Land based survey of Tursiops truncatus interaction with boat traffic in Lampedusa island.

LAND BASED SURVEY OF *TURSIOPS TRUNCATUS* INTERACTION WITH BOAT TRAFFIC IN LAMPEDUSA ISLAND

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Introduction:

Beginning in 2003, as part of the LIFE project "Del.Ta." (NAT/IT/000163), a bottlenose dolphin community has been studied in the Pelagie Archipelago (Sicily, Italy). The aim of this study was to verify the impact of boat traffic on animals behavior.

Material and methods:

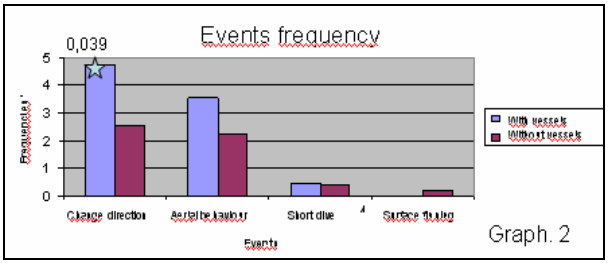
During the summer 2006 land-based surveys were carried out at Lampedusa, one of the Archipelago's Islands, at fixed hours from 6 locations in typical weather condition. Continuous horizon scan and focal group sampling methodology were adopted.
Dolphin behavior and dolphin-boat interaction were recorded for each sighting.
A total of about 236 hours were spent monitoring from a cliff. 35 sightings were recorded.

Results

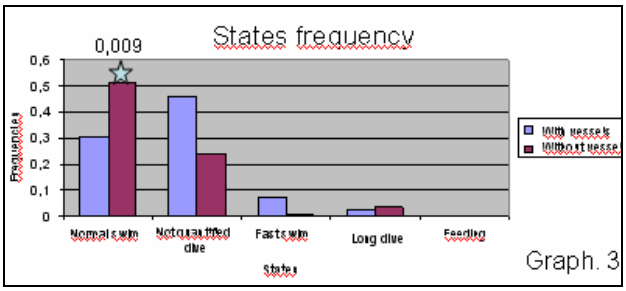
The study analyzed differences in sighting time with or without vessels.

	without boats	with boats
N	27	15
Minimum	0,03	0,05
Maximum	1,70	0,85
Mean	0,56	0,28
Std. Deviation	0,46	0,28

Statistical analysis shows that sighting time decreases in the presence of vessels. Animals tend to reduce time of interaction in presence of vessels and to go away in a vertical or horizontal way (P = 0,034).
Behavioral analysis shows that animals change their activity in presence of vessels, increasing direction changes and decreasing normal swim. (Graph. 2,3)



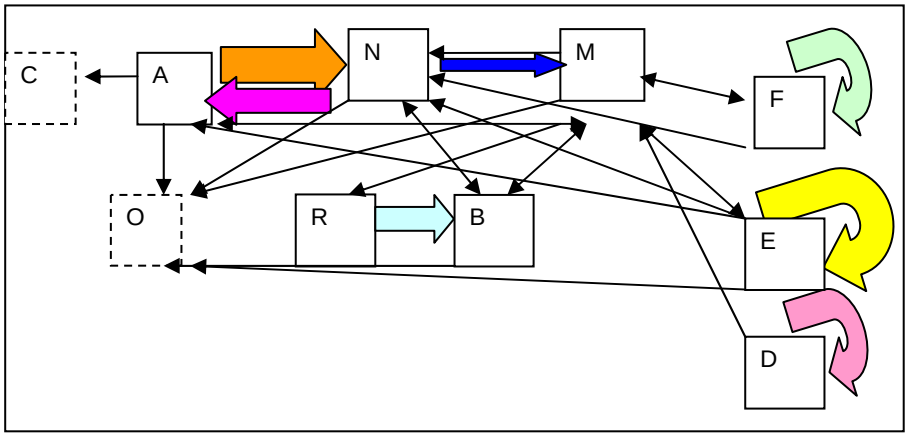
Graph. 2

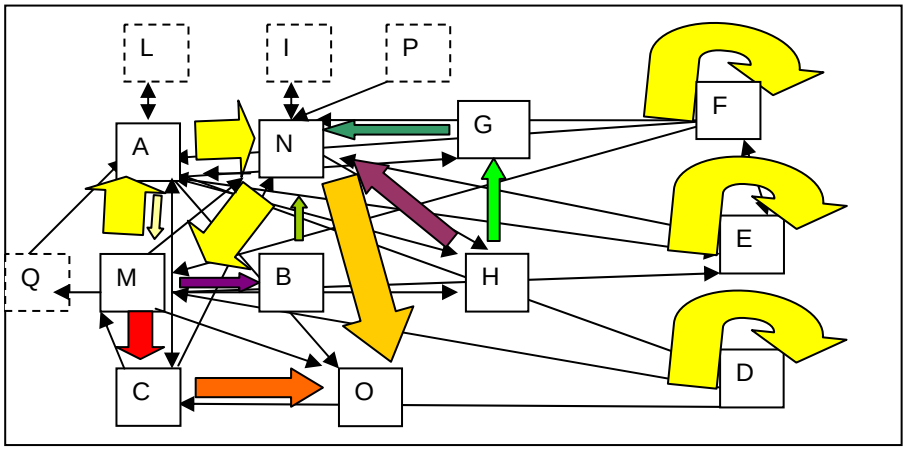


Graph. 3

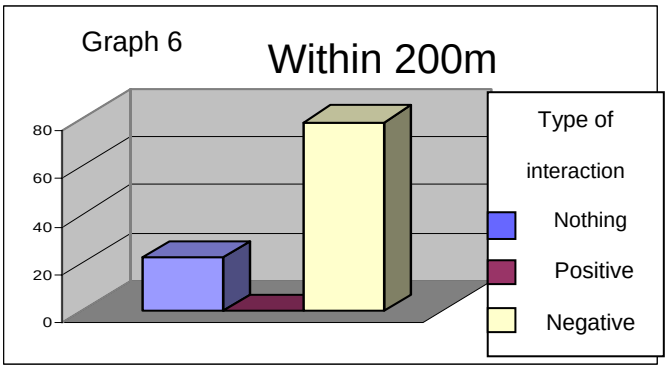
A	NORMAL SWIM	B	FAST SWIM	C	LONG DIVE	D	FAST DIVE
E	BREACH	F	LEAP	G	TAIL SLAP	H	SURFACE FINNING
I	CHIN UP	L	CHIN SLAP	M	CHANGE DIRECTION	N	NOT QUANTIFIED DIVE
O	END SIGHTING	P	FEEDING	Q	CARTWHEELING	R	DEPARTING SWIM

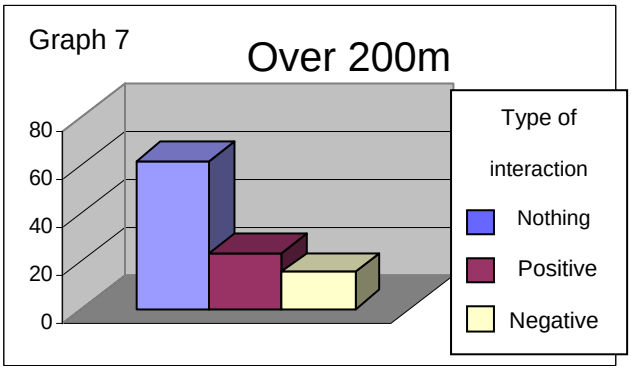
The 1° Order Markovian Chains used to quantify dependence between 2 following events show that animals simplify their behaviors near boats, while in their absence they show a major number of behavioral sequences with a high stereotyped level. (GRAPH 4,5)



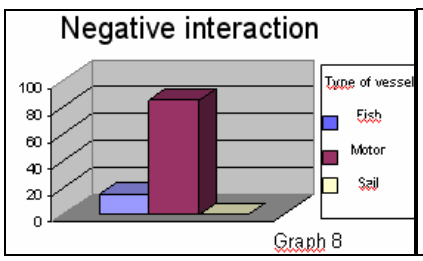


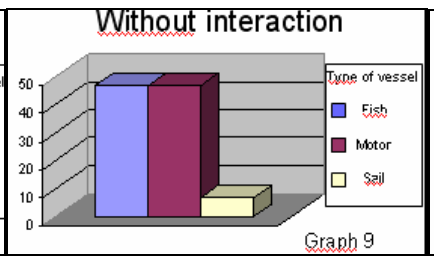
More than 78% of sightings resulted in negative interaction (avoidance) between dolphins and vessels within 200m. Over 200m most of the animals tent to have no interaction with vessels except for about the 20% of them that positively approached the boats (Graph. 6, 7).

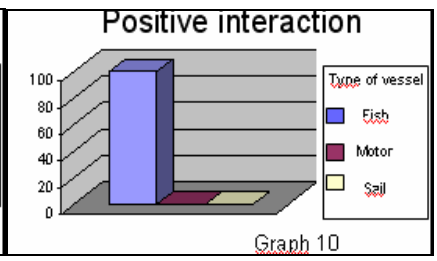




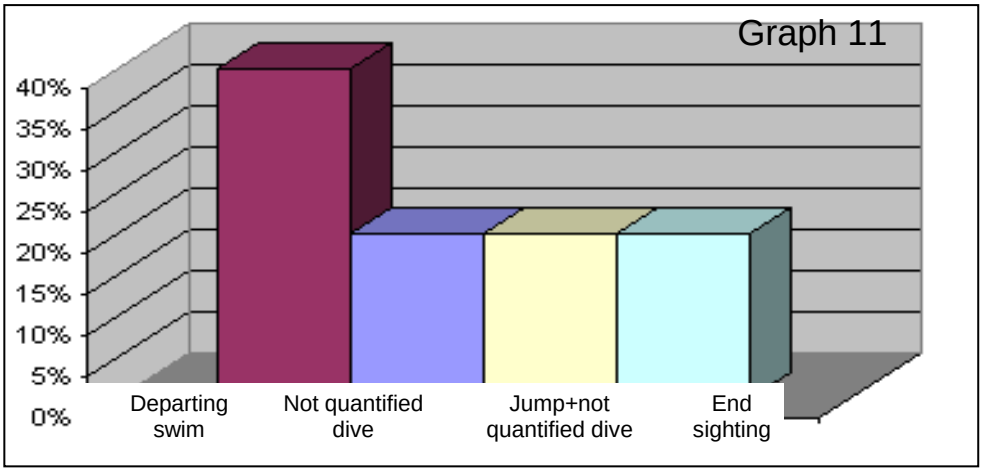
Animals interact in a negative way especially with motorboats. Positive interactions (approaching and following a boat) were recorded just among dolphins and fishing vessels over than 200m. This can be justify by nets dimensions comprised between 200 and 250 m. (Graph. 8, 9, 10).







The transit of fast ships that don't modify speed and direction leads the animals to break off activity and swim away rapidly. (Graph.11)



Discussion

This study demonstrates that dolphins can be disturbed by vessel traffic in the area because they show behavioral modifications particularly with motorboat within 200m. It is necessary to investigate the possible long-term negative impacts on the population of this disturbance. A comparison with other areas dealing with a similar phenomenon would be very useful.

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