V4

_FINAL

Port Pegasus/ Pikihatiti Salmon Farms

Natural Character, Landscape and Visual Amenity Effects Assessment
Prepared for Environment Southland & Ministry for Primary Industries

11 October 2017

Document Quality Assurance

Bibliographic reference for citation:
Boffa Miskell Limited 2017. *Port Pegasus/ Pikihatiti Salmon Farms: Natural Character, Landscape and Visual Amenity Effects Assessment*. Report prepared by Boffa Miskell Limited for Environment Southland & Ministry for Primary Industries.

Prepared by:	James Bentley Principal Landscape Architect Boffa Miskell Limited	
Reviewed by:	Yvonne Pfluger Principal Landscape Architect Boffa Miskell Limited	
Status: Final	Revision / version: [E]	Issue date: 11 October 2017

Template revision: 20150331 0000

File ref: C16160A_01e_Natural_Character_Landscape_Assessment_Clean_20171011.docx

Cover photograph: [Port Pegasus coastal interface, © James Bentley, 2017]

CONTENTS

Appendices

Executive Summary

The Ministry for Primary Industries (MPI) along with The Southland Regional Development Strategy (SoRDS) have identified opportunities for fin fish farming within the Southland Region. Investigations into this have identified the North Arm of Port Pegasus, Stewart Island/ Rakiura as being an area where fin fish farming could occur. Boffa Miskell was commissioned by MPI and Environment Southland to undertake a Natural Character, Landscape and Visual Amenity Assessment for investigations for various scenarios of fin fish farming, assisted by ecological data provided by Cawthron, the Department of Conservation and Environment Southland.

The North Arm of Port Pegasus is located in a part of the remote and isolated east coast of southern Stewart Island. Stewart Island is renowned for its wild and remote landscape values, containing very high levels of naturalness and very high heritage values. Human modification is limited to discrete parts of the island.

Being remote and isolated from much of mainland New Zealand has resulted in the island holding a relatively diverse number of terrestrial habitats, ranging from indigenous forests and shrublands to wetlands, sand/ dune communities and alpine ecosystems. There is a wide diversity of indigenous species on and around Stewart Island, including rare and endemic lizards and invertebrates, and birds such as the Stewart Island brown kiwi/tokoeka.

Within 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 subantartic waters further south. An array of marine wildlife 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 highly natural marine habitats in New Zealand. It is the southern extreme of many mainland species and communities.

In terms of cultural and heritage aspects, Stewart Island is extremely important to Maori where numerous middens, burial areas and waka-landing sites have been identified that support this. European adventurers have also explored this island, setting up sealing and whaling related activities.

Based on the above, Stewart Island, and the North Arm of Port Pegasus, holds special landscape values and has been assessed as being an Outstanding Natural Landscape, under Section 6(b) of the RMA and under Policy 15 of the NZCPS.

Furthermore, due to North Arm's limited modifications holding almost intact indigenous marine and terrestrial habitats, it is concluded that this area retains Outstanding levels of Natural Character under Section 6(a) of the RMA and under Policy 13 of the NZCPS.

Allied to this, the Island, including North Arm, also holds very high levels of amenity values.

The introduction of structures and modifications will affect many of the values that make this part of Stewart Island outstanding. For landscape, it is considered that the insertion of salmon farming would adversely affect the landscape and natural qualities of North Arm of Port Pegasus and of Big Ship Passage to such a degree that the area, or part of the area, could no longer be considered outstanding, irrespective of a chosen scenario. Part of North Arm and Big

Ship Passage would then be aligned with the non-outstanding rating of Big Glory Bay and parts of Half Moon Bay, where a relatively high level of development has occurred. As a result, it is considered that the scenarios assessed here would be contrary to the RMA and the direction of the objectives and policies of Policy 15 (1) of the New Zealand Coastal Policy Statement, as well as the regional and district plans. The effects would be significant within the North Arm of Port Pegasus.

For natural character, and with the natural elements, patterns and processes evident within North Arm being amongst the highest in the country, these enclosed waters will be adversely affected by the development scenarios, both at a broad scale and at a more local scale. The farm scenario would interrupt and be discordant with the natural elements, patterns and processes that are currently present and would affect the scale and natural cohesiveness of the area, directly impacting on experiential aspects. It is concluded that all scenarios will have very high adverse natural character effects both at the broad and more local scales. The scenarios would also be inconsistent with the RMA and the direction of Policy 13 (1) (a) of the New Zealand Coastal Policy Statement.

With visual amenity values, irrespective of which scenario is chosen, the grow out farms in Big Ship Passage would be very visible for up to 2km and when travelling south from North Arm, may appear partly against the horizon, amplifying their visual presence. They would affect the visual cohesion of the area and with their central presence within Big Ship Passage, their visual presence would be amplified.

The location of any semi-industrial style activity within an area retaining outstanding landscape and natural character values, with no or very little existing modification, will create significant adverse effects on those values that underpin the landscape and natural character overlays. Irrespective of where the farms are located and which scenario is selected, the effects cannot be avoided, remedied or mitigated. The key visual effects relate principally to the insertion of human elements within a wholly natural environment.

The significance of landscape, natural character and visual amenity effects is considered to be in the highest category on the scale of effects outlined in the methodology. The scenarios constitute a substantial change to an area holding some of the most sensitive and valued landscape, natural character and visual amenity values in the country, leading to highly adverse effects, irrespective of which scenario is chosen.

1.0 Introduction

1.1 Boffa Miskell Limited (BML) was commissioned by Environment Southland (ES) and the Ministry for Primary Industries (MPI) to undertake a Natural Character, Landscape and Visual Amenity Assessment for investigations into finfish (salmon) farming to be located within the waters of Port Pegasus (North Arm), Stewart Island. Currently there is no aquaculture development or permanent structures within the waters of Port Pegasus.

1.2 BML have worked alongside the Cawthron Institute (Cawthron), MPI, ES, the Department of Conservation (DOC) and Southland Regional Development Strategy (SoRDS) staff to understand the investigation requirements and to assist in developing options for the design and placement of the farms. The clients are aware of the very high landscape and natural character sensitivities of Port Pegasus from initial discussions and this report assesses the effects of several scenarios against these high values and characteristics. BML is also aware that under the current statutory documents, the placement of salmon farms within Port Pegasus is a prohibited activity. This report and other specialist assessments articulate the effects of the scenarios, while overall decisions on the appropriateness of such an activity will be made by the relevant consent authorities and/or other decision makers.

1.3 Within this report, 'the Site' refers to the location of all of the salmon farming infrastructure scenarios within the two areas in the North Arm of Port Pegasus (see Image 1). All the scenarios are indicative, designed to test the feasibility and effects of certain production levels in the two general areas. In the scenarios, all infrastructure is located within the water-space and not on the land. Additional potential land-based infrastructure for staff accommodation and feed storage has not been taken into account within this report.

1.4 A **graphic attachment** accompanies this report with a number of maps and photographs, taken by the author and peer-reviewer during on-site investigations undertaken on 22 May 2017. The site visit involved investigations by boat in the North and South Arm of Port Pegasus.

1.5 BML has a long and involved history with aquaculture related activities throughout New Zealand, being involved with landscape, visual and natural character assessments for many complex applications for both applicants and councils. Based on this, BML personnel is considered to have the skills and experience to undertake this assessment.

Purpose and Scope of report

1.6 This landscape and visual assessment considers all aspects of the scenarios throughout construction and operation, including the effects of introducing structures into the Port Pegasus North Arm landscape. The report also considers the various scenarios considered, including location, layout and design of the structures. As mentioned above, the scenarios are indicative and potential land-based infrastructure for staff accommodation and feed storage has not been taken into account within this report.

Investigation and Potential Options

1.7 MPI is investigating the potential for establishing salmon farming operations within the waters of North Arm in Port Pegasus. Alongside a series of studies undertaken by Cawthron, MPI and Boffa Miskell, broad areas were identified based on benthic habitat value and suitability, and a series of farm scenarios developed. The hatched area on the plan is essentially governed by biological data observed by Cawthron, and represents areas where some of the most ecologically significant benthic species and habitats are not present. This area is outlined below on Image 1.

Image 1: Identified areas of where salmon farming activities could be considered

1.8 Through a series of telephone-based workshops, where ecological and landscape considerations were discussed, these areas were refined and a series of scenarios developed based on different tonnages of fish and different polar cage sizes. Tonnage relates to a series of considerations, including water flow, water depth and location.

1.9 These initial scenarios were presented and developed as part of the first draft of this report. Following a review of the initial reports, a review of the scenarios was undertaken to maximise their efficiency following receipt of further technical information from Cawthron. Based on this, a refreshed set of scenarios was developed, centred around one smolt growing area in North Arm and four mid-channel farms in Big Ship Passage. These refined scenarios were centred on fixed 160m circumference pens (as opposed to pens of varying sizes) and developed around the quantum of feed and number of pens required to safely manage fin-fish farming in these locations.

1.10 As a result, this assessment assesses four indicative infrastructure scenarios, to test different configurations of feed quantity and pen numbers. These are listed as Scenarios 1a, 2a, 3a and 4a. A further set of scenarios have also been developed, based on scenarios (a), where the same amount of infrastructure is required however their quantum of feed has been increased. This second set of scenarios (listed as Scenarios 1b, 2b, 3b and 4b) is based on increasing the density of fish and consequently the quantity of feed.

1.11 The following scenarios were established by the client and considered under this assessment (Table 1):

Table 1: Production number and farm sizes[1]

Scenario	Input parameters	Farming area				Grow-out totals	Smolt totals
		f1	f2	f3	f4		
1a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		64
	Number pens	16	16	16	16	64	8
	Total feed (tonne)	2100	2100	2400	3600	10200	510
	Total production (FCE 1.7)	1235	1235	1412	2118	6000	
2a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		63
	Number pens	8	10	14	14	46	6
	Total feed (tonne)	1050	1312.5	2100	3150	7613	381
	Total production (FCE 1.7)	618	772	1235	1853	4478	
3a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		79
	Number pens	6	8	12	12	38	4
	Total feed (tonne)	787.5	1050	1800	2700	6338	317
	Total production (FCE 1.7)	463	618	1059	1588	3728	
4a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		60
	Number pens	4	6	8	10	28	4
	Total feed (tonne)	525	787.5	1200	2250	4763	238
	Total production (FCE 1.7)	309	463	706	1324	2801	
1b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		85
	Number pens	16	16	16	16	64	8
	Total feed (tonne)	2800	2800	3200	4800	13600	680
	Total production (FCE 1.7)	1647	1647	1882	2824	8000	
2b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		85
	Number pens	8	10	14	14	46	6
	Total feed (tonne)	1400	1750	2800	4200	10150	508
	Total production (FCE 1.7)	824	1029	1647	2471	5971	
3b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		102
	Number pens	6	8	12	12	38	4
	Total feed (tonne)	1050	1400	2400	3600	8450	407
	Total production (FCE 1.7)	618	824	1412	2118	4971	
4b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		79
	Number pens	4	6	8	10	28	4
	Total feed (tonne)	700	1050	1600	3000	6350	317
	Total production (FCE 1.7)	412	618	941	1765	3735	

[1] Cawthron (October 2017) Report No. 3047 Benthic Habitat Assessment: North Arm Port Pegasus/ Pikihatiti, Table A9.1 Farm scenarios and parameters, page 92

1.12 Each scenario includes five barges associated with each farm (grow out pens and smolt). The scenarios are further described within Section 3 of this report illustrated in **Appendix 3**.

Methodology

1.13 While there is no universally accepted method for natural character, landscape and visual assessments, best practice combines both technical and evaluative components and is tailored to suit the nature of the project and its context including the framework of the governing legislation. For the purposes of this assessment, the Resource Management Act (RMA) is the principal Act under which the assessment has been made.

1.14 Within **Appendix 1** of this report is a more detailed methodology which is summarised. below:

- Description of Existing Landscape. The existing landscape is described in terms of the current landscape's physical, perceptual and associated factors. An evaluation was also undertaken to determine the landscape's significance when assessed against sections 6(a) and 6(b) of the RMA as well as the objectives of the Conservation Act, and provisions in the Southland Regional Policy Statement and Stewart Island/Rakiura Conservation Management Strategy insofar as they apply to landscape.
- Relevant Statutory Provisions. Consideration has been given to statutory provisions relevant to natural character, landscape and visual matters. These are identified in Section 4 of this report.
- Assessment of Natural Character, Landscape and Visual Amenity Values. A stock take of existing documents and the values identified. Furthermore, a review of other scientific reports relevant to this investigation is undertaken, notably for natural character reasons.
- Assessment of Natural Character and Landscape Effects. Assessment of the scenarios against the existing landscape character and values identified above in the context of RMA Sections 6(a) and (b), the New Zealand Coastal Policy Statement, the Conservation Management Strategy and the Conservation Act 1987. Note this report does not consider effects on significant ecological values in terms of Section 6(c) of the RMA.
- An assessment of the visual amenity effects as a result of the changes to prominent or important views, aesthetic coherence and to public accessibility.
- An assessment of cumulative effects is included, since multiple farms are included in each scenario.
- Recommendations: Where appropriate, measures are recommended in order to avoid or mitigate the level of potential natural character, landscape and visual amenity effects, where possible.

Data Sources

1.15 Key data sources used in the preparation of this assessment include:

- The relevant statutory planning documents (refer to Section 4 of this report)
- Relevant expert reports including:
    - Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti prepared by Cawthron (Report No. 3047) and dated October 2017.
    - Pelagic Biophysical Assessment: Port Pegasus/ Pikihatiti prepared by Cawthron (Report No. 3076) and dated October 2017Review of potential NZ sea lion interactions with aquaculture at Port Pegasus / Pikihatiti, prepared by NIWA for the Department of Conservation (Report No: 2017264WN), August 2017
- Google Earth
- NZ 1:50,000 Topographical Maps
- Observations and photographs recorded during field work

Site Visits and Photographic Records

1.16 A site visit by boat was undertaken by James Bentley and Yvonne Pfluger on Monday 22 May 2017. The weather was overcast. The sea conditions off the eastern coast of Stewart Island were reasonably calm, with a swell recorded of between 2.0 to 3.0 metres. Within Port Pegasus, the swell was significantly less, to virtually very calm conditions. There was little wind. The boat sailed from Oban down the eastern coastline of Stewart Island to Port Pegasus. Once there, the main vessel anchored and a smaller boat was used to explore the northern part of North Arm, noticeably Belltopper Falls and the location of the former freezing works. The vessel then travelled down the north-western part of North Arm, visiting Albion Inlet, Bens Bay and Bulling Bay before exiting North Arm through Pegasus Passage towards South Arm. In South Arm, Shipbuilders Cove was visited followed by the western end of South Arm near Bald Cone. The vessel then travelled to Disappointment Bay and Fright Cove, before exiting through South Passage and back to Oban.

1.17 A series of photographs were taken during the boat trip and a selection of these are included within the accompanying Graphic Supplement (Site Photographs 1 to 20).

2.0 Description of Existing Environment

Site Location

2.1 The Site is located with North Arm of Port Pegasus, a remote and isolated part of the east coast of southern Stewart Island (see **Figure 1** Location Plan in graphic attachment).

Stewart Island

2.2 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 (see Figures 3 and 4). Human modification is limited to discrete parts of the island, such as Halfmoon Bay where the principal small settlement of Oban is located, and Horseshoe Bay. Throughout the remainder of the island, modification is limited (e.g. recreation infrastructure such as tracks and huts).

2.3 Having geological links to the granite geology of Fiordland, Stewart Island/ Rakiura contains a range of impressive landforms, from the granite and schist ridges of the southern inland ranges to the broad inland freshwater basin and bogs in the north (see Figure 2). Being a highly indented island, Stewart Island/ Rakiura contains two large and several smaller inlets. Patterson Inlet on the east coast and Port Pegasus on the southern coast are the most significant in terms of sizes and complexity and contain quieter, more settled waters, whilst the remaining coastline is rugged and rocky. Broad sandy beaches are also evident, with the most significant beach being at Mason Bay on the west coast.

2.4 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 (see Figures 2 and 5). 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 littoralis*, lancewood and tree ferns. Some browsing is experienced throughout the island by deer and possums. The ground and shrub tiers of the forest are often sparse with very few young hardwood trees.

2.5 There is a wide diversity of indigenous species on and around Stewart Island, including rare and endemic lizards and invertebrates, and birds such as the Stewart Island brown kiwi/tokoeka. Other rare/ threatened birds include three penguin species (yellow-eyed penguin, Fiordland crested penguin and little blue penguin) as well as other birds, including the weka, southern NZ dotterel, shags, Stewart Island robin and Stewart Island fernbird. The critically endangered kakapo exists on Codfish Island. Stewart Island/ Rakiura also has nationally significant populations of sooty shearwater, red-crowned parakeet and South Island saddlebacks[2].

2.6 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 subantartic 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 wildlife 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

[2] Conservation Management Strategy Stewart Island, page 26

highly natural marine habitats in New Zealand. It is the southern extreme of many mainland species and communities.

2.7 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 Rakitamau, 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 Rakiura is also referred to as Te Puka a te Waka a Maui 'The Anchor of Maui's Canoe'

2.8 It is understood that people first stepped ashore 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.

2.9 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.

2.10 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".

2.11 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".

2.12 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[3]".

2.13 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.

Port Pegasus/ Pikihatiti

2.14 Port Pegasus/ Pikihatiti forms the second largest sheltered inlet in Stewart Island and is located on the island's southern coast (see Figures 5 and 8). Port Pegasus/ Pikihatiti

[3] Only the Twittering of Birds, Ulva Goodwillie. Quote used in this text: *"The face of the earth is changing so rapidly that soon there will be little of the primitive nature left. In the Old World, it is practically gone forever. Here, then, is Stewart Island's prime advantage and one hard to overestimate. It is an actual piece of the primeval world."* Leonard Cockayne, 1909

comprises two distinct ‘arms’; north and south waterbodies connected by the narrow Pegasus Passage. Port Pegasus/ Pikihatiti is reasonably remote and isolated from the rest of the island, with travel to the area restricted to a three-hour boat journey from Oban or a long multi-day tramp through the centre of the island. The area is used as shelter by passing boats as well as supporting a number of recreational activities, including hunting, fishing, diving, tramping and kayaking. North Arm is relatively exposed to wave action through Big Ship Passage, but Pearl Island in the east provides shelter from the easterly and south-easterly swells. South Arm is more sheltered and relatively shallow in comparison (c. 20-28 m water depth)[4]. Port Pegasus/ Pikihatiti also retains a relatively a number of historical associations (see Figure 9). These are described further below.

2.15 In the national context, Port Pegasus is arguably one of New Zealand’s most natural inlet environments. The relative lack of human activity and the protected forested catchments mean that human impacts on the inlet ecosystem are lower than other similar landscapes. Such places are increasingly uncommon at the national and international scales. In 2010-2012 Port Pegasus was selected as a benchmark of a pristine inlet for DOC’s national marine monitoring programme.

North Arm

2.16 North Arm is defined by the naturally indented shoreline to the north and by Pearl Island to the south. Whale Passage, forming a narrow channel to the north-east provides access to vessels travelling from the north and the wider Big Ship Passage defines the southernmost channel used for boat access. A smaller channel, Pegasus Passage connects westwards with South Arm. Anchorage Island and Noble Island act as a division between the North and South Arms.

Image 2: North Arm of Port Pegasus

2.17 The topography of North Arm is reasonably consistent close to the shore, where rounded and steep landforms define the numerous large and small embayments that extend right around the perimeter of this stretch of water. Beyond the shoreline, steeper topography is evident, such as the Tin Range to the north-east. The shoreline is

[4] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 2

predominantly rocky (see photograph 1 below), however within some coves and embayments, sandy beaches can be found (such as at Red Beach).

Photograph 1: A typical coastal interface of North Arm illustrating the rocky foreshore and steep vegetated topography

2.18 The waterbody of North Arm is reasonably well contained by the relatively steep and rocky shoreline. The widest part of the waterbody is between Chase Head and Diprose Bay to the north, which measures 2.1km. Otherwise, North Arm typically has an average width of between 1.1km and 1.3km. Whale Passage at 230m at its narrowest point, is the shortest distance between land.

2.19 The waterbody, being calmer than waters associated with the Southern Ocean beyond Pearl Island, retains reflective qualities of the sky and adjacent land and changes colour throughout. The more sheltered bays are typically brown in colour, due to the numerous tannin-coloured watercourses draining the land. Within the centre of North Arm, the colour is typically bluer. Other than numerous buoys indicating the location of where crayfish pots and cod pots[5] are located (see photograph 2 below), there is no other modification[6] associated with the waterbody. Recreational dredging for scallops and oysters has been reported, but the location, amount and effect is uncertain.

[5] It is unknown whether these craypots observed during the site visit were actively used (or even associated with commercial fishing purposes).

[6] Excluding occasional recreational fishing.

Photograph 2: Buoys indicating the locations of the temporary storage of crayfish pots.

2.20 As outlined earlier, North Arm is relatively exposed to wave action through Big Ship Passage, but Pearl Island in the east provides shelter from easterly and south-easterly swells[7]. North Arm is also relatively deep (compared to the shallower South Arm) with depths of up to 50m found to the northwest of Pearl Island, with the remainder of the mid-channels being approximately 30-40m deep[8].

2.21 Rocks in this part of Stewart Island are relatively complex with underlying granite bedrock overlain with softer materials. Large boulders are sighted, especially the granite protrusions on the Tin Range to the north-east of the area. Over time, watercourses have and continue to drain the surrounding landscape, making channels between the rock. The larger watercourses include Basin Creek which exits into Albion Inlet and Pegasus Creek which drains via Belltopper Falls into the northern part of North Arm (see photograph 3 below). Any sedimentation from these watercourses are considered to be entirely natural due to limited or no current human modifications evident within the catchments.

Photograph 3: Belltopper Falls

[7] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 2

[8] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 2

2.22 Native vegetation covers the area and is generally mature and in some places original, however due to past human activities and in some cases due to fire, some of this vegetation is regrowth. Due to this the area has a largely intact ecosystem, extending from the tops of the granite peaks to the floor of the seabed[9]. The vegetation diversity is reasonably high, with subalpine vegetation associated with the Tin Range readily apparent, along with podocarp forests and shrublands, wetlands and coastal fringe vegetation (see Figure 8 graphic attachment). The Conservation Management Strategy (CMS) states that due to the large number of locally endemic species within these habitats (which is not common elsewhere in New Zealand), this places a higher level of importance on the vegetation. Furthermore, the CMS notes that the large-scale naturalness, and the ecological linkages between the forest, alpine, coastal and freshwater ecosystems is also important and rare in the broader New Zealand context[10].

2.23 The CMS records that there are a number of birds that nest within the Port Pegasus/ Pikihatiti area, including kiwi, yellow-eyed penguins, Southern New Zealand dotterels, Stewart Island wekas, titi/ sooty shearwater as well as numerous other terrestrial and sea bird species[11]. Other species, such as the red-crowned parakeet, and South Island saddleback are also notable species common in the area. The Harlequin gecko is also found within the area.

2.24 Port Pegasus supports a growing breeding population of New Zealand (NZ) sea lions (*Phocarctos hookeri*)[12], that is also one of the priority breeding sites in the NZ Sea Lion Threat Management Plan (NZSL TMP)[13]. This species is designated as 'Nationally Critical' by the NZ Classification System and 'Endangered' by the International Union of Conservation of Nature[14].

2.25 Port Pegasus/ Pikihatiti generally retains a rich cultural heritage to iwi. This is specifically the case where Port Pegasus/ Pikihatiti was used as a transit point to and from the Titi Islands (Muttonbird Island off South West Cape).

2.26 The late 1800's and early 1900's saw tin mining occur on the Tin Range and whilst this wasn't extensively excavated due to the low grade of extracted tin, disturbance was caused to some of the waterways. A very small settlement was apparent close to the waterfront, with a hotel and post office (refer to image below).

[9] Stewart Island/ Raikura Conservation Management Strategy, paragraph 8.5.3

[10] Stewart Island/ Raikura Conservation Management Strategy, page 20

[11] Stewart Island/ Raikura Conservation Management Strategy, paragraph 8.5.3

[12] NIWA (Report No. 2017264WN) Review of potential NZ sea lion interactions with aquaculture at Port Pegasus/ Pikihatiti – prepared for DOC (August 2017), first bullet point under Executive Summary

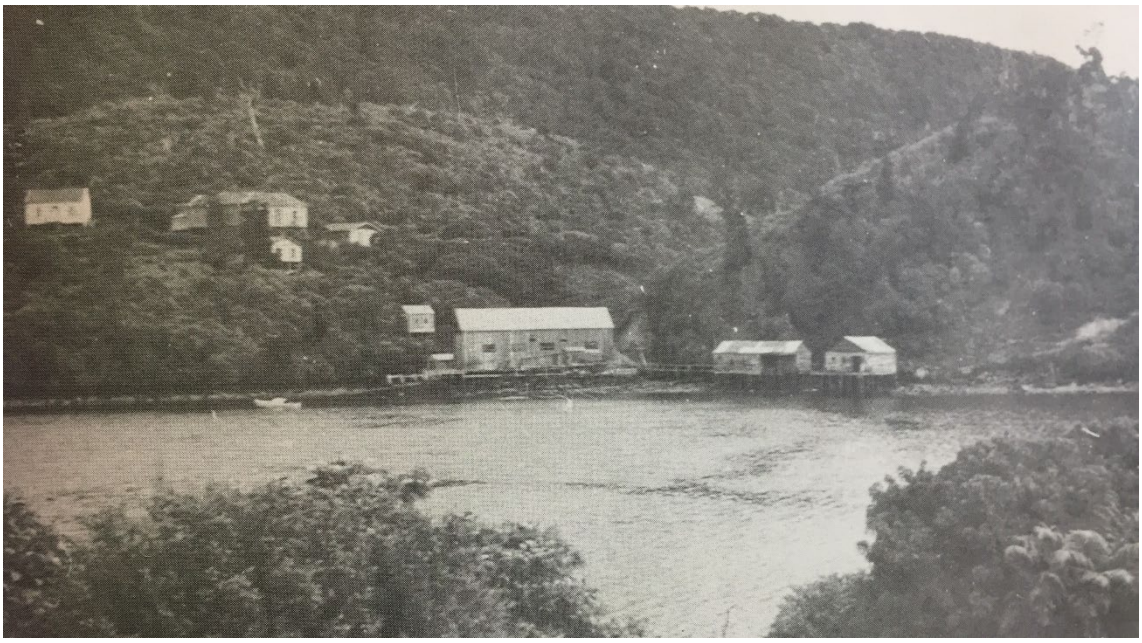
[13] New Zealand Sea Lion Threat Management Plan 2017-2022: http://www.doc.govt.nz/Documents/conservation/native-animals/marine-mammals/nz-sea-lion-tmp/nz-sea-lion-threat-management-plan.pdf

[14] NIWA (Report No. 2017264WN) Review of potential NZ sea lion interactions with aquaculture at Port Pegasus/ Pikihatiti – prepared for DOC (August 2017), first bullet point under Executive Summary

Photograph 4: Hotel and Post office at Port Pegasus

2.27 Tailings and other features also remain however are largely covered over by regrowth of the vegetation.

2.28 Just north of Rosa Island was a freezing facility, used for the active fishing industry that established itself in North Arm during the late 19th and early 20th centuries[15] (see Figure 9 graphic attachment).



Photograph 5: Composite photograph of Pegasus settlement in the 1930s. The large shed in the centre of the image contains the third freezer and the smaller two sheds to the right are all that remained (at the time) of the first freezer.

2.29 Some evidence of this is still apparent today, notably with the concrete platform of the third freezer shed located by the water's edge.

[15] Refer also to the Stewart Island/ Rakiura Conservation Management Strategy, paragraph 8.5.4

Photograph 6: Location of the former freezer works in North Arm

2.30 A plan illustrating all known historical, cultural and archaeological sites in Port Pegasus/ Pikihatiti is contained within the Graphic Supplement as **Figure 9**.

2.31 In terms of recreation opportunities, there is a small, informal trail extending onto the Tin Range, which connects with a small embayment just north of Diprose Bay (marked by a small white ribbon close by the water's edge). It is understood that this is unmarked and seldom used. There is also a hunters' hut, located on the western side of Pegasus Passage[16]. Kayaking and fishing also occurs in Port Pegasus however due to the access being principally by boat, many recreational opportunities are very much dictated by the weather conditions.

Photograph 7: North Pegasus Hunters Hut

2.32 Due to the location of North Arm, the area retains an overwhelming sense of remoteness and isolation. The lack of modification amplifies the sense of wildness and naturalness. The steep vegetated hills adjacent to the coast promotes the highest sense

[16] DOC data reveals that the occupancy rate for each hut is between 100-180 days per year, with party sizes ranging from 1 through to groups of 10 people. (Pegasus Hunter data 2014-2017, DOC excel spreadsheet)

of naturalness with experiential aspects changing around the 'Arm'. Experiential aspects can become more enclosed in many of the sheltered coves and more exposed within the central part of the water. These very high sensory values also include the rich sounds and smells of the area which adds to the area's appeal. In general, a sense of containment is gained within the arm, which provides shelter from the rough seas.

South Arm

2.33 South Arm extends in a south-westerly and north-easterly direction and provides more open views to the south than North Arm due in part to the more varied topography that contains and defines this part of Port Pegasus/ Pikihatiti. Noble Island and Anchorage Island define the north-eastern extents of South Arm. Numerous embayments, including Shipbuilders Cove and Islet Cove broaden the waterbody in parts to reach up to 2.8km in width.

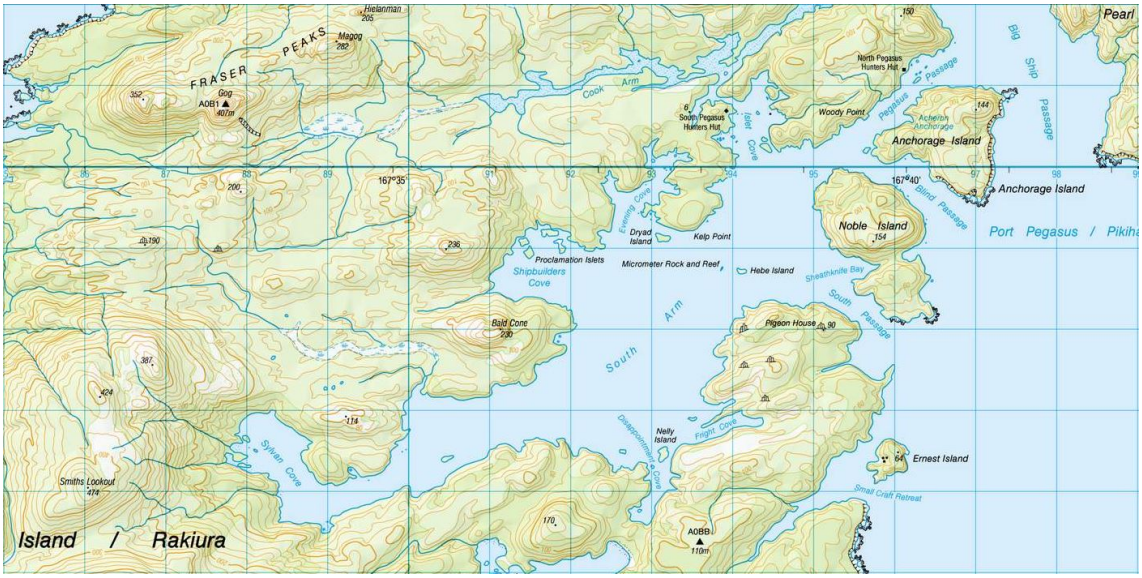


Image 3: South Arm of Port Pegasus

2.34 The noticeable difference in the above-water character of South Arm is its visual association to the granite tors and stacks of Fraser Peaks (Gog and Magog) and Bald Cone and the lower topography close to the water's edge.

Photograph 8: Bald Cone and Magog tor evident in the distance

2.35 Whilst retaining a similar sense of naturalness to North Arm, where no or very limited modification is apparent, the landscape appears more open, and expressive of its formative processes. As a consequence of the landform, parts of the South Arm appear wider than the North Arm, although there is actually little difference when measured[17]. Aesthetically, South Arm rates strongly for its dramatic features, including rocky outcrops (such as Pigeon House) granite tors and stacks (Bald Cone) and intimate long and deep coves (such as Disappointment Cove and Fright Cove).

2.36 As with North Arm, a plan illustrating all known historical, cultural and archaeological sites in Port Pegasus/ Pikihatiti is contained within the Graphic Supplement as **Figure 9**.

3.0 The Investigation

3.1 The investigation is looking at the potential to establish salmon farming in parts of North Arm. Through an iterative design process, a number of indicative scenarios have been developed, based on different fish production quantities. As outlined earlier two broad areas have been explored within Port Pegasus, North Arm and Big Ship Passage. Following further work by Cawthron, eight different scenarios were developed centred on fixed 160m circumference pens (as opposed to pens of varying sizes) to test the effects of various quantums of feed and number of pens.

3.2 This assessment assesses four different infrastructure scenarios, based on different quantities of feed and number of pens. These are listed as Scenarios 1a, 2a, 3a and 4a. A further set of scenarios have also been developed, based on scenarios (a), where the same amount of infrastructure is required however their quantum of feed has been increased. This second set of scenarios (listed as Scenarios 1b, 2b, 3b and 4b) is based on increasing the density of fish. Refer to Table 1 earlier in this report and also refer to **Appendix 2** for a detailed explanation of the farm site selection and production scenarios.

3.3 Specifically, the scenarios contain the following related infrastructure:

- For farms f1, f2, f3 and f4 all pens will be 160m circumference polar circles.
- For the smolt growing area (s1), the pens will be 100m circumference polar circles.
- Four grow farms and one smolt farm will comprise each of the scenarios, with the number of pens and quantum of feed varying for each scenario.
- The polar circles are typically dark in colour and lie low on the water. Predator proof netting will be provided around the structure, again typically dark in colour.
- Each farm area has been identified by a number (i.e. farm 1– or f1, f2, f3, f4 and s1 – for smolt 1) will be serviced by a floating barge. For farm areas f1, f2,

[17] The South Arm is approximately 2.5km wide at its widest point (from Nelly Island to north of Shipbuilders Cove) and 8.5km long (from Sylvian Cove to Noble Island). The North Arm/ Big Ship Passage is approximately 2.3km in width at its widest point (from just south of Chase Head to the head of Albion Inlet) and 6.2km in length (from Scout Bay to outer part of Anchorage Island/ Pearl Island), averaging 1.3km in width.

f3 and f4, the barge will be a 600 tonne feed barge (with no accommodation) of up to 40m in length, 12m in width and 5m high. For farm s1 (the smolt farm), the barge includes accommodation and up to 400 tonnes of feed capacity. The barges will need to be capable of withstanding significant weather, however can be towed to areas of shelter if required. An example of the barge is illustrated below:

Image 4: Computer image of the barge. Source: Akvagroup

3.4 Each scenario (in terms of its infrastructure) is outlined below in Table 2:

Table 2: Scenario by its infrastructure and numbers

Scenario	Infrastructure	Farming Areas					Total surface area (approx.)
		f1	f2	f3	f4	s1	
1a & 1b	No. of pens	16	16	16	16	8	33 ha
	No. of barges	1	1	1	1	1	
2a & 2b	No. of pens	8	10	14	14	6	24 ha
	No. of barges	1	1	1	1	1	
3a & 3b	No. of pens	6	8	12	12	4	19 ha
	No. of barges	1	1	1	1	1	
4a & 4b	No. of pens	4	6	8	10	4	14 ha
	No. of barges	1	1	1	1	1	

3.5 The farms are likely to comprise of the following elements:

- Sea cages – plastic or steel circular cages, grouped, with a 15-20m gap between each cage. An example of this is illustrated below.

Image 5: An example of a black polar circle in the Marlborough Sounds (shown at 60m circumference)

- Steel or plastic floatation structures – these support the suspended grower nets (forming the salmon farm cages), predator nets (see below) and walkways (around, and sometimes over, the cages).
- Netting– these include the grower nets in the cages, bird netting over the top of the cages and predator exclusion nets and barriers around the perimeter and below the farm.
- Moorings and Anchors – includes the underwater mooring lines and anchoring systems on the seafloor. These extend beyond the immediate extent of the surface facilities.
- Lighting - navigational lighting, accommodation lighting and underwater lighting.
- Noise– from barges, activities on farm, above water and underwater sound
- Barges, as illustrated above.

3.6 Also, the floating barges on the water that are included as part of the scenarios will be in recessive colours such as the karaka green, such as what is currently used for salmon farm sites in the Marlborough Sounds by New Zealand King Salmon.

4.0 Statutory Planning Context

4.1 This section outlines the relevant planning provisions that relate to the project. An assessment against relevant provisions is set out in Section 8 of this report.

4.2 There are a number of statutory documents that are relevant. These particularly relate to legislation under the Resource Management Act, however there are also a range of other relevant statutes. The relevant legislation includes:

4.2.1 The Resource Management Act 1991 (RMA) and associated legislation:

- New Zealand Coastal Policy Statement 2010 (NZCPS)
- Operative and Proposed Southland Regional Policy Statements
- Southland Regional Coastal Plan
- Operative and Proposed Southland District Plans

4.2.2 Other Statutes and related documents:

- National Parks Act 1980
- Conservation Act 1987
- Stewart Island/Rakiura Conservation Management Strategy
- Rakiura National Park Management Plan (2011-2021) March 2012
- Marine Mammals Protection Act 1978
- Wildlife Act 1953

Resource Management Act legislation

Resource Management Act 1991 (RMA)

4.3 As relevant to this assessment, the RMA outlines the following matters which must be considered as part of this investigation.

4.4 Section 6 – Matters of National Significance

(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:

4.5 Section 7 – Other Matters

(c) the maintenance and enhancement of amenity values,

(d) the maintenance and enhancement of the quality of the environment

4.6 'Amenity values' is defined in the RMA as, "*those natural or physical qualities and characteristics of an area that contribute to peoples' appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes*".

4.7 Visual amenity is a component of the overall amenity of a place. Amenity includes a combination of many factors, such as visual amenity, ambient noise, air quality, and recreational and cultural attributes. It is noted that the effects of the scenarios with respect to these other elements of amenity beyond visual amenity (i.e. noise, air quality, recreational and cultural attributes) are dealt with comprehensively in other reports. This report has focussed on visual amenity effects as well as other matters of relevance under the Resource Management Act.

New Zealand Coastal Policy Statement 2010 (NZCPS)

4.8 The NZCPS is a national document intended to state policies in order to achieve the purpose of the Resource Management Act in relation to the coastal environment of New Zealand. It contains a number of Policies that are relevant to the project.

4.9 Policy 1: Extent and Characteristics of the Coastal Environment provides a list of characteristics as a basis for establishing what might be included within the coastal environment. It is noted that this project is wholly contained within the coastal environment.

4.10 Most pertinent to the natural character, landscape and visual amenity elements of this project will be Policy 13: Preservation of Natural Character, Policy 14 Restoration of Natural Character and Policy 15: Natural Features and Natural Landscapes.

4.11 **Policy 13 Preservation of 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;

(2) Recognise that natural character is not the same as natural features and landscapes or amenity values and may include matters such as:

(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

4.12 Natural Character is not defined in either the RMA or the NZCPS. The New Zealand landscape profession defines natural character as, 'the expression of natural elements, patterns and processes in a landscape'[18]. Natural character is the term used to describe the natural elements of coastal environments as the expression of natural elements, patterns and processes in a landscape (or the 'naturalness') where the degree of 'naturalness' depends on:

- The extent to which natural elements, patterns and processes occur.

[18] Best Practice Note: Landscape Assessment and Sustainable Management 10.1, NZILA, page 5

- The nature and extent of modifications to the landscape, seascape and ecosystems

4.13 Policy 15 of the NZCPS is relevant as the majority of Stewart Island/ Rakiura (including the whole of Port Pegasus, including its waters) is an Outstanding Natural Landscapes (ONL) within the District and Regional plans and under separate assessment. Policy 15 also relates to other natural features and natural landscapes.

4.14 **Policy 15 Natural features and natural landscapes**

To protect the natural features and natural landscapes (including seascapes) of the coastal environment from inappropriate subdivision, use, and development:

(a) avoid adverse effects of activities on outstanding natural features and outstanding natural landscapes in the coastal environment; and

(b) avoid significant adverse effects and avoid, remedy, or mitigate other adverse effects of activities on other natural features and natural landscapes in the coastal environment;

Operative and Proposed Southland Regional Policy Statements

4.15 The proposed Southland Regional Policy Statement is largely operative and includes a chapter dealing with coastal issues. The relevant objectives seek to provide clear direction on appropriate and inappropriate activities within the coastal environment. In particular Objective COAST.2 states "*Infrastructure, ports, energy projects, aquaculture, mineral extraction activities, subdivision, use and development in the coastal environment are provided for and able to expand, where appropriate, while managing the adverse effects of those activities".*

4.16 In addition, there are objectives seeking to maintain or enhance coastal water quality and ecosystems, and to restore, rehabilitate or preserve the natural character of the coastal environment. An additional objective has been sought through submissions in relation to marine farming and this point remains under appeal.

4.17 The intention through the policy framework is that the regional and district plans will clearly set out locations within the coastal environment where activities are appropriate, inappropriate or where they need further consideration through an approval process. This type of approach would provide greater certainty over where activities may be expected to develop over time, including areas appropriate for aquaculture activities.

Southland Regional Coastal Plan

4.18 The purpose of the Regional Coastal Plan is to set out the provisions that manage activities in the coastal marine area. The Plan includes a section setting out the values of the coastal marine area and in relation to Stewart Island and other offshore islands, the Plan sets out the key values as including:

- Areas containing significant values – including all of the coast of Stewart Island and the waters within 5 km of the mean high water mark. Specifically mentioned is the brachiopod habitat in Port Pegasus.
- Marine mammals and birds, and the feeding and breeding role that Stewart Island plays for many species.

- Ecosystems, vegetation and fauna habitats, with a particular emphasis on the unmodified state of the habitat being of significant value. Again, Port Pegasus is mentioned for its black coral colonies and brachiopod communities.
- Natural character and landscape values, with an emphasis on very high natural character and outstanding quality.
- Heritage and archaeological values.
- Coastal landforms and associated processes.
- Recreational and amenity values, with many visitor activities available.
- Commercial values and anchorage value, with Port Pegasus mentioned as containing extremely high anchorage value.

4.19 The Plan also includes an appendix setting out landscape values and, within this, Port Pegasus is identified as having the highest possible naturalness rating. Specifically mentioned is that *high impact water-based activities e.g. salmon farming* has the potential to adversely affect natural character.

4.20 The Plan also contains rules relating to activities within the coastal marine area and includes a section on marine farming. The key objective for these activities is to *avoid, remedy or mitigate any adverse effects of marine farming operations*. Marine farming in the Stewart Island waters, including Port Pegasus, is identified in rule 15.1.54 as prohibited for the following reasons:

Explanation - Port Pegasus is a traditional safe anchorage on the leeward side of Stewart Island. The area has outstanding natural character and is recognised for the clarity of water in its sandy bays. Black coral colonies exist here and both Port Pegasus and Paterson Inlet contain brachiopod communities. Brachiopods are of scientific interest because their phylum has survived for approximately 600 million years with no basic change. Brachiopods are common as fossils throughout the world, but are not common in modern seas. They have been designated by the International Union for Conservation of Nature and Natural Resources (IUCN) as threatened internationally. The area is important for a number of species of birds including giant petrels, New Zealand dotterels, yellow-eyed and Fiordland crested penguins. Hooker sea-lions also breed in the area.

Southland District Plans

4.21 The District Plans (operative and proposed) relate to the use of land above mean high water springs and thus have less relevance to the use of Port Pegasus waters. The proposed Plan (which is largely operative) does identify the land surrounding Port Pegasus as being an Outstanding Natural Landscape. The Plan expects that Outstanding Natural Features and Landscapes will be protected from inappropriate subdivision, land use and development.

4.22 The proposed District Plan also includes a section on the Coastal Environment, which has a focus on ensuring that activities are managed to avoid adverse effects particularly on natural character values, outstanding natural landscapes and other key values.

Other Statutes and related documents

National Parks Act 1980

4.23 85% of Stewart Island/Rakiura is managed as a National Park (created in March 2002), which equates to approximately 157,000 hectares of land (see Figure 4 graphic attachment). The Park includes most of mainland Stewart Island/Rakiura from the northwest of the Island to South Cape/ Whiore, extending to mean high water spring around the coastline. It includes many offshore islands such as those in Port Pegasus/ Pikihatiti and Paterson Inlet/ Whaka a Te Wera along with the Freshwater River and Upper Rakeahua River. The coastal water surrounding Stewart Island/Rakiura is not included in the Park[19].

4.24 The National Parks Act (1980) outlines the structure and management of national parks in New Zealand. Section 4 of the Act states that the purpose of national parks is that *'Parks to be maintained in a natural state, and public to have right of entry…'*. The requirements of this Act apply within the national park land which makes up much of the land adjacent to Port Pegasus.

Conservation Act 1987

4.25 The Conservation Act defines 'conservation' as:

'the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations'.

4.26 The emphasis of the Conservation Act is to ensure the preservation and protection of the natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations.

4.27 The Conservation Act is administered by the Department of Conservation and is most relevant to the land outside the National Park, although it has some overlap in the management of the land and waters around Port Pegasus.

Stewart Island/Rakiura Conservation Management Strategy and the Rakiura National Park Management Plan (CMS)

4.28 This Strategy and Management Plan are combined into one document (CMS) having been prepared in accordance with the Department of Conservation's functions under the Conservation Act and the National Parks Act. While they are still two legally distinct documents, they are physically combined into one document for ease of reference.

4.29 The CMS describes the conservation values present in the Stewart Island/ Rakiura CMS areas and outlines relevant policies and management strategies. The CMS outlines terrestrial and marine ecosystems and habitats as well as relevant threats to the identified values and management objectives and policies. Recreation, historical and other cultural aspects are also covered in this document. The CMS has been a

[19] Stewart Island/Raikura Conservation Management Strategy, Department of Conservation, p137.

useful document in the preparation of much of the background information for Port Pegasus.

Marine Mammals Protection Act 1978 and Wildlife Act 1953

4.30 The Marine Mammals Protection Act and Wildlife Act have some relevance to activities within this area. For example, a permit under the Wildlife Act would be required if any black coral was to be disturbed. These Acts do not however have a focus on Natural Character, Landscape or Visual Amenity Values, and the key aspects of these Acts are covered by other reports.

Summary of Statutory Documents

4.31 In summary, the above documents outline the special qualities and values of Stewart Island, and in particular those of Port Pegasus. Together the documents highlight the outstanding values that require protection from activities and the need to ensure adequate protection from inappropriate development.

5.0 Natural Character Values

Definition

5.1 Natural character is generally assessed on a continuum of modification that describes the expression of natural elements, patterns and processes (or the 'naturalness') in a coastal area where the degree of 'naturalness' depends on:

1) The extent to which the natural elements, patterns and processes occur;

2) The nature and extent of modifications to the ecosystems and landscape/seascape.

The degree of natural character is highest where there is least modification.

The effect of different types of modification upon natural character varies with context and may be perceived differently by different parts of the community.

5.2 Policy 13 of the NZCPS seeks to 'preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development'. It is acknowledged that the investigation scenarios fall entirely within the coastal environment,[20] as illustrated on Figure 7 of the Graphic Supplement (Policy 1). Natural

[20] The coastal environment varies depending on the nature of a particular coastline. Policy 1 of the NZCPS 2010; *Extent and Characteristics of the Coastal Environment* recognises that the extent and characteristics of the coastal environment will vary from location to location. In the context of this assessment, the Coastal Environment is defined *as an environment in which the coast is a significant part or element and includes:*

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.

character is a condition of the coastal environment, and is value-free (other than judging areas as having outstanding natural character).

5.3 The natural character assessment for this investigation utilises the methodology outlined below, with input provided by the associated technical reports to ascertain 'marine naturalness'.

Methodology

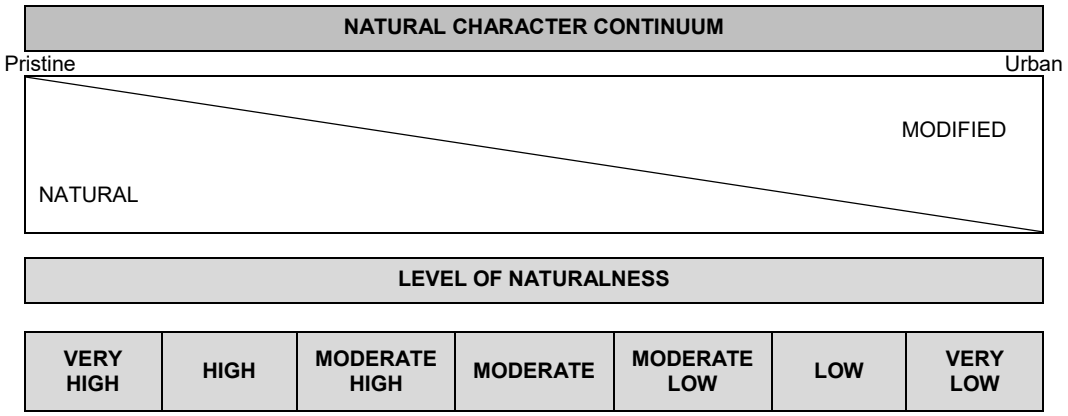
5.4 A series of selected technical reports have been prepared[21] and these have assisted to ascertain the relevant data pertaining to the level of natural character within the terrestrial and marine environments.

5.5 Due to the different data available, sourced from a range of areas, it was logical to split land or terrestrial components (or areas) from marine components when evaluating and mapping natural character. Grouping available information into physical (or abiotic or non-living) attributes and biological (or biotic or living) attributes further assists interpretation and understanding of this material. Abiotic attributes include climate, geology, currents, and sediment and biological attributes include benthic habitats, species and communities, fish, mammals, and seabirds. Experiential attributes (as noted within the NZCPS Policy 13) were also taken into account.

5.6 Given natural character is assessed over a continuum from highly natural (pristine) to totally modified (urban), half of the continuum (i.e. above moderate) can be considered to be predominantly "natural", while the half below moderate can be considered to be primarily modified. Consequently, and in natural character terms, where the level of natural character is highest, it is generally more sensitive to change.

5.7 The table below illustrates in diagrammatic form, the natural character continuum relative to the 7 point assessment scale used to assess the levels of natural character / modification. The threshold between what can be considered to be a predominantly "natural environment" and a predominantly "urban environment" is also shown.

Table 2: Natural Character Continuum diagram



Consequently, for the purposes of this assessment, all the land in the vicinity of the scenario sites is considered to fall within the coastal environment (with the landward extent mapped on Figure 7). The seaward extent of the coastal environment extends to the CMA boundary, which extends 12 nautical miles from MHWS.

[21] Refer to Data Sources (section 1.13) of this report.

5.8 Policy 13(i)(a) of the NZCPS clearly requires the avoidance of adverse effects on natural character in areas of ONC.

5.9 With respect to all other areas, Policy 13(i)(b) requires the avoidance of significant adverse effects and the requirement to avoid, remedy or mitigate other adverse effects on natural character in the coastal environment.

Existing condition and mapped extents: Port Pegasus wide

5.10 Within the operative Regional Coastal Plan for Southland, reference is made to the report undertaken by Alan Petrie of the Department of Conservation (entitled Stewart Island Coastline: Natural Character Study, dated May 1994). Within this Study the whole of Port Pegasus lies in Landscape Unit 26: Pegasus.

5.11 While the information contained in the study is somewhat outdated, it assists to some degree to gain an understanding of the natural character of Port Pegasus. However, the methodology employed to undertake natural character assessments has been advanced over the years. This has further been amplified with the arrival of the NZCPS 2010 and subsequent case law, which has provided added emphasis on the characteristics and values of what underpins the level of naturalness.

5.12 Within this context, the 1994 Study lists the following information about Pegasus:

Table 3: Stewart Island Coastline Natural Character Study

Landscape Unit 26: Pegasus
Key Landscape Elements: - An intricate stretch of coastline with numerous sheltered bays, arms and coves. - Numerous islets dot the coastal margin. - Low rounded coastal hills, with granite domes forming an impressive backdrop. - Mixed coastal forest, with wind-swept shrublands covering the conical hills.
Distinctive Features: - A traditional safe anchorage being on the leeward side of the island. - The distinctive shaped domes dominating the immediate skyline. - The strong feeling of containment and enclosure. - The close contact between the forest's edge and water, in some places the vegetation overhangs the coastal margin. - The clarity of water in the sandy bays.
Cultural Elements: - Signs of early European occupation, e.g.: fish processing plant.
Naturalness Rating: 5
Potential activities that could easily adversely affect the natural character:

- Further land-based activities such as fishing gear storage sites and recreational hunters' campsites.
- Introduction of high impact water-based activities, e.g. salmon farming.
- Petroleum exploration infrastructure.
- Loss of forest health through indiscriminate vegetation clearing.
- Placement of installations on prominent domes.

5.13 In 2016, Environment Southland approached Boffa Miskell to undertake a Landscape and Coastal Natural Character Study of Stewart Island. Whilst not linked to statutory requirements, this report provides a more recent study of the natural character of Stewart Island and the Port Pegasus area (which include both North and South Arms). Within this report, both the terrestrial and the marine environments of Port Pegasus have been described separately (see also Figures 5 and 7 of graphic attachment).

5.14 Port Pegasus in this updated study is included within Character Area 4 and Marine Area D. The introductory text (which includes landscape related commentary too) states:

> *'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'.*

5.15 The following natural character table (which includes both terrestrial and marine data for the two arms of Port Pegasus combined) is reproduced from the Boffa Miskell study below:

Table 4: Reproduction from the Boffa Miskell Study: Natural Character of Both North and South Arms of Port Pegasus

Terrestrial	Marine
Abiotic Natural Character Attributes:	**Abiotic Natural Character Attributes:**
Numerous islets dot the coastal margin. Gog and Magog are exfoliation domes and are a nationally significant geographic feature. Low rounded coastal hills, with granite domes forming an impressive backdrop, including Bald Cone Conical Hills An intricate stretch of coastline with numerous sheltered bays, arms and coves	The clarity of water in the sandy bays. 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. Contains some of the largest areas of near pristine marine habitat surrounded by catchments of native vegetation in New Zealand.

Terrestrial	Marine
	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. Has an intact ecosystem extending from the tops of the granite peaks to the floor of the seabed. Brackish waterways e.g. tidal influence extends in rivers. The tidal reaches entering the Inlet form part of a near pristine freshwater system now rare in New Zealand. Low sediment inputs.
Biotic Natural Character Attributes Numerous islets dot the coastal margin. Continuous relatively intact natural vegetation cover extends down to the shoreline Mixed coastal forest, with wind-swept shrublands covering the conical hills. Numerous wetland, heathland, turf, rock veneer and cushion communities are present intact. Kiwi, yellow-eyed penguins, Southern New Zealand dotterels, Stewart Island weka, tītī/sooty shearwater *(Puffinus griseus)* and numerous species of seabird nest in the area. 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.	**Biotic Natural Character Attributes** Important foraging habitat for Nationally Vulnerable Yellow-eyed penguins (hoiho, *Megadyptes antipodes*). Nesting and foraging habitat for little blue penguins. High natural state and functional integrity of benthic communities. Very high and stable seaweed diversity with limited presence of opportunistic species. Black coral (*Antipathes sp*) colonies Thought to be free of invasive marine pests. High abundance of small fish, including juveniles that may be indicative of high quality nursery habitat. NZ sea lion creche and adult haul-out site. Presence of brachiopods. . Aggregations of upright colonial ascidians, some of which may be unique to Port Pegasus. Freshwater fish, including whitebait, eels, smelts, bullies migrate through the inlet and/or utilize tidal habitats.
Experiential Natural Character Attributes The strong feeling of containment and enclosure due to the sheltered bays and coves. Remote character. Dominant forces of the waves tides and winds, contribute to wildness and isolation.	

Terrestrial	Marine
Sea-kayakers and recreational fishing utilise Port Pegasus as shelter primarily for its remote and very high naturalness. Recreational hunters are a user of the area. Often hunters have dinghys for transport within Port Pegasus. Commercial fishers are also a user and use the area to overnight and store cray and cod pots. A traditional safe anchorage being on the leeward side of the island. The strong feeling of containment and enclosure. Strong sense of remoteness and wildness.	

5.16 In terms of modifications to the above, the study mentions that the man-made changes are associated with early signs of European occupation, e.g. fish processing plant. The Study also mentions that there are two hunters huts present, one at North Arm (North Pegasus Hunters Hut) and the other at Cook Arm/South Pegasus. There are also remnants of freezing works West Port Pegasus and remnants of historic tin mining and a railway around the Tin Range (see Figure 9 of graphic attachment). Fire has also affected some areas.

5.17 With this 2016 study, both the terrestrial description and the marine description, rate the whole of Port Pegasus as **retaining very high levels of natural character**.

5.18 Furthermore, the area was considered to hold Outstanding Natural Character, stating:

> *'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'.*

Local Natural Character Condition

5.19 Both of the studies outlined above assess the natural character condition at the broader, Stewart Island and Port Pegasus scales. This section appraises some of the features of North Arm of Port Pegasus at the local, more detailed scale than the section above. This appraisal has been assisted by the ecological work undertaken by Cawthron as well as by the site visit.

Abiotic Marine attributes

5.20 Water depths within North Arm vary between 30 to 40m with isolated shallower patch reefs present,[22] predominantly closer to areas of land. Depths of greater than 40m are present off Chase Head (Pearl Island), and within the southern part of Big Ship Passage.. North Arm has steep drop-offs along much of the coastline and has relatively deep water when compared to other embayments around Stewart Island/Rakiura. North Arm has a surface area of about 1,120 ha and encompasses a volume of about 320

[22] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.1

million m3. The area is relatively exposed to wave action through the southern entrance, Big Ship Passage; however, Pearl Island in the east provides shelter from the easterly and south-easterly swells[23].

5.21 In terms of benthic habitat mapping, Cawthron have identified a number of different habitats within North Arm, namely mud, sand, rocky reefs/ soft sediment (i.e. patch reefs or boulder substrate with surrounding areas of mud or sand) and rocky reef[24]. Through sonar mapping and sampling, Cawthron identified that mud-dominated habitats were prevalent to the north and northwest of Chase Head (Pearl Island), in areas of increased water depth and lower wave energy. Sand habitats were extensive, ranging from fine rippled sand (Big Ship Passage) through to coarse sand and cobble habitat (entrance to Whale Passage). Rocky reef habitats were present in all shallow areas at the shoreline, and were particularly extensive along the western edge of Pearl Island[25]. It is understood that there has been some disturbance to parts of the benthic environment but how recent and significant is difficult to ascertain.

5.22 On the whole, the benthic environment retains much of its original naturalness.

Biotic Marine attributes

5.23 Biotic aspects of natural character include all living organisms/ habitats associated with the marine environment. The benthic ecology of the Site has been assessed by Cawthron Institute and reference to those reports highlighted in paragraph 1.3 of this report has been cited below.

5.24 Within the mud and sand substrates, epifaunal assessblages were relatively sparse, however both were punctuated by occasional hard substrate (i.e. cobble, shell debris) with significantly increased epifaunal diversity. Of species found, Brittle stars (mostly *Ophiopsammus maculata*), purple fanworms (*Branchiomma* sp.), sea cucumbers, sponges, brachiopods (likely *Neothyris lenticularis* and *Magasella sanguinea*), tube-dwelling anemones (*Cerianthus* sp.), black coral (order Antipatharia), sea pens (likely *Virgularia* sp.), and scallops (*Pecten novaezelandiae*) were observed on both substrate types. In addition, horse mussels (*Atrina zelandica*) and unidentified solitary ascidians were noted on mud substrates, and occasional sea stars on sand substrates[26].

5.25 Within the coarse sand and cobble habitat close to the entrance of Whale Passage, Cawthron identified that there was a diverse range of sessile invertebrate species (e.g. sponges, ascidians, anemones, tubeworms). Scallops, brachiopods, dog cockles (*Tucetona laticostata*), flat oysters (*Ostrea chilensis*), horse mussels, brittle stars, sea cucumbers, eleven-armed sea stars (*Coscinasterias* sp.) and unidentified bivalves and gastropods were also observed[27].

5.26 Within the rocky reef habitats (which includes areas of rocky reef with surrounding areas of soft sediment), a greater abundance of epifaunal species and demersal fish were present, which included sponges, sea cucumbers, colonial ascidians, anemones and tubeworms. In addition, encrusting and turfing coralline algae and various kelp

[23] Cawthron Report 3076: Pelagic Biophysical Assessment: Port Pegasus/ Pikihatiti, paragraph 1.3

[24] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.3

[25] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.3

[26] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.3

[27] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.3

species (*e.g. Ecklonia*, *Carpophyllum*, *Macrocystis*, *Caulerpa*) were abundant, and kina (*Evechinus chloroticus*), cup sponges (*Cymbastela* sp.) and paua (*Haliotis* sp.) were occasionally observed[28].

5.27 Table 5 below outlines the most conspicuous epifauna and fish species found in North Arm. This is copied from Table 2, page 20 from within Cawthron Report 3047.

Table 5: Conspicuous epifauna and fish species observed in high-level habitats within North Arm, Port Pegasus/ Pikihatiti

Habitat type	Area	Depth range	Conspicuous/ benthic biota	Fish species observed[29]
Mud	North and northwest of Chase Head, south-western shoreline (south of Albion Inlet to Pegasus Passage)	20-45	Brittle stars (mostly *Ophiopsammus maculata*), purple fanworms (*Branchiomma* sp.), sea cucumbers (various species), sponges, scallops (*Pecten novaezelandiae*), large calcareous tubeworms (various species), brachiopods (likely *Neothyris lenticularis* and *Magasella sanguinea*), horse mussels (*Atrina zelandica*), black corals, sea pens (*Virgularia* sp.)	Lemon sole (Pelotretis flavilatus), Blue cod (Parapercis colias)
Sand	Big Ship passage, northeast of Chase Head, shallow areas	6-44	Brittle stars (mostly *O. maculata*), diatom films, purple fanworms (*Branchiomma* sp.), sea cucumbers (various species), sponges, scallops (*P. novaezelandiae*), brachiopods (likely *N. lenticularis* and *M. sanguinea*), sea stars	Blue cod *(Parapercis colias)* flounder (Rhombosolea sp)
Coarse Sand/ Cobble	Entrance to Whale Passage, northeast of Pearl	15-25m	Purple fanworms (*Branchiomma sp.*), tube-dwelling anemones (*Cerianthus*	Blue cod *(Parapercis colias),* Draught board shark

[28] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.3

[29] 'Fish species were noted when observed on the video footage. However, as the survey method (i.e. drop-camera assessments) is not generally used for highly mobile species other taxa may have been present.'

	Island, west of Chase Head		sp.), scallops (*P. novaezelandiae*), dog cockles (*Tucetona laticostata*), brachiopods (likely *N. lenticularis* and *M. sanguinea*), flat oysters (*Ostrea chilensis*), finger sponges, horse mussels (*A. zelandica*), brittle stars (mostly *O. maculata*), eleven-armed seastars (*Coscinasterias* sp.), cushion stars (*Patiriella regularis*), bilvalves, gastropods	*(Cephaloscyllium isabellum)* opal fish, triple fin (Triptergiidae)
Rocky reef/ soft-sediment	Northeast of Bens Bay, entrance to Albion Inlet, west and southwest of Chase Head, shallow areas along coastline	6-42	Cup sponges (*Cymbastela* sp.),finger sponges, small hydroids, small bryozoans, encrusting and turfing coralline algae, sea cucumbers (various species), kelp species (e.g. *Ecklonia, Carpophyllum, Macrocystis, Caulerpa)*, ascidians, sea stars, kina (*Evechinus chloroticus*), paua (*Haliotis* sp.) anemones	Tarakihi (Nemadactylus macropterus), Butterfly perch (Caesioperca lepidoptera), trumpeter (Latris lineata), scarlet wrasse (Pseudolabrus miles), blue cod (*P. colias*), blue moki (*Latridopsis ciliaris*), leather jacket (*Parika scaber*)
Rocky reef	West of Pearl Island, offshore from Anchorage Island, patch reefs	8-30	As specified for 'Rocky reef/ sfot-sediment' habitats. Areas of higher wave exposure (i.e. along the shoreline) generally had increased cover of kelp species (e.g. *Ecklonia, Carpophyllum, Macrocystis, Caulerpa)*,	As specified for 'Rocky reef/soft-sediment' habitats

5.28 Cawthron noted that several notable taxa were identified through the course of this survey work, including brachiopods, black coral, sea pens, tube-dwelling anemones and several large bivalve taxa (scallops, flat oysters, horse mussels and dog cockles)[30].

5.29 Brachiopod densities ranged considerably, with isolated individuals commonly observed. Large numbers of brachiopods were present on coarse sand and cobble substrates near Whale Passage[31]. Four individual black coral colonies (possibly *Antipathes fiordensis*) were observed on two video transects north of Chase Head. All were observed on soft sediment substrates. [32].Large tube-dwelling anemones (*Cerianthus* sp.) were also observed, with singular individuals commonly encountered, although densities were slightly higher on sandy substrate southwest of Chase Head.. Cawthron observed that in general, there was a lack of three-dimensional biogenic structure across most of the soft-sediment habitats within North Arm. The sand substrate in Big Ship Passage is noted for its lack of epifauna, due in part for the large area of sand waves indicating sediments in this area are highly mobile[33].

5.30 A NIWA report[34] specifically commissioned to review existing observations of NZ sea lions outlined that Port Pegasus is the main breeding location of the Stewart Island population, close to breeding colony status and likely to continue to grow. This breeding location is important for the NZSL TMP and facilitating growth in the population on the New Zealand mainland and the resilience of the sea lion population nationally.

Abiotic and Biotic Terrestrial attributes

5.31 With the national park status over almost all the land surrounding Port Pegasus and most of Stewart Island / Rakiura indicates the significance of the area's natural character[35].

5.32 In terms of the terrestrial environment, large areas of vegetation have remained unmodified with limited man-made intervention, with some of the most notable examples of indigenous forest in the country. Port Pegasus is also significant for its intact inlet catchments and land/ sea ecotones from a national perspective. Any land disturbance has occurred principally around the Belltopper Falls area and directly opposite where a small settlement once existed. Grazing and other impacts from exotic mammals (i.e. deer, possum, rats etc.) are present throughout Port Pegasus and the island, however in generally low numbers[36].

5.33 In terms of the vegetation, much of the forest is made up of podocarp-hardwood, comprising rimu, kamahi and southern rata. Other notable species include miro, *Griselinia*, lancewood, tree fern and marble leaf.

---

[30] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.4

[31] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.4

[32] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.4

[33] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, paragraph 4.4

[34] NIWA (Report No. 2017264WN) Review of potential NZ sea lion interactions with aquaculture at Port Pegasus/ Pikihatiti – prepared for DOC (August 2017)

[35] In addition, scoping is underway for a 'Predator Free Stewart Island' as part of the Predator Free New Zealand initiative. The past usage of Pearl Island as a refuge for kakapo may also be relevant to this initiative (Pearl Island is no longer used for kakapo management, partially because it is not predator-free).

[36] DOC (2012) Stewart Island/ Rakiura Conservation Management Strategy and Rakiura National Park Management Plan 2011-2021, paragraph 3.2.2 (p156)

5.34 Kiwi, yellow-eyed penguins, Southern New Zealand dotterels, Stewart Island weka, tītī/sooty shearwater (*Puffinus griseus*) and numerous species of seabird nest in the Port Pegasus area[37].

5.35 Marine mammals, specifically sea lions (and also fur seals) are increasingly using the terrestrial environment for hauling-out and breeding.

Experiential attributes

5.36 Port Pegasus retains much of its experiential character from its remote and isolated location. Few people travel this distance, but those few that do, are rewarded by a highly remote and natural setting. It is understood that no commercial recreational activities occur in the area, with generally small, private parties accessing the area for hunting, fishing, kayaking, walking and occasionally boating. Diving is also undertaken, which contributes to the experiential aspects of natural character beneath the water.

5.37 The experiential aspects here are also transitory, where weather patterns can change one's experiences dramatically. Remote and wild qualities can be experienced during wilder weather however quite different experiences can occur on calm, sunny days. The lack of modification within the area has a profound impact on the level of naturalness experienced.

5.38 The calmer waters of North Arm lend their way to even calmer waters within the numerously located inlets, including Albion Inlet and Bens Bay. The presence of native wildlife also amplifies one's experience of natural character.

Summary of local natural character

5.39 Based on this, it is considered that despite some localised historic modification, the entire area retains very high levels of marine and terrestrial natural character, noted predominantly for the areas seamless intact transition between the two areas. Within the Boffa Miskell Natural Character Study, the area retains Outstanding Natural Character at a broader level and this is confirmed with reference to the various specific ecological reports.

6.0 Landscape Values

Approach

6.1 Under Policy 15 of the NZCPS, there is a requirement to avoid adverse effects of activities on outstanding natural features and outstanding natural landscapes in the coastal environment. In addition, there is a requirement to avoid significant adverse

[37] No analysis has considered the potential effects on these species and that further work might be needed to assess these potential effects

effects and avoid, remedy, or mitigate other adverse effects of activities on other natural features and natural landscapes in the coastal environment[38].

Methodology

6.2 As part of the methodology[39] and to assist in assessing the effects of the Scheme on the landscape values, the sensitivity of the landscape needs to be determined. The sensitivity of the landscape depends upon the degree that a particular landscape or feature can accommodate change without detrimental effects on its character. This will vary upon the following factors:

- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosure / openness of views and distribution of the viewing audience;
- The value or importance placed on the landscape; and
- The scope for mitigation, which would be in character with the existing landscape.

6.3 The determination of the sensitivity of the landscape resource is dependent upon the susceptibility to change. This is similar to 'landscape sensitivity' identified within a landscape character area but is specific to the particular development investigation. It takes account of both the attributes of the receiving environment and the characteristics and effects of the development scenario. Landscape value or importance such as underlying Outstanding Landscape or Significant Amenity Landscape classifications must also be taken into account.

6.4 The Environment Court case *Wakatipu Environmental Society vs Queenstown Lakes District Council* [2000] NZRMA 59 established a number of principles that assist when considering landscape and visual matters, which included a set of factors referred to as the 'Amended *Pigeon Bay* Criteria'[40] to be considered when assessing landscapes. These factors have been widely used, often in a formulaic way, and have often meant that landscape values have been 'double counted' or that the 'essence' or 'spirit' of a section 6(b) landscape is often lost. The Environment Court has also criticised this approach, preferring landscape to be described and evaluated within three broader categories, namely, biophysical, perceptual/experiential and associative[41]. These three broader categories are also in line with current professional practice and outlined within

[38] Policy 15 (a) and (b) of the New Zealand Coastal Policy Statement 2010.

[39] Refer to Appendix 1 of this Report.

[40] The Pigeon Bay criteria include but are not restricted to: the natural science factors - the geological, topographical, ecological and dynamic components of the landscape; its aesthetic values including memorability and naturalness; its expressiveness - how obviously the landscape demonstrates the formative processes leading to it - transient values: occasional presence of wildlife; or its values at certain times of the day or of the year; whether the values are shared and recognised; its value to tangata whenua; its historical associations.

[41] See *Upper Clutha Tracks Trust v Queenstown Lakes District Council* [2010] NZEnvC 432 . Biophysical values refer to the geology, geomorphology, soils, vegetation and biota. It refers to the natural elements and their processes of the landscape. Perceptual/ Experiential values refer to the way people view and experience the landscape, its scenic qualities, attractiveness and sense of naturalness. Associative values refer to the cultural aspects of the landscape, its sense of place, its historical and spiritual associations. These three categories encapsulate the broad dimensions of landscape.

the New Zealand Institute of Landscape Architect's '*Best Practice Note: Landscape Assessment and Sustainable Management 10.1*' (NZILA's Best Practice Note)

6.5 To meet the requirements of section 6(b) a landscape should have both a high degree of naturalness and be 'outstanding'. It should be *'conspicuous, eminent, especially because of excellence; remarkable in'*[42]. An assessment of outstanding natural landscapes and features should also be undertaken at a district or regional scale, for comparison purposes[43].

6.6 Through successive Environment Court cases factual questions have been defined that need to be answered in determining the scale of landscape, and whether a landscape qualifies as outstanding under RMA section 6(b). The courts also outline a definition of landscape. The questions, originally scribed within High Country Rosehip Orchards Limited v Mackenzie District Council [2011] NZEnvC 387 at paragraph 74 noted that it is necessary:

1. to identify the landscape in which a proposal is set;
2. to ascertain whether the landscape is natural and, if so, how natural; and
3. to assess whether any natural landscape is also outstanding [within the Region or District].

6.7 On the definition of landscape, in Wakatipu Environmental Society v Queenstown-Lakes District Council the court wrote *'landscape' involves both natural and physical resources themselves and also various factors relating to the viewer and their perception of the resources*[44]'. Within the NZILA's Best Practice Note, the definition of landscape *'is the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations'.* Both definitions are closely related and fit within the three broad categories identified above.

Mapped extents and degree of naturalness

6.8 Within the operative Southland District Plan, reference is made to the majority of Stewart Island being an Outstanding Natural Landscape. This landscape overlay has been derived from the Southland Regional Landscape Assessment, prepared by Boffa Miskell in August 1997.

6.9 As mentioned above, Boffa Miskell also prepared a Landscape and Coastal Natural Character Study of Stewart Island for Environment Southland early in 2017.This updated 2017 report provides a more recent study of the landscape values of Stewart Island and the Port Pegasus area. The natural character assessment also indicates that the landscape is sufficiently natural to be considered as an ONL. The following paragraphs describe the relative landscape values and characteristics that underpin these mapped landscape overlays (see Figure 6 of graphic attachment).

[42] *Wakatipu Environmental Society v Queenstown-Lakes District Council* [2000] NZRMA 59 paragraph 82.

[43] The Environment Court found that 'outstanding' can be considered on a regional basis, if being assessed by a regional council. If being considered by a district council, then outstanding must be considered in terms of the district. In relation to a district plan, what is outstanding can only be assessed on a district-wide basis, because the sum of the district's landscapes are the only immediate comparison that the council has (WESI vs QLDC [2000] p. 49)

[44] *Wakatipu Environmental Society v Queenstown-Lakes District Council* [2000] NZRMA 59 paragraph 77.

Landscape Values

6.10 Within the operative Southland District Plan, reference is made to the majority of Stewart Island being an Outstanding Natural Landscape. This landscape overlay has been derived from the Southland Regional Landscape Assessment, prepared by Boffa Miskell in August 1997.

6.11 The 1997 study states:

> *'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'.*

6.12 The report mentions that the entire island and its surrounding islets with the exception of the modified area of Oban and Halfmoon Bay are to be included within this overlay.

6.13 As part of a review of the operative plans, Environment Southland commissioned Boffa Miskell to undertake a revision of the 1997 study, focusing specifically on Stewart Island, using up to date best practice that has evolved since the original study was undertaken. This study also references the NZCPS 2010.

6.14 Within the 2017 Study (which also includes natural character considerations) Port Pegasus is contained within Character Area 4 with the marine component within Character Area D. The description of Character Area D is:

> *'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'*

6.15 The following table represents the combined values from both Character Area 4 and Character Area D:

Table 6: Boffa Miskell 2017 Landscape Study of Stewart Island, list of values and characteristics

Biophysical Landscape & Seascape Attributes:
Around Bald Cone and Cook Arm bare granite domes protrude from the landscape and dominate the immediate skyline, with Bald Cone exfoliation dome being a regionally significant geographic feature.
An intricate, bush-clad stretch of coastline with numerous sheltered bays, arms and coves
Wind swept shrub lands and mixed coastal forest predominate.
The seamless transition and close contact between the forest's edge and water, in some places the vegetation overhangs the coastal margin.
Extensive fire-induced manuka shrublands fires occur.
All of this Character Area retains Outstanding Natural Character values.
Pigeonhouse Bay within Port Pegasus Character area is an important nesting habitat for Nationally Vulnerable Yellow-eyed penguins (hoiho, *Megadyptes antipodes*).
The very high clarity of water in the sandy embayments.
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.
Low abundances of protected black coral (*Antipathes spp*) colonies found within parts of Port Pegasus/Pikihatiti.
Port Pegasus is itself a nationally significant geopreservation site
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.
Port Pegasus/Pikihatiti is also the southernmost inlet in New 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.
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.
Sensory Landscape & Seascape Attributes:
The strong feeling of containment and enclosure due to the sheltered bays and coves.
A traditional safe anchorage being on the leeward side of the island
Remote and isolated with very high levels of naturalness and wildness present.
Impressive Belltopper Falls.
Serene and sheltered experience within Port Pegasus which is very different from the open Southern Ocean beyond.
High degree of coherence with limited modification.
Associative Landscape & Seascape Attributes:
The entire land area is within National Park status.
Rich settlement and land use history

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.

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.

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)

Gold was found at Port Pegasus/Pikihatiti.

A permanent Ngāi Tahu settlement was located at Port Pegasus where numerous middens and cave dwellings remain.

An area used for overnight shelter by fishing vessels and as an emergency anchorage by other vessels during extreme weather events.

Two blocks of freehold land are located at the head of the North Arm, one being an old hotel site.

Is valued by iwi, the Stewart Island/Rakiura community, hunters, yachties, divers, kayakers and some trampers as a destination.

Port Pegasus/Pikihatiti is significant as the last southern place that most vessels can sail to before entering sub-Antarctic waters

The harbour is noted in the 1825 journal of Thomas Shepard and noted for is beautiful appearance.

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.

Ecological studies have used Port Pegasus as a place that characterises a healthy marine environment compared to other places in NZ.

6.16 Based on these values, the 2017 study concluded that the entire Character and Seascape 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 regenerating bush and untouched forest provide a very high level of naturalness, coupled with views to the dramatic and extremely expressive Bald Cone mountain in South Arm. A rich European and tangata whenua history is also associated with this area.

6.17 The Stewart Island/ Rakiura Conservation Management 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'.

6.18 For the purposes of this report, it is concluded that based on the 1997 (operative) study and the updated 2016 study, the entire land and water of the Port Pegasus landscape contains outstanding landscape values and is sufficiently natural to be considered outstanding under Section 6(b) of the RMA.

7.0 Visual Amenity Values

7.1 Visual amenity aspects are a part of amenity values (Section 7c of RMA), and are separate from Section 6 matters such as natural character and outstanding natural features and landscapes. Visual amenity values stem from the observer's appreciation of the pleasantness, aesthetic coherence and cultural and recreational attributes of an area.

7.2 Visual coherence is where natural systems are broadly intact and aesthetically coherent, not displaying significant visual signs of disharmony. The patterns of land cover and land use are largely in harmony with the underlying natural pattern of the landform of the area where there are no significant discordant elements of land cover or land use. Coherence describes the way in which the visual elements or components of any landscape come together. Landscapes with high levels of coherence will have their visual elements in harmony and reinforcing each other. They will have unity, whilst they may be either visually diverse or relatively simple in terms of their elements. They work together in terms of their composition.

7.3 Visual Amenity values will vary to certain degrees throughout Stewart Island, in much the same way as the landscape values do. People value different parts of the landscape for different reasons. Features that contribute to landscape quality (which can be extensions to outstanding landscape values) include rocky coastlines, prominent ridges and peaks, enclosed bay and uninterrupted views. The high level of naturalness experienced in Stewart Island will assist in providing a greater level of visual amenity than other areas of New Zealand.

7.4 Whilst isolated and remote attributes also provide visual amenity, this amenity depends to some extent on the weather, as the area can change dramatically. This is often the case for Stewart Island, where weather patterns can dictate the appeal of an area. More sheltered parts of the Island are likely to have different amenity appeals than more exposed parts.

7.5 For Port Pegasus, visual amenity values are high, due to the coherence of the surrounding land and water and unmodified character. The sheltered and calmer conditions also present a different level of amenity to the more exposed outer coast. Small coves and embayments present further containment and offer a more intimate association with the area. Based on this, it is considered that Port Pegasus retains very high levels of visual amenity values, based predominantly on the area's lack of apparent modification and very high levels of naturalness.

8.0 Effects Assessment

Overall approach to assessing effects

8.1 Natural character, landscape and visual effects result from natural or induced change in the components, character or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. Each type of change is assessed to determine their effects on landscape character and quality, rural amenity and on public and any private views. All of this is scale related, so the effects of any change will be assessed at two scales; broad and more local. This assessment scale is important in understanding how the scenarios affect the values of natural character, landscape and visual amenity, where they do occur at a variety of scales.

8.2 This assessment of potential effects is based on a combination of the landscape's value and visibility and the nature and scale of the scenarios.

8.3 This assessment has been broken into the following section headings:

1. Assessment of Effects on the Natural Character of the Coastal Environment
2. Assessment of Effects on Natural Features and Landscapes
3. Assessment of Effects on Visual Amenity

Natural Character of the Coastal Environment Effects

8.4 In terms of natural character, the highest degree of naturalness occurs where there is the least amount of human induced modification. Salmon farms, due to their unnatural form and impacts on biophysical values and processes, can adversely change and alter the natural character of an area. The significance of this effect is dictated by the size (including configuration and production levels) and location of the farms, and the sensitivity of the receiving environment.

Broad Scale Natural Character Effects

8.5 At a broad scale, the salmon farm scenarios would physically affect a very small part of Stewart Island and Port Pegasus (for example 33ha for Scenario 1a/1b and 14ha for Scenario 4a/4b within an area of water of approximately 1,092ha for North Arm and Big Ship Passage[45]). However, they would be introducing industrial style modifications into an area of the island that currently has virtually no modification. Despite historic modification relating to industry occurring in the area almost a century ago, very little of this infrastructure remains. The land has virtually restored itself, to the extent that it is very difficult to identify where modification once existed.

8.6 With the vast majority of land based modification on Stewart Island focused around Halfmoon Bay and marine based modification around both Halfmoon Bay and Big Glory Bay, modification within the Port Pegasus area would represent a departure from this existing pattern. As identified, the natural character of Stewart Island as a whole

[45] Refer to different mapped scenarios in Appendix 3 for spatial extents.

(excluding Halfmoon Bay/Oban and Big Glory Bay) is considered to be Outstanding. It is considered that with any of the salmon farm development scenarios in place in the water of North Arm, much of this area would be reclassified as a lower degree of naturalness. Much of the water space affected by the scenarios in North Arm would therefore lose its status as holding Outstanding Natural Character.

8.7 The structures associated with the indicative scenarios would introduce localised industrial style activity into an area of Stewart Island that retains outstanding levels of abiotic, biotic and experiential natural character.

8.8 The broad abiotic aspects would be associated with the anchorage systems to the sea bed, and effects on water quality, currents and sediment chemistry. Whilst some of these aspects would be localised, it is understood that these areas where the farm scenarios are located have little or no modification. The effects are therefore likely to be very high in nature.

8.9 The broad biotic adverse effects would be caused predominantly by the presence and feeding of salmon in confined pens. This would have a direct impact to the benthic environment beneath the farms where a slow build-up of faecal matter, decayed fish and uneaten food would be present. To some extent this material would disperse and the degree of this dispersal would be dependent on which design is opted for. However, whatever the design and quantity of farms, the scenarios would locally change the underwater habitat directly beneath the pens as well as in their immediate vicinity. The farms may also attract other fauna (mammals, fish and sea birds) that would not necessarily frequent the Port Pegasus waters, and potentially alter the behaviour or negatively interact with fauna inhabiting the area.

8.10 As outlined within the Cawthron benthic habitat assessment, depositional modelling, combining physical properties of water currents with farm configuration and production parameters, was used to predict the potential distribution and intensity of waste product (i.e. uneaten feed and faeces) deposition to nearby benthic habitats[46]. Further details and conclusions of this modelling can be found in the Cawthron report.

8.11 In terms of sea lions, the NIWA[47] report notes that the potential for interactions between NZ sea lions and the proposed farms at Port Pegasus is extremely high. A global review identified potential direct interactions that were consistent across otariids (sea lion species including fur seals), including: entanglement mortality in nets and intentional harm on 'problem' individuals. Also, some potential indirect effects, including: habitat loss or degradation, visual or noise disturbance and the spread of parasites and disease[48]. An analysis of tracking data found that reproductive females forage almost entirely within 50 km of Port Pegasus and that the North Arm of Port Pegasus was well-used.

8.12 The scenarios would also severely affect the broad experiential aspects and values of Port Pegasus. Port Pegasus would no longer hold the remoteness and wildness factors, as the structures, despite their localised footprint, would introduce industrial style development into an area holding outstanding levels of remoteness and wilderness qualities. The scenarios would also severely affect the perceived naturalness of Port

[46] Cawthron Report 3047: Benthic Habitat Assessment: North Arm, Port Pegasus/ Pikihatiti, Executive Summary, page ii

[47] NIWA (Report No. 2017264WN) Review of potential NZ sea lion interactions with aquaculture at Port Pegasus/ Pikihatiti – prepared for DOC (August 2017)

[48] NIWA report, executive summary, page 5.

Pegasus, from an area not holding any infrastructure, to one that contains salmon farms, fish farming activity and the ongoing presence of humans.

8.13 At night, lighting would also disrupt the experience of the area, where no other lights are present. Artificial lights would be present on the farm structures and could be visible for up to 5km or more depending on conditions.

8.14 Notwithstanding the fact that the experiential natural character effects would relate to a confined area in the North Arm, the appreciation of the area by the wider public would be reduced due to the fact that no other development is currently located in this part of Stewart Island. That broader experiential association (and whilst not solely related to experiential aspects of natural character) would change the way people perceive and consequently experience North Arm of Port Pegasus.

8.15 It is assessed that the introduction of salmon farming in the North Arm of Port Pegasus would affect the broad experiential attributes of natural character to a very high, adverse degree.

Local Natural Character Effects

Abiotic Attributes

8.16 No land based activities have been assessed as part of these indicative scenarios, therefore no adverse abiotic effects would be experienced on the land.

8.17 As discussed above, the presence of the salmon farms would physically affect the benthic environment of North Arm, due to the anchors required to secure the farms as well as other physical effects, including sediment structure and chemistry. The scenarios would also affect to varying degrees the clarity of the water column, although further reports would need to be undertaken to enable data to be analysed regarding this.

Biotic Attributes

8.18 One of the principles employed for development of this investigation was to avoid placing a salmon farm on any identified ecologically significant benthic values (habitat, species or communities, including black coral and brachiopod beds). Despite the avoidance of these particular areas, localised effects on other areas that do not contain ecologically significant benthic habitats will occur, that may change the currently highly natural marine environment. Despite the farms being located predominantly over a muddy and sandy benthic environment within the mid-channel, with relatively limited marine fauna[49], the makeup of the sea bed in this area is representative of its naturally occurring and unmodified character despite species diversity and abundance being much reduced.

8.19 Further, salmon farms attract other species that would not normally frequent areas otherwise. This can therefore change (or enrich) the localised ecology[50], which in turn can affect the natural character. So, whilst other species may be attracted to the area, this is a change to the current baseline scenario.

[49] Refer to Cawthron Report No. 3047 Benthic Habitat Assessment: North Arm Port Pegasus/ Pikihatiti

[50] Effects are not only limited to benthic habitats, but also to wildlife, such as marine mammals (including sea lions) and other wildlife (such as sea birds).

8.20 The predicted benthic effects of farm scenarios, including biodeposits and associated enrichment, are detailed in Section 5.4 (page 57) of the Cawthron benthic report 3047.

8.21 Based on the discussion above, it is considered that all salmon farm scenarios, would have highly adverse effects on the biotic aspects of natural character locally. The size of the footprint of the effects would vary with the size of the farm.

Experiential Attributes

8.22 There will be a significant change to the experiential aspects of natural character resulting from the presence of the salmon farms. The farms would represent the only form of visible development in the local area. The farms would interrupt the open and unmodified water surface and introduce unnatural elements into a highly natural setting. Remote and isolated aspects would be adversely affected. The presence of up to five floating barges would further interrupt and detract from the seascape character.

8.23 Experiential aspects relating to naturalness would be adversely affected, especially because no other modification is readily apparent in the area. Whilst siting and recessive colouration of the structures can assist to mitigate this to varying degrees, the presence and associated effects (e.g. noise and lighting) of humans working on the salmon farms and barges would continue to have adverse effects, most noticeably on the grow farms within Big Ship Passage. Navigational lighting will also make the farms very noticeable at night.

8.24 Based on this assessment, it is considered that the adverse effects of any of the scenarios on the experiential aspects of natural character would be very high.

Overall Natural Character Effects

8.25 The natural elements, patterns and processes evident within North Arm are amongst the highest in the country. The enclosed waters of the inlet will be adversely affected by the development scenarios, both at a broad scale and at a more local scale. Whilst the scenarios will not directly adversely affect the more sensitive marine benthic habitats / communities[51], the scenarios will interrupt and be discordant with the natural elements, patterns and processes that are currently present in the broader area.

8.26 For the NZ sea lion, the effects are considered much higher. Potential interactions with resident female pups at Port Pegasus that disturb breeding behaviour are of particular concern. The implications of a major increase in NZ sea lion numbers and associated changes to demographic composition and behaviour that could dramatically alter the frequency and nature of interactions in future years needs to be considered[52].

8.27 The scenarios would affect the scale and natural cohesiveness of the area, directly impacting on experiential aspects. Whilst located within North Arm and Big Ship Passage, the experiential aspects of natural character of the entire Port Pegasus will be affected by the knowledge of the farms' existence within an area currently holding outstanding natural character and low human presence/ modification.

8.28 Based on this assessment, it is considered that the scenarios will have very high adverse natural character effects both at the broad and more local scales. The

[51] Refer to third bullet point of paragraph 5.4 of Cawthron Report No. 3047.

[52] NIWA, Review of potential NZ sea lion interactions with aquaculture at Port Pegasus/ Pikihatiti, last bullet point of Executive Summary (August 2017).

scenarios would also be inconsistent with the direction of Policy 13 (1) (a) of the New Zealand Coastal Policy Statement.

Landscape and Natural Feature Effects

8.29 Landscape effects are the actual or induced changes to the landscape character of an area. Port Pegasus as a whole is an impressive, highly indented coastal inlet that clearly demonstrates its formative processes though its natural legibility. Port Pegasus is recognised as an Outstanding Natural Landscape.

Effects on the Outstanding Natural Landscape

8.30 The salmon farm scenarios assessed here will introduce structures and activity that have incongruities with the surrounding biophysical environment. This is most acute in this part of Stewart Island due to the lack of modification apparent and overwhelming sense of naturalness present. Development, irrespective of scale will adversely affect the values and qualities that underpin this special place.

8.31 Whilst each of the scenarios will not directly affect many of the broader and more local biophysical landscape values present (such as the highly expressive sequence of indigenous vegetation and landforms), they will each affect the human-based perceptions of naturalness of the area. Qualities such as '*Port Pegasus/Pikihatiti….is one of few inlets nationally that is still relatively pristine'*[53] will be eroded. The near-pristine levels of naturalness will no longer be evident.

8.32 From an associational perspective, Port Pegasus is known as an area of Stewart Island that is highly valued for its remoteness as well as its beautiful scenery, and North Arm is an important component of this. Whilst the scenarios are located within parts of this inlet, the associational connotations with development will adversely affect and erode those qualities to some extent within the wider North Arm area.

8.33 From a sensory perspective, the insertion of lines of circular cages and feed barges (and one accommodation barge) will adversely affect the natural aesthetic of the wild and highly natural coastal area and interrupt the sequencing of the unmodified land and sea interface. The size of the salmon farms in relation to the scale of the landscape within Big Ship Passage will influence the significance of these effects on sensory values, as they relate to the experience of the area. Scenarios 1a/1b would introduce a far greater level of visual clutter than Scenario 4a/4b, however all scenarios would affect the underlying sensory values of this area significantly.

8.34 Based on this assessment, it is considered that the insertion of salmon farming would adversely affect the landscape and natural qualities of North Arm of Port Pegasus and of Big Ship Passage to such a degree that the area, or part of the area, could no longer be considered outstanding, irrespective of chosen scenario. Part of North Arm and Big Ship Passage would be aligned with the non-outstanding rating of Big Glory Bay and parts of Half Moon Bay, where a high level of development has occurred. As a result, it is considered that the scenarios assessed here would be contrary to the direction of the objectives and policies of Policy 15 (1) of the New Zealand Coastal Policy Statement,

[53] Boffa Miskell 2017 Landscape Study, list of values and characteristics: Character Area D.

as well as the regional and district plans. The effects would be significant within the North Arm of Port Pegasus.

Visual Amenity Effects

8.35 Visual amenity effects are influenced by a number of factors, including the nature of the activity/ development, the visual absorption capability (i.e. the site / locality's ability to visually absorb change) and the character of the Site and the surrounding area. Visual amenity effects are also dependent on the distance between the viewer and the activity/ development, the complexity of the intervening landscape and the nature of the view. For salmon farms, there are also a considerable number of other factors which relate to visual amenity and how visible an activity/ development might be perceived, including weather and light conditions, farm design, location (near to coast/ away from coast) as well as cumulative issues.

8.36 Views from the land to the sea and from the sea to the land can offer quite different perceptions of the same area. The view towards open water between headlands for instance, may channel the eye whereas a land backdrop will reduce visual impact.

8.37 From the sea it is very difficult to discern indentations in the coast so the coastline typically appears flattened without perspective or depth. In contrast, elevated views from land provide greater visibility of activities within the seascape, while actual distance to the horizon line increases with elevation of the viewer. This difficulty of appreciating distance and scale, presents a further complication to visual assessment. However, the indented coastline of much of the North Arm provides clues about scale to judge distances against the adjoining land.

8.38 The natural and physical qualities and characteristics of Port Pegasus that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes include the sheltered coastal waters, the wildlife, the impressive seascape views, the backdrop of indigenous steep bush-clad hills, the visual subservience of any built structures, and the rocky outcrops and beaches. Salmon farms may affect an observer's appreciation of these attributes of an area. However, while some may find the development detracts from their experience, it is also conceivable that others may find it interesting.

8.39 The principal elements of the scenarios that will give rise to visual effects are:

- The cage structures (including netting/ gantry and feed areas)
- Buildings (barges)
- Vessels that service the cages
- Lighting.

Visibility

8.40 Salmon farms may affect an observer's appreciation of the pleasantness, aesthetic coherence and cultural and recreational attributes of an area.

8.41 One of the challenges to visual assessments involving the coastal environment is the great variability of the sea. Variable conditions can make a considerable difference to the visual impacts of activities such as salmon farms. Variables include wind, light, tidal

movements and the clarity of the atmosphere. For the purposes of this assessment good weather conditions are assumed: clear skies, flat water within the inlet and light winds.

8.42 The further the viewer is from a development the less visible an activity such as a salmon farm is likely to be. From close to sea level (e.g. from a boat), steel cage/ polar circle salmon farms are generally visible up to 3km, beyond which they remain discernible but components become difficult to see particularly when the viewer is not deliberately looking for them. From elevated viewpoints the salmon farm is considered to become a minor element in the view, when viewed beyond 5km.

8.43 The visibility of salmon farms and their potential effects, as mentioned earlier, can vary according to a variety of factors including:

- Daytime visibility
- The size and configuration of the farm and number of buildings (barges)
- The density and buoyancy of structures
- Pen design, including the colour and reflectivity of each component, particularly the buildings and netting which are major visual components of salmon farms;
- Weather conditions
- Sea conditions
- The position of the farm in relation to the land; and
- Distance and elevation of the viewer

8.44 Visual effects occur in direct response to the visibility of an activity or object. In this regard, visibility and visual effect, while related, are two quite different matters. Visibility is measureable, whereas while visual effects can be described, they often create different responses from different people.

8.45 A visibility table for water-based **(Table 7A**) and elevated land-based views has been prepared (**Table 7B**). The table is extrapolated from observations of farms from elevated land throughout the country. It is acknowledged that there are no, or if any, very sparse elevated land based vantage points in the Port Pegasus area where views would be gained to the farm-related activities/ developments in these scenarios. The tables serve as a guide for comparison purposes in this case only.

Table 7A: Visibility of Salmon Farms from the water

Distance	0-500m	0.5-1km	1-2km	2-3km	3km and beyond
Impact on view	Extremely visible	Very visible	Visible	Partially visible or minor part of the view	Components become difficult to see

Table 7B: Visibility of Salmon Farms from elevated/ land based views

Distance	0-1km	1km-2.5km	2.5-5km	5km and beyond
Impact on view	Extremely visible	Very visible	Visible	Partially visible or minor part of the view

8.46 In terms of general visibility, the significance of views to the scenarios is elevated in the Port Pegasus setting due to the lack of modifications evident in the broader area (i.e. lack of built forms, jetties, huts and other infrastructure), with any modifications present being subservient to the area. The principal modifications in North Arm are the former historic freezer sheds, a hunters' hut, an overgrown track and some buoys associated with cod and crayfishing[54]. Despite these, the area is overwhelmingly natural and seemingly visually untouched.

8.47 Due to the location of the smolt farms in the inner bay area, these would almost entirely be seen against a land back-drop. The grow farms located within Big Ship Passage would be seen from some water-based angles as appearing against a land backdrop and from others appearing against the open horizon of the Southern Ocean (i.e. between Anchorage Island and Pearl Island). View-points experienced from a boat change obviously as one travels around the area.

8.48 For all options, the farms will represent a level of modification currently not evident within the area. The extent of the farms visibility is largely dependent on which scenario is assessed, however whichever scenario is opted for, the visual effects would vary little due to the fact that development is being placed within an environment where none is currently present. Clearly the least amount of structures associated with any scenario (i.e. scenario 4a/4b) would appear smaller in scale than scenario 1a/1b where vastly more structures are evident, extending the farms visibility. Barges would be apparent for each farm irrespective of scenario.

8.49 As mentioned, the principal views will be from the water. Port Pegasus is remote and difficult to access by boat, and comparatively few recreationalists travel to the area (when compared with other areas of Stewart Island/ New Zealand). A larger vessel is usually needed to access the area due to the exposed access route. People who travel this distance are likely to particularly appreciate and seek the remote and natural qualities of the area and based on this are likely to be more sensitive to the changes presented in these scenarios.

8.50 Arriving from Whale Passage, the smolt farms (s1) would be the first grouping of salmon farms visible. Once inside North Arm, the smolt farms would be the first visible sign of any salmon farming activity in the area. The distance from Whale Passage to the smolt farms is typically 2km. On the water, and depending on conditions, the farms would appear small and be seen entirely against a land back drop, irrespective of which scenario is assessed. It is likely that the barge/ accommodation building would be the most evident element at this distance, along with any servicing vessels. The pens would appear low to the water and would not instantly be visible, due in part to their low profile and their recessive colouration. The smolt farm would appear as one small grouping of structures and increase in visibility the closer one gets towards the central and western part of North Arm.

8.51 Towards the northern, inner part of North Arm, closer to Twilight Bay, views of the part of the southerly located grow farms would become apparent. From here, the various scenarios of the larger farms associated with the central channel of Big Ship Passage would be apparent, most noticeably those associated with f1 and f2, and potentially the

[54] Anecdotal evidence has also highlighted that unused numbers of craypots are occasionally stored on land in parts of the Inlet, however none were spotted during the site visit.

northern part of f3. f4 would be difficult to perceive from this location due to its location behind parts of Pearl Island

8.52 At distances of 2.5km or more, the farms within Big Ship Passage, irrespective of scenario, would appear low on the water, with only the barge buildings being the main visible objects. In the design of the different scenarios, the barge structures may be visible together, as taller structures on the surface of the water, potentially seen 'stacked' against each other, and potentially on the horizon, which would amplify their visual presence. The smolt farms would become clearer when viewed from this inner bay area, and individual cages would be identifiable. The currently perceived naturalness in views from the central and inner North Arm would be affected by these structures.

8.53 From certain parts of North Arm, farms f1-f4 will not be visible, due to the shape of Pearl Island, with intervening landform blocking the views. In this case the grow farms would be located at a distance of around 3km, leading to visual separation between smolt and grow farm structures. This extent of separation would be extended somewhat with the differences in the amount of structures required under the different scenarios, however it is considered that due to their mid-channel location, this would make little overall difference in terms of visibility.

8.54 Due to the smolt farms being smaller in size (i.e. circular cages with 100m circumference as opposed to the larger 160m circumference of the grow farms), than the grow farms, and being located generally away from routes that vessels would travel, (therefore enabling vessels to travel at greater/ varied distances from the smolt farms), it is considered that the visual effects are concentrated to within a kilometre of the farm's footprint. However, when travelling through the narrow Big Ship Passage, the travelling routes are located close to the grow farms with much shorter viewing distances (i.e. approximately 250-350m) which would make them appear much more evident.

8.55 It is concluded that the visual effects will be greater for the grow farms in Big Ship Passage, irrespective of chosen scenario, due to the more geographically constrained area of water, being a 'main' travelling route for passing vessels, larger pen design and four feed barges for each farm.

8.56 In terms of the different scenarios for Big Ship Passage, the difference in visual effect is negligible. The central locations of the farms in this waterway exposes the visible nature of the infrastructure associated with each farm and when seen together from certain viewpoints (such as between Chase Head and Albion Inlet) creates increased cumulative visual effects. When approaching from Pegasus Passage towards Big Ship Passage, the southern part of f2 and the majority of f3 will be evident in the view, backdropped by Pearl Island. The barges will further amplify the visible nature of these farms.

8.57 Irrespective of which scenario is chosen, the grow farms in Big Ship Passage would be very visible for up to 2km and when travelling south from North Arm, may appear partly against the horizon, amplifying their visual presence. Within scenarios 1a/1b and potentially 2a/2b and 3a/3b the pens would partly 'block' views through to the horizon, where farms would overlap forming a solid interface, which would amplify their presence. This would be further strengthened by the presence of the barges. Visual effects are therefore considered to be highly adverse for views gained from within Big Ship Passage and the northern parts of North Arm. Options that keep cages and barges closer to the shoreline of the western embayment of Pearl Island, instead of utilising the

central part of Big Ship Passage, would generally have lower visual effects due to their visual catchment being reduced.

8.58 In summary, the choice of scenario will change little the overall spatial extent of visual amenity effects. Clearly the larger scenarios where more infrastructure is utilised will have greater impacts than the smaller scenarios, however due to the farms within Big Ship Passage being mid-channel, this, by default, amplifies their presence, rather than lessens them.

8.59 It is concluded that the visual effects of the smolt and grow farms in these scenarios would severely interrupt the apparent naturalness of the area and create adverse visual effects that are very high. The larger the scenario, the greater the spatial extent of visual effects, however overall, this has little bearing on the overall visual effect due to the main area of farms being located within the middle of Big Ship Passage.

Summary of Actual and Potential Effects

8.60 The location of any semi-industrial style activity within an area retaining outstanding landscape and natural character values, with no or very little existing modification, will create significant adverse effects on those values that underpin the landscape and natural character overlays. Irrespective of where the farms are located and which scenario is selected, the effects cannot be avoided, remedied or mitigated. The key visual effects relate principally to the insertion of human elements within a wholly natural environment.

8.61 The significance of landscape, natural character and visual amenity effects is considered to be in the highest category on the scale of effects outlined in the methodology. The scenarios constitute a substantial change to an area holding some of the most sensitive and valued landscape, natural character and visual amenity values in the country, leading to highly adverse effects, irrespective of which scenario is chosen.

9.0 Recommended Measures to Reduce Significance of Effects

9.1 As outlined in the previous section, it is impossible to locate salmon farming within Port Pegasus without creating very high adverse effects to the landscape, natural character and visual amenity values. This is irrespective of which scenario is selected and where the farms are ultimately located, even outside of the indicative scenarios assessed in this report. As mentioned in the earlier chapters, as part of the assessment of effects, measures have been discussed to ‘lessen’ the severity of the farms’ effects. Whilst initial discussions with the project team entertained some of these aspects, which included siting, location of cages, number of barges and the colouration of the structures, very few have been taken through to the final set of scenarios.

9.2 The final scenarios were ultimately refined through recent work undertaken by Cawthron, concerning water flow matters and benthic ecological values. These scenarios are outlined within **Appendix 3** of this report.

10.0 Conclusion

10.1 The investigation considers scenarios for salmon farms to be located within the North Arm and Big Ship Passage area of Port Pegasus, Stewart Island. For the reasons outlined in this report, the vast majority of the island, including the Port Pegasus area retains outstanding levels of natural character, is an outstanding natural landscape and retains very high levels of visual amenity. In essence, Port Pegasus is one of the truly wild, remote and intact landscapes in New Zealand that is mostly untouched by current human modification.

10.2 Despite the area supporting historic activity, much of the associated infrastructure has been removed, with very little visual evidence remaining. Historically, in a landscape sense, Port Pegasus rates as one of the country's pioneering areas, where first settlers tried to carve a living in this remote place. Since then, nature has invaded and almost eradicated the signs of past human use. Culturally, this area of Stewart Island is highly valuable to the local iwi.

10.3 Biophysically, the land and waters support some of the most intact areas of vegetation in the country. Some significant threatened species are noted as living in this area.

10.4 By locals and visitors, Port Pegasus is known as a special place. As a result, and despite the work undertaken during this investigation, any infrastructure introduced into this area would have a significant adverse effect, irrespective of location or chosen scenario. The introduction of salmon farms would erode the values and qualities of this special place to such an extent that its status as an outstanding landscape would be compromised, similar to other more developed areas on Stewart Island.

10.5 The effects created by the scenarios are contrary to a number of national, regional and local planning provisions relating to landscape and natural character. The scenarios do not align with the direction of current regional policies since salmon farming is currently a prohibited activity.

10.6 The significance of landscape, natural character and visual amenity effects is considered to be in the highest category on the scale of effects outlined in the methodology. The scenarios constitute a substantial change to an area holding some of the most sensitive and valued landscape, natural character and visual amenity values in the country, leading to highly adverse effects, irrespective of which scenario is chosen.

10.7 Based on this overall assessment, it is concluded that salmon farms in North Arm and Big Ship Passage would create landscape, natural character and visual amenity effects that would be significantly adverse at all scales, and could not be avoided, remedied or mitigated. These effects will be contrary to policies in the NZCPS, and the RMA.

Appendix 1: Landscape & Visual Methodology

Introduction

The landscape and visual effects assessment process provides a framework for assessing and identifying the nature and significance of potential landscape and visual effects that may result from a proposed development. Such effects can occur in relation to changes to physical elements and the existing character of the landscape and impacts on viewing audiences and visual amenity. This process should include an iterative design development approach which seeks to avoid, remedy or mitigate adverse effects and where appropriate include stakeholder engagement (see Figure 1).

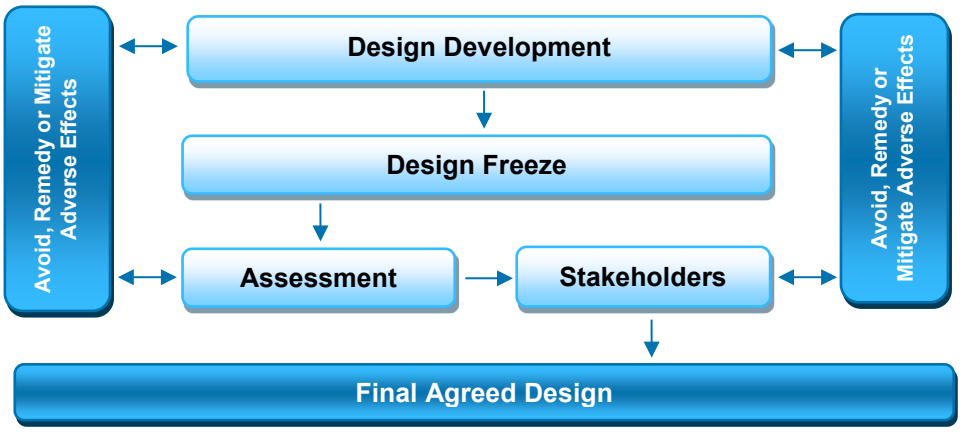


Figure 1: Design feedback loop (Adapted from GLVIA3)

When undertaking landscape and visual effects assessments, it is important that a structured and consistent approach is used to ensure that findings are clear and as objective as possible. Judgement should always be based on training and experience, and be supported by explicit evidence and reasoned argument.

The existing landscape and its visual context form the 'baseline' for landscape and visual effects assessments. In order to assess such effects, the landscape must first be described, including an understanding of the key characteristics that make an area distinctive. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into distinct character areas or types and describing the characteristics of each area. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described alongside a judgement made on the value or importance of the potentially affected landscape.

Although landscape and visual effects assessments consider the effect of the proposed development on a landscape, they form separate procedures. The assessment of the potential effect on the landscape forms the first step in this process and is carried out as an effect on an environmental resource (i.e. landscape elements, features and character).

The assessment of visual effects considers how changes to the physical landscape affect the viewing audience.

The types of effects can be summarised as follows:

Landscape effects:

Change in the physical landscape, which may change its character or value.

Visual effects:

Change to specific views which may change the visual amenity experienced by people.

This outline of the landscape and visual effects assessment methodology has been undertaken with reference to the Quality Planning Landscape Guidance Note[55] and its signposts to examples of best practice which include the UK guidelines for landscape and visual impact assessment[56] and the New Zealand Landscape Institute Guidelines for Landscape Assessment[57].

A separate assessment is required to assess changes in natural character in coastal areas and other waterbodies.

Landscape Effects

Assessing landscape effects requires a thorough understanding of the landscape character and importance or value of the landscape. Using this baseline, a *determination* of landscape sensitivity and the magnitude of change which results from a proposed development can be made to determine the overall significance of landscape effects.

Landscape Sensitivity

The determination of the sensitivity of the landscape resource is described in terms of both the susceptibility of an area of landscape to change and the value of the landscape.

The sensitivity of the landscape depends upon the degree that a particular landscape or feature can accommodate change. This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;
- Visual enclosure / openness of views and distribution of the viewing audience;
- The value or importance placed on the landscape; and
- The scope for mitigation, which would be in character with the existing landscape.

The susceptibility to change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of Outstanding Natural Landscape (RMA s.6(b)) based on important biophysical, sensory/ aesthetic and associative landscape attributes which have potential to be affected by a proposed development.

Magnitude of Landscape Change

The magnitude of landscape change judges the amount of change that is likely to occur to existing areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the significance of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. **Table 1** below has been compiled to help guide this process.

[55] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[56] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)
[57] Best Practice Note Landscape Assessment and Sustainable Management 10.1, NZILA

Contributing Factors		Higher	Lower
Sensitivity	**Susceptibility to change**	The landscape is strongly distinctive with important biophysical, sensory and associative aspects. There is an absence of landscape detractors which make it highly vulnerable to the type of change which would result from the proposed development.	The landscape lacks any distinctive biophysical, sensory or associative aspects. It has many detractors and has the ability to accommodate the proposed development without undue consequences to landscape character.
	The value of the landscape	The landscape requires protection as a matter of national importance (ONF/L).	The landscape is of low or local importance.
Magnitude of Change	**Size or scale**	Total loss or addition of key features or elements. Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements.	The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent.
	Geographical extent	Landscape character area scale.	Site scale, immediate setting.
	Duration and reversibility	Permanent. Long term (over 10 years).	Reversible. Short Term (0-5 years).

Table 1: Determining the significance of landscape effects

Visual Effects

To assess the visual effects of a proposed development on a landscape, a visual baseline must first be defined. The visual baseline identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or zone of visual influence of the site and proposal. Where possible, computer modelling can assist to determine the actual extent of visibility together with field work which should be undertaken to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

Visual Sensitivity

Visual sensitivity is dependent upon the susceptibility of the viewing audience to change and the value attached to views. The susceptibility of the viewing audience is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focussed on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focussed on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the landscape setting.

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors. Important viewpoints are also likely to appear in guide books or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

Magnitude of Visual Change

The assessment of visual effects also considers the potential magnitude of change which will result from the nature of a proposed development and its potential visibility. This takes account of the size or scale of the effect, any mitigation measures and their impact over time and the geographical extent of

views. Preparation of any simulations of visual change should be guided by best practice as identified by the NZILA[58].

The assessment of visual effects should also distinguish between temporary (often associated with construction) and permanent effects where relevant. The duration of the temporary effects may also be a consideration when evaluating the magnitude of visual change.

The magnitude of change resulting from the proposed development is combined with the sensitivity of the viewing audience to determine the overall significance of visual effects.

It should also be noted that a change in view is not always negative and does not automatically generate adverse effects. **Table 2** below has been prepared to help guide this process:

Contributing Factors		Higher	Lower
Sensitivity	**Susceptibility to change**	Views from dwellings and recreation areas where attention is typically focussed on the landscape.	Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors.
	Value attached to views	Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature. High visitor numbers.	Viewpoint is not typically recognised or valued by the community. Infrequent visitor numbers.
Magnitude of Change	**Size or scale**	Loss or addition of key features in the view. High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture). Full view of the proposed development.	Most key features of view retained. Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture. Glimpse / no view of the proposed development.
	Geographical extent	Front on views. Near distance views; Change visible across a wide area.	Oblique views. Long distance views. Small portion of change visible.
	Duration and reversibility	Permanent. Long term (over 15 years).	Transient / temporary. Short Term (0-5 years).

Table 2: Determining the significance of visual effects

Nature of Effects

In combination with assessing the significance of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is considered to be benign in the context of where it occurs.

This assessment of the nature effects can be further guided by **Table 3** set out below:

Nature of effect	Use and Definition
Adverse (negative):	The proposed development would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values
Neutral (benign):	The proposed development would complement (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values
Beneficial (positive):	The proposed development would enhance the landscape and / or visual amenity through removal of restoration of existing degraded landscapes uses and / or addition of positive elements or features

Table 3: Determining the Nature of Effects

[58] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

Cumulative Effects

During the scoping of an assessment, where appropriate agreement should be reached with the relevant local authority as to the nature of cumulative effects to be assessed. This can include effects of the same type of development (e.g. wind farms) or the combined effect of all past, present and approved future development[59] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can be positive or negative.

Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and significance of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the sensitivity and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

Determining the Overall Significance of Landscape and Visual Effects

The landscape and visual effects assessment concludes with an overall assessment of the likely significance of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation.

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in **Table 4** below. This table which can be used to guide the significance of landscape and visual effects uses an adapted seven-point scale derived from NZILA's Best Practice Note.

Effect Rating	Use and Definition
Very High:	Total loss to the characteristics or key attributes of the receiving environment and /or visual context amounting to a complete change of landscape character.
High:	Major change to the characteristics or key attributes of the receiving environment and /or the visual context within which it is seen; and/or a major effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *High: adjective-* ***1.*** *Extending above the normal level.* ***2.*** *Great in amount, value, size, or intensity.*

[59] The life of the statutory planning document or unimplemented resource consents.

Moderate- High:	A moderate - high level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate - high level of effect on the perceived amenity derived from it.
Moderate:	A moderate level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a moderate level of effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *Moderate: adjective- average in amount, intensity, or degree*
Moderate - Low:	A moderate - low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have moderate - low level of effect on the perceived amenity derived from it.
Low:	A low level of effect on the character or key attributes of the receiving environment and/or the visual context within which it is seen; and/or have a low effect on the perceived amenity derived from it. *Oxford English Dictionary Definition* *Low: adjective- **1.** Below average in amount, extent, or intensity.*
Very Low:	Very low or no modification to key elements/ features/ characteristics of the baseline or available views, i.e. approximating a 'no change' situation.

Table 4: Determining the overall significance of landscape and visual effects

Determination of "minor"

Decision makers in assessing whether an application should be notified must assess whether the adverse effects of the activity on the environment will be more than minor. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be minor or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration guidance may be sought on whether the landscape and visual effects are considered minor. In relation to this assessment of moderate-low significance would generally equate to 'minor.

Very Low	**Low**	**Moderate – Low**	**Moderate**	**Moderate-High**	**High**	**Very High**

Table 5: Determining minor effects for the purpose of notification determination and non-complying activities

Appendix 2: Explanation of farm site selection and production scenarios

Selection of potential farm areas:
Results of the benthic habitat assessment were used to prioritise potential locations for finfish farming operations within the Port Pegasus North Arm area. Circular exclusion 'buffers' were placed around areas of hard substrate or coarse-grained sediments (100 m radius) and areas containing potentially sensitive taxa (250 m radius), identified through sonar imagery and drop-camera transects. Larger exclusion zones were used for potentially sensitive taxa as their exact densities and distributions are unknown.

To provide additional guidance on suitable locations for potential farm sites, an Index of Suitable Location (ISL) for finfish farming was calculated for the entire North Arm area, based on depth and water current data. Results of the ISL analysis indicated that mid-channel areas in Big Ship Passage have the greatest potential for farming, when taking into account exclusion buffers and water depth.

Four potential farming (grow out) areas (c. 10 h each) were subsequently selected within Big Ship Passage (f1, f2, f3 & f4), along with a smaller smolt growing area (c. 1.3 h) at the northern coastline. The smolt farm location was selected as it provided some separation from grow-out areas, a feature that was requested during discussions with industry. A maximum of 16 x 160 m circumference pens (two rows of eight pens, c. 20 m spacing between pens) was considered at each of the four potential farming areas. A maximum of 8 x 100 m circumference pens (two rows of four pens, c. 15 m spacing between pens) was considered for the smolt growing area.

Depositional modelling and feed inputs:
As an indicator of likely finfish production capacity within the North Arm area, varying feed input and cage configuration scenarios (a, b, c & d) were modelled across the four farming areas using DEPOMOD v 2.2. Two sets of scenarios were modelled (1 & 2), based on the farming areas operating in a similar way to either low-flow or more dispersive (high-flow[60]) sites within the Marlborough Sounds. This modelling was undertaken to test two very different biophysical response regimes to varying feed inputs.

Maximum feed inputs per pen for each farm area were based on preliminary DEPOMOD assessments for a range of feed inputs for a single pen at each farm area (131 - 400 t). Feed inputs that resulted in maximum depositional rates of ~6 kg m^{-2} yr^{-1} at the net pen edge were used for DEPOMOD assessments for the low-flow farm scenarios. Feed inputs that resulted in maximum depositional rates of ~13 kg m^{-2} yr^{-1} at the net pen edge were used for DEPOMOD

[60] This does not suggest that farm sites are 'high-flow', rather that some of the sites may be 'low-flow sites with episodic wave action' which may have a mitigating effect on benthic enrichment. The magnitude of that potential beneficial effect is currently unknown. The use of the high-flow assumption is for comparison purposes only, and does not suggest that the potential effect from waves would be of similar magnitude as high-flow tidal currents in the Marlborough Sounds. The 'high-flow' based scenarios and their associated potential production figures should therefore be interpreted with caution.

assessments for the high-flow farm scenarios. These levels of deposition are predicted to result in c. ES 5 conditions if the effects of the farm are similar to low-flow or high-flow farm sites in the Marlborough Sounds region, respectively.

A maximum of 64 grow-out pens (16 pens per area) across the four farm areas were assessed in the modelling, so maximum production was associated with all pens operating at all farms (Table 1). Scenarios with lower levels of production were achieved by reducing the number of pens at each of the farm areas. Across the two sets of scenarios (low-flow/high-flow), feed input per pen over a 1-year period varied depending on whether the effects of the farms were modelled as behaving like low-flow or high-flow sites.

As the total number of pens varied across scenarios, the total feed input at each farm area also varied. The feed inputs resulted in scenarios with a range of production levels at each site (~2,800 - 8,000 t production, per annum; Table 1). The likely production from each scenario was estimated using a feed conversion efficiency (FCE) ratio of 1.7:1.

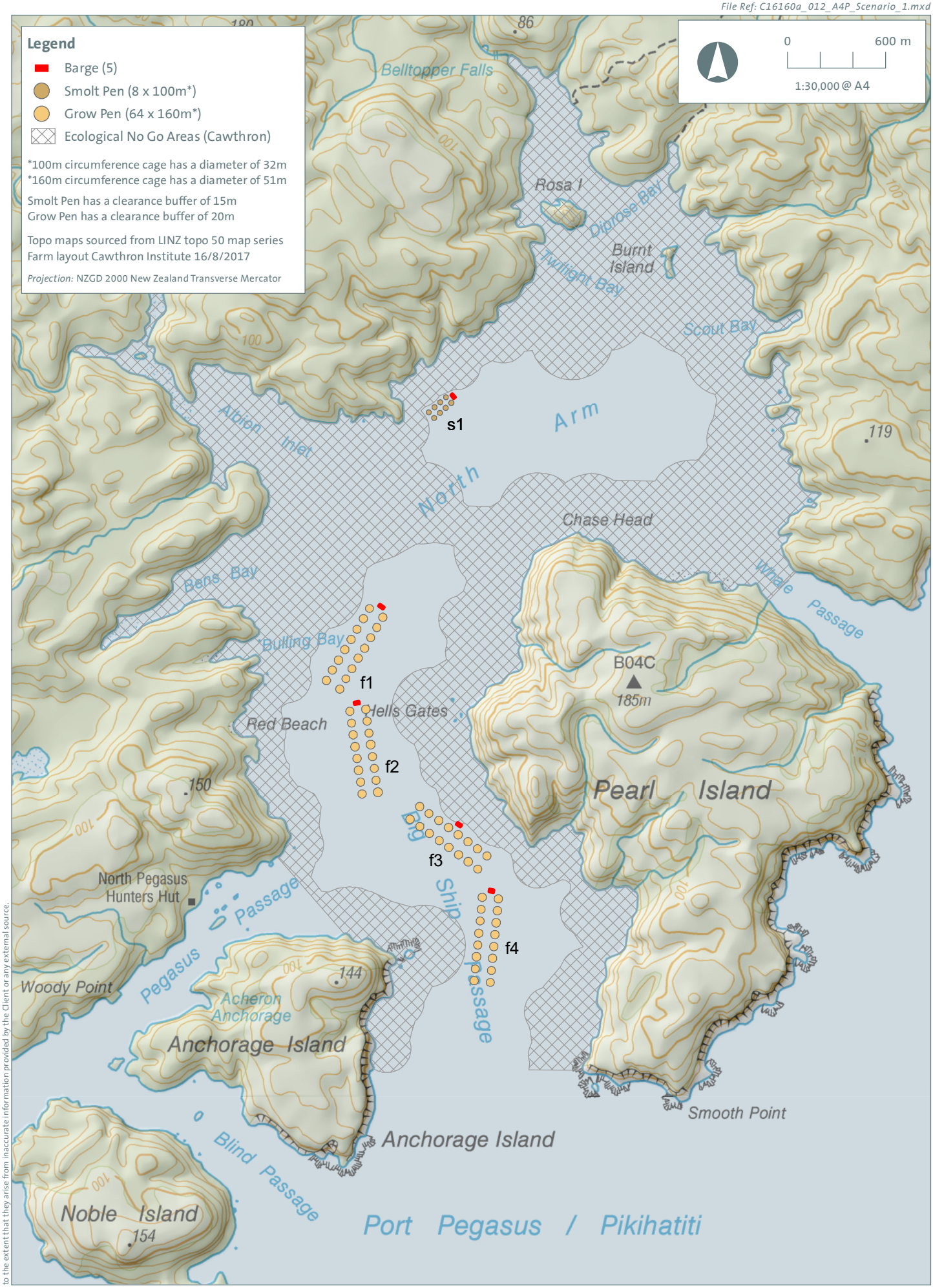
For the smolt farm, a feed level of 5% of the total feed input across the four grow-out farms was used across the two sets of scenarios (238 - 680 t per annum; Table 1). Smolt feed was spread evenly across 4, 6 or 8 smolt pens in each scenario, which resulted in feed inputs of 60 - 102 t per pen (per annum).

Table 1. Farm scenarios and parameters, including feed input per pen (tonnes per annum), number of pens (160 m circumference for grow-out and 100 m circumference for smolt), total feed input and estimated production (tonnes per annum) for the four grow-out areas (f1-f4) and the smolt growing area (s1).

Scenario	Input parameters	Farming area				Grow-out totals	Smolt totals
		f1	f2	f3	f4		
1a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		64
	Number pens	16	16	16	16	64	8
	Total feed (tonne)	2100	2100	2400	3600	10200	510
	Total production (FCE 1.7)	1235	1235	1412	2118	6000	
2a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		63
	Number pens	8	10	14	14	46	6
	Total feed (tonne)	1050	1312.5	2100	3150	7613	381
	Total production (FCE 1.7)	618	772	1235	1853	4478	
3a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		79
	Number pens	6	8	12	12	38	4
	Total feed (tonne)	787.5	1050	1800	2700	6338	317
	Total production (FCE 1.7)	463	618	1059	1588	3728	
4a	Feed per pen (tonne)	**131**	**131**	**150**	**225**		60
	Number pens	4	6	8	10	28	4
	Total feed (tonne)	525	787.5	1200	2250	4763	238
	Total production (FCE 1.7)	309	463	706	1324	2801	
1b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		85

	Number pens	16	16	16	16	64	8
	Total feed (tonne)	2800	2800	3200	4800	13600	680
	Total production (FCE 1.7)	1647	1647	1882	2824	8000	
2b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		85
	Number pens	8	10	14	14	46	6
	Total feed (tonne)	1400	1750	2800	4200	10150	508
	Total production (FCE 1.7)	824	1029	1647	2471	5971	
3b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		102
	Number pens	6	8	12	12	38	4
	Total feed (tonne)	1050	1400	2400	3600	8450	407
	Total production (FCE 1.7)	618	824	1412	2118	4971	
4b	Feed per pen (tonne)	**175**	**175**	**200**	**300**		79
	Number pens	4	6	8	10	28	4
	Total feed (tonne)	700	1050	1600	3000	6350	317
	Total production (FCE 1.7)	412	618	941	1765	3735	

Appendix 3: Different Scenarios



Boffa Miskell
www.boffamiskell.co.nz

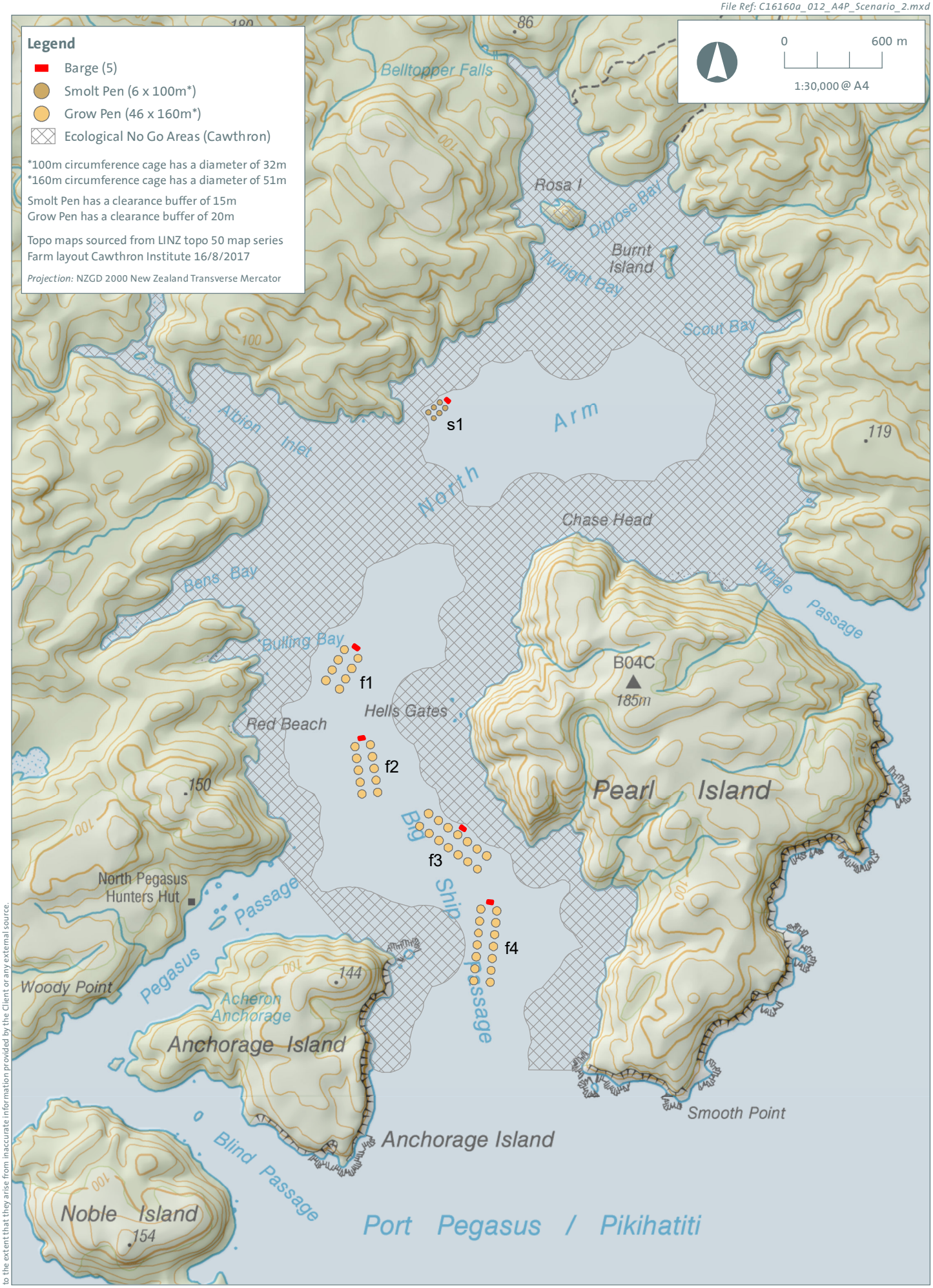
PORT PEGASUS SALMON FARMS

Scenario 1a and 1b

Date: 18 August 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* BMc | *Checked:* JBe



Boffa Miskell
www.boffamiskell.co.nz

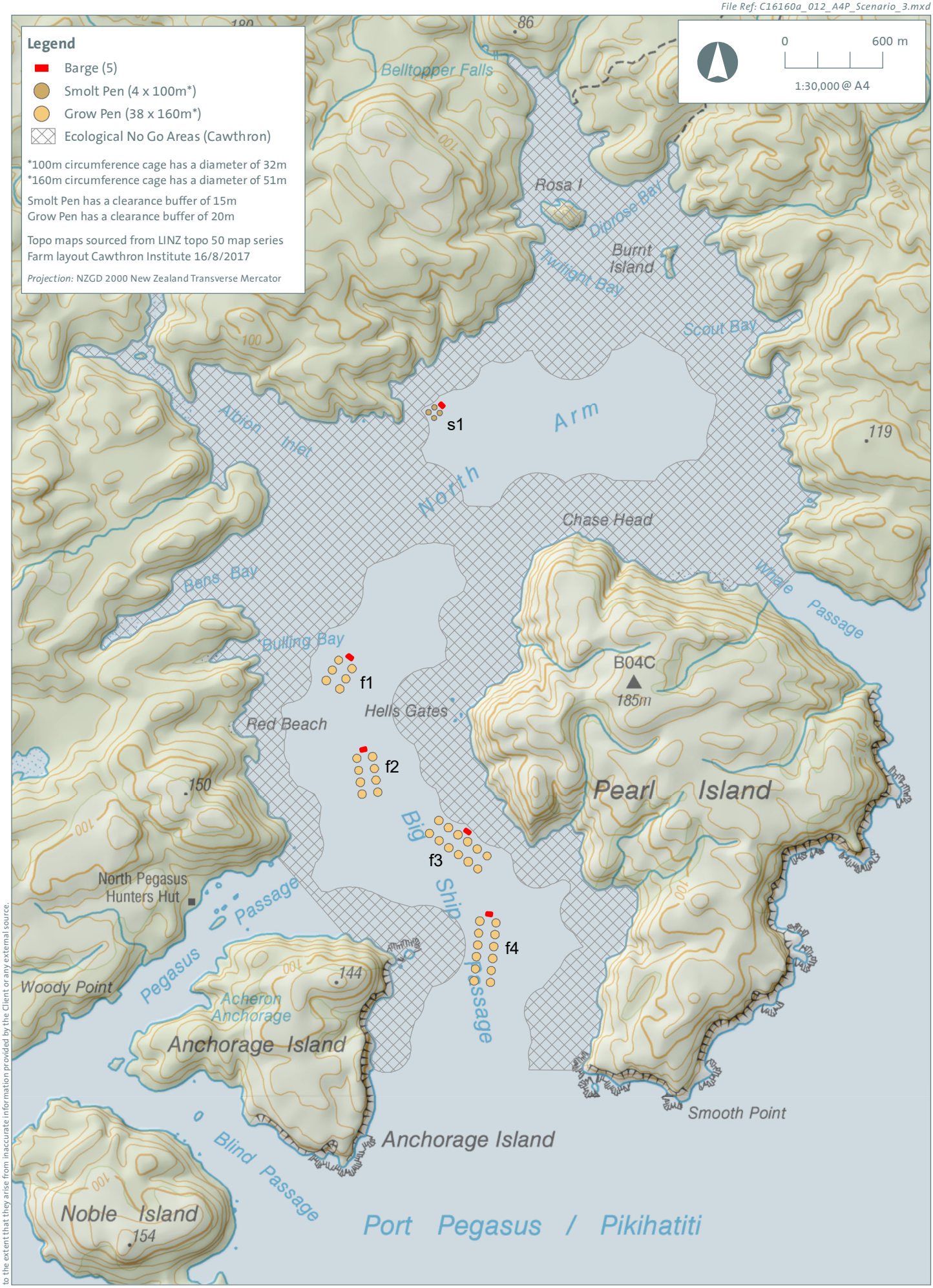
PORT PEGASUS SALMON FARMS

Scenario 2a and 2b

Date: 18 August 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* BMc | *Checked:* JBe



Boffa Miskell
www.boffamiskell.co.nz

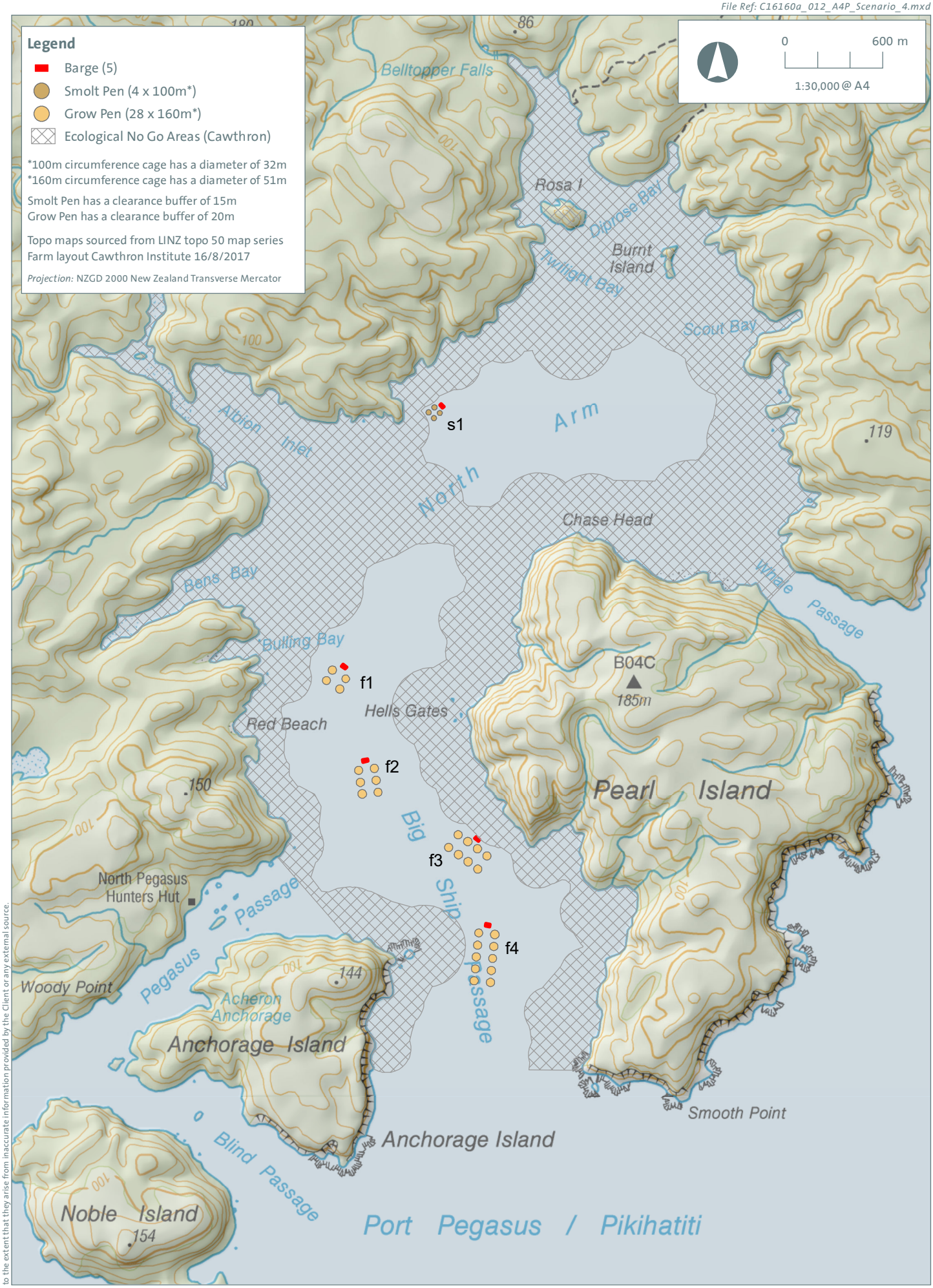
PORT PEGASUS SALMON FARMS

Scenario 3a and 3b

Date: 18 August 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* BMc | *Checked:* JBe



Boffa Miskell
www.boffamiskell.co.nz

PORT PEGASUS SALMON FARMS

Scenario 4a and 4b

Date: 18 August 2017 | Revision: 0

Plan prepared for Environment Southland by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* BMc | *Checked:* JBe