Project South Marine Farm

Navigational Assessment

5 March 2020

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1. INTRODUCTION

This report contains an assessment of the navigational issues associated with the siting of the Project South Five Farmed Areas, south east of Ruapuke Island to the east of Stewart Island.

It is prepared by Jason Eriksson who holds a Coastal Masters, Deep-sea Mates and Coastal Fishing Tickets and who has worked as a skipping on vessels in this area for more than forty years.

The report contains five sections as follows:

Section 1: Is this introduction.

Section 2: Describes the proposed activity.

Section 3 Describes the context for this navigation assessment, including the applicable statutory framework which applies here, marine traffic in the area and other notable aspects of the existing environment.

Section 4: Assesses the effects of the Five Farmed Areas on safe and efficient navigation through the area and identifies the appropriate measures to ensure effects on navigation are managed in a manner which aligns with statutory obligations and international best practice insofar as it applies to an activity of this type in this location.

Section 5: Is a conclusion

2. THE PROPOSED ACTIVITY

The proposed marine farm site is shown in Figure 1, 2 and 3. It is located in an area south east of Ruapuke Island, just outside Foveaux Strait and includes five 157 hectare farming areas occupied at full development by ten 120 circumference polar circle fish pens, and anchors and warps extending out to 340 meters on the surrounding sea floor. The pens will be supported by a control barge, and have the capacity to submerge in severe weather.

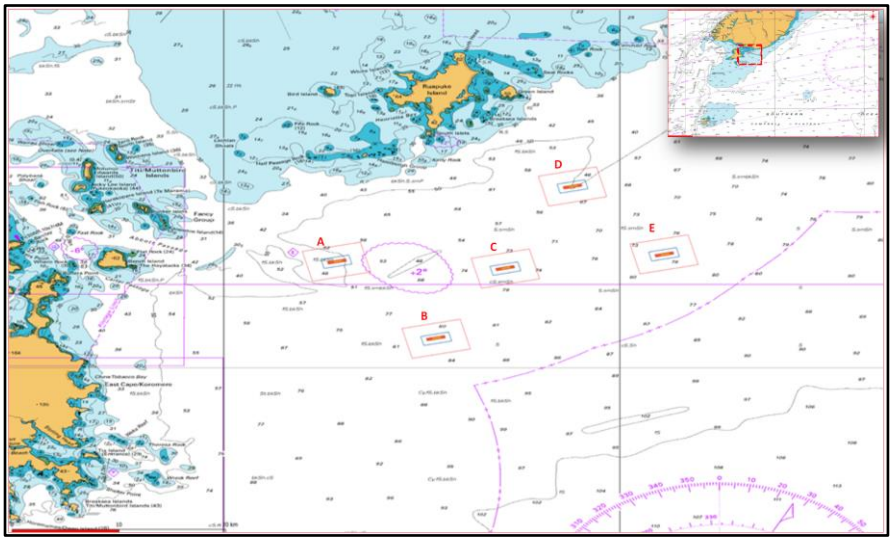

Figure 1: Proposed five farming areas

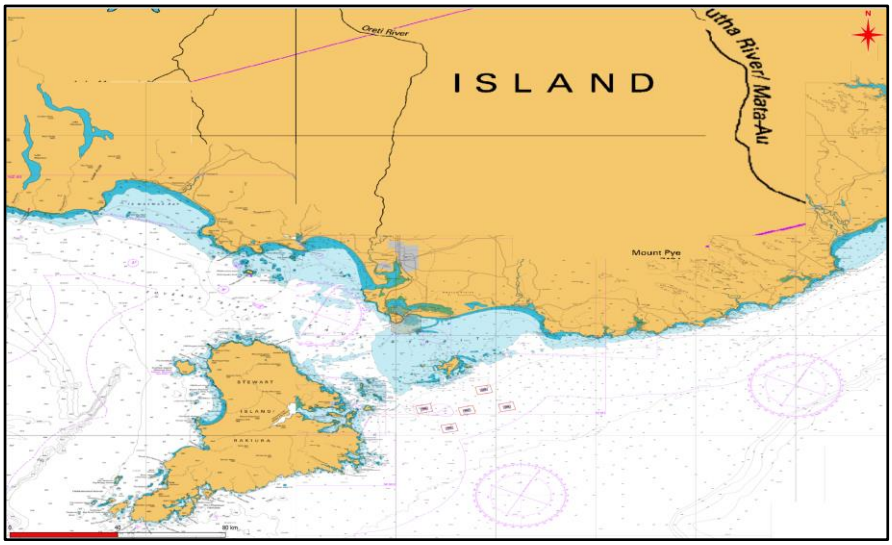

Figure 2: Proposed five farming areas and South Coast and Stewart Island

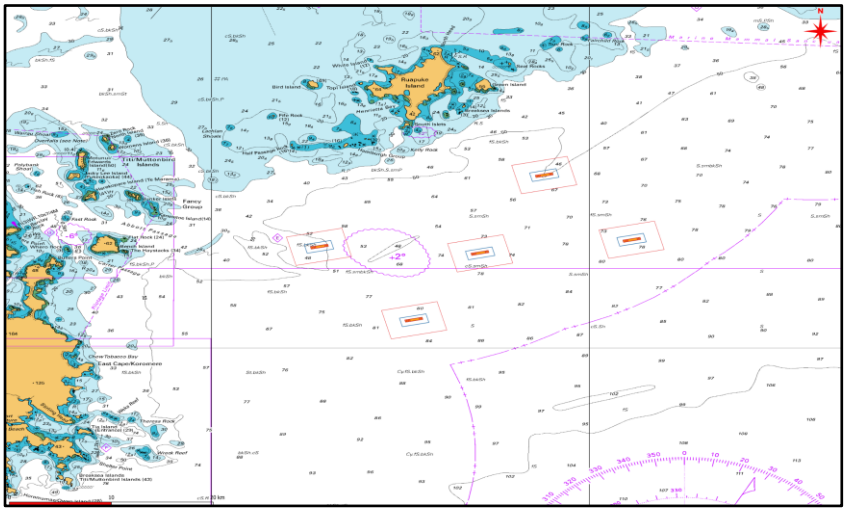

Figure 1: Proposed five farming areas and Ruapuke Island.

The application area is located in water depths of between 55 and 85 m. The Foveaux Strait area is a high energy environment with currents up to 1.2 m s^{-1} and wave heights of up to 10 m having been recorded.

The Five Farmed Areas differ from other fin fish farms already operating in New Zealand in that they will be located in the open ocean, as opposed to a sheltered bays. The open ocean environment requires the pens to be designed and constructed to withstand high velocity wave energy. The assessment of pen design, mooring and anchoring systems is provided by another expert. This report deals with the potential navigation issues and how to manage them.

3. ASSESSMENT CONTEXT

3.1 STATUTORY FRAMEWORK

3.1.1 The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)

The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) provides guidance and recommendations on a global system of marks and lights. Its focus is safe coastal maritime navigation, although its guidance is also commonly adopted in inland waters and rivers.

3.1.2 International Convention on the Safety of Life at Sea

New Zealand is a signatory of the SOLAS (International Convention on the Safety of Life at Sea) Convention.

Chapter V, Regulation 13 of SOLAS addresses the establishment and operation of aids to navigation. It directs that:

1 Each Contracting Government undertakes to provide, as it deems practical and necessary either individually or in co-operation with other Contracting Governments, such aids to navigation as the volume of traffic justifies and the degree of risk requires.

2 In order to obtain the greatest possible uniformity in aids to navigation, Contracting Governments undertake to take into account the international recommendations and guidelines[†] when establishing such aids.

3 Contracting Governments undertake to arrange for information relating to aids to navigation to be made available to all concerned. Changes in the transmissions of position-fixing systems which could adversely affect the performance of receivers fitted in ships shall be avoided as far as possible and only be effected after timely and adequate notice has been promulgated.

3.1.3 Maritime Transport Act 1994

Section 200(2) of the MTA provides that the operator of any marine farm is responsible for providing and maintaining aids to navigation for the facility.

Maritime NZ ensures international obligations are met through a specific approval process for aids to navigation.

Under section 200(7) of the Maritime Transport Act 1994 (MTA), no person may erect, place, alter or remove a 'navigational aid' without the approval of the Director of Maritime NZ (the Director). This applies irrespective of the owner (e.g. even Maritime NZ officials seek approval to place, alter or remove aids to navigation operated by Maritime NZ). As part of the approval process, IALA guidance will be considered and recommendations may be incorporated into any conditions.

In some parts of New Zealand including Southland the MTA section 200(7) power to approve aids to navigation has been delegated to named harbor masters in relation to aids to navigation for marine farms. The Southland Harbor Master is Lyden Cleydon.

When the MTA section 200(7) power to approve aids to navigation has been delegated to harbor masters, the delegation includes a condition that the delegate 'must have regard to' relevant guidance from Maritime NZ. This guidance must be given due weight and consideration when exercising the delegated power. Applicants for aids to navigation should be mindful of this expectation on the local harbor master when they are the

delegated decision maker[1]. Harbor masters should seek advice from Maritime NZ regarding unusual or unfamiliar situations. The Director remains responsible for decisions made under delegation and can withdraw the delegation at any time, if necessary.

Southland Regional Council Navigation Safety Bylaws 2009 The Southland Regional Council Navigation Safety Bylaws 2009 (bylaws) apply to all navigable waters within the Southland Region. This includes the areas in which Project South and the Five Farmed Areas are located.

Among other things the bylaws contain provisions which address:

- Mooring and securing of vessels;
- Aids to navigation;
- Sound and light signals;
- Operating requirements for vessels;
- Hazardous cargoes, hazardous works and dangerous materials; and
- Special provisions which apply to specific geographic areas (none of which apply to the Project South Five Farmed Areas)

3.1.4 Maritime New Zealand Marine Farm Guidelines

The Maritime New Zealand Marine Farm Guidelines document is designed to assist people involved in marine farms. It is relevant to those establishing/managing marine farms, harbor masters, local authorities and other interested parties.

The document provides recommendations and good practice examples on matters of navigational safety, particularly for aids to navigation on marine farms.

It is relevant to all types of marine farms, including offshore fin fish farms

It covers best practice for the positioning, type of marks and lights, ongoing maintenance of aids to navigation and other matters relevant to navigational safety. Local conditions and other water users must be considered so that decisions on aids to navigation are appropriate.

3.1.5 Resource Management Act

Marine farms in this location require a coastal permit from the Southland Regional Council (Regional Council) under the Resource Management Act 1991 (RMA), and navigational safety is considered during the resource consent process. This includes consideration of

[1] In Southland there are two, a Harbourmaster and a Deputy Harbourmaster

farm location, relationship to surrounding features, communities and navigational routes, and an appropriate lighting and maintenance plan for aids to navigation.

Further detail on the outcomes sought by the Regional Council are included in its Regional Coastal Plan for Southland. Of most relevance are the objective and policies in Chapter 11.8 which address navigational safety and state:

> ***Objective 11.8.1 - Safe and efficient navigation***
>
> *To ensure there is safe and efficient navigation in the coastal marine area*
>
> ***Policy 11.8.1 - Existing navigation routes***
>
> *Preserve existing navigation routes:*
>
> - *around the coast of the region; and*
> - *to and from launching places, ports and anchorages.*
>
> ***Policy 11.8.2 - Avoid adverse effects on navigation safety***
>
> *Avoid any adverse effects from structures and activities on navigation safety.*

3.2 LOCATION OF THE PROPOSED FARM

3.3 MARINE TRAFFIC IN THE AREA

There are no defined shipping channels or traffic separation schemes in the vicinity of Project South. Any such channels would be shown on the marine chart.

However, it is in the general area of natural uncharted vessel transit routes for:

- Vessels travelling to and from offshore destinations; and
- Inshore traffic travelling within New Zealand.

Each is described below.

3.3.1 Offshore Marine Traffic Travelling to and From Offshore Destinations

Vessels which pass through the Project South area include:

- Vessels travelling between Bluff and the Southern Ocean or South America; or
- Vessels travelling between international waters to the south west of New Zealand and Timaru or Lyttleton.

Although depending on the personal preference of the skipper and weather vessels in the latter category can often pass north of Ruapuke Island. The decision on which route to take is made by the skipper of the vessel taking into account the condition of the vessel (its load condition), weather and tidal conditions at the time it is passing through Foveaux Strait, and how much time they have to complete their journey, as going south of the Island could add another 16nm or 2 two hours steaming for a vessel travelling at 8 knots.

Neither route is navigationally complex. This is reflected in Figure X below, which shows vessel movements in the vicinity of the proposed farm site using AIS data.[2]

Most of these vessels are large commercial shipping vessels, cruise ships, of fishing boats that fish offshore (beyond the 12 mile limit such as factory trawlers), and would have draughts deeper than 5m.

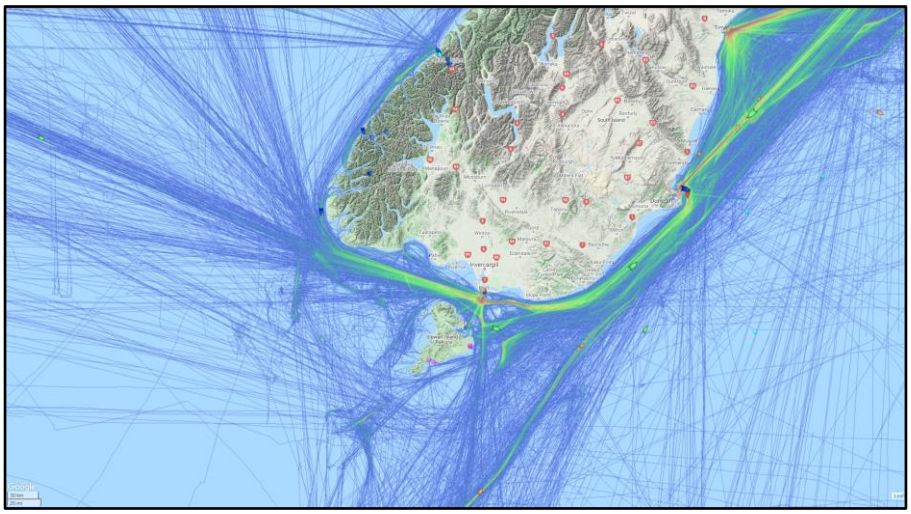

Figure 4: Vessel Routes from AIS equipped vessels. Red line depicts higher the traffic, lighter green less traffic, blue lines are not a lot of traffic

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[2] Automatic identification system (AIS) is an automatic tracking system that uses transponders on ships. Relying on the AIS data for the marine traffic has inherent limitations as not all vessels have and / or will use AIS while passing through the area, however, it does provide a very good snapshot of use.

It is a legal requirements for the following vessels to fit AIS under SOLAS V regulations and Maritime New Zealand Rules, Part 40C:

- A ship of 300 gross tonnage or more constructed before 1 January 2017 but on or after 25 May 1980 that proceeds on an international voyage, not later than the first survey on or after 1 January 2017:
- A ship of 300 gross tonnage or more constructed on or after 1 January 2017 that proceeds on an international voyage:
- A ship of 500 gross tonnage or more constructed before 1 January 2017 but on or after 25 May 1980 that proceeds beyond restricted limits, not later than the first survey on or after 1 January 2017:
- A ship of 500 gross tonnage or more constructed on or after 1 January 2017 that proceeds beyond restricted limits.
- Fishing Vessels use of AIS above 45 deg south is mandatory when fishing for Hoki only, any other time the use is strictly voluntary, it is very common for masters to turn the AIS off to maintain their personal Intellectual property and guard fishing locations from competitors, predominantly AIS is only on in the southern ocean when bulk fisheries like squid or Southern Blue Whiting are in spawn and vessel traffic is high and becomes an essential safety tool.

It is also becoming more common that smaller recreational vessels, in particular sailing vessels, are fitting AIS units, and this is reflected in the AIS data for the general area.

A few local, smaller fishing vessels also have AIS.

As is shown in Figure 4 above, Foveaux Strait and waters on the northern site of Ruapuke Island, rather than the proposed farm site is the main navigation route for:

- Vessels travelling between international waters and Bluff or Dunedin; and
- Vessels steaming between the east and west coast of the South Island.

The northern side of Ruapuke Island offers a more direct line but is shallower water and in some weather and tidal conditions skippers may elect to steam to the southern side of the Island to stay in deeper water.

The decisions on which route to take is made by the skipper of the vessel taking into account the condition of the vessel (its load condition), weather and tidal conditions at the time it is passing through Foveaux Strait, and how much time they have to complete their journey, as going south of the Island could add another 16nm or 2 two hours steaming for a vessel travelling at 8 knots. Neither route is navigationally complex.

There is deeper water to the south east of Ruapuke and a skipper in charge of a big vessel in high tides or strong winds may elect to stay in this channel.

The next set of Figures (5 through to 10) show the aggregated AIS vessel tracks for the last six months, with the line depicting the most common track, and the circles the outer edge taken by at least one vessel.

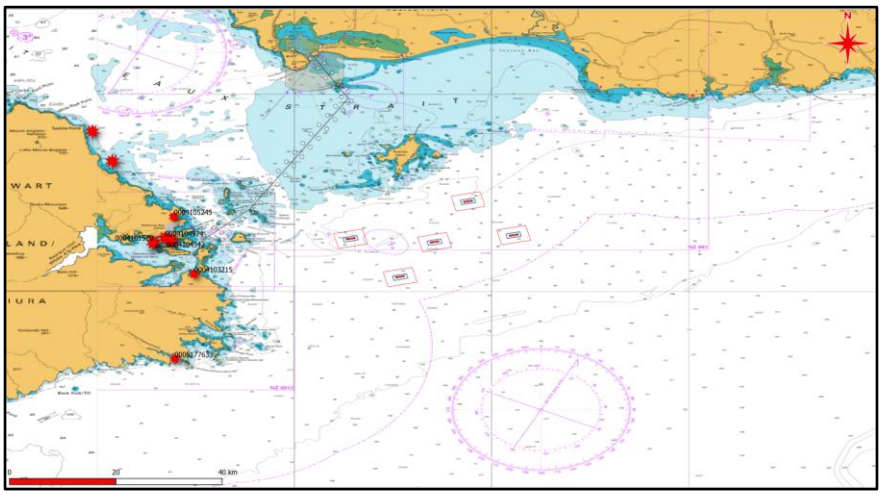

Figure 5: Vessels travelling the route Bluff to Stewart Island or back. The red dots are designated anchorages.

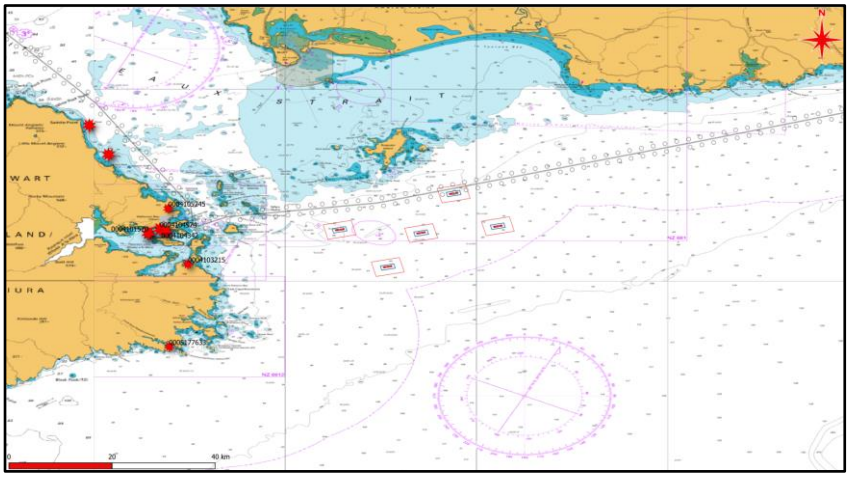

Figure 6: Vessels travelling from East Coast to Stewart Island Route (for example cruise ships)

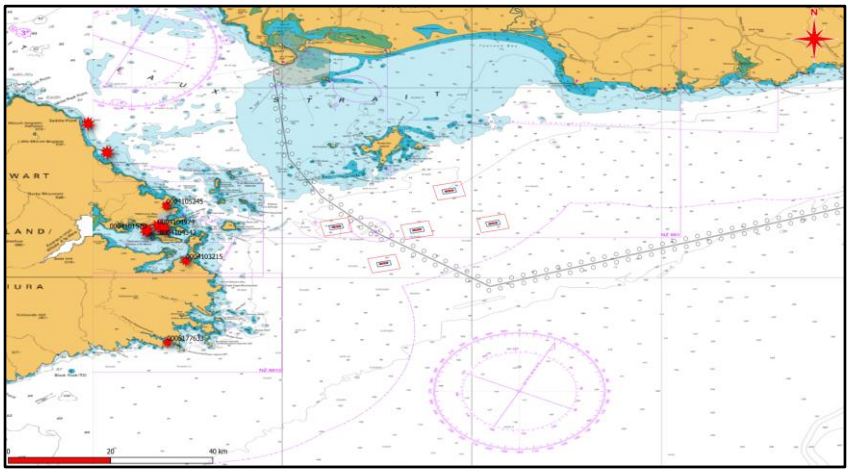

Figure 7: Vessels coming down the east coast and turning into Bluff, South Ruapuke Island Route

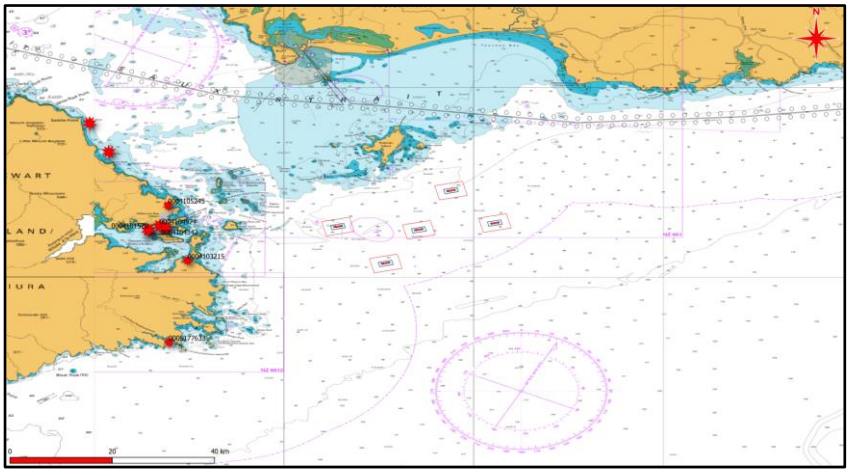

Figure 8: North Ruapuke Route

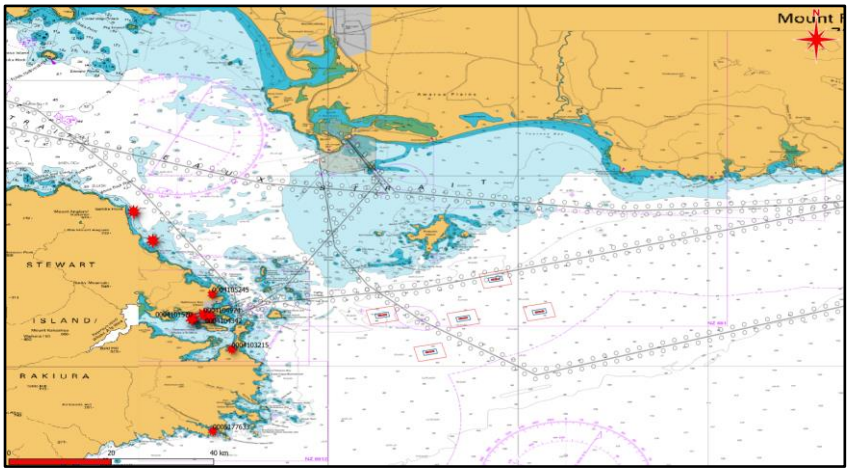

Figure 9: All Routes excluding Fishing

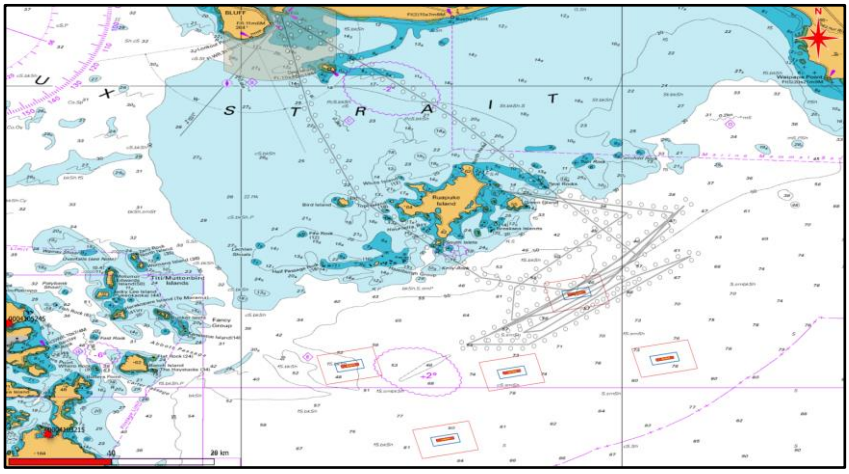

Figure 10: Fishing Activity Inshore Vessels (predominantly one vessel)

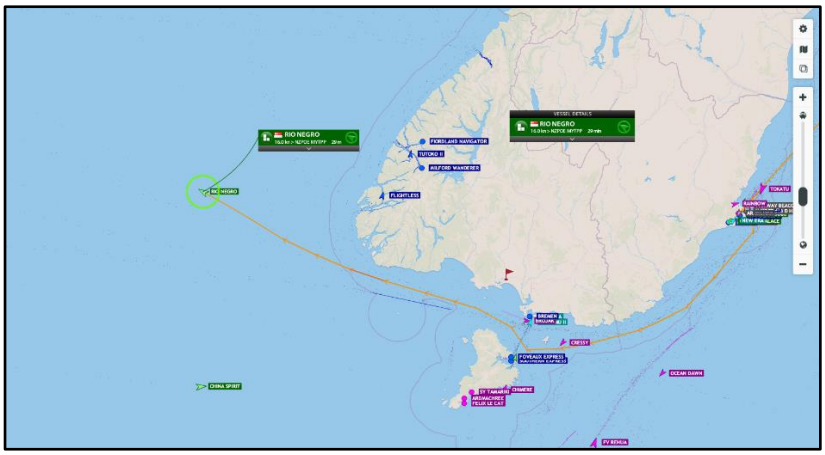

Figure 11: Provides an example of the cargo vessel Rio Negro which steamed down the east coast, south of Ruapuke Island and then west through Foveaux Strait.

3.3.2 Inshore Marine Traffic

Inshore marine traffic in the Project South includes, fishing boats, freighters, tugs and recreational pleasure craft departing or returning to Bluff or Dunedin from Stewart Island.

However, as shown on Figure 5 the Project South five farming areas is not in the main navigation route between Bluff and Stewart Island. That route is west of Ruapuke Island.

Vessels on the coastal transit route between the West Coast and East Coast of the South Island around the South Coast generally travel through Foveaux Strait north Ruapuke Island, rather than through the Project South area, because the northern route is the most direct, as shown in Fig 4 by the red line. These vessels include fishing boats (factory trawlers and smaller boats that fish inside Fiordland waters), freighters and cruise ships. As above, the weather, tide and wind will be taken into consideration by the skipper, but the smaller vessels will less draught will invariably go between Bluff and the north side of Ruapuke Island.

Most of the commercial inshore fishing vessels active in Fish Management Area 25 have their home port of Bluff, Riverton, Waikawa or Stewart Island (these are predominately small vessels that are trawling or set netting).

There are no larger fishing boats based in Bluff. All large factory trawlers (and smaller less than 42m length scampi vessels) are visiting boats and would have arrived at Bluff on a port call for crew change, unloading or refuelling. These boats which mostly fish in the Southern Ocean, or on the Chatham Rise are highly unlikely to transit through the Project South because of the Hazel Burgh Group of rocks and islands.

The only fishing boats that would be working in the proposed farm area would be local smaller boats, with one of two crew and a skipper that are catching predominately shark and flounder.

There are small trawlers based in Bluff, of which two are also set netting for rig in season. These vessels fish the waters around Stewart Island and Ruapuke, Island, and may fish in or cross through the proposed farm site. However, all of these boats would have a draught of four metres or less and an overall length of 24 meters or less. All of these smaller inshore fishing vessels could safely steam within 100m of the Five Farmed Areas, however, if they were bottom trawling they would need to stay well clear of the farm anchors and warps to avoid ripping their gear.

Yachts are infrequent visitors to the Project South Area. Yachts sailing to Stewart Island would travel to the north of Ruapuke Island, as would yachts sailing around the south coast to the West Coast, Yachts sailing through this water are in transit, and likely to have GPS or radar and it is expected that they would have constant deck look outs. This is not an area of water where people idle.

3.3.3 Total Vessel Numbers

AIS data from 2018 has been used to provide context to the number and type of offshore and inshore vessels which currently transit through the Project South area using the routes described above. The results are set out in Table 1 below. Traffic has been broken down into the number of transits that occurred on each route across the Project South area in 2018. This is taken from AIS data and so shows all vessels of 500gt or more, all vessels of 300gt of more which are operating internationally, all passenger ships, and those smaller vessels that have AIS fitted.

3.4 NAVIGATION AIDS

There are no existing navigation aids in the Project South area.

3.5 NAVIGATION HAZARDS

Project South is not located in an area of navigational complexity. While vessels regularly steam through the area it is an open ocean site and requires no complex maneuvers. Vessels use their AIS receivers or radars to know what other vessels are in the area as well as crew with lookout responsibilities in the wheelhouse.

Ruapuke Island lies more than 13.9 km to the nor east of site A and 10.4 km nor west of site D. Apart from rock outcrops around this Island, and those associated with Stewart Island there are no reefs, rock outcrops or other navigational hazards in the area. The seabed of the proposed site is open water, sandy seafloor.

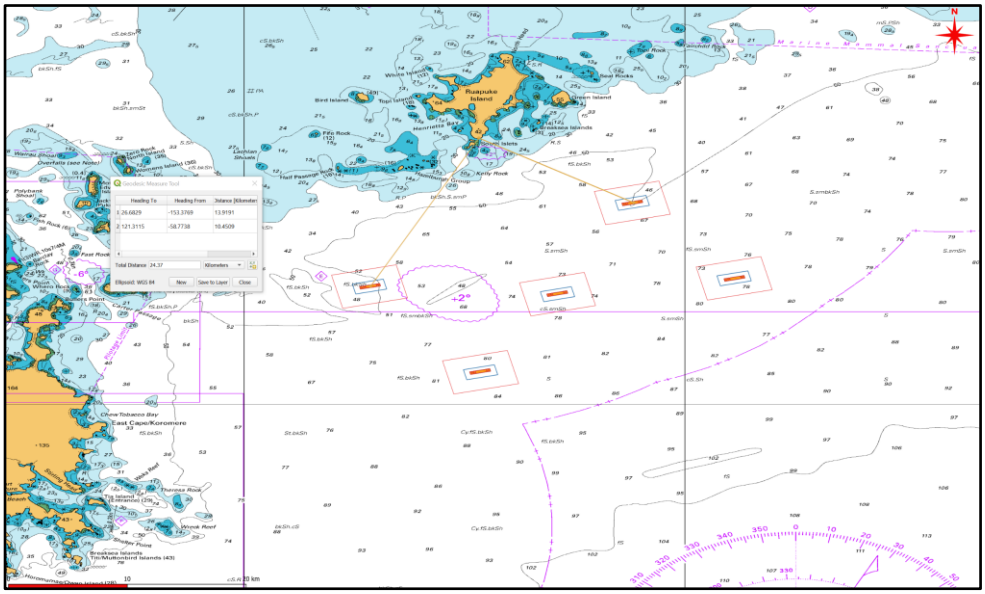

Figure 12: Distances of farming area A and D to Ruapuke Island

3.6 CHOKE POINTS, ANCHORAGES AND SAFE HAVENS

Project South is located in open ocean and vessels steam through the area. There are no navigational choke points where vessels are likely to congest.

The Bluff harbor entrance is some 28.3 km away from site A and 28.1 km away from site D. Vessels waiting to enter the port are not idling around the proposed site.

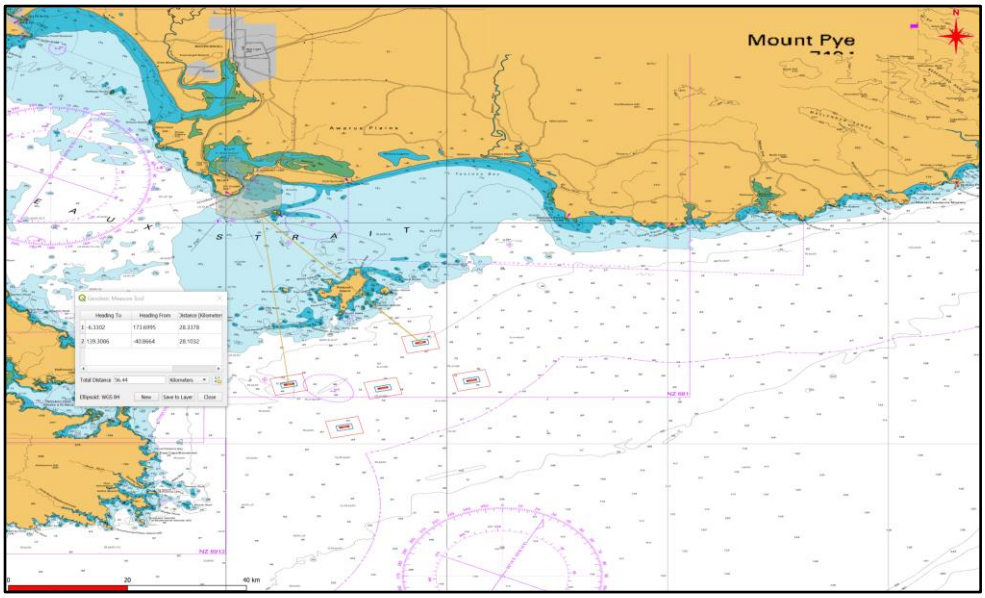

Figure 13: The grey shaded area is the Bluff harbor official harbor entrance

Foveaux Strait has five legal anchorages shown on LINZ charts – all are a long distance from the proposed farm site (see Figure 14).

This are no sheltered areas close to the farm site where vessels would anchor or seek shelter

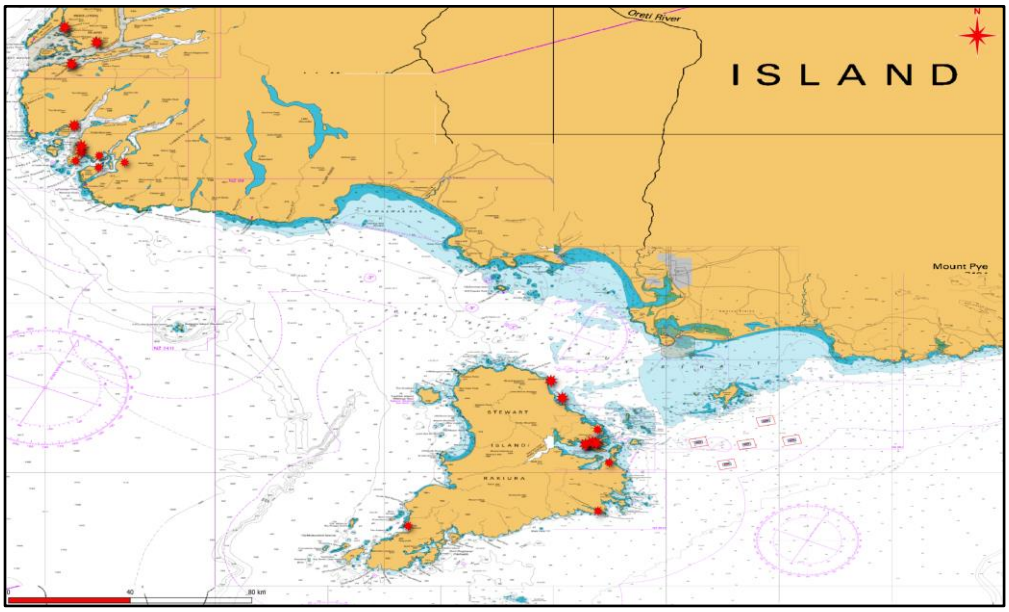

Figure 14: Red dots show Foveaux Strait legal anchorages.

4. EFFECTS

4.1 SHIPPING AND CRUISE SHIPS

4.1.1 Effects on Shipping and Cruise Ships

If the ship is transiting along the east coast (for example from Dunedin or further north such as from Canterbury or Tauranga and steaming directly to Stewart Island, it is likely that the proposed five farming areas would be in the direct transit line. The cruise ship season is predominately January through to March.

Before moving through the area around Stewart Island, Foveaux Strait and Ruapuke Island the skipper of a commercial shipping vessel or cruise ship would plot the ships route in advance.

Because there are no defined shipping channels or traffic separation schemes in the vicinity of the Project South area, the skipper would select this route motivated to take the most practical safest line.

This is a relatively routine task for Masters of commercial vessels who all hold maritime qualifications. Generally, the larger the vessel (length and weight) the higher the

qualification. Correspondingly the further out to sea the vessel steams, the higher the qualification.[3]

The Master would take into account the tidal conditions (height of the tide at the time of transiting), current variations along the ship's route, weather (sea conditions, wind and visibility), Navigational Aids and any Navigational Hazards (rock outcrops, reefs, marine farms etc.). Time of day is unlikely to be a variable when they are choosing their route. The skipper would also consider the draught, condition and the maneuverability (swing) of their vessel.

When selecting the route in advance the Skipper would expect any offshore marine farm structures to:

- Be identified on their Automatic Information System (AIS); and
- To be shown on nautical charts.

And provided this is the case they would take account of the Farming Areas when planning their route and steer a course around the Farming Areas. There are no navigational restrictions in this marine area which would make this challenging.

As they move through the area the skipper would also expect that:

- Electronic confirmation of the Farming Areas would be provided by the ships radar; and
- Visual confirmation of the Farming Area would be provided by sighting its cardinal buoyage system, and marker lights.

Once the ship had gone through the area first time the skipper would also mark up the location of established Farming Areas on their transit routes for future reference.

4.1.2 Management Measures

To enable safe and efficient passage of shipping through the area the following should occur:

- Each of Farming Area should be marked on the maritime charts before structures are installed;
- An AIS transmitter be included on the barge that is moored at each of the Five Farming Areas which provides detailed information on the hazards and exclusion

[3] All commercial vessels are licensed and operate under Maritime New Zealand rules, these licenses prescribe the number of crew (manning), and suite of tickets the vessel must have before it departs the wharf. These are internationally benchmarked certifications (tickets and licenses).

zones at that Farming Area (including the 500m safety zone for commercial boats with a draught of more than 5 metres);

- Radar reflectors be included on each of the pens and the barge to provide the skipper of shipping electronic confirmation of the Farming Area when the ship moves through the area; and
- The Farming Areas should be identified by marking and lighting which is in accordance with IALA Guidelines and approved by the Harbour Master under his or her Maritime Delegation from the Director of Maritime New Zealand pursuant to sections 200, 444(2) and 444(4) of the Maritime Transport Act 1994..

4.2 FISHING VESSELS

4.2.1 Vessels in Transit

As described in Section 3, it is unlikely, but possible that large fishing vessels will transit through the area in which Project South would be located.

Small inshore fishing vessels also fish in the area.

All skippers in charge of fishing vessels will be hold appropriate and necessary maritime qualifications, generally the larger the vessel (length and weight) the higher the qualification. Correspondingly the further out to sea the fishing vessel steams, the higher the qualification.[4] The skippers of large fishing vessels would also plan their route in advance in a similar manner to the skippers of commercial shipping. In that respect the commentary included in Section 4.1 on those vessels would apply equally to those vessels.

However, in addition local fishing vessels talk frequently and will be well abreast of a Farming Area being established.

4.2.2 Active Fishing

As described in Section 3, from time to time small set net and trawlers may fish in the area.

These small local boats mostly owner-operated, with at least one to two crew. These boats are less than 24 meters in length and have a draught at full load of less than 4 meters. The boats are manned to their fishing and survey requirements, but in all cases are likely to have a crew of less than five.

[4] All commercial vessels are licensed and operate under Maritime New Zealand rules, these licenses prescribe the number of crew (manning), and suite of tickets the vessel must have before it departs the wharf. These are internationally benchmarked certifications (tickets and licenses).

The skippers are local people, they have all been fishing in the area for many years and have their spots/marks that they would routinely return to. While they don't have specific fishing grounds marked, they do have areas / season / species routines.

Any skipper who is mid water or bottom trawling works through a process of identifying the area they are going to fish, and a key part of this is identifying hazards which would present a risk to ripping their fishing net.

In making this decision the presence of the Farming Areas would be front of mind. Because the Five Farming Areas are at least 8 km apart is it possible that a skipper might choose to fish the area outside of the mooring and screw anchors. This would create no safety issue provided the fishing vessel remained at least 300m from warps and screw anchors.

4.2.3 Management Measures

To enable safe and efficient passage of fishing vessels through the area, and to enable safe fishing in the area, the following should occur:

- Each of Farming Area should be marked on the maritime charts before structures are installed;
- An AIS transmitter be included on the barge that is moored at each of the Five Farming Areas which provides detailed information on the hazards and exclusion zones at that Farming Area (including the 500m safety zone for commercial boats with a draught of more than 5 metres);
- Radar reflectors be included on each of the pens and the barge to provide the skipper of shipping electronic confirmation of the Farming Area when the ship moves through the area;
- The Farming Areas should be identified by marking and lighting which is in accordance with IALA Guidelines and approved by the Harbour Master under his or her Maritime Delegation from the Director of Maritime New Zealand pursuant to sections 200, 444(2) and 444(4) of the Maritime Transport Act 1994;
- A 300 meter exclusion zone for all active commercial fishing should be established around each Farming Area;
- A 200 meter exclusion zone for all commercial fishing vessels not actively fishing be established around surface structures on each Farming Area;
- Warning signs be erected on the structures, pens and barges advising other vessels to stay at least 200m clear of the fish pen and grid system, and also that the vessel is under video surveillance; and
- For deep water fishing vessels that use 'SeaPlot" each Farming Area could be geo-fenced, which means that the co-ordinates of the farmed areas once constructed can

be marked on an electronic maritime chart and will ping an alert when the fishing vessel steams close to it. Geo-fencing is an increasingly common way that (fishing) vessels know when they are entering a maritime protection area.

4.3 RECREATION VESSELS

4.3.1 Effects on Recreational Vessels

Recreation vessels in the area of the proposed farm would be limited to:

- Infrequent private recreation and charter fishing boats; and
- Infrequent private yachts.

These people would more than likely be transiting through the area.

As set out in Section 3 it would be usual for a locally based recreational vessel to be in this area as it is an open ocean a long way from shore that contains no 'interesting' reefs (where fish are likely to aggregate) and is not on the pathway to Stewart Island or further south to the Subantarctic Islands. However, it is possible that once established a Farming Area would attract smaller boats to the area (which were perhaps fishing around Ruapuke Island), in anticipation that wild fish have aggregated there.

The level of experience held by skippers of these recreational vessels will vary. Most who venture to this location would have as a minimum their Day Skipper Ticket, and prudent boat owners undertaking overnight and long voyagers would have their Off Shore Yacht Masters ticket. However, some may have no maritime qualifications

The way that recreational skippers identify navigation hazards is very dependent on the skipper's level of experience and whether or not they are locally based.

Experienced skippers would often plan their route in advance in the same manner as the commercial skippers discussed in previous sections. They will also have similar tools at their disposal, including AIS, maritime charts, radar and GPS.

Inexperienced skippers are only likely to be moving through this area during daytime and they will likely rely on visual confirmation of the Farming Areas for navigation.

In either case a full cardinal buoyage system and lighting plan will be important to visually identify the presence of the Farming Areas structures to these skippers and allow them to navigate around them.

4.3.2 Management Measures

To enable safe and efficient passage of recreational vessels through the area the following should occur:

- Skippers be provided advanced notice of the Farming Areas by them being marked on nautical charts prior to structures being established onsite.
- A 200 meter exclusion zone for all recreational vessels be established around surface structures on each Farming Area.
- To make the Farming Areas visible to recreational skippers they should be identified by marking and lighting which is in accordance with IALA Guidelines and approved by the Harbour Master under his or her Maritime Delegation from the Director of Maritime New Zealand pursuant to sections 200, 444(2) and 444(4) of the Maritime Transport Act 1994.
- To avoid recreational vessels getting to close warning signs be erected on the structures, pens and barges advising other vessels to stay at least 200m clear of the fish pen and grid system, and also that the vessel is under video surveillance.
- Each Farming Area should be geo-fenced.

4.4 EFFECTS OF TRAFFIC GENERATED FROM THE NEW FARM

It is expected that the five new farm sites will be serviced by vessels departing from Bluff. Vessels would include staff vessels and then feed-in and fish-out well boat. These vessels will not significantly increase the generic traffic flow in the area in a manner which is an issue when considering safe and efficient navigation. The vessels when working on the farm will be fully located within the 500m radius of the pens where they have a sufficiently turning and maneuvering circle.

5. CONCLUSION

While there are no formal navigation routes pass through the farm, it is located in the vicinity of natural uncharted vessel routes used by international and domestic shipping, and fishing vessels. It is also subject to some low intensity recreational use for fishing and yachting.

Vessels navigating through the area in which the proposed farm would be located would need to take account of the presence of the marine farm, which will take some additional effort. However, by implementing the various measures are identified in this report to identify the farm to mariners, this can be done safely and efficiently, Implementing those measures will also ensure the proposed farm manages its effects on navigation in a manner which aligns with statutory obligations and international best practice insofar as it applies to an activity of this type in this location.

Because these farms will not be relocated, once established the navigational issues for local and recreational vessels would reduce over time.

The final design of those measures should be of a type, design, functionality, and placement which accords with IALA Guidelines, and is to the approval of the Harbor master under his or her Maritime Delegation from the Director of Maritime New Zealand pursuant to sections 200, 444(2) and 444(4) of the Maritime Transport Act 1994.

However, based on this assessment it is considered they should include at least the following:

- An 500 meter exclusion zone for all commercial boats with a draught of more than 5 meters should be established around each Farming Area.
- A 300 meter exclusion zone for all active commercial fishing boats should be established around each Farming Area.
- A 200 meter exclusion zone for all other vessels should be established around surface structures on each Farming Area.
- An Automatic Identification System (AIS) transmitter on each barge that is permanently moored onsite at each farm;
- Radar reflectors should be installed on each of the fish pens and the barge;
- Each Farming Area should be geo-fenced with radar alerts;
- Warning signs be erected on the structures, pens and barges advising other vessels to stay at least 200m clear of the fish pen and grid system, and also that the vessel is under video surveillance; and
- The Farming Areas should be identified by marking and lighting which is in accordance with IALA Guidelines and approved by the Harbour Master under his or her Maritime Delegation from the Director of Maritime New Zealand pursuant to sections 200, 444(2) and 444(4) of the Maritime Transport Act 1994.

In addition, before any structures associated with the proposed marine farm are installed:

- Each farm area should be marked on maritime charts; and
- An Advisory to Mariners should be released.