Photo: Dr. Deborah Thiele

Cross-cultural knowledge, citizen science and expert elicitation inform the predicted distribution of snubfin dolphins *(O. heinsohni)* in the Kimberley, Western Australia

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1 Background

- Designing effective management measures for data-deficient, low-abundant species is a major challenge for ecologists & policy-makers.
- There is currently little information on the distribution & abundance of Australian snubfin dolphins (*Orcaella heinsohni*) in the Kimberley region of W Australia.
- Such knowledge gaps preclude robust assessments of the species' conservation status & prevent the monitoring of long-term population trends.

2 Dolphin data

- We compiled a database of visual sightings spanning the last 20 years.
- Dolphin observations were collated from multiple sources, including:

-- Dedicated (known effort) **(Figure 1)**

  - Vessel-based & aerial line transects for marine megafauna
  - Aboriginal ranger monitoring programmes

-- Opportunistic (unknown effort)

  - Public-domain repositories
  - Museum/Government archives;
  - Peer-reviewed literature
  - Citizen science initiatives

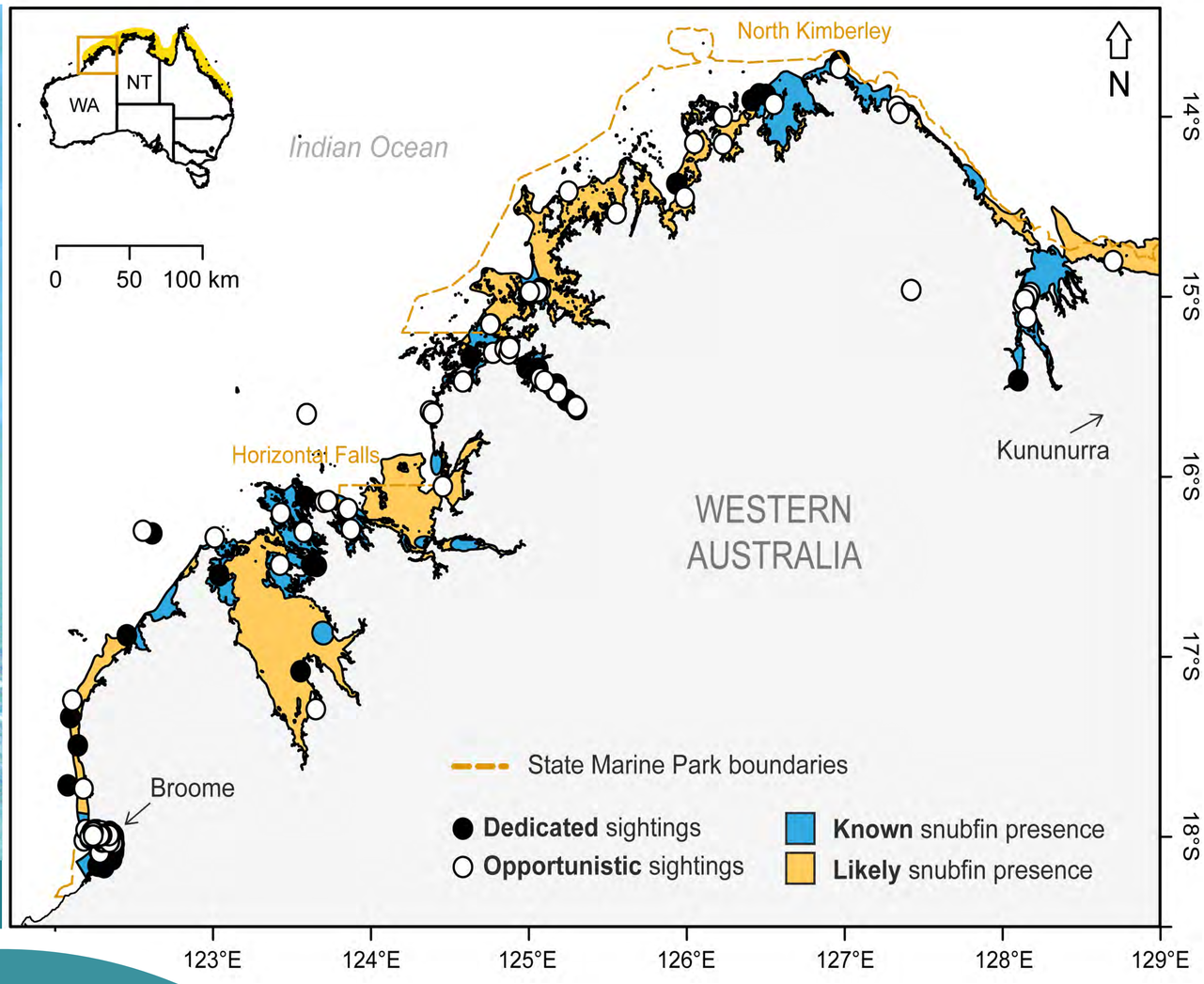

Fig. 1. Reported snubfin dolphin occurrence in northwestern Australia.

3 Proposed methods

- Known and likely areas of dolphin occurrence were identified from expert maps and traditional ecological knowledge **(Figure 1).**
- These will serve as spatial offsets in Maxent-style/Poisson point process models of dolphin distribution, following Merow *et al. (*2017).
- Models will relate sightings from dedicated surveys to variables thought ecologically important to snubfins but seldom considered, such as mangrove biomass, freshwater inputs etc.
- Estimates of the species' regional extent of occurrence (EOO) and area of occupancy (AOO) will be obtained in GIS by clipping model predictions with alpha-shapes drawn around the entire set of data points, as per Fivaz & Gonseth (2014) **(Figure 2).**

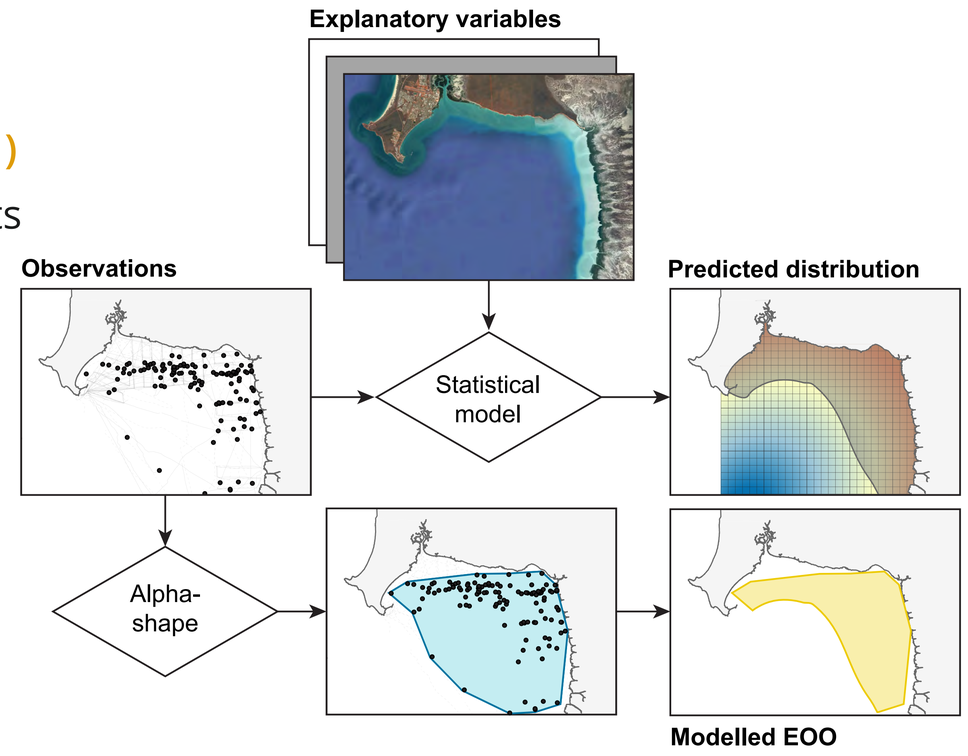

Fig. 2. Simplified flowchart of the proposed protocol. The example area shown is Roebuck Bay, a known snubfin dolphin hotspot.

4 Related work

- We are also modelling dolphin abundance in a regional hotspot using both distance sampling and mark-recapture methods.
  Ask me about the sister paper!

Merow C, Wilson AM, Jetz W. 2017. Integrating occurrence data and expert maps for improved species range predictions. GEB 26: 243–258.

Fivaz FP, Gonseth Y. 2014. Using species distribution models for IUCN Red Lists of threatened species. J Insect Conserv 18: 427-436.

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