Amrun Project 2017 Inshore Dolphin Survey Summary – Blue Planet Marine

As part of the RTA Weipa Pty Ltd (RTW's) Amrun Project *Inshore Dolphin Offset Strategy*[1], vessel-based surveys have been undertaken to obtain knowledge about the distribution, abundance and habitat use by Australian snubfin and humpback dolphins in the region from Weipa to Aurukun. Following a pre-construction phase baseline survey conducted by GHD in 2014, Blue Planet Marine (BPM) was contracted by RTA to conduct surveys in 2016 and 2017 during the construction phase of the Amrun Port and river facilities. This interim summary report provides details about the 2017 survey. A full report including inter-year analysis will be provided on completion of the final construction survey (2018).

Survey training days, which included testing of equipment and data collection, were completed on 11 to 13 October. Surveys were completed over 14 days from 14 to 27 October 2017 inclusive. The methods used for the 2017 survey followed those of the 2014 and 2016 surveys, described in detail in the *Inshore Dolphin Offset Strategy*[1], the *2014 Inshore Dolphin Baseline Survey*[2] report, and the *Amrun Project Inshore Dolphin Survey 2016 Report*[3]. Three vessels undertook simultaneous, predetermined line-transect surveys to collect sighting, photo-identification and habitat data on inshore dolphins encountered at three sites ranging from Pine River in the north to Aurukun in the south (Figure 1).

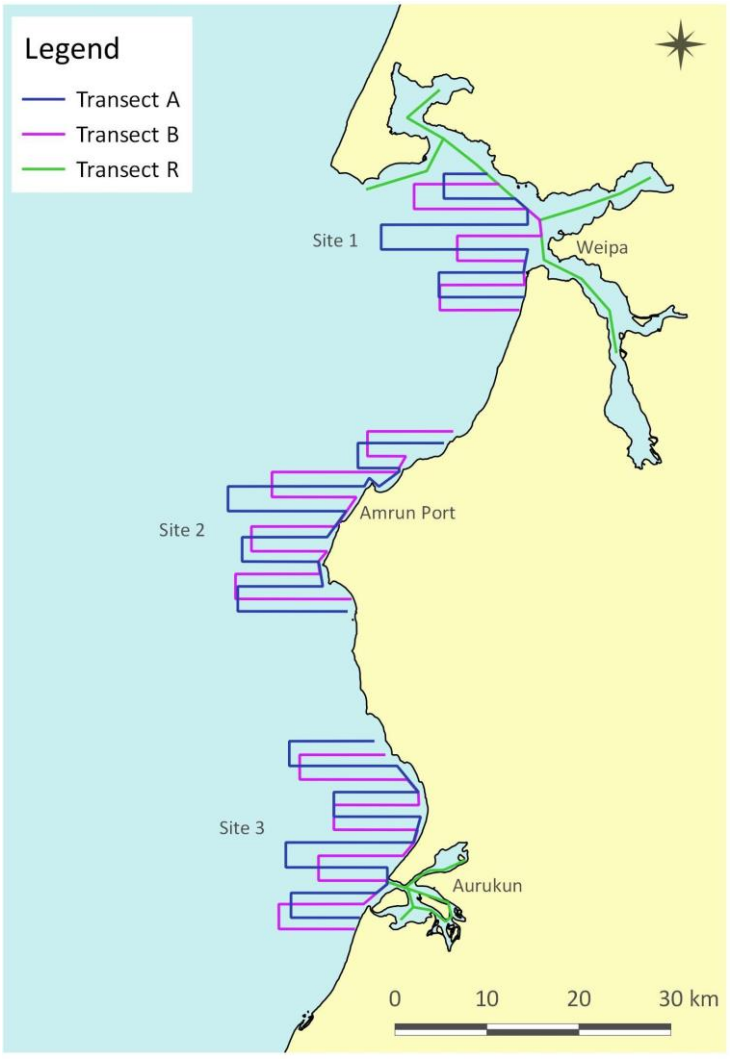

Figure 1. Overview of transects for the Inshore Dolphin Survey undertaken in Ocotober 2017.

1. Rio Tinto Alcan (2015) Inshore Dolphin Offset Strategy - South of Embley Project
2. GHD (2015) Rio Tinto Alcan, South of Embley Inshore Dolphin Project, December 2014 Baseline Survey
3. Blue Planet Marine (2017) Amrun Project Inshore Dolphin Survey 2016 Report

These surveys were designed using Robust Design capture-recapture methods, such that each primary sample (i.e. each year's total survey) consisted of a number of smaller secondary samples. For the 2014, 2016 and 2017 surveys, the primary sample included four secondary samples, made up of either "A" or "B" transects at each site, plus river transects ("R" transects) for sites 1 and 3 (Table 1).

Sample	Site 1 transects	Site 2 transects	Site 3 transects
Secondary sample 1	A1 to A13, R1-R15	A14 to A32	A33 to A49, R16-R28
Secondary sample 2	B1 to B14, R1-R15	B15 to B32	B33 to B51, R16-R28
Secondary sample 3	A1 to A13, R1-R15	A14 to A32	A33 to A49, R16-R28
Secondary sample 4	B1 to B14, R1-R15	B15 to B32	B33 to B51, R16-R28

Table 1. Transects completed per secondary sample during the 2017 survey.

A team of seventeen researchers undertook the surveys in 2017, including Traditional Owners Alicia Topping, Tracey Matthew, Tianna Chevathen, Bernadette Chevathun, Pearl Matthew and Trini Kerindun, members of RTW's HSE team Linda Wells, Steven Miller, Emma Nelson and Vicki Fullagar and BPM's Dave Paton, David Donnelly, Liz Hawkins, Corey Lardner, Mitch Burrows, Andrew Nichols and Dan Burns. BPM's 6m RHIB, *Beluga*, was used to survey site 1, while the 17m live-aboard vessel, *Phantom IV*, was used in conjunction with the 6.4m RHIB, *Coda*, to complete the surveys at Sites 2 and 3 and to assist with site 1 as needed.

A total of 307 hours and 58 minutes were spent on the water for the 2017 survey, with all vessels at all sites totalling 3,813 kilometres travelled. Of this time, 123 hours and 8 minutes were spent on transect (1,572 km). Beaufort conditions ranged from 0 to 4 throughout the survey, during which time the research team sighted a total of 87 dolphin pods consisting of 467 individuals (Figures 2-5). Nine of the 87 pods were mixed species groups, including eight groups of Australian humpback dolphins with inshore bottlenose dolphins and one mixed species group of Australian humpback and snubfin dolphins. Separating the mixed groups into their component species, the total 'on' and 'off effort' sightings included:

- 58 Australian humpback dolphin pods consisting of 221 individuals (Group size (GS) ranged from 1-20),
- 26 inshore bottlenose dolphin pods consisting of 178 individuals (GS: 1-31),
- 1 offshore bottlenose dolphin pod consisting of 25 individuals (GS: 25),
- 5 Australian snubfin dolphin pods consisting of 12 individuals (GS: 2-3),
- 3 spinner dolphin pods consisting of 29 individuals (GS: 4-18), and
- 3 unidentified dolphin pods consisting of 3 individuals (GS: 1).

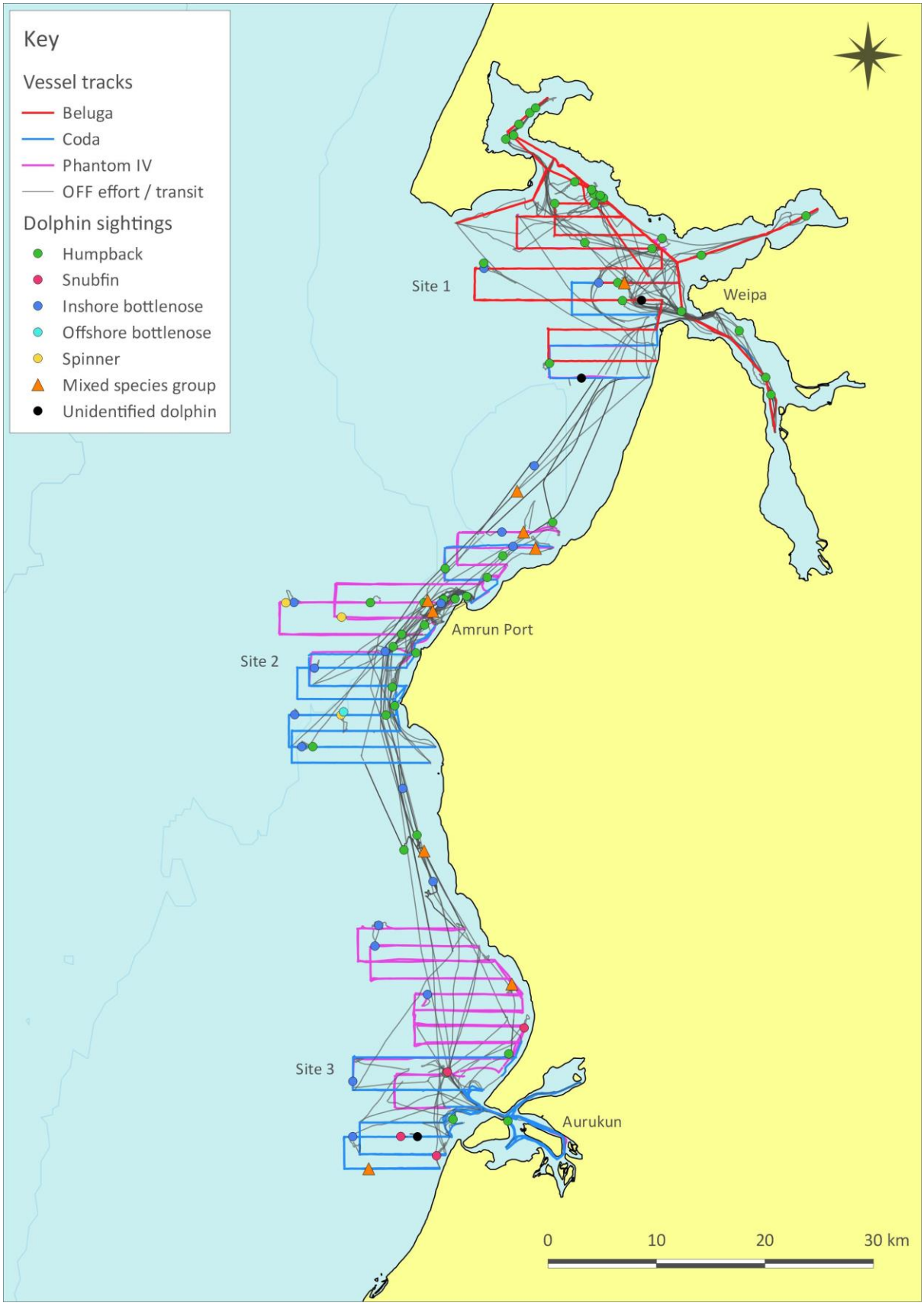

Figure 2. Overview of dolphin sightings and on and off survey effort for the 2017 Inshore Dolphin Survey.

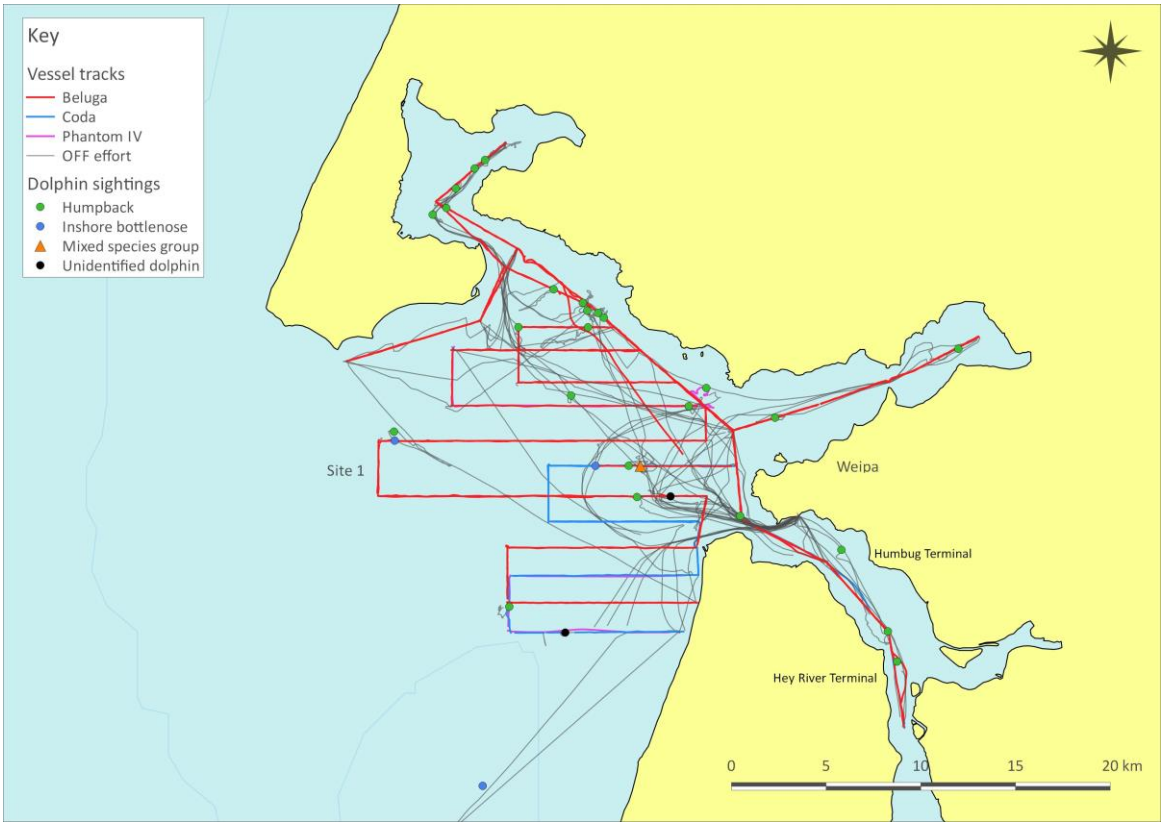

Figure 3. Dolphin sightings and on and off survey effort at Site 1 for the 2017 Inshore Dolphin Survey.

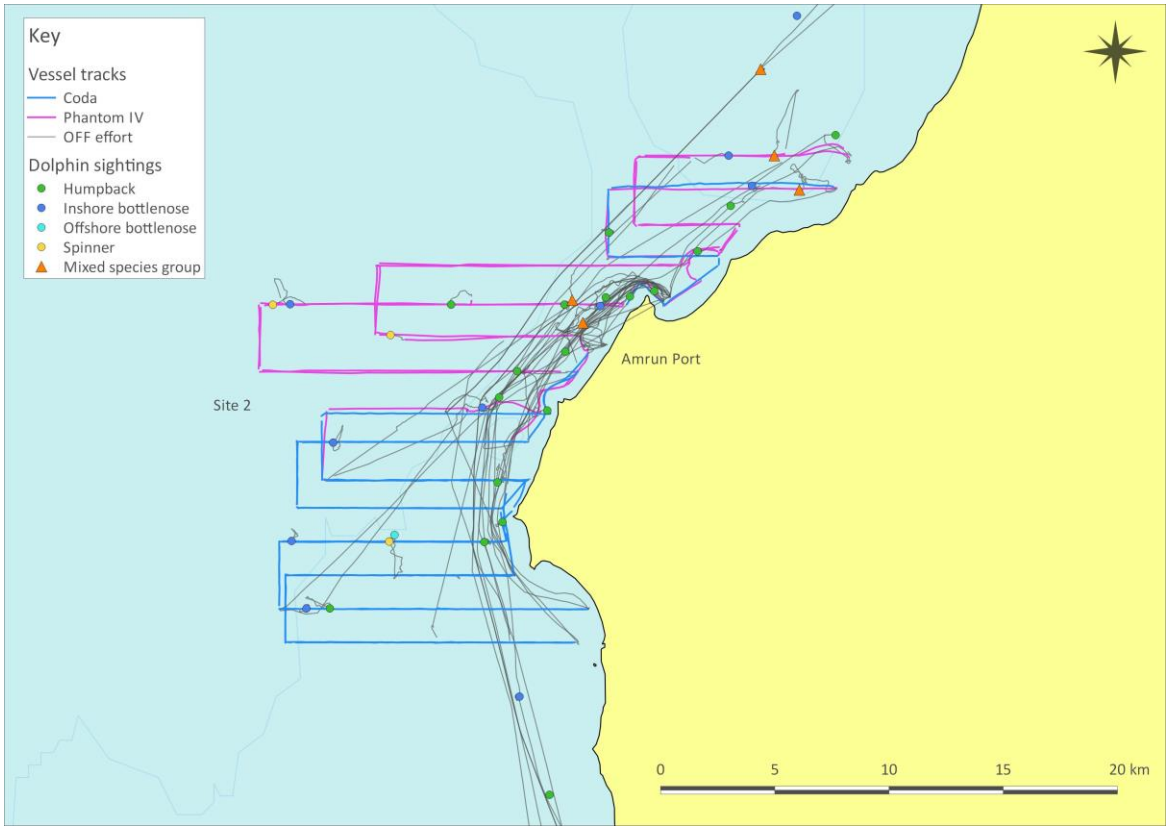

Figure 4. Dolphin sightings and on and off survey effort at Site 2 for the 2017 Inshore Dolphin Survey.

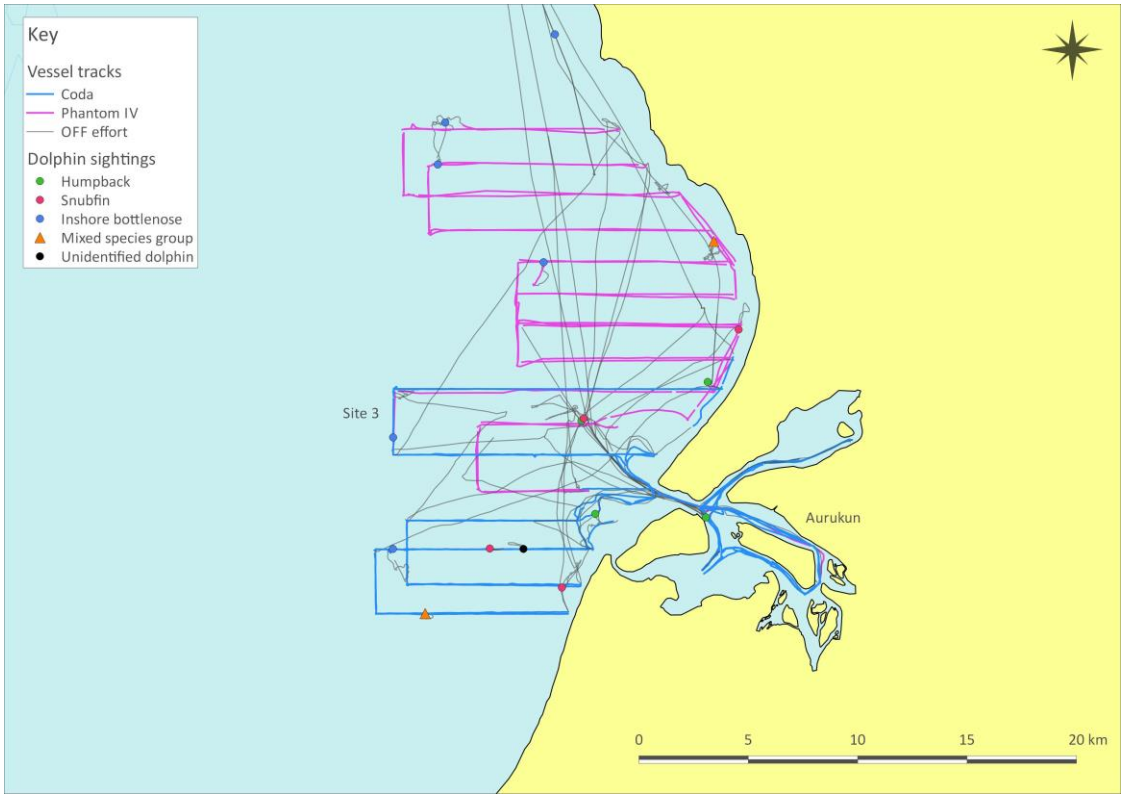

Figure 5. Dolphin sightings and on and off survey effort at Site 3 for the 2017 Inshore Dolphin Survey.

Overall Linear Encounter Rates (LER), calculated using the total number of dolphins sighted while 'on effort' divided by the total kilometres travelled on transect during the 2017 survey are shown in Table 2.

Distance travelled on effort (km)	Mean Linear Encounter Rate on effort (per km of transect)				
	Humpback	Inshore bottlenose	Spinner	Offshore bottlenose	Snubfin
1,572	**0.064**	**0.036**	**0.018**	**0.016**	**0.004**

Table 2. Overall on effort Linear Encounter Rates of dolphin species during the 2017 survey.

Using a 3 x 3 km grid overlain on the study area and assuming a 500 m strip width (i.e. 250 m either side of the transect line, estimated to be the average distance to which dolphins could be reliably observed under a variety of sea conditions (Brown et al. 2014), on-transect survey effort (km^2 per grid cell) was calculated for all four sampling occasions combined. These data will be used to calculate Survey Area Encounter Rates (SAERs) of dolphins per grid cell for the 2017 survey and are represented in Figure 6. Overall SAERs for the 2017 survey were 0.127 humpback dolphins per km^2 on effort, 0.071 for inshore bottlenose, 0.037 for Spinner, 0.032 for offshore bottlenose and 0.009 for snubfin.

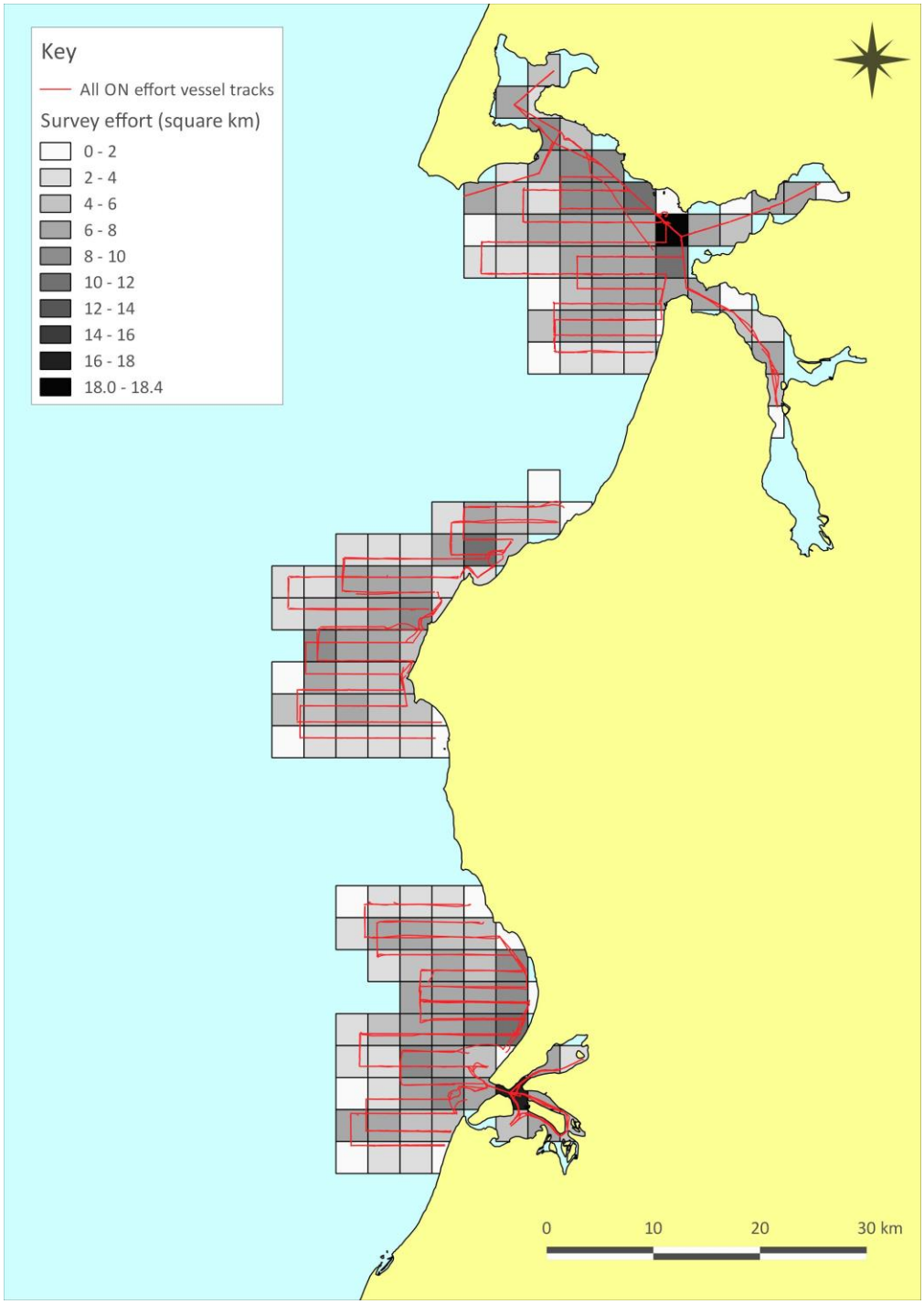

Figure 6. Survey effort with 3x3km grid overlay showing effort in km^2 per grid cell for the 2017 survey. These data will be used to calculate Survey Area Encounter Rates per grid cell.

Analyses of the dolphin photo identification data are currently being finalised and will be included in the full 2017 survey report, along with further details about encounter and resight rates, abundance estimates, and habitat preferences.

During the 2017 inshore dolphin surveys, the observer team also sighted 308 individuals of other marine megafauna species. Of the non-dolphin species sighted, the most common were marine turtles (n=120, 39%), sea snakes (n=94, 31%) and sharks (n=51, 17%). Locations of other marine megafauna sightings are shown in Figure 7.

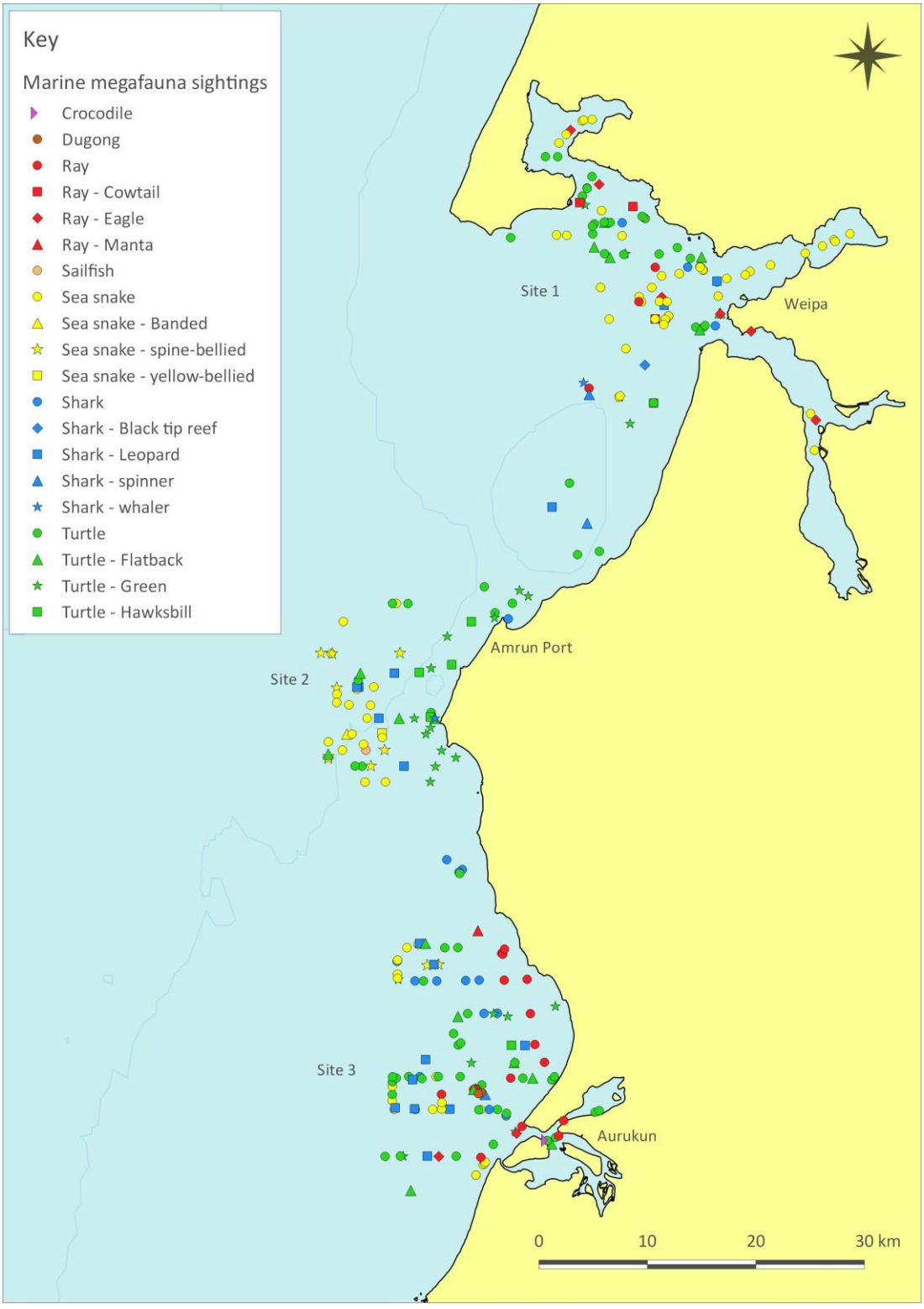

Figure 7. Locations of marine megafauna sightings during the 2017 dolphin survey.