

Appendix B - Plan Change 1 - Technical advice for s42A reply – Southern right whales

Introduction

1. My full name is Chloe Lucinda Corne.
2. The information, advice and opinion below are provided in response to Minute 3 issued by the Hearing Commissioners for Plan Change 1 for the Regional Coastal Plan: Kermadec and Subantarctic Islands (RCP).
3. This technical advice is supplementary to my written advice dated 7th May 2026.

Topic 6: Access and Anchoring – Request for an anchorage at Tucker Point, Port Ross, Auckland Island

Background context

4. Sanford Limited has sought that Tucker Point be considered as an additional permitted anchorage location. In the written evidence of Mr Darryn Shaw on behalf of Sandford Ltd, Mr Shaw stated that the area of Tucker Point is outside DOC's identified high whale activity areas (paragraph 50(b)). Mr Shaw also made this point in his oral evidence to the Hearing Commissioners on 9th June 2026.

Comment

5. Tucker Point is located inside the harbour of Port Ross (Figure 1), which is the key breeding habitat for the NZ population of tohorā /southern right whales (*Eubalaena australis*). As Mr Shaw stated, it is outside the areas of highest density published in Carroll et al., (2022). However, this does not mean that an anchorage at Tucker Point would be without potential impacts on southern right whales.
6. In brief, southern right whale sightings inside Port Ross (see Figure 2 to Figure 5) have generally been concentrated in the southwest, central harbour, and around the south coast of Enderby Island (Carroll et al., 2022; Patenaude & Baker, 1996; Rayment et al., 2012, 2015), although whales have been recorded throughout the harbour. Sightings near Tucker Point include both cow-calf and non-calf groups but have been recorded less frequently comparative to core areas.
7. Using data collected during 2020 and 2021, Carroll et al. (2022) estimated the relative density of southern right whales in Port Ross at a 50 x 50m resolution. The highest densities of whales were in the inner, central and southwestern parts of Port Ross, and south of Enderby Island. Smaller areas of high density were also present in parts of the outer harbour (see Figure 6).
8. A closer examination of Figure 6 (see insets) shows that although whale densities in the vicinity of Tucker Point are lower comparative to other parts of the harbour, some cells exhibit higher densities than the minimum. This is apparent in both the cow-calf pair (Figure 6a) and the adults-only density estimates (Figure 6b). These estimates indicate that southern right whales do use the area, albeit at lower densities than elsewhere within Port Ross.

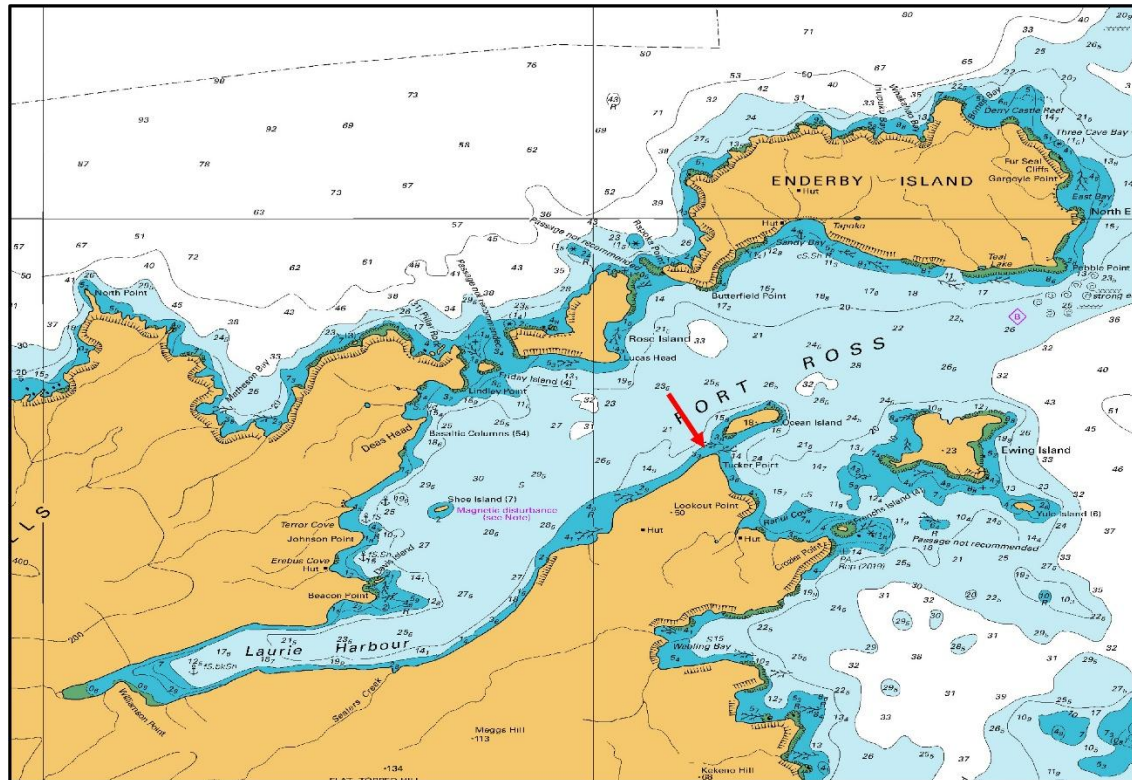


Figure 1 Port Ross as shown in LINZ Chart NZ Plans in the Auckland Island – Enderby Island to Smith Harbour. Location of Tucker Point is indicated by the red arrow.

9. Although surveys varied in duration, they were generally conducted during the peak breeding season (July-August) and provide a robust indication of southern right whale distribution and relative density within Port Ross. However, whale distribution is dynamic rather than static; there will be some variation in exact locations over time given that southern right whales are highly mobile marine mammals. Further, detecting whale presence is easier than demonstrating genuine absence (MacKenzie & Royle, 2005), as whales must be both present and observable when a survey is conducted. Animals that are submerged or using an area outside survey periods may go undetected. Given these limitations, and because survey coverage was not continuous (i.e., researchers cannot continuously survey all areas throughout the entire breeding season), low numbers or an absence of sightings around Tucker Point during surveys should not be interpreted as evidence that southern right whales do not use the area.
10. The area around Tucker Point has all the key habitat characteristics preferred by cow-calf pairs and (to a lesser extent), adult groups. These features include <0.5m swell, <1000m to sheltered shoreline, 5-20m depth, and 200-1200m from coast. Habitat suitability modelling identified shallow, sheltered nearshore areas around Port Ross, including around Tucker Point, as suitable habitat for cow-calf groups and adult groups (Figure 7 and Figure 8; Rayment et al., 2014). The area around Tucker Point has all the key habitat characteristics preferred by cow-calf pairs and (to a lesser extent), adult groups. These features include <0.5m swell, <1000m to sheltered shoreline, 5-20m depth, and 200-1200m from coast. Habitat suitability modelling identified shallow, sheltered nearshore areas around Port Ross, including around Tucker Point, as suitable habitat for cow-calf

groups and adult groups (Figure 7 and Figure 8; Rayment et al., 2014). As the population continues to recover, density dependent range expansion is likely to occur. Evidence from southern right whale wintering grounds in Golfo Nuevo (Peninsula Valdés, Argentina) suggests there may be a density threshold beyond which increases in southern right whale abundance are accommodated through greater use of adjacent lower-density areas (Sueyro et al., 2018). Accordingly, this means that the pattern of high densities in the inner, southwest and central harbour, and south of Enderby Island at Port Ross is likely to persist, but that population growth may result in greater use of adjacent lower density areas. This is consistent with observations from Peninsula Valdés, where cow–calf pairs tended to remain concentrated in preferred habitat, while non-calf groups were more likely to expand into peripheral areas (Sueyro et al., 2018). Given that the New Zealand southern right whale population remains at less than 12% of its estimated pre-whaling abundance (28,800–47,100; Jackson et al., 2016), increasing use of areas such as Tucker Point may be reasonably expected as recovery continues.

11. Vessel strike risk occurs when whales and vessels overlap in space and time, with naïve individuals considered particularly susceptible (Laist et al., 2001). Whilst the likelihood of collision may be reduced through detection and avoidance by either the whale or vessel, such mechanisms are not fail-safe. Both North Atlantic right whales (*E. glacialis*) and southern right whales have been shown to exhibit limited responses to approaching vessels (Argüelles et al., 2022; Nowacek et al., 2004). Argüelles et al. (2022) showed that southern right whales did not react to transiting vessels until close range, although responses varied according to behavioural state and group composition. Successful avoidance depends on the whale detecting the vessel, recognising it as a threat, and responding in sufficient time. A failure at any point in this sequence may result in collision. Similarly, bow watches and vessel-based detection technologies have limitations, particularly where whales are submerged and unavailable for visual or thermal detection. This is of relevance for cow-calf pairs in particular, as injury or mortality affecting breeding females or calves has the potential to influence population recovery (e.g., Corkeron et al., 2018; Linden et al., 2024).
12. The route taken to and from Tucker Point is also relevant to the assessment of potential effects. In his oral evidence, Mr Sam Penwarden indicated that based on the information available on the marine chart, a vessel master would be more likely to access the anchorage via the centre of Port Ross rather than navigating through the waters around Tucker Point, Ocean Island, and Frenchs Island. Notwithstanding Mr Jim Dilley’s discussion of navigational access in his *Plan Change 1 - Technical Advice for s42A reply – Navigation Safety*, should a vessel’s master elect to transit through the central harbour, the route would likely pass through areas where southern right whales are commonly recorded. This includes areas of relatively high whale density (refer to Figure 6), thereby increasing the likelihood of vessel–whale overlap.
13. In summary, although Tucker Point lies outside the areas of highest estimated southern right whale density within Port Ross, the available evidence indicates

that the area is used by both cow-calf pairs and other demographic groups, contains habitat characteristics preferred by southern right whales, and may experience increased use as the population recovers. Consequently, the potential for vessel-whale interactions associated with an anchorage at Tucker Point should not be discounted solely because the area is not currently identified as a core concentration area.

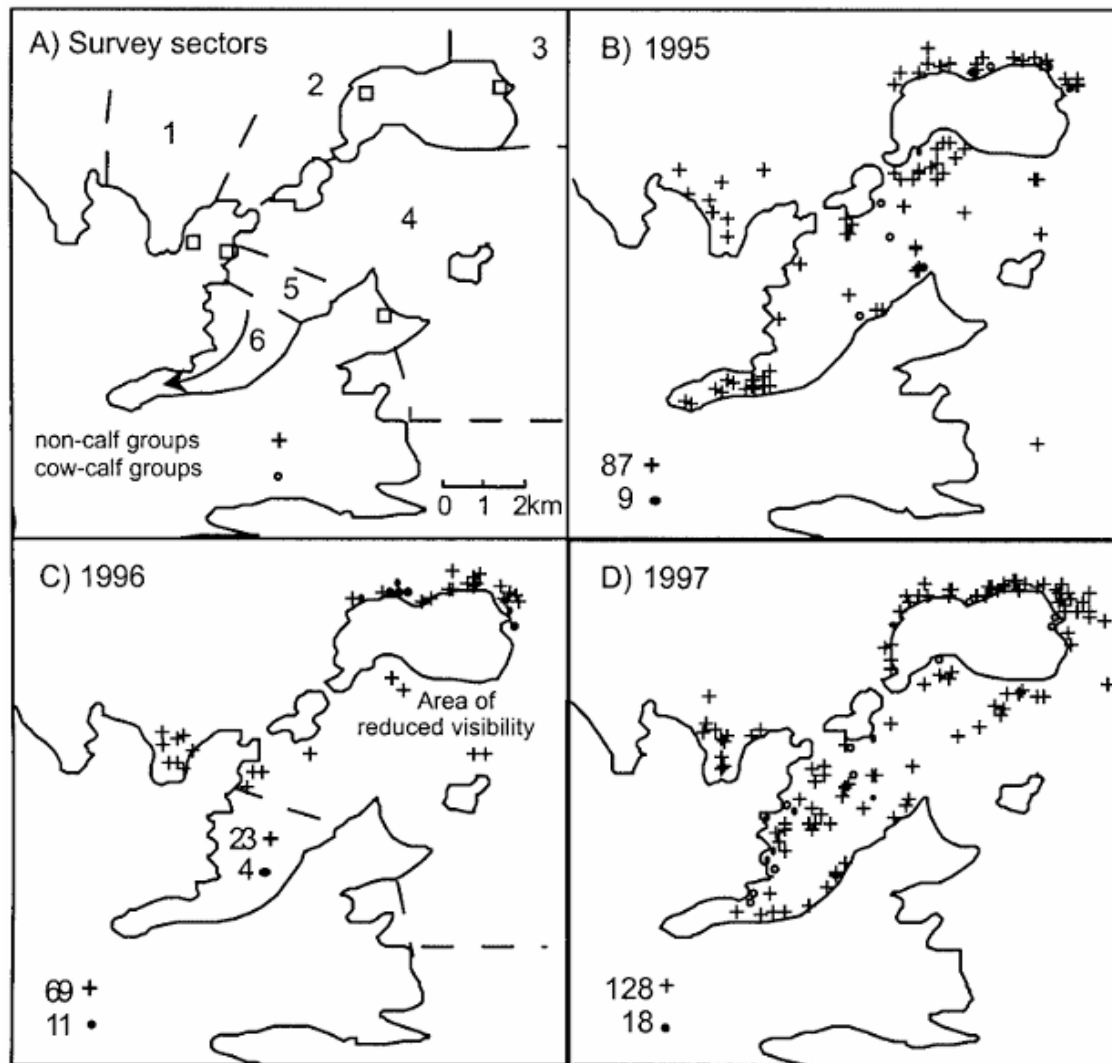


Figure 2 Adapted from Fig. 2 in Patenaude & Baker (2001). Study area (A) shows squares representing land-based observation points, whilst the arrow shows path of vessel-based survey. Locations of southern right whale sightings during simultaneous surveys in Port Ross and around Enderby Island between 1995-1997 are shown (B – D). Surveys were 2-3 weeks' duration between mid-July to early August. Whale locations were not recorded in 1996.

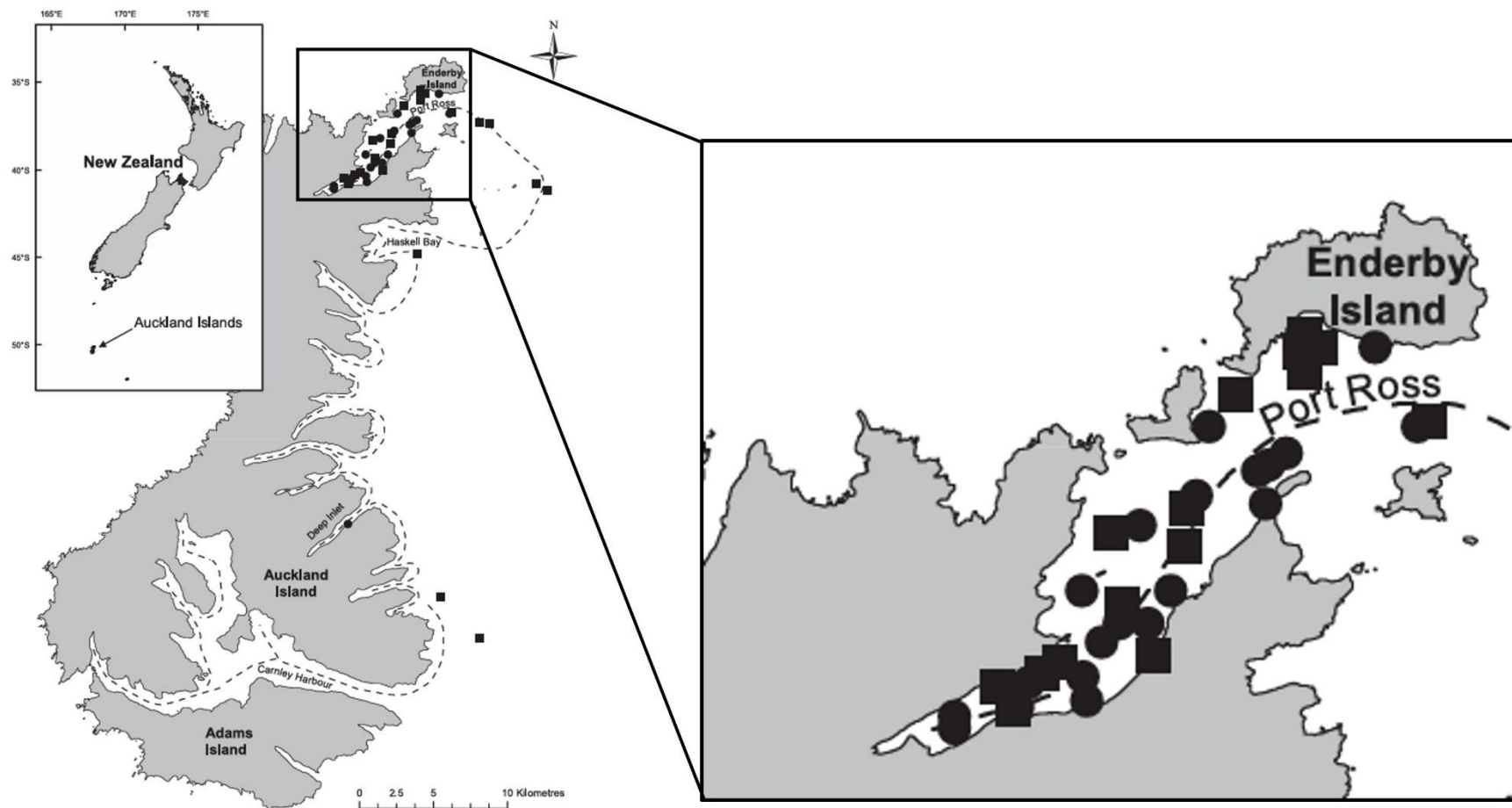


Figure 3 Adapted from Figure 1 in Rayment et al., (2012), showing southern right whale locations in Port Ross (and around the Auckland Islands) on 2nd and 3rd August 2011. Dashed line shows the vessel track; circles show cow-calf pairs and squares show all other whales.

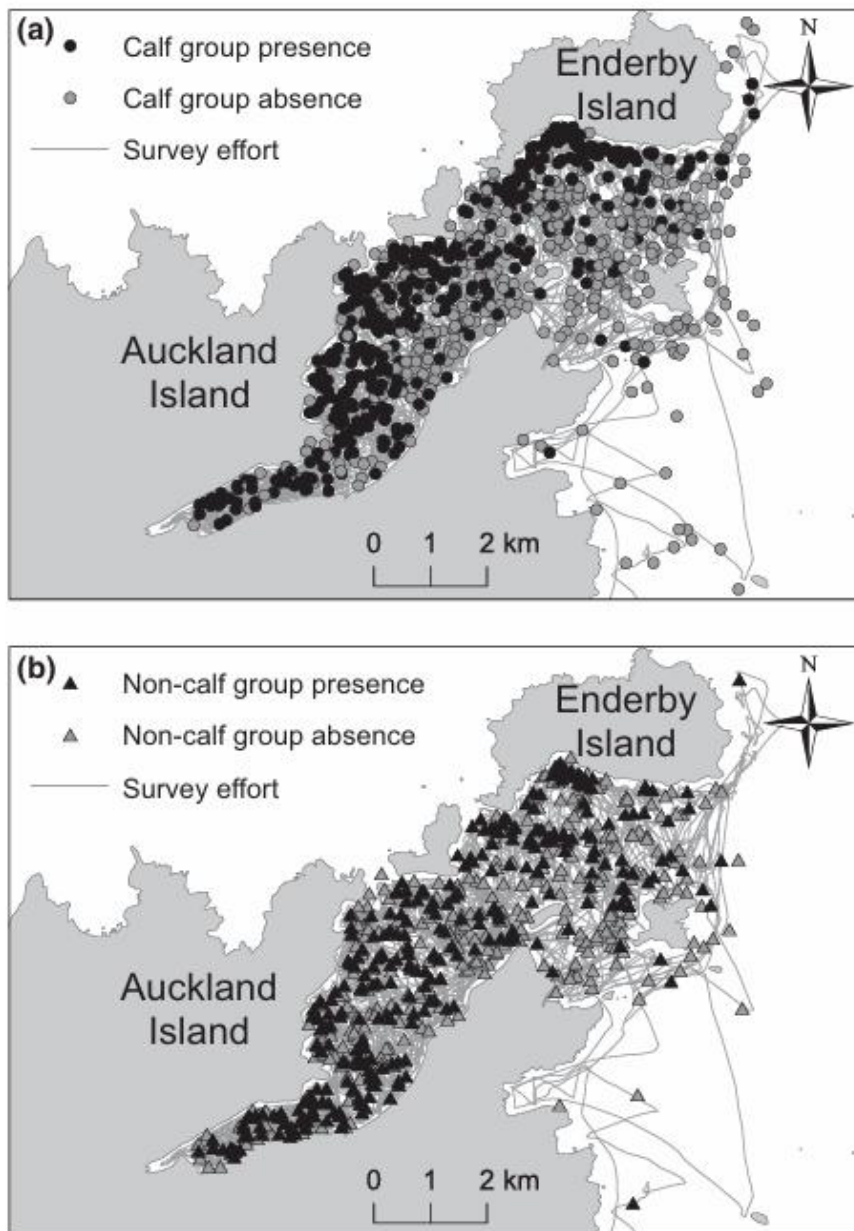


Figure 4 Adapted from Figure 3 in Rayment et al., 2014. Survey effort in and around Port Ross during winters of 2010, 2011 and 2012. Sighting locations for cow-calf groups (a) and non-calf groups (b) are shown with black circles and black triangles respectively. Grey circles and triangles denote pseudo-absence locations.¹

¹ Further information can be provided regarding the methods, function and reasoning for use of pseudo-absence locations in species distribution modelling in Rayment et al., (2014) upon request. In brief, genuine absence is difficult to confirm for mobile aquatic species that may be underwater (i.e., present, but not observable), so pseudo-absence points can be generated to provide the model with a point of contrast to a sighting location.

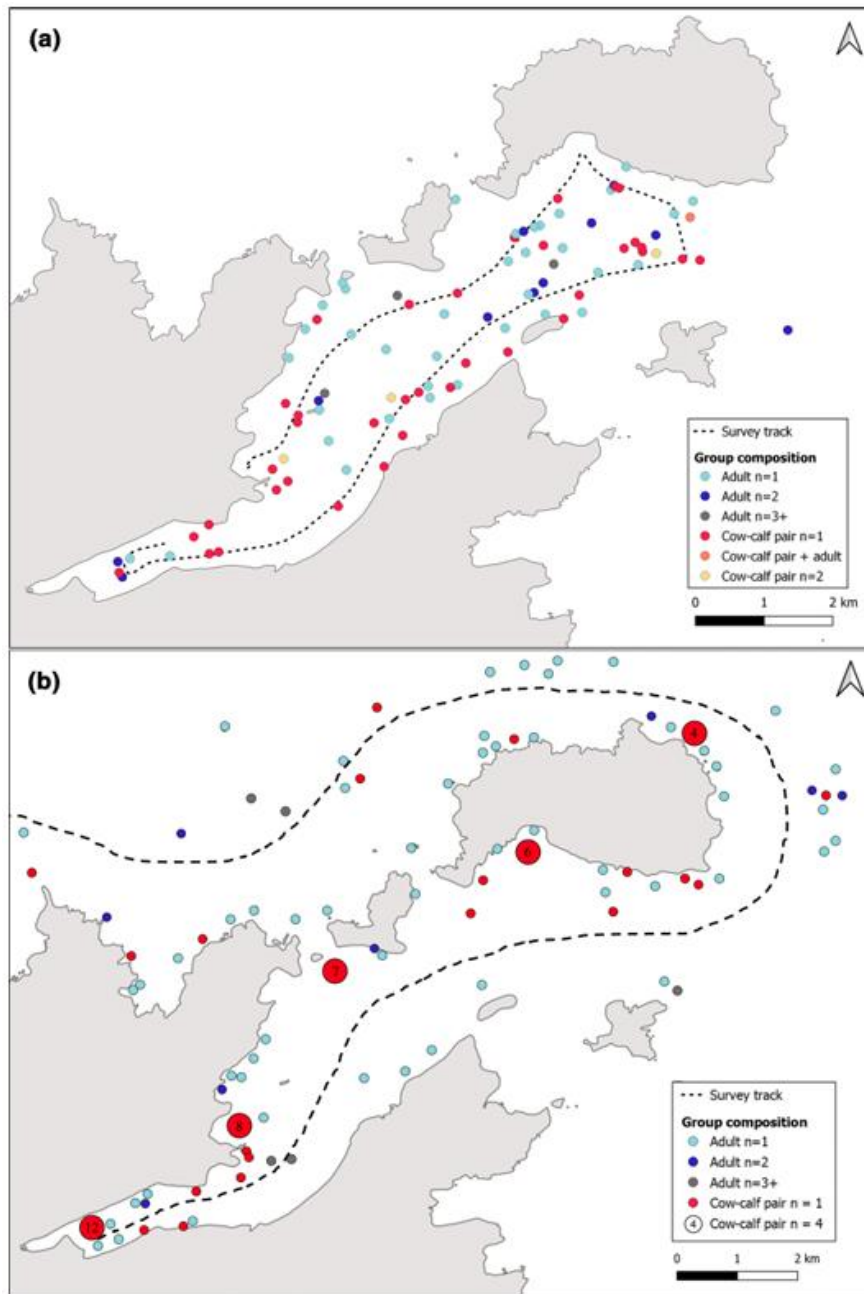


Figure 5 Adapted from Carroll et al., (2022). Comparison of southern right whale sightings from single day non-systematic vessel-based surveys in Port Ross on 10th July 2021 (a) and 29th July 2008 (b).

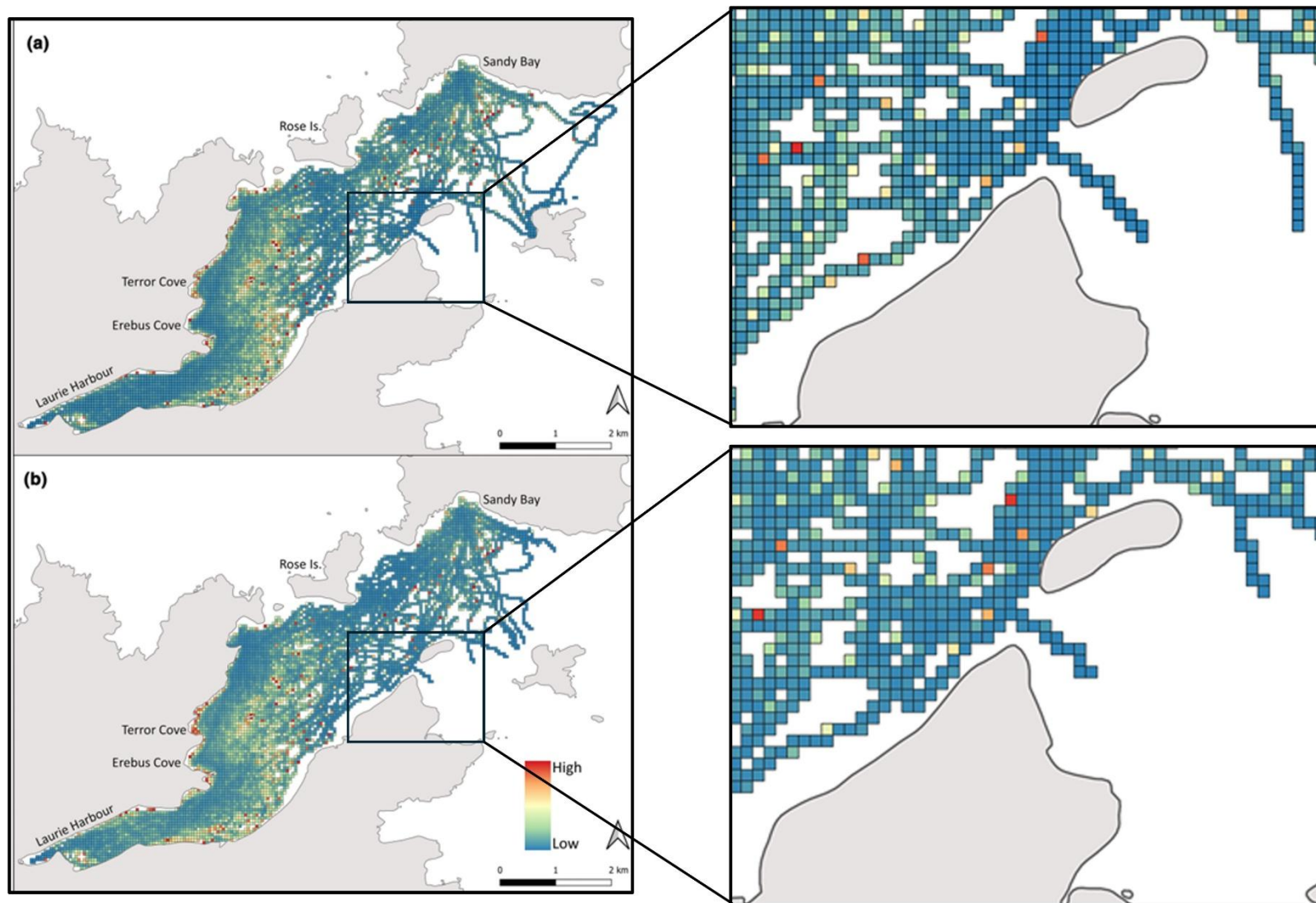


Figure 6 Adapted from Carroll et al., (2022). Southern right whale density (2020 and 2021 seasons combined) for cow-calf pairs (a) and adult groups (b). Densities are estimated in 50x50m grid cells and are displayed as a 'heatmap', with red indicating areas of highest density. Insets show close view of densities in the vicinity of Tucker Point.

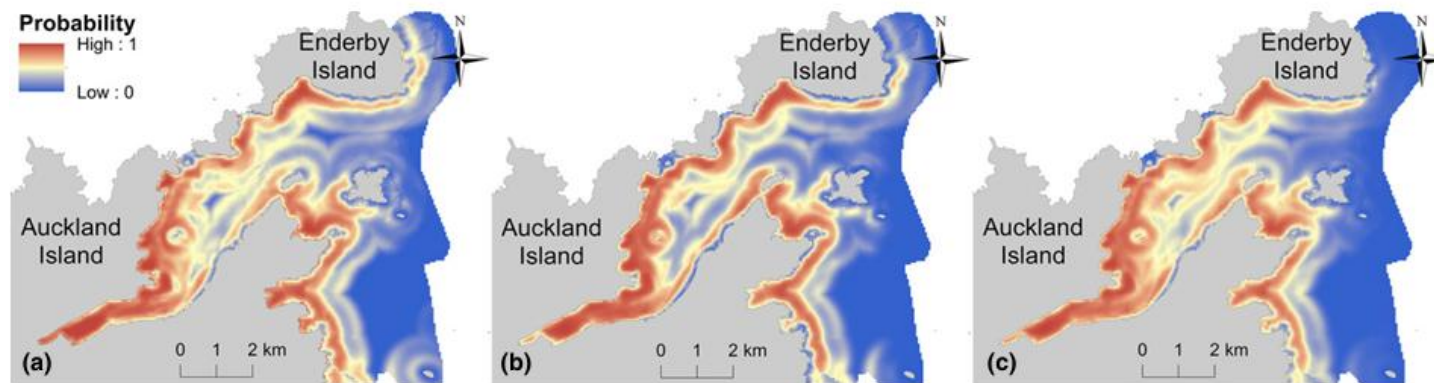


Figure 7 Adapted from Figure 6 in Rayment et al., (2014). Predicted habitat suitability for southern right whale mothers and calves during winter, based on observed habitat characteristics and whale locations collected during surveys in 2010–2012. The predictions were developed using data from two survey years and then tested against the third year to ensure the results were reliable. Three different combinations of years were used, these being (a) 2010 and 2011, (b) 2010 and 2012, and (c) 2011 and 2012. All models produced broadly similar patterns of suitable habitat.

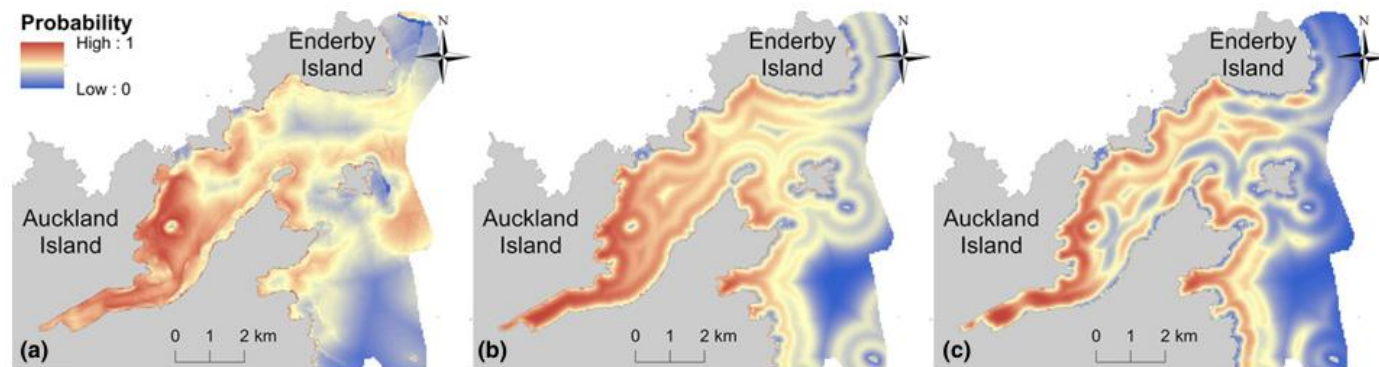


Figure 8 Adapted from Figure 7 in Rayment et al., (2014). Predicted habitat suitability for southern right whale non-calf groups during winter, based on observed habitat characteristics and whale locations collected during surveys in 2010–2012. The predictions were developed using data from two survey years and then tested against the third year to ensure the results were reliable. Three different combinations of years were used, these being (a) 2010 and 2011, (b) 2010 and 2012, and (c) 2011 and 2012. All models produced broadly similar patterns of suitable habitat.

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