



Australian Government
Australian Maritime Safety Authority

LADS Passage

The last new shipping route...

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Opened on the 4th of July 2004 LADS Passage forms a new section of the Great Barrier Reef inner route and is Australia's, and possibly the world's, last new major shipping route to be opened up through hitherto unsurveyed waters. LADS Passage is about 20 nautical miles shorter than the section of route it replaces and is now used by 96% of traffic. During its first twelve months of use LADS Passage has provided an increased level of navigation safety for 1 294 vessel transits (vessels greater than 70 metres in length) saving an estimated 3 200 tonnes of fuel and 1 941 hours (81 days) of ship steaming time.¹

Whilst tortuous and narrow, the Great Barrier Reef inner route provides a sheltered passage for vessels travelling the 1 000 nautical miles between Gladstone on the central Queensland Coast and Torres Strait. Capt James Cook first used it in 1770 on his return from Tahiti where he was sent to observe the transit of Venus across the sun the previous year. On Monday the 11th of June 1770 his ship, the barque *Endeavour*, ran aground on what is now called Endeavour Reef. This episode led Cook to leave the inner route near Lizard Island and make the remainder of the journey to Torres Strait via the Coral Sea, or the Great Barrier Reef outer route. In the years that followed, other adventurers, explorers and surveyors added to Cook's work to improve our knowledge of the Great Barrier Reef inner route and this work continues today.

Since the early 1800's the majority of ships' masters have preferred the inner route instead of the alternative outer route. The inner route is shorter and for smaller vessels it provides protection from seas generated by southeasterly trade winds, which prevail for much of the year.

Approximately 90 nautical miles long, LADS Passage is a shorter alternative between Princess Charlotte Bay and Cape Direction. The new route is not only shorter but it is easier to navigate with more water (width and depth) and there are fewer fishing vessels in LADS Passage, thus improving safety for merchant and fishing vessels alike.

¹ Assumptions: 1.5 hrs saved each transit. Average typical fuel consumption 40 tonnes per day.

There had long been speculation that a simpler and shorter route extended north from Princess Charlotte Bay, still within the Great Barrier Reef but further offshore. However, it wasn't until the 1970's that a combination of satellite imagery and hydrographic surveys undertaken by the Royal Australian Navy's Hydrographic Service proved the validity of these speculations.

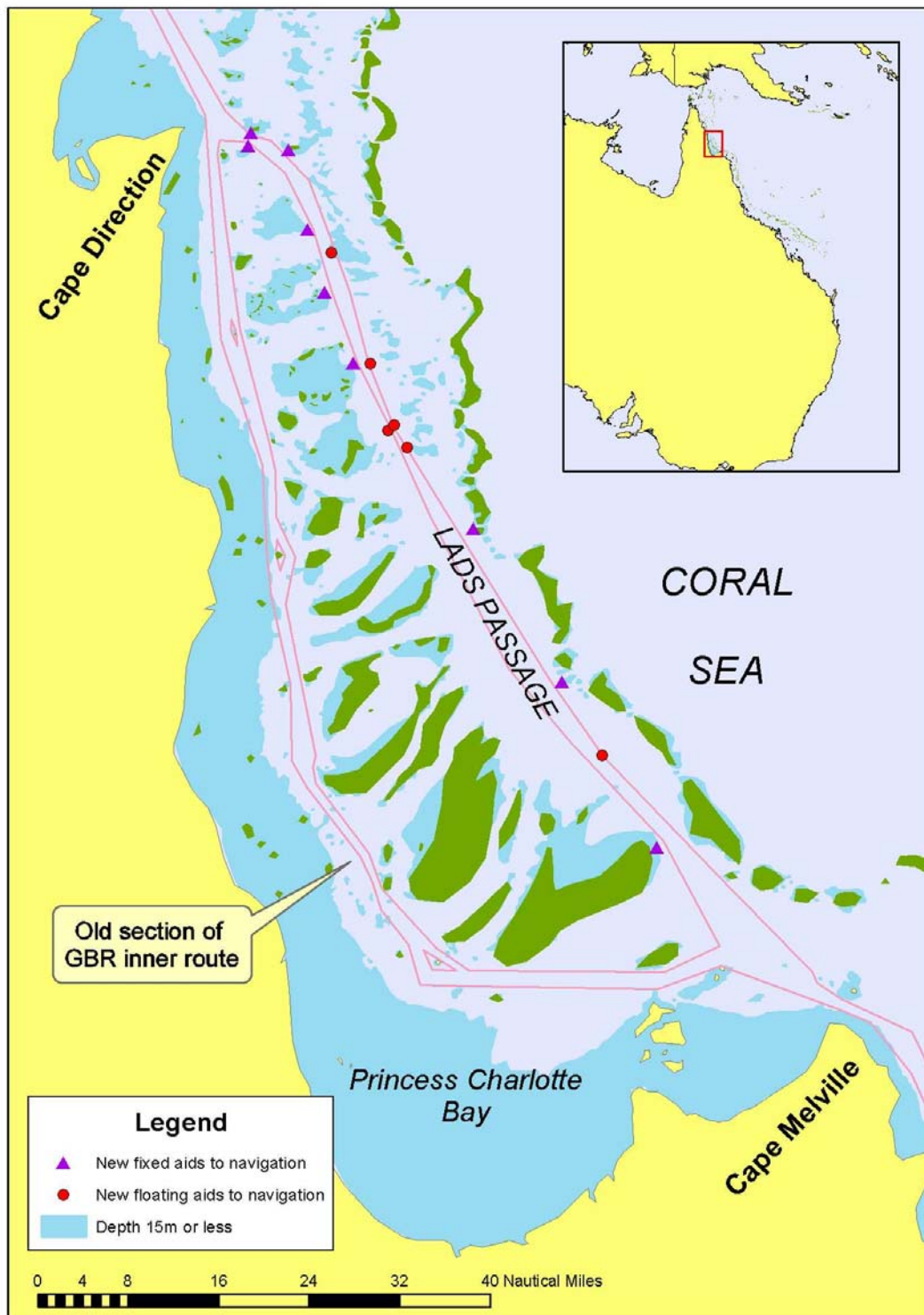


Diagram depicting LADS Passage and the old section of the Great Barrier Reef inner route

In the 1990's, with the advent of laser airborne hydrography, the Australian Navy was able to rapidly complete the surveys needed to pave the way for the establishment of a new route.

Of note is the name of the new route, which acknowledges the not insignificant efforts of the personnel who flew the Australian Navy's Laser Airborne Depth System (LADS).



1995 LADS Flight Crew who carried out the bulk of the LADS Passage surveys*



The LADS Flight in action*

Survey ships were used to confirm least depths in navigationally critical areas, where there are shoals and typical depths of 15 to 20 metres. Commencing in 1996 and completed in 2000, the Australian Navy's survey ships carried out a series of such surveys.



RAN Survey vessel HMAS SHEPPARTON*

With the surveys complete, staff at the Australian Maritime Safety Authority designed a network of aids to navigation. This network consists of nine fixed structures (three multi-pile and six mono-pile) as well as six buoys. In comparison, the bypassed section of the inner route is marked with 13 fixed and one floating aid to navigation.

* Picture supplied by the Australian Hydrographic Service (RAN)

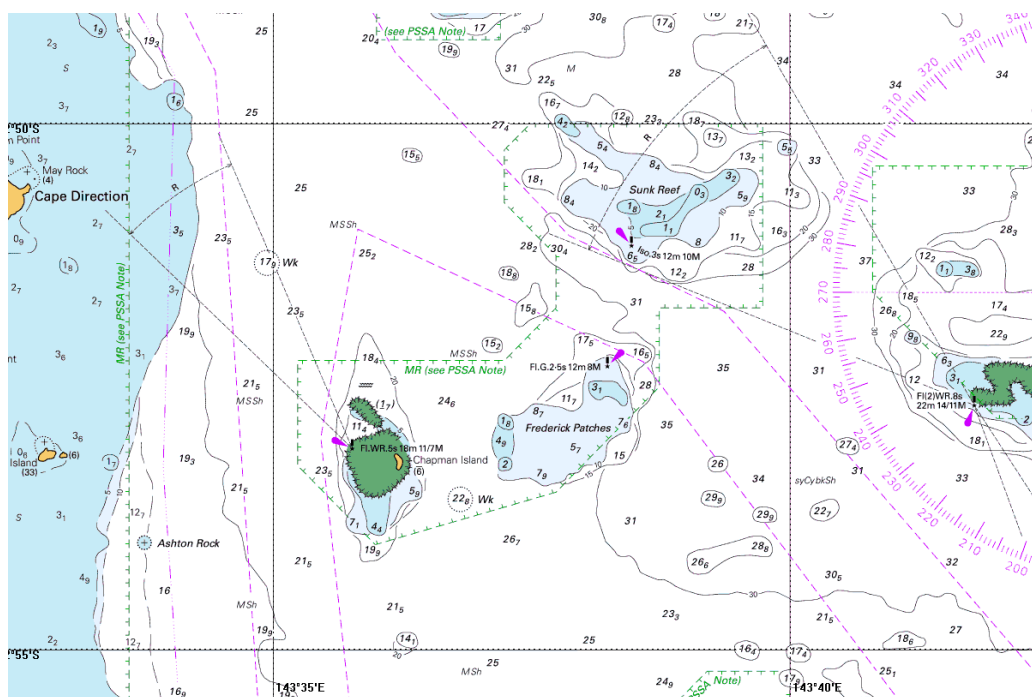


Sunk Reef mono-pile



Robin Reef multi-pile

In tandem with the design of the network of aids, the Australian Hydrographic Service produced a new edition of chart Aus 834 (published in April 2002) depicting a consolidated view of the area. Further, a new large scale chart, Aus 281, was published in July 2004, covering the northern section of LADS Passage, which is navigationally more challenging than the southern part of the route. Having the new charts available was integral to the timing of the route's official opening.



Extract of new chart Aus 281 showing northern LADS Passage*

In developing the network of aids to navigation, influencing factors included channel depth and width, navigational difficulty, distance to grounding if an alteration of course was delayed and the degree of reliance on navigational equipment. For vessels drawing less than 10 metres navigation throughout the route is elementary. However about one third of vessels draw between 10 and 12.2 metres, and for these vessels there are several areas where available depths limit room to manoeuvre and this has required the judicious placement of aids to navigation.

The aid to navigation network has been optimised to provide transits for course alterations and head marks and stern marks. In addition, a combination of fixed light sectors and buoys enables intuitive but tightly controlled navigation/pilotage.

In order to verify the network's intended 'usefulness', simulated transits were made under various conditions (day, night and poor visibility) using the Integrated Marine Simulator at the Australian Maritime College in Launceston, Tasmania. This exercise was conducted with the assistance of three Australian Maritime Safety Authority personnel (ex-mariners), a Great Barrier Reef pilot and two Det Norske Veritas consultants.

To finalise the planned aid to navigation network, a team comprising Australian Maritime Safety Authority staff and their project management and construction contractors carried out site inspections to collect bathymetric and geotechnical data to help with design and construction. Some minor adjustments to planned aid to navigation positions were made to accommodate engineering and construction requirements. The use of GIS models made it relatively easy to make these changes whilst also maintaining the integrity of transits, head marks and stern marks.

Feedback from mariners, primarily coastal pilots, indicates the LADS Passage aids to navigation are performing very well. However, there was some cause for concern in March 2005 when the area was struck by tropical Cyclone Ingrid. As Ingrid passed over LADS Passage it was rated a category four cyclone (the second highest cyclone rating). It did cause some minor damage to several of the new aids, but all in all the aids weathered the storm well.

The Australian Government endorses that in the maritime context 'safer and more efficient navigation reduces incidents and pollution of the marine environment', and that 'more efficient navigation, regardless of transport mode, will reduce fuel consumption, the resultant pollution and traffic congestion'.² Whilst these benefits are articulated with reference to satellite navigation, LADS Passage is nonetheless a clear example of how improvements to the safety and efficiency of marine navigation can benefit mariners and the environment alike.

Given there are about 1 500 ship transits annually (all sizes) through the Great Barrier Reef inner route, the primary benefit of LADS Passage is the improvement it brings to navigation safety in this environmentally sensitive and pristine area. In addition, for the mariner the most tangible benefits of LADS Passage are the savings in bunker costs and reduced steaming time.

² Positioning for the Future, Australia's Satellite Navigation Strategic Policy