HIGH EFFICIENCY FEEDING STRATEGY OF *TURSIOPS TRUNCATUS* IN THE FISHING GEAR DEPREDATION.

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Abstract
Some feeding strategies of Bottlenose dolphin appear to be associated to human activities, allowing dolphins to catch prey at a low energetic cost. A comparison study on three different artisanal fishing gears depredated by a *Tursiops truncatus* population was the objective of this work. Two monofilament nets named "Sgammerrara" (Sg1, Sg2) and one trammel net were used. An analysis of the collected data set suggests that the phenomenon of depredation is an example of *Tursiops truncatus* high behavioural plasticity and ability to discriminate between different opportunities, choosing those providing greater benefits.
Keywords: Fisheries, Coastal Systems, Competition, Diet, Behaviour

Introduction
Some feeding strategies of Bottlenose dolphin appear to be associated to human activities allowing dolphins to catch preys at a low energetic cost. The bottlenose dolphin diet is varied and often includes many fishes that are the target species of small-scale fisheries [1]. The "Operational Interaction" with artisanal fisheries is a serious problem because of attacks to nets and the economic damages for fishermen [2]. A comparative study on three different artisanal fishing gears depredated by a Tursiops truncatus population is the objective of this work.

Materials and methods
The study was carried out on November 2005 inside the Ognina bay (South-East Sicily), where a family of fishermen claimed frequent depredation raids by Tursiops truncatus in their nets. Two 254 m long nets named "Sgammerrara" (Sg1, Sg2) and one 1,080 m long Trammel net were used. The Sgammerrara is a fixed monofilament net, divided into three continuous functional sectors: the first two sectors are named respectively "Coda" and "Petto", while the third is named "Campile" and has the same shape as a hook [Fig. 1]. Data comprising species, weight of the catch, as well as damages on the nets (number of holes/tears testifying the dolphin depredation) were collected daily. CPUE and damages were calculated in order to asses differences among the nets. Moreover, the visual monitoring of the Sg1 was performed in order to report dolphins presences, behaviours and photo-ID of the specimens near the nets.

Fig. 1. The Sgammerrara net

Results
11 sampling sessions on Sg1, 11 on Sg2 and 7 in the Trammel net were carried out. In relation to the damages on the nets, it can be assumed that dolphins depredated more the Sg1 (82% of hauls), less with the Sg2 (63% of hauls) and never the Trammel net (ANOVA $p<0.001$). Moreover, the CPUE was the highest for the most damaged gear (Sg1-CPUE=9 ± 2 kgh-1m-1; Sg2-CPUE=1.09 ± 0.07 kgh-1m-1; Trammel net-CPUE=1.04 ± 0.09 kgh-1m-1; ANOVA $p<0.001$) [Fig. 2]. In addition, the composition of the catches was different between Sgammerrara and Trammel net. No by-catch event was registered during the experiments. Three different animals were identified (Foto-ID) twice and the observation indicated that specimens moved towards the Campile and stayed there (in total 3.5 hours) with a feeding behaviour.

Discussion
A careful analysis of the collected data set suggests that the dolphins differently depredated the nets in relation to nets fishing efficiency and to species composition. The behavioural observation allowed to make the hypothesis that dolphins could use the Campile sector of Sgammerrara as a barrier against which they push fish. The experiment confirms the efficiency of Tursiops truncatus strategies as a result of its behavioural performances and its absence of by-catch events. The analysed phenomenon of depredation is an example of Tursiops truncatus high behavioural plasticity and ability to discriminate among different opportunities, choosing those providing greater benefits.

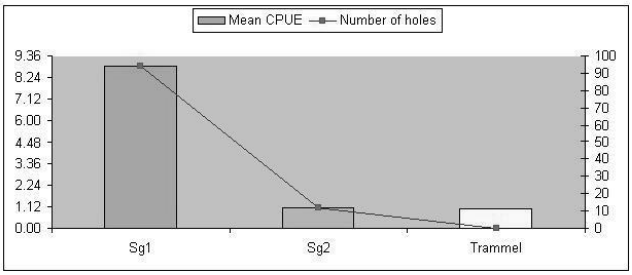

Fig. 2. Mean of CPUE values and of holes number for the three nets

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