smith & Jim Maass Barrett', are each unlikely to cause environmental effects of concern on their own. However, consideration of cumulative effects on phytoplankton depletion and current speed may be appropriate.

The application focussed on nutrient enrichment potentially caused by the proposed farms, however depletion effects are a more important consideration for the water column. Depletion effects are not well considered in the application or the RFP. While the effects of small- to medium scale farms are not generally expected to be of concern, the siting of the farms in an enclosed bay with significant existing mussel farming and relatively slow current speeds increases the likelihood of phytoplankton depletion.

The likelihood of cumulative effects of the multiple farms within Big Glory Bay is difficult to assess. A bay-wide approach is necessary to assess cumulative effects and can range in complexity. Quantification of the historical and current levels of mussel farming is required as the first step in any such assessment. In this case, it seems that if it can be demonstrated that the three proposed farms would not increase the intensity of mussel farming beyond that of the past farming intensity (due to other farms being converted from mussel to finfish farming) and those historic effects were acceptable, then concerns regarding cumulative

effects of mussel farms could be addressed. If an unacceptable degree of uncertainty remains after further information is sought, a staged approach to development (with appropriate monitoring) of the proposed farms may be appropriate.

Single-farm monitoring would not address bay-wide effects of aquaculture on the water column, and integrated monitoring and/or modelling would be a better approach.

I hope this review is of use, please do not hesitate to contact Cawthron if we can be of further assistance.

Yours sincerely

Scientist



Emma Newcombe
Coastal Ecologist
Cawthron Institute

Reviewed by



Ben Knight
Marine Biophysical Scientist
Cawthron Institute

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Appendix 4 - Recommended Schedule of Conditions

Term and Purpose

1. This consent expires on the [redacted], unless it has been lapsed, cancelled or surrendered at an earlier date pursuant to Sections 125, 126 or 138 respectively of the Resource Management Act 1991.

Comment [AM1]: Recommendation is 20 years from the date of approval

Note:

- (a) *In accordance with Sections 125 and 126 of the Resource Management Act 1991, this coastal permit may be lapsed or cancelled if it has not been exercised within 5 years from the date of granting or if exercised in the past but has not been exercised during the preceding 5 years. Continuing to exercise this coastal permit means the site is actively used to farm the authorised species, not just having structures on the site.*
- (b) *Pursuant to Sections 123 and 124 of the Resource Management Act 1991, a new consent may be required at the expiration of this consent. The application will be considered in accordance with the plans in effect at that time, and the adverse effects of the proposed activity. The holder of this coastal permit has a preferential right to apply for a new consent pursuant to Sections 165ZH and 124 of the Resource Management Act 1991.*
2. (a) This consent authorises the placement of structures in, on and over the seabed, and the occupation of the coastal marine area with the structures for the purpose of marine farming the following species:
- Green-lipped mussels (*Perna canaliculus*);
 - Blue mussels (*Mytilus galloprovincialis*);
 - Ribbed mussels (*Aulacomya ater*)
 - Scallops (*Ostrea chilensis*)
- as described in the application (APP-20181316) for resource consent dated May 2018 and updated with: further information dated 23 August 2018 and 12 December 2018, and an email from the applicant dated 11 July 2019.
- (b) Except for green-lipped mussels, spat and stock shall only be obtained from the Stewart Island/Rakiura coastal waters.
- (c) All green-lipped mussel spat and stock shall be obtained from Ninety Mile Beach, unless authorised by a separate resource consent.
- (d) This consent also authorises the deposition, on the seabed, of material, arising from marine farming the various organisms.
3. The occupation of the coastal marine area for marine farming activities, pursuant to this consent, shall only occur within the application co-ordinates as detailed below and shown on the attached in Appendix 1.

Site	Corner	Eastings	Northings	Area (ha)
Site 1	NE	1229203.93	4786587.20	6
Site 1	SE	1229236.61	4786261.04	
Site 1	SW	1229043.82	4786190.15	
Site 1	NW	1229076.70	4786488.97	
Site 2	NE	1228804.62	4784931.42	5
Site 2	SE	1228762.07	4784787.58	
Site 2	SW	1228570.29	4784844.31	
Site 2	NW	1228612.84	4784988.15	
Site 3	NE	1229226.68	4785067.47	5
Site 3	SE	1229784.13	4784923.64	
Site 3	SW	1228992.34	4784980.37	
Site 3	NW	1229034.89	4785124.21	

In addition, all used and unused mussel anchors outside the above co-ordinates that are detailed on the attached survey map are to be considered part of the marine farm site.

4. Except to the extent that it is necessary to achieve the purpose of this consent and for public safety, members of the public shall not be excluded from the marine farm site at all times.

Note: This consent does not authorise exclusive occupation within the authorised area even though the marine farming structures and operations will result in some physical exclusion over part of that area. The extent that the physical exclusion over part of the authorised area is necessary for the normal operation of the marine farm is provided for by this consent (refer to Section 122(5) of the Resource Management Act 1991).

Restrictions on Operations

5. (a) The consent holder shall at all times during the continuance of this consent maintain the marine farm structures, including but not restricted to the associated structures of anchors, lines, droppers, buoys, and if relevant cages and fixed barges, in good repair, appearance and condition. The marine farm structures shall also be secured so as to not create a navigation hazard. No significant alteration or deviation from the authorised structures that may adversely alter the impact on the environment is permitted without the prior written approval of the Council's Director of Policy, Planning and Regulatory Services.

Note: Any such alteration may require an application for a new resource consent or an amendment to this consent.

- (b) Any authorised officer of the Council may, at all times, enter upon the marine farm structures and view its state of repair, including all associated structures. Upon receipt of a notice in writing, of any defect or want of repair in the structures, requiring the consent holder to repair the structures, the consent holder shall, with all reasonable speed, cause the defect to be removed or the repairs to be made.

6. (a) The consent holder shall ensure all the marine farming structures are laid out and the boundaries of the marine farm marked and lit in accordance with the navigation and safety requirements of the Council's Harbourmaster or their delegate.

Note: Navigation and safety guidelines for aquaculture areas can be found in the "Guideline for Aquaculture Management Areas and Marine Farms" booklet dated December 2005 produced by Maritime New Zealand, or its replacement booklet.

- (b) Except for the purpose of navigational safety pursuant to condition 9(a), the exterior colour of any structures used on the marine farm site shall be consistent with the surrounding physical landscape.

7. The consent holder shall manage the marine farming operation in such a way that deposition of shell, and other material, on the seabed is minimised. Any shell and other material collected from the site shall not be disposed of in the coastal marine area in an unauthorised manner.

8. (a) Any equipment or materials, excluding vessels, used in the coastal marine area, for marine farming purposes, which have been previously used or stored in another geographic coastal marine area, shall be thoroughly cleaned and sterilised before transport to the marine farm site and used. It shall be the consent holder's responsibility to ensure that any marine farming structure, including associated structures, is maintained free of unwanted organisms and pests as identified by either or both Biosecurity New Zealand or the Council's Regional Pest Management Strategy. Any removed unwanted organism or pest shall be disposed of at an authorised land disposal site, to the satisfaction of the Council's Director of Policy, Planning and Regulatory Services.

Note:

(a) *Another geographic coastal marine area from Big Glory Bay is outside of the Stewart Island / Rakiura coastal waters.*

(b) *Under Section 44 of the Biosecurity Act 1993 every person has a duty to inform Biosecurity New Zealand, as soon as practicable, of the presence of an organism not normally seen or otherwise detected in New Zealand.*

(c) *Under Section 46 of the Biosecurity Act 1993 every person is required, without unreasonable delay, to notify the chief technical officer at Biosecurity New Zealand of the presence or possible presence of notifiable organisms. Unwanted organisms also fit under this category.*

- (b) The consent holder shall advise the Council's Biosecurity Manager, no later than 5 working days after detecting any incidence of unwanted organisms and/or pests not normally seen or detected within Big Glory Bay.

Comment [AM2]: This condition may not be required if covered within the Biosecurity Management Plan.

9. The consent holder shall ensure that:

- (a) the marine farm site identification number _____ is displayed above the water level at each four corners of the surface infrastructure block, and if relevant on the salmon marine farm structure, at all times to the satisfaction of the Council's Compliance Manager;
- (b) no equipment or materials from the marine farming activity is stored in an unauthorised manner;

- (c) all rubbish is removed from the marine farm site and disposed of at an authorised refuse site;
 - (d) any material lost from the marine farm site is retrieved where relevant, as soon as practicable;
 - (e) all reasonable steps are taken to retrieve any lost material from the marine farm site that could constitute a navigation hazard, and the Council's Harbourmaster is notified immediately of the situation;
 - (f) other than the deposition authorised under Condition 2, no oil, diesel, petrol, grey water, detergents, cleaning materials, bilge water, sewage or any other toxic or polluting substances, shall be discharged into the coastal marine area at the site, either directly or indirectly, as a result of exercising this consent;
 - (g) in the event of any spill of oil or fuel at the marine farm site, the first person to the scene shall:
 - (i) take immediate steps to contain the spill and to recover it; and
 - (ii) notify as soon as practicable the Southland Regional Council's pollution hotline on 03 211 5245 that a spill has occurred. Notification shall include the type and quantity of oil or fuel spilled and the steps taken to remedy or mitigate any adverse effects; and
 - (h) in the event of a spill of any contaminant, no dispersants or degrading agents shall be discharged to water without the approval of the Southland Regional Council.
10. In the event a marine mammal is entangled or stranded within the marine farm structures, the consent holder shall as soon as practicable contact the Department of Conservation Southland Conservancy.
11. Neither the issuing of this consent nor anything contained in it shall affect the liability of the consent holder for any injury caused by the marine farm structures to any vessel or person through any default or neglect of the consent holder.
12. Upon expiry of the period for which the consent is granted, or on any cancellation of the consent, the consent holder shall, if required by the Council to do so, remove the marine farm structures, including all associated structures, entirely from the site and to restore the site as near to its original condition within three months of the date of expiry, or cancellation. If the consent holder fails to do so, the Council may cause the marine farm structures, including all the associated structures, to be removed and the site restored, and may recover the costs incurred by the removal and restoration from the consent holder.

Monitoring

13. (a) The consent holder shall carry out the Big Glory Bay Monitoring Programme specified in Appendix 2.
- (b) The consent holder shall carry the following monitoring programme for the activity authorised by Condition 2(d) of this consent:
- (i) Monitor at least 10 percent of each re-seeded crop transferred to Big Glory Bay by lifting the trays on which seeded stock are attached out of the water and visually inspect for contamination by any unwanted pests and/or species not found within Stewart Island coastal waters at 1, 3, 6 and 12 months after the droppers are hung. Visual Inspections shall also be undertaken at the time the

re-seeded crop is harvested. The work is to be carried out by a suitably qualified person to detect unwanted organisms and pests.

- (ii) Ensure that if any unwanted organism, pest (excluding Undaria), and/or species not found within Stewart Island coastal waters is found on the re-seeded crop, the trays and re-seeded stock are removed immediately from the coastal waters and disposed of at an authorised land disposal site. In addition, the surrounding area shall be inspected and, if necessary, cleaned of the unwanted organism pest (excluding Undaria), and/or species not found within Stewart Island coastal waters, and a monitoring program approved by the Council's Director of Policy, Planning and Regulatory Services established to ensure the unwanted organism pest (excluding Undaria), and/or species not found within Stewart Island coastal waters no longer exists at the location. If the unwanted organism pest (excluding Undaria), and/or species not found within Stewart Island coastal waters infestation are such that the biosecurity of Stewart Island is considered to be at risk, then the consent holder shall remove all of the trays and other equipment used for the re-seeded crop from the coastal marine area.
- (iii) The consent holder shall maintain a log of all re-seeded spat and stock, including the timing, amount and location of re-seeded spat and stock, treatments and monitoring carried out in accordance with Conditions 13(b)(i) and 13(b)(ii) of this consent. A copy of the entries in this log shall be made available to the Council on request.

14. Monitoring in accordance with the Big Glory Bay Monitoring Programme specified in Appendix 2 shall conform with the following standards:

- (a) sample collection, preservation and analysis of the seabed samples shall be carried out by a suitably qualified person or as agreed to, in writing, by the Council's Director of Policy, Planning and Regulatory Services;
- (b) sample collection, preservation and analysis of the water quality samples shall be carried out in accordance with the most recent edition of APHA "Standard Methods for the Examination of Water and Wastewater" or as agreed to, in writing, by the Council's Director of Policy, Planning and Regulatory Services;
- (c) the monitoring and analyses are to be carried out by a laboratory with IANZ accreditation or equivalent, or as agreed to, in writing, by the Council's Director of Policy, Planning and Regulatory Services;
- (d) the result of seabed analysis shall be supplied to the Southland Regional Council no later than five working days of the consent holder receiving them. The methods of analysis are to be specified with the results;
- (e) the results of water quality analysis shall be supplied to the Southland Regional Council no later than 20 working days from the end of the month in which the samples are taken. The methods of analysis are to be specified with the results; and
- (f) the Southland Regional Council may audit monitor sample collection up to once each year at a cost covered by the consent holder.

15. The consent holder shall undertake an investigation, if the result from any one sample in the Big Glory Bay Monitoring Programme identifies an adverse effect on the environment, to determine the probable cause of the adverse effect. A report shall be provided summarising the results and analysis on completion of the investigation sampling, but no later than two months from the initial sample that identified an adverse effect being provided to the Council.
16. The consent holder shall provide an annual report summarising the results and analysis of the Big Glory Bay Monitoring Programme on completion of the sampling but no later than 31 July each year.

Other Permits

17. The granting of this consent does not absolve the consent holder from the responsibility to obtain any approval, permit, licence, concession or consent from any other body.

Council Charges

18. In consideration of the right to occupy Crown land in the coastal marine area for the activity specified above, the consent holder shall, each year, pay to the Southland Regional Council the appropriate coastal occupation charge specified in the Regional Coastal Plan. Each financial year, commencing 1 July, the charge shall be adjusted for inflation in accordance with the Consumer Price Index. The sum payable in the first year of this consent (or the proportion thereof for which the consent is current) is \$____ plus GST, and shall be payable in advance on invoice. The revenue from this charge shall be used only for the purpose of promoting the sustainable management of the coastal marine area.
19. In addition to the above sum, the consent holder shall pay an administration and monitoring charge to the Southland Regional Council collected in accordance with Section 36 of the Resource Management Act, payable upon invoice.

Biosecurity Management Plan

20. The consent holder shall undertake all parts of their activity in accordance with the Biosecurity Management Plan provided as part of the application documents titled 'xx' dated xx.

Comment [AM3]: New condition

Review of Conditions

21. The Southland Regional Council may, in accordance with Sections 128 and 129 of the Act, serve notice, during the months of August to October each year, of its intention to review the conditions of the consent for the purposes of:
 - (i) dealing with any adverse effect or cumulative effects on the environment which may arise from the exercise of this consent; or
 - (ii) considering any changes to information on the effects of marine farming, particularly information gained from monitoring; or
 - (iii) complying with the requirements of a regional plan; or

- (iv) providing for a bond if further investigation and/or information, including relevant case law on the application of bonds to consents, shows that one is necessary to avoid, remedy or mitigate potential adverse effects on the environment.

Note: The consent holder may request the Council to collaboratively review under Section 127 of the Act any specific consent conditions at any time for the same purposes in Condition 20 (a)-(d).

for the **Southland Regional Council**

Michael Durand
Consents Manager

APPENDIX TWO
Big Glory Bay Monitoring Programme

1. The consent holder shall monitor the effects of the marine farming activities on the seabed, as follows:
 - (a) (i) except for LI339, LI340, MF249, MF250, MF271, MF272 and MF365, monitoring of the seabed at representative locations under the marine farm site shall be undertaken at least once prior to 1 January 2025.

Note: It is the Council's intention that the Programme shall monitor at least two marine farm sites per year within the bay from the following marine farm sites LI149, LI315, LI316, LI317, LI318, LI319, LI320, LI321, LI322, LI323, LI324, LI325, LI337, LI338, LI342, LI366, LI418, LI461, LI474, LI475, MF244, MF245, MF246, MF247, MF248, MF273, MF274, MF275 and MF326 so each site is monitored at least once prior to 1 January 2025.
 - (ii) in addition to Clause 1(a)(i), monitoring of the seabed at two control sites identified in the Programme and approved, in writing, by the Council's Director of Policy, Planning and Regulatory Services. The monitoring shall occur every year for the first three years, then once every three years thereafter.
 - (b) the samples will be analysed for the following to assess the sediment quality:
 - sediment colour, including providing a colour photograph of the sediment sample;
 - depth of the oxygenated layer below the sediment surface;
 - occurrence of hydrogen sulphide;
 - sediment texture and grain size;
 - total organic carbon content; and
 - infaunal and epifauna community composition.
2. The consent holder shall monitor the effects of the marine farming activities on the water quality, as follows:
 - (a) (i) monitoring of the water column shall be undertaken monthly for the first two years, commencing from 1 July 2011, by taking samples at four sites within Big Glory Bay and two control sites inside the bay, at a depth of 5 metres, as identified in the Programme and approved, in writing, by the Council's Director of Policy, Planning and Regulatory Services.
 - (ii) after the first two years outlined in clause 2(a)(i), monitoring of the water column shall be undertaken three times during the period of 1 November to 30 June each year and once during the period of 1 July to 31 October each year at four sites within Big Glory Bay and two control sites inside the bay, at a depth of 5 metres, as identified in the Programme and approved, in writing, by the Council's Director of Policy, Planning and Regulatory Services.

(b) the water quality samples will be analysed for the following:

- water temperature;
- chlorophyll *a*;
- vertical seechi depth; and
- dissolved oxygen.

Andrew Maclennan

From: John Engel <john@bonisch.nz>
Sent: Thursday, 11 July 2019 2:06 PM
To: Andrew Maclennan
Subject: APP-20181316 - Zane Smith & Jim Maass-Barrett application for marine farming

Follow Up Flag: Follow up
Flag Status: Completed

Hi Andrew.

I wish to formally advise that Zane Smith & Jim Maass-Barrett wish to amend their application by removing oysters from the species to be farmed.

Ideally, they would like to retain the oysters in case they are ever able to be farmed again in the future, in the same way that oysters are still part of a number of the existing consents in Big Glory Bay. However, as the likelihood of that happening in the foreseeable future is low, and it is the only matter that concerns a number of the submitters, Messrs Smith and Barret have decided to remove them from the application.

By taking this action, Te Ao Marama Inc has withdrawn its right to be heard (a copy of the withdrawal form has been sent directly to the Council), and Bluff Oyster Management Co. Ltd has advised that it will also, although its status is still to be confirmed.

Following discussions with the applicants, EEC Ltd (Helen Cave) has also agreed to withdraw and, as I advised you previously, the Department of Conservation is also withdrawing but I haven't received that in writing yet.

In regard to possible consent conditions should the Commissioner decide to grant the application, are you able to advise if Council will recommend any significant changes to the standard ones that were applied to shellfish farming following the aquaculture reform work in about 2010-11. As this matter may still have to go to a hearing, it would be useful for the applicants to know sooner rather than later so that they can address those changes in evidence and submissions.

Thanks.

John

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