CAPRICORN CETACEANS PROJECT

http://www.capricorncetaceansproject.com/

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The River Dolphins

EXTINCT

CRITICALLY ENDEANGERED

CRITICALLY ENDEANGERED

CRITICALLY ENDEANGERED
The Maui and Hector dolphins are critically endangered with extinction.
The Atlantic humpback dolphin

CRITICALLY ENDEANGERED
Australian inshore dolphins

NEAR THREATENED
Humpback and Snubfin

Humpback dolphin

Snubfin dolphin
Snubfin and humpback dolphins

Snubfin dolphin
(Orcaella heihnsohni)

Humpback dolphin
(Sousa sp)

- Recently described as new species (potentially endemic to Australian waters)
- Inhabit mainly shallow inshore and estuarine waters
- Live in small populations of 50-150 individuals
- IUCN: Near threatened
- EPBC ACT: Data Deficient
Dolphins at risk

- Rapid increase of coastal developments has raised concerns about their conservation
  - Port capacity along the east coast of Queensland is expected to triple by 2020
  - Circa 35 new development proposals are awaiting approval by 2013
  - UNESCO-IUCN report (2012): “scale of coastal development currently being proposed and consented presents a significant risk to the conservation of the GBR”

Grech et al. 2013
How we study them

- Boat Based Survey
- Collect data
- Species
- Group size
- Composition
- Behaviour
- Water quality
Photo-identification

2006
Challenges: Population structure?

- Management units
- Monitoring
- Protected areas
Anthropogenic contaminants
Methods: Biopsy sampling (2006-2011)

Snubfin (n= 91)
- TV (n = 39)
- WS (n = 23)
- KB (n = 29)

Humpback (n=159)
- HB (n = 8)
- TV (n = 17)
- WS (n = 8)
- KB (n = 38)
- GS (n = 25)
- NGSS (n = 12)
- SGSS (n = 23)
- MB (n = 28)

QLD
Implications for conservation

- Significant genetic structure and relatively small migration rates suggest
  - species particularly vulnerable to rapid population declines and local extinction
  - Need for management strategy that reflects population subdivision over small and regional scales.
  - Snubfin: minimum of two management units: MU-1 (TV, WS) and MU-2 (KB).
  - Humpback: minimum of 6 management units: MU-1 (HB), MU-2 (TV, WS), MU-3 (KB, GS), MU-4 (NGSS), MU-5 (SGSS) and MU-6 (MB).
  - Designation of protected areas that are supported by underlying population structure and migration corridors
Australian Snubfin dolphins
Snubfin dolphin

Summary Genetic

Distribution

QLD

TV

WS

KB

Curtis Bay

Great Keppel Island

Cape Capricorn

Coral Sea

Gladstone

Fanning Island

Rods Harbour

150°40'0"E
150°50'0"E
150°60'0"E
151°00'0"E
151°10'0"E
151°20'0"E
151°30'0"E
151°40'0"E

100 Kilometers

0

50

100

120
Snubfin dolphins

Home Range

Abundance

May-Sept

Years
2006 2007 2008 2009 2010 2011 2012 2013
Population Estimates
64 66 68 70 72 74 76 78 80 82

Snubfin dolphins

Home Range

Abundance

May-Sept
Snubfin Threats

- **FR >50% scarred**
- **Entanglement = 55.9%**
- **Shark = 32.3%**
- **Vessel = 4.4%**
- **Unknown = 1.3%**
<table>
<thead>
<tr>
<th>Category</th>
<th>Snubfin dolphins</th>
<th>CE</th>
<th>EN</th>
<th>VU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Home Range</strong></td>
<td>1,255 km²</td>
<td>100</td>
<td>5,000</td>
<td>20,000</td>
</tr>
<tr>
<td><strong>Area of Use</strong></td>
<td>349 km²</td>
<td>10</td>
<td>500</td>
<td>2000</td>
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<tr>
<td><strong>Isolation</strong></td>
<td>Genetically isolated</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Habitat loss</strong></td>
<td>A decline in habitat quantity was observed and is expected to continue</td>
<td></td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td><strong>Habitat fluctuation</strong></td>
<td>Flooding and constructions are expected to cause fluctuation in the area of use</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Mature N</strong></td>
<td>52 (50-55)</td>
<td>50</td>
<td>250</td>
<td>1000</td>
</tr>
</tbody>
</table>
Humpback dolphins
Humpback dolphins

Summary Genetic

Distribution

HB
TV
WS
KB
GS
NGSS
SGSS
MB
Humpback dolphins

Social Structure

Geographic Divisions
Humpback dolphin

Port Curtis Home Range

Keppel Bay Home Range

Keppel Bay Abundance

Port Curtis Abundance

![Map of Humpback dolphin home ranges and abundance over time.](image-url)
Comparison before-after 2010

Distribution 2008-2010

Distribution 2011-2013
Humpback Threats

Keppel Bay
- KB = 51.6% scarred
- Entanglement = 13.6%
- Shark = 69.3%
- Vessel = 18.2%
- Unknown = 1.3%

Port Curtis
- PC = 42.5% scarred
- Entanglement = 28.4%
- Shark = 56.7%
- Vessel = 8.6%
- Unknown = 3.3%
Contaminants by species

**Total PAHs**

- **Humpback**
- **Snubfin**
- **Bottlenose**

**Carcinogenic PAHs**

- **Humpback**
- **Snubfin**
- **Bottlenose**

![Box plots for Total PAHs and Carcinogenic PAHs for different species across different locations.](image-url)
Contaminants by species

**PCBs**

- Total PCBs (ng/g lipid weight)
  - Threshold
  - Immunosuppression
  - Impaired reproduction

**DDTs**

- Total DDTs (ng/g lipid weight)
  - Immunosuppression

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**Species**

- Humpback
- Snubfin
- Bottlenose
Dolphins at risk

- Rapid increase of coastal developments has raised concerns about their conservation
  - Port capacity along the east coast of Queensland is expected to triple by 2020
- Increase in intensity and frequency of large floods
  - Floods frequency is expected to increase by 13% in the next 30 years
- Water quality
- Human interaction

Grech et al. 2013
Implications for conservation

- Both species from distinct management units
- Population are small with limited distribution and high residency
- Both species particularly vulnerable to rapid population declines
- Need for local management strategy
- Designation of protected areas