MRes Rebecca Dudley

Cornwall Wildlife Trust

England's only resident population!

The Southwest Bottlenose Dolphin Community

No specific protection is currently offered to bottlenose dolphins in the region despite being consistently sighted from land and boats throughout southwest England. However, there is currently no robust data available to support the notion that bottlenose dolphins reside in the area year-round.

In 2016, the **Southwest Bottlenose Dolphin Consortium**, a collaborative partnership coordinated by the Cornwall Wildlife Trust, was established. The partnership includes a wide range of groups, organisations, businesses and individuals who agreed to share their data. Bottlenose dolphin sightings and associated photographs were collected throughout the southwest, enabling photo identification of individual dolphins (see below). All of the data was incorporated into a shared database in an effort to better understand this resident dolphin population.

Questions we wanted to answer...

- Is there a distinct **inshore** group of bottlenose dolphins in the southwest ?
- What is the population **range** of these coastal animals?
- How **many** dolphins are in the inshore population?

Photo-Identification

Identifying individual dolphins allows for the study of distribution, population dynamics, social structure and behaviour of a group over time. Luckily for researchers, bottlenose dolphins can be identified by looking at photographs of their dorsal fins.

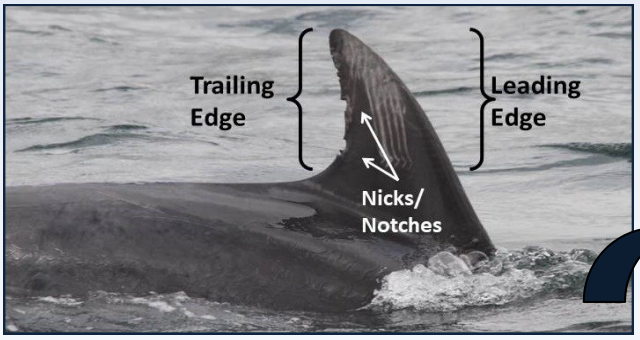

Figure 1: Bottlenose dolphin dorsal fin with characteristics used for identification

Southwest Bottlenose Dolphin

ID Catalogue 2007-2016

ID catalogues were made which included 98 photo-identified individuals

A dorsal fin is as unique to an individual dolphin as a fingerprint is to a human. In dorsal fin identification, the trailing edge of the fin is most commonly used to identify an individual dolphin. This area of the fin is the most distinguishable because it is particularly susceptible to tearing. Once torn, the tissue does not regenerate, thus creating unique permanent notches.

Photo Quality

Photos were obtained from a variety of sources throughout the Southwest. Therefore, rigorous quality control was applied to ensure that any inconsistencies in data collection were minimised. Photos were given a grade from 1-4.Only photos of a certain quality were used in the analysis (see the next page)

Grade 1

Grade 2

Grade 3

Grade 4

Do you have any data?

Please enter any sightings and photos of bottlenose dolphins onto our dedicated recording form at https://www.orks.org.uk/swbottlenoseproject-submit. For more information on the Consortium contact: ruth.williams@cornwallwildlifetrust.org.uk

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3843 records entered into the database

Identifying the coastal community

Along the southwest coastline, multiple overlapping social communities of bottlenose dolphins may be observed. Therefore, before investigating a population, it is critical to first separate individuals observed in the area into coastal residents and non-residents, ensuring that dolphins just passing through are not included in the analysis.

Social Structure

Dolphins were divided into communities by evaluating the social structure of the population. This was accomplished by observing which dolphins spend time (or are associated) with other individuals. The graph (Figure 2) shows how the population was separated into 10 clusters or communities.

Analysing social structure also revealed differences in sighting frequency between communities. Community A (circled) clearly contains the individuals that are seen the most, and it was therefore concluded that this was the **resident southwest community**. Dolphins within the other communities were only seen once, with two exceptions, and were determined to be non-residents passing through the area.

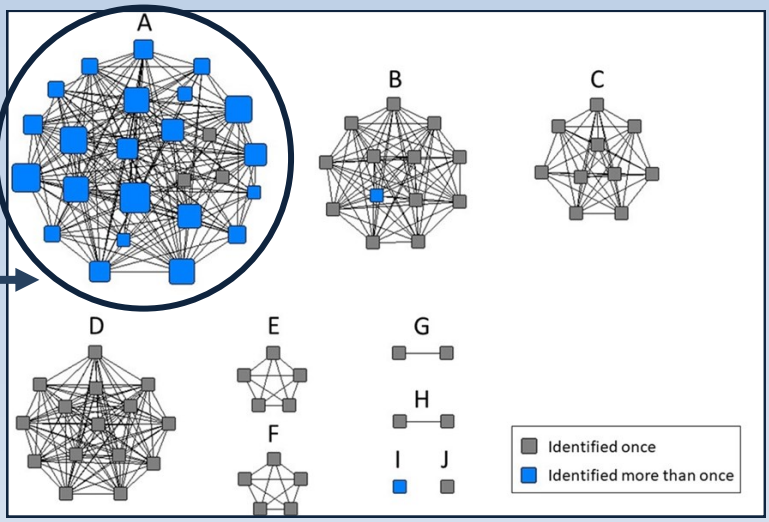

Figure 2: Each square represents an individual dolphin, the square size corresponding to the amount of sightings (range= 1-64). Grey squares show individuals seen once, and blue squares show dolphins seen more than once. *Lines between the squares represent association between individuals.*

Depth

Clear distinctions between coastal and offshore communities can be made based on the depth of their preferred habitat. Globally, coastal communities are often restricted to waters < 50 m deep, with offshore communities seen in deeper waters. Community (network) A were encountered in much **shallower waters** (<45 m) than the other communities (Figure 3), supporting the inference that this community contained the coastal resident dolphins.

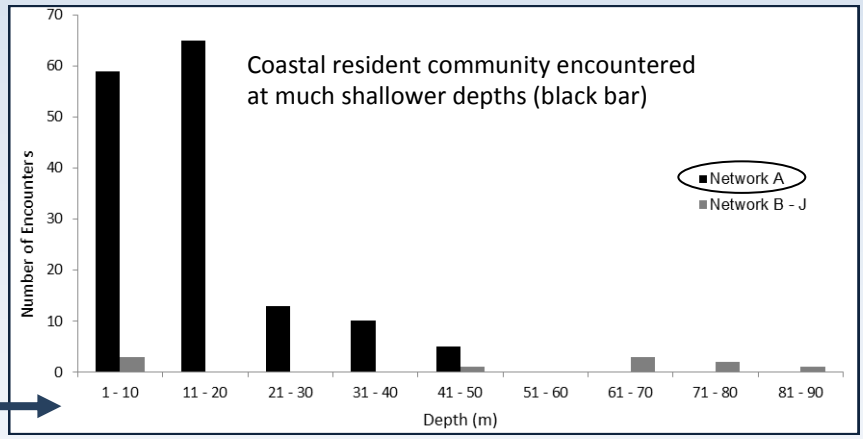

Figure 3: Depth of encounters for network A (black) and network B- J (grey).

Distribution of the population

192 photo-identified encounters

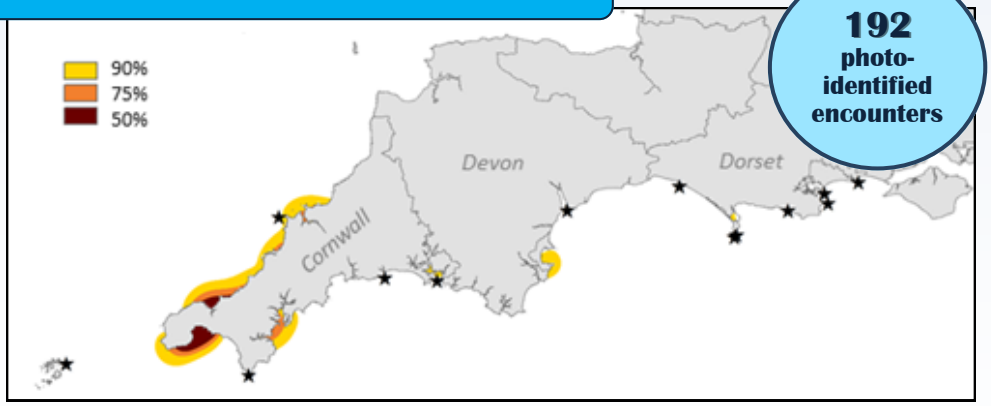

Figure 4: Distribution of encounters using kernel density analysis. Density contours show areas containing 50%, 75% and 90% of encounters. Stars represent outliers (encounters outside of the 90% contour).

Sightings of dolphins were unevenly distributed, but remained concentrated in **two core areas** along the coastline (figure 4). However, ranging behaviour demonstrated that dolphins were not confined to these core sites.

Main Findings

- **There is a resident population of bottlenose dolphins in the southwest region that are seen throughout the year!**
- **The minimum number of dolphins within this population is 36 (currently being investigated further).**
- **Dolphins are seen all along the southwest coastline but appear to be concentrated in two areas of the Cornish coast.**