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QUEENSLAND COASTAL PASSAGE PLAN



JULY 2014

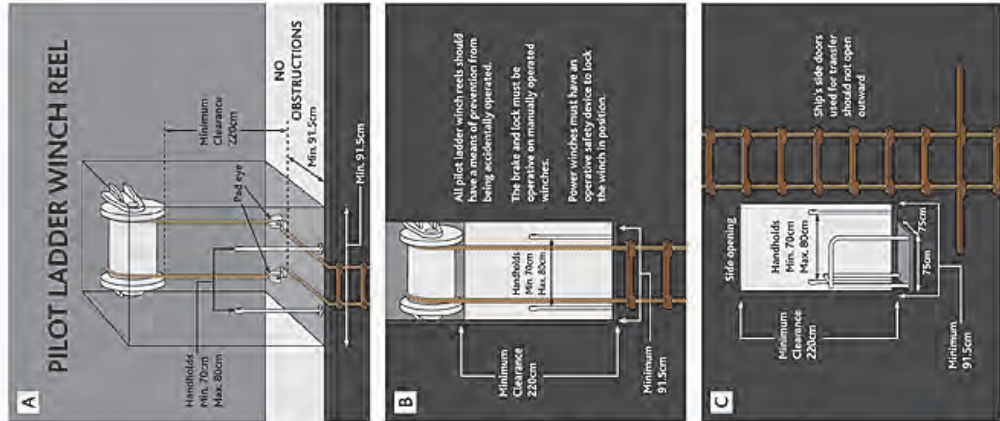
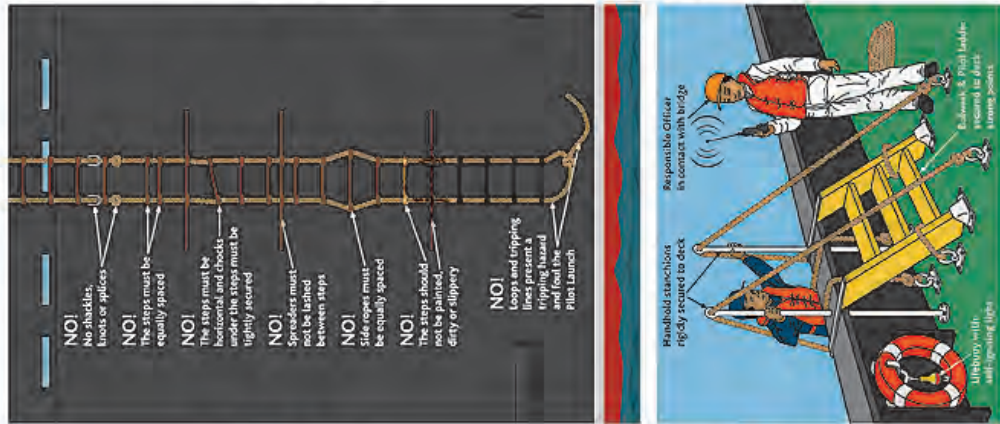
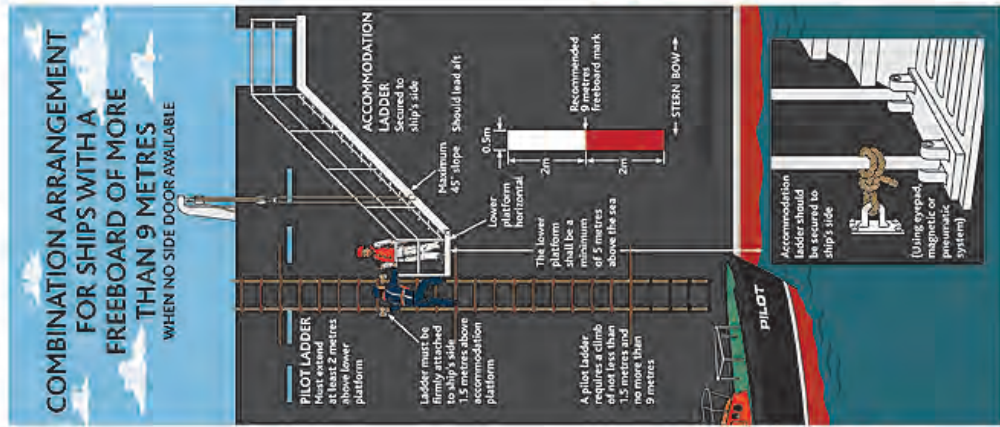
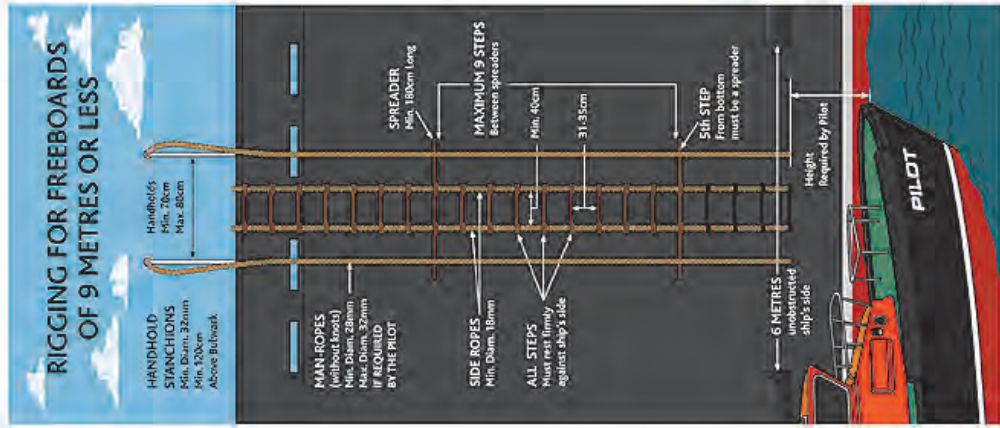
REQUIRED BOARDING ARRANGEMENTS FOR PILOT



In accordance with SOLAS Regulation V/23 & IMO Resolution A.1045(27)

INTERNATIONAL MARITIME PILOTS' ASSOCIATION

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Reference: http://www.impahq.org/downloads/final_impa_pladder_poster.pdf



Australian Government

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QUEENSLAND COASTAL PASSAGE PLAN

This publication was originally developed in December 2011 by the Australian Maritime Safety Authority (AMSA) and the Coastal Pilot Working Group, with significant contributions from coastal pilots and pilotage stakeholders. The information provided in this publication is the 'passage plan model' referenced in Marine Order 54.

The 'Queensland Coastal Passage Plan' (QCPP) has been developed as a guide for the conduct of pilotage in Queensland coastal pilotage areas. It does not constitute the provision of legal advice. The QCPP is published for reference purposes only. The Commonwealth, its agents, instrumentalities, officers and employees do not guarantee or accept any legal liability arising from, or connected to, the accuracy, reliability, currency or completeness of any material contained in the QCPP. Seafarers should use the information and chartlets provided in the QCPP to support voyage (passage) planning, the principles of navigation and the usual practices of seamanship. An electronic version of this publication can be found on the AMSA coastal pilotage web portal at www.amsa.gov.au/pilotage.

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QUEENSLAND COASTAL PASSAGE PLAN

PART 1 **GENERAL**

ABOUT THIS PUBLICATION

Purpose and audience

The Queensland Coastal Passage Plan (QCPP) is a document produced and issued by the Australian Maritime Safety Authority (AMSA), which seeks to improve pre-pilotage communications between coastal pilotage providers, the ships they service and the pilots embarked within these ships. The QCPP helps to prepare ships for transits of the coastal pilotage areas described in Marine Order 54.

The QCPP improves the readiness of ships transiting coastal pilotage areas within the Great Barrier Reef and Torres Strait by ensuring that voyage plans, waypoints and other planning considerations have been completed in a standardised manner. The QCPP seeks to achieve consistency across ships by ensuring that ships arrive at the pilot boarding ground (PBG) in a state that is standardised, predictable and well informed. In doing so, the pilot can embark with confidence at the 'starting position' for the pilotage. Masters are encouraged to keep a copy of the QCPP on the bridge for quick reference and ensure it is available for the initial Master/Pilot exchange.

This document has been developed primarily for the benefit of Masters and mates of ships transiting any of the coastal pilotage areas described herein, including Torres Strait, the Great North East Channel, the Inner Route of the Great Barrier Reef and Hydrographers Passage. Ship owners, charterers and agents may also find the document useful.

AMSA encourages all Masters transiting any of these coastal pilotage areas to consider the information contained within the QCPP when preparing associated passage plans.

Marine Order 54

Marine Order 54 states that it is a condition of a restricted pilot licence and unrestricted pilot licence that "... the licensed pilot must ... prepare a detailed passage plan for the pilotage of a ship that:

- (i) uses the approved *passage plan model*, specific to the ship being piloted; and
- (ii) is agreed with the Master of the ship."

The QCPP is the approved passage plan model which will be used by pilots. Ship Masters are therefore encouraged to prepare their voyage plans from the QCPP. This means that revisions made by the pilot to cater for the specific conditions of each pilotage are kept to a minimum. The pilot will expect ships to have the waypoints and courses detailed in the QCPP accurately transferred to charts and electronic navigation systems prior to boarding.

Related publications

Importantly, the QCPP does not seek to replicate material that is available in other nautical publications which are expected to be carried onboard. The QCPP predominantly contains material that otherwise does not exist in other documents.

Ships intending to transit the Great Barrier Reef and Torres Strait should hold and consult the following publications:

- Tide Tables - either Australian National Tide Tables (ANTT) or Admiralty Tide Tables (ATT) Vol. 4
- Australia Pilot Vol. III
- Admiralty Sailing Directions (NP15)
- Admiralty List of Lights Vol. K (NP83)
- Admiralty List of Radio and Fog Signals.

Part 1 - General

In addition, the following publications should be available:

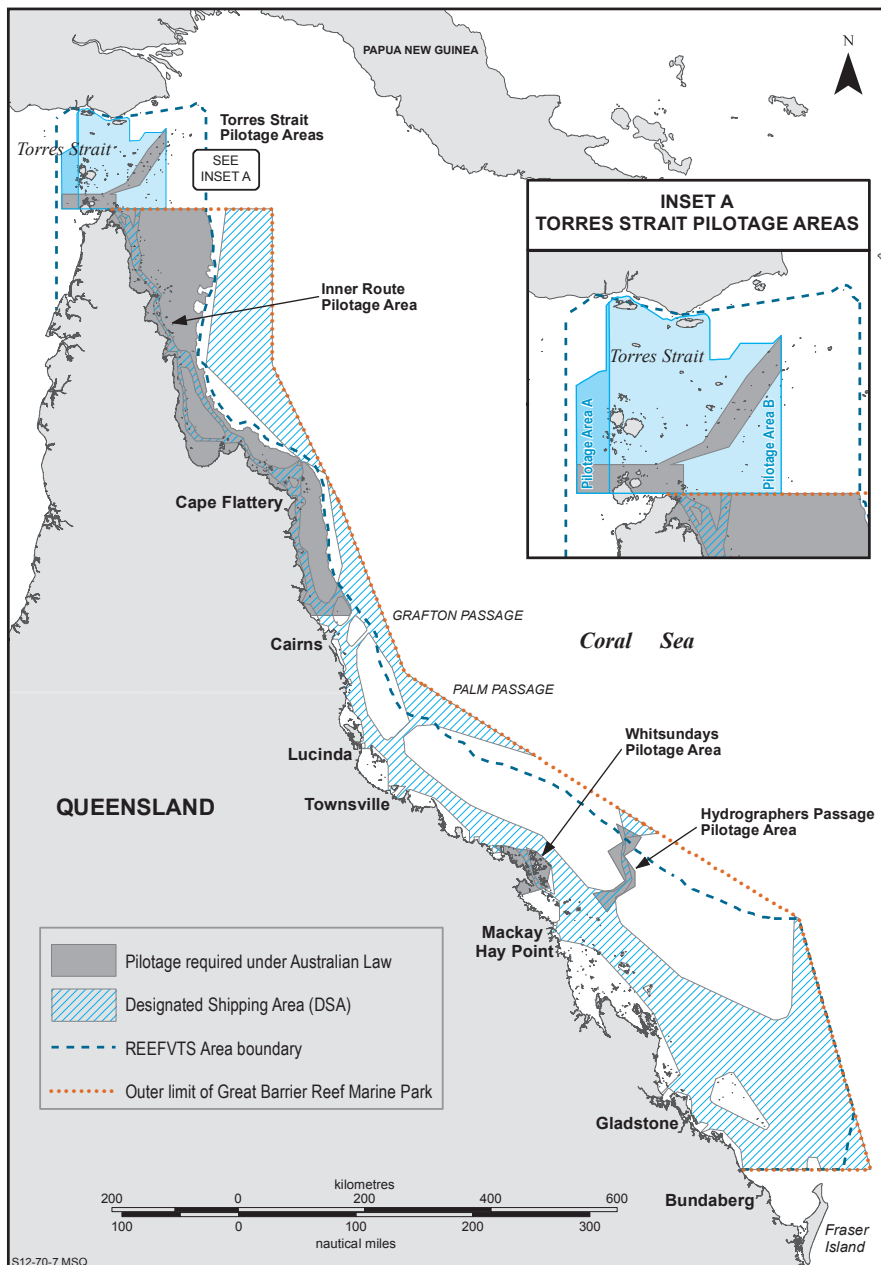
- Australian Annual Notices to Mariners Summary, and fortnightly editions
- AMSA Marine Orders and Notices (available from AMSA's website: www.amsa.gov.au)
- The current Great Barrier Reef and Torres Strait Vessel Traffic Service (REEFVTS) User Guide
- Australian Seafarers Handbook (AHP20).

Licensed coastal pilots are required to hold electronic copies of many publications, orders, notices and advisory notes published by AMSA. The QCPP will also be carried by pilots. Ships can request the latest edition direct from their pilotage provider. The QCPP can also be downloaded from the AMSA website (www.amsa.gov.au).

The QCPP is not corrected by Australian Notices to Mariners. It is revised and re issued by AMSA on an 'as required' basis. Ship Masters are encouraged to provide feedback on the QCPP direct to licensed pilots, who will forward their comments to AMSA for consideration.

The geographic areas where pilotage is required under Australian Law are depicted on Figure 1 below.

Figure 1 - Areas where pilotage is required under Australian Law



COASTAL PILOTAGE IN THE GREAT BARRIER REEF AND TORRES STRAIT

Coastal pilotage

The Great Barrier Reef (GBR) is the world's largest coral living structure. Stretching over 1,000 NM along the Queensland coastline, almost all of the GBR is protected by the GBR Marine Park, established in 1975. The Torres Strait is also an environmentally and culturally sensitive region and, along with the GBR, is an International Maritime Organisation (IMO) recognised 'particularly sensitive sea area' (PSSA).

Pilotage has been compulsory within the GBR since 1991 and the Australian pilotage regime came into existence for the Torres Strait - Great North East Channel (GNEC) in 2006. In accordance with the *Navigation Act 2012* ships over 70m in length; loaded oil tankers, loaded chemical carriers and loaded liquefied gas carriers (irrespective of length) are required to embark a licensed coastal pilot when transiting the coastal pilotage areas described below. AMSA regulates coastal pilotage, including pilotage providers and pilots, via Marine Order 54, associated Marine Notices and Pilot Advisory Notices.

There are four coastal pilotage areas regulated under Australian Law:

- 1) The Inner Route
- 2) The Great North East Channel
- 3) Hydrographers Passage, and
- 4) Whitsundays

Note: Ships transiting the Inner Route and Great North East Channel utilise Prince of Wales Channel (POWC) and its western approaches to enter (or clear) the Torres Strait region.

Coastal versus port pilotage

Whilst coastal pilotage and port pilotage share many common risks and requirements, coastal pilotage places the following unique challenges upon the bridge team and ship:

- The length of a GBR coastal pilotage can range from approximately 100 NM to 500 NM which, at normal speed, can translate to up to 48 hours under pilotage conditions.
- Despite the length involved, coastal pilotage remains a 'one-pilot' activity. Occasionally two pilots are embarked, but this is normally for training or pilot assessment purposes.
- A high emphasis is placed on fatigue management associated with the conduct of pilotages in the GBR and Torres Strait due to the length of the pilotage. Pilots will routinely leave the bridge to rest when the vessel is transiting the less complex or less navigationally challenging areas of the GBR. During these periods it is vitally important that the Officer of the Watch (OOW) follows the directions established during the Master/Pilot information exchange.
- Coastal pilots effectively 'live onboard' for the duration of the pilotage. Ships are therefore expected to meet the basic accommodation, meal and hygiene requirements of the embarked pilot. Such requirements would be in line with normal Australian standards.
- There is less traditional ship handling conducted during coastal pilotage. Whilst ships will often proceed to anchor awaiting tidal windows and manoeuvre at slow speeds to maintain acceptable Under Keel Clearance (UKC), most coastal pilotage is conducted at sea speeds.
- Full sea speed is ordinarily ordered during coastal pilotage, so anchors are normally cleared away prior to conducting the pilotage, however it is not normal practice to have the anchor(s) manned throughout the entire pilotage.

Part 1 - General

- Complacency and inattention, particularly during the longer stretches of the coastal pilotage, present an ever present risk that must be closely managed. Maintaining an effective lookout, especially at night, is a particularly important activity when long periods of inactivity can lead to a loss of situational awareness.
- Normal bridge staffing for the less challenging stretches of the coastal pilotage would normally be the pilot plus usual bridge watch keepers. The Master normally attends the bridge only as required by preference or policy. Junior officers, helmsmen and lookouts are therefore required to work more directly with the pilot than during port pilotage.
- Ships transiting the far northern and eastern sections of the GBR and Torres Strait cannot rely upon the emergency infrastructure and facilities that are routinely provided during port pilotage. There are no tugs, mobile and internet communications are poor and there are often no nearby ships.

These challenges, and the risks they present, are to be managed closely by the pilot and the Master. The unique nature of coastal pilotage calls for an effective Master/Pilot exchange, which may be different to a typical 'port pilotage' approach.

ROUTES AND DRAUGHT RESTRICTIONS

The Torres Strait

The recommended western entry to the Torres Strait is through either Varzin Passage or Gannet Passage, leading into the Prince of Wales Channel (POWC), the main shipping route through Torres Strait. These western approaches hold the minimum depth likely to be experienced by a deep draught ship within the entire GBR pilotage area.

The minimum charted depth in Torres Strait (and approaches) is 10.3m (Nov 2011). Mariners should consult the latest chart for accurate depth information. Under Australian law, ships of up to 12.2m static draught are permitted to enter, depart, and transit the Torres Strait and approaches (whilst maintaining the nominated UKC requirements detailed below).

The minimum dynamic (net) UKC required within Varzin and Gannet Passages is 1.0m. Within the POWC, the UKC requirement is 10% of the static draught for ships of 11.9m draught or greater, and 1.0m UKC for ships up to 11.9m draught. These UKC limits allow ships with maximum static draught 12.2m to make a safe transit of the Torres Strait at certain stages of the tide.

The main PBG for eastbound vessels is charted on the recommended track to the west of Booby Island. Depending on the ship's draught, ships can use either Varzin Passage or Gannet Passage from this boarding ground. Westbound ships which have successfully completed their transit of the area may land their pilot once the ship is past 141° 51.7 E, or if the draught is less than 8m, once the ship is past 142° 05.0 E.

Torres Strait is an interface between the diurnal tidal regime of the Indian Ocean and the semi-diurnal tidal regime of the Pacific Ocean. This creates a highly variable and complex tidal regime with fast flowing tidal streams up to 8 knots predicted in the tidal stream tables at Hammond Rock within the POWC. Tidal levels change rapidly. It is not uncommon to have the tide rising at one location, only to be found falling close nearby. This large tidal range and local seasonal adverse weather conditions can make for testing navigational conditions.

Coastal pilots use a combination of predicted tidal levels, real-time tidal levels, and experience to plan and execute ship transits of the Varzin Passage, Gannet Passage and POWC areas, whilst maintaining the minimum UKC required throughout. A full transit of the most constrained area is approximately 36 NM in length, which can take many hours to complete if a deep draught ship is constrained by complex and strong tides. It is therefore not uncommon for ships to anchor in the approaches to this area, awaiting a suitable tidal window for the transit.

Pilotage providers may assist Masters of deep draught ships in determining tidal windows or constraints.

Although coastal pilotage is not determined by draught, ships of less than 8.0m static draught may elect to board and disembark their pilot from the Goods Island boarding ground in lieu of the Booby Island boarding ground.

The Inner Route

The Inner Route Pilotage Area extends from Cape York to Cairns. Although the Inner Route is often stated to include POWC, the pilotage area north of Cape York (including POWC) is technically part of the Great North East Channel Pilotage Area (see page 15). The route from POWC to Cairns is approximately 450 NM in length within these pilotage areas, which for most ships can mean a transit time of between 24 and 48 hours with a licenced pilot embarked.

Southbound ships board their pilot by boat from either the Booby Island PBG or Goods Island PBG depending on the ship's draught. Ships of static draught of 8m or greater must use the Booby Island PBG. The Booby Island PBG is approximately 20 NM from the pilot station at Thursday Island.

Northbound ships embark the pilot near Cairns, using the particular PBG nominated by their pilotage provider. Occasionally pilots also board by helicopter at the nominated PBG near Cairns by arrangement with the pilotage provider.

The Inner Route passes between the mainland and the GBR. In some sections it is extremely narrow, with reefs edges only 3 cables from the ship's track. In other sections the nearest reef will be at a distance of several miles. This variety makes for a transit of variable complexity which calls for the full attention of the bridge team in support of the pilot at all times.

Traffic conditions are generally light when compared to the major shipping straits within Asia and Europe. All reporting ships are monitored by REEFVTS with shipping reports and Automatic Identification System (AIS) data combining to provide information on shipping traffic, including expected meeting and passing times. Small vessels, such as fishing vessels, local recreational boats and sailing vessels are not required to report to REEFVTS and may pose a risk to navigation. A proper and effective lookout is required at all times so that these smaller vessels can be avoided. Complacency is therefore a major risk to be managed whilst transiting the GBR.

Depending on the prevailing circumstances and conditions, there are sections of the Inner Route where the pilot will leave the bridge, making it important that the OOW fully understands the intended passage plan and the instructions to be followed in the absence of the pilot. The notes contained in the section '*Whilst under pilotage*' (below) provide more information on what to expect and what is expected.

Part 1 - General

The Great North East Channel

The Great North East Channel (GNEC) links POWC to the northern most entrance to the GBR, 120 NM away. Pilotage requirements for vessels proceeding south-west through the GNEC commence from Dalrymple Island (also referred to as Dalrymple *Islet* in various publications), with pilots embarking by pilot boat at the PBG located approximately 6 NM north-east of Dalrymple Island.

This section of the GBR is quite remote; pilots often have to commute from Thursday Island to join vessels. ETA management, particularly for westbound ships through the GNEC, is therefore very important.

The GNEC offers two choices of route (either east or west of Rennel Island when proceeding south-west and either east or west of Richardson Reef when proceeding north-east), with the eastern route being the deepest in both cases.

When compared with the POWC, the GNEC is quite wide and deep, however constant attention to position is required as tidal streams set strongly across the track, and leeway induced by wind can be significant.

Ships transit entirely within the charted two-way route. The courses in the QCPP should be applied to paper charts and electronic navigation equipment to meet this requirement.

All major shipping in the GNEC is monitored by REEFVTS, with shipping reports and AIS data combining to provide information on expected meeting and passing times of other ships. A constant lookout is required for occasional small traffic, fishing vessels and local trading vessels that often work within the GNEC which can be encountered with little notice.

Hydrographers Passage

Hydrographers Passage is the main inbound route for ships proceeding to the ports of Hay Point, Dalrymple Bay and Mackay. Approximately 80 NM in length, the passage is well marked, deep, and can experience strong spring tidal streams. Hydrographers Passage can cater for any sized ship that can be loaded at the Hay Point or Dalrymple Bay terminals including Cape size ships.

Pilots embark and disembark ships to seaward of the outer edge of the GBR by helicopter at the Blossom Bank PBG. Masters must ensure that helicopter operations are conducted strictly in accordance with current National and International standards, including Marine Order 57 (Helicopter Operations) 2010.

Coastal pilots are not licensed to pilot ships within Queensland State pilotage areas. If ship Masters require pilotage assistance in a Queensland pilotage area (such as the Hay Point Pilotage Area), they need to engage a pilot licensed by Maritime Safety Queensland (MSQ), as required.

Whitsundays

The Whitsundays area, including Whitsunday Passage, the Whitsunday Group of islands and the Lindeman Group of islands, is a popular tourist and cruise vessel destination. The extent of the Whitsundays pilotage area is defined in the *Great Barrier Reef Marine Park Regulation 1983*, regulation 118(4).

Ship Masters and cruise ship companies wishing to operate regulated vessels in the Whitsundays pilotage area are required to engage the services of a licensed pilot for the Whitsunday area and/or Whitsundays anchorages. Pilotage services for the Whitsundays can be arranged by contacting pilotage providers as required.

REEFVTS

REEFVTS is the Great Barrier Reef and Torres Strait Vessel Traffic Service. REEFVTS incorporates the ship reporting system (SRS) REEFREP and is operated jointly by the Australian Maritime Safety Authority (AMSA) and Maritime Safety Queensland (MSQ). AMSA is an agency of the Australian Federal government and MSQ is an agency of the Queensland State Government.

REEFVTS operates 24 hours a day from the VTS centre, situated at Townsville, on the Queensland coast. Ships transiting through the Great Barrier Reef and Torres Strait must report to REEFVTS. A full description of the reporting requirements can be found in Marine Order 56 (REEFREP) 2004, ALRS Vol 6(4), Australian Seafarers Handbook and the REEFVTS User Guide.

Reporting requirements

- A **Pre-Entry Position Report** is required at least two hours prior to entering the REEFVTS area, or at least two hours prior to departing from a port within the REEFVTS area.
- An **Entry Report** is required when a ship enters the REEFVTS area, or departs from a port within the REEFVTS area.
- A **Final Report** is required when a ship exits to sea, or arrives at a port within the REEFVTS area.
- Additional reports may be required, including route deviation reports, and/or defect reports, depending on the circumstances. See the REEFVTS User Guide for further information.

Shipping in the REEFVTS area is monitored primarily using AIS. Another mechanism used is Automated Position Reporting (APR) via Inmarsat-C. REEFVTS will generally carry out APR remotely without any intervention of ship's crew. Please ensure the Inmarsat-C equipment remains active in the 'LOGIN' mode at all times for the Pacific Ocean Region. Providing the ship's AIS and Inmarsat-C equipment are working correctly, there is no requirement for further position reports to REEFVTS.

Details on communicating with REEFVTS are available in the REEFVTS User Guide. Reports can be made by:

- Inmarsat-C. Messages sent to REEFVTS use the special access code (SAC) 861, via Pacific Ocean Region (POR) LES 212). REEFVTS will pay the cost of sending these messages.
- VHF Radio. Contact REEFVTS 24 hours a day on either VHF channel 11 or 14 (call sign 'REEFVTS')). VHF Coverage is limited in some areas. Please use Inmarsat-C messaging and email in the areas between:
 - Inset (J) and Heath (K) – LADS Passage and Fairway Channel
 - Swain (Z1) and Archer (Z2) – Offshore from Gladstone in the SE area
- Other communications (telephone, fax or e-mail).

The pilot will make a 'pilot commencing duties' report to REEFVTS (via VHF) as soon as safely possible after the Master/Pilot exchange is complete and the vessel has entered the pilotage area.

Pilots will make a final 'pilot ceases duties' report to REEFVTS (via VHF) when the vessel exits the pilotage area and the pilot is preparing to depart the vessel. The pilot will clarify with the Master and REEFVTS any additional reporting requirements to be followed once the pilot has left the vessel.

Ship Traffic Information

REEFVTS will provide information on expected traffic during the voyage using Inmarsat-C messages. The OOW should closely monitor all incoming Inmarsat-C messages for Ship Traffic Information (STI), and share these messages with the pilot upon receipt.

BEFORE THE PILOT BOARDS

Estimated time of arrival (ETA) management

Coastal pilotage is a remote area activity. Coastal pilots often travel long distances on aircraft and in pilot boats before they board a ship.

Coastal pilots are required by law to have minimum periods of rest, excluding travel time in aircraft and pilot boats, before they can legally commence a pilotage. As a result, pilotage providers rely heavily upon accurate and timely information from ships in order to coordinate getting a rested pilot to a ship on time at the boarding grounds.

Individual pilotage providers have their own communication protocols and requirements, which are repeated in the various navigational publications held onboard. As a minimum, bookings should be made with the preferred pilotage provider well in advance of the requirement for a pilot, and regular ETA updates should be given to the pilotage provider.

Charts to be carried

AMSA expects all vessels navigating in the GBR and Torres Strait, which are subject to the requirements of Chapter V to the International Convention for the Safety of Life at Sea (SOLAS) and which rely on paper charts, to carry a complete folio of fully corrected paper charts for all the areas to be visited. In particular, the correct large scale charts should be available such that pilotage is always conducted on the best scale chart available. For ships operating with an approved Electronic Chart Display and Information System (ECDIS), the corresponding chart permits and updates should be available (see additional information below for ECDIS-fitted vessels).

In addition to all charts that cover approaches to the coastal pilotage areas, the latest editions of the following paper charts are also to be carried:

- Inner Route (Booby Island to Cairns): AUS 270, 292, 293, 296, 830, 831, 832, 833, 834, 835, 839
- GNEC: AUS 292, 293, 839, 840
- Hydrographers Passage: AUS 821
- Whitsundays: AUS 252, 253, 254, 824, 825

With adequate notice, pilotage providers can normally supply any charts that may be missing from onboard folios. The agent or the pilotage provider can be contacted directly to make the necessary arrangements.

ECDIS-fitted vessels

Vessels intending to employ ECDIS to meet the chart carriage requirements of SOLAS Chapter V (i.e. vessels not carrying a full folio of paper charts onboard) must conform to the relevant performance standards of the IMO specified in Resolution A.817(19), MSC.86(70) and MSC.232(82), including back-up arrangements.

Such vessels must have the official Electronic Navigational Charts (ENC's) loaded for the intended voyage(s). Official ENC's are those produced by a recognised authority such as a national Hydrographic Office. Commercially produced ENC's may not meet the IMO carriage requirements. Further information can be obtained from AMSA Marine Notice 11/2012.

Pilots will expect Masters and mates of ECDIS-fitted vessels that intend to use ECDIS to meet SOLAS chart carriage requirements to demonstrate they can competently and safely operate the ECDIS equipment.

Part 1 - General

Passage plan

Ships are expected to have a completed passage plan laid out on the appropriate paper charts and electronic navigation systems prior to pilot boarding. The courses, waypoints and charts listed in this document provide an appropriate 'starting point' to achieve this. Masters should ensure that all navigational references have been properly consulted, that initial tidal and UKC calculations have been made, and that all charts in use are corrected and up to date. Equally, full permits for any electronic charts and ECDIS systems should be available. Any deficiencies in this process should be immediately highlighted to the pilot upon boarding.

The courses in this document are generally considered safe for transit, however the pilot, in discussion with the Master, will agree on the specific courses to be followed and will decide, when there are alternative routes, on whether the shallow, moderate, or deep draught routes should be followed.

Emergency arrangements

Masters should ensure that appropriate tests of main propulsion, electrical and steering systems have been conducted prior to entering a coastal pilotage area. Onboard drills should be completed so that the ship can respond quickly and competently in the event of an emergency whilst in a coastal pilotage area. Ship's anchors are to be cleared away and made ready for letting go in an emergency.

The pilot will seek confirmation that emergency arrangements are completed prior to commencement of the passage.

Pilot ladder

Masters should pay close attention to pilot ladder rigging arrangements before embarking a pilot. Licensed coastal pilots expect pilot ladders to be fully compliant with International standards, and will not board if the ladder is unsound. Pilots are required to report non-compliances to AMSA for follow-up with the ship concerned, which could lead to closer Port State Control (PSC) inspection arrangements. Information on changes to pilot boarding arrangements agreed by the IMO is provided in Marine Notice 20/2012 available from the AMSA website www.amsa.gov.au.

Ships should confirm waterline to ladder heights, boarding speeds and courses, and other arrangements with the pilotage provider. Many of these instructions will initially be passed via email and confirmed by VHF, therefore it is important that ships monitor the correct VHF channels as they approach the pilot boarding grounds.

Pilot cabin

A pilot cabin should be prepared for the coastal pilot's use during the transit. On occasions there will be a request to embark two pilots for the passage (normally for the purposes of pilot training and assessment), which means two cabins should be prepared. Pilots will expect meals to be provided onboard, clean bedding, towels and linen and high standards of hygiene in the provided accommodation.

Pilot card

A pilot card should be prepared to assist with the efficient communication of the major characteristics of the ship and the current equipment status. Items of particular interest should be highlighted and brought to the attention of the pilot.

Note: Most pilot card templates are designed to cater for port pilotage. Masters should consider including remarks or notes that relate specifically to the coastal pilotage task.

Part 1 - General

Equipment checklist

Prior to boarding the pilot, the Master should confirm that the main engine, steering, radio and bridge equipment are all in good working order. Any defects which may affect the safe transit of the vessel through a coastal pilotage area should be reported to the pilotage provider at the time of pilot booking, to REEFVTS in the Pre-Entry report and to the pilot when boarding.

Masters are reminded of their requirement to report general incidents about defective equipment, marine accidents, or other incidents using the AMSA Form 18 and AMSA Form 19, available from the AMSA website under 'Shipping Safety > Incident Reporting > General Incident Reporting'.

The following equipment should be in good working order:

- VHF radios - tuned to the correct channels
- Inmarsat-C logged in and polling
- Lamps, repeaters, flags and shapes available
- Navigation lights serviceable and alternate means tested
- Gyro compass and repeaters synchronised. Any error determined
- Radar and ARPA equipment tuned and working
- GPS units with waypoints correctly input
- GPS datums set correctly on all systems
- Appropriate cross track error and waypoint arrival alarms set
- Sound signalled equipment available and tested
- Echo sounder tested, calibrated and tuned
- AIS working with correct voyage data entered
- Doppler speed log on bottom track
- Ship whistle tested
- *Diesel generators on line
- Steering gear shall be fully functional with all motors/pumps operable. All sources of power including alternative/emergency sources must tested and available as required whilst in a coastal pilotage area.
- Anchors cleared away and made ready for letting go.

*Note: Shaft generators are not to be used in coastal pilotage areas unless arrangements for the ship's main source of electrical power and lighting systems meet the requirements specified in SOLAS Regulations 40 and 41 (i.e. arrangements are such that the services necessary to provide normal operating conditions for propulsion and safety can be maintained regardless of the speed and direction of rotation of the propulsion machinery or shafting).

WHILST UNDER PILOTAGE

Master/pilot exchange

Immediately upon boarding, the pilot will proceed to the bridge to meet the Master. Once the pilot boat is clear of the ship, and the ship is set on an appropriate initial heading and speed, the pilot will commence the Master/ Pilot exchange.

The ship should have completed all the necessary planning requirements and considered all issues, including (but not limited to) those described in this publication. This applies especially to the information contained in the section '*Before the Pilot Boards*' above. Any gaps in preparation may prevent the Master/Pilot exchange from proceeding smoothly. Often, a smooth and efficient exchange is important due to imminent navigational or vessel traffic considerations.

It is highly recommended that all OOW's be present to witness and participate in the Master/Pilot exchange. Where this is not possible, the Master should implement procedures to ensure that relevant instructions are communicated to subsequent watch keepers before they take over their next watch.

The pilot should be presented with a pilot card and a verbal brief on the seaworthiness, equipment state and readiness of the ship. Any defect to any of the bridge, radio or machinery of the vessel which may affect the safe transit through a coastal pilotage area should be clearly communicated to the pilot.

As a minimum, the Master/Pilot exchange will address:

- The seaworthiness of the ship, its handling characteristics and its readiness to commence the passage
- The equipment and machinery status of the ship as detailed in the pilot card
- The choice of route, courses and waypoints, including any departures from the QCPP, and rationale for such departures
- Confirmation that the chosen route has been properly applied to paper charts, electronic charts, and GPS units, and that appropriate cross track error and waypoint arrival alarms have been set
- Confirmation of draughts and location of echo sounder transducers
- Precise calculations relevant to UKC requirements
- Confirmation that emergency arrangements have been completed and that initial response procedures have been discussed
- Agreed frequency of fixing, methods of fixing, and navigational reports expected by the pilot, and
- Agreed approach to maintaining a proper and effective lookout, including the traffic to be expected and the reports expected by the pilot

Once the seaworthiness and other requirements relevant to the intended passage have been discussed between the Master and pilot, the pilot will then commence conning the vessel.

Operational discharges

The GBR and Torres Strait are both designated as 'particularly sensitive sea areas' by the IMO. These areas are specifically protected from the risks posed by shipping through various regulatory controls, including strict pollution and ship-sourced discharge legislation. AMSA and the Great Barrier Reef Marine Park Authority (GBRMPA) take their responsibilities for the protection of these areas very seriously and discharge restrictions are strictly enforced. All discharge regulations and pollution restrictions must be followed. In particular:

- Ballast water must not be exchanged within the GBR
- No garbage whatsoever should be thrown over the side
- No cargo residues can be washed from the decks

Australia's coastal pilotage and remote border areas are regularly patrolled by aircraft fitted with thermal imaging equipment and cameras. Penalties for non-compliance are high.

Designated Shipping Area (DSA)

A DSA is charted throughout the GBR Marine Park as an additional measure to protect the GBR from shipping incidents. The courses detailed in the QCPP are all within the DSA. Ships may enter any 'Marine Park Zone' inside the DSA. Outside the DSA, ships can only operate in a 'General Use Zone'. Masters are reminded that penalties apply to vessels that enter any other zone outside the DSA without the written permission of the GBR Marine Park Authority.

Two-way route

The charted two-way route is not a "Narrow Channel or Fairway" as defined in the 'International Regulations for Preventing Collisions at Sea 1972' (COLREGs), however it is customary and prudent for ships to bias their tracks to the starboard side of the centreline of the route where sea room permits. Keeping as far to the starboard side (as is safe and practicable), helps ensure ships pass 'red to red' in accordance with the standard practice of seamanship. The courses detailed in the QCPP are generally biased to starboard to align with this practice.

Speeds and response

Except when UKC constraints impose otherwise, transits of the GBR are usually carried out at full sea speed. Maneuvering speeds will only be used when embarking/disembarking by pilot boat, and during the draught-restricted transits of the Torres Strait, or if required for some other special circumstance.

This is a significant departure from port pilotage practice, and places extra emphasis on the ship's ability to cope with navigational emergencies. This matter should be addressed during the Master/Pilot exchange and considered for the duration of the transit.

Passage monitoring

Whilst transiting the GBR, the pilot will expect the OOW to maintain a full awareness of the ship's position in relation to the agreed passage at all times. The OOW is expected to apply appropriate navigational techniques and principles including placing fixes on the chart, using parallel indexing and clearing indexing on radars, and monitoring electronic systems for alarms and warnings. The OOW is also expected to maintain a full appraisal of all shipping and traffic in the area, quite independently of the pilot. It is common practice for the OOW and pilot to use separate radars and/or displays for this purpose. If a specific radar and/or display is assigned primarily for the use of the pilot, the pilot and the OOW should agree on any process regarding shared use.

Although the pilot may have the conning whilst on the bridge, the OOW is not relieved of his/her obligations for ship safety. The OOW is expected to work closely with the pilot during the passage. In particular, the pilot will expect reports on:

- Any unexpected cross track error, or when cross track error exceeds the limits agreed in the Master/Pilot exchange
- The nominated approach distance to next waypoint, including confirmation of the next course, and whether the next course is clear of traffic
- Any concerns in relation to UKC, unexpected depths, or unexpected tidal streams
- Approaching traffic, whether detected by radar, visual lookout, AIS, or REEFVTS reports. Such reports should ensure that passing arrangements and distances have been agreed
- Any concerns in relation to the passage plan, or the course being steered, and
- The correct application of the helm, or next heading nominated by the pilot during course alterations

Departure from the agreed courses may become necessary from time to time due to passing traffic or for other operational reasons. If the OOW is in anyway concerned that the vessel is not within the nominated cross track error limits, this should be brought to the pilot's notice for immediate clarification.

As the voyage continues, the courses may have to be adjusted further to take into account weather conditions, tidal heights, or the characteristics of the particular ship in shallow water. Any deviations from the agreed pilotage plan should be discussed with the Master and OOW before any changes are made.

Collision avoidance

Fishing boats towing trawls can be seen in the GBR during the fishing season from March to November. They work during the hours of darkness often near the two-way route at trawling speeds generally around 3-4 knots.

These vessels may also be encountered in daylight moving to new fishing grounds. Great caution should be exercised when passing areas where fishing boats are operating. VHF radio should be monitored closely when in the vicinity of fishing boats / fleets.

At any time of the year, fishing boats (towing up to six small work boats) may be encountered. These small workboats may be unlit and caution should be exercised when passing these fishing boats at night.

The GBR is also used by cruising sailors and other small, poorly lit vessels. Such vessels will not appear on REEFVTS reports, may not have AIS and may have poor radar reflecting properties. It is imperative that a proper and effective lookout be kept at all times for such vessels.

Any small vessels sighted within close proximity of the ship's intended track are to be brought to the attention of the pilot.

Calling the pilot

In addition to any instructions left by the individual pilot, the OOW should call the pilot to the bridge, in the manner agreed during the Master/Pilot exchange, on the following occasions:

- Where the pilot indicates 'Please Call Pilot' on the chart
- When there are any concerns or doubts about the navigational safety of the ship
- When there are any concerns or doubts about passing arrangements for closing vessels, or when vessels are initially detected ahead of the ship at close range
- If visibility is reduced or when there are potential issues or concerns for the keeping of a proper and effective lookout
- In the event of any significant equipment or operational defect or deficiency
- If the ship receives information via VHF or Inmarsat-C concerning navigational warnings, events, incidents or problems nearby, and
- If another pilot or REEFVTS wishes to speak to the pilot

UNDER KEEL CLEARANCE (UKC)

What is UKC?

Under Keel Clearance, or UKC, is the vertical distance between the lowest part of the ship's hull and the seabed. Maintaining a UKC margin in Torres Strait is important because it ensures a ship's keel is kept clear of the seabed and minimises the chance of the vessel running aground.

What is UKCM?

UKCM stands for 'Under Keel Clearance Management.' The UKCM System is provided by the Australian Maritime Safety Authority (AMSA) as a specific aid to navigation for large ships transiting Torres Strait in Australia's north.

It is an advanced web-based system for enhancing the safety of those large vessels whose keel is close to the seabed in the shallow Torres Strait region. The system was declared 'operational' by AMSA in December 2011.

UKCM systems are often used in ports; however this is the first time a UKCM system has been implemented in a coastal environment in Australia.

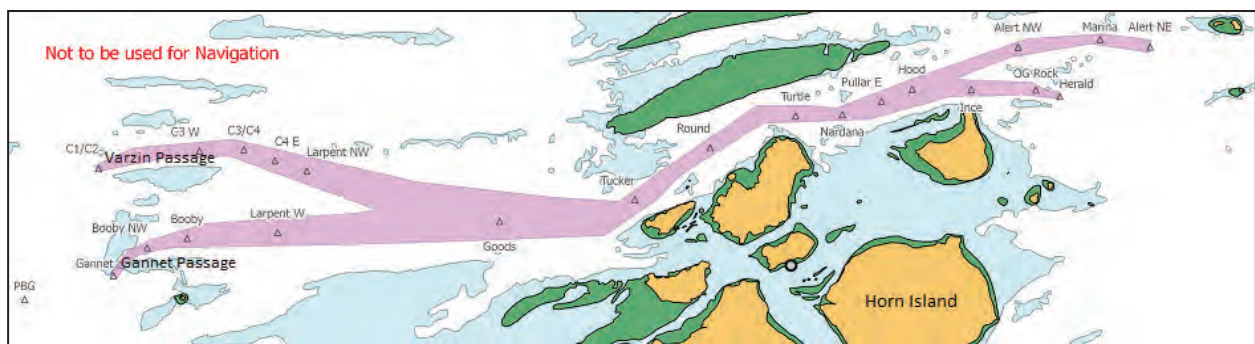
Area of operation

Torres Strait can be a navigationally hostile and demanding environment. It lies between Papua New Guinea and the northern tip of the Australian continent and is a vital shipping route for the Asia-Pacific region.

Numerous large vessels transit Torres Strait and face many challenges to safe navigation due to the numerous reefs, shallow waters, complex tides, strong tidal streams, strong winds and seasonal rain squalls which affect visibility.

The UKCM System is in use for vessels transiting Varzin Passage, Gannet Passage and the Prince of Wales Channel in Torres Strait (as indicated in Figure 2 below).

Figure 2 - Area of Operation of UKCM System in Torres Strait



How does UKCM work?

The UKCM system is web-based and uses accurate vessel information, hydrodynamic modeling to predict the motion of the ship (squat and heel) and the latest bathymetry and environmental data from tide, stream, wind and wave sensors, to estimate a vessel's UKC in real time. UKCM allows coastal pilots and vessel operators to plan and monitor the safe and efficient passage of deep draught vessels transiting Torres Strait.

By adhering to a set of operational parameters, the UKCM system allows the calculation of tidal windows to meet AMSA's under keel clearance requirements. The system can then be used to monitor the UKC margin throughout the ship's transit.

Use of the UKCM system

From 1 January 2014, Pilotage Providers are required to ensure the UKCM System (as implemented by AMSA) is used by pilots assigned to the transit of a ship of 8 metres draught (or more), through the Prince of Wales Channel, Varzin Passage or Gannet Passage (i.e. the UKCM System area of operation).

The responsibility for safe navigation continues to reside with mariners (masters and pilots) through the appropriate use of the UKCM system in conjunction with other aids to navigation, official hydrographic products and prudent seamanship, including appropriate passage planning.

The UKCM system complements the Great Barrier Reef and Torres Strait Vessel Traffic Service (REEFVTS) as one of a number of protective measures implemented by AMSA to enhance the safety of shipping in these environmentally sensitive marine areas.

BRIDGE RESOURCE MANAGEMENT

Bridge resource management and the passage plan

Seafarers, shipowners and pilots are reminded of the importance of effective Bridge Resource Management (BRM) and the use of efficient watch keeping techniques to enhance safety and reduce human and systemic errors in navigating ships.

Mariners should be familiar with the provisions of Marine Order 28 (Operations standards and procedures) 2012, the STCW Convention 1978, as amended, Chapter VIII - Watchkeeping and the requirement to plan their voyage, as identified in SOLAS Chapter V, regulation 34.

Australian communities are very sensitive to incidents that adversely affect the marine environment such as collisions or groundings in ports, harbours, or other waterways including the GBR and other environmentally sensitive regions – particularly if such incidents result in pollution.

Effective BRM should begin at the initial passage planning stage and include full consideration of the following:

- Navigation and operational tasks and responsibilities should be clearly defined and delegated (as required)
- Dangers that may be encountered throughout each voyage and the precautions and contingency arrangements necessary to manage these risks should be identified
- Priorities should be set and constantly reviewed
- The vessel's position, speed, and heading with respect to other vessels and all navigation hazards should be continuously monitored
- Monitoring of the vessel's navigation against the agreed passage plan should be continuous
- Deviation from the agreed plan or standard operating procedures should be noted and acted upon immediately
- Electronic aids should be used in an informed and careful manner
- Support for the Master and pilot when navigating should be sufficient and positive at all times

It is expected that the Master and bridge watch keeping officers will participate in the use of BRM techniques and support the pilot by closely following the agreed passage plan while in coastal pilotage waters. It is essential that every member of the bridge team understands the part they are to play in ensuring that the agreed passage plan is safely, effectively and fully executed.

Human error and performance

Analysis of maritime incidents suggests that a large percentage of incidents are caused by human error and not by mechanical breakdown or lack of competency. Many incidents are attributed to “single person” error, where a mistake made by one person was not noticed or corrected by other members of the bridge team in time to prevent an incident from occurring (e.g. an incorrectly applied helm order).

Where marine casualties have occurred with a pilot on board, many have been attributed to flawed Master/Pilot relationships. In many cases, when the pilot boarded the ship, the Master and deck officers ceased to monitor the navigation and the position of the ship.

It is therefore essential that the pilot, Master, and bridge team work together to ensure that small errors that could have been made by either the pilot, Master, OOW or helmsman, are detected early and corrected before the ship is put into any danger.

The Master, OOW or other members of the bridge team should be prepared to challenge the pilot if they are unsure of the pilot’s intention.

To facilitate communications, every member of the bridge team should follow the IMO Standard Marine Communication Phrases. A closed loop communication technique should be used to eliminate any doubt or ambiguity.

The Master and the bridge team should remember that they are always responsible for the safe navigation of the ship, even when a pilot is embarked. This responsibility is evident in Provision 326 of the *Navigation Act 2012*.

All Australian pilots, including licensed coastal pilots, expect Masters and watch keepers to fully participate in the navigation of the ship during pilotage. The Master and deck officers must continue to monitor the safe passage of the ship, critically appraise the pilot’s advice, and incorporate the pilot into the bridge team in a mutually supportive manner, to ensure efficient and safe navigation.

COASTAL PILOTAGE RISK MANAGEMENT

Risk Management

The following information provides a number of suggestions which should be considered when managing risks posed during pilotage transits. The list below is not exhaustive and does not address all possible risks which may be encountered.

Ships masters are encouraged to develop appropriate Risk Management arrangements for each transit of a coastal pilotage area dependent on the operational requirements and the prevailing circumstances and conditions.

Helm put the wrong way A member of the bridge team should be delegated to check the rudder angle indicator when the pilot is conning the ship. The bridge team should follow the IMO Standard Communication Phrases and closed loop communication technique should be used to eliminate any doubt or ambiguity when communicating with the helmsman. The use of hand signals to enhance the communication of helm orders should be considered.

Electrical Power Failure The Engine Room team should ensure that sufficient generating power available at all times. Extra care should be taken when putting generators on the switchboard as blackouts have occurred in the past due to non-synchronisation issues.

Main Engine Failure Main Engine failures occur from time to time and dependent on the proximity of hazards and the vessel characteristics, the ship can normally be steered into safe water. Whilst most modern vessels have unmanned machinery spaces, it is preferable to have the Engine Room manned during the transit.

Collision The main risk of collision is with fishing vessels and small pleasure craft. Keep a careful lookout at all times and ensure the radar is on the correct range and properly adjusted for sea-clutter. Keep a good listening watch on VHF channel 16 and do not hesitate in calling the pilot if the pilot is absent from the bridge at any time.

Human Error It is essential that the bridge team work together to ensure that small errors that could have been made by the pilot, Master, navigation watch keeper or helmsman are detected early and corrected before the ship is put into any danger.

Case studies reflect that it is normally a series of small errors (normally unchecked and/or unreported) which compound together to result in a large scale incident or catastrophic situation. It is therefore very important that every member of the bridge team and crew is free to voice any concerns, or raise any errors which may be detected, in a timely manner, without fear of repercussion.

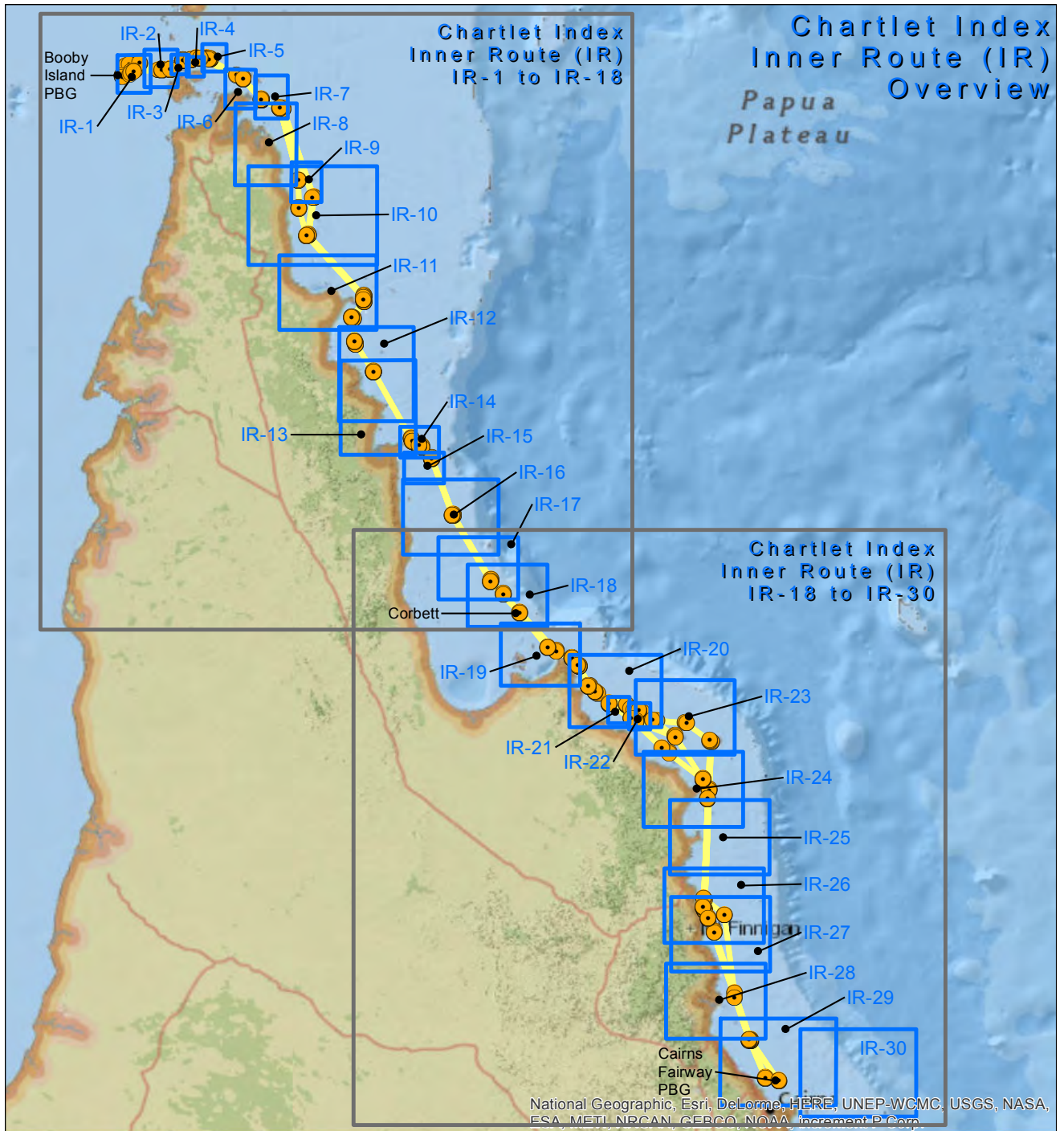
QUEENSLAND COASTAL PASSAGE PLAN

PART 2 PLANNING CHARTLETS

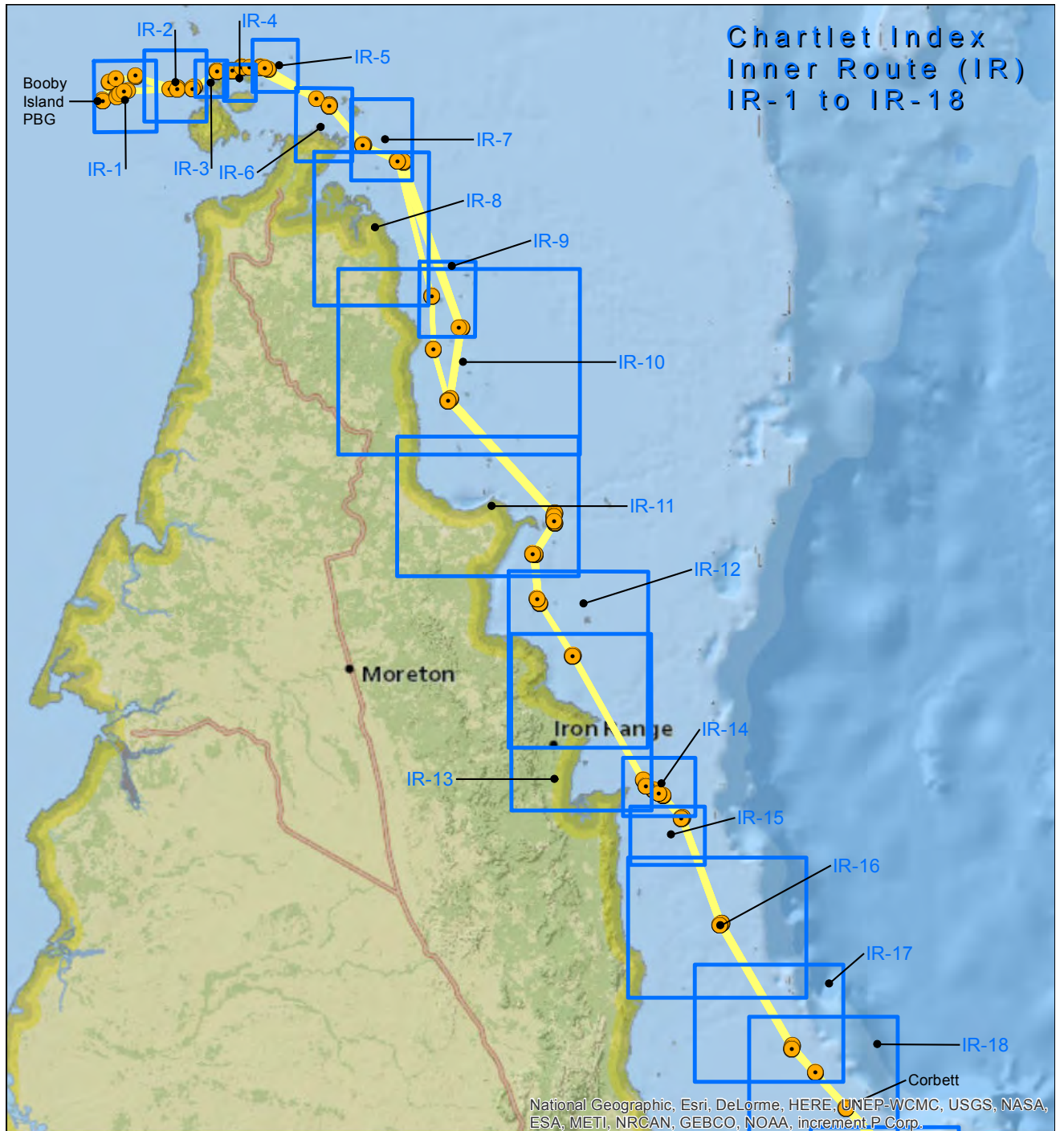


PLANNING CHARTLETS
GREAT BARRIER REEF
INNER ROUTE
BOOBY ISLAND TO CAPE GRAFTON

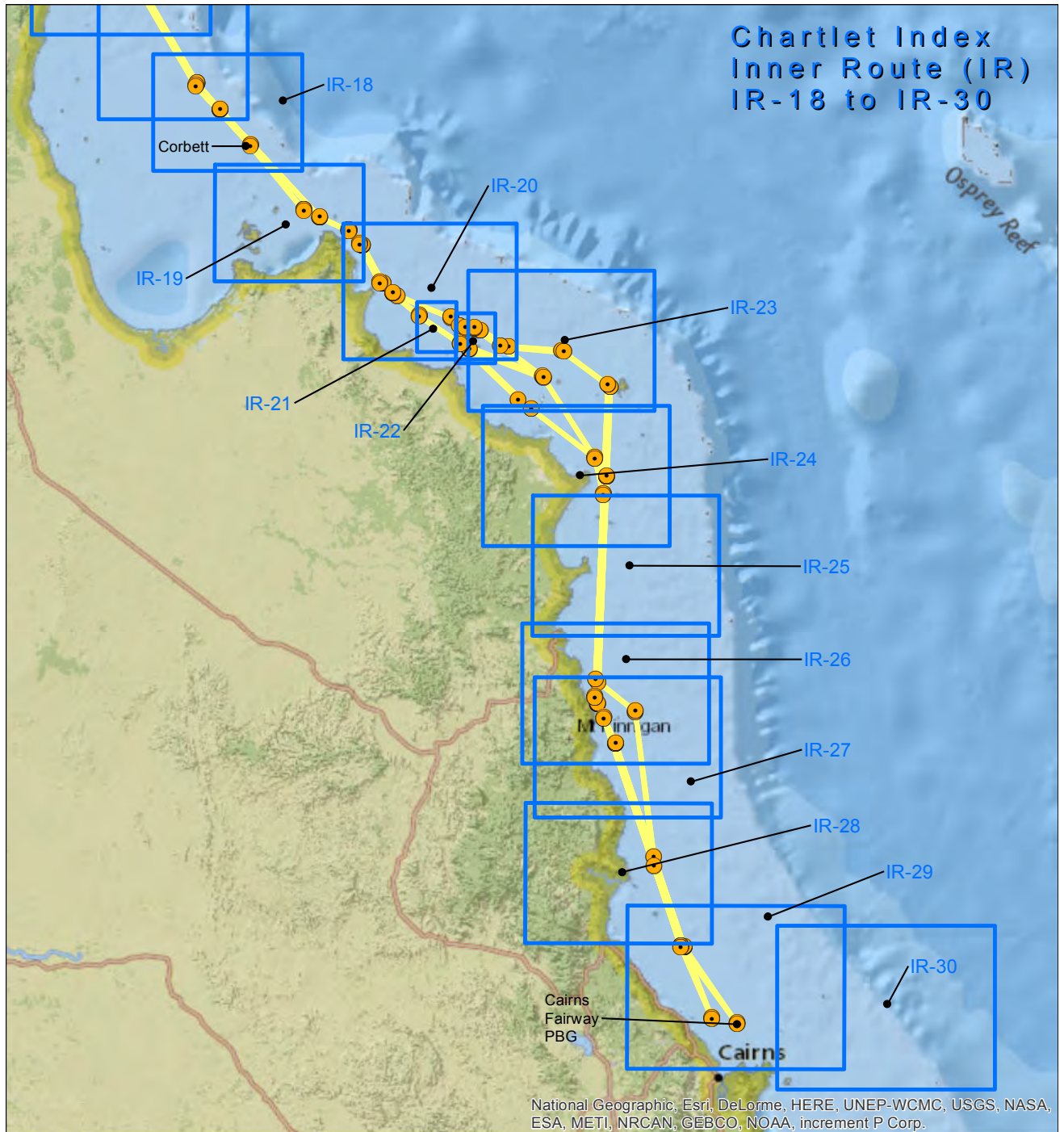
Geographical overview of IR chartlets



Geographical overview of IR chartlets 1 to 18

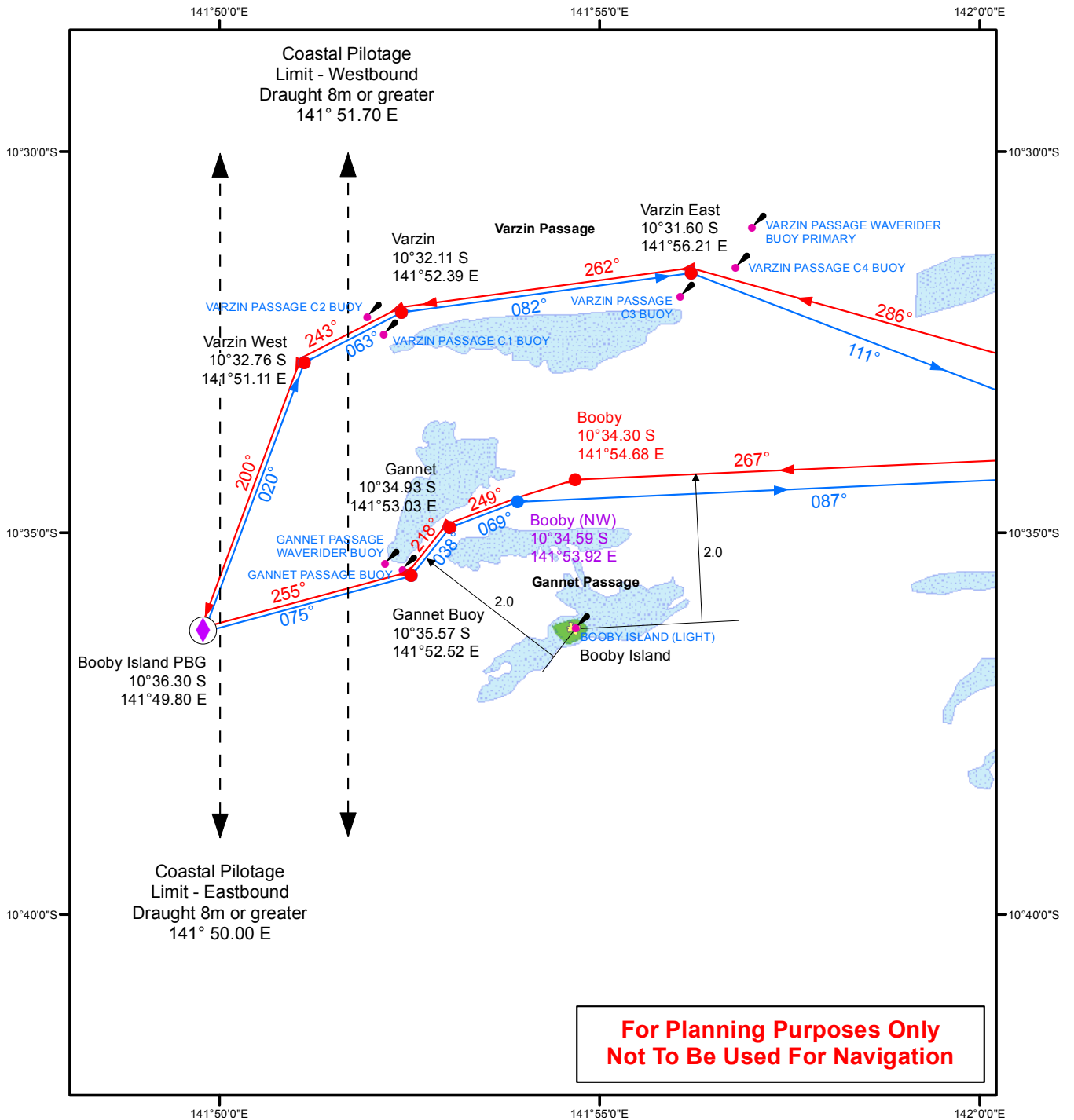


Geographical overview of IR chartlets 18 to 30



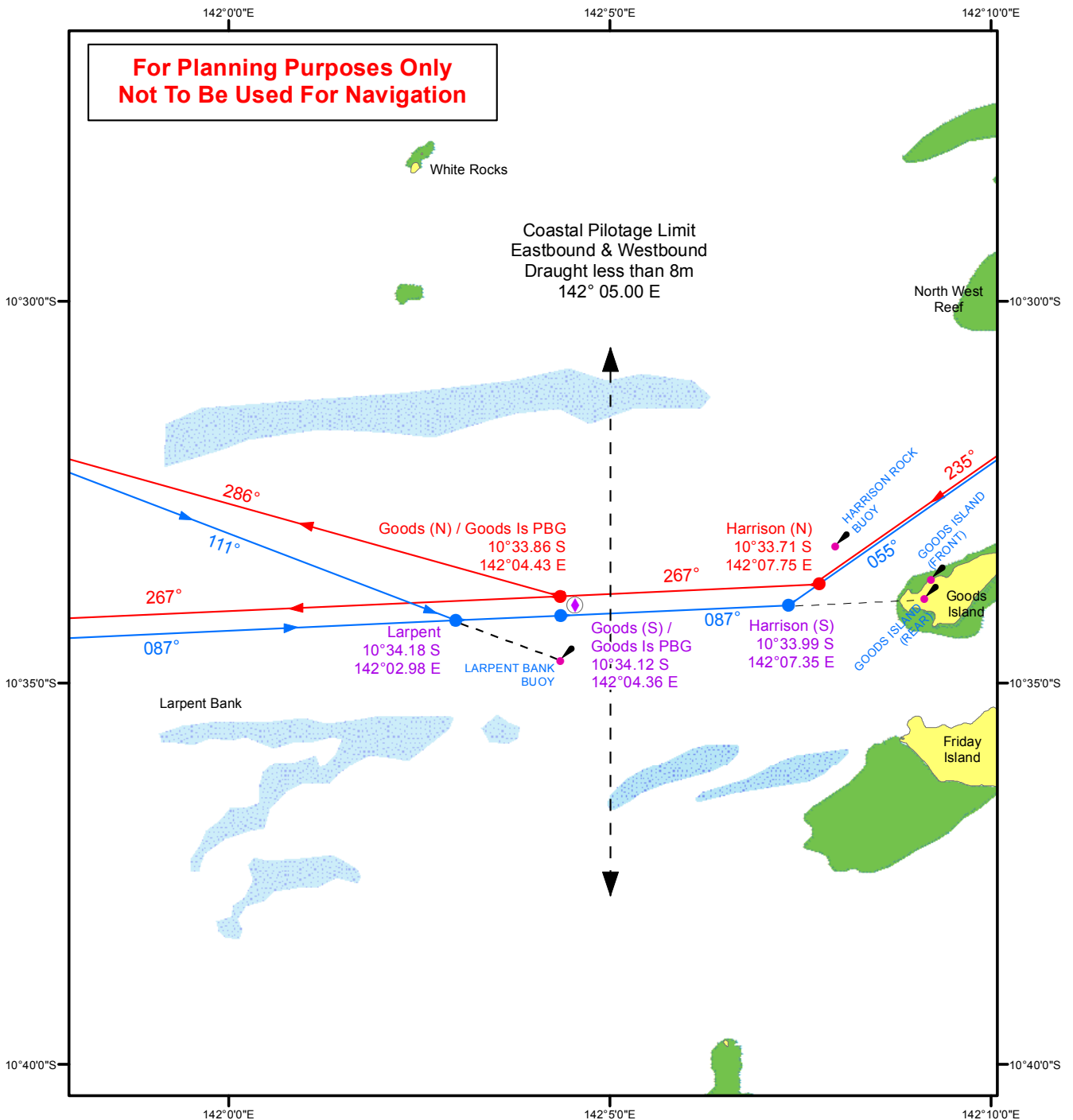
Booby Is PBG to Varzin and Gannet Passages

IR-1



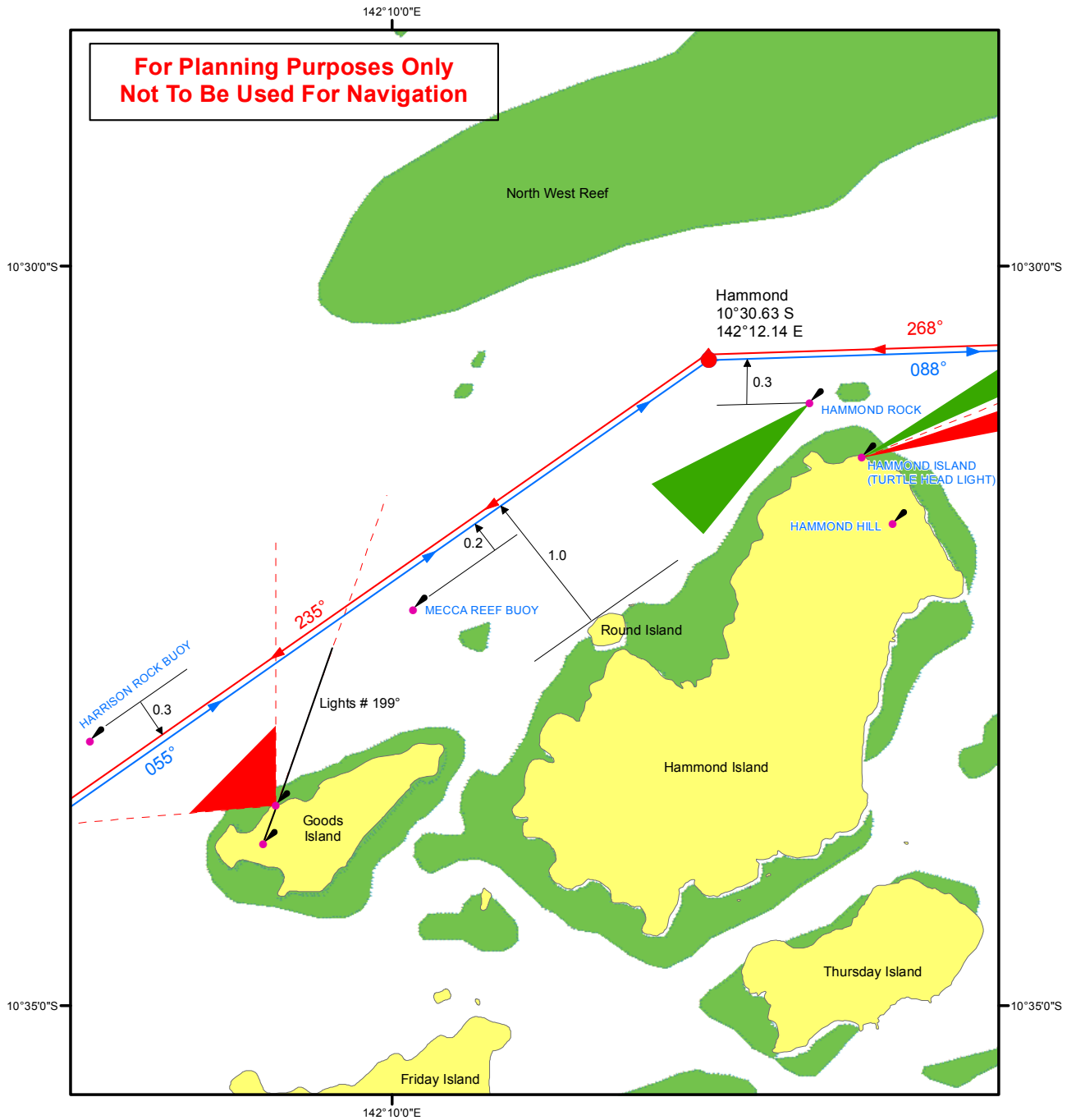
Larpent Bank to Goods Is and Goods Is PBG

IR-2



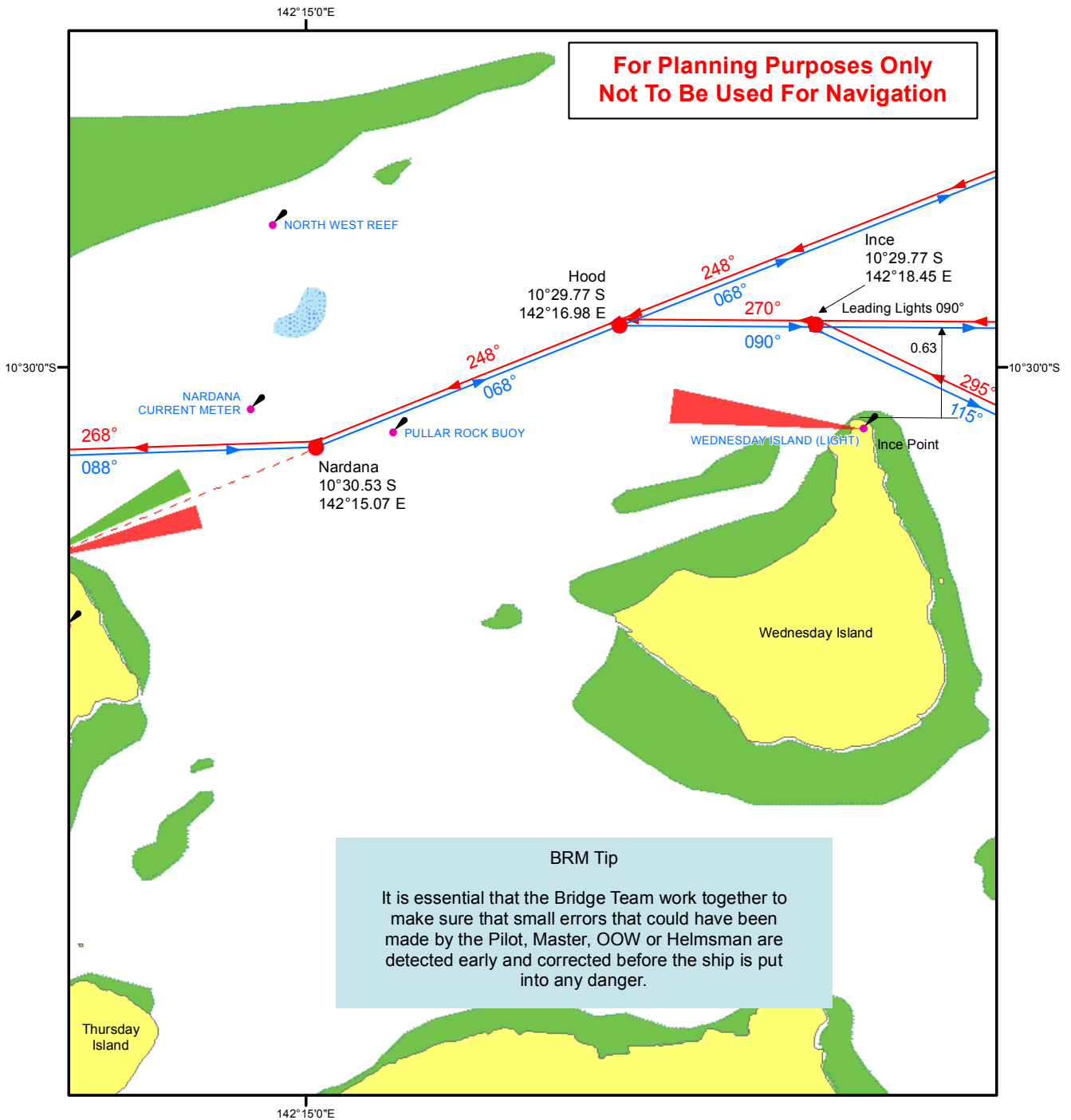
Prince of Wales Channel –
Harrison Rock to Hammond Rock

IR-3



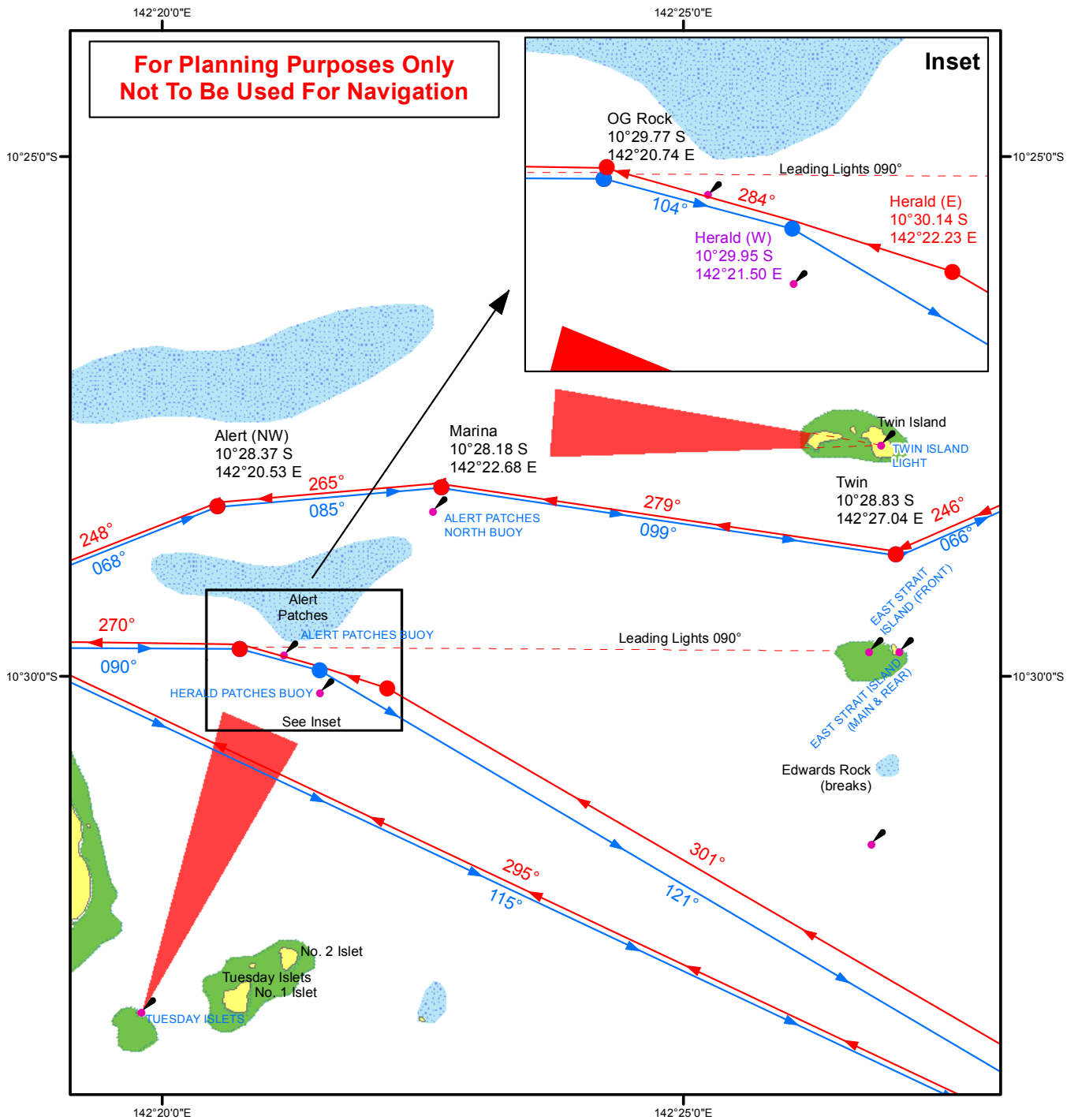
Prince of Wales Channel –
Nardana Patches to Ince Point

IR-4



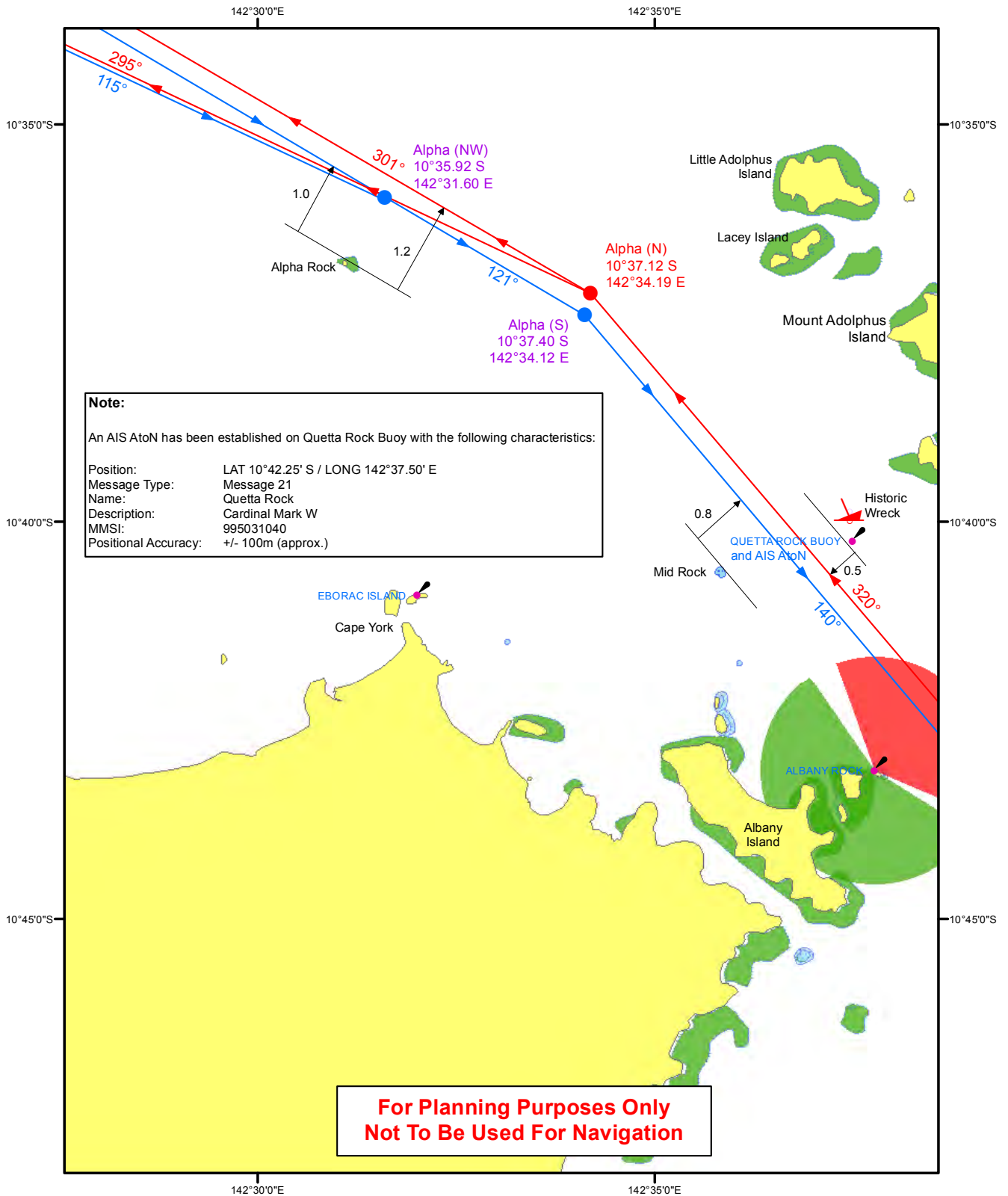
Herald Patches to Edwards Rock

IR-5



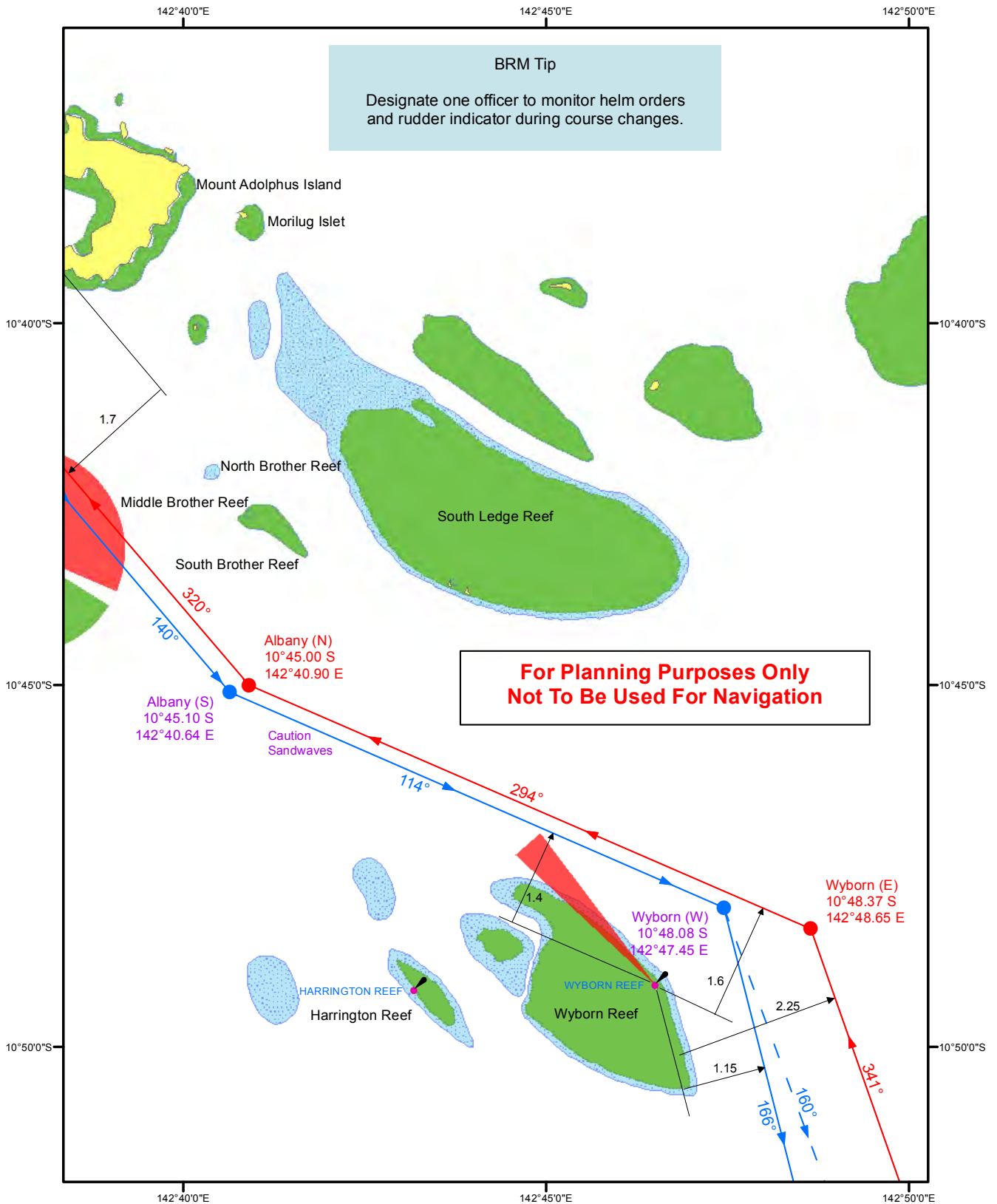
Alpha Rock to Albany Rock

IR-6



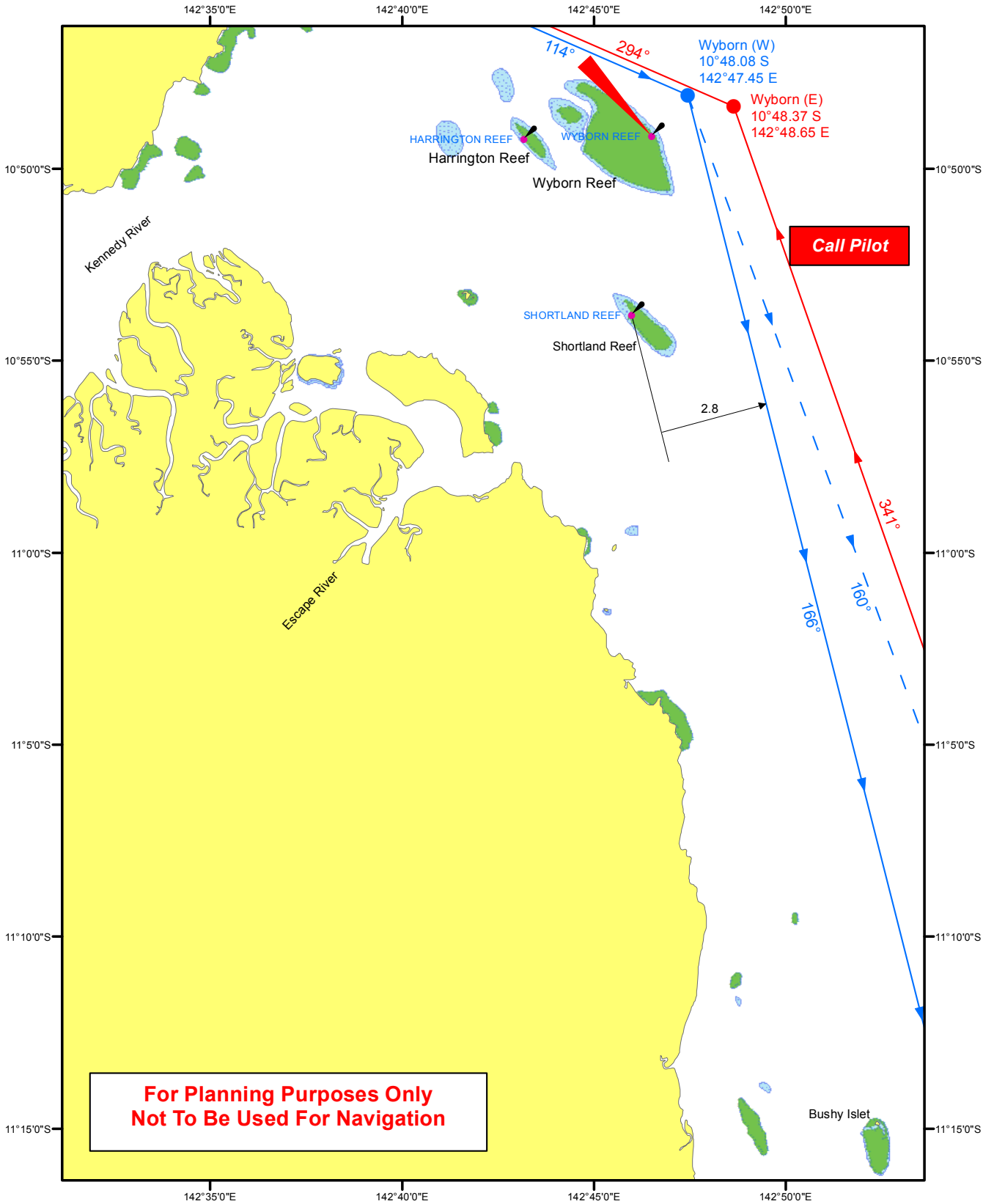
Albany Rock to Wyborn Reef

IR-7



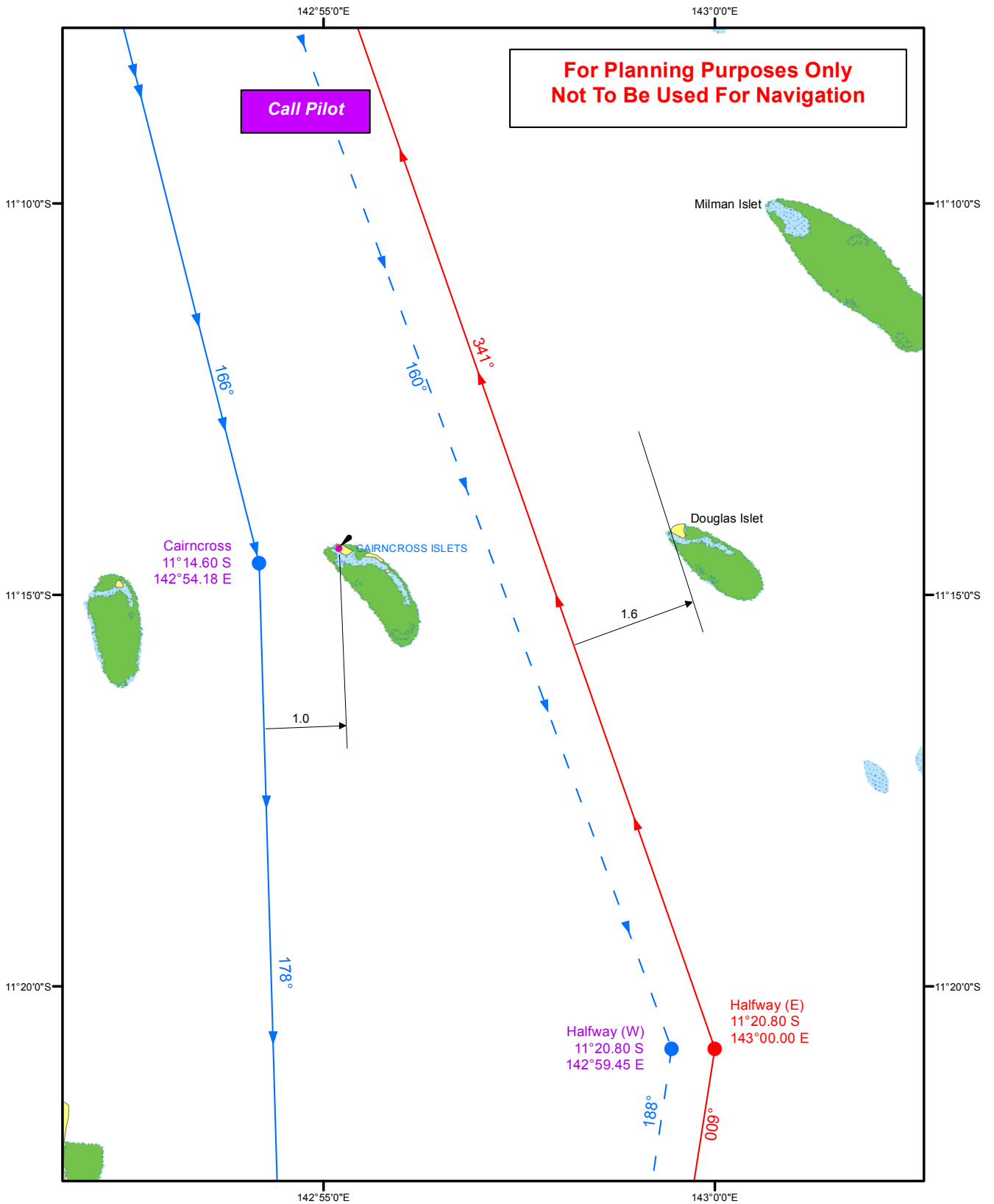
Wyborn Reef to Bushy Islet

IR-8



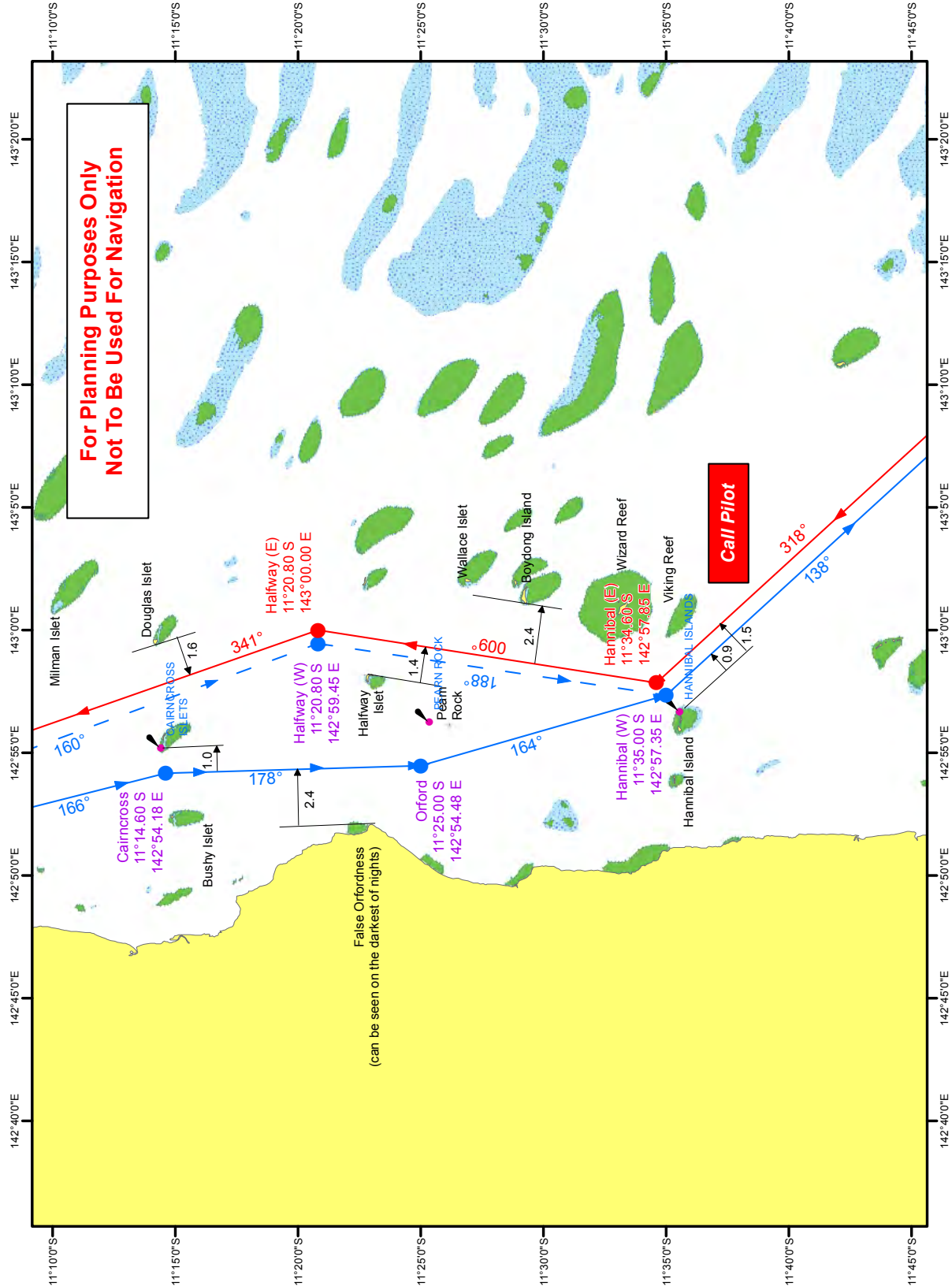
Cairncross Islets

IR-9



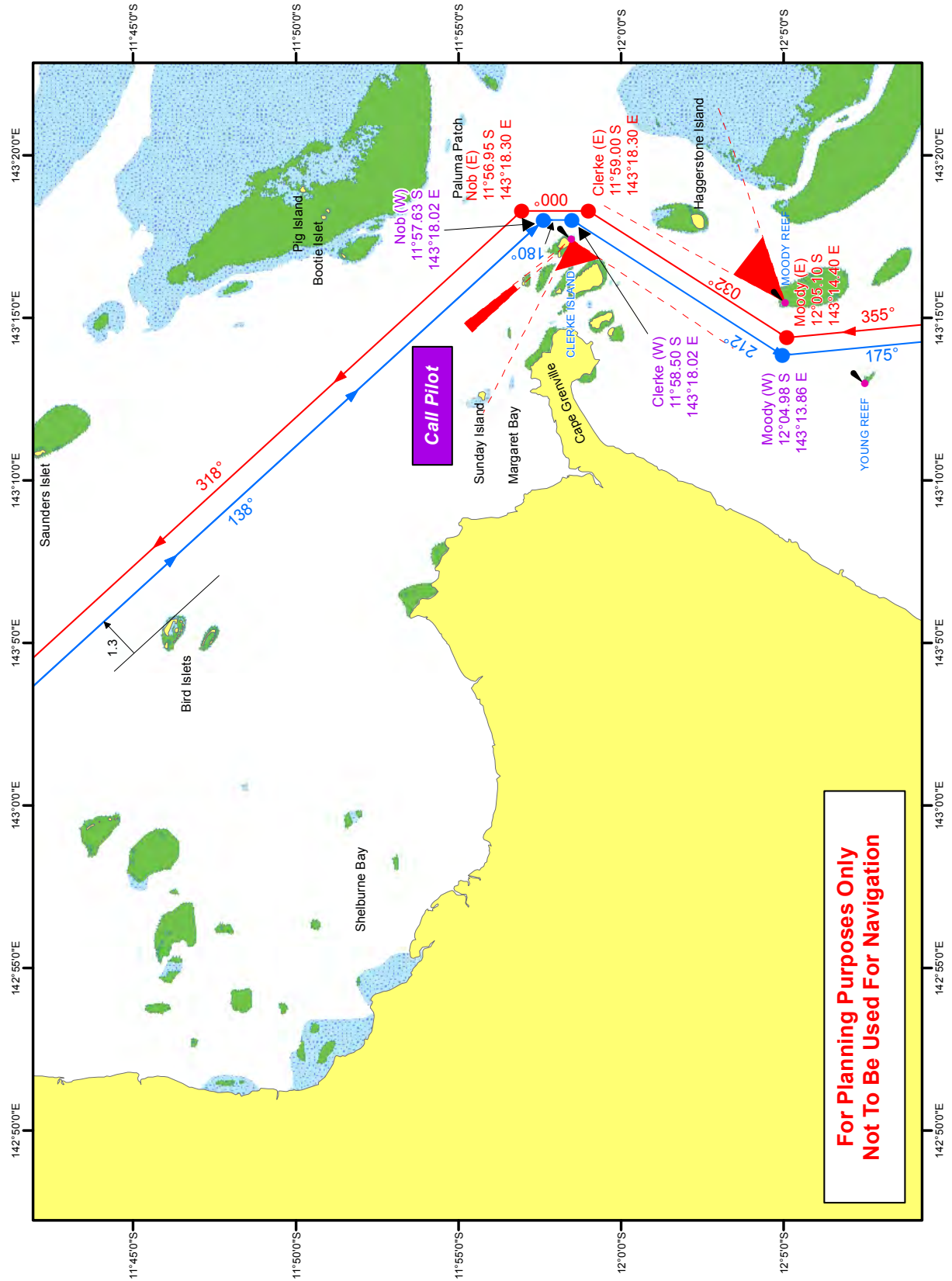
Cairncross Islets to Hannibal Island

IR-10



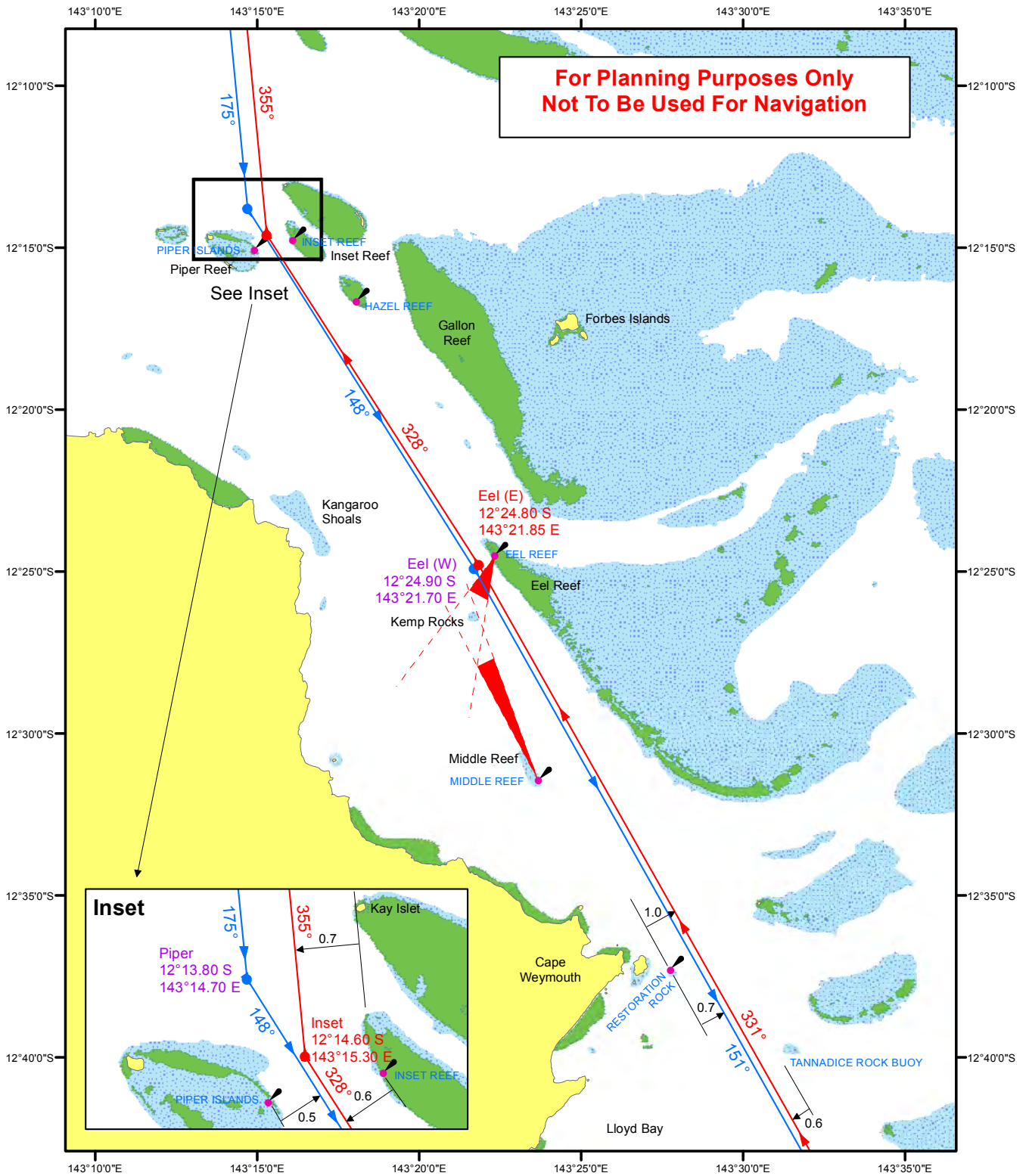
Bird Islets to Moody Reef

IR-11



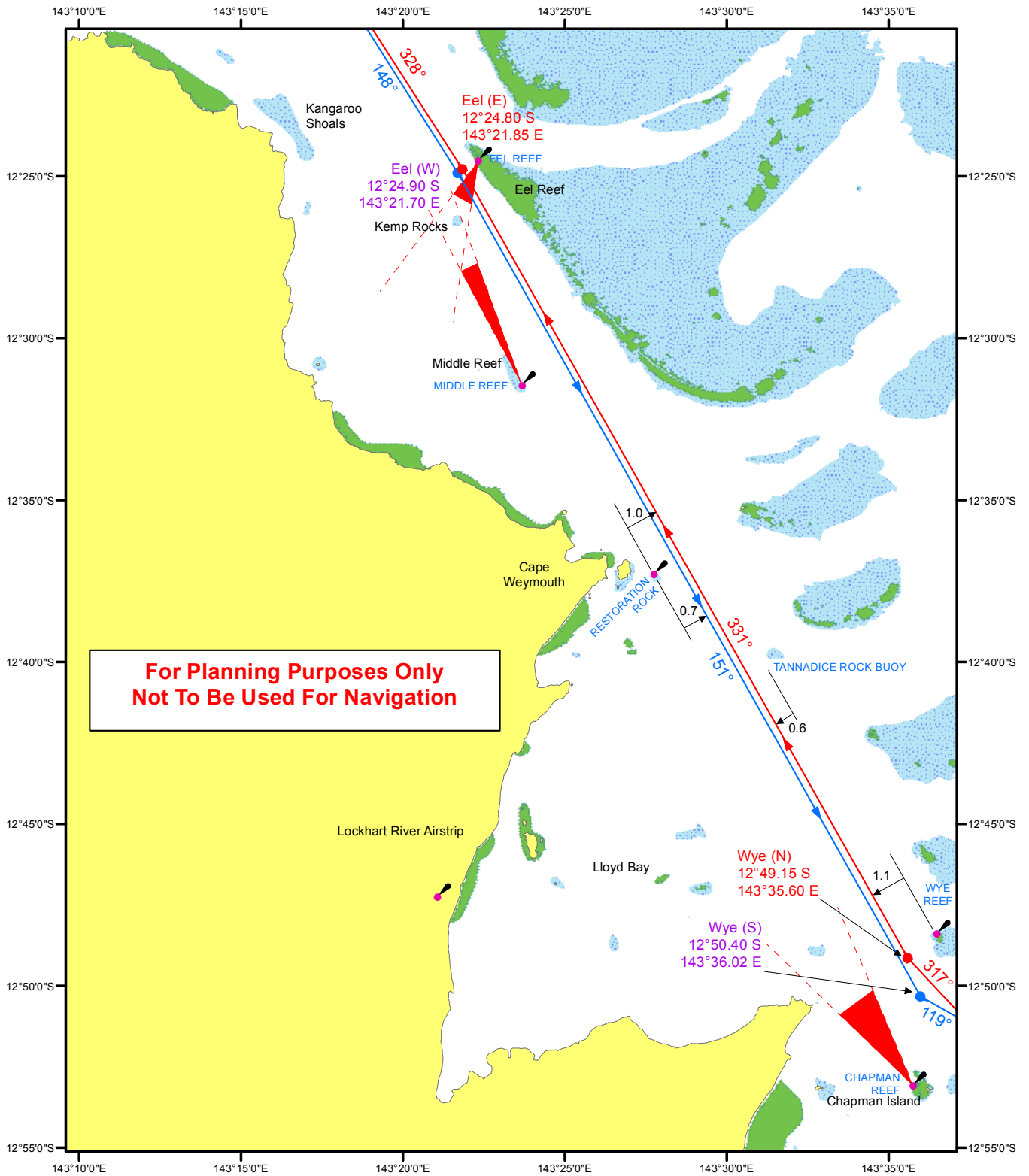
Piper Reef to Tannadice Rock

IR-12



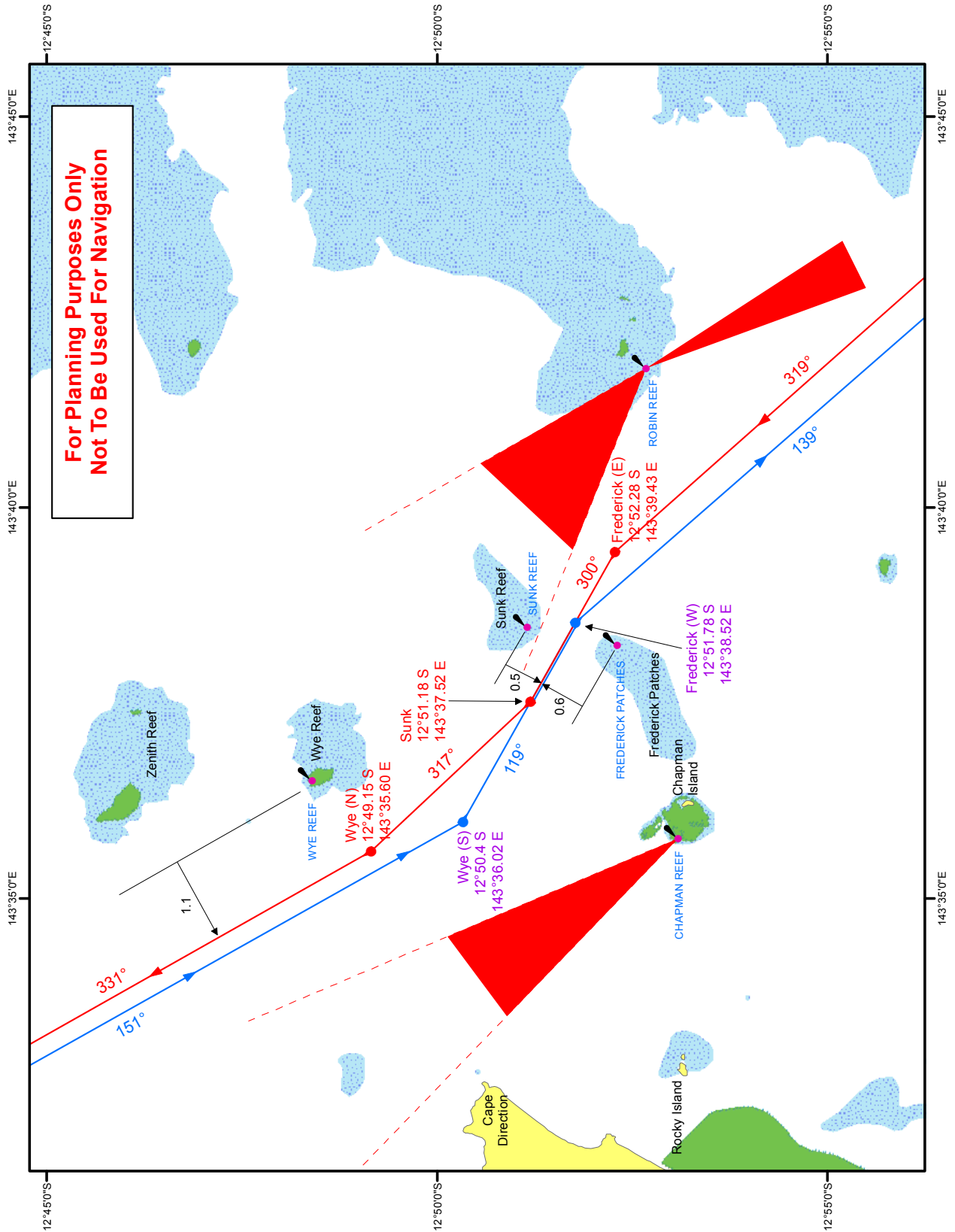
Eel Reef to Chapman Island

IR-13



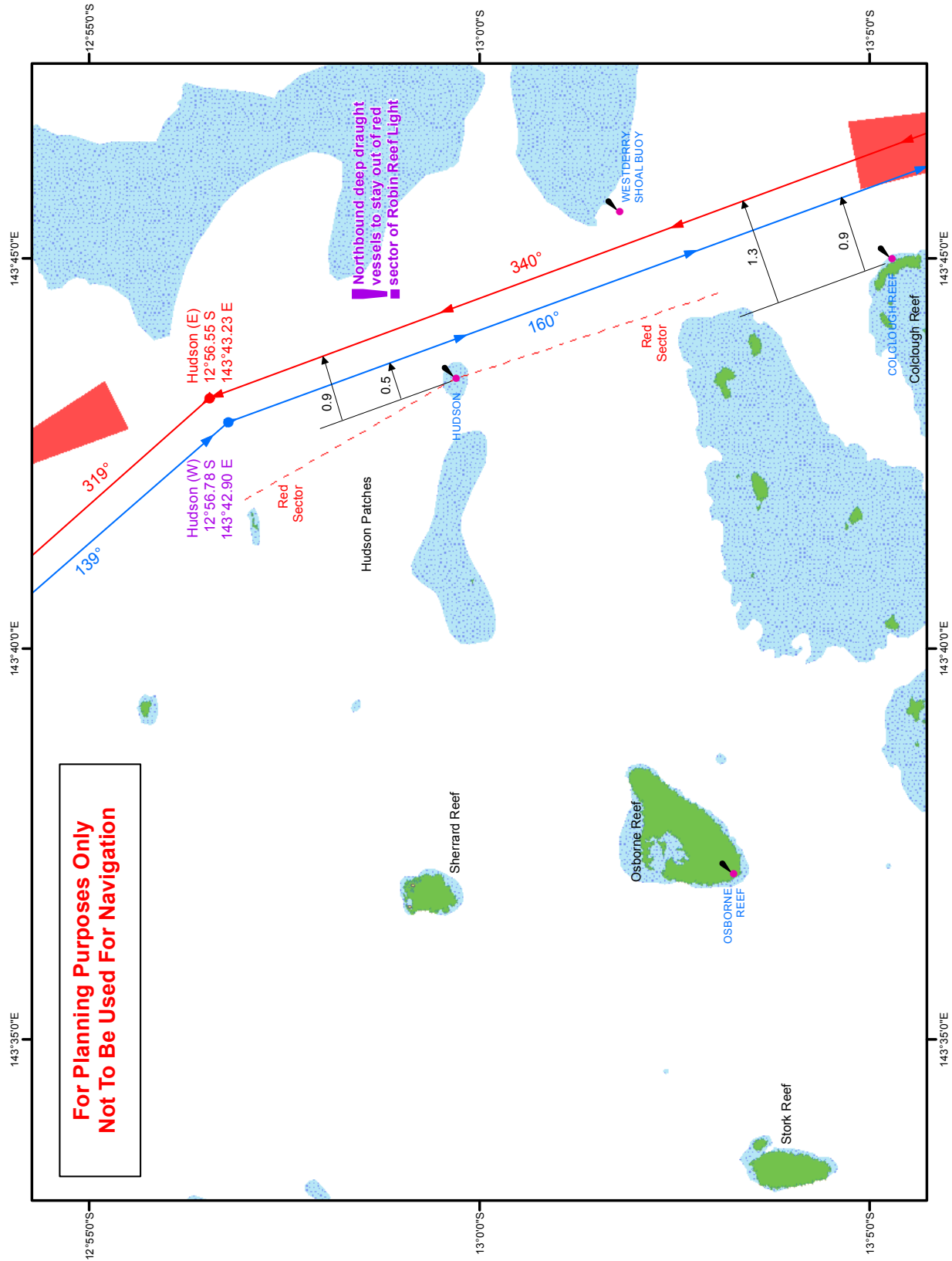
LADS Passage – Wye Reef to Robin Reef

IR-14



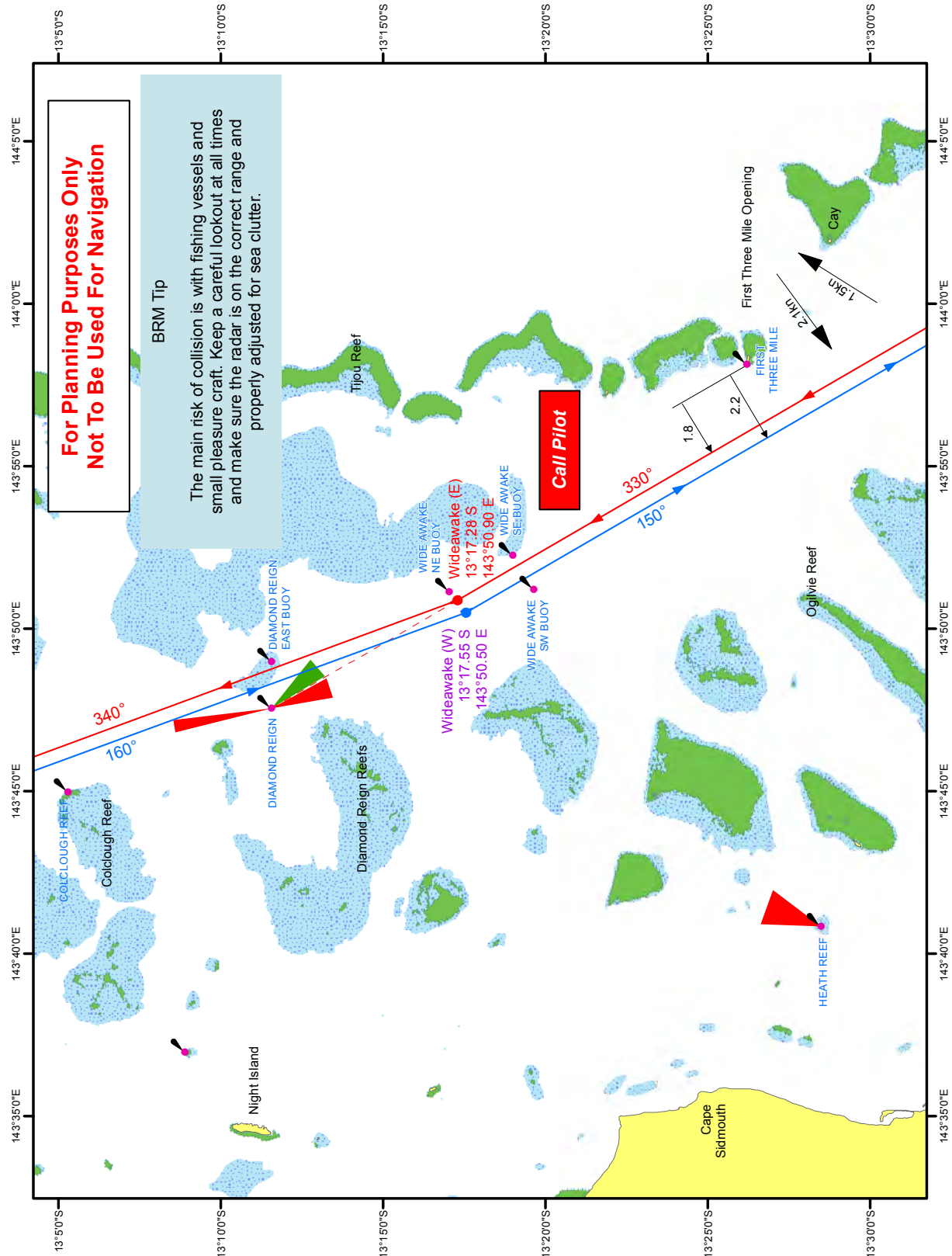
LADS Passage – Hudson Patches to Colclough Reef

IR-15



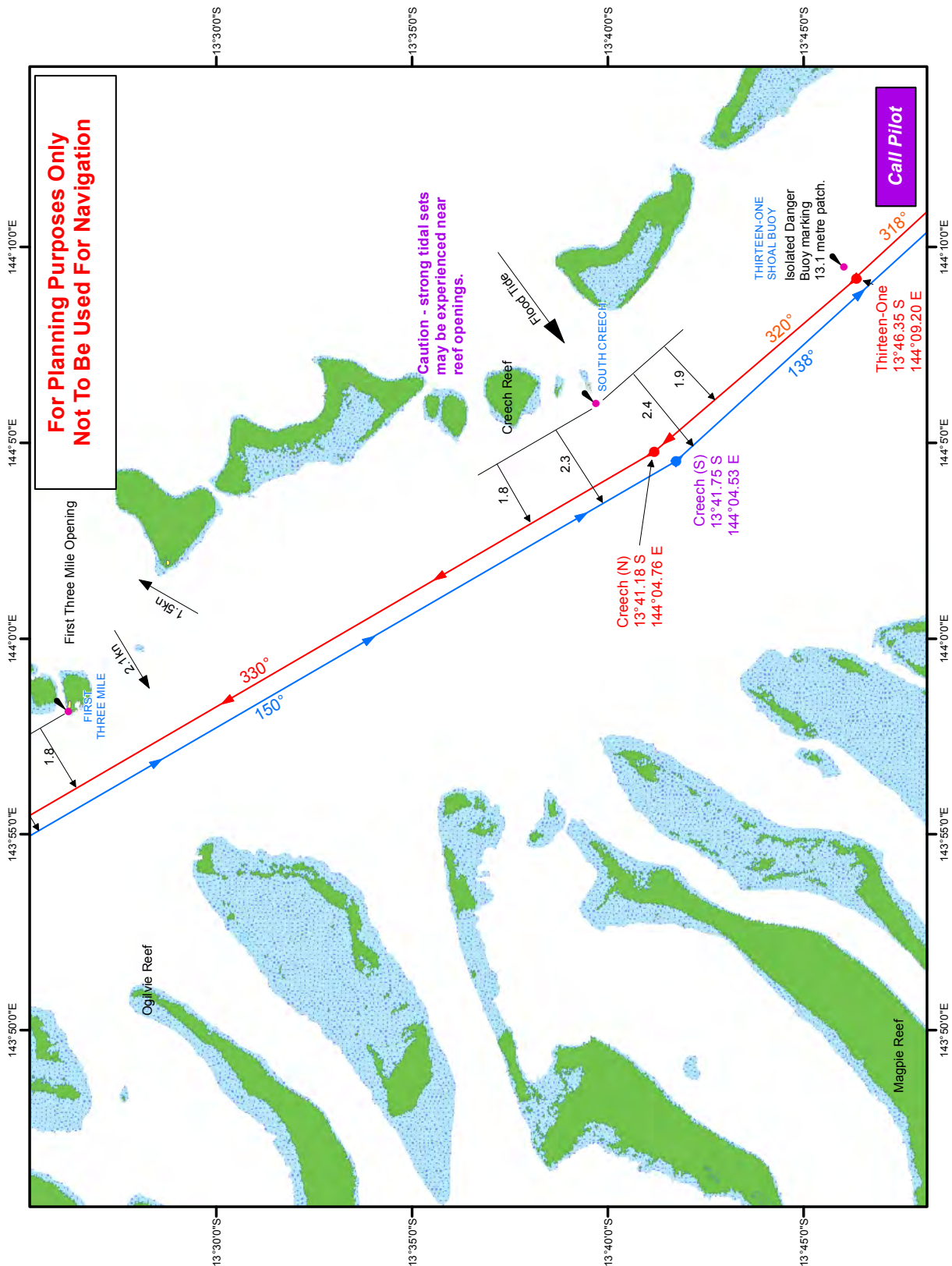
LADS Passage – Colclough Reef to First Three Mile Opening

IR-16



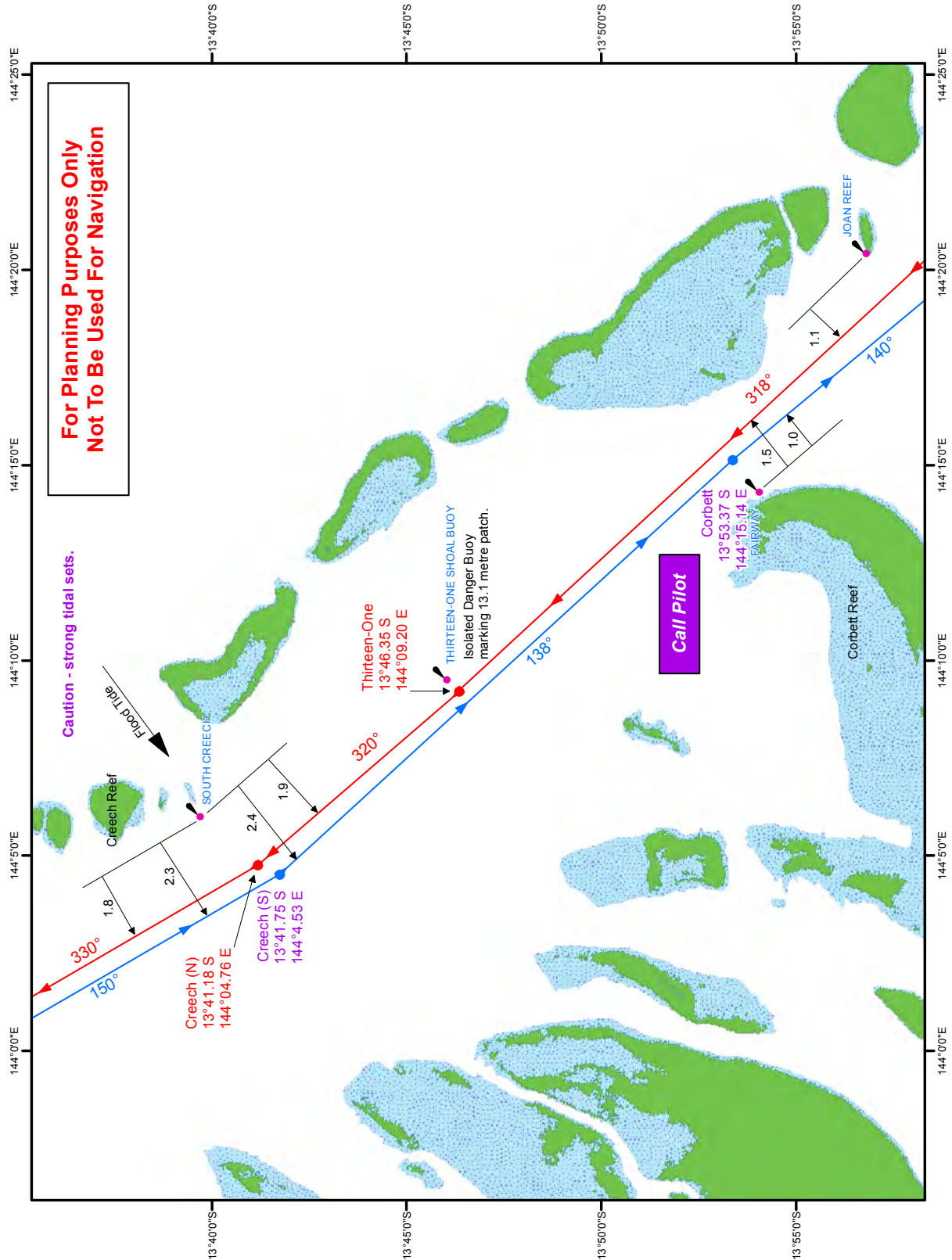
LADS Passage – First Three Mile Opening to Creech Reef

IR-17



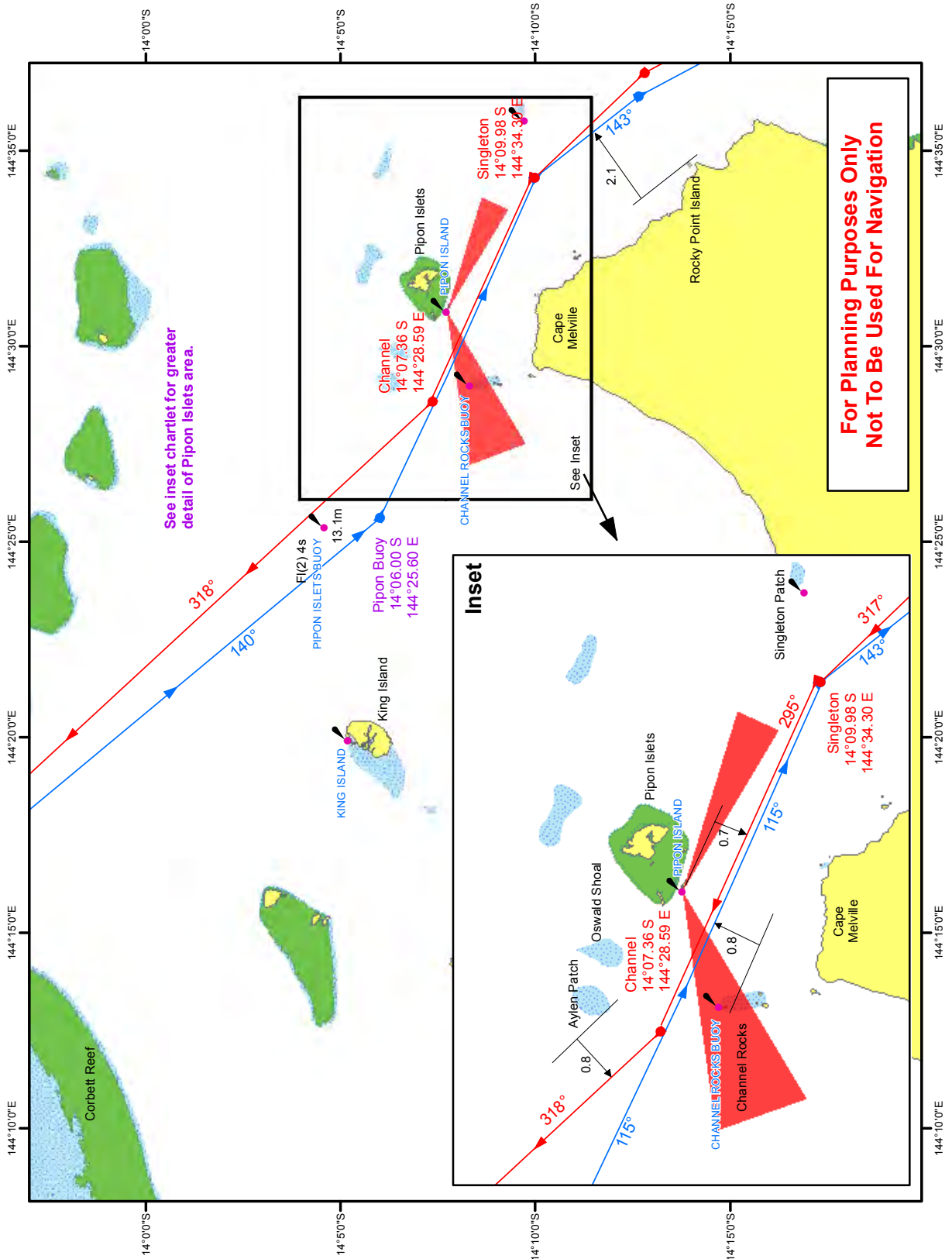
Fairway Channel – Creech Reef to Joan Reef

IR-18



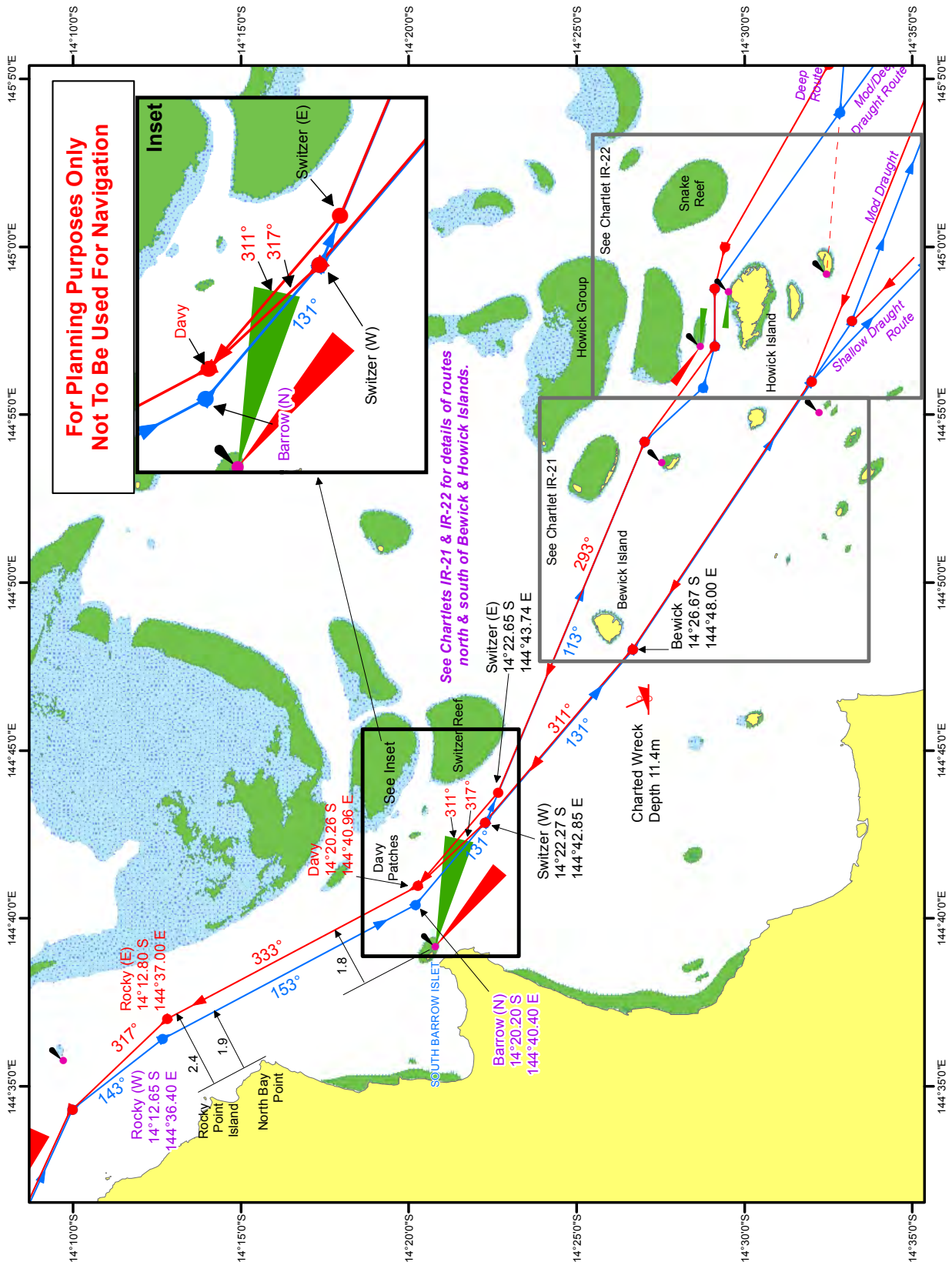
Fairway Channel to Pipon Islets

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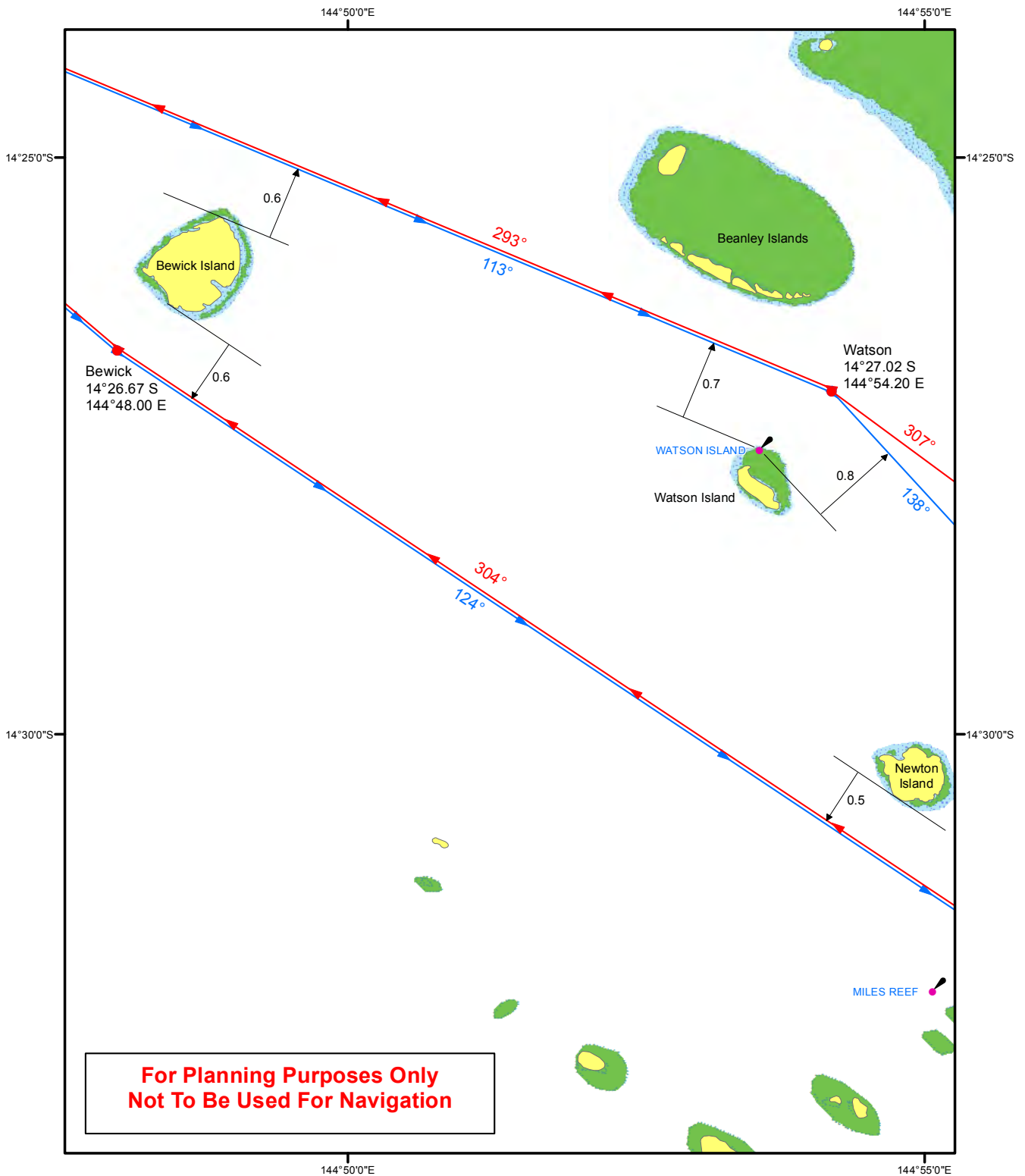
Cape Melville to Howick Island

IR-20



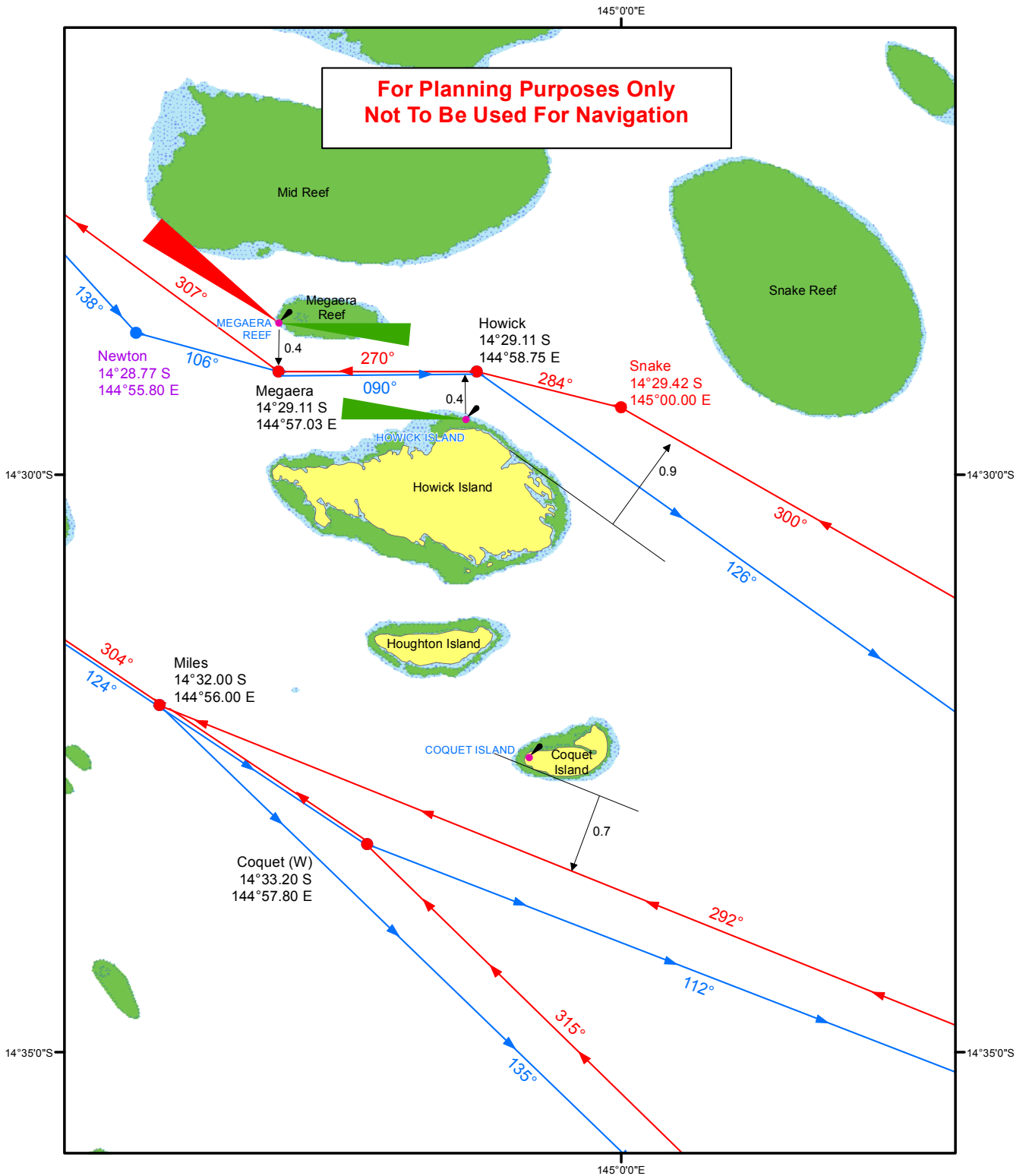
Bewick Island to Newton Island

IR-21



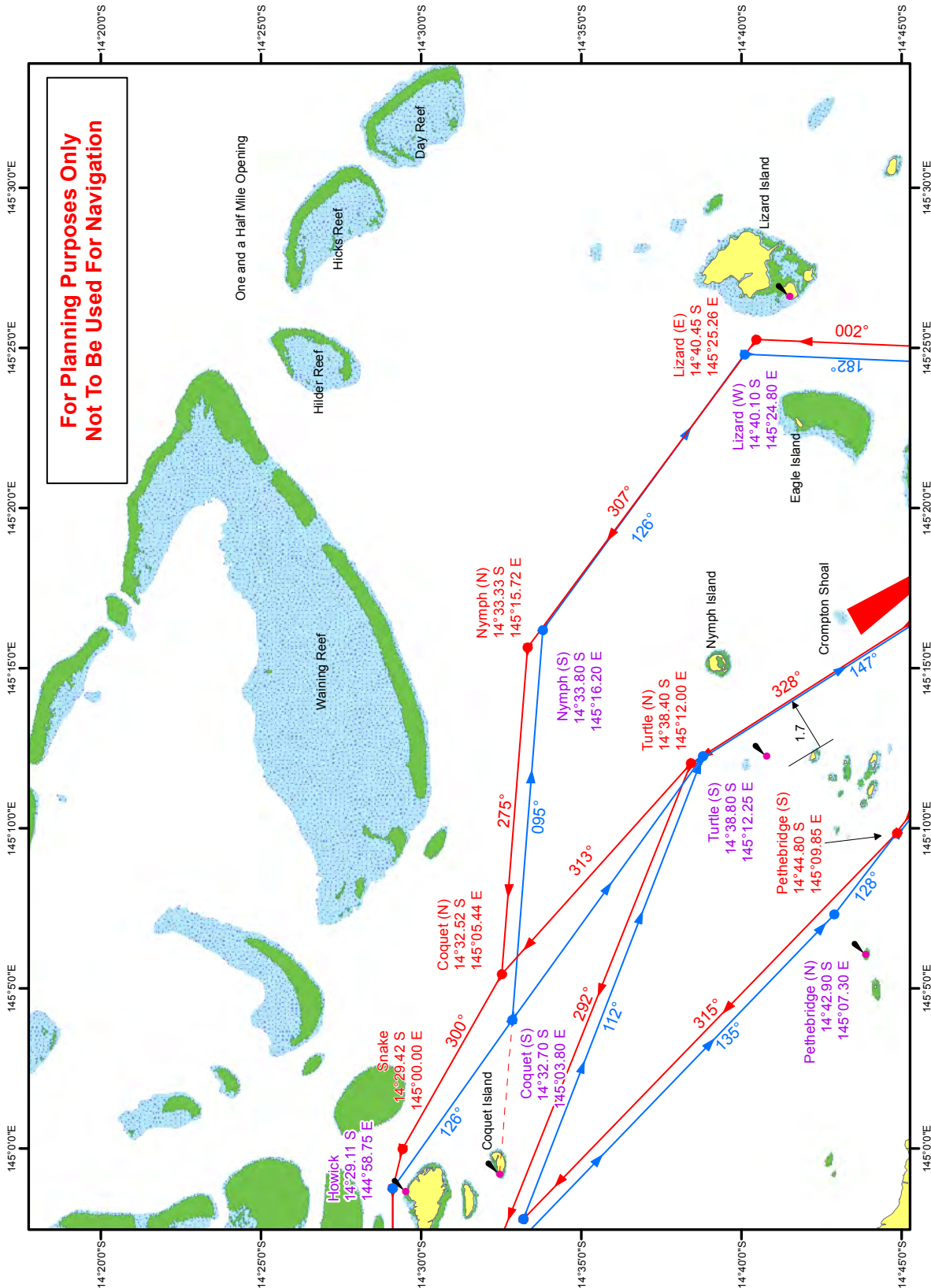
Mid Reef to Coquet Island

IR-22



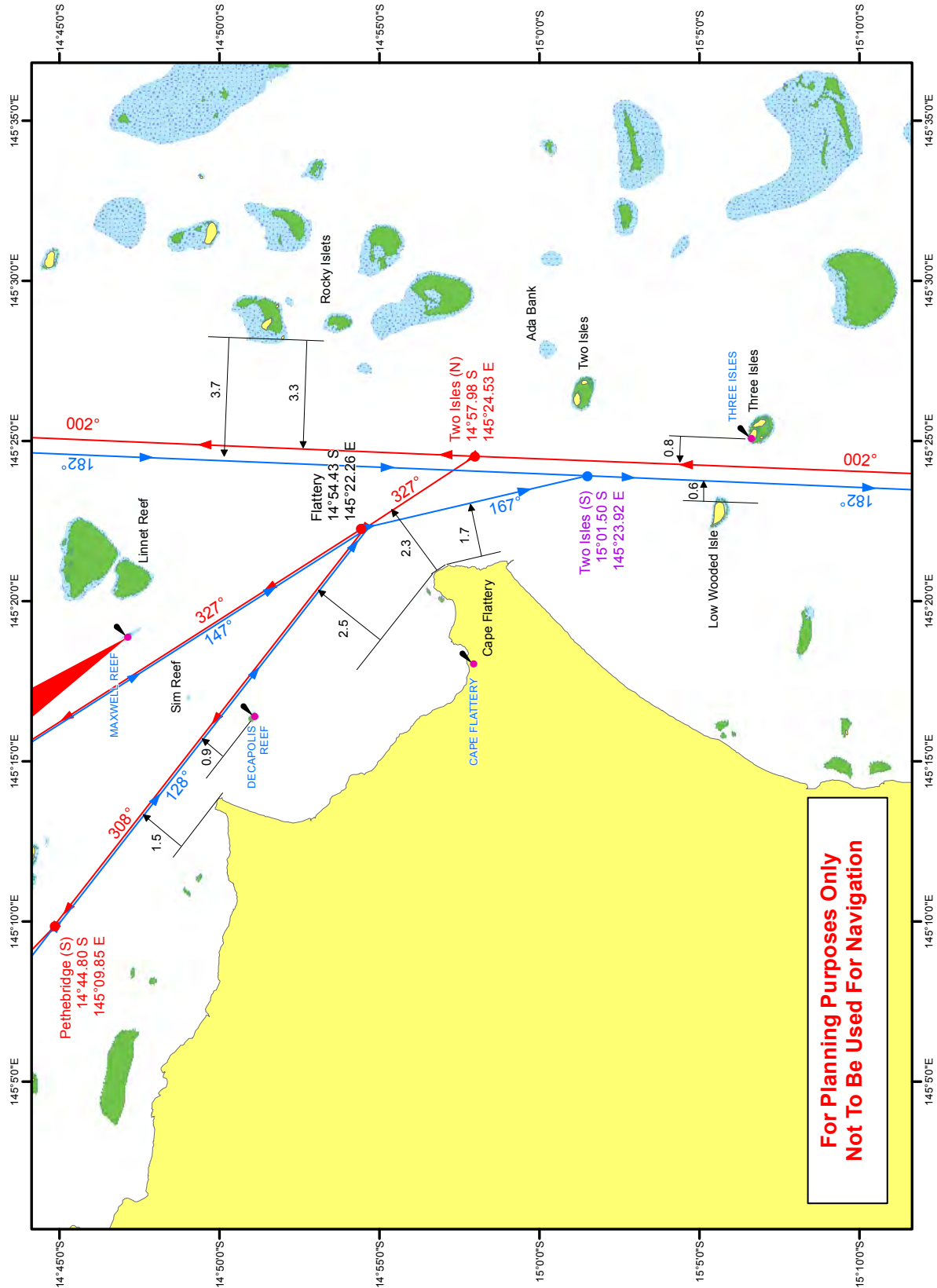
Coquet Island to Lizard Island

IR-23



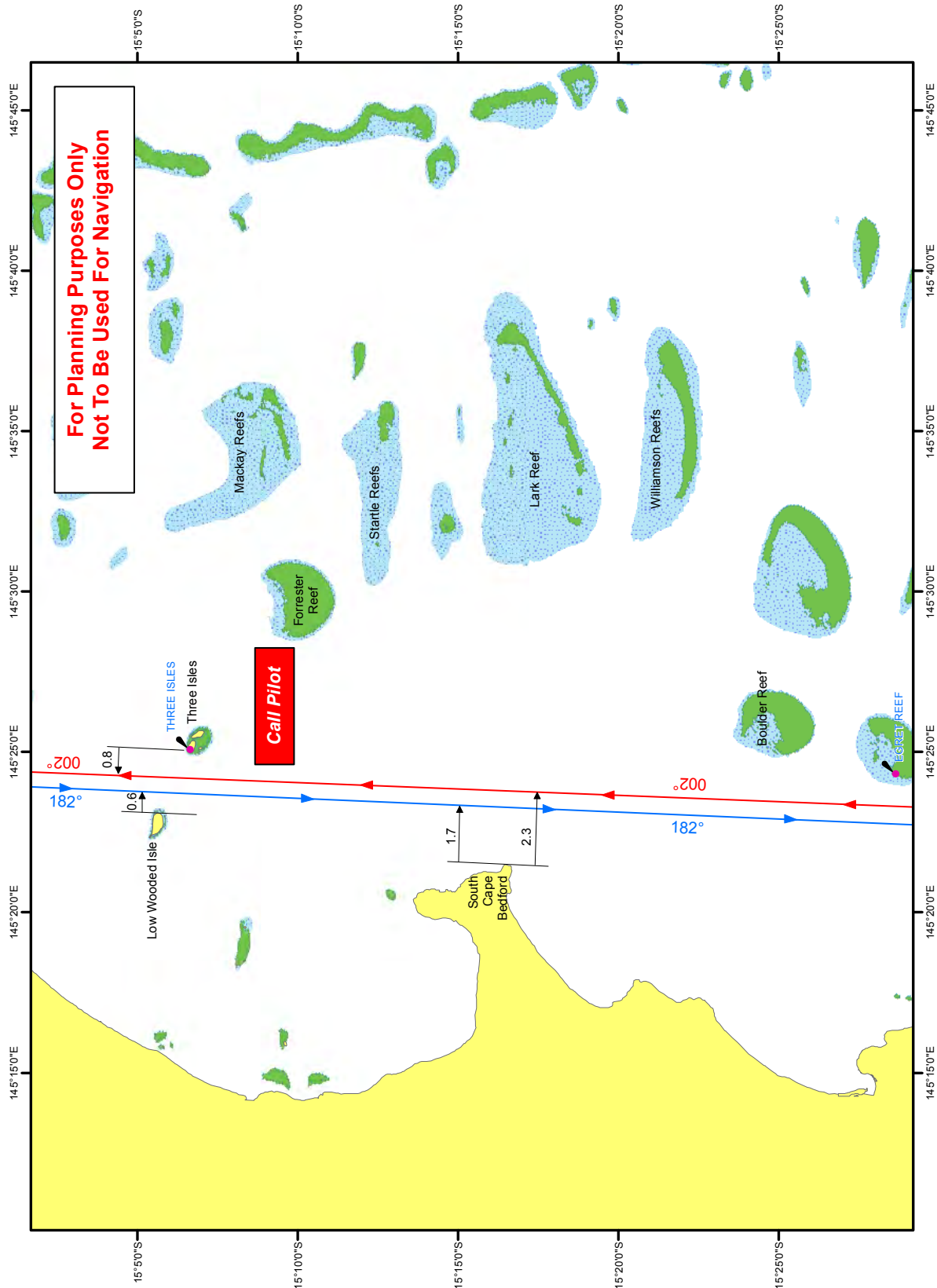
Linnet Reef to Three Isles

IR-24



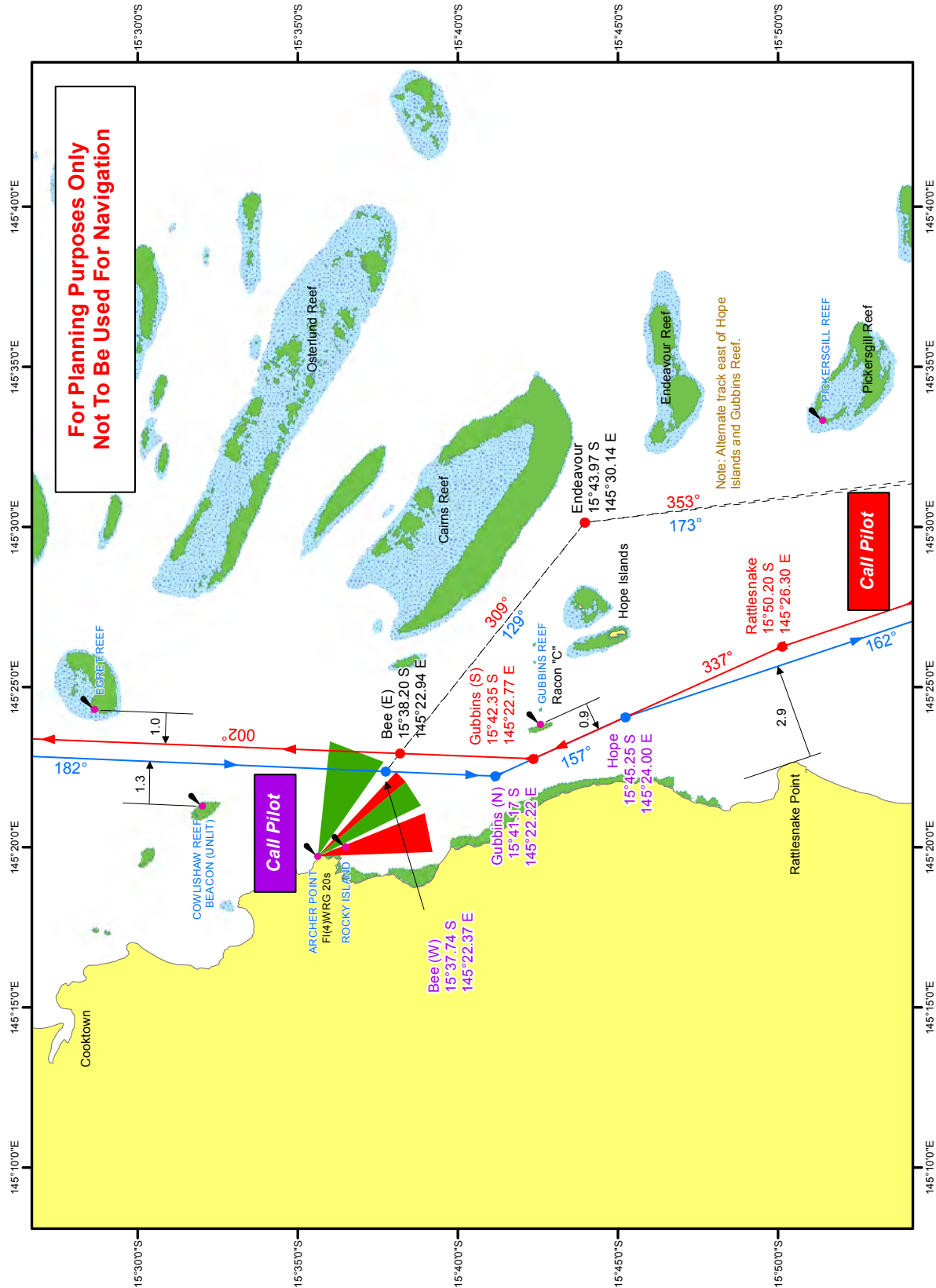
Three Isles to Egret Reef

IR-25



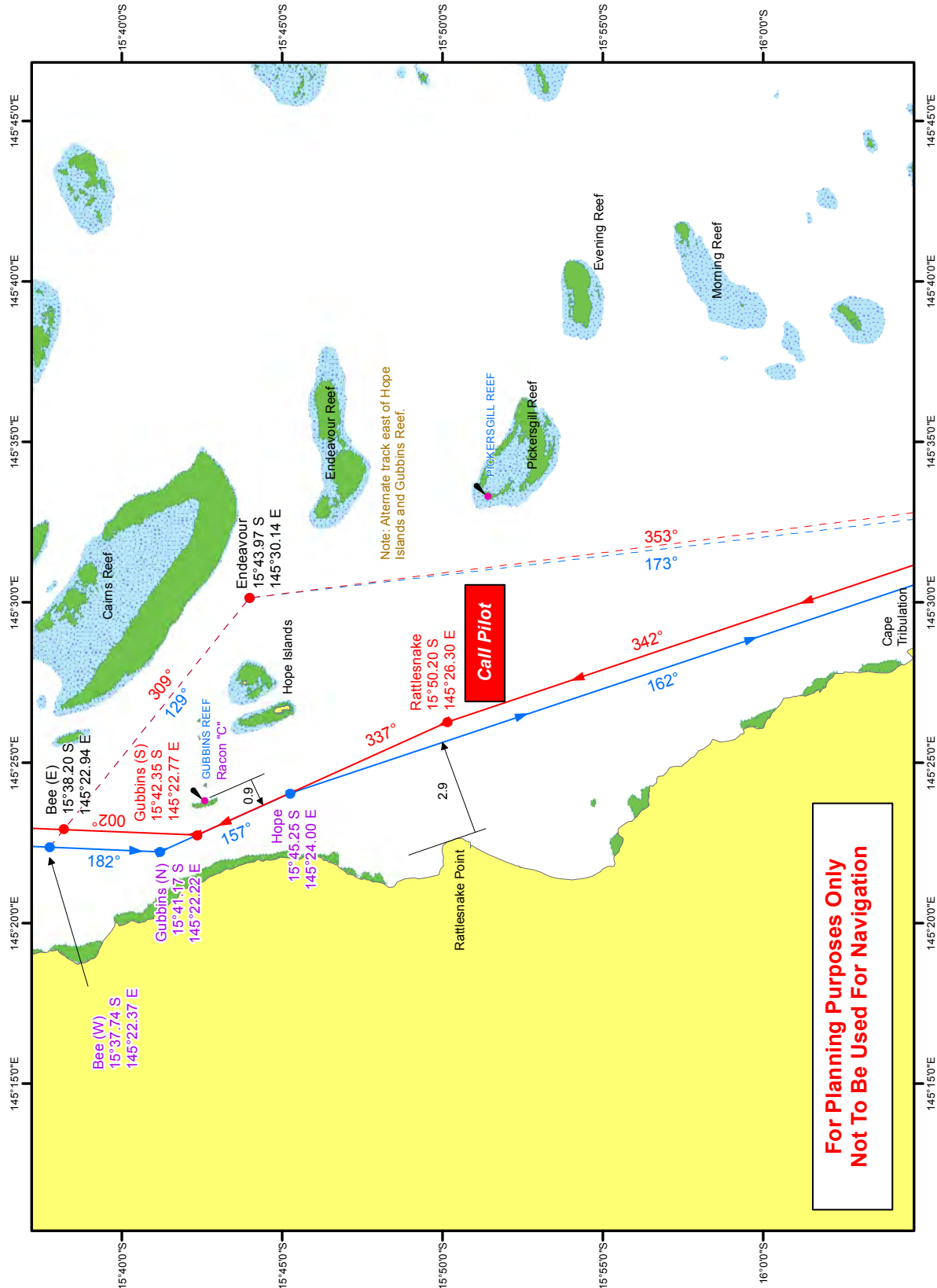
Egret Reef to Hope Islands

IR-26



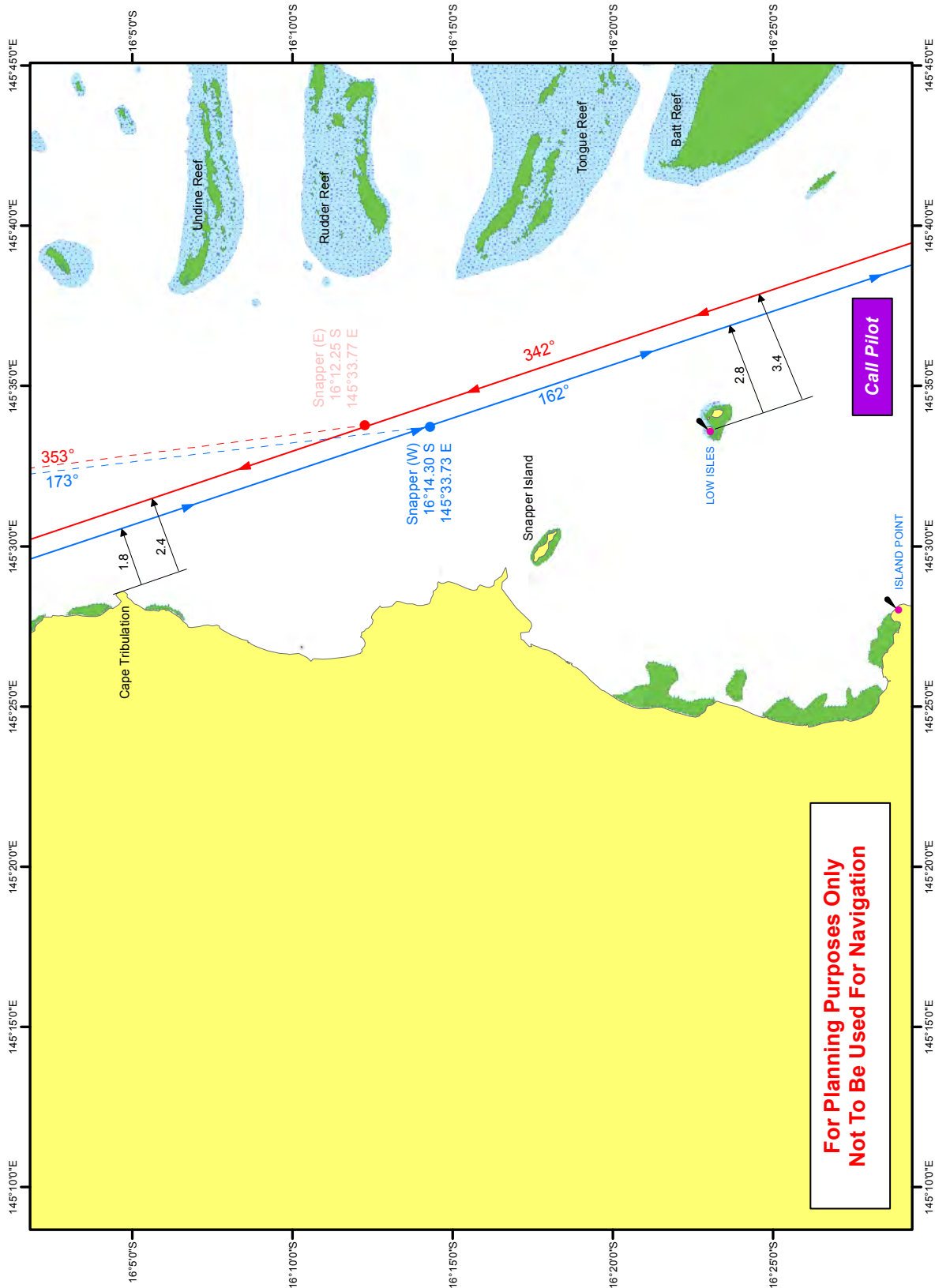
Gubbins Reef to Cape Tribulation

IR-27



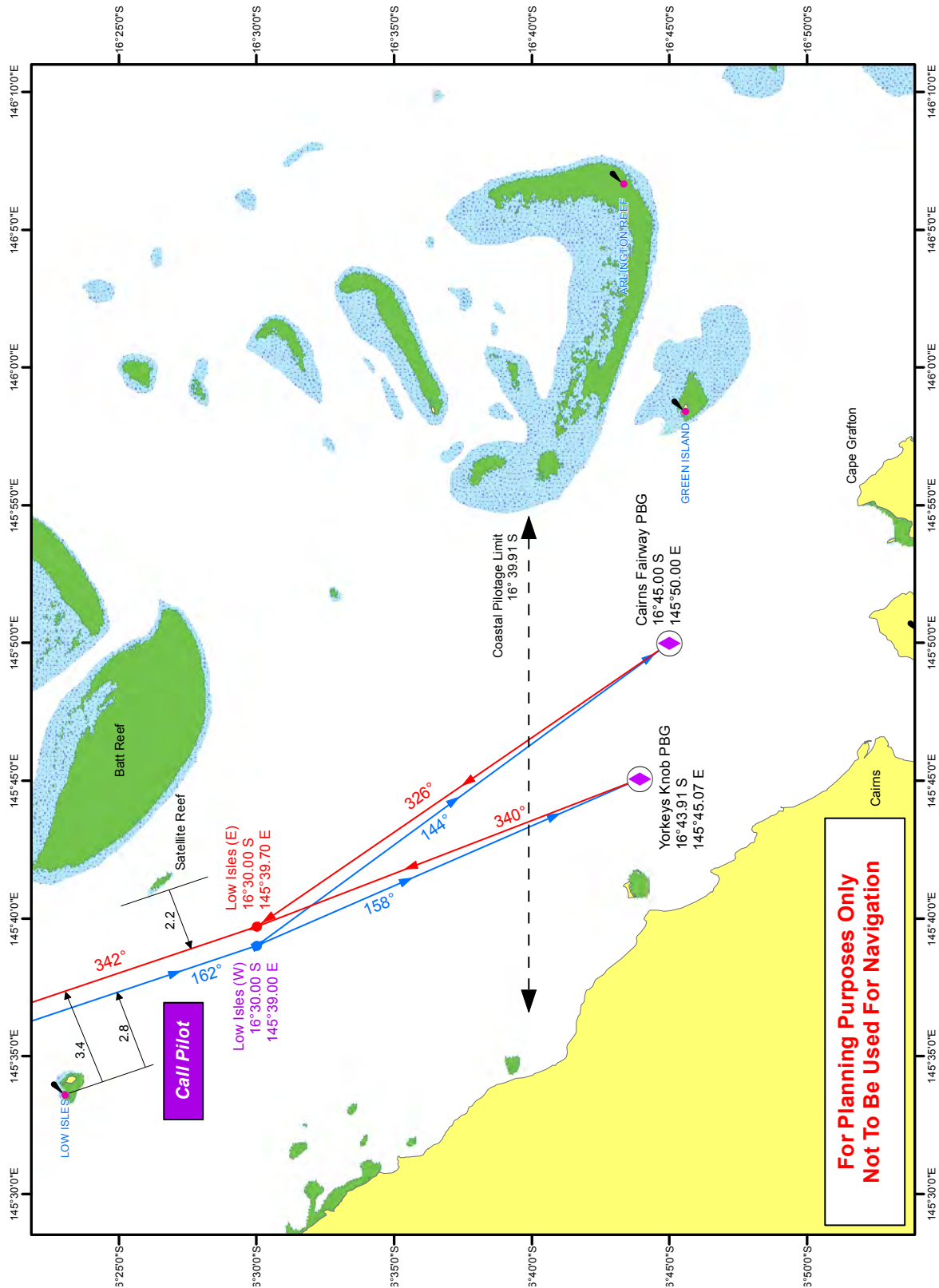
Cape Tribulation to Low Isles

IR-28



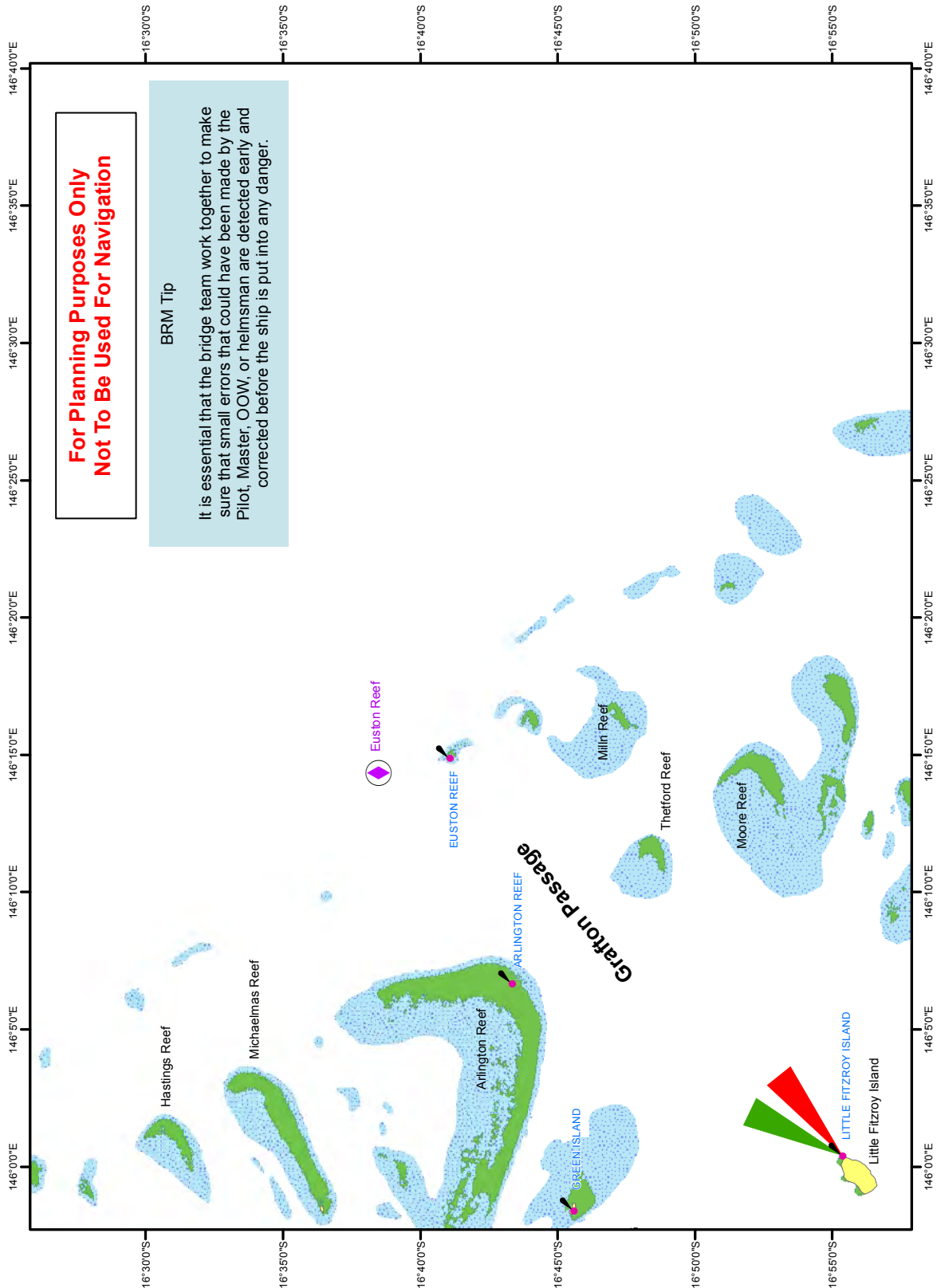
Low Isles to Cape Grafton

IR-29



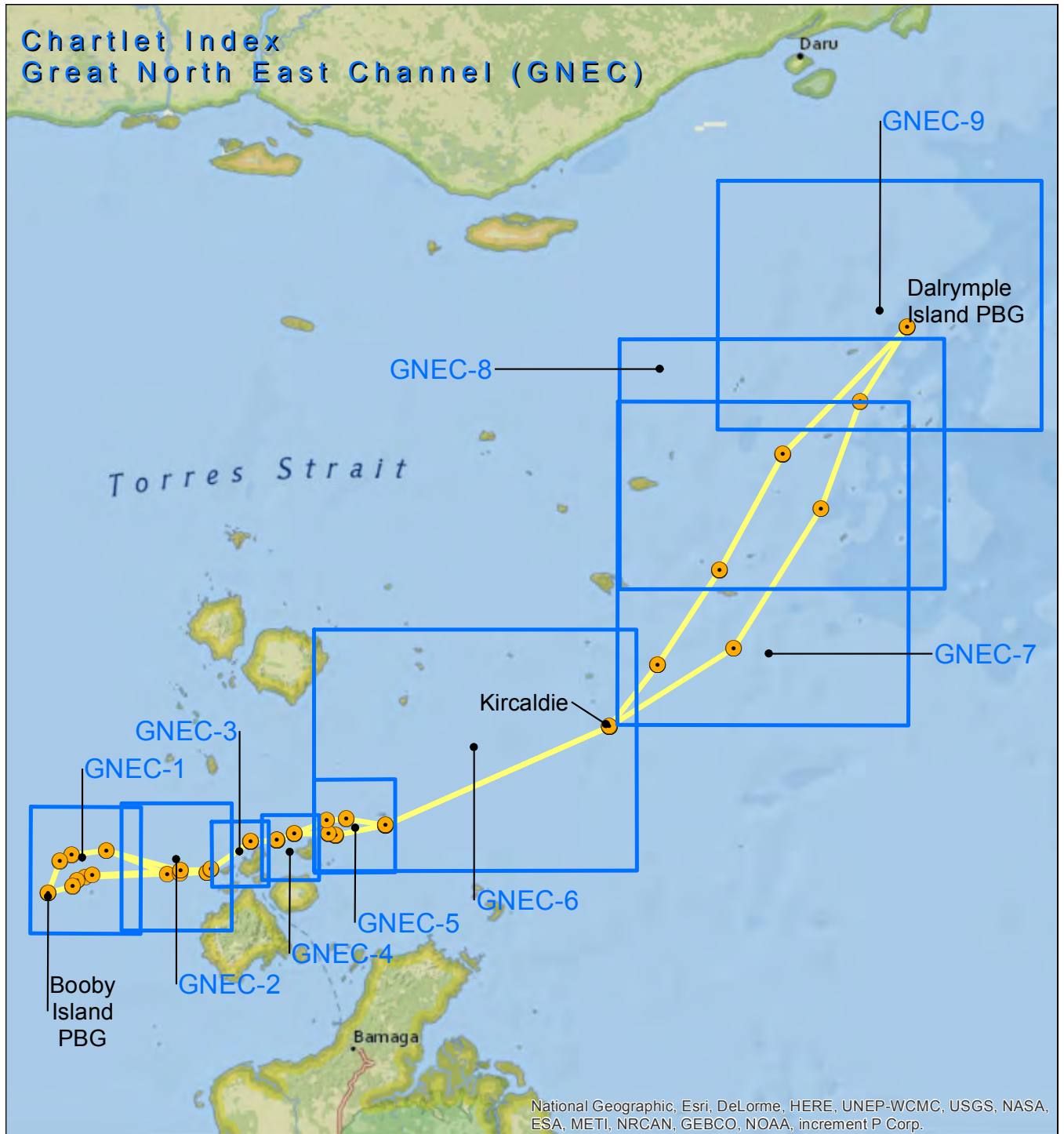
Grafton Passage

IR-30



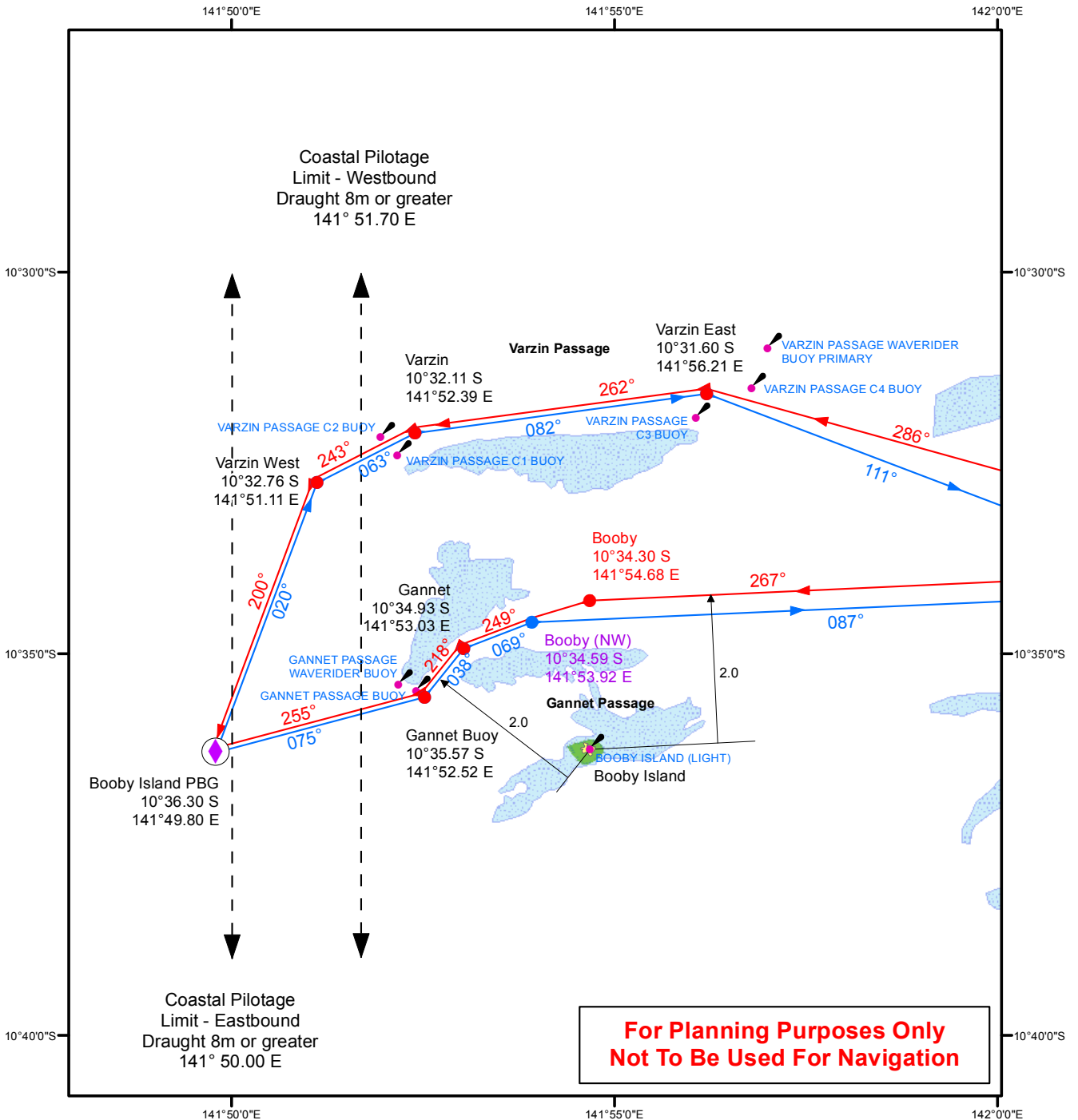
PLANNING CHARTLETS
GREAT NORTH EAST CHANNEL
BOOBY ISLAND TO DALRYMPLE ISLAND
VIA PRINCE OF WALES CHANNEL

Geographical overview of GNEC chartlets



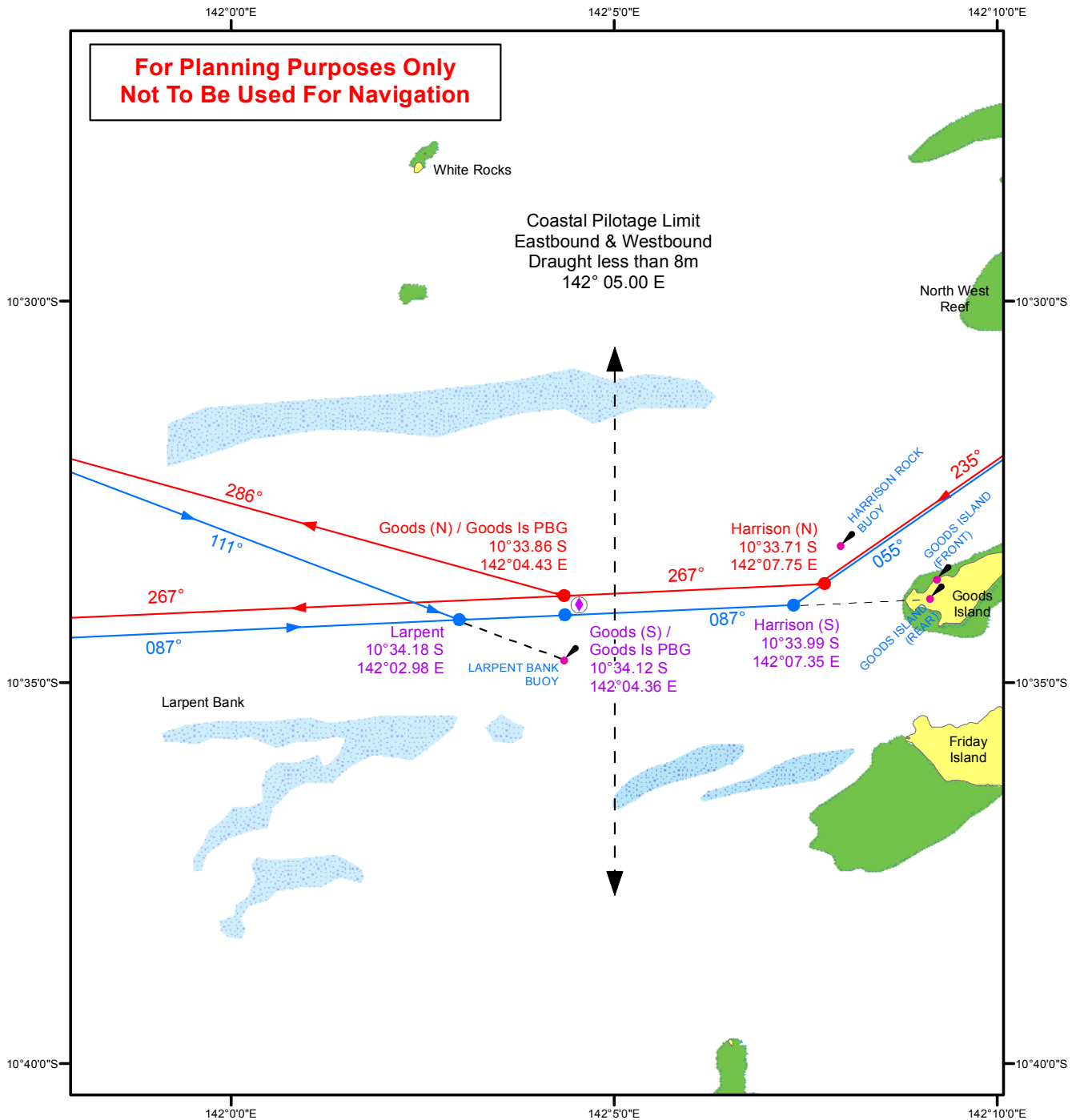
Booby Is PBG and Varzin and Gannet Passages

GNEC-1



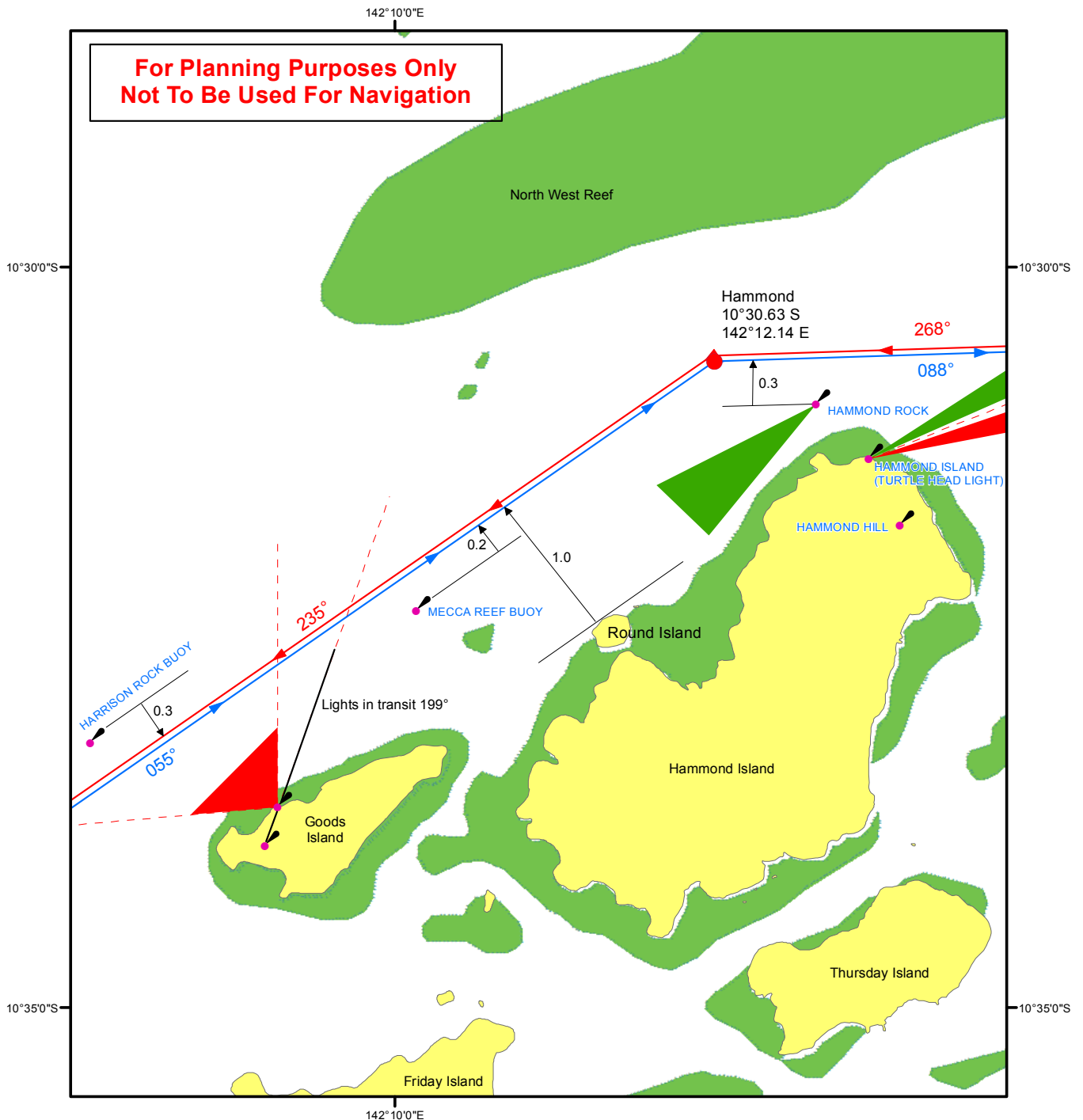
Larpent Bank to Goods Is and Goods Is PBG

GNEC-2



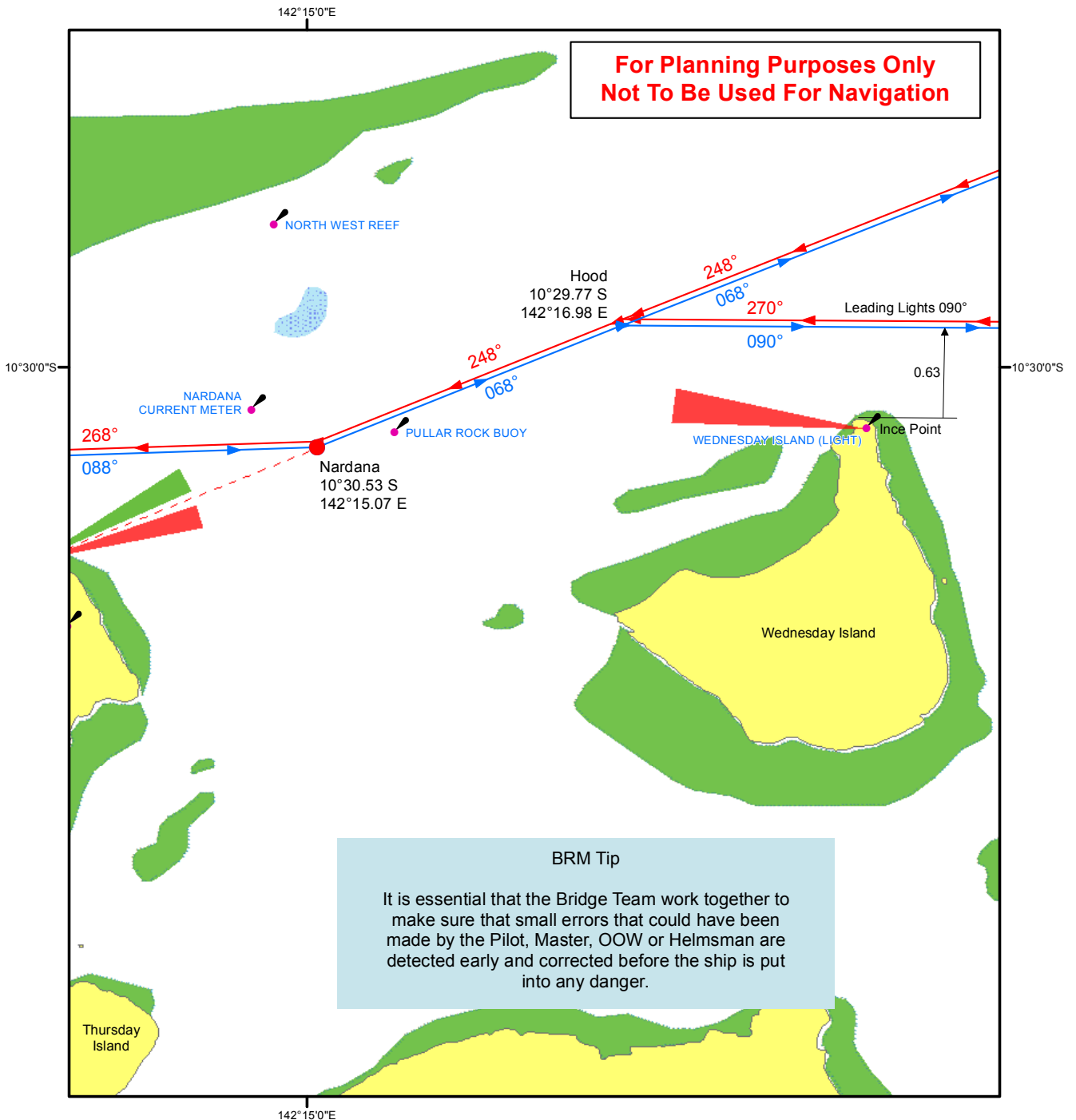
Prince of Wales Channel –
Harrison Rock to Hammond Rock

GNEC-3



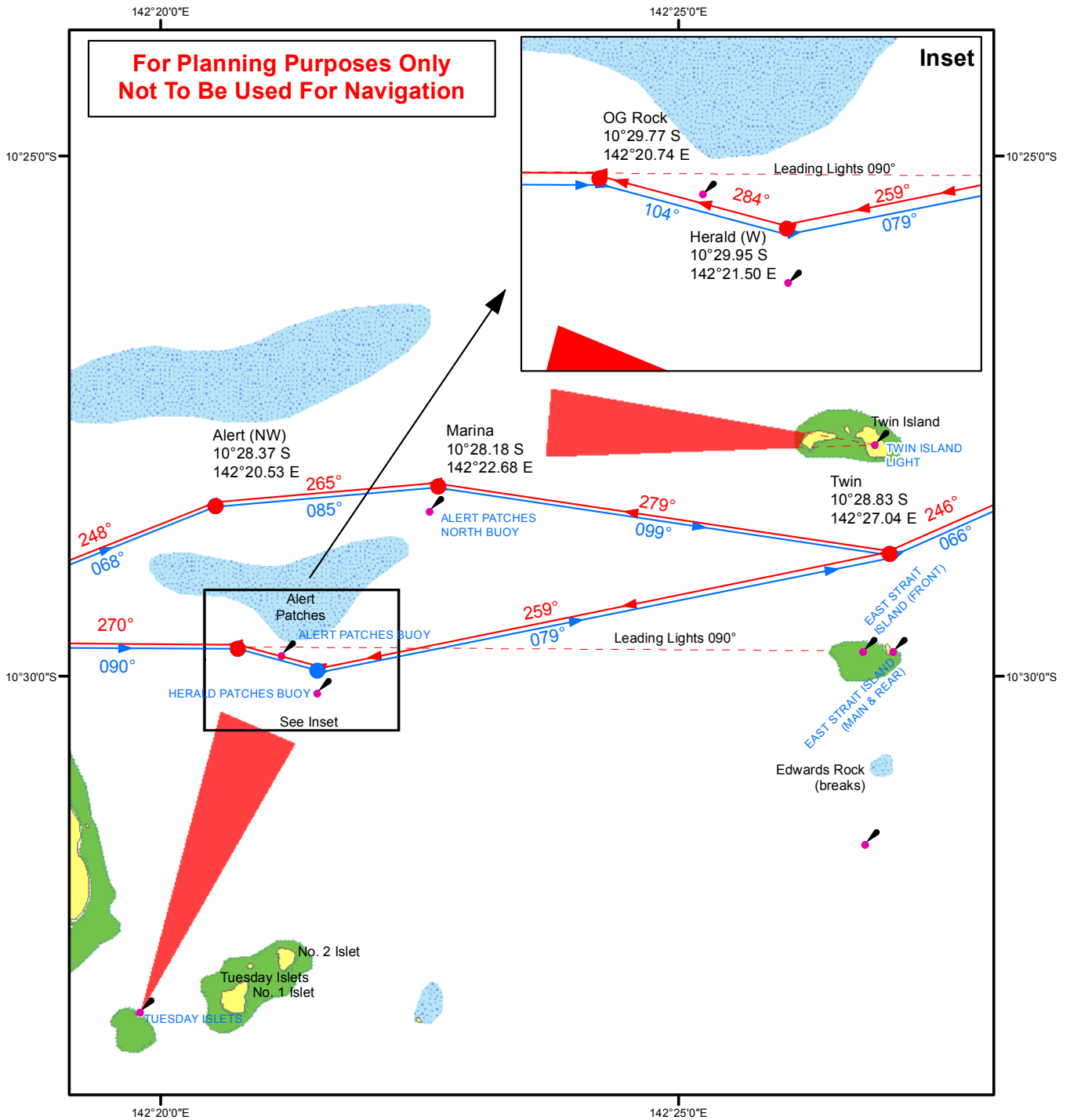
Prince of Wales Channel –
Nardana Patches to Ince Point

GNEC-4



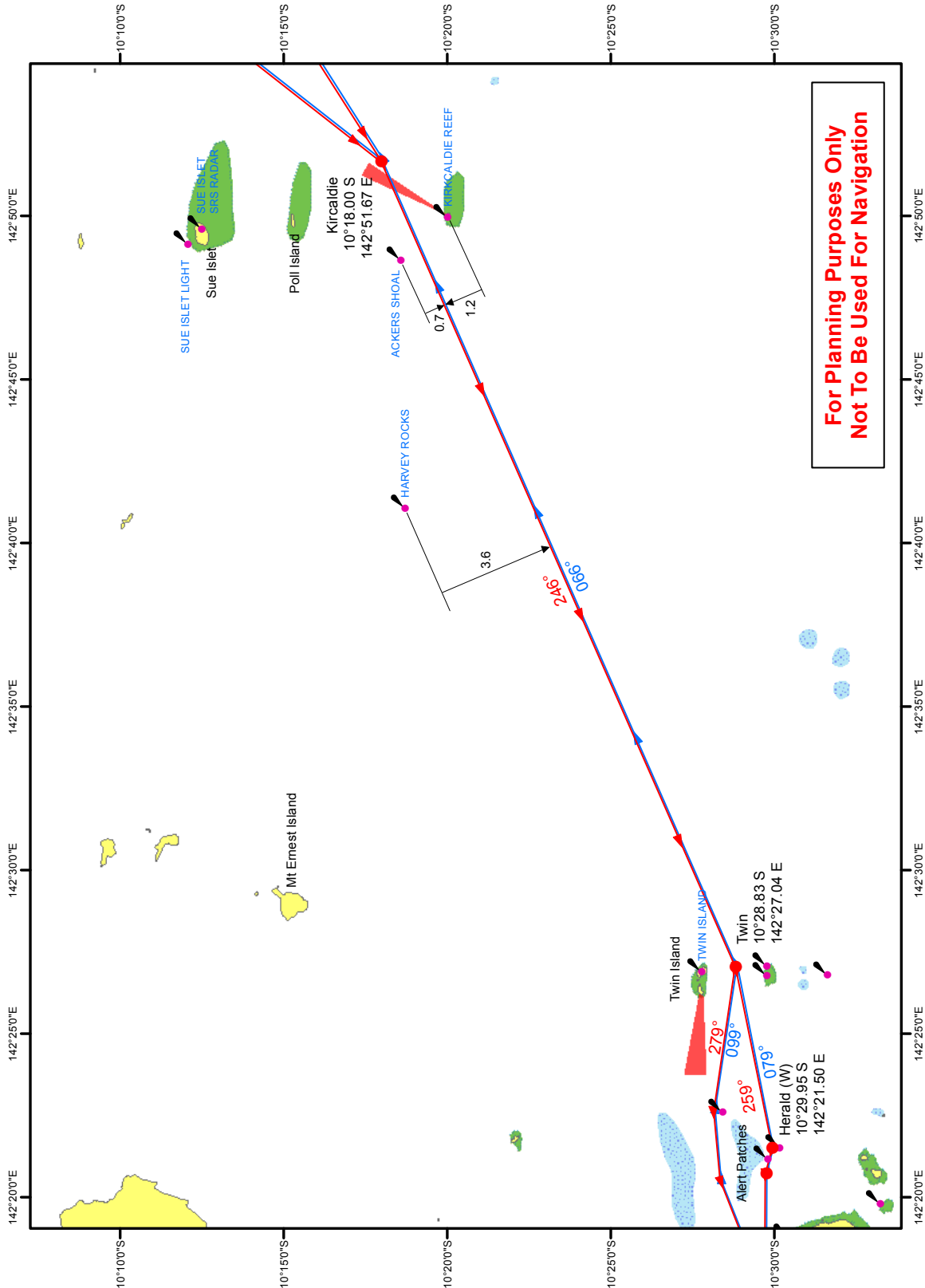
Herald and Alert Patches to Twin Island (inset)

GNEC-5



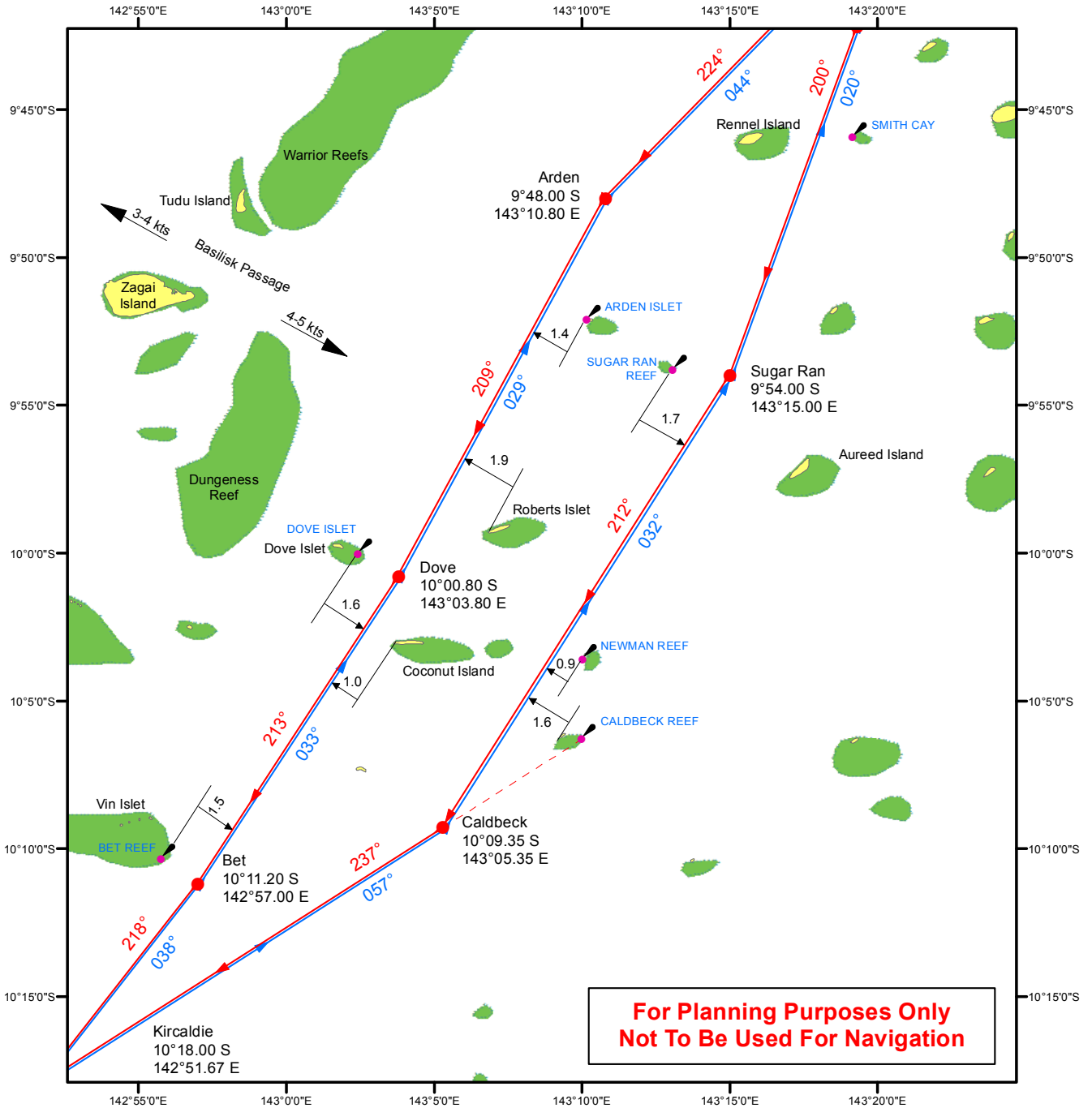
Twin Island to Kircaldie Reef

GNEC-6



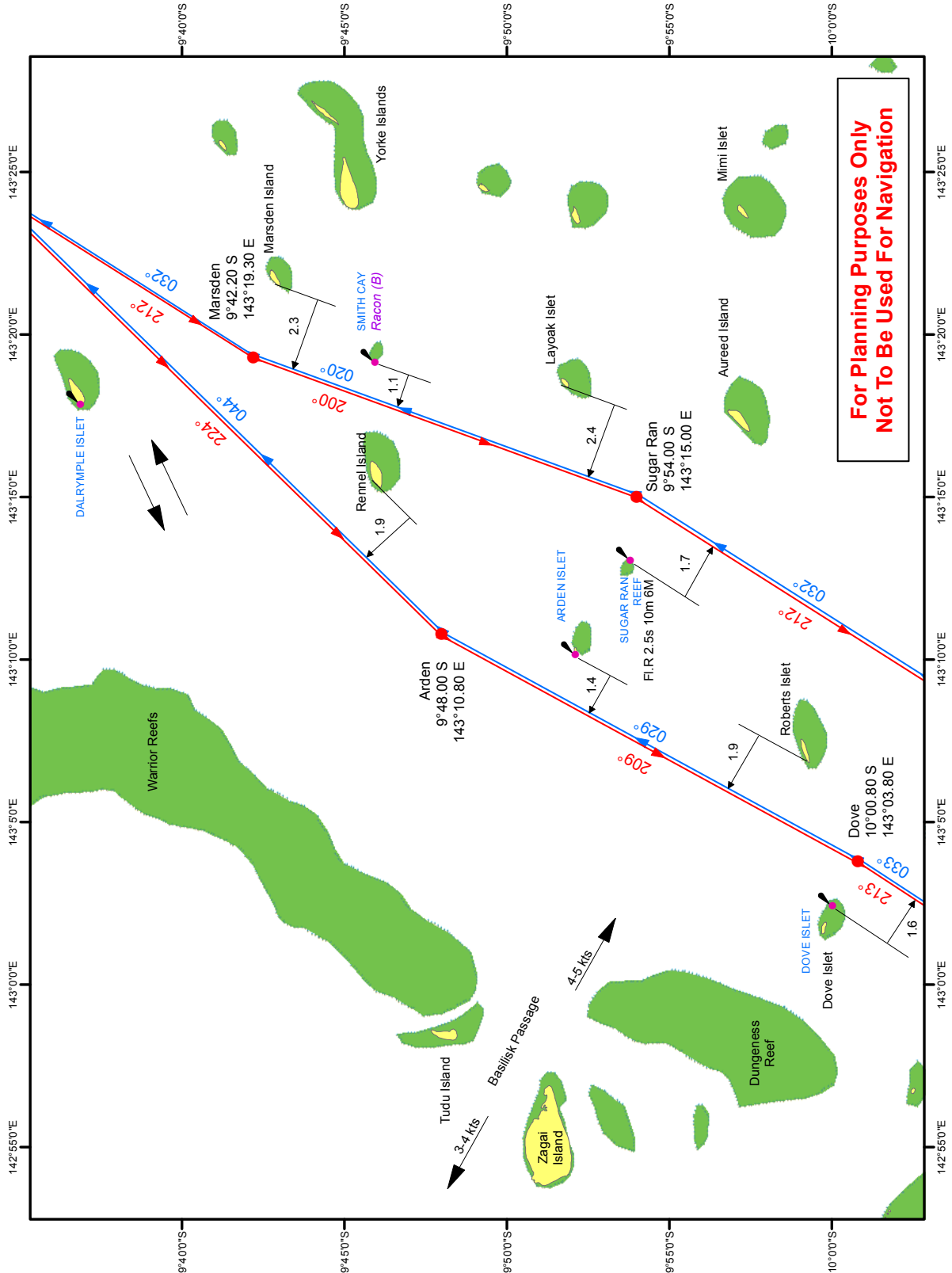
Kircaldie Reef to Arden Islet and Sugar Ran Reef

GNEC-7



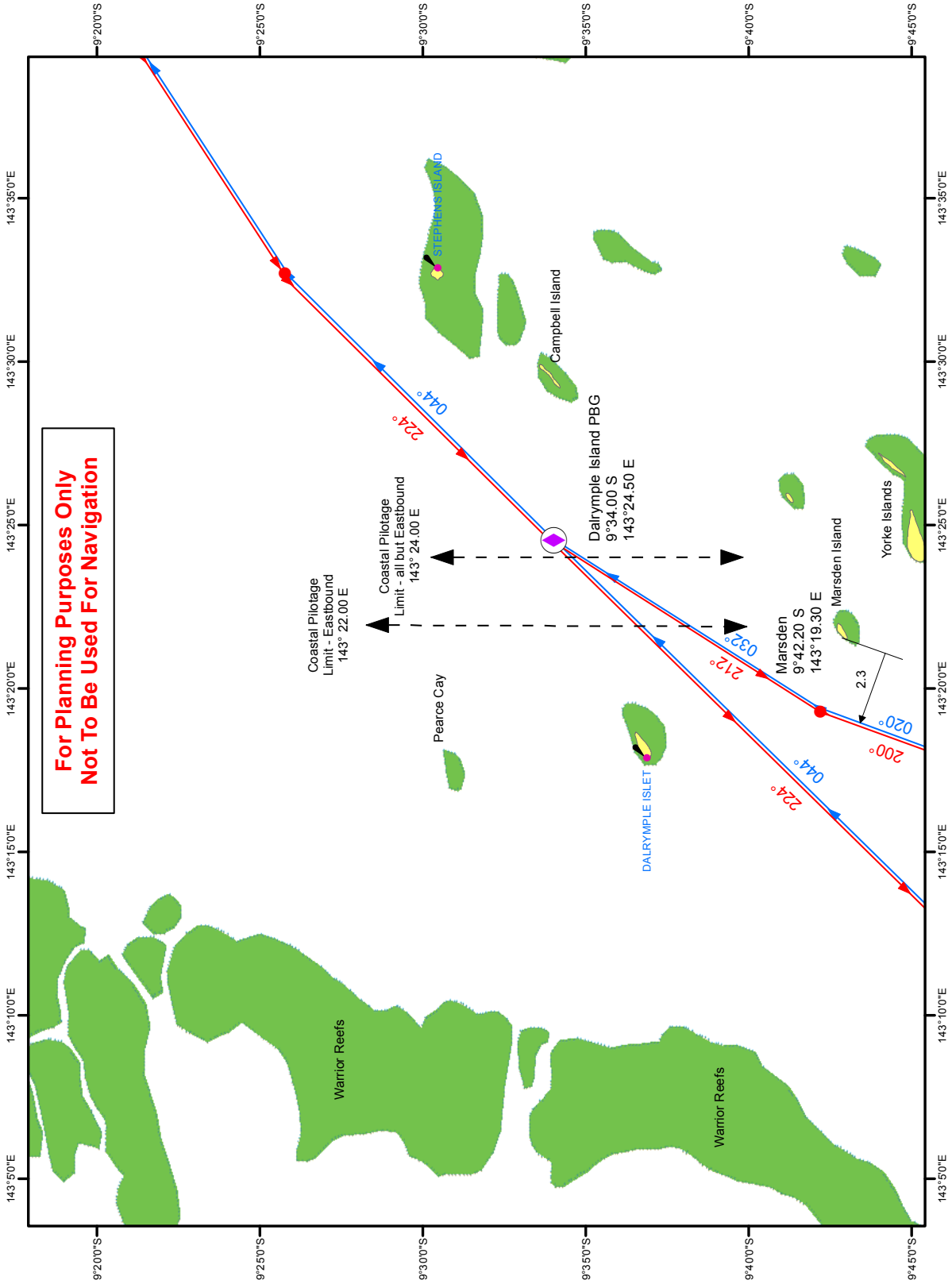
Arden Islet to Dalrymple Island

GNEC-8



Dalrymple Island PBG to Stephens Island

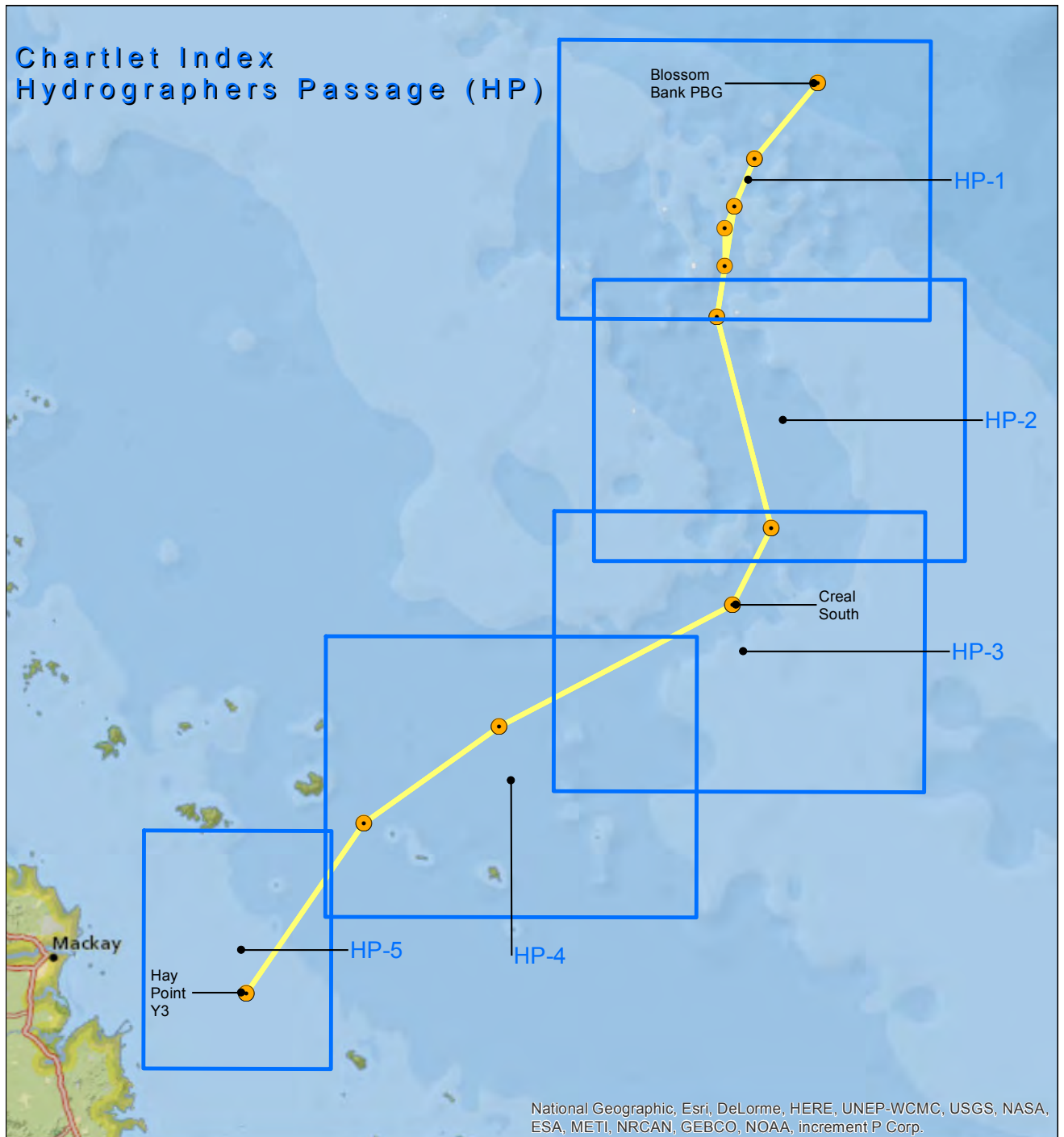
GNEC-9





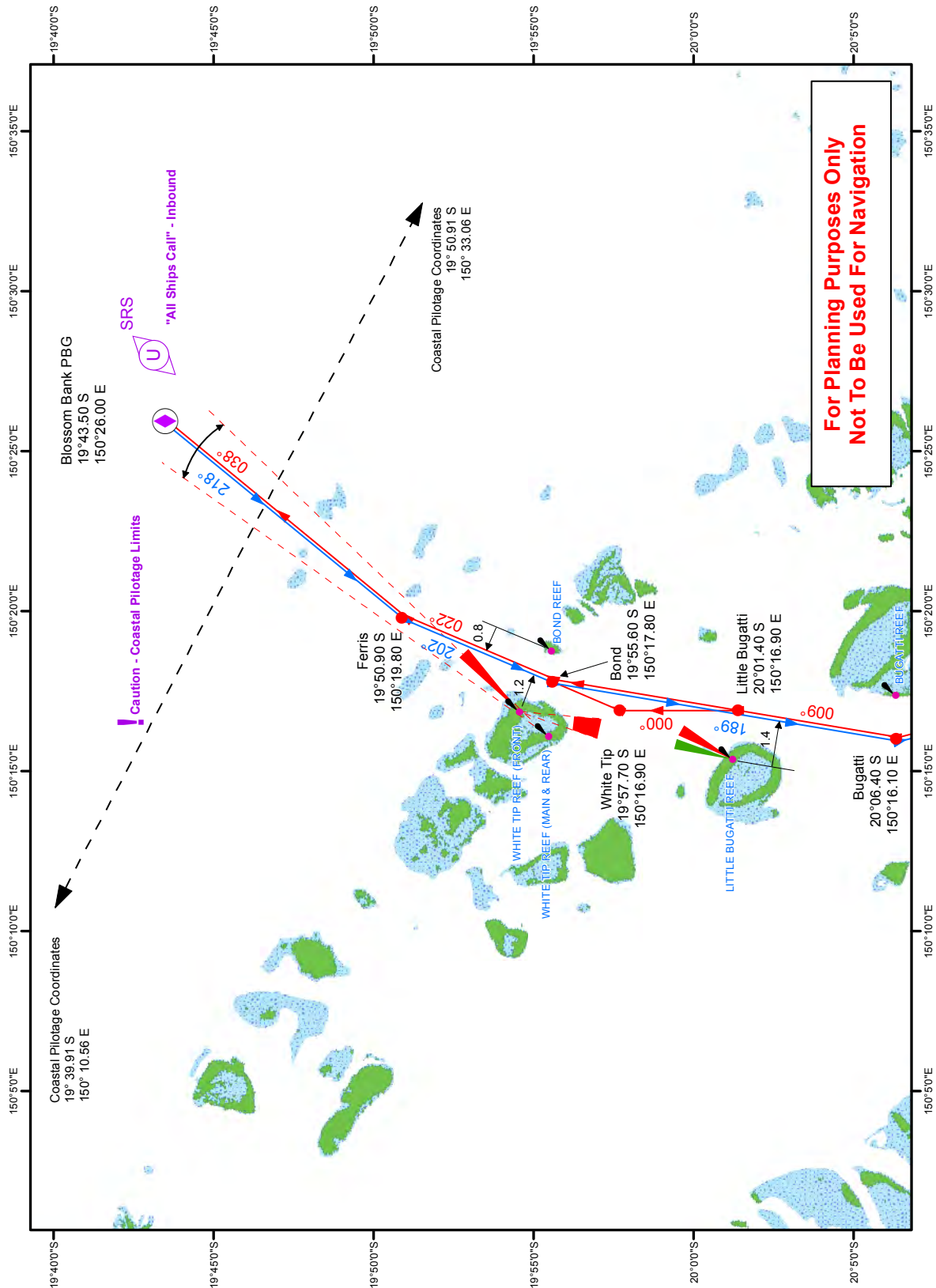
PLANNING CHARTLETS
**GREAT BARRIER REEF
HYDROGRAPHERS PASSAGE
BLOSSOM BANK TO HAY POINT
VIA HYDROGRAPHERS PASSAGE**

Geographical overview of HP chartlets



Blossom Bank to Bugatti Reef via Bond Entrance

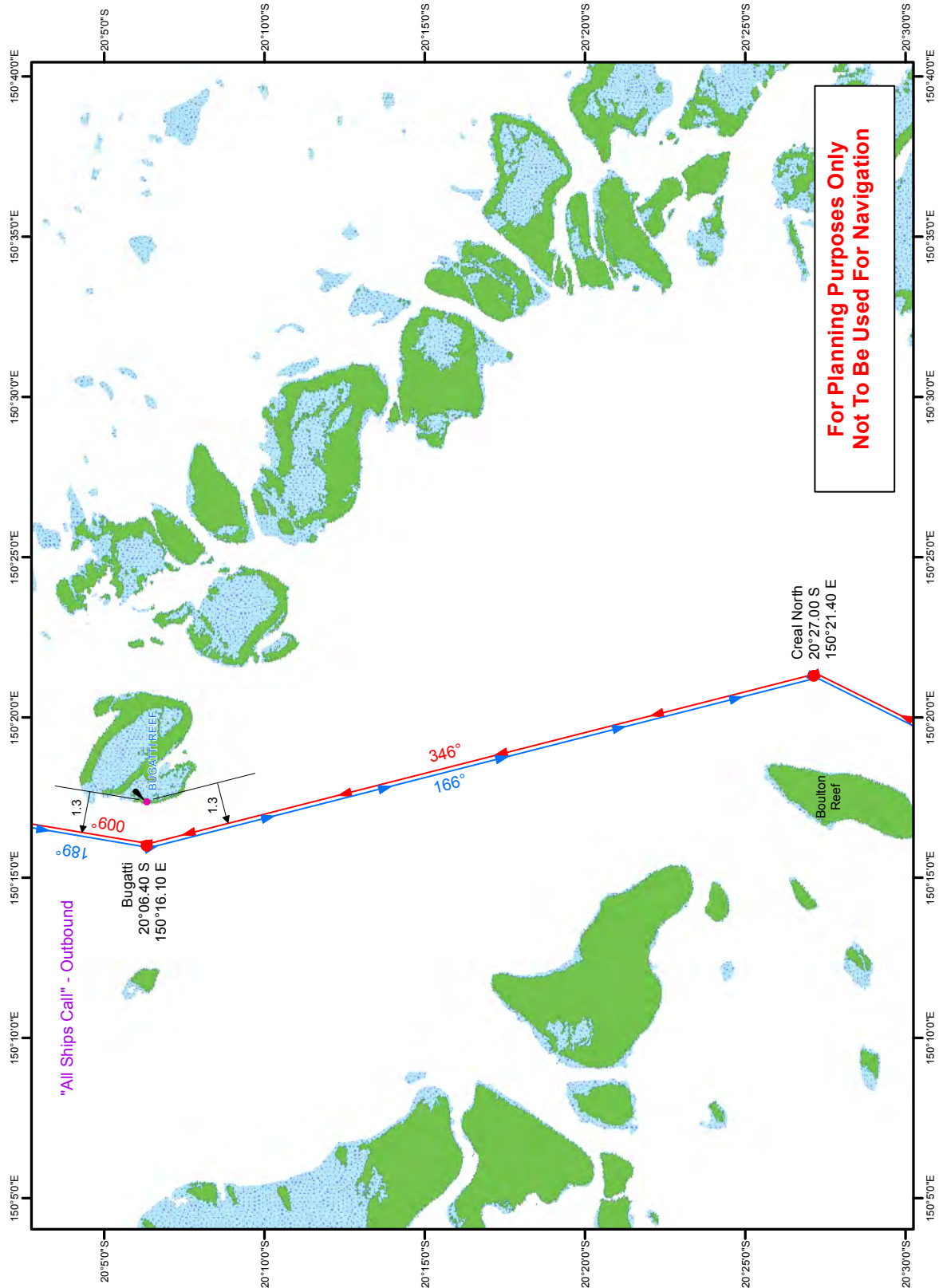
HP-1



**For Planning Purposes Only
Not To Be Used For Navigation**

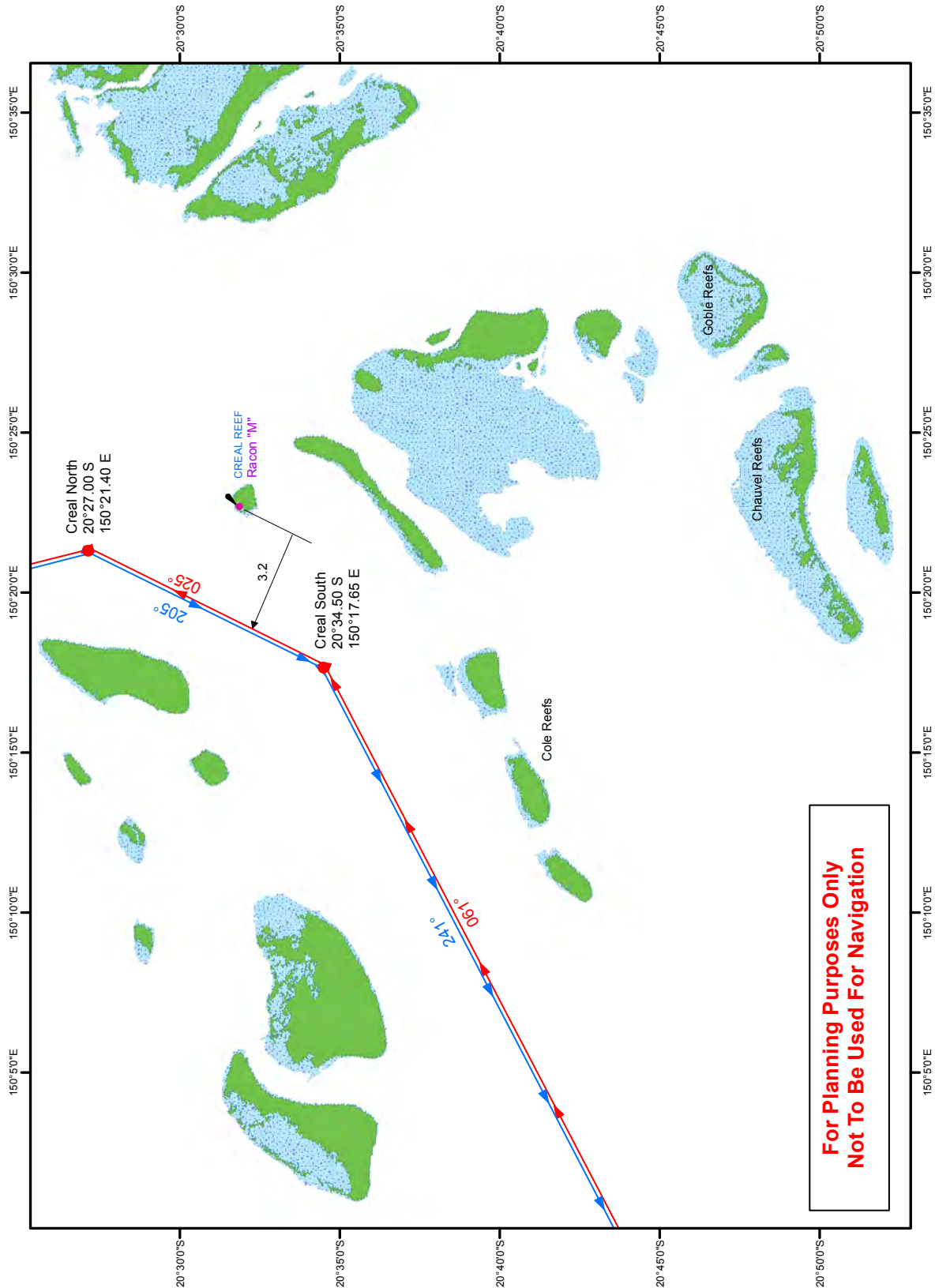
Bugatti Reef to Boulton Reef

HP-2



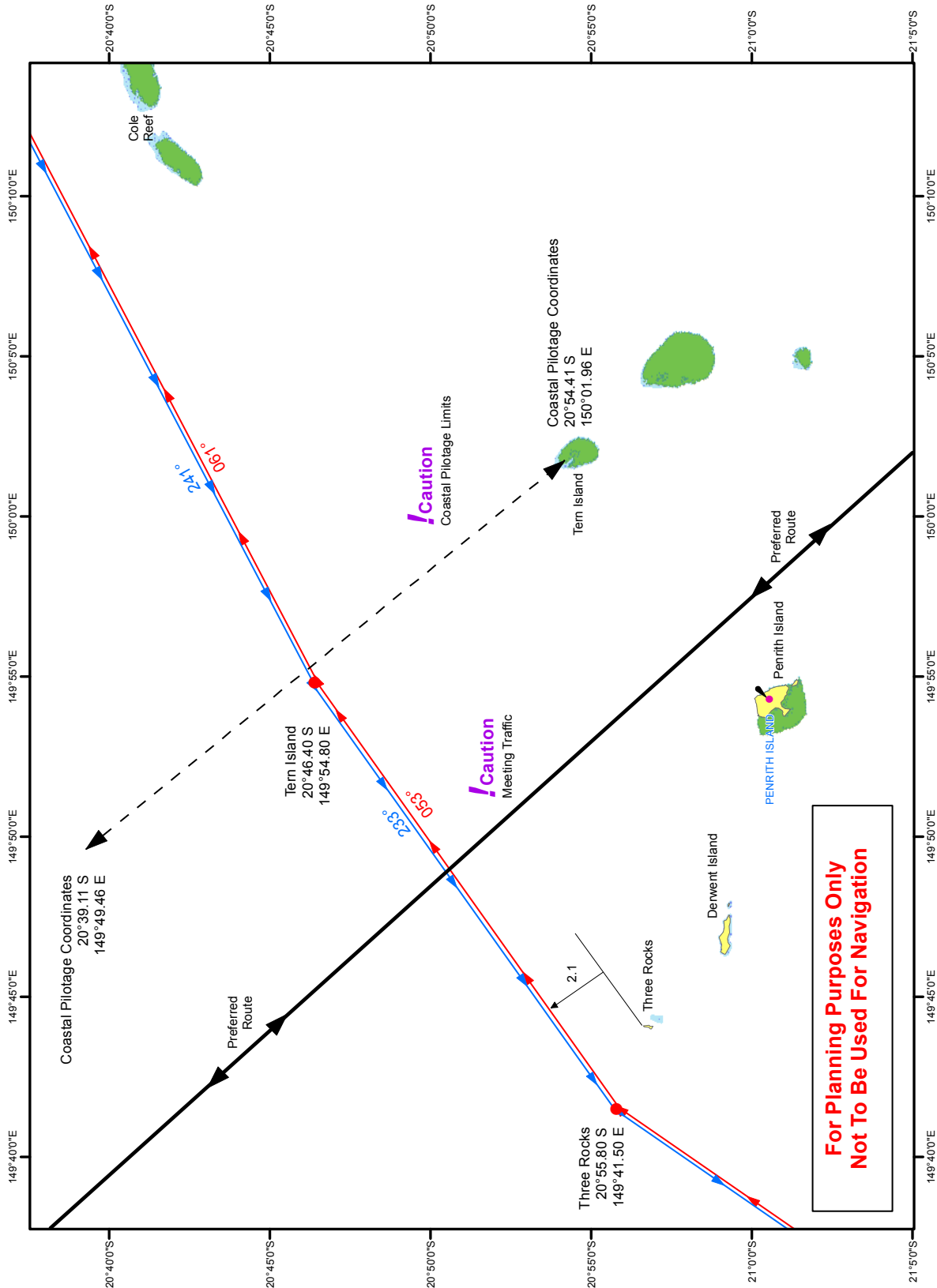
Creal Reef to Cole Reefs

HP-3



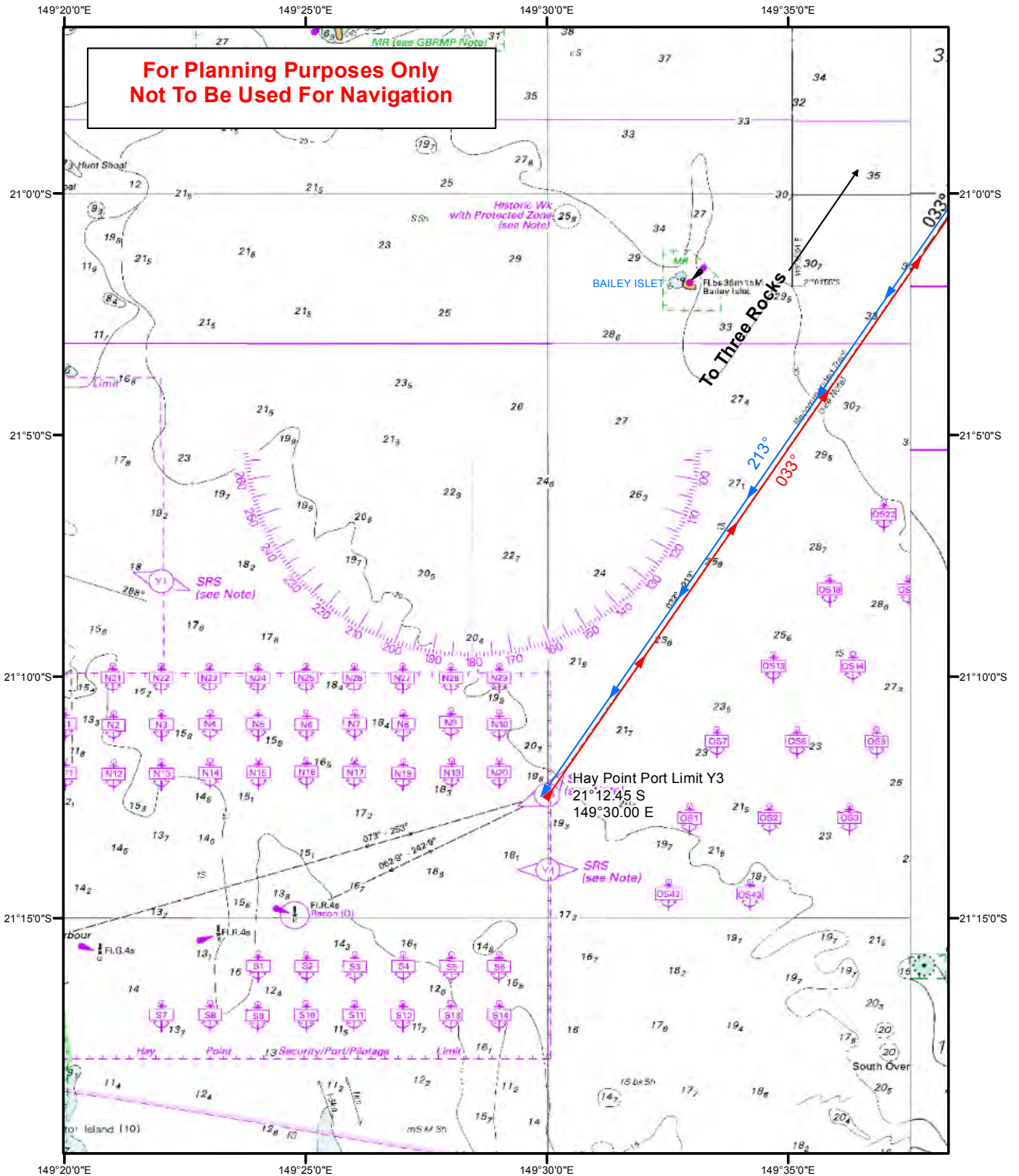
Cole Reefs to Three Rocks

HP-4



Bailey Islet to Hay Point

HP-5





QUEENSLAND COASTAL PASSAGE PLAN

PART 3 UNIFORM WAYPOINTS

**UNIFORM WAYPOINTS
INNER ROUTE NORTH**

IR-ND1**Northbound - Deep Draught 1****Yorkeys Knob PBG to Booby Is PBG –
Via Lizard Is, Howick North Channel & Varzin Passage**

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Yorkeys Knob PBG	16 43.91	145 45.07	339.6	14.78
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	61.69
5	Lizard (E)	14 40.45	145 25.26	307.5	11.65
6	Nymph (N)	14 33.33	145 15.72	274.6	10.00
7	Coquet (N)	14 32.52	145 05.44	300.3	6.11
8	Snake	14 29.42	145 00.00	284.3	1.25
9	Howick	14 29.11	144 58.75	270.0	1.67
10	Megaera	14 29.11	144 57.03	307.2	3.45
11	Watson	14 27.02	144 54.20	293.2	11.04
12	Switzer (E)	14 22.65	144 43.74	311.4	3.60
13	Davy	14 20.26	144 40.96	332.6	8.36
14	Rocky (E)	14 12.80	144 37.00	317.0	3.84
15	Singleton	14 09.98	144 34.30	295.2	6.13
16	Channel	14 07.36	144 28.59	317.9	28.16
17	Thirteen-One	13 46.35	144 09.20	320.0	6.72
18	Creech (N)	13 41.18	144 04.76	330.4	27.36
19	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
20	Hudson (E)	12 56.55	143 43.23	318.9	5.64
21	Frederick (E)	12 52.28	143 39.43	300.4	2.16
22	Sunk	12 51.18	143 37.52	317.1	2.76
23	Wye (N)	12 49.15	143 35.60	331.0	27.72
24	Eel (E)	12 24.80	143 21.85	327.7	12.01
25	Inset	12 14.60	143 15.30	354.7	9.50
26	Moody (E)	12 05.10	143 14.40	032.2	7.18
27	Clerke (E)	11 59.00	143 18.30	000.0	2.04
28	Nob (E)	11 56.95	143 18.30	317.9	29.96
29	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
30	Halfway (E)	11 20.80	143 00.00	340.9	34.16
31	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
32	Albany (N)	10 45.00	142 40.90	319.9	10.26
33	Alpha (N)	10 37.12	142 34.19	300.5	13.68
34	Herald (E)	10 30.14	142 22.23	284.1	1.51
35	OG Rock	10 29.77	142 20.74	270.0	3.70
36	Hood	10 29.77	142 16.98	248.1	2.03
37	Nardana	10 30.53	142 15.07	268.0	2.89
38	Hammond	10 30.63	142 12.14	234.7	5.30
39	Harrison (N)	10 33.71	142 07.75	267.4	3.27
40	Goods (N) / Goods Is PBG	10 33.86	142 04.43	285.5	8.40
41	Varzin East	10 31.60	141 56.21	262.3	3.80
42	Varzin	10 32.11	141 52.39	242.8	1.42
43	Varzin West	10 32.76	141 51.11	200.1	3.75
44	Booby Island PBG	10 36.30	141 49.80		
				Total Distance	493.34

IR-ND2

Northbound - Deep Draught 2

Cairns Fairway PBG to Booby Is PBG –
Via Lizard Is, Howick North Channel & Varzin Passage

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Cairns Fairway PBG	16 45.00	145 50.00	326.5	17.92
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	61.69
5	Lizard (E)	14 40.45	145 25.26	307.5	11.65
6	Nymph (N)	14 33.33	145 15.72	274.6	10.00
7	Coquet (N)	14 32.52	145 05.44	300.3	6.11
8	Snake	14 29.42	145 00.00	284.3	1.25
9	Howick	14 29.11	144 58.75	270.0	1.67
10	Megaera	14 29.11	144 57.03	307.2	3.45
11	Watson	14 27.02	144 54.20	293.2	11.04
12	Switzer (E)	14 22.65	144 43.74	311.4	3.60
13	Davy	14 20.26	144 40.96	332.6	8.36
14	Rocky (E)	14 12.80	144 37.00	317.0	3.84
15	Singleton	14 09.98	144 34.30	295.2	6.13
16	Channel	14 07.36	144 28.59	317.9	28.16
17	Thirteen-One	13 46.35	144 09.20	320.0	6.72
18	Creech (N)	13 41.18	144 04.76	330.4	27.36
19	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
20	Hudson (E)	12 56.55	143 43.23	318.9	5.64
21	Frederick (E)	12 52.28	143 39.43	300.4	2.16
22	Sunk	12 51.18	143 37.52	317.1	2.76
23	Wye (N)	12 49.15	143 35.60	331.0	27.72
24	Eel (E)	12 24.80	143 21.85	327.7	12.01
25	Inset	12 14.60	143 15.30	354.7	9.50
26	Moody (E)	12 05.10	143 14.40	032.2	7.18
27	Clerke (E)	11 59.00	143 18.30	000.0	2.04
28	Nob (E)	11 56.95	143 18.30	317.9	29.96
29	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
30	Halfway (E)	11 20.80	143 00.00	340.9	34.16
31	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
32	Albany (N)	10 45.00	142 40.90	319.9	10.26
33	Alpha (N)	10 37.12	142 34.19	300.5	13.68
34	Herald (E)	10 30.14	142 22.23	284.1	1.51
35	OG Rock	10 29.77	142 20.74	270.0	3.70
36	Hood	10 29.77	142 16.98	248.1	2.03
37	Nardana	10 30.53	142 15.07	268.0	2.89
38	Hammond	10 30.63	142 12.14	234.7	5.30
39	Harrison (N)	10 33.71	142 07.75	267.4	3.27
40	Goods (N) / Goods Is PBG	10 33.86	142 04.43	285.5	8.40
41	Varzin East	10 31.60	141 56.21	262.3	3.80
42	Varzin	10 32.11	141 52.39	242.8	1.42
43	Varzin West	10 32.76	141 51.11	200.1	3.75
44	Booby Island PBG	10 36.30	141 49.80		
				Total Distance	496.48

IR-NM1**Northbound - Moderate Draught 1**

Yorkeys Knob PBG to Booby Is PBG –

Via Mid Decapolis (Crompton Shoals), Miles Reef & Gannet Passage

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Yorkeys Knob PBG	16 43.91	145 45.07	339.6	14.78
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	44.22
5	Two Isles (N)	14 57.98	145 24.53	328.1	22.97
6	Turtle (N)	14 38.40	145 12.00	292.3	16.77
7	Miles	14 32.00	144 56.00	304.4	9.40
8	Bewick	14 26.67	144 48.00	311.2	6.65
9	Switzer (W)	14 22.27	144 42.85	317.5	2.72
10	Davy	14 20.26	144 40.96	332.6	8.36
11	Rocky (E)	14 12.80	144 37.00	317.0	3.84
12	Singleton	14 09.98	144 34.30	295.2	6.13
13	Channel	14 07.36	144 28.59	317.9	28.16
14	Thirteen-One	13 46.35	144 09.20	320.0	6.72
15	Creech (N)	13 41.18	144 04.76	330.4	27.36
16	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
17	Hudson (E)	12 56.55	143 43.23	318.9	5.64
18	Frederick (E)	12 52.28	143 39.43	300.4	2.16
19	Sunk	12 51.18	143 37.52	317.1	2.76
20	Wye (N)	12 49.15	143 35.60	331.0	27.72
21	Eel (E)	12 24.80	143 21.85	327.7	12.01
22	Inset	12 14.60	143 15.30	354.7	9.50
23	Moody (E)	12 05.10	143 14.40	032.2	7.18
24	Clerke (E)	11 59.00	143 18.30	000.0	2.04
25	Nob (E)	11 56.95	143 18.30	317.9	29.96
26	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
27	Halfway (E)	11 20.80	143 00.00	340.9	34.16
28	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
29	Albany (N)	10 45.00	142 40.90	319.9	10.26
30	Alpha (N)	10 37.12	142 34.19	300.5	13.68
31	Herald (E)	10 30.14	142 22.23	284.1	1.51
32	OG Rock	10 29.77	142 20.74	270.0	3.70
33	Hood	10 29.77	142 16.98	248.1	2.03
34	Nardana	10 30.53	142 15.07	268.0	2.89
35	Hammond	10 30.63	142 12.14	234.7	5.30
36	Harrison (N)	10 33.71	142 07.75	267.4	12.89
37	Booby	10 34.30	141 54.68	248.9	1.74
38	Gannet	10 34.93	141 53.03	218.3	0.81
39	Gannet Buoy	10 35.57	141 52.52	254.8	2.78
40	Booby Island PBG	10 36.30	141 49.80		
Total Distance					483.19

IR-NM2**Northbound - Moderate Draught 2**

Cairns Fairway PBG to Booby Is PBG –
Via Mid Decapolis (Crompton Shoals), Miles Reef & Gannet Passage

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Cairns Fairway PBG	16 45.00	145 50.00	326.5	17.92
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	44.22
5	Two Isles (N)	14 57.98	145 24.53	328.1	22.97
6	Turtle (N)	14 38.40	145 12.00	292.3	16.77
7	Miles	14 32.00	144 56.00	304.4	9.40
8	Bewick	14 26.67	144 48.00	311.2	6.65
9	Switzer (W)	14 22.27	144 42.85	317.5	2.72
10	Davy	14 20.26	144 40.96	332.6	8.36
11	Rocky (E)	14 12.80	144 37.00	317.0	3.84
12	Singleton	14 09.98	144 34.30	295.2	6.13
13	Channel	14 07.36	144 28.59	317.9	28.16
14	Thirteen-One	13 46.35	144 09.20	320.0	6.72
15	Creech (N)	13 41.18	144 04.76	330.4	27.36
16	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
17	Hudson (E)	12 56.55	143 43.23	318.9	5.64
18	Frederick (E)	12 52.28	143 39.43	300.4	2.16
19	Sunk	12 51.18	143 37.52	317.1	2.76
20	Wye (N)	12 49.15	143 35.60	331.0	27.72
21	Eel (E)	12 24.80	143 21.85	327.7	12.01
22	Inset	12 14.60	143 15.30	354.7	9.50
23	Moody (E)	12 05.10	143 14.40	032.2	7.18
24	Clerke (E)	11 59.00	143 18.30	000.0	2.04
25	Nob (E)	11 56.95	143 18.30	317.9	29.96
26	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
27	Halfway (E)	11 20.80	143 00.00	340.9	34.16
28	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
29	Albany (N)	10 45.00	142 40.90	319.9	10.26
30	Alpha (N)	10 37.12	142 34.19	300.5	13.68
31	Herald (E)	10 30.14	142 22.23	284.1	1.51
32	OG Rock	10 29.77	142 20.74	270.0	3.70
33	Hood	10 29.77	142 16.98	248.1	2.03
34	Nardana	10 30.53	142 15.07	268.0	2.89
35	Hammond	10 30.63	142 12.14	234.7	5.30
36	Harrison (N)	10 33.71	142 07.75	267.4	12.89
37	Booby	10 34.30	141 54.68	248.9	1.74
38	Gannet	10 34.93	141 53.03	218.3	0.81
39	Gannet Buoy	10 35.57	141 52.52	254.8	2.78
40	Booby Island PBG	10 36.30	141 49.80		
Total Distance					486.33

IR-NS1**Northbound - Shallow Draught 1**

Yorkeys Knob PBG to Goods Is PBG –
Via Pethebridge, Miles Reef and south of Herald Patches

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Yorkeys Knob PBG	16 43.91	145 45.07	339.6	14.78
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	44.22
5	Two Isles (N)	14 57.98	145 24.53	328.1	4.16
6	Flattery	14 54.43	145 22.26	308.6	15.38
7	Pethebridge (S)	14 44.80	145 09.85	314.7	16.43
8	Coquet (W)	14 33.20	144 57.80	304.4	11.52
9	Bewick	14 26.67	144 48.00	311.2	6.65
10	Switzer (W)	14 22.27	144 42.85	317.5	2.72
11	Davy	14 20.26	144 40.96	332.6	8.36
12	Rocky (E)	14 12.80	144 37.00	317.0	3.84
13	Singleton	14 09.98	144 34.30	295.2	6.13
14	Channel	14 07.36	144 28.59	317.9	28.16
15	Thirteen-One	13 46.35	144 09.20	320.0	6.72
16	Creech (N)	13 41.18	144 04.76	330.4	27.36
17	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
18	Hudson (E)	12 56.55	143 43.23	318.9	5.64
19	Frederick (E)	12 52.28	143 39.43	300.4	2.16
20	Sunk	12 51.18	143 37.52	317.1	2.76
21	Wye (N)	12 49.15	143 35.60	331.0	27.72
22	Eel (E)	12 24.80	143 21.85	327.7	12.01
23	Inset	12 14.60	143 15.30	354.7	9.50
24	Moody (E)	12 05.10	143 14.40	032.2	7.18
25	Clerke (E)	11 59.00	143 18.30	000.0	2.04
26	Nob (E)	11 56.95	143 18.30	317.9	29.96
27	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
28	Halfway (E)	11 20.80	143 00.00	340.9	34.16
29	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
30	Albany (N)	10 45.00	142 40.90	319.9	10.26
31	Alpha (N)	10 37.12	142 34.19	295.2	17.14
32	Ince	10 29.77	142 18.45	270.0	1.45
33	Hood	10 29.77	142 16.98	248.1	2.03
34	Nardana	10 30.53	142 15.07	268.0	2.89
35	Hammond	10 30.63	142 12.14	234.7	5.30
36	Harrison (N)	10 33.71	142 07.75	267.4	3.27
37	Goods (N) / Goods Is PBG	10 33.86	142 04.43		
Total Distance					466.29

IR-NS2

Northbound - Shallow Draught 2

Cairns Fairway PBG to Goods Is PBG –
Via Pethebridge, Miles Reef and south of Herald Patches

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Cairns Fairway PBG	16 45.00	145 50.00	326.5	17.92
2	Low Isles (E)	16 30.00	145 39.70	342.0	41.68
3	Rattlesnake	15 50.20	145 26.30	336.5	8.53
4	Gubbins (S)	15 42.35	145 22.77	002.2	44.22
5	Two Isles (N)	14 57.98	145 24.53	328.1	4.16
6	Flattery	14 54.43	145 22.26	308.6	15.38
7	Pethebridge (S)	14 44.80	145 09.85	314.7	16.43
8	Coquet (W)	14 33.20	144 57.80	304.4	11.52
9	Bewick	14 26.67	144 48.00	311.2	6.65
10	Switzer (W)	14 22.27	144 42.85	317.5	2.72
11	Davy	14 20.26	144 40.96	332.6	8.36
12	Rocky (E)	14 12.80	144 37.00	317.0	3.84
13	Singleton	14 09.98	144 34.30	295.2	6.13
14	Channel	14 07.36	144 28.59	317.9	28.16
15	Thirteen-One	13 46.35	144 09.20	320.0	6.72
16	Creech (N)	13 41.18	144 04.76	330.4	27.36
17	Wideawake (E)	13 17.28	143 50.90	340.1	21.95
18	Hudson (E)	12 56.55	143 43.23	318.9	5.64
19	Frederick (E)	12 52.28	143 39.43	300.4	2.16
20	Sunk	12 51.18	143 37.52	317.1	2.76
21	Wye (N)	12 49.15	143 35.60	331.0	27.72
22	Eel (E)	12 24.80	143 21.85	327.7	12.01
23	Inset	12 14.60	143 15.30	354.7	9.50
24	Moody (E)	12 05.10	143 14.40	032.2	7.18
25	Clerke (E)	11 59.00	143 18.30	000.0	2.04
26	Nob (E)	11 56.95	143 18.30	317.9	29.96
27	Hannibal (E)	11 34.60	142 57.85	008.7	13.90
28	Halfway (E)	11 20.80	143 00.00	340.9	34.16
29	Wyborn (E)	10 48.37	142 48.65	293.7	8.33
30	Albany (N)	10 45.00	142 40.90	319.9	10.26
31	Alpha (N)	10 37.12	142 34.19	295.2	17.14
32	Ince	10 29.77	142 18.45	270.0	1.45
33	Hood	10 29.77	142 16.98	248.1	2.03
34	Nardana	10 30.53	142 15.07	268.0	2.89
35	Hammond	10 30.63	142 12.14	234.7	5.30
36	Harrison (N)	10 33.71	142 07.75	267.4	3.27
37	Goods (N) / Goods Is PBG	10 33.86	142 04.43		
Total Distance					469.43

IR-NA1**Northbound - Alternative Leg 1**

Via East of Hope Islands
for Northbound routes IR-ND1, IR-ND2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Low Isles (E)	16 30.00	145 39.70	342.1	18.57
2	Snapper (E)	16 12.25	145 33.77	352.9	28.38
3	Endeavour	15 43.97	145 30.14	309.6	9.01
4	Bee (E)	15 38.20	145 22.94	002.2	57.55
5	Lizard (E)	14 40.45	145 25.26		
Total Distance					113.51

Northbound - Alternative Leg 2**IR-NA2**

Via East of Hope Islands
for Northbound routes IR-NM1, IR-NM2, IR-NS1, IR-NS2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Low Isles (E)	16 30.00	145 39.70	342.1	18.57
2	Snapper (E)	16 12.25	145 33.77	352.9	28.38
3	Endeavour	15 43.97	145 30.14	309.6	9.01
4	Bee (E)	15 38.20	145 22.94	002.2	40.08
5	Two Isles (N)	14 57.98	145 24.53		
Total Distance					96.04

Northbound - Alternative Leg 3**IR-NA3**

Via Mid Decapolis (Crompton Shoals)
for Northbound routes IR-ND1, IR-ND2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Gubbins (S)	15 42.35	145 22.77	002.2	44.22
2	Two Isles (N)	14 57.98	145 24.53	328.1	22.97
3	Turtle (N)	14 38.40	145 12.00	312.6	8.65
4	Coquet (N)	14 32.52	145 05.44	300.3	6.11
5	Snake	14 29.42	145 00.00		
Total Distance					81.95

**UNIFORM WAYPOINTS
INNER ROUTE SOUTH**

IR-SD1**Southbound - Deep Draught 1**

Booby Is PBG to Yorkeys Knob PBG –

Via Varzin Passage, West of Cairncross, Howick North Channel & Lizard Is

No	Waypoint	Latitude S	Longitude E	Course	Distance	
1	Booby Island PBG	10 36.30	141 49.80	020.1	3.75	
2	Varzin West	10 32.76	141 51.11	062.8	1.42	
3	Varzin	10 32.11	141 52.39	082.3	3.80	
4	Varzin East	10 31.60	141 56.21	111.1	7.15	
5	Larpen	10 34.18	142 02.98	087.5	4.31	
6	Harrison (S)	10 33.99	142 07.35	054.7	5.78	
7	Hammond	10 30.63	142 12.14	088.0	2.89	
8	Nardana	10 30.53	142 15.07	068.1	2.03	
9	Hood	10 29.77	142 16.98	090.0	3.70	
10	OG Rock	10 29.77	142 20.74	103.5	0.77	
11	Herald (W)	10 29.95	142 21.50	120.8	14.47	
12	Alpha (S)	10 37.40	142 34.12	140.1	10.00	
13	Albany (S)	10 45.10	142 40.64	113.9	7.33	
14	Wyborn (W)	10 48.08	142 47.45	165.9	27.22	
15	Cairncross	11 14.60	142 54.18	178.4	10.36	
16	Orford	11 25.00	142 54.48	164.2	10.35	
17	Hannibal (W)	11 35.00	142 57.35	138.1	30.31	
18	Nob (W)	11 57.63	143 18.02	180.0	0.87	
19	Clerke (W)	11 58.50	143 18.02	212.3	7.63	
20	Moody (W)	12 04.98	143 13.86	174.7	8.82	
21	Piper	12 13.80	143 14.70	148.2	13.00	
22	Eel (W)	12 24.90	143 21.70	151.2	28.99	
23	Wye (S)	12 50.40	143 36.02	119.4	2.80	
24	Frederick (W)	12 51.78	143 38.52	139.3	6.56	
25	Hudson (W)	12 56.78	143 42.90	160.3	21.97	
26	Wideawake (W)	13 17.55	143 50.50	150.5	27.70	
27	Creech (S)	13 41.75	144 04.53	138.3	15.51	
28	Corbett	13 53.37	144 15.14	141.1	16.17	
29	Pipon Buoy	14 06.00	144 25.60	115.1	9.34	
30	Singleton	14 09.98	144 34.30	142.5	3.35	
31	Rocky (W)	14 12.65	144 36.40	152.7	8.46	
32	Barrow (N)	14 20.20	144 40.40	130.9	3.15	
33	Switzer (W)	14 22.27	144 42.85	113.3	11.99	
34	Watson	14 27.02	144 54.20	138.3	2.33	
35	Newton	14 28.77	144 55.80	105.8	1.24	
36	Megaera	14 29.11	144 57.03	090.0	1.67	
37	Howick	14 29.11	144 58.75	126.1	6.06	
38	Coquet (S)	14 32.70	145 03.80	095.2	12.08	
39	Nymph (S)	14 33.80	145 16.20	127.0	10.43	
40	Lizard (W)	14 40.10	145 24.80	182.3	60.86	
41	Gubbins (N)	15 41.17	145 22.22	157.1	4.41	
42	Hope	15 45.25	145 24.00	162.1	46.85	
43	Low Isles (W)	16 30.00	145 39.00	157.2	15.03	
44	Yorkeys Knob PBG	16 43.91	145 45.07			
96					Total Distance	492.91

IR-SD2

Southbound - Deep Draught 2

Booby Is PBG to Cairns Fairway PBG – Via Varzin Passage,
West of Cairncross, Howick North Channel & Lizard Is

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Booby Island PBG	10 36.30	141 49.80	020.1	3.75
2	Varzin West	10 32.76	141 51.11	062.8	1.42
3	Varzin	10 32.11	141 52.39	082.3	3.80
4	Varzin East	10 31.60	141 56.21	111.1	7.15
5	Larpen	10 34.18	142 02.98	087.5	4.31
6	Harrison (S)	10 33.99	142 07.35	054.7	5.78
7	Hammond	10 30.63	142 12.14	088.0	2.89
8	Nardana	10 30.53	142 15.07	068.1	2.03
9	Hood	10 29.77	142 16.98	090.0	3.70
10	OG Rock	10 29.77	142 20.74	103.5	0.77
11	Herald (W)	10 29.95	142 21.50	120.8	14.47
12	Alpha (S)	10 37.40	142 34.12	140.1	10.00
13	Albany (S)	10 45.10	142 40.64	113.9	7.33
14	Wyborn (W)	10 48.08	142 47.45	165.9	27.22
15	Cairncross	11 14.60	142 54.18	178.4	10.36
16	Orford	11 25.00	142 54.48	164.2	10.35
17	Hannibal (W)	11 35.00	142 57.35	138.1	30.31
18	Nob (W)	11 57.63	143 18.02	180.0	0.87
19	Clerke (W)	11 58.50	143 18.02	212.3	7.63
20	Moody (W)	12 04.98	143 13.86	174.7	8.82
21	Piper	12 13.80	143 14.70	148.2	13.00
22	Eel (W)	12 24.90	143 21.70	151.2	28.99
23	Wye (S)	12 50.40	143 36.02	119.4	2.80
24	Frederick (W)	12 51.78	143 38.52	139.3	6.56
25	Hudson (W)	12 56.78	143 42.90	160.3	21.97
26	Wideawake (W)	13 17.55	143 50.50	150.5	27.70
27	Creech (S)	13 41.75	144 04.53	138.3	15.51
28	Corbett	13 53.37	144 15.14	141.1	16.17
29	Pipon Buoy	14 06.00	144 25.60	115.1	9.34
30	Singleton	14 09.98	144 34.30	142.5	3.35
31	Rocky (W)	14 12.65	144 36.40	152.7	8.46
32	Barrow (N)	14 20.20	144 40.40	130.9	3.15
33	Switzer (W)	14 22.27	144 42.85	113.3	11.99
34	Watson	14 27.02	144 54.20	138.3	2.33
35	Newton	14 28.77	144 55.80	105.8	1.24
36	Megaera	14 29.11	144 57.03	090.0	1.67
37	Howick	14 29.11	144 58.75	126.1	6.06
38	Coquet (S)	14 32.70	145 03.80	095.2	12.08
39	Nymph (S)	14 33.80	145 16.20	127.0	10.43
40	Lizard (W)	14 40.10	145 24.80	182.3	60.86
41	Gubbins (N)	15 41.17	145 22.22	157.1	4.41
42	Hope	15 45.25	145 24.00	162.1	46.85
43	Low Isles (W)	16 30.00	145 39.00	144.8	18.30
44	Cairns Fairway PBG	16 45.00	145 50.00		
Total Distance					496.18

IR-SM1**Southbound - Moderate Draught 1**

Booby Is PBG to Yorkeys Knob PBG – Via Gannet Passage,
Cairncross (west), Miles Reef & Mid Decapolis (Crompton Shoals)

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Booby Island PBG	10 36.30	141 49.80	074.8	2.78
2	Gannet Buoy	10 35.57	141 52.52	038.3	0.81
3	Gannet	10 34.93	141 53.03	068.9	0.94
4	Booby (NW)	10 34.59	141 53.92	087.4	13.24
5	Harrison (S)	10 33.99	142 07.35	054.7	5.78
6	Hammond	10 30.63	142 12.14	088.0	2.89
7	Nardana	10 30.53	142 15.07	068.1	2.03
8	Hood	10 29.77	142 16.98	090.0	3.70
9	OG Rock	10 29.77	142 20.74	103.5	0.77
10	Herald (W)	10 29.95	142 21.50	120.8	14.47
11	Alpha (S)	10 37.40	142 34.12	140.1	10.00
12	Albany (S)	10 45.10	142 40.64	113.9	7.33
13	Wyborn (W)	10 48.08	142 47.45	165.9	27.22
14	Cairncross	11 14.60	142 54.18	178.4	10.36
15	Orford	11 25.00	142 54.48	164.2	10.35
16	Hannibal (W)	11 35.00	142 57.35	138.1	30.31
17	Nob (W)	11 57.63	143 18.02	180.0	0.87
18	Clerke (W)	11 58.50	143 18.02	212.3	7.63
19	Moody (W)	12 04.98	143 13.86	174.7	8.82
20	Piper	12 13.80	143 14.70	148.2	13.00
21	Eel (W)	12 24.90	143 21.70	151.2	28.99
22	Wye (S)	12 50.40	143 36.02	119.4	2.80
23	Frederick (W)	12 51.78	143 38.52	139.3	6.56
24	Hudson (W)	12 56.78	143 42.90	160.3	21.97
25	Wideawake (W)	13 17.55	143 50.50	150.5	27.70
26	Creech (S)	13 41.75	144 04.53	138.3	15.51
27	Corbett	13 53.37	144 15.14	141.1	16.17
28	Pipon Buoy	14 06.00	144 25.60	115.1	9.34
29	Singleton	14 09.98	144 34.30	142.5	3.35
30	Rocky (W)	14 12.65	144 36.40	152.7	8.46
31	Barrow (N)	14 20.20	144 40.40	131.2	9.79
32	Bewick	14 26.67	144 48.00	124.4	11.52
33	Coquet (W)	14 33.20	144 57.80	111.7	15.08
34	Turtle (S)	14 38.80	145 12.25	148.1	18.34
35	Flattery	14 54.43	145 22.26	167.2	7.22
36	Two Isles (S)	15 01.50	145 23.92	182.4	39.54
37	Gubbins (N)	15 41.17	145 22.22	157.1	4.41
38	Hope	15 45.25	145 24.00	162.1	46.85
39	Low Isles (W)	16 30.00	145 39.00	157.2	15.03
40	Yorkeys Knob PBG	16 43.91	145 45.07		
Total Distance					481.93

IR-SM2

Southbound - Moderate Draught 2

Booby Is PBG to Cairns Fairway PBG – Via Gannet Passage,
Cairncross (west), Miles Reef & Mid Decapolis (Crompton Shoals)

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Booby Island PBG	10 36.30	141 49.80	074.8	2.78
2	Gannet Buoy	10 35.57	141 52.52	038.3	0.81
3	Gannet	10 34.93	141 53.03	068.9	0.94
4	Booby (NW)	10 34.59	141 53.92	087.4	13.24
5	Harrison (S)	10 33.99	142 07.35	054.7	5.78
6	Hammond	10 30.63	142 12.14	088.0	2.89
7	Nardana	10 30.53	142 15.07	068.1	2.03
8	Hood	10 29.77	142 16.98	090.0	3.70
9	OG Rock	10 29.77	142 20.74	103.5	0.77
10	Herald (W)	10 29.95	142 21.50	120.8	14.47
11	Alpha (S)	10 37.40	142 34.12	140.1	10.00
12	Albany (S)	10 45.10	142 40.64	113.9	7.33
13	Wyborn (W)	10 48.08	142 47.45	165.9	27.22
14	Cairncross	11 14.60	142 54.18	178.4	10.36
15	Orford	11 25.00	142 54.48	164.2	10.35
16	Hannibal (W)	11 35.00	142 57.35	138.1	30.31
17	Nob (W)	11 57.63	143 18.02	180.0	0.87
18	Clerke (W)	11 58.50	143 18.02	212.3	7.63
19	Moody (W)	12 04.98	143 13.86	174.7	8.82
20	Piper	12 13.80	143 14.70	148.2	13.00
21	Eel (W)	12 24.90	143 21.70	151.2	28.99
22	Wye (S)	12 50.40	143 36.02	119.4	2.80
23	Frederick (W)	12 51.78	143 38.52	139.3	6.56
24	Hudson (W)	12 56.78	143 42.90	160.3	21.97
25	Wideawake (W)	13 17.55	143 50.50	150.5	27.70
26	Creech (S)	13 41.75	144 04.53	138.3	15.51
27	Corbett	13 53.37	144 15.14	141.1	16.17
28	Pipon Buoy	14 06.00	144 25.60	115.1	9.34
29	Singleton	14 09.98	144 34.30	142.5	3.35
30	Rocky (W)	14 12.65	144 36.40	152.7	8.46
31	Barrow (N)	14 20.20	144 40.40	131.2	9.79
32	Bewick	14 26.67	144 48.00	124.4	11.52
33	Coquet (W)	14 33.20	144 57.80	111.7	15.08
34	Turtle (S)	14 38.80	145 12.25	148.1	18.34
35	Flattery	14 54.43	145 22.26	167.2	7.22
36	Two Isles (S)	15 01.50	145 23.92	182.4	39.54
37	Gubbins (N)	15 41.17	145 22.22	157.1	4.41
38	Hope	15 45.25	145 24.00	162.1	46.85
39	Low Isles (W)	16 30.00	145 39.00	144.8	18.30
40	Cairns Fairway PBG	16 45.00	145 50.00		
Total Distance					485.20

IR-SS1**Southbound - Shallow Draught 1**

Goods Is PBG to Yorkeys Knob PBG –

Via south of Herald patches, Miles Reef & Pethebridge

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Goods (S) / Goods Is PBG	10 34.12	142 04.36	087.5	2.95
2	Harrison (S)	10 33.99	142 07.35	054.7	5.78
3	Hammond	10 30.63	142 12.14	088.0	2.89
4	Nardana	10 30.53	142 15.07	068.1	2.03
5	Hood	10 29.77	142 16.98	090.0	1.45
6	Ince	10 29.77	142 18.45	115.3	14.33
7	Alpha (NW)	10 35.92	142 31.60	120.7	2.89
8	Alpha (S)	10 37.40	142 34.12	140.1	10.00
9	Albany (S)	10 45.10	142 40.64	113.9	7.33
10	Wyborn (W)	10 48.08	142 47.45	165.9	27.22
11	Cairncross	11 14.60	142 54.18	178.4	10.36
12	Orford	11 25.00	142 54.48	164.2	10.35
13	Hannibal (W)	11 35.00	142 57.35	138.1	30.31
14	Nob (W)	11 57.63	143 18.02	180.0	0.87
15	Clerke (W)	11 58.50	143 18.02	212.3	7.63
16	Moody (W)	12 04.98	143 13.86	174.7	8.82
17	Piper	12 13.80	143 14.70	148.2	13.00
18	Eel (W)	12 24.90	143 21.70	151.2	28.99
19	Wye (S)	12 50.40	143 36.02	119.4	2.80
20	Frederick (W)	12 51.78	143 38.52	139.3	6.56
21	Hudson (W)	12 56.78	143 42.90	160.3	21.97
22	Wideawake (W)	13 17.55	143 50.50	150.5	27.70
23	Creech (S)	13 41.75	144 04.53	138.3	15.51
24	Corbett	13 53.37	144 15.14	141.1	16.17
25	Pipon Buoy	14 06.00	144 25.60	115.1	9.34
26	Singleton	14 09.98	144 34.30	142.5	3.35
27	Rocky (W)	14 12.65	144 36.40	152.7	8.46
28	Barrow (N)	14 20.20	144 40.40	131.2	9.79
29	Bewick	14 26.67	144 48.00	124.4	9.40
30	Miles	14 32.00	144 56.00	134.8	15.42
31	Pethebridge (N)	14 42.90	145 07.30	128.4	18.49
32	Flattery	14 54.43	145 22.26	167.2	7.22
33	Two Isles (S)	15 01.50	145 23.92	182.4	39.54
34	Gubbins (N)	15 41.17	145 22.22	157.1	4.41
35	Hope	15 45.25	145 24.00	162.1	46.85
36	Low Isles (W)	16 30.00	145 39.00	157.2	15.03
37	Yorkeys Knob PBG	16 43.91	145 45.07		
Total Distance					465.21

IR-SS2

Southbound - Shallow Draught 2

Goods Is PBG to Cairns Fairway PBG –

Via south of Herald patches, via Miles Reef & Pethebridge

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Goods (S) / Goods Is PBG	10 34.12	142 04.36	087.5	2.95
2	Harrison (S)	10 33.99	142 07.35	054.7	5.78
3	Hammond	10 30.63	142 12.14	088.0	2.89
4	Nardana	10 30.53	142 15.07	068.1	2.03
5	Hood	10 29.77	142 16.98	090.0	1.45
6	Ince	10 29.77	142 18.45	115.3	14.33
7	Alpha (NW)	10 35.92	142 31.60	120.7	2.89
8	Alpha (S)	10 37.40	142 34.12	140.1	10.00
9	Albany (S)	10 45.10	142 40.64	113.9	7.33
10	Wyborn (W)	10 48.08	142 47.45	165.9	27.22
11	Cairncross	11 14.60	142 54.18	178.4	10.36
12	Orford	11 25.00	142 54.48	164.2	10.35
13	Hannibal (W)	11 35.00	142 57.35	138.1	30.31
14	Nob (W)	11 57.63	143 18.02	180.0	0.87
15	Clerke (W)	11 58.50	143 18.02	212.3	7.63
16	Moody (W)	12 04.98	143 13.86	174.7	8.82
17	Piper	12 13.80	143 14.70	148.2	13.00
18	Eel (W)	12 24.90	143 21.70	151.2	28.99
19	Wye (S)	12 50.40	143 36.02	119.4	2.80
20	Frederick (W)	12 51.78	143 38.52	139.3	6.56
21	Hudson (W)	12 56.78	143 42.90	160.3	21.97
22	Wideawake (W)	13 17.55	143 50.50	150.5	27.70
23	Creech (S)	13 41.75	144 04.53	138.3	15.51
24	Corbett	13 53.37	144 15.14	141.1	16.17
25	Pipon Buoy	14 06.00	144 25.60	115.1	9.34
26	Singleton	14 09.98	144 34.30	142.5	3.35
27	Rocky (W)	14 12.65	144 36.40	152.7	8.46
28	Barrow (N)	14 20.20	144 40.40	131.2	9.79
29	Bewick	14 26.67	144 48.00	124.4	9.40
30	Miles	14 32.00	144 56.00	134.8	15.42
31	Pethebridge (N)	14 42.90	145 07.30	128.4	18.49
32	Flattery	14 54.43	145 22.26	167.2	7.22
33	Two Isles (S)	15 01.50	145 23.92	182.4	39.54
34	Gubbins (N)	15 41.17	145 22.22	157.1	4.41
35	Hope	15 45.25	145 24.00	162.1	46.85
36	Low Isles (W)	16 30.00	145 39.00	144.8	18.30
37	Cairns Fairway PBG	16 45.00	145 50.00		
Total Distance					468.48

IR-SA1**Southbound - Alternative Leg 1**

Via East of Cairncross Islets for Southbound routes.

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Wyborn (W)	10 48.08	142 47.45	160.1	34.64
2	Halfway (W)	11 20.80	142 59.45	188.3	14.29
3	Hannibal (W)	11 35.00	142 57.35		
Total Distance					48.93

IR-SA2**Southbound - Alternative Leg 2**

Via Mid Decapolis for Southbound routes IR-SD1, IR-SD2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Howick	14 29.11	144 58.75	126.4	16.26
2	Turtle (S)	14 38.80	145 12.25	148.1	18.34
3	Flattery	14 54.43	145 22.26	167.2	7.22
4	Two Isles (S)	15 01.50	145 23.92	182.4	39.54
5	Gubbins (N)	15 41.17	145 22.22		
Total Distance					81.36

Southbound - Alternative Leg 3**IR-SA3**

Via East of Hope Islands for Southbound routes IR-SD1, IR-SD2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Lizard (W)	14 40.10	145 24.80	182.3	57.44
2	Bee (W)	15 37.74	145 22.37	129.6	9.73
3	Endeavour	15 43.97	145 30.14	173.5	30.40
4	Snapper (W)	16 14.30	145 33.73	162.1	16.44
5	Low Isles (W)	16 30.00	145 39.00		
Total Distance					114.01

Southbound - Alternative Leg 4**IR-SA4**

Via East of Hope Islands for Southbound routes IR-SM1, IR-SM2, IR-SS1, IR-SS2

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Two Isles (S)	15 01.50	145 23.92	182.4	36.12
2	Bee (W)	15 37.74	145 22.37	129.6	9.73
3	Endeavour	15 43.97	145 30.14	173.5	30.40
4	Snapper (W)	16 14.30	145 33.73	162.1	16.44
5	Low Isles (W)	16 30.00	145 39.00		
Total Distance					92.69

**UNIFORM WAYPOINTS
GREAT NORTH EAST CHANNEL**

GNEC-ED1**Eastbound - Deep Draught 1**

Booby Is PBG to Dalrymple Is PBG –
Via Varzin Passage & East of Coconut Is

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Booby Island PBG	10 36.30	141 49.80	020.1	3.75
2	Varzin West	10 32.76	141 51.11	062.8	1.42
3	Varzin	10 32.11	141 52.39	082.3	3.80
4	Varzin East	10 31.60	141 56.21	111.1	7.15
5	Larpent	10 34.18	142 02.98	087.5	4.31
6	Harrison (S)	10 33.99	142 07.35	054.7	5.78
7	Hammond	10 30.63	142 12.14	088.0	2.89
8	Nardana	10 30.53	142 15.07	068.1	2.03
9	Hood	10 29.77	142 16.98	090.0	3.70
10	OG Rock	10 29.77	142 20.74	103.5	0.77
11	Herald (W)	10 29.95	142 21.50	078.5	5.57
12	Twin	10 28.83	142 27.04	066.1	26.56
13	Kircaldie	10 18.00	142 51.67	057.5	16.00
14	Caldbeck	10 09.35	143 05.35	031.9	18.00
15	Sugar Ran	09 54.00	143 15.00	019.9	12.49
16	Marsden	09 42.20	143 19.30	032.2	9.64
17	Dalrymple Island PBG	09 34.00	143 24.50		
Total Distance					123.86

GNEC-EM1**Eastbound - Moderate Draught 1**

Booby Is PBG to Dalrymple Is PBG –
Via Gannet Passage & West of Coconut Is

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Booby Island PBG	10 36.30	141 49.80	074.8	2.78
2	Gannet Buoy	10 35.57	141 52.52	038.3	0.81
3	Gannet	10 34.93	141 53.03	068.9	0.94
4	Booby (NW)	10 34.59	141 53.92	087.4	13.24
5	Harrison (S)	10 33.99	142 07.35	054.7	5.78
6	Hammond	10 30.63	142 12.14	088.0	2.89
7	Nardana	10 30.53	142 15.07	068.1	2.03
8	Hood	10 29.77	142 16.98	090.0	3.70
9	OG Rock	10 29.77	142 20.74	103.5	0.77
10	Herald (W)	10 29.95	142 21.50	078.5	5.57
11	Twin	10 28.83	142 27.04	066.1	26.56
12	Kircaldie	10 18.00	142 51.67	037.8	8.57
13	Bet	10 11.20	142 57.00	033.0	12.34
14	Dove	10 00.80	143 03.80	028.5	14.49
15	Arden	09 48.00	143 10.80	044.2	19.42
16	Dalrymple Island PBG	09 34.00	143 24.50		
				Total Distance	119.89

GNEC-ES1**Eastbound - Shallow Draught 1**

Goods Is PBG to Dalrymple Is PBG –
Via north of Alert Patches and West of Coconut Is

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Goods (S) / Goods Is PBG	10 34.12	142 04.36	087.5	2.95
2	Harrison (S)	10 33.99	142 07.35	054.7	5.78
3	Hammond	10 30.63	142 12.14	088.0	2.89
4	Nardana	10 30.53	142 15.07	068.2	5.79
5	Alert (NW)	10 28.37	142 20.53	084.9	2.13
6	Marina	10 28.18	142 22.68	098.6	4.34
7	Twin	10 28.83	142 27.04	066.1	26.56
8	Kircaldie	10 18.00	142 51.67	037.8	8.57
9	Bet	10 11.20	142 57.00	033.0	12.34
10	Dove	10 00.80	143 03.80	028.5	14.49
11	Arden	09 48.00	143 10.80	044.2	19.42
12	Dalrymple Island PBG	09 34.00	143 24.50		
				Total Distance	105.26

GNEC-WD1**Westbound - Deep Draught 1**

Dalrymple Is PBG to Booby Is PBG –
Via East of Coconut Is & Varzin Passage

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Dalrymple Island PBG	09 34.00	143 24.50	212.2	9.64
2	Marsden	09 42.20	143 19.30	199.9	12.49
3	Sugar Ran	09 54.00	143 15.00	211.9	18.00
4	Caldbeck	10 09.35	143 05.35	237.4	16.00
5	Kircaldie	10 18.00	142 51.67	246.0	26.56
6	Twin	10 28.83	142 27.04	258.5	5.57
7	Herald (W)	10 29.95	142 21.50	283.5	0.77
8	OG Rock	10 29.77	142 20.74	270.0	3.70
9	Hood	10 29.77	142 16.98	248.1	2.03
10	Nardana	10 30.53	142 15.07	268.0	2.89
11	Hammond	10 30.63	142 12.14	234.7	5.30
12	Harrison (N)	10 33.71	142 07.75	267.4	3.27
13	Goods	10 33.86	142 04.43	285.5	8.40
14	Varzin East	10 31.60	141 56.21	262.3	3.80
15	Varzin	10 32.11	141 52.39	242.8	1.42
16	Varzin West	10 32.76	141 51.11	200.1	3.75
17	Booby Island PBG	10 36.30	141 49.80		
Total Distance					123.59

GNEC-WM1**Westbound - Moderate Draught 1**

Dalrymple Is PBG to Booby Is PBG –
Via West of Coconut Is & Gannet Passage

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Dalrymple Island PBG	09 34.00	143 24.50	224.1	19.42
2	Arden	09 48.00	143 10.80	208.5	14.49
3	Dove	10 00.80	143 03.80	212.9	12.34
4	Bet	10 11.20	142 57.00	217.8	8.57
5	Kircaldie	10 18.00	142 51.67	246.0	26.56
6	Twin	10 28.83	142 27.04	258.5	5.57
7	Herald (W)	10 29.95	142 21.50	283.5	0.77
8	OG Rock	10 29.77	142 20.74	270.0	3.70
9	Hood	10 29.77	142 16.98	248.1	2.03
10	Nardana	10 30.53	142 15.07	268.0	2.89
11	Hammond	10 30.63	142 12.14	234.7	5.30
12	Harrison (N)	10 33.71	142 07.75	267.4	12.89
13	Booby	10 34.30	141 54.68	248.9	1.74
14	Gannet	10 34.93	141 53.03	218.3	0.81
15	Gannet Buoy	10 35.57	141 52.52	254.8	2.78
16	Booby Island PBG	10 36.30	141 49.80		
Total Distance					119.86

GNEC-WS1**Westbound - Shallow Draught 1**

Dalrymple Is PBG to Goods Is PBG –
Via West of Coconut Is and north of Alert Patches

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Dalrymple Island PBG	09 34.00	143 24.50	224.1	19.42
2	Arden	09 48.00	143 10.80	208.5	14.49
3	Dove	10 00.80	143 03.80	212.9	12.34
4	Bet	10 11.20	142 57.00	217.8	8.57
5	Kircaldie	10 18.00	142 51.67	246.0	26.56
6	Twin	10 28.83	142 27.04	278.6	4.34
7	Marina	10 28.18	142 22.68	264.9	2.13
8	Alert (NW)	10 28.37	142 20.53	248.2	5.79
9	Nardana	10 30.53	142 15.07	268.0	2.89
10	Hammond	10 30.63	142 12.14	234.7	5.30
11	Harrison (N)	10 33.71	142 07.75	267.4	3.27
12	Goods (N) / Goods Is PBG	10 33.86	142 04.43		
				Total Distance	105.10

**UNIFORM WAYPOINTS
HYDROGRAPHERS PASSAGE**

HP-E1**Eastbound 1****Hay Point Y3 to Blossom Bank PBG**

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Hay Point Y3	21 12.45	149 30.00	033.0	19.77
2	Three Rocks	20 55.80	149 41.50	053.1	15.58
3	Tern Island	20 46.40	149 54.80	061.1	24.49
4	Creal South	20 34.50	150 17.65	025.2	8.26
5	Creal North	20 27.00	150 21.40	346.3	21.12
6	Bugatti	20 06.40	150 16.10	008.5	10.88
7	Bond	19 55.60	150 17.80	021.9	5.05
8	Ferris	19 50.90	150 19.80	038.4	9.41
9	Blossom Bank PBG	19 43.50	150 26.00		
Total Distance					114.56

HP-E2**Eastbound - Alternative**

Hay Point Y3 to Blossom Bank PBG,
Via Little Bugatti and White Tip waypoints

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Hay Point Y3	21 12.45	149 30.00	033.0	19.77
2	Three Rocks	20 55.80	149 41.50	053.1	15.58
3	Tern Island	20 46.40	149 54.80	061.1	24.49
4	Creal South	20 34.50	150 17.65	025.2	8.26
5	Creal North	20 27.00	150 21.40	346.3	21.12
6	Bugatti	20 06.40	150 16.10	008.6	5.04
7	Little Bugatti	20 01.40	150 16.90	000.0	3.69
8	White Tip	19 57.70	150 16.90	022.0	7.30
9	Ferris	19 50.90	150 19.80	038.4	9.41
10	Blossom Bank PBG	19 43.50	150 26.00		
Total Distance					114.66

HP-W1**Westbound****Blossom Bank PBG to Hay Point Y3**

No	Waypoint	Latitude S	Longitude E	Course	Distance
1	Blossom Bank PBG	19 43.50	150 26.00	218.4	9.41
2	Ferris	19 50.90	150 19.80	201.9	5.05
3	Bond	19 55.60	150 17.80	188.5	10.88
4	Bugatti	20 06.40	150 16.10	166.4	21.12
5	Creal North	20 27.00	150 21.40	205.2	8.26
6	Creal South	20 34.50	150 17.65	241.0	24.49
7	Tern Island	20 46.40	149 54.80	233.0	15.58
8	Three Rocks	20 55.80	149 41.50	212.9	19.77
9	Hay Point Y3	21 12.45	149 30.00		
				Total Distance	114.56

QUEENSLAND COASTAL PASSAGE PLAN

PART 4

LIST OF ACRONYMS

LIST OF ACRONYMS

List of acronyms used in this publication

ACRONYM:	DEFINITION:
AIS	Automatic Identification System
AMSA	Australian Maritime Safety Authority
ANTT	Australian National Tide Tables
APR	Automated Position Reporting
ARPA	Automatic Radar Plotting Aid
ATT	Admiralty Tide Tables
BRM	Bridge Resource Management
DSA	Designated Shipping Area
ECDIS	Electronic Chart Display and Information System
ENC	Electronic Navigational Chart
ETA	Estimate Time of Arrival
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GNEC	Great North East Channel
IMO	International Maritime Organisation
LES	Land Earth Station
MSQ	Maritime Safety Queensland
OOW	Officer of the Watch
PBG	Pilot Boarding Ground
POR	Pacific Ocean Region
POWC	Prince of Wales Channel
PSC	Port State Control
PSSA	Particularly Sensitive Sea Area(s)
QCPP	Queensland Coastal Passage Plan
REEFVTS	Great Barrier Reef and Torres Strait Vessel Traffic Service
SAC	Special Access Code
SOLAS	International Convention for the Safety of Life at Sea, 1974
SRS	Ship Reporting System
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
STI	Ship Traffic Information
UKC	Under Keel Clearance
UKCM	Under Keel Clearance Management (System)
VHF	Very High Frequency

