



VELLA

Study of Bottlenose dolphins' association with aquaculture and tuna penning in Maltese waters



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INTRODUCTION

Bottlenose dolphins (*Tursiops truncatus*) are known to inhabit coastal waters and to interact with various anthropogenic activities [Vella 1998]. Amongst these there are also aquaculture and tuna penning activities which involve the rearing and feeding of fish kept in cages which in turn attract various other species, including fish and bottlenose dolphins.

The Maltese Islands, that are situated in the central Mediterranean, have a relatively large number of such cages most of which are situated in shallower waters within the 6km distance from the shore. To understand the extent of association, dependence and risks dolphins face in spending time within the aquaculture and tuna penning areas dedicated land and marine surveys have been run to assess the seasonal presence and behaviours of bottlenose dolphins in the areas.

This project complements the long-term cetacean marine and aerial research project run in the Maltese waters since 1997 to assess cetacean abundance and distribution within and beyond the 25nm fisheries management zone [Vella, 1998; Mannocci et al., 2018].

Additionally the increasing awareness of the public to the presence of bottlenose dolphins close to these activities have exponentially increased the number of leisure vessels, jet skis and ferries travelling to the area especially during the summer months therefore causing an increasing risk that needs urgent conservation management for these legally protected species.

METHODS

The fish farm area was observed from land [geographical coordinates: 35°50'31" N 14°34'17" E at an elevation of 4m]. A 12x50 Nikon Action binoculars and a Canon camera EOS 1200D with a 75-500mm lens were used to visualise and record photographically research observations. In most cases, a minimum of two researchers participated in such efforts. The focus was to study anthropogenic activities taking place near the shore, such as boat activity and aquaculture in relation to the local dolphin population.

When dolphins are sighted, time, group size, behaviour/s and location with respect to fish farms were recorded. Weather and sea state were also recorded. Marine/Boat Traffic in the area was also recorded.

RESULTS

Out of the 47 hours of area observation, sampling different seasons, between December 2021 and February 2023 a total of 59 dolphins were recorded for an **encounter rate of 1.3/hour and 64% survey dolphin sighting rate. The average group size for the whole duration presented here is of 3.5 individuals (SD=3.95, range 1-15).**



Figure 1: Bottlenose dolphin close to aquaculture net – Maltese waters



Figure 2a: Bottlenose dolphins close to aquaculture cages – Maltese waters

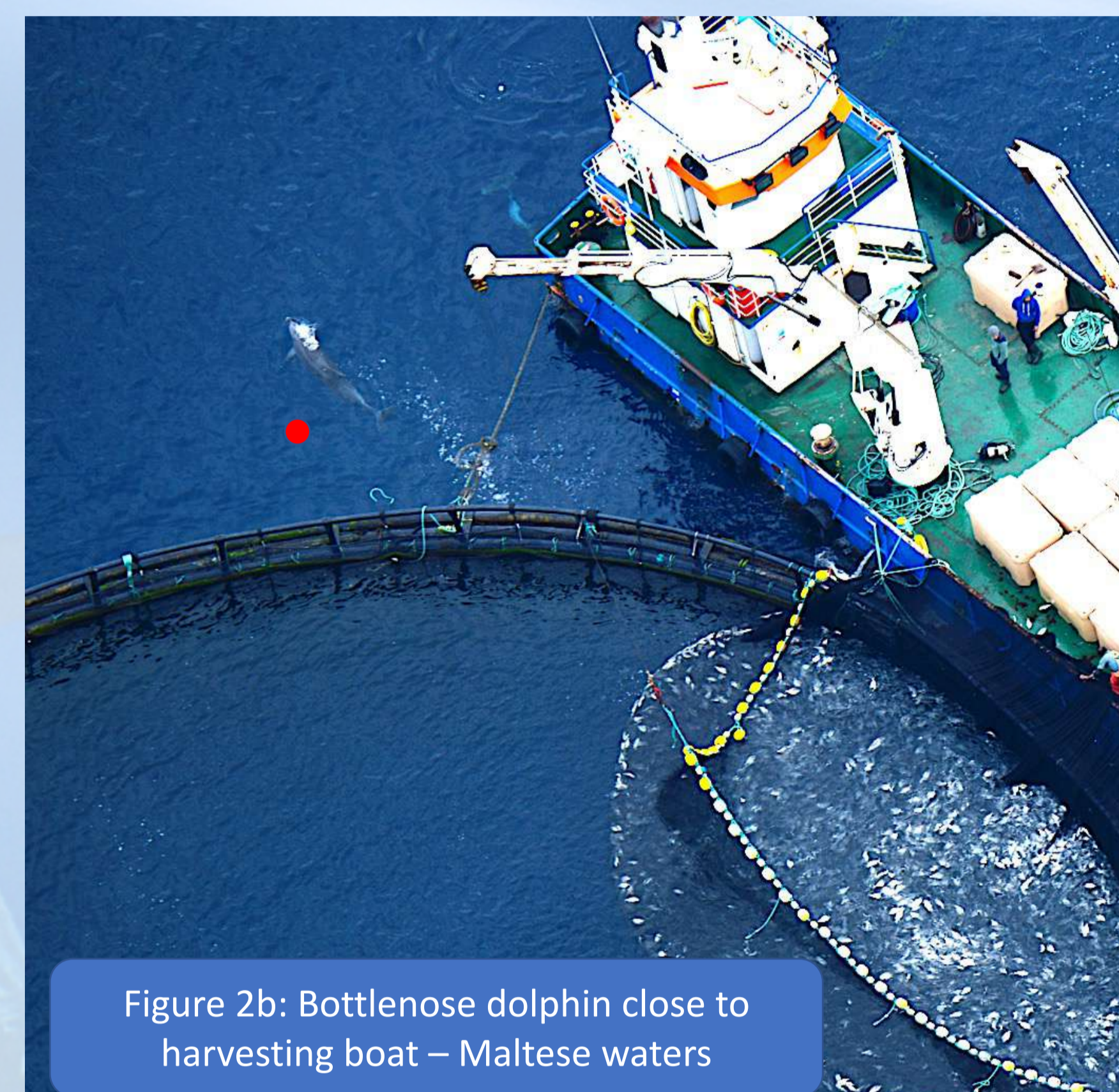


Figure 2b: Bottlenose dolphin close to harvesting boat – Maltese waters

Dolphins made use of the whole area entering very close to the nets and operating vessels. Presence was strongest during and after aquaculture harvesting and feeding operations and with low seasonal variation. The dramatic increase of vessel traffic in summer (up to 28 boats per hour in August) also saw the decline in dolphin presence which contrasts with the winter lower vessel traffic and highest dolphin presence (group size up to 15 individuals).

CONCLUSION

This poster presents one aspect of cetacean research in Maltese waters which investigates the presence of Bottlenose dolphins in aquaculture areas. The regular presence of dolphins and the increasing traffic being observed near these sites especially during summer needs to be considered in policies to manage coastal anthropogenic activities for the safety of this coastal protected species.

References:

1. Vella, Adriana, 1998. Cetacean Research Surveys around the Maltese Islands and Maltese Sea-User Cetacean questionnaire study. First World Marine Mammal Conference in Monaco proceedings: *European Research on Cetaceans – No. 12*. Eds. Evans, and Parsons.
2. Mannocci, L., ...Adriana Vella, Joseph Vella, 2018. Assessing Cetacean Surveys throughout the Mediterranean Sea: a Gap Analysis in Environmental Space. *Scientific Reports, Nature.com*.

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Figure 3: Bottlenose dolphins close to aquaculture vessel in operation – Maltese waters