# Effects of acoustic alarms on coastal dolphins

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## Presentation outline

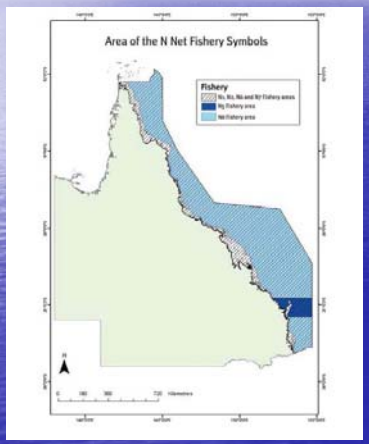
- The importance of inshore net fisheries
- The importance of coastal dolphins
- The problem of bycatch
- Proposed solutions
- How research informs policy
- My research project
- The need for involvement of stakeholders

# The importance of inshore net fisheries

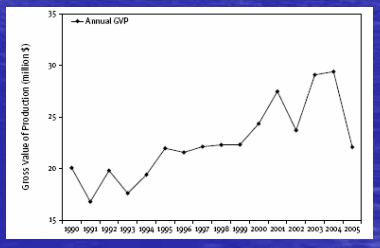
- Summary facts:
  - QLD Commercial fishery GVPY: $220 mill AUD
  - Net fishery GVPY: $40 mill AUD (third largest commercial fishery in Queensland)
  - East coast inshore fin fish fishery GVPY: $20-$30 mill AUD
- Average Effort / year = 30,000 days
- Number of licenses = 2400 approx

(Department of Primary Industries & Fisheries 2006)

# Distribution of net fisheries within the Great Barrier Reef

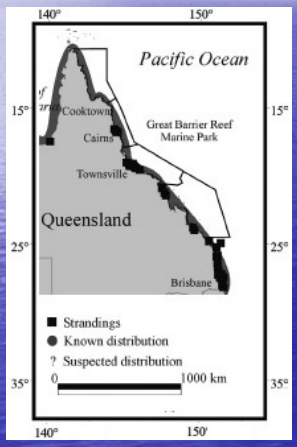



- Major reduction in the areas available for netting after RAP zoning plan




(Department of Primary Industries & Fisheries 2006)

## Distribution of coastal dolphins in the Great Barrier Reef




(Parra et al. 2004)

- Overlap of Indo-pacific humpback dolphins and snubfin dolphin distribution with areas used by net fisheries

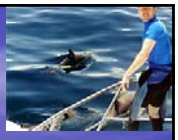
## The importance of coastal dolphins

- Mayor influence on the structure & function of marine communities as major consumers of production at most trophic levels (Bowen 1997).

- Coastal dolphins are very vulnerable to coastal human development (Klinowska 1991).
- Snubfin dolphin: 1st Australian endemic cetacean (Beasley et al. 2005)
- Similar uniqueness believed for Australian populations of Indo-pacific humpback dolphin (Hale et al. 1998)
- Both dolphins' populations composed of very low numbers, increasing their vulnerability against anthropogenic disturbances (Parra 2006).

Australian Government
Great Barrier Reef Marine Park Authority

## Commitment towards biodiversity



- Responsibility to preserve biodiversity
  - Action Plan for Australian Cetaceans (Ross 2006)
  - QLD Nature Conservation (Whales & dolphins) Conservation Plan 1997
- GBRMPA priority species of coastal dolphins:
  - Indo-pacific humpback dolphin
  - Australian snubfin dolphin
- Research needed to inform policy and improve conservation management plans

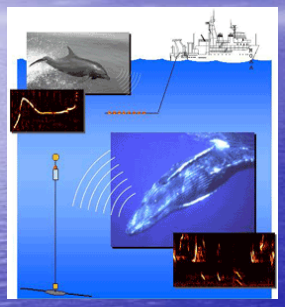
## The problem of bycatch

- Bycatch: Incidental capture of non-target species (sea turtles, dugongs, dolphins, whales, etc.)
- Although probability of dolphin bycatch is low, small genetic stocks of slow reproductive coastal dolphins are vulnerable (Bannister 1996)
- Potential Biological Removal:
  PBR = $N_{min}$ x (0.5) $R_{max}$ x $F_R$
  $N_{min}$ = 64 snubfins (Parra 2006)
  $R_{max}$ = 0.04 ( Wade 1998)
  $F_R$ = 0.1 (endangered stocks)
  PBR = 0.13 / year

- Queensland fisheries and the Shark Control program are conscious of this problem

## The proposed solutions

- DPI is developing and testing 2 approaches:



- Avoidance: Passive acoustic detection system to locate dolphin schools and avoid them: modifies fisheries behaviour

- Minimisation: Reduce interaction between dolphins and fisheries by alerting the animal of the presence of nets using acoustic alarms (pingers): modifies dolphins behaviour

(CRC Conference, Townsville 2006)

## How research informs policy

- Acoustic detection: Information needed on vocalisation patterns of coastal dolphins and their relationship to their behaviour

- Acoustic alarms:
  - Despite successes in reducing harbour porpoises' bycatch, pingers do not elicit the same response from some other cetaceans (Dawson 1994)
  - IWC promotes pinger studies on other dolphin species and habitats (IWC 2000)
  - To use pingers as a multi-species solution to bycatch they must work on at least one species and negatively affect none

## The proposed research

- Project will study the acoustic and surface behaviour of humpback & snubfin dolphins and how it changes with the presence of pingers

- Research will use audio-visual techniques and tracking systems to study behaviour.

## Involvement of stakeholders required

- Possible application of research findings
- Involvement of stakeholders at an early stage guarantees smooth collaboration between parties
- Progress so far:
  - GBRMPA
  - EPA Queensland
  - Shark Control Program

## Conclusion

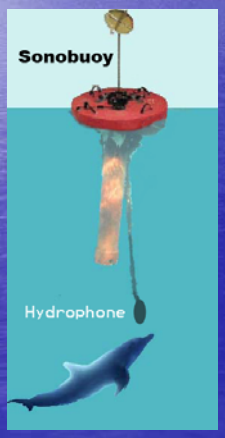
- Inshore net fisheries play an important role on Queensland economy
- The diversity of Queensland's coastal dolphins present in the GBR must be protected
- Both sides seek the same goal: to reduce bycatch of coastal dolphins while maintaining a functional fishing industry
- Proposed solutions such as acoustic detection of dolphins and acoustic alarms to alert them, must be evaluated through independent research
- Early involvement of stakeholders on research will result on improved application of scientific findings into relevant conservation and management policies

## Acknowledgements

- Supervisors: Prof. Helene Marsh, Dr. Michael Noad, Dr. Guido Parra & Dr. Ivan Lawler
- Kirstin Dobbs & Sarah Salmon (GBRMPA)
- James Cook University and University of Queensland
- Marine Tropical Science Research Facility
- Wayne Sumpton (Shark Control Program, DPI)
- Dr. Neil Gribble (DPI)
- Volunteers

# Experimental Design:

- Acoustic recordings to categorise vocalisations




- Photo-identification


- Video recordings to monitor surface behaviour:

Feeding

Socialising

Traveling

Milling