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First attempt to understand the effect of pingers on static fishing gear in Bulgarian Black Sea coast

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Abstract. Acoustic deterrent devices (pingers) were used on static fishing gear called dalyans in an attempt to reduce bycatch of small cetaceans and/or to reduce depredation in the Bulgarian Black Sea coast. Between April and July 2015 dalyans were equipped with harbour porpoise pingers in the northern part of the coast. Observations were carried out on regular bases on active (with pingers) and on control dalyans (without pingers). The preliminary results were positive in reducing damages on fishing gear.

Key words: pingers, damages, fisheries, dolphins, Black Sea.

Introduction

The interaction between dolphins and fisheries is a worldwide concern as it affects both the survival of wild dolphin populations and the livelihood of the fishermen (Bearzi *et al.* 2003, Bordino *et al.* 2002, Brotons & Grau 2008, Northridge 1984, Read 2003). The past two decades large research efforts are directed towards seeking ways of limiting the harmful effects of these relations (Kraus 1997).

This global problem also occurs in the Black Sea with the three species of cetaceans found there - bottlenose dolphin (*Tursiops truncatus* Montagu, 1821), short-beaked common dolphin (*Delphinus delphis* Linnaeus, 1758), and harbour porpoise (*Phocoena phocoena* Linnaeus, 1758).

One of the possible solutions is the use of acoustic deterrent devices (pingers) on fishing gears (Brotons *et al.* 2008). Their effectiveness is tested for the first time in the Bulgarian Black Sea coast during this study.

Materials and Methods

Surveys were carried out during the spring-summer season (from April to July) of 2015 in the northern Bulgarian Black Sea coast on traditional static fishing gears called dalyans.

Dalyan is one of the main stationary gear used for passive commercial fishing in Bulgaria. A pair of dalyans – active and control were monitored on each of the two survey sites (dalyans Kavarna and dalyans Balchik) 13 km apart from each other.

The active dalyans were equipped with 10 kHz Porpoise Pingers ("Future Oceans"). Pingers were installed according to producer's recommendations and in compliance with the specifics of the dalyans.

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Observations were carried out every month for a four days average from a vantage point located on a high cliff on the coast. Fishermen also were taking notes about dolphin's presence and behavior near the dalyans during the survey period.

Results and Discussion

During the study period 37 separate observations of dolphins were made near the active dalyans. The total number of observed animals is 60 (min 1, max 4, avg. 1,6 individuals at each observation). The average distance, which the animals' keep from the nets equipped with pingers, is avg. 174 m (range 0-400 m) for dalyan Kavarna and 129 m (range 0-250 m) for dalyan Balchik.

The most frequently observed species is the harbour porpoise. Only in July exceptionally, around dalyan Balchik the most observed species is the bottlenose dolphin, which caused a lot of damages on this dalyan.

In the same time, in the area of dalyan Kavarna the frequency of observations of harbour porpoise is even higher but there is only one attack (Fig. 1).

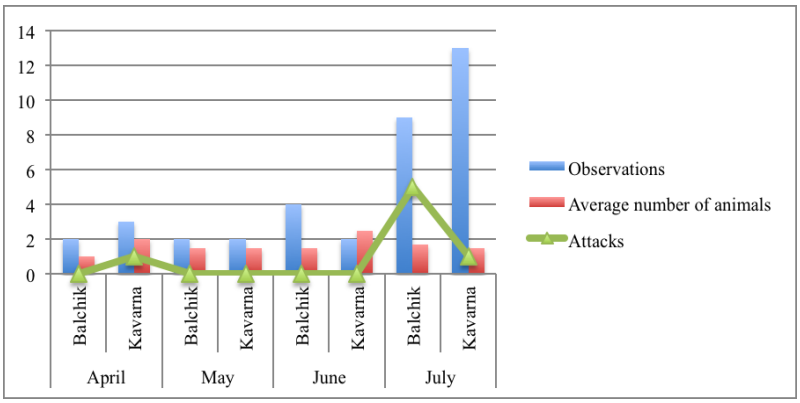

Fig. 1. Correlation between the numbers of observations and attacks on active dalyans.

The frequency of attacks on dalyans with and without pingers is analyzed. The results show that the control dalyans have more attacks by dolphins in comparison with active dalyans during the study period. In both cases, the frequency of attacks is lowest at the beginning of the season in April and is highest in July (Fig. 2).

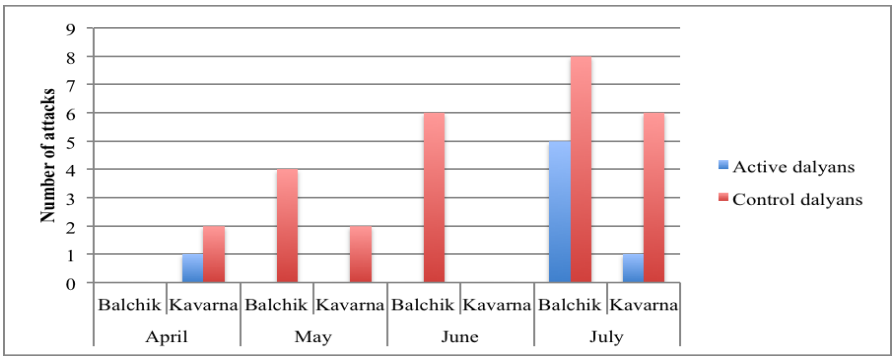

Fig. 2. Comparison of number of attacks on active and control dalyans.

The damages on control dalyans are severe, the fishermen declare meters of torn nets and loss of catch. Attacks on active dalyans are less frequent and without serious damages on the gear - only several small holes on the nets and no catch loss.

No bycatch of dolphins occurred during the study period in all experimental gear.

The preliminary results show that pingers have significant effect against damages caused by dolphins on the studied fishing gear but do not keep the animals far away from their habitats. The pingers used do not affect the target fish catch. As this is first experimental trial, observations will continue to establish if the results are consistent.

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