Evaluating Inshore Dolphin Status in Girringun Managed Sea Country

September 2016

Isabel Beasley and Girringun Rangers
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Acknowledgements

Many thanks to Girringun Aboriginal Corporation and Traditional Owners for allowing these surveys to be undertaken in Girringun Managed Sea Country. Particular thanks to Phil Rist (Executive Officer, Girringun Aboriginal Corporation), for completely supporting dolphin and dugong surveys since 2012.

Many thanks to Karman Lippitt, Whitney Rassip, Sean Walsh and Janie Eaton for facilitating the surveys.

Special thanks to the Traditional Owners that participated in these surveys; Nanna Marjorie Kinjun (Gulnay), Leonard Andy (Djiru), Melisa Anderson (Nywaigi) and Leisha Anderson (Nywaigi)

Thanks also to Mathew Golding, who skippered the vessel, and assisted significantly with observations and data entry.

This project was conducted under James Cook University (JCU) Human Ethics Permit Number H4451, JCU Animal Ethics Permit Number A1750, Department of Environment and Heritage Protection Permit Number WISP11956112 and Great Barrier Reef Marine Parks Authority Permit Number 35496.

Project Sponsors – Boat Surveys

Thanks to WWF – Australia and Tassal for providing the JCU vessel used to conduct surveys.

Many thanks to James Cook University and the Commonwealth Department of Environment for providing funding to support these surveys.

Thanks to the Department of Prime Minister and Cabinet and the Department of Environment and Heritage Protection for providing funding for Girringun Aboriginal Rangers time and resources to participate in these surveys through the Working On Country Program and the Queensland Indigenous Land and Sea Rangers Program.
Executive Summary

This report documents a training workshop and boat-based surveys conducted in partnership with Girringun Aboriginal Corporation during 2016.

Training Workshop
- A four-day training workshop was conducted in May 2016.
- The workshop consisted of two days in-class and three days conducting surveys.
- During the training surveys, 360 km was travelled over 35 hours, resulting in 273 km on transect conducting surveys (28 hours)
- A total of 18 groups of dolphins (total group size = 72) were sighted during the training surveys:
  - 1 snubfin dolphin group (total group size = 10)
  - 12 humpback dolphin groups (total group size = 54)
  - 1 bottlenose dolphin group (total group size = 4)
  - 4 unknown dolphin groups (total group size = 4)

Survey Effort
- A total of 15 days were spent conducting boat-based surveys throughout the Girringun TUMRA region during September/October 2016.
- A total of 1919 km were travelled during surveys over 140 hours (i.e. transiting to and from transects, and distance/time spent photographing dolphin groups).
- A total of 752 km (84 hours) were spent on transect, surveying for dolphin groups and other marine megafauna.
- All of the proposed survey lines were completed throughout Girringun Sea Country.

Dolphin Sightings
A total of 34 dolphin groups (203 individuals) were sighted during surveys, consisting of:
- 18 humpback dolphin groups (total group size = 92)
- 5 snubfin dolphin groups (total group size = 36)
- 1 mixed snubfin and humpback dolphin group (total group size = 21 individuals; 9 humpback dolphins and 12 snubfin dolphins)
- 7 bottlenose dolphin groups (total group size = 50)

Photo-identification
Of the 34 groups sighted, 32 groups were photographed, with at least one individual being photo-identified. A total of 23,564 images were taken.

A total of 64 individuals were photo-identified:
- 8 snubfin dolphins
- 40 humpback dolphins
- 16 bottlenose dolphins
Megafauna
A total of 57 groups of megafauna (110 individuals) were sighted during surveys, consisting of the following;

- 17 dugong groups (43 individuals)
- 66 turtles – unknown species
- 30 green turtles groups (57 individuals)
- 1 ray
- 2 sharks
- 2 crocodiles

Discussion

Survey Importance

- These were the third broad-scale surveys to be conducted throughout Girringun Sea Country since 2013.
- The large study area provided important information on distribution of inshore dolphins, and the opportunity to compare occurrence and movements from other nearby sites (i.e. Dr. Cagnazzi’s study south of Townsville, Townsville and North Queensland surveys).
- Photo-identification comparisons between sites along the North Queensland coast will be undertaken once other survey reports have been completed.

Dolphin Sightings

- Humpback dolphins were sighted throughout Girringun Sea Country, from Balgal Beach north to Mission Beach.
- Snubfin dolphins were very elusive, and only sighted near Lucinda and Balgal Beach. No snubfin dolphins were sighted north of Lucinda.
- Bottlenose dolphins were primary sighted in deeper waters south of Lucinda, although one group was sighted near Tully Heads.

Megafauna Sightings

- In addition to dolphin sightings, these surveys collected information on marine megafauna (i.e. turtles, dugongs, seasnakes) sighted during surveys.
- Dugong were primarily sighted within Missionary Bay, Hinchinbrook Island, indicating this is an extremely important habitat that should be considered a high priority for future conservation and management initiatives.

Collaboration with Girringun Aboriginal Corporation

- Collaboration with Girringun Aboriginal Corporation and Traditional Owners was essential to the success of this project.
- Future projects are planned that build on this initial study and partner with Terrain NRM and other Aboriginal Corporations.
**Background**

**North Australian Inshore Dolphins**

The Australian snubfin dolphin (*Orcaella heinsohni*), Australian humpback dolphin (*Sousa sahulensis*), and Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) are tropical inshore dolphins of northern Australia. The Australian snubfin dolphin and Australian humpback dolphin are newly described species (2005 and 2014 respectively), thought to be endemic to northern Australia and southern Papua New Guinea (Beasley et al., 2016, Beasley et al., 2005, Jefferson and Rosenbaum, 2014). These little-known dolphin species occur in small, localised populations in often remote regions of northern Australia, from the Fitzroy River on the east coast of Australia across to the Dampier Peninsula on the west coast (Parra et al., 2002, Parra and Cagnazzi, 2016, Parra et al., 2004, Hanf et al., 2016). All three inshore dolphin species are listed as migratory and Matters of National Environmental Significance in Australian legislation. Snubfin and humpback dolphins were recently assessed as Vulnerable under the Queensland Nature Conservation Act and IUCN Red List (Parra and Cagnazzi, 2016).

**Project Aims and Objectives**

The aim of this study is to obtain information on broad-scale distribution of inshore dolphins in the Girringun TUMRA region, and collaborate with Girringun Rangers.

The objectives are:

- **Objective 1** – Collate existing data on inshore dolphin distribution, abundance and habitat use within the Girringun TUMRA region, based on data collected by Girringun rangers and James Cook University from 2012-2015.

- **Objective 2** – Investigate inshore dolphin distribution throughout the Girringun TUMRA region during the dry season (September 2016) and compare results to previous wet season surveys (i.e. February 2013 and 2014).

- **Objective 3** – Continue to build capacity of Girringun Rangers to conduct inshore dolphin surveys and analyse photo-identification and boat-based survey data.

**Study Area**

The study area for boat-based surveys consisted of all coastal waters of Girringun Sea Country, from Balgal Beach north to Kurramine Beach (just south of Innisfail). This region is encompassed by the Girringun Traditional Use of Marine Resources Agreement (Figure 1). There are six Girringun Aboriginal Corporation coastal tribal groups within the Girringun TUMRA region (Figure 2):

- Djiru
- Gulnay
- Girramay
- Bandjin
- Nywaigi
- Warrgmay
Figure 1. Girringun TUMRA region

Figure 2. Girringun Tribal Area Boundaries
Previous Inshore Dolphin Studies in Girringun Sea Country

Girringun Ranger Surveys – 2010 to 2012
Girringun Aboriginal Corporation (GAC) Ranger Unit was established in 2010. Rangers began recording opportunistic dolphin sightings in 2010. From 2010-2012, rangers recorded 28 marine mammal groups (Figure 3), consisting of:

- 8 humpback dolphin groups (one with unknown position information)
- 3 bottlenose dolphin groups
- 1 snubfin dolphin group
- 6 unknown dolphin species groups
- 8 dugong groups
- 2 humpback whale groups

Photographs were obtained of some dolphin groups confirming species identifications (Figures 4-8).
James Cook University Aerial Surveys
James Cook University has conducted aerial surveys along the north Australian coast for the past 20 years. Surveys were conducted along the northern GBR coast in 1992, 1994, 2005, and 2011.

Dolphin sightings obtained as part of these dugong surveys from 1992-2005 are shown in Figure 9, where the majority of sightings are ‘unknown’ groups, apart from one humpback dolphin group sighted near the north-western tip of Hinchinbrook Island.

According to Sobtzick et al (2012), the estimated size of the dugong population in the Southern GBR region in November 2011 was 481 ± 43, which are the lowest estimates since surveys began in the 1980s (Figure 10). Only four of the 21 blocks provided sufficient sightings for population size estimations in 2011: S5 (Shoalwater Bay), C6 (Upstart Bay), C10 and C11 (Hinchinbrook area) (Sobtzick, 2012).

Dugong population size estimates for the Hinchinbrook regions ranged from:
• 144-168 individuals (Block C10)
• 106-112 individuals (Block C11)
Aerial Surveys Conducted by Tony Preen (JCU)
From March 1997 – April 1998, Dr. Tony Preen (JCU) conducted aerial surveys for inshore dolphins and dugongs around the Townsville to Hinchinbrook region, and also conducted satellite tracking on some dugongs (Preen, 2000). This study was funded by the Commonwealth Government to determine marine mammal occurrence in relation to the Port Hinchinbrook development, and provided very important information on dugongs and turtles (Figure 11) and dolphins (Figure 12), being:

- the first detailed, year-round study of dugong distribution, abundance and movement patterns in the region using repeated aerial surveys, satellite tracking, historical aerial surveys and other approaches to obtain independent data on habitat use.
- the first summary of inshore dolphin occurrence and habitat use for the Townsville to Hinchinbrook region.


Figure 11. Locations of dugong (left) and turtles (right) observed during aerial surveys (Preen 2000)
Humpback Dolphin Sighting Locations 97-98

Snubfin Dolphin Sighting Locations 97-98

Figure 12. Locations of humpback dolphins (left map) and snubfin dolphins (right map) observed during aerial surveys (Preen 2000)

Hinchinbrook Region – Boat-based Surveys Conducted by Dr. Guido Parra (JCU)

From 1999-2003, Dr. Guido Parra from James Cook University conducted boat surveys to investigate the status of inshore dolphins for his PhD (Parra et al., 2002, Parra, 2005). Although Dr. Parra’s work was primarily focused in Cleveland Bay near Townsville, he also conducted some surveys in other areas along the northern Great Barrier Reef coastline, including Girringun Sea Country.

During Parra’s surveys in Girringun Sea Country, a total of 61 dolphin groups were observed (Figure 13), consisting of:

- 49 humpback dolphin groups
- 2 bottlenose dolphin groups
- 10 snubfin dolphin groups

There is currently no information available on months that dolphins were sighted, however, this information will hopefully become available in the near future to assist with survey design and planning.

Figure 13. Sightings of dolphins observed during Dr. Guido Parra’s boat-based surveys. Data and map kindly contributed by Dr. Guido Parra
Hinchinbrook Region – GAC/James Cook University Dolphin and Dugong Surveys

GAC in collaboration with James Cook University have been conducting inshore dolphin surveys since 2012 (Beasley et al., 2013). The study area for these surveys is Balgal Beach north to Kurramine Beach. Bottlenose, humpback and snubfin dolphins, and dugong, have been sighted in Girringun Sea Country, although snubfin dolphins have only been sighted a few times near Lucinda (Figures 14-15). This report presents results of the most recent surveys from September 2016.

Figure 14. Snubfin dolphins previously sighted in Girringun Sea Country near Lucinda

Figure 15. Snubfin dolphins previously sighted in Girringun Sea Country near Lucinda
Training Schedule

Four training days were conducted in May 2016. This training consisted of two days in-class, and three days conducting boat-based surveys (Figures 16-17). The training surveys covered:

- species identification
- survey methods and protocols
- data collection
- photo-identification
- data entry
- vessel safety and navigation

Figure 16. Ranger co-ordinator Sean Walsh going through the boat induction with rangers

Figure 17. Launching ‘Bruce’ at Clump Point, Mission Beach
Broad-scale Survey Schedule

A total of 15 days boat-based survey were conducted from 12 September – 18 October 2016, covering all of Girringun Sea Country (Table 1). Most days, two vessels were used for surveys, resulting in 23 vessel survey days (Figure 18).

Table 1. Survey schedule for Girringun surveys

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Boat Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-Sep-16</td>
<td>Balgal Beach</td>
<td>Warranaka</td>
</tr>
<tr>
<td>13-Sep-16</td>
<td>Balgal Beach</td>
<td>Bruce</td>
</tr>
<tr>
<td>13-Sep-16</td>
<td>Balgal Beach</td>
<td>Warranaka</td>
</tr>
<tr>
<td>14-Sep-16</td>
<td>Lucinda</td>
<td>Bruce</td>
</tr>
<tr>
<td>14-Sep-16</td>
<td>Lucinda</td>
<td>Bruce</td>
</tr>
<tr>
<td>14-Sep-16</td>
<td>Lucinda</td>
<td>Warranaka</td>
</tr>
<tr>
<td>15-Sep-16</td>
<td>Lucinda</td>
<td>Bruce</td>
</tr>
<tr>
<td>15-Sep-16</td>
<td>Lucinda</td>
<td>Warranaka</td>
</tr>
<tr>
<td>16-Sep-16</td>
<td>Lucinda</td>
<td>Bruce</td>
</tr>
<tr>
<td>16-Sep-16</td>
<td>Lucinda</td>
<td>Warranaka</td>
</tr>
<tr>
<td>18-Sep-16</td>
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<td>Warranaka</td>
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<td>Cardwell</td>
<td>Bruce</td>
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<td>Bruce</td>
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<td>Mission Beach</td>
<td>Warranaka</td>
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<td>Warranaka</td>
</tr>
<tr>
<td>22-Sep-16</td>
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<td>Bruce</td>
</tr>
<tr>
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<td>Tully</td>
<td>Bruce</td>
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<tr>
<td>23-Sep-16</td>
<td>Lucinda</td>
<td>Warranaka</td>
</tr>
<tr>
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<td>Cardwell</td>
<td>Warranaka</td>
</tr>
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<td>28-Sep-16</td>
<td>Mission Beach</td>
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</tr>
<tr>
<td>17-Oct-16</td>
<td>Balgal Beach</td>
<td>Warranaka</td>
</tr>
<tr>
<td>18-Oct-16</td>
<td>Balgal Beach</td>
<td>Warranaka</td>
</tr>
</tbody>
</table>

Figure 18. Photographing a humpback dolphin group in Hinchinbrook Channel
Methods

As part of the Commonwealth Department of Environment funded project – Evaluating Inshore Dolphin Status in Girringun Managed Sea Country', boat-based surveys were conducted throughout Girringun Sea Country from 12 September – 18 October 2016.

Project Participants

James Cook University
Isabel Beasley
Mat Golding

University Papua New Guinea
Wilma Mavea

Girringun Aboriginal Corporation
Karman Lippitt
Whitney Rassip
Sean Walsh
Cindy-Lou Togo
Hayden Togo
Trevor Rumble
Penny Bong
Elliot Cassady

Traditional Owners
Nanna Marjorie Kinjun (Gulnay)
Leonard Andy (Djiru)
Melisa Anderson (Nywaigi)
Leisha Anderson (Nywaigi)

Survey Methods

Boat-based survey methods are described in the Girringun report to the Department of Environment and heritage Protection ‘Palangal (Dolphins), Balangal (Dugong) & Badgigal (Turtles) of Girringun Managed Sea Country’ – May 2016’ (Figure 19).

Figure 19. Girringun rangers conducting surveys
Data Entry

Data entry for these surveys utilised a purpose-made app. (developed by Environmental Systems Solutions (ESS), Girringun Aboriginal Corporation (QLD) and Dr. Beasley), where the data could be collected in the field and then uploaded to a central database once back to internet reception (Figure 20).

![Dolphin Survey project]

Figure 20. Environmental Systems Solutions database developed specifically for inshore dolphin surveys

Vessels Used

Two vessels were used for these surveys, the JCU vessel ‘Warranaka’ and the Girringun Ranger vessel ‘Bruce”

Warranaka
The JCU vessel ‘Warranaka’ a 5.8m Formosa was used for these surveys (Figure 21). This vessel has been sponsored by WWF-Australia and Tassal to be used for inshore dolphin surveys in northern Australian waters, particularly along the north Queensland coast.

![Figure 21. The JCU vessel Warranaka]

Bruce
The Girringun Sea Ranger vessel ‘Bruce’ was used for the majority of surveys. Registration number is 30477QC. The vessel is a 5.95m rear centre console and is in 2C survey (Figure 22).
Figure 22. Girringun ranger vessel ‘Bruce’

**Transect Lines**

Transect lines were placed at 5km intervals, 10-15km from the coast (Figure 23). Survey lines were from Balgal Beach north to Kurramine Beach; a total transect distance of 530 transect km, consisting of:

- 235 km north of Hinchinbrook Island,
- 250km south of Hinchinbrook Island and
- 45 km in the Hinchinbrook Channel

Figure 23. Proposed survey lines throughout Girringun Sea Country
Survey Results

Survey Effort

- A total of 15 days were spent conducting boat-based surveys in the Girringun TUMRA region (Figure 24; Table 2).
- A total of 1919 km were travelled during surveys over 140 hours (this total includes transiting to and from transects, and distance/time spent photographing dolphin groups).
- A total of 752 km (84 hours) were spent on transect, surveying for dolphin groups and other marine megafauna.
- All of the proposed survey lines were completed throughout Girringun Sea Country.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Boat Name</th>
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<th>Total Time</th>
<th>Total Transect KM</th>
<th>Total Transect Time</th>
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<td>11:19:00</td>
<td>80.20</td>
<td>7:01:00</td>
<td>1</td>
</tr>
<tr>
<td>18-Oct-16</td>
<td>Balgal Beach</td>
<td>Warranaka</td>
<td>79.10</td>
<td>5:51:00</td>
<td>6.80</td>
<td>11:02:24</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td></td>
<td><strong>1918.82</strong></td>
<td><strong>140:39:00</strong></td>
<td><strong>751.76</strong></td>
<td><strong>84:04:24</strong></td>
<td><strong>33</strong></td>
</tr>
</tbody>
</table>
Figure 24. Survey lines completed throughout Girringun Sea Country
Beaufort Conditions

Sea conditions were very good during surveys. The majority of survey time searching was spent in Beaufort 2 (315 km) and Beaufort 3 (240.4 km) conditions (Table 3; Figure 25).

Table 3. The number of kilometres surveyed in each Beaufort state

<table>
<thead>
<tr>
<th>Beaufort</th>
<th>Kilometres surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32.9</td>
</tr>
<tr>
<td>1</td>
<td>163.8</td>
</tr>
<tr>
<td>2</td>
<td>314.7</td>
</tr>
<tr>
<td>3</td>
<td>240.4</td>
</tr>
<tr>
<td>4</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>751.8</strong></td>
</tr>
</tbody>
</table>

Figure 25. Bar chart showing total kilometres surveyed during transect surveys in each Beaufort state during Girringun surveys.

Dolphin Sightings

A total of 34 dolphin groups (203 individuals) were sighted during surveys (Figure 26), consisting of:

- 18 humpback dolphin groups (total group size = 92)
- 5 snubfin dolphin groups (total group size = 36)
- 1 mixed snubfin and humpback dolphin group (total group size = 21 individuals; 9 humpback dolphins and 12 snubfin dolphins)
- 7 bottlenose dolphin groups (total group size = 50)
- 3 groups of unknown species (total group size = 4)
Figure 26. Dolphin sightings during Girringun surveys
Calves Sighted in Groups

Few calves were sighted during surveys (Figure 27). Humpback dolphin calves were sighted in Hinchinbrook Channel, Lucinda and Balgal Beach river mouth. No snubfin or bottlenose dolphin calves were sighted.

Figure 27. Dolphin sightings with calves in groups in Girringun Sea Country
Moon and Tide States

Surveys were conducted during both spring and neap tides. Dolphins were primarily sighted in the Mission Beach region during neap tides, Hinchinbrook Channel during both neap and spring tides, and Balgal Beach region during spring tides (Figure 28).

Figure 28. Dolphin sightings by moon state in Girringun Sea Country
Surveys were also conducted throughout a variety of tide states (Figure 29), where dolphins were sighted during:

- high tide near the Balgal Beach river mouth
- flood tides near Mission Beach
- various tides around the Cardwell/Hinchinbrook region

Figure 29. Dolphin sightings by tide state in Girringun Sea Country
Relative Sighting Rate

The relative sighting rate for species sighted during surveys are shown in Table 4. The most commonly sighted species was the humpback dolphin.

Table 4. Group and individual sighting rate for each dolphin species sighted during Girringun surveys

<table>
<thead>
<tr>
<th>Species</th>
<th>Km Traveled</th>
<th>Groups/km surveyed</th>
<th>Individuals/km surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humpback</td>
<td>752</td>
<td>0.02</td>
<td>0.12</td>
</tr>
<tr>
<td>Snubfin</td>
<td>752</td>
<td>0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Humpback/Snubfin</td>
<td>752</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Bottlenose</td>
<td>752</td>
<td>0.01</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Recent surveys along the North Queensland coast (i.e. Saunders Beach north to Port Douglas, excluding Girringun Sea Country) during September/October 2016, using identical survey methods, resulted in a near-identical relative sighting rates (Table 5).

Table 5. Group and individual sighting rate for each dolphin species sighted during North Queensland surveys

<table>
<thead>
<tr>
<th>Species</th>
<th>Km Traveled</th>
<th>Groups/km surveyed</th>
<th>Individuals/km surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humpback</td>
<td>867</td>
<td>0.02</td>
<td>0.11</td>
</tr>
<tr>
<td>Snubfin</td>
<td>867</td>
<td>0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Humpback/Snubfin</td>
<td>867</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Bottlenose</td>
<td>867</td>
<td>0.01</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Species Summaries And Environmental Parameters

A summary of group size, composition and associated environmental parameters for each species sighted is below.

Humpback dolphins
A total of 18 humpback dolphin groups (total group size = 92) were sighted during surveys, consisting of:
- 64 adults
- 25 juveniles
- 3 calves

No newborns were sighted. These groups were sighted throughout the Girringun coast. The following environmental parameters collected at sighting locations (Table 6, Figures 30-32):

Table 6. Environmental parameters at humpback dolphin sighting locations

<table>
<thead>
<tr>
<th></th>
<th>Depth (m)</th>
<th>Temperature (°C)</th>
<th>Salinity (ppt)</th>
<th>Turbidity (NTU)</th>
<th>pH</th>
<th>Tide Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>9.0</td>
<td>26.9</td>
<td>34.8</td>
<td>6.5</td>
<td>8.4</td>
<td>1.7</td>
</tr>
<tr>
<td>SD</td>
<td>4.94</td>
<td>1.42</td>
<td>1.71</td>
<td>12.9</td>
<td>0.86</td>
<td>0.83</td>
</tr>
<tr>
<td>Range</td>
<td>1.8 – 21.9</td>
<td>25.0 – 29.5</td>
<td>31.5 – 37.4</td>
<td>0.0 – 35.4</td>
<td>7.7</td>
<td>0.4 – 2.8</td>
</tr>
</tbody>
</table>
Snubfin dolphins
Five snubfin dolphin groups (total group size = 36) were sighted, consisting of:

- 34 adults
- 2 juveniles

No calves or neonates were sighted. These groups were all sighted in the Saunders/Balgal Beach and Lucinda regiona. The following environmental parameters collected at sighting locations (Table 7, Figures 33 and 34):

Table 7. Environmental parameters at snubfin dolphin sighting locations

<table>
<thead>
<tr>
<th></th>
<th>Depth (m)</th>
<th>Temperature (°C)</th>
<th>Salinity (ppt)</th>
<th>Turbidity (NTU)</th>
<th>pH</th>
<th>Tide Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>7.4</td>
<td>28.3</td>
<td>36.8</td>
<td>9.0</td>
<td>8.3</td>
<td>1.7</td>
</tr>
<tr>
<td>SD</td>
<td>1.47</td>
<td>1.03</td>
<td>0.68</td>
<td>20.2</td>
<td>0.21</td>
<td>0.81</td>
</tr>
<tr>
<td>Range</td>
<td>5.3 – 9.3</td>
<td>26.5 – 29.0</td>
<td>35.6 – 37.2</td>
<td>0.0 – 45.0</td>
<td>8.0 – 8.5</td>
<td>0.9 – 2.7</td>
</tr>
</tbody>
</table>
Mixed humpback and snubfin dolphins
One mixed group of humpback/snubfin dolphins (total group size = 21; nine humpback dolphins and 12 snubfin dolphins) was sighted near Lucinda (southern Hinchinbrook Island), consisting of:

- 7 adults (five humpback dolphins and two snubfin dolphins)
- 1 juvenile (humpback dolphin)
- 1 calf (humpback dolphin)

No newborns were sighted. The following environmental parameters were collected at the sighting location (Table 8, Figures 35 and 36):

**Table 8. Environmental parameters at mixed humpback and snubfin dolphin sighting locations**

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Temperature (°C)</th>
<th>Salinity (ppt)</th>
<th>Turbidity (NTU)</th>
<th>pH</th>
<th>Tide Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>8.0</td>
<td>27.3</td>
<td>34.9</td>
<td>13.5</td>
<td>8.4</td>
</tr>
<tr>
<td>SD</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Range</td>
<td>---</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Bottlenose dolphins
Seven bottlenose dolphin groups (total group size = 50) were sighted, consisting of:

- 44 adults
- 6 juveniles

No calves or newborns were sighted. These groups were primarily sighted south of Hinchinbrook and Port Douglas. The following environmental parameters were collected at the sighting locations (Table 9, Figure 37):

Table 9. Environmental parameters at bottlenose dolphin sighting locations

<table>
<thead>
<tr>
<th></th>
<th>Depth (m)</th>
<th>Temperature (°C)</th>
<th>Salinity (ppt)</th>
<th>Turbidity (NTU)</th>
<th>pH</th>
<th>Tide Height (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>15.2</td>
<td>26.7</td>
<td>36.3</td>
<td>0.3</td>
<td>8.4</td>
<td>1.9</td>
</tr>
<tr>
<td>SD</td>
<td>6.24</td>
<td>1.05</td>
<td>0.73</td>
<td>0.67</td>
<td>0.13</td>
<td>0.65</td>
</tr>
<tr>
<td>Range</td>
<td>5.7 – 24.6</td>
<td>24.7 – 27.8</td>
<td>35.1 – 37.5</td>
<td>0.0 – 1.8</td>
<td>8.1 – 8.5</td>
<td>1.2 – 2.8</td>
</tr>
</tbody>
</table>

Figure 36. Potential hybrid humpback/snubfin dolphin sighted near Lucinda

Figure 37. Bottlenose dolphins sighted near Lucinda – 18 September 2016
Photo-identification

Of the 34 groups sighted, 32 groups were photographed, with at least one individual being photo-identified. A total of 23,564 images were taken.

A total of 64 individuals were photo-identified:
- 8 snubfin dolphins (Figures 38-40)
- 40 humpback dolphins (Figures 41-43)
- 16 bottlenose dolphins (Figures 44-46)

Snubfin Dolphins

Snubfin dolphin groups were observed near Balgal Beach, Taylors Beach and Lucinda. Of the dolphins identified, all were only sighted once (Figures 35-37).
Humpback dolphins

Humpback dolphins were sighted throughout the study area. Of the 40 humpback dolphins, 38 were sighted once and two were sighted twice (Figures 38-40).

Figure 41. SSAH67 – 14 September 2016 – Hinchinbrook Channel

Figure 42. SSAH69 – 14 September 2016 – Hinchinbrook Channel

Figure 43. SSAH72 – 14 September 2016 – Hinchinbrook Channel
Bottlenose dolphins

Sixteen bottlenose dolphins were photo-identified during surveys. These groups were sighted near Port Douglas, Innisfail and Cairns. Of the sixteen bottlenose dolphins photo-identified, all individuals were sighted once (Figures 52-54).

Figure 44. TADU35 – 18 September 2016 - Innisfail

Figure 45. TADU37 – 18 September 2016 - Innisfail

Figure 46. TADU41 – 18 September 2016 - Innisfail
Marine Megafauna Sightings

A total of 57 groups of megafauna (110 individuals) were sighted during surveys (Figure 47), consisting of the following:

- 17 dugong groups (43 individuals)
- 66 turtles – unknown species
- 30 green turtles groups (57 individuals)
- 1 ray
- 2 sharks
- 2 crocodiles

Of the 43 dugongs sighted, 40 were adults and 3 were juveniles. No calves were confirmed. The majority of dugongs were sighted in Missionary Bay, Hinchinbrook Island. One dugong was sighted near Taylors Beach and one dugong was sighted near the Tully River mouth.

Figure 47. Marine megafauna sighted during Girringun surveys
Discussion

Survey Importance

- These were the third broad-scale surveys to be conducted throughout Girringun Sea Country since 2013.
- The large study area provided important information on distribution of inshore dolphins, and the opportunity to compare occurrence and movements from other nearby sites (i.e. Dr. Cagnazzi’s study south of Townsville, Townsville and North Queensland surveys).
- Photo-identification comparisons between sites along the North Queensland coast will be undertaken once other survey reports have been completed.

Dolphin Sightings

- Humpback dolphins were sighted throughout Girringun Sea Country, from Balgal Beach north to Mission Beach.
- Snubfin dolphins were very elusive, and only sighted near Lucinda and Balgal Beach. No snubfin dolphins were sighted north of Lucinda.
- Bottlenose dolphins were primary sighted in deeper waters south of Lucinda, although one group was sighted near Tully Heads.

Megafauna Sightings

- In addition to dolphin sightings, these surveys collected information on marine megafauna (i.e. turtles, dugongs, seasnakes) sighted during surveys.
- Dugong were primarily sighted within Missionary Bay, Hinchinbrook Island, indicating this is an extremely important habitat that should be considered a high priority for future conservation and management initiatives.

Collaboration with Girringun Aboriginal Corporation

- Collaboration with Girringun Aboriginal Corporation and Traditional Owners was essential to the success of this project. Future projects are planned that build on this initial study and partner with Terrain NRM and other Aboriginal Corporations.

Figure 48. Marine megafauna sighted during Girringun surveys
General Images

Figure 49. Girringun Rangers with a group of snubfin dolphins sighted near Mulligan Bay

Figure 50. Girringun Rangers with a group of snubfin dolphins sighted near Mulligan Bay

Figure 51. Snubfin dolphins
Figure 52. Girringun Rangers with a group of snubfin dolphins sighted near Mulligan Bay

Figure 53. Girringun Rangers with a group of snubfin dolphins sighted near Mulligan Bay

Figure 54. Snubfin dolphins
Figure 55. Girringun Rangers with a group of snubfin dolphins sighted near Mulligan Bay

Figure 56. Photographing humpback dolphins near Tully Heads with Girringun Rangers

Figure 57. Bottlenose dolphin sighted near Lucinda on 18 September 2016

Figure 58. Humpback dolphin sighted near Balgal Beach on 18 September 2016
Figure 59. Snubfin dolphins sighted at Balgal Beach

Figure 60. Juvenile humpback dolphin sighted at Balgal Beach
References

BEASLEY, I., GOLDING, M. & RANGERS, G. 2013. Looking for Palangal (dolphins) and Balangal (dugongs) in Girringun Sea Country.


SOBTZICK, S. 2012. Aerial survey of the urban coast of Queensland to evaluate the response of the dugong population to the widespread effects of the extreme weather events of the summer of 2010-11.