

Looking for Dolphins and Dugongs in Mandubarra Sea Country

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Table of Contents

Table of Contents	2
Executive Summary	3
Background	5
Introduction	5
Project Objectives	6
Norman Wettenhall Foundation Background	6
Study Area	7
Project Initiation – June 2014	7
Project Participants	7
Inshore Dolphin Training	7
Initial Questionnaire	8
Species Identification Exercise	8
Boat-based Survey Introduction	9
Boat-based Survey Training	11
Vessel Used	11
Transect Lines	11
Data Collection	12
Survey Effort	13
Dolphin Sightings	15
<i>Humpback dolphins</i>	15
Megafauna Sightings	16
Photo-identification	16
Humpback dolphins	16
Mandubarra Dolphin and Dugong Survey Manual	18
Discussion	19
Training and Surveys Lines	19
Dolphin Sightings	19
Megafauna Sightings	19
Future Survey Schedule	19
General Mandubarra Images	20

Executive Summary

Background

In 2013, funding for this project ‘**Looking for dolphins and dugongs in Mandubarra sea country**’ was provided by the Norman Wettenhall Foundation (<http://nwf.org.au/grants/awarded-grants/2013-august>). As a result of poor weather conditions, the project start-date was delayed until June 2014.

The aims of this project are to:

1. increase local indigenous capacity to monitor dolphin and dugongs in Sea Country,
2. monitor dolphin and dugong populations in Sea Country to contribute to State and Commonwealth conservation assessments, and
3. raise local community awareness of the conservation status of marine megafauna

Inshore Dolphin Training

From 18-19 June 2014, an in-class training was conducted with Mandubarra Land and Sea Inc. Traditional Owners. This training consisted of presentations discussing:

- why inshore dolphins are a conservation priority (snubfin dolphins as a case study),
- aims, objectives and methods of the recently funded Norman Wettenhall Foundation grant – *Looking for dolphins and dugongs in Mandubarra Sea Country*,
- marine mammal identification (with identification exercise)
- cultural mapping exercise,
- boat survey methods, data collection and photo-identification.

Boat-based Survey Training

On 20-21 June, boat-based surveys were conducted throughout Mandubarra Sea Country, to:

- train Mandubarra Traditional Owners on marine mammal survey techniques and data collection,
- design future survey lines in Mandubarra Sea Country,
- develop a practical survey manual to assist with future data collection and analysis.

During the survey training, a total of 11.3km were transited over 2 hours 16 minutes. Of this time, 8.4km (1 hour 13 minutes) were spent ‘on-effort’ searching for marine megafauna.

Survey Effort

Two days of surveys were conducted throughout Mandubarra Sea Country. From the start to end of each day, a total of **103.9km was travelled over 10hrs and 25mins**. Of this effort, a total of **49.2km (5hrs and 53 mins)** was spent ‘on transect’ searching for dolphins, dugongs and other marine megafauna.



Sea conditions were generally poor, with the majority of surveys undertaken in Beaufort 3 and Beaufort 2 conditions.

Dolphin Sightings

Primarily as a result of the rough sea conditions, only one dolphin group was sighted during surveys:

- 1 humpback dolphin group (total group size = 4).

Megafauna Sightings

- Only one green turtle was sighted during surveys.

Photo-identification

A total of 156 images were taken of the humpback dolphin group. The two adults were photo-identified, while the calf was unidentifiable.



Photo-identified humpback dolphin adult female (left)



Survey lines and dolphin (top) and turtle (bottom) sightings

Discussion

Training and Survey Lines

- Weather conditions have been consistently unfavourable along the Queensland coast during 2014, with high winds and rough sea conditions postponing four previous attempts to conduct this in-class training and associated boat-based surveys.
- Despite continuing unfavourable conditions, the training session was very beneficial for Mandubarra Traditional Owners to gain knowledge on the dolphin species found in Sea Country, and survey methods to assess population.
- The training was also helpful to refine the pre-designed survey lines, which originally extended too far north of Mourilyan Harbour.

Dolphin Sightings

- Despite unfavourable conditions, one humpback dolphin group was sighted near Cowley Beach, southern Mandubarra Sea Country. The presence of a young calf in this group was an encouraging sign that the humpback dolphin population is calving in the area.

Megafauna Sightings

- As with the lack of dolphin sightings, the poor weather conditions were probably responsible for a lack of megafauna sightings.

Future Survey Schedule

- Future surveys are a high priority for Mandubarra Land and Sea Inc.



Background

Introduction

Mandubarra Traditional Owners and local community of the south Innisfail region, north Queensland, have an on-going commitment to conservation of marine megafauna. Mandubarra Traditional Owners have recently submitted an application to the Great Barrier Reef Marine Park Authority (GBRMPA) for a Traditional Use of Marine Resources Agreement (TUMRA), and are subsequently eager to begin monitoring marine megafauna in Sea Country to enable effective management of their TUMRA region.

As part of increased management of Sea Country, Mandubarra and have recently been awarded a State Government Grant to establish a marine turtle rehabilitation center at Coquette Point, Innisfail in co-operation with Cairns Turtle Rehabilitation Centre (<http://www.ehp.qld.gov.au/coastal/management/indigenous-sea-country-grants.html>).

Inshore Dolphin and Dugong Monitoring

The conservation status of inshore dolphins and dugongs in Mandubarra Sea Country remains unknown, although opportunistic sightings are often reported. Mandubarra Traditional Owners are particularly interested to gain an understanding of the conservation status of the Australian snubfin dolphin (*Orcaella heinsohni*), which is an endemic dolphin species facing continued and increasing threats along the Queensland coast. These threats include accidental catch in shark nets and fishing gear, habitat degradation and loss from port and coastal developments, and exclusion from important areas from coastal construction disturbance. Monitoring Australian snubfin dolphin populations is now a national priority to enable State and Commonwealth status assessments, which this project hopes to contribute towards.

Dugong and Turtle Monitoring

The key species for management of TUMRA regions are turtle and dugongs. Through the Mandubarra TUMRA, there will be no take of turtles or dugongs, given that populations are currently facing great pressure as a result of recent floods and associated habitat loss (i.e. seagrass). This project hopes to contribute to monitoring of dugong and turtle populations, to assess status and have a presence on the water to ensure compliance with TUMRA regulations.

Continuing Threats

Continued threats to marine megafauna in Mandubarra Sea Country and along the Queensland coast are illegal take for human consumption, coastal development (i.e. the proposed development at Ella Bay - <http://www.ellabay.com.au>), accidental bycatch from the inshore finfish fishery (i.e. an Indo-Pacific humpback dolphin was found in February 2013 that appeared to have been caught in a gillnet) and degradation of habitat. It is therefore to raise awareness within the local community about conservation status of marine megafauna, and threats facing populations.

In 2014, funding for this project ‘**Looking for dolphins and dugongs in Mandubarra sea country**’ was provided by the Norman Wettenhall Foundation. As noted on the Norman Wettenhall Foundation website (<http://nwf.org.au/grants/awarded-grants/2013-august>):

Mandubarra Land and Sea Inc

Looking for dolphins and dugongs in Mandubarra sea country

Mandubarra Traditional Owners and local community of the south Innisfail region, north Queensland, have an on-going commitment to conservation of marine megafauna. This project aims to carry out important monitoring of marine megafauna, as well as begin collaborations with the adjacent Traditional Owner groups, to encourage management across Sea Country.

Collaboration with university researchers will enable and assist with training and capacity building, development of appropriate community awareness materials, and ensuring that information gathered from this project will contribute towards a national assessment of the status of the Australian snubfin dolphin. The collaboration between James Cook University and Mandubarra provides Mandubarra people with the opportunity to increase their scientific knowledge, which can complement their cultural knowledge.

Project Objectives

The aims of this project are to:

1. increase local indigenous capacity to monitor dolphin and dugongs in Sea Country,
2. monitor dolphin and dugong populations in Sea Country to contribute to State and Commonwealth conservation assessments, and
3. raise local community awareness of the conservation status of marine megafauna



Figure 1. Australian snubfin dolphin, a focus species of this project (Photo – Isabel Beasley)

Norman Wettenhall Foundation Background

Established in 1997, the Norman Wettenhall Foundation acted as the culmination of Norman Wettenhall's lifelong love affair with the Australian bush and the birds and plants that inhabit it. Funds for the Foundation were raised from the sale of Norman's treasured natural history book collection, which was widely regarded as the most complete private collection celebrating the wonder and beauty of Australia's fauna and flora.

Norman Wettenhall had from his youth a great love and appreciation for Australian art, culture, history and this continent's unique ecosystems. Like many people who make a difference, while he was out of step with public opinion of his time, he possessed the necessary selflessness and stubbornness, the dedication and determination to convince others to share his vision and walk alongside him (<http://nwf.org.au/about/the-founder/>).

Study Area

Mandubarra Sea Country extends from Maria Creek north to Mourilyan Harbour, Innisfail, north Queensland.

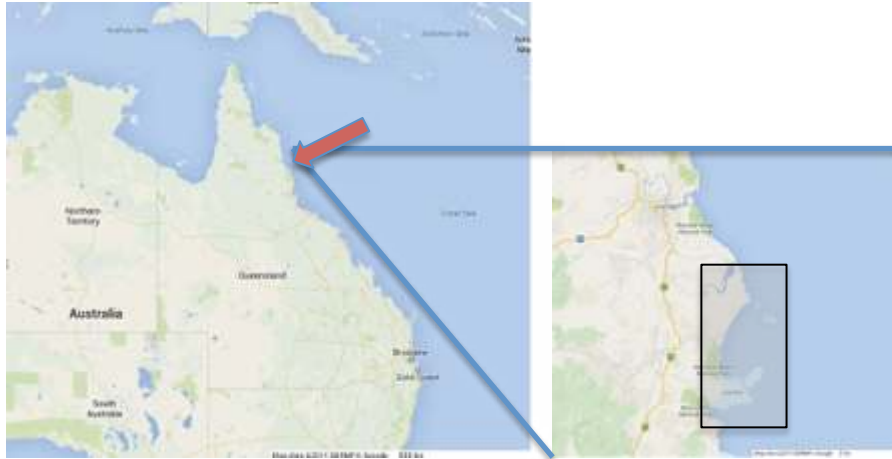


Figure 2. Location map of Mandubarra Sea Country, Innisfail (left), with a close up of Mandubarra Sea Country (right). Map courtesy of Google maps.

Project Initiation – June 2014

Field-work for the Norman Wettenhall Foundation funded project '**Looking for dolphins and dugongs in Mandubarra sea country**' was initiated in June 2014, with an in-class training and preliminary boat-based surveys.

Project Participants

Mandubarra Land and Sea Inc.

Nellie Epong
Henry Epong
Rebecca Epong
Junette Epong
Henry Jnr Epong
Naomi Epong

Jason Epong
Andrew Appo

James Cook University

Isabel Beasley
Jessica Riggin

Inshore Dolphin Training

From 18-19 June 2014, an in-class training was conducted with Mandubarra Land and Sea Inc. Traditional Owners (Figure 3). This training consisted of presentations discussing:

- why inshore dolphins are a conservation priority (snubfin dolphins as a case study),
- aims, objectives and methods of the recently funded Norman Wettenhall Foundation grant – *Looking for dolphins and dugongs in Mandubarra Sea Country*,
- marine mammal identification (with identification exercise,
- cultural mapping exercise,
- boat survey methods, data collection and photo-identification.



Initial Questionnaire

Prior to the presentations beginning, a questionnaire was completed by participants to assess their currently knowledge of marine mammals in Sea Country, and best methods to study inshore dolphins.

1. Name three marine mammal species in Mandubarra Sea Country.

The majority of participants did not know the names of specific species, rather general groups; i.e. dolphin, whale, turtle and dugong. The two participants who had extensive previous experience with marine mammal research correctly identified species, such as indo-pacific humpback dolphin, snubfin dolphin, dugong, humpback whale and bottlenose dolphin. Upon conclusion of the project, all participants should be able to correctly name 3 marine mammal species.

2. What is the best method to study inshore dolphins

The participants answers to this question were:

- boat
- human interaction/photographs
- video documentation
- photograph/record/observe/gps and tagging to identify again
- onshore monitoring/surveys by boat
- boat
- boat/shore-based monitoring
- boat-based study

The primary answer to this question should have been photo-identification. Upon conclusion of the project, all participants should be aware that photo-identification is the best method to study inshore dolphins.

3. The pieces of equipment used to study inshore dolphins

The participants answers to this question included:

- camera
- boat
- GPS
- video camera
- notebook
- binoculars

The majority of participants answered this question correctly, with boat, gps, camera and binoculars being the four most important items.

Species Identification Exercise

The species identification component of the presentation aims to:

- introduce participants to the variety of dolphin species that can be found in northern Australia
- introduce participants to the three main species of inshore dolphins and dugong, and highlight identification features
- emphasise the importance of recording 'don't know' if the species identification is uncertain
- assess identification ability and understanding of recording species as 'don't know' if species identification is uncertain.

Fourteen slides were shown to participants (Appendix 1). Participants were required to imagine that they were out on a Mandubarra survey, and were responsible to collect data on the species identification for storage into the Mandubarra database. The main point of this exercise was for participants to write 'don't know' if they were not confident sure on species identification. In this assessment, all participants should be able to achieve a 100% correct identification, because the correct answer could be:

1. the correct species
2. don't know

Of the participants who did not have prior experience with marine mammal surveys, scores ranged from 7 – 13 (out of 14), with a mean of 8.2. Upon completion of this project, all participants should obtain 100% for this exercise.



Figure 3. Mandubarra training (Photo – Isabel Beasley)

Boat-based Survey Introduction

As part of this training, the morning on 19 June was spent conducting preliminary surveys in Mourilyan Harbour (Figures 4 and 5), to familiarise participants with the datasheets, GPS and water quality equipment, as well as conduct the required boating inductions.

This component of the training is normally undertaken before the in-class presentation. However, because the previous day ran over-time, the boat-based survey was undertaken prior to the in-class training.

Interestingly, participants found that conducting boat-based surveys prior to the presentation was a much better format, so they could understand what was being presented. This format will therefore be followed in future trainings.



Figure 4. Mandubarra boat-based training (Photo – Isabel Beasley)

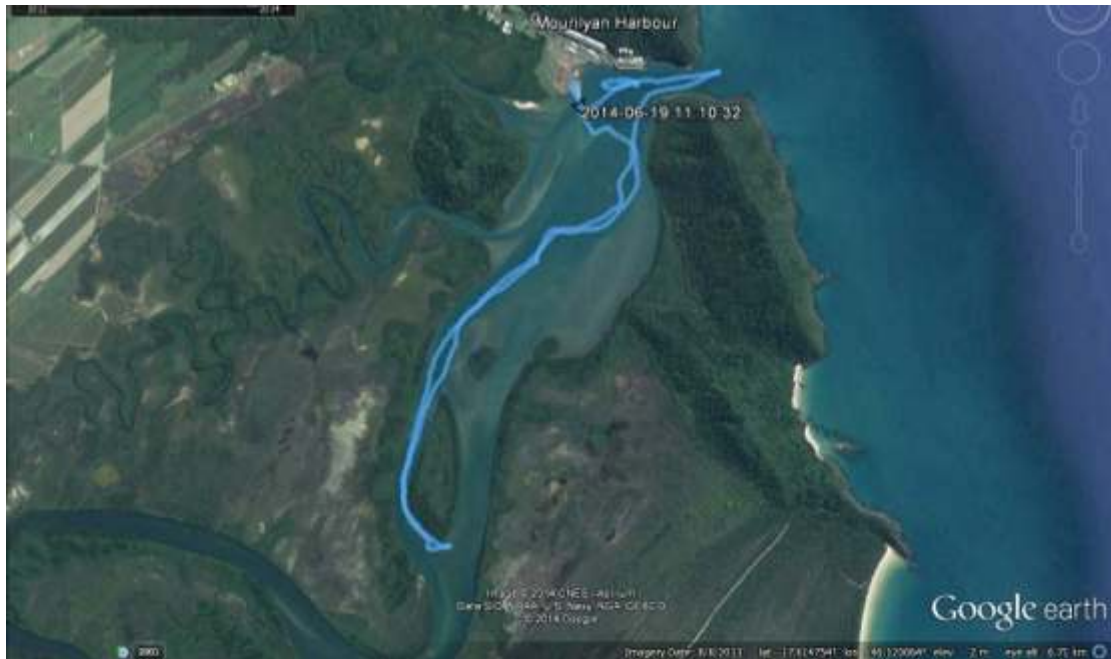


Figure 5. Survey lines conducted during the training session (Map created by Isabel Beasley)

At the end of the in-class training, a dolphin survey kit was donated to Mandubarra Land and Sea Inc. to facilitate future boat-based surveys (Figure 4). The kit consisted of:

- Bushnell 7x50 waterproof binoculars,
- Garmin GPSMap78 GPS,
- Nellie bin with folders, data sheets, cleaning equipment and identification cards,
- Canon EOS700D digital camera with 250mm lens (including accessories).



Figure 6. Participants of the Mandubarra training, with the survey kit donated by the Norman Wettenhall Foundation (Photo – Jessica Riggin)

Boat-based Survey Training

On 20-21 June, boat-based surveys were conducted throughout Mandubarra Sea Country, to:

- train Mandubarra Traditional Owners on marine mammal survey techniques and data collection,
- design future survey lines in Mandubarra Sea Country,
- develop a practical survey manual to assist with future data collection and analysis.

During the survey training, a total of 11.3km were transited over 2 hours 16 minutes. Of this time, 8.4km (1 hour 13 minutes) were spent ‘on-effort’ searching for marine megafauna.

Vessel Used

One vessel was used for these survey, ‘*Snubby*’, a 5.8m Formosa centre console, which was donated to James Cook University by WWF-Australia and Tassal (Figure 7).



Figure 7. Survey vessel sponsored by WWF-Australia and Tassal (Photo – Isabel Beasley)

Transect Lines

Transect lines were pre-designed, and aimed to systematically cover Mandubarra Sea Country. Transects were spaced 5km apart, and extended 10-20km from the coast (i.e. one section was 20km from the coast, followed by one section 10km from the coast; Figure 8). The aim of the training session was to refine the survey lines to ensure adequate coverage, and to ensure to sacred sites or permanently shallow or rocky areas were traversed.



Figure 8. Pre-designed survey lines throughout Mandubarra Sea Country (Map created by Isabel Beasley)

Data Collection

Methods for data collection are discussed in the ‘Mandubarra Survey Manual for Dolphins and Dugongs’. Key points are:

- the survey vessel travelled at 10-12km/hr (5-7kts/hr) while ‘on effort’
- surveys were only conducted in Beaufort 1-3 conditions
- while ‘on effort’ two observers searched on the left and right sides of the vessel, with one recorder position when enough personnel were available
- observers rotated positions every 30 minutes to reduce observer fatigue
- data sheets and GPS were used to collect survey information (total km travelled, total time, Beaufort state)
- a PDA with I-tracker sequence was simultaneously used to collect effort and sighting information (Figure 8)
- when a dolphin group was sighted, effort ceased and the vessel approached the group to take photographs and record associated information (i.e. group size and composition). Once enough photographs were taken, or the group was lost, the vessel would return to the transect line and continue ‘on effort’



Figure 9. PDA with I-tracker sequence

Survey Effort

Two days of surveys were conducted throughout Mandubarra Sea Country. From the start to end of each day, a total of **103.9km** was travelled over **10hrs and 25mins**. Of this effort, a total of **49.2km (5hrs and 53 mins)** was spent 'on transect' searching for dolphins, dugongs and other marine megafauna (Figures 10-12).

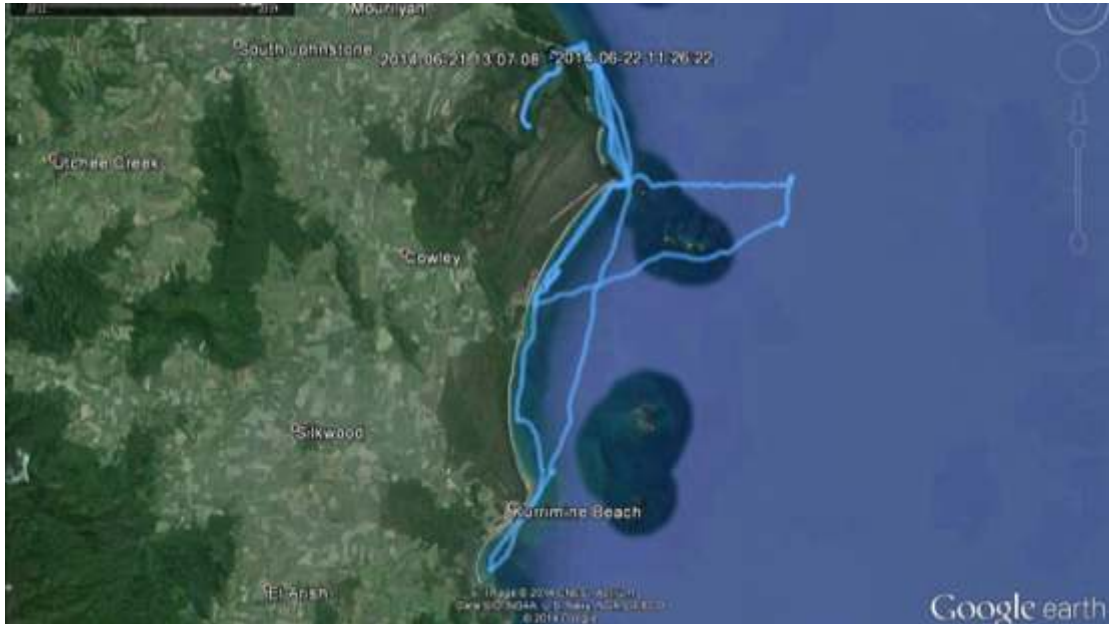


Figure 10. Combined survey lines conducted throughout Mandubarra Sea Country on 20-21 June 2014 (Map created by Isabel Beasley)

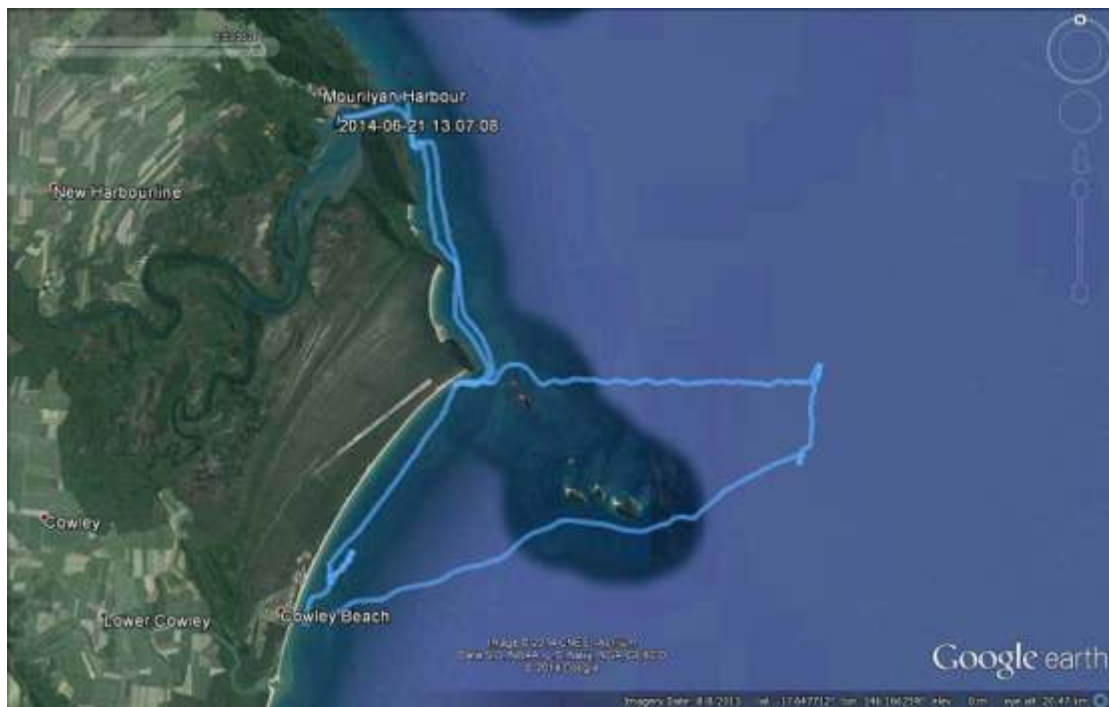


Figure 11. Survey lines conducted on 20 June 2014 (Map created by Isabel Beasley)

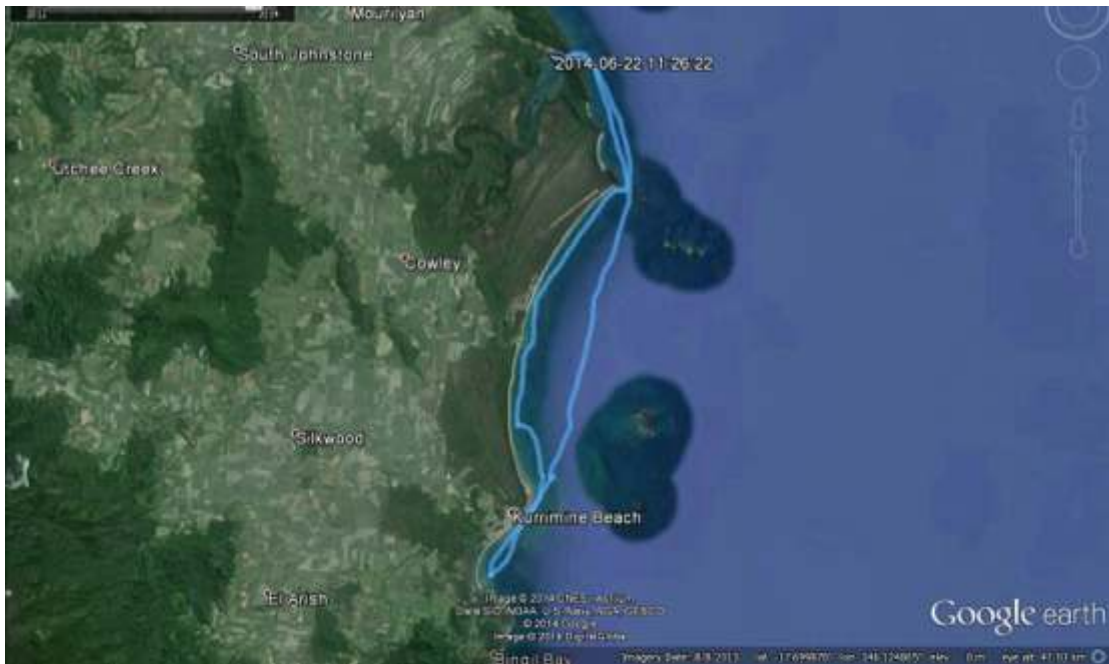


Figure 12. Survey lines conducted on 21 June 2014 (Map created by Isabel Beasley)

Sea conditions were generally poor, with the majority of surveys undertaken in Beaufort 3 and Beaufort 2 conditions (Table 1; Figure 13).

Table 1. The number of kilometers surveyed in each Beaufort state throughout Mandubarra Sea Country

Beaufort	Kilometers surveyed
0	0.00
1	0.00
2	11.75
3	29.60
4	7.80
Total	49.15

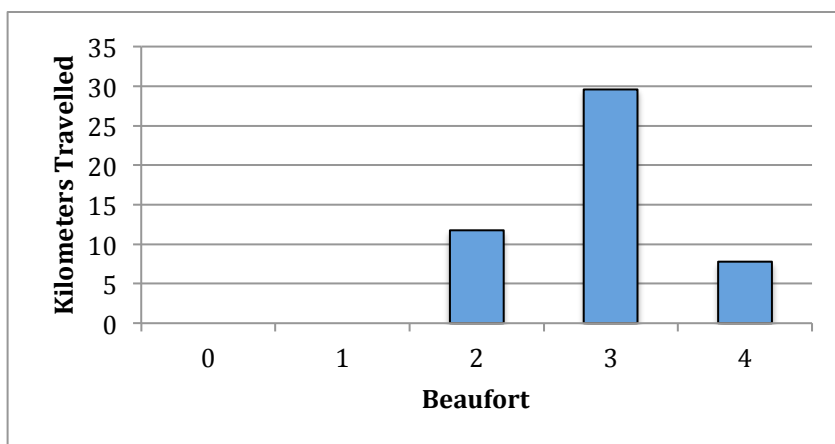


Figure 13. Bar graph showing the number of kilometres travelled in each Beaufort State throughout Mandubarra Sea Country

Dolphin Sightings

Primarily as a result of the rough sea conditions, only one dolphin group was sighted during surveys (Figure 14):

- 1 humpback dolphin group (total group size = 4)

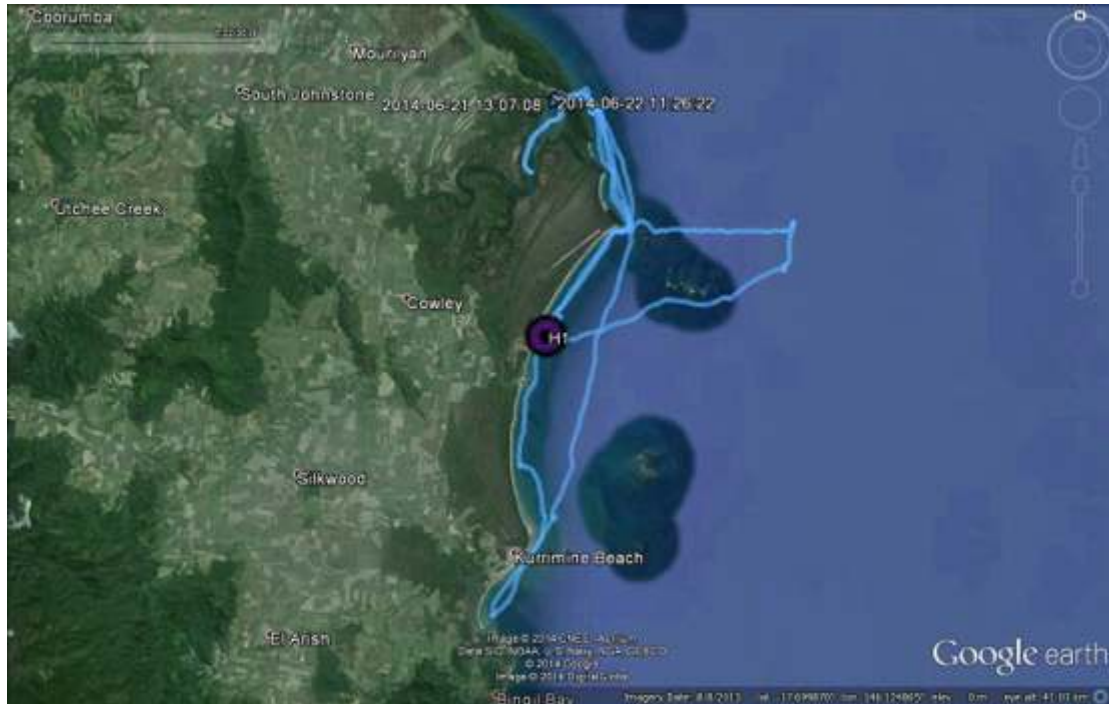


Figure 14. Humpback dolphin sighting in Mandubarra Sea Country (purple circle) (Map created by Isabel Beasley)

The sighting rate for inshore dolphins in Mandubarra Sea Country is shown in Table 3.

Table 3. Group and individual sighting rate for each dolphin species.

Species	Groups/km surveyed	Individuals/km surveyed
Humpback	0.02	0.08

Humpback dolphins

One **humpback dolphin group (total group size = 4)** was sighted (Figure 14), consisting of:

- 3 adults
- 1 calf

No juveniles were sighted. This groups was sighted near Cowley Beach, with the following environmental parameters collected at the sighting locations (Table 4):

Table 4. Environmental parameters at the humpback dolphin sighting location.

	Depth (m)	Temperature (°C)	Salinity (ppt)	Turbidity (NTU)	pH
Measure	5.8	24.2	31.2	7.4	8.3

Megafauna Sightings

Only one green turtle was sighted during surveys (Figure 15).

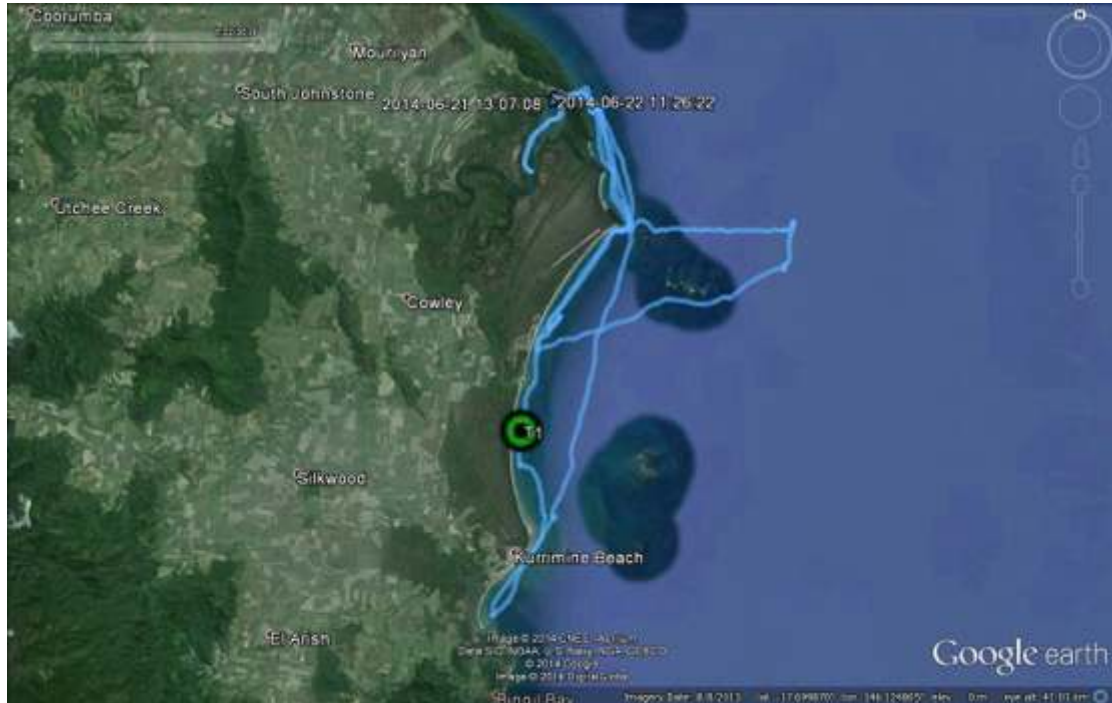


Figure 15. Green turtle sighted in Mandubarra Sea Country (Map created by Isabel Beasley)

Photo-identification

A total of 156 images were taken of the humpback dolphin group (16-21). The two adults were photo-identified, while the calf was unidentifiable.

Humpback dolphins



Figure 16. SCH101_20 June 14_Sighting 1 (Photo – Jessica Riggin)



Figure 17. SCHI01_20 June 14_Sighting 1 (Photo – Jessica Riggin)



Figure 18. SCHI01 Calf_20 June 14_Sighting 1 (Photo – Jessica Riggin)



Figure 19. SCHI02_20 June 14_Sighting 1 (Photo – Jessica Riggin)



Figure 20. SCHI02_20 June 14_Sighting 1 (Photo – Jessica Riggin)



Figure 21. SCHI03_20 June 14_Sighting 1 (Photo – Jessica Riggin)

Mandubarra Dolphin and Dugong Survey Manual

Following on from the June 2014 training and boat-based surveys, a survey manual was drafted with assistance from Mandubarra Land and Sea Inc. Traditional Owners to assist with continuing surveys, data collection and data download protocols (Figure 22).

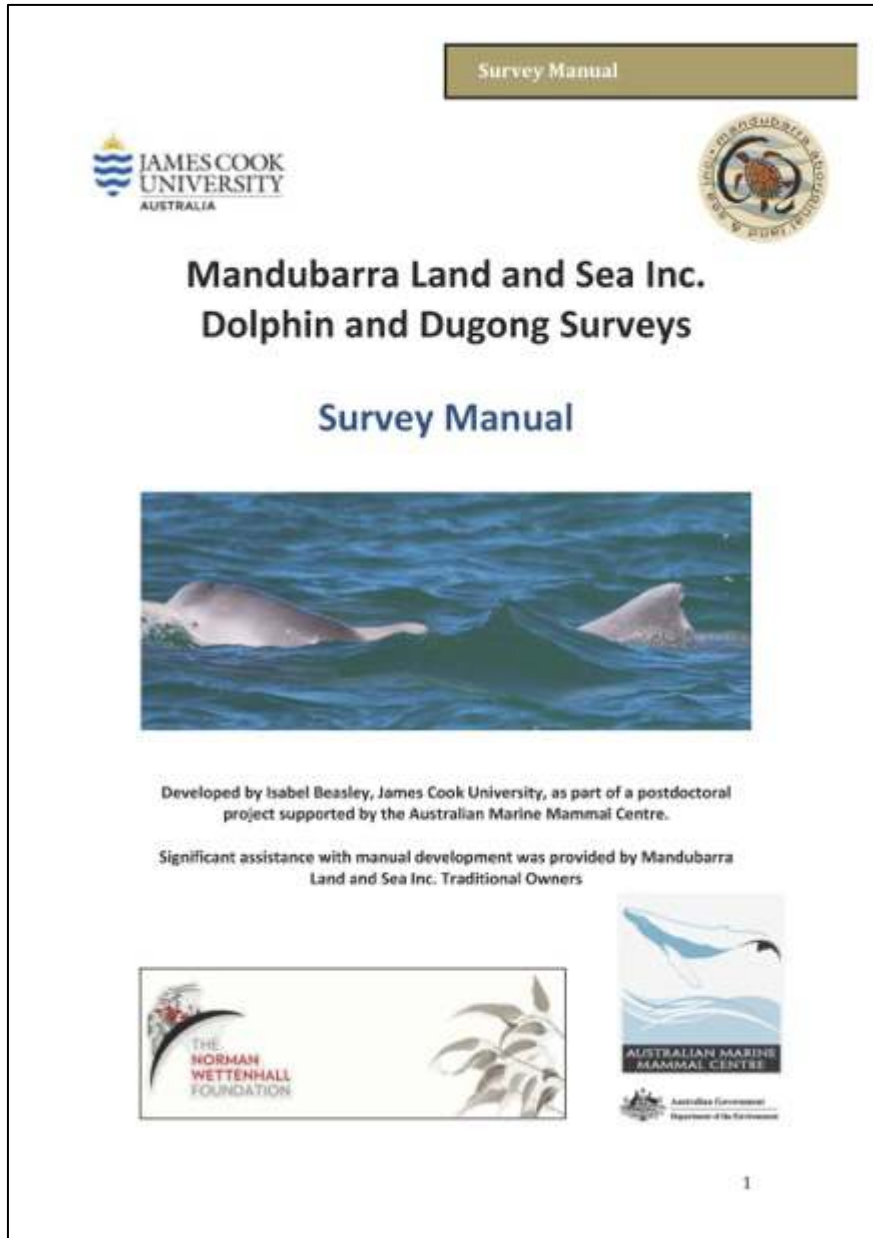


Figure 22. Mandubarra survey manual (Developed by Isabel Beasley and Mandubarra Land and Sea Inc).

Discussion

Training and Surveys Lines

- Weather conditions have been consistently unfavourable along the Queensland coast during 2014, with high winds and rough sea conditions postponing four previous attempts to conduct this in-class training and associated boat-based surveys.
- Despite continuing unfavourable conditions during June, it was decided to continue with the training, so that the project could be initiated and training conducted
- The training session was very beneficial for Mandubarra Traditional Owners to gain knowledge on the dolphin species found in Sea Country, and survey methods to assess population.
- The training was also helpful to refine the pre-designed survey lines, which originally extended too far north of Mourilyan Harbour.

Dolphin Sightings

- Despite unfavourable conditions, one humpback dolphin group was sighted near Cowley Beach, southern Mandubarra Sea Country. The presence of a young calf in this group was an encouraging sign that the humpback dolphin population is calving in the area.

Megafauna Sightings

- As with the lack of dolphin sightings, the poor weather conditions were probably responsible for a lack of megafauna sightings.
- Only one turtle was sighted during these surveys, in the rocky reef area near Kurramine Beach.

Future Survey Schedule

- Future surveys are a high priority for Mandubarra Land and Sea Inc., however their ability to undertake these surveys is restricted by lack of a vessel.
- As a result of a lack of survey vessel, JCU will assist with future surveys wherever possible.
- Mandubarra will also endeavour to undertake independent land-based and boat-based surveys when the opportunity arises, particularly when a smaller vessel is used for coastal sea patrols for turtles.



Figure 23. Humpback dolphins sighted near Cowley Beach (Photo – Jessica Riggin)

General Mandubarra Images



Figure 24. First slide of Mandubarra presentation (Photo – Jessica Riggin)



Figure 25. At-sea training morning (Photo – Isabel Beasley)



Figure 26. Cultural mapping with Mandubarra Traditional Owners and Russell Constable (Photo – Isabel Beasley)



Figure 27. Cultural mapping with Mandubarra Traditional Owner Andrew Appo (Photo – Isabel Beasley)



Figure 28. Cultural mapping with Mandubarra Traditional Owners, from left – Junette Epong, Naomi Epong, Henry Jnr Epong (photo – Isabel Beasley)



Figure 29. Humpback dolphin sighted on 20 June 14 (Photo – Jessica Riggin)



Figure 30. Photographing humpback dolphins while recording associated data, from left – Junette Epong and Russell Constable (Photo – Isabel Beasley)



Figure 31. Naomi Epong photographing humpback dolphins (Photo – Isabel Beasley)



Figure 32. Rebecca Epong (left) and Jessica Riggan (right) photographing humpback dolphins (Photo – Isabel Beasley)



Figure 33. Survey team, from left – Naomi Epong, Jessica Riggin, Junette Epong and Rebecca Epong (Photo – Isabel Beasley)



Figure 34. Humpback dolphin adult female with her calf (Photo – Jessica Riggin)



Figure 35. Survey team, from left – Russell Constable, Junette Epong, Jessica Riggin and Rebecca Epong (Photo – Isabel Beasley)



Figure 36. Mandubarra Traditional Owners, from left – Jason Epong, Henry Epong, Henry Jnr Epong and Naomi Epong (Photo – Isabel Beasley)



Figure 37. Nellie Epong, Henry Epong and Jessica Riggan at the Mandubarra Turtle Rehabilitation Centre in Innisfail (Photo – Isabel Beasley)



Figure 38. Cindy Lou, the green turtle being cared for at the Mandubarra Turtle Rehabilitation Centre in Innisfail (Photo – Isabel Beasley)