

Technical maritime advice for the preparation of a regional coastal plan for New Zealand's off-shore islands

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Introduction

As per your instructions this report provides navigation safety advice covering the New Zealand sub-Antarctic islands and the Kermadec islands coastal marine areas.

We have reviewed the work done by DOC staff to date and comments on this work are included in this report.

Organisation and individuals consulted

To prepare this report we have made extensive use of the local knowledge of Henk Haazen who has operated small craft in this area for many years, Greg Gibbs a local scampi fisherman and Barry Young who specializes in the operation of smaller commercial vessels and recreational boats. In addition we have made use of the Admiralty Sailing Directions - the New Zealand pilot (NP 51)ⁱ, and nautical chartsⁱⁱ of the areas.

Meetings

Meetings were held with DOC staff in Invercargill on Friday 19 June 2009 to discuss the sub-Antarctic Islands, and in Auckland on Monday, 22 June 2009 to discuss the Kermadec Islands.

Review of the DOC work

It is our understanding from the work done by DOC staff to date that zones of restricted access are suggested around each of the islands involved with a limiting gradation system applying to vessels of different lengthⁱⁱⁱ. These limits are set in general at 300m, 600m and 1000m from the Mean High Water Spring line. In areas with numerous islets, rocks and other dangers the base line^{iv} is drawn around the outside of these dangers from the where the limits are measured. This method of measuring distances to high or low water lines is in accordance with the United Nations Convention on Law of the Sea^v (UNCLOS). Part 2, section 2, article 7: describes how to draw the baseline from which to measure distances to the shore: *"1. In localities where the coastline is deeply*

indented and cut into, or there is a fringe of islands along the coast in its immediate vicinity, the method of straight baselines joining appropriate points may be employed:"

The territorial waters from 1000m to 12 nautical miles^{vi} from the baseline are also covered by this report however no limitations on access based on vessel length are put in place for this zone.

The creation of such zones of restricted access seems to be a pragmatic approach to protecting the islands and the marine environment from both human intervention and from pests. The reasoning behind the ranges of the suggested limits based on DOC experience with distances that rats and other rodents are able to swim is very reasonable. These limits should not interfere with the normal operation of vessels that are currently visiting the islands. Nor hinder the innocent passage that all ships enjoy while passing the islands, as good seamanship demands a greater distance to any known dangers to navigation.

Shipping routes

The Kermadec Islands are on commercial trading routes between Tonga/Niue and New Zealand, as well as between the Cook Islands and French Polynesia to Bass Strait, between south-east Australia and Tasmania. Vessels trading on these routes enjoy the right of innocent passage^{vii} through the territorial waters of the Islands. As well, the Kermadec Islands are regularly visited by those on ocean yacht voyages for recreational purposes, on routes between New Zealand and Tonga and Niue.

The Sub-Antarctic Islands are outside any regular commercial trading routes and are more commonly visited by vessels that have one or more of the sub-Antarctic islands as destination.

Given the remoteness and location of both island groups, visitation has not been high. Although there appears to be an increased interest in adventure type tourism, there is no clear view on how this will affect travel to the islands.

Both island groups are valuable as a shelter in bad weather and in particular the Kermadec Islands are a safe shelter for passing yachts. The shelter is dependent on the vessel (size) and the direction of the winds.

Approach limits

UNCLOS was agreed in 1982 and came into force in New Zealand in July 1996. It provides a framework to regulate many aspects of uses of the sea and conservation of the marine environment. UNCLOS includes the right of innocent passage of foreign ships through the territorial sea, and the Exclusive Economic Zone (EEZ).

The right of innocent passage allows foreign ships to pass through the territorial sea, without entering internal waters or calling at a roadstead or port facility. Passage must be continuous and expeditious, but includes stopping and anchoring in the course of ordinary navigation, or if it is necessary by *force majeure* or distress or to assist persons, ships or aircraft in danger or distress. Certain activities are specified as not being innocent passage including launching, landing or taking on board aircraft; wilful and serious pollution contrary to UNCLOS; fishing; research or survey activities not having a direct bearing on passage.

UNCLOS requires that foreign ships enjoying the right of innocent passage through the territorial sea must comply with laws relating to certain matters, including conservation of living resources of the sea; prevention of infringement of the fisheries laws; preservation of the environment and the prevention, reduction and control of pollution of the environment; and marine scientific research and hydrographic surveys.

Good seamanship and worldwide best practice for navigation safety require that commercial vessels passing by coastlines, islets, reefs etc. remain at a safe distance from these dangers to navigation. This safe distance depends on the type, size and manoeuvring capabilities of the ship, and on environmental factors such as weather patterns and availability of updated weather forecasts, currents and natural debris such as seaweed, and on external issues such as

accuracy of nautical charts and date of most recent survey for the area. Even for relatively small vessels (<75m) best practice requires a safe distance of >2.0 NM, well beyond the 1000m distance suggested for the outer limit of the zones of restricted access.

Accuracy of navigation information

The accuracy of the navigation charts depends on the dates of the bathometric survey. In 1998 the International Hydrographic Organisation introduced standards for surveys^{viii}. Those surveys carried since WWII but before 1998 were done to generally accepted guidelines of about 1.5mm to design scale of the charts and surveys older than WWII have variable standards from 50m to 500m to unknown. The dates of the surveys of all sections of each nautical chart can be found in the source diagram^{ix}, printed in the header section of the nautical chart. Review of the nautical charts of both Kermadec and Sub-Antarctic islands shows that most surveys were carried out before the introduction of the IHO1998 standards. Only all areas of NZ2411 covering the Snares Islands were surveyed since the introduction of the IHO1998 standards, in 1999.

Although positioned on the trading routes as described above, few ships have reason to transit within 10 Nautical Miles of either the Kermadec Islands or the Sub-Antarctic islands^x, nevertheless, pollution from ships passing near the islands has the potential to adversely affect the island's ecosystems. Pollution originating from commercial shipping including oil and oil products, other chemicals, garbage, marine debris and sewage, could cause significant damage to most marine life including birds, fish and corals. Ballast water release is also one of the main vectors for translocation of non indigenous organisms around the world.

Environmental factors

Kermadec Islands: The Kermadec Islands and surrounding seas lie in a area of known volcanic activity. There may be less water than charted in the vicinity of the islands which are not fully surveyed (see note on the navigation charts). The currents in the seas surrounding these islands are minimal easterly when

the water depth is greater than 3500m, however in areas with less water depth the current sets easterly with a rate of up to 1 knot. The cyclone season runs from December through to late April and visiting vessels should pay special attention to weather forecasts and signs of a cyclone during this period. Outside the cyclone season the winds are variable, both in direction and force.

Sub-Antarctic islands: The sub-Antarctic islands are located in the southern hemisphere Westerlies, a steady circulation of westerly wind caused by air flowing from the sub-tropical high to the polar low. The direction and force of this wind is monitored continuously by the meteorological stations on Enderby Island and Campbell Island. A review of the climatic table based on the observations of these weather stations confirm the general westerly direction of the wind throughout the year, varying from north-west to south-west for about 75% of the observations. The average force of the wind varies from a low of 15 knots to an average high of 20 knots, both at 6 am and at noon. Interestingly there are little variations in the wind direction and force throughout the year. Although anecdotal evidence from early settlers and current navigators indicate more severe weather for the west coast and for Carnley Harbour, there is no evidence to support this. However these figures are averages and the climatic table also shows 3 to 4 days of gales (wind force over 34 knots) each month on Enderby Island and slightly higher at 4 to 7 gales per month on Campbell Island. In comparison with the SW coast of New Zealand the automatic weather station on Puysegur Point records average wind force of 13 to 19 knots from variable directions.

The currents around the sub-Antarctic islands are strong and irregular. The tidal streams set NNE with a rising tide and S with a falling tide, while the tide itself is subject to a "remarkable" oscillation near the time of high water, according to the sailing directions: After rising to nearly its full height the tide falls about 6 cm and then rises again about 9 cm so as to exceed the former height by about 3cm.^{xi}

Zones of restricted access

Within the zones of restricted access, several anchorages have been allocated in which vessels of certain length may anchor without prior approval from DOC.

Again, this demonstrates a pragmatic approach to allowing passing recreational vessels to safely drop anchor without interfacing with the shore, before proceeding to their port of destination. Because of the density of recreational traffic between New Zealand and Tonga/Niue, this will affect all of the Kermadec Islands.

The near constant westerly winds in around the sub-Antarctic islands create a severe westerly swell that makes anchoring as close to the coast as safely possible desirable, in particular for smaller vessels. The allocated anchorages within the zones of restricted access offer visiting vessels the opportunity to anchor without needing a permit first. Limiting the anchorages may affect the scampi vessels, however those that have a compelling need for another anchorage can do so by applying for a permit from DOC.

Fitness for purpose

For commercial vessels > 500GRT^{xii} trading on international routes, the fitness of purpose is laid down in the international Safety of Life At Sea (SOLAS)^{xiii} regulations. For yachts leaving New Zealand waters on ocean or open water passages Maritime NZ requires a Category 1 Safety Certificates. In addition all recreational vessels departing NZ waters (i.e. outside 200nm) are required to present a completed Inspection Certificate: MNZ 12409, to Customs to obtain clearance to depart. We suggest that DOC specifies these requirements for all arriving vessels in both Kermadec Islands and Sub-Antarctic islands, even though they may be arriving from New Zealand and therefore are not required to complete this certificate. NZ recreational vessels also need to be registered on the Maritime NZ Register of Ships.

Fast changing weather conditions are typical in the waters surrounding the Sub-Antarctic Islands, therefore we recommend that recreational vessels carry additional weather fax machines so as to be able to receive regular weather information, and radar to identify the numerous outlying rocks, islets and other dangers. Anchoring in the rough waters of the southern ocean and the numerous scattered rocks and boulders on the sea floor around the sub-Antarctic islands creates a lot of wear and tear of the anchor gear. To mitigate

this high wear on the anchor gear, we further recommend that these vessels in addition to the Category 1 safety gear, are equipped with anchor chain, strong anchor handling gear and a spare anchor and chain. These upgraded requirements are not essential for vessels visiting the Kermadec Islands. Foreign vessels that intend to visit any of the New Zealand islands must be cleared by NZ Customs in New Zealand before proceeding to their destination.

The current work done by DOC identifies the vessel's length as the distinguishing measure for the different zones of restricted access, this appears to be entirely appropriate for this plan. The proposed length classification is simple and acceptable for navigation safety purposes. Feedback from the tourism/recreational and fisheries industry and research of operator's websites confirms that the current actual use of the area falls well within these classification requirements.

Fuel transfer

Because of the sensitivity of the islands, it is our opinion that it is reasonable to prohibit ship to ship fuel transfer within the coastal marine areas of both the Kermadec – and the sub-Antarctic islands.

Type of fuel

Smaller vessels, including fishing vessels, typically use diesel fuel (marine gas oil – MGO). However the larger commercial vessels that may visit the islands in the future use heavy fuel, typically Intermediate Fuel Oil (IFO) 380 or IFO 180.

IFO is a blend of gasoil and heavy fuel oil with less gasoil than marine diesel oil. The figures 380 and 180 refer to the maximum viscosity of 380 and 180 centistokes respectively. When fuel oils are cooled down the viscosity increases and in the least blended fuels this may lead to congealing of the fuel. When spilled the fuel oil is likely to breakdown with the gasoil particles evaporating, leaving the heavy fuel particles, would be particularly slow to break down in cold sub-Antarctic waters, in the marine environment.

The definition of heavy fuel, as per MARPOL^{xiv}, and accepted by the Antarctic Treaty Consultative Parties (ATCPs) is "all fuels of higher number than Intermediate Fuel Oil 180 (IFO 180)"^{xv}

The danger with any fuel is that when it is carried in tanks adjacent to the hull of the vessel, this could spill in the case of damage to the hull, as was the case in the recent grounding of the ms "Ushuaia" and ms "Lybov Orlova". However heavier fuels, such as IFO 180 are less likely to flow out of a damaged tank due to the low viscosity of the fuel, and when the damage is under water, the relatively lower specific gravity of the fuel oil in comparison with the surrounding sea water.

In our opinion DOC should consider applying to IMO for "Special Area"^{xvi} status for both Kermadec and Sub-Antarctic islands under the MARPOL convention. These special areas are provided with a higher level of protection than other areas of the sea.

Port of refuge

Port of refuge is defined in the maritime dictionary as "nearest accessible port available in a storm or other emergency". In this case port should be understood to be place of shelter which can be the lee side of an island or a sheltered harbour. All islands can be considered port of refuge for a vessel that becomes distressed when sailing near the island. Whether access be granted to a vessel in distress must be decided on a case by case basis. When this involves a major commercial vessel a full risk analysis of the particular situation will be required.

Scampi boats

Appropriate shelter at a distance of more than 300m from shore for the scampi vessel will depend on the prevailing wind and swell at the time. This shelter might be found at any of a number of places but it is impractical to assign one area over another because of the variability of the weather. It is our opinion that

it must be left to the discretion of the master of the vessel to find shelter outside the 300m zone of restricted access.

Research of anchorages used by scampi boats over the last season shows that these boats anchored in Musgrave harbour and North arm, both in Carnley Harbour. The proposed approved anchorages will affect the use of these "preferred" anchorages by the scampi fleet.

Oil exploration

The needs for the oil exploration industry are based on navigation safety considerations and do not consider the impact of a possible oil spill on the environment and bio security of the area.

The oil exploration industry requires a sheltered area near the explorations areas to outfit the oil rigs. A production platform (more commonly known as oil-rig) is typically transported on board a semi-submersible vessel, to be off loaded in a sheltered area near the drilling area. Once off loaded, the rig will be equipped with anchors, drilling equipment and provisions before being towed or moved under their own power to the drill site. This out fitting may take from a few weeks to several months. The requirements for the sheltered area are that it has deep water (deep enough for the semi-submersible vessel to submerge as much as needed to float the rig of its cargo deck) and that it is sheltered from the prevailing winds and sea. The size of the semi-submersible vessel, loaded with a platform, can exceed the 125m length restrictions of the 300m-600m zones.

If and when the oil exploration industry embarks on exploration of the waters surrounding the sub-Antarctic islands and require access to the territorial and/or internal waters of the sub-Antarctic islands they must approach DOC for a permit for any use of these waters. At such a time a full risk analysis should be carried out to take all aspects of the operation into considerations, including the potential impact on bio security and environment.

Mining industry

The needs for the deep-sea mining industry are based on navigation safety considerations and do not consider the impact of a possible oil spill on the environment and bio security of the area.

The requirements for deep-sea mining are not yet clear. Technology developed for the offshore oil industry can nowadays be employed for mining. In particular, the deep-water pumps and suction pipes developed to bring subsea oil up to the surface can be used in the riser pipes needed to bring minerals (mixed with water) up from a massive-sulphide mine. The oil industry has also developed remotely-operated vehicles to make trenches for seabed pipelines, which can be adapted for cutting ore, even though it may lie much deeper, at, say, 1.5km down.

Neptune Minerals^{xvii}, an Australian-based company, applied for a mining licence in 2008 for two deposits in about 1,250 metres of water near the Kermadec islands off New Zealand.

Currently the needs for deep-sea mining are very similar to those for the oil industry, however this may change with the development of appropriate technology. If and when the deep-sea mining requires access to the territorial and/or internal waters of the sub-Antarctic islands they must approach DOC for a permit for any use of these waters. At such a time a full risk analysis should be carried out to take all aspects of the operation into consideration, including the potential impact on bio security and the environment.

Cruise ships

One cruise ship operator has requested access to Carnley Harbour for a 260m long vessel for a scenic cruise through the fiord. Cruise operators in general are in a continuous search for new destinations to diversify and distinguish themselves from other operators. Carnley Harbour and Port Ross are two ports that may be considered for such diversification. These cruise vessels are

typically well equipped to manoeuvre without assistance from tugboats and can turn within their own length.

The manoeuvrability standards for ships over 100m in length are prescribed in the Maritime Safety Committee (MSC) resolution 137(76)^{xviii}. These standards were developed for ships with traditional propulsion and steering systems. Vessels with more advanced systems such as podded propulsion perform well above these standards. The MSC is a sub-committee of the IMO.

To consider entry in Carnley Harbour and Port Ross the important manoeuvres are the turning ability of the ship and its stopping distance. The standards required are that the ship must be able to turn within 5 ship-lengths when sailing at any speed, i.e. 1300m for a 260m long vessel. This turning diameter can be significantly improved by accelerating through the turn. The stopping distance from full speed should not exceed 15 ship-lengths, however using an emergency stopping manoeuvre ("slow speed rudder cycling") the stopping distance of a conventional ship is between 6 to 8 ship-lengths. Vessels entering a port will be sailing at a reduced speed to enable optimum manoeuvring.

In addition to the IMO standards, the cruise industry standards^{xix} require that the vessels can be kept from drifting when experiencing 25 knots beam wind, more when the wind angle is less than 90°. When entering ports such as Carnley Harbour or Port Ross where the winds blow along the direction of the channel, the wind blows "head-on" onto the ship and a few degrees rudder angle will compensate for the severest head winds. If the Master considered the wind too strong for exposing the vessel sideways to the wind he would look for a more sheltered place to turn the vessel. In the case of Carnley Harbour this could be off Tagua Bay or in North Arm. In any case, a cruise ship would only visit the Harbour for a short time period of may be 1 to 2 hours and in adverse weather conditions this call would be cancelled. If DOC were to consider issuing a permit for a large cruise ship visit, it would be prudent to stipulate a maximum windforce above which the permit would become invalid and a restriction for the vessel to remain mid channel. We recommend a steady wind force of 25 knots would be safe to carry out a scenic cruise in this area.

Before entering a port all vessels must test navigation equipment and machinery as per SOLAS standards and any deficiency in critical equipment must be rectified before the final approach.

Risk analysis

A full risk analysis for (cruise) vessels entering the fiords of the sub-Antarctic Islands is beyond the scope of this report. However completed risk analysis for similar areas, such as Fiordland National Park have identified certain risks associated with large vessels cruising and anchoring in the fiords.

Considering the climatic information available from the Puysegur Point automatic meteorological observation station, that shows similar wind force with less consistency compared to the same information obtained from the stations at Enderby Island and Campbell Island. In addition the fiords and inlets of Fiordland National Park have similar topographic conditions to the sub-Antarctic Islands, although in general the fiords in Fiordland are much narrower, less straight and have numerous boulders, islets and other navigation dangers. Therefore a risk analysis comparison with Fiordland is valid, however when considering the mitigating circumstances one should allow for the remoteness of the sub-Antarctic islands.

The identified risks included the failure of steering gear or main engines while in the fiord, grounding of the vessel or touching the side of the fiord, the collision of a large vessel with a smaller recreational or fishing vessel, contact with underwater log, swamping kayaks sailing nearby, man overboard and high wind speeds in certain fiords.

Analysis of these risks identified the likely frequency^{xx} and consequences^{xxi} of each risk. A risk matrix combining frequency and consequences was calculated for each risk and a number assigned consistent with the ALARP^{xxii} approach.

Hazards identified with a risk of 6 or greater generally will require further attention (but not necessarily immediate attention) to reduce that risk to as low as reasonably practicable (ALARP). Hazards identified with a risk of 7 or greater require more immediate attention.

No hazard was identified in the "Fiordland" analysis with a risk of 6 or greater:

"Comparison with risk assessment made in the highly litigious US environment has shown that cruise ships are acceptable within their fiord systems in Alaska. A comparison with Alaska shows that New Zealand's fiords are no more challenging. The gaps identified for this hazard that should be addressed are the review of each cruise ship's records, before joining the cruise agreement, as well as annually, limiting access to high risk areas, further risk evaluation of passages in Fiordland, the determination of factors elevating risk for types of cruise ships, and a review of the cruise ship agreement." ... *extract from Fiordland Port & Harbour risk assessment.*

Pilotage

Identifying compulsory pilotage areas is a function of regional authorities. The basis of this would be the navigation dangers of the area, including dangers of grounding and traffic density. When considering an area for compulsory pilotage it should be considered how a person is to achieve competency as pilot, how he is to maintain this competency and whether such a person is likely to be found and willing to take on this responsibility. Competency requirements for pilots are prescribed in NZ Maritime Rules part 90. None of the Sub-Antarctic or the Kermadec Islands have been identified as compulsory pilotage areas. Therefore ships are not required to take on a pilot before entering the internal waters of the islands. This is in accordance with current best practice - no pilots are required for Antarctica, neither is a pilot required for New Zealand ports such as Akaroa Harbour and Pegasus Bay (Stewart Island).

Navigation safety limits/Passage plan

There are no specific navigation safety dangers outside the zones of restricted access or in the "600m – 1000m" zone.

If vessels over 125m length are permitted to enter, these vessels should always navigate mid-channel when entering Carnley Harbour, Port Ross or Perseverance Harbour. They must ensure that they maintain minimal 600m from shore, using

radar's parallel index techniques and electronic chart systems, where ever possible. The course alteration point for each leg of a passage plan is depending on the vessel's length/beam ratio, and other manoeuvring characteristics. Because of the short ranges on each course the course alteration point for some vessels maybe reached before the ship has steadied on the course. Because of this and the fluctuating weather and the local currents, it is not practical to prescribe an exact passage plan for these harbours.

For vessels under 125m length, that are permitted (or have discretionary access) to the inshore zones, these vessels should refer to the sailing directions in the annex for navigation safety directions.

Zones of restricted access

To accommodate future uses, it is our opinion that two amendments be of use:

- **Carnley Harbour:** The entrance to Carnley Harbour is clear and provides no specific navigation difficulties for shipping. Neither does the main body of Carnley Harbour, and clear water is available throughout at distances greater than 600m from the MHWS line, the only exception is a 15m deep patch in North arm which is well charted. The entrance to Carnley Harbour is 1200m wide which limits vessels allowed to enter the Harbour to those with a length of less than 125m (600m from each coastline) provided it has a permit. It may be an option to provide access to Carnley Harbour for larger ships, by creating a mid-channel - 100m wide "600m-1000m" zone at the entrance, reverting to the actual 600m-1000m zone for the rest of the Harbour. This would allow vessels of less than 125m length to enter without permit and those that are longer to enter with permit. The NZ Pilot talks about severe squalls in bad weather, however these squalls will come down the length of the channel and should not interfere with the manoeuvring of larger vessels.

It is our opinion that discretionary access to ships > 125m should be granted on a case by case basis and that DOC should be guided by maintenance records (port state inspection reports) of these ships rather than length of the vessel. This would give DOC control over which vessels are allowed to visit. These

larger ships should be given instructions to remain mid-channel at all time (i.e. remain in the 600m-1000m zone). There is no need for an upper limit of vessel length in our opinion, because each application will be dealt with on an individual basis and should be judged on vessel size, propulsion power/manoeuvrability, time of year, length and purpose of visit.

- **Perseverance Harbour:** The harbour entrance is about 700m wide. We suggest for the same reasoning as above, to create a 100m wide mid channel zone of restricted access equivalent to the "600m-1000m" zone, to allow vessels up to 125m length unlimited access and those over 125m length require a coastal permit to access this harbour with a permit. Similar to Carnley Harbour, no upper limit is set, however permits need to be granted on a per case basis depending on all factors, including windage area of vessel, intended time spend in the fiord etc.

Anchorage

A vessel at anchor is limited in its manoeuvrability, and typically requires sufficient space around the vessel to swing around the anchor with sufficient safe water depth. This swinging room depends on the vessel's length, water depth and the length of anchor chain or rope that has been paid out. The latter is to the master's discretion, and depends among others on the holding ground, wind and weather (forecasted) and available shelter on the anchorage.

Current DOC work has identified a number of anchorages for vessels up to 25m length and for vessels up to 75m length^{xxiii}. These anchorages are in general well chosen with ample swinging room for the vessel of the approved length. These areas appear to have reasonable holding ground in general and offer some shelter for the prevailing conditions, however the weather in both the Kermadec Islands and the sub-Antarctic islands is very changeable and mariners should be advised to payout^{xxiv} anchor chain generously as strong westerly wind conditions prevail in this area and they must be prepared to move their vessel at short notice. Under no circumstances should vessels be left unattended. For specific details and sailing directions for all anchorages see appendix.

Approved anchorages

It is our opinion that the following amendments to the approved anchorages will allow vessels a choice of safe anchorage depending on the weather conditions at the time:

- **Kermadec Islands:** To move the anchorage off the north coast of Raoul Islands to about 300m north of 'fishing rock' and add an anchorage approximately 300m west of 'Meyer Island'.

NB: The anchorages on the revised bathymetry chart already reflect these amended anchorages and are appropriate for this area (see end note xiv)

Charts and publications

All vessels visiting the Islands must have onboard nautical charts and sailing directions published by LINZ^{xxv}. These publications are the main source of information for the master. The sailing directions (NP51) and nautical charts of the Islands have identified 14 safe anchorages off the Sub-Antarctic islands and another 7 off the Kermadec Islands. Most of these anchorages are within 1000m offshore and therefore fall within the limitations of these proposals^{xxvi}. We recommend that DOC request LINZ to remove these anchorages from the charts and from the NZ pilot (NP 51) and replace them with the DOC approved anchorages so as to avoid ambiguity and confusion.

The sailing directions (NP51) describe all islands as nature reserves and warns mariners to approach the islands with caution because of incomplete hydrographic surveys. The source data on nautical charts indicates the dates of the surveys. Surveys completed before 1998 are carried out with a significant lower accuracy standard compared to the current surveys that work to the international IHO98 standards. Only relatively small sections of the islands have been surveyed since 1998, and mariners should take the date of the surveys in consideration when navigating around the islands.

All nautical charts have been reconfigured so as to be WGS 84 compatible. This means that positions taken from the Global Positioning System (GPS) or other

satellite positioning system calculating its position to WGS 84 standards, may be plotted directly on the charts and no corrections need to be applied.

NZ Maritime Rule 25 require mariners, both professional and recreational, to use official nautical charts to plan and execute their sea voyage. These charts may be paper charts or digital charts (ENCs) that are used in Electronic Chart Display and Information Systems (ECDIS), and must be regularly updated with the latest correction. In the title of each chart they are marked with the notifications that the islands are nature reserves and it refers to the NZ Pilot (NP 51) for further information. The NZ Pilot (NP 51) is an excellent tool to promulgate DOC information on the navigation limitations for the islands. We recommend that the approved DOC maps, showing the zones of restricted access and approved anchorages, are reproduced in the NZ Pilot (NP 51).

Annex

Sailing directions

(These sailing directions are for use under all circumstances and mariners must consider using these in conjunction with actual current and weather circumstances. Where landings and anchorages are mentioned these are referring to navigation safety only and do not refer to recommended or approved anchorages as per DOC planning maps)

Kermadec Islands

The Kermadec Islands include Raoul, Macauley, Cheeseman, Curtis and L'Esperance Rock. Chart NZ 2225 and the New Zealand Pilot should be referred to.

All vessels wishing to land on the Kermadec Islands are required to obtain a permit from the Department of Conservation (DoC) before departing from New Zealand. It is not possible to obtain a permit on arriving at Raoul Island.

Vessels calling at Raoul should contact the DoC base on VHF Channel 16.

There are no safe anchorages in the Kermadec Islands.

The three designated anchorages off Raoul Island are shown on the DoC planning maps and on Chart NZ 2225. All of these anchorages are exposed, open anchorages with poor holding ground. They are prone to sudden changes in wind direction and strength, particularly with the passage of a frontal system. Mariners should be prepared to move their vessels at short notice should the need arise. Under no circumstances should vessels be left unattended.

Because of the presence of the derrick and cable way at Fishing Rock on the northern side of Raoul Island, this is the most commonly used anchorage. Vessels should approach from the North West as there are no off lying dangers from this direction. There is a distinctive white winch-house on Fishing Rock which is clearly visible on approach. The bottom is sand with some rocks.

With a change in wind direction vessels will have to move to one of the two other anchorages. Denham Bay is prone to heavy swells and dangerous surf usually breaks on the beach. Boat Cove anchorage is sheltered from winds from west through to north but particular care must be taken when anchored here with a cold front approaching. The change in wind direction from northerly to south west as the front passes, can be both sudden and violent and can result in onshore gale conditions within minutes.

Vessels forced to move round the island to another anchorage should stand well offshore to avoid the numerous off lying rocks and shoals.

Vessels passing by Raoul Island should keep at least three miles offshore and be aware of the strong currents that may be experienced.

Auckland 24 June 2009 These navigational notes are written for inclusion in the Dep. of Conservation (DOC) coastal management plan for the NZ offshore islands. They are not to be used in any other publication. Intellectual copyright and publishing rights are the sole ownership of the author Henk Haazen, and no part may be copied or distributed (except for inclusion in the DOC coastal management plan) without permission in writing from the Author

Auckland Islands

Directions

Chart NZ 286 Auckland islands, Chart NZ 2862, Plans in the Auckland islands.

The Auckland islands are the remains of two volcanoes; they are mostly wooded, steep sided rugged hills. The West coast is a very steep sided cliff exposed to the prevailing westerly weather system.

There is no shelter for vessels on the west coast of the Auckland Islands.

There are only sporadic soundings available for the West coast and care should be taken when passing in between Disappointment Island and the main island, this passage should only be taken in good weather conditions as there are several pinnacle islets and rocks in the area.

The East coast is undulated with a series of navigable Fiords, it is much like Fiordland on the westcoast of New Zealand, except that the Fiords face away from the prevailing weather conditions, making them safer to navigate.

Not all of the Fiords have been charted and vessels are advised not to enter these areas.

There are 2 major harbours, Port Ross in the north and Carnley harbour in the South, inside these harbours are several small coves and bays suitable as anchorages.

The Southern side is formed by Adams Island, which is the most untouched island in the group, there are no introduced pests on Adams Island contrary to the main Auckland islands which has introduced pigs, cats and mice.

Local Conditions

Weather

The prevailing weather system is a never ending series of lows approaching from the west, the centres of which mostly pass to the south of the Auckland Islands, occasionally the centre of the low is passing right over the island or to the north, depending on what latitude the highs come down to, generally in summer time the highs travel along a more southern latitude bringing short spells of fine weather.

The lows bring overcast skies, drizzle and rain, interspersed with the occasional fine day. The island group is located in the roaring forties and furious fifties and the wind strength is strong accordingly, a wind speed of 35 knots is a nice day. The prevailing westerly wind is often funnelling violently out of the mouths of the fiords on the eastern sides which can make it hard to make head way into the fiords for smaller vessels.

The Weather systems usually pass over in two to three days, it is essential to obtain good weather info, the NZ Met Service provides a good weather fax service for the area.

Currents and Tidal stream

The currents around the islands are very strong and irregular.

When approaching Enderby Island from the north it pays to approach well from the north east and stay clear of Bristow Rock for several miles, there is a strong tidal stream extending 10 to 12 miles north and north east of Enderby Island creating standing waves.

There is a reef in the passage between Kekeno point and Dundas Island with strong tidal flow and a standing wave, this passage is not recommended.

The other small boat passages, Port Ross between Rose Island and Friday Island and between Rose Island and Enderby Island and Victoria Passage in Carnley

Harbour, are exposed to strong tidal flows and are not recommended without local knowledge.

A strong current sets between Disappointment Island and the main island.

Anchorage

For Small vessels a good anchorage can be found in Port Ross, Carnley Harbour and Waterfall Inlet. Most of these anchorages are within 300 meters from the shore. For bigger vessels up to 75 meters an anchorage can be found in deeper water in Port Ross and Carnley Harbour.

Landings

All the NZ Sub Antarctic Islands are a National Nature Reserves^{xxvii} and Landings are not permitted unless you have a DOC landing permit.

Directions for Port Ross

When approaching from the north stay well clear from Bristow Rock, it is best to approach Enderby Island well from the north-east avoiding the strong tidal current north of Enderby Island and Bristow Rock.

You enter Port Ross between Enderby Island and Ewing Island, a clear passage, with some minor tidal eddies south of Enderby Island.

Port Ross is a well charted clean harbour with no hidden dangers other than those rocks and shallows close inshore as indicated on the chart.

Strong westerly wind can become violent squalls further out in the harbour and at the harbour entrance.

Anchorage for large vessels 125 meters and above can be found well inside the harbour towards Shoe Island, giving protection from most wind directions except for easterlies, which can cause some wave build up inside the harbour.

Anchorage for smaller vessels with reasonable to good holding can be found close at Erebus Cove (also known as Sarah's bosom) rocky bottom with seaweed

Directions for heading South from Port Ross

It is recommended to leave Port Ross between Enderby and Ewing Island then pass with sufficient clearance to the east of Green Island, after passing Blanche Rock to the east there are some outlying rocks close inshore and there is a shallow patch of Fella Peninsula hallway down the main Auckland islands.

The passage in between French Island and Ewing Island and then onwards in between Kekeno point and Dundas Island is not.

Directions for Waterfall Inlet

Waterfall Inlet is small clean fiord with a narrow entrance at its head allowing passage for smaller vessels to the inner basin where there is a good anchorage with good holding bottom is rocky with fine sand patches there is protection from all wind directions, the wind can have dramatic directional changes as it comes down the valleys.

Directions for Carnley Harbour

Carnley Harbour is the biggest natural harbour in the NZ Sub-Antarctic Islands, its entrance is wide and deep with no hidden dangers it opens up into a big navigable harbour with several small coves and bays. There are no hidden dangers inside the harbour except for the shallows, sea weeds and rocks close inshore and it is safe to enter and navigate for large vessels 125 meters and above.

When entering Carnley Harbour from the east there is often a strong wind funnelling down between the steep side shores which can make it hard work getting up the harbour and dangerous for vessels under sail.

Tagua Bay is the first good anchorage inside Carnley Harbour for both large vessels 125 meters and above, and for small vessels. There is good holding both close inshore and further out.

Camp cove is a good anchorage for smaller vessels, but the holding is average, rocky bottom with seaweed fouling the anchor when dragging.

Antipodes Islands

Chart NZ 3111 Campbell Island/Motu Ihupuku, Bounty Islands and the Antipodes Island group

Directions

The Antipodes Islands are a rugged and very remote group of islands rarely visited by vessels

They consist of the main island with several large to medium islands around them and navigable passages in between some of the islands.

The coast line has steep sided rugged cliff faces with very few landing possibilities, the land is high and has scrubs and grasses but no trees.

There are no natural harbours and there are no safe anchorages in the Antipodes Islands.

Local conditions

Weather

The Antipodes Islands are situated slightly more to the north than the Auckland Islands but the weather systems follow a very similar pattern to that present at the Auckland Islands .

Currents and Tidal flow

There is a strong tidal flow between the main Antipodes Islands and Bollons Island, which can turn into a nasty sea in a wind against tide situation.

Bounty Islands

Chart NZ 3111 Campbell Island/Motu Ihupuku, Bounty Islands and the Antipodes Island group.

Description

The Bounty Islands are a desolate group of granite rock outcrops totally occupied by birds, penguins, seals and every other creature that needs to rest ashore from the surrounding ocean environment. In good conditions you can smell them from some way off.

Most of the area close in is unsurveyed. There are several underwater peaks, rock and shallow patches strewn around the main island group creating hazards to navigation.

Local conditions

Weather

The prevailing weather conditions are similar to the Antipodes and Auckland Islands

Anchorage

There are no safe anchorages in the Bounty Islands.

Landings

Like all of to the NZ Sub-Antarctic Islands the Bounty Islands are a National Nature Reserve and landing is not permitted unless you have a DOC permit.

Campbell Island

Chart NZ 3111 Campbell Island/Motu Ihupuku, Bounty Islands and the Antipodes Island group

Directions

Campbell Island is a hilly rugged island with scrub and grasses. It features several large bays all of them navigable with several dangerous outcrops and rock stacks and small islands cantered on the main island.

The coastline is made up of steep rock walls boulder beaches and a few sandy beaches.

There are only sporadic soundings available and care should be taken when approaching the islands from any direction.

The islands are pest free and great care should be taken that no rodents or other pests are introduced to the islands.

Local Conditions

Weather

The prevailing weather system is similar to the Auckland Islands with a never ending series of lows approaching from the west. The biggest difference is that the Campbell Island is just that much further south and therefore has more severe weather systems with more lows passing closer by the island or just to the south or north bringing on average stronger winds and bigger seas.

The prevailing westerly wind is often funnelling violently out of the mouths of the harbours which can make it hard to make head way for smaller vessels.

Some the heads of the 2 bays are prone to strong westerly winds coming down the hills and valleys due to the lay of the land.

The weather systems usually pass over in two to three days, it is essential to obtain good weather info, the NZ Met Service provides a good weather fax service for the area.

Currents and Tidal

The tidal streams around Campbell Island are strong

There is a strong tidal flow in between Bull Rock and North Cape and this passage is not recommended.

There is a strong tidal from North Cape towards the shallow area and beyond 2 miles north east from North Cape.

There is a strong tidal flow between Dent Island and Ramp Point

Anchorage

Larger vessels up to 125 meters, can find safe anchorage in Perseverance Harbour.

Landings

All the NZ sub-Antarctic Islands are a National Nature Reserve and landing is not permitted unless you have a DOC permit.

Direction for the area directly north of Campbell Island.

Great care should be taken and all hatches battened down hard when north of Campbell Island on the Campbell Island Plateau. The ocean rises quickly from 4000 meters to 1000 meters and then to 150 meters on the Campbell Island Plateau, several vessels have reported large waves swamping them in this area during strong westerly conditions, doing severe damage to wheelhouse windows and deck equipment. It is a treacherous stretch of water.

Directions for Perseverance Harbour

Perseverance Harbour is aptly named, old time square rigged sailing vessels would have to battle it out hard making trying to make head way against the strong wind funnelling out of the harbour in the prevailing Westerly conditions.

There is a strong tidal flow around Davies Point towards Erebus Point with foul ground and seaweed close inshore.

When coming up the harbour in daylight you will find two triangular beacons lining up on a course steering you clear of Terror Reef until it is time to turn on two beacons south of the boathouse by the small boat jetty at the old weather station.

Large vessels 125 meters or more, can anchor north-west of Terror Reef or further out in the harbour west of Terror Reef.

Smaller vessels can anchor closer in by the old weather station or in front of Depot Point.

The holding in Perseverance Harbour is average to poor, the bottom is rocky with seaweed and the occasional sandy patches, and there are many historical accounts of small and large vessels dragging anchor with very strong westerly winds funnelling down from the large valley to the west.

During the time when the weather station was built and manned the area was also used as a dumping ground for obsolete equipment so there is a small chance of fouling the anchor especially further out in the harbour.

Snares Islands

Chart NZ 2411 Snares Islands/Tini Heke and Solander Island (Hautere)

Directions

The Snares Islands are a steep sided rugged island group with no big natural boat harbours. The island group is well charted and sounded. There are no outlying dangers except those close inshore as indicated on the chart.

Local conditions

Weather

Prevailing westerly conditions similar to the Auckland Islands

Landings

Like all of the NZ Sub-Antarctic Islands the Snares Islands are a National Nature Reserve and landing is not permitted unless you have a DOC permit.

References

ⁱ Admiralty sailing directions – The New Zealand pilot (NP 51), 17th edition
Published by: The UK Hydrographic Office, Taunton, Somerset, UK

ⁱⁱ NZ2225 Plans in the Kermadec Islands, new edition published June 2008; NZ3111 Campbell Island/Motu Ihupuku, Bounty Islands and the Antipodes Island group, published June 2008; NZ2862 Plans in the Auckland Islands, published April 1992; NZ286 Auckland Islands, published April 1992; NZ2411 Snares Islands/Tini Heke and Solander Island (Hautere), published July 2000.

ⁱⁱⁱ length of a vessel is the over-all length of the vessel (LOA)

^{iv} <http://www.linz.govt.nz/hydro/nautical-info/maritime-boundaries/definitions/index.aspx#tsb>

^v The United Nations Convention on the Law of the Sea (UNCLOS), concluded in 1982, is often described as a “constitution for the oceans”. It sets out a comprehensive regime for the law of the sea, covering such matters as territorial sea limits, navigational rights, the legal regime for the 200 nautical mile wide exclusive economic zone (EEZ) and the continental shelf, the high seas and the legal status of resources of the deep seabed outside the limits of any nation’s jurisdiction, passage of ships through narrow straits, conservation and management of fisheries, the protection and preservation of the marine environment, marine scientific research, the transfer of marine technology and dispute settlement procedures. Over 150 States are party to UNCLOS and many aspects of its provisions are widely regarded as reflecting customary international law so that they are legally binding on all States.

In 1994 an additional agreement was adopted to implement the provisions of Part XI of UNCLOS relating to the resources of the deep seabed outside the limits of any nation’s jurisdiction. This Agreement and Part XI of the Convention are interpreted and applied together as a single instrument. New Zealand played an active role in the negotiations of both UNCLOS and the Part XI Implementing Agreement, and became party to both on 19 July 1996

^{vi} 1 Nautical Mile equals 1852 meters

^{vii} United Nations Convention on Law of the Sea (UNCLOS) part II, section 3, article 17, states that "ships of all States, whether coastal or landlocked, enjoy the right of innocent passage through the territorial sea." The meaning of an "innocent passage" is stated in article 18 as:

"1. navigating through the territorial sea for the purpose of a) traversing that sea without entering internal waters or calling at a roadstead or port facility outside internal waters, and
2. the passage shall be continuous and expeditious".

In subsequent articles 19 to 26 it defines "innocent passage" in greater detail and describes meaning and rules applicable to all ships and all States.

UNCLOS therefore provides all ships the right to passing by both Kermadecs and Sub-Antarctic islands, allowing ships to come as close to the islands as is safe for navigation as long as they do not enter any internal waters.

Internal waters are defined in UNCLOS part 2, section 2, article 8 as "... waters on the landward side of the baseline of the territorial sea ...". And UNCLOS part 2, section 2, article 7: describes how to draw the baseline from which to measure distances to the shore: "1. In localities where the coastline is deeply indented and cut into, or there is a fringe of islands along the coast in its immediate vicinity, the method of straight baselines joining appropriate points may be employed".

^{viii} http://www.iho.shom.fr/publicat/free/files/S-44_5E.pdf

^{ix} <http://www.linz.govt.nz/docs/hydro/stds-and-specs/chartspecv3-10.pdf>

^x See Admiralty chart 5128, Routing Chart South Pacific Ocean

^{xi} Sailing Directions, NP51, page 329: paragraph 11.96

^{xii} GRT means Gross Registered Tonnes, an international measurement for commercial ships

^{xiii} The International Convention for the Safety of Life at Sea (SOLAS) is the most important treaty protecting the safety of merchant ships. The first version of the treaty was passed in 1914 in response to the sinking of the RMS Titanic. It prescribed numbers of lifeboats and other emergency equipment along with safety procedures, including continuous radio watches.

Newer versions were adopted in 1929, 1948, 1960, and 1974. The 1960 Convention — which was activated in 1965 — was the first major achievement for International Maritime Organization (IMO) after its creation and represented a massive advance in updating commercial shipping regulations and in staying up-to-date with new technology and procedures in the industry. The 1974 version simplified the process for amending the treaty. A number of amendments have been adopted since. In particular, amendments in 1988 based on amendments of International Radio Regulations in 1987 replaced Morse code with the Global Maritime Distress Safety System (GMDSS) and came into force beginning 1 February 1992. An idea of the range of issues covered by the treaty can be gained from the list of sections (below).

The intention had been to keep the convention up to date by periodic amendments, but the procedure to incorporate the amendments proved to be very slow: it could take several years for the amendments to be put into action since countries had to give notice of acceptance to IMO and there was a minimum threshold of countries and tonnage. The latest Convention in 1974 therefore included the "tacit acceptance" procedure whereby amendments enter into force by default unless nations file objections that meet a certain number or tonnage. *Source: Wikipedia.com*

^{xiv} The International Convention for the Prevention of Pollution from Ships 1973 and Protocol of 1978. MARPOL 73/78 is the foremost marine pollution prevention convention. Annex I, which contains provisions addressing prevention of pollution by oil and also defines heavy grade oils, is ratified by 147 contracting states representing over 99% of the world's shipping tonnage, including all the Antarctic Treaty Consultative Parties.

^{xv} XXVIII Antarctic Treaty Consultative Meeting. "Decision 8 (2005) Use of Heavy Fuel Oil (HFO) in Antarctica." - Final Report of the 28th Consultative Meeting.

The regulation lists several technical specifications that will qualify a fuel as a Heavy Grade Oil. Some IFO-180 meets the specifications as a crude oil that has a density at 15°C higher than 900 kg/m³, but some IFO-180 have a lower density and these will still be allowed to be used once the ban is in place.

^{xvi} Special Areas under MARPOL - In Annexes I Prevention of pollution by oil, II Control of pollution by noxious liquid substances and V Prevention of pollution by garbage from ships, MARPOL defines certain sea areas as "special areas" in which, for technical reasons relating to their oceanographical and ecological condition and to their sea traffic, the adoption of special mandatory methods for the prevention of sea pollution is required. Under the Convention, these special areas are provided with a higher level of protection than other areas of the sea.

^{xvii} <http://www.neptuneminerals.com/Neptune-Minerals-Kermadec.html>

^{xviii} [http://www.navcen.uscg.gov/MARCOMMS/imo/msc_resolutions/Resolution%20MSC.137\(76\).pdf](http://www.navcen.uscg.gov/MARCOMMS/imo/msc_resolutions/Resolution%20MSC.137(76).pdf)

^{xix} www.ICCL.org

^{xx} Frequency – if something similar happened last year = F1 (frequent); if something similar happened a “few years ago” = F2 (likely); if anyone could remember something similar = F3 (possible); if it could happen but F1–F3 were not appropriate = F4 (unlikely); otherwise it went to F5 (rare).

^{xxi} Consequence – this was determined by judgment and experience after consultation with stakeholders – C0 = Insignificant; C1 = Minor; C2 = Moderate; C3 = Major; and C4 = Catastrophic.

^{xxii} <http://www.maritimenz.govt.nz/Publications-and-forms/Commercial-operations/Ports-and-harbours/Port-harbour-risk-assessment.pdf>

^{xxiii} The anchorage area and symbol on the navigation chart are an indication only of the area that has been approved as suitable for a certain size of vessel. It is the master's responsibility to locate the safest and best place to anchor in that general area, including suitable water depth and weather circumstances at the time of anchoring

^{xxiv} **Payout** anchor chain means lengthening (or increase the length) of anchor chain

^{xxv} NZ Maritime Rule part 25

^{xxvi} Following anchorages are indicated on the nautical chart NZ2225 and prescribed in the Admiralty sailing directions – New Zealand Pilot (NP51), chapter 11 “Kermadec & sub-Antarctic: (*positions are approximate only*)

Off Raoul Island:

- 200m west Meyer Island
- 700m south Meyer Island “east anchorage”
- 250m east Sunshine camp/Raoul “SE anchorage”
- 2300m west Denham Bay “west anchorage”
- 1500m north Western Springs “north anchorage”

Off MaCauly Island:

- 350m east Annexation Pt/Lava cascade

Off Curtis & Cheeseman Island:

- 500m north Curtis/NE Cheeseman

Off Cambell Island:

Off Beeman Pt wharf, Perseverance Harbour

Off Antipodes Islands:

- 500m off shore Ringdove Bay
- 370m offshore Anchorage Bay

Off Bounty Islands:

150m offshore Bradley Cove

Off Auckland Islands:

700m offshore Tagua Bay (*Carnley Harbour*)
150m offshore Camp Cove (*Carnley Harbour*)

150m offshore Waterfall Inlet (head)
100m offshore Hanfield Inlet – south arm
150m offshore Hanfield Inlet – north arm
100m offshore Smith Harbour (head)

200m offshore Laurie Harbour (*Port Ross*)
200m offshore Erebus Cove (*Port Ross*)
200m offshore Terror Cove (*Port Ross*)
100m offshore Sandy Bay (*Port Ross*)

^{xxvii} National Reserve meaning that its status can only be changed by Act of parliament