

## BEHAVIOUR OF A NURSERY GROUP OF ENTANGLED SPERM WHALE (CAPO PALINURO, SOUTHERN TYRRENIAN SEA, ITALY)

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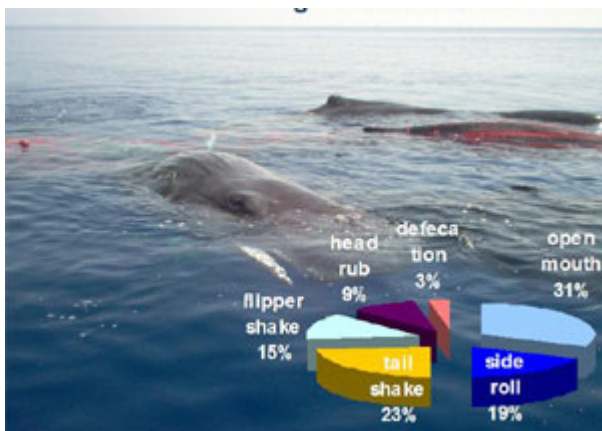
Historically, driftnetting is the most significant source of entanglements for cetaceans, with devastating consequences in the Mediterranean Sea. Of large cetaceans, the sperm whale (*Physeter macrocephalus*) is most affected by this fishery.

On 9th August 2004 a group of five sperm whales – two adults and three immature individuals – was found entrapped in a driftnet 50 miles S-W off Capo Palinuro (Italy). Their tails were tied by the net and one animal was completely entangled. The group was succoured by the divers nucleus of the Coastguard, which had played a leading role in the two-day rescue operations. The first day they managed to free two animals (one adult and one immature), cutting the polyfilaments with scissors. The immature individual showed nervous behaviours, vigorously moving the tail during the net removal. The untied whales then remained near the others, watching the divers’ work until evening, touching the entangled tails and rubbing their sides with the melon (Fig. 1).



**Fig. 1, sperm whales' rubbing behaviour**

During rescue procedures, behaviour of entangled animals included: roll on side, open the mouth, shake the tail and the pectoral fins, and sound production (Fig. 2).



**Fig. 2, behaviours of entangled animals**

During the night, whales were constantly monitored from the Coastguard boat by radar equipment. The group kept together. On 10th August early morning, the divers started to cut the net again, freeing the other two immature animals and then the adult. This last animal remained closed to the divers for one hour after liberation, showing slow movements and accepting hand contacts on side. All the whales had a large number of lesions on their body (tails were strongly damaged) and were clearly stressed.

Acoustic vocalizations (45 minutes recorded) were slow clicks, codas and a very high rate of chirrups. 4094 clicks were counted by Rainbow Click and 2355 were attributed to whales. IPI was measured for 210 clicks, results showed 6 size categories ranging from 5.75 to 9.34 m (Tab. 1).

Average IPI (ms)	N	Lenght estimates equation 1	Lenght estimates equation 2
0,63	52	5,75	9,53*
0,84	33	6,05	9,47*
1,04	35	6,34	9,42*
1,25	61	6,65	9,38*
2,09	15	7,87	9,31
2,04	14	8,31	9,34

Both equations by Gordon (1991) were used  
 Body Length 1=  $4,833 + 1,453 \text{ IPI} - 0,001 \text{ IPI}^2$   
 Body Length 2=  $9,75 - 0,521 \text{ SL} + 0,068 \text{ SL}^2 + 0,057 \text{ SL}^3$   
 where SL is spermaceti length, calculated as  
 $\text{SL} = \text{IPI} \times \text{sound speed in spermaceti} / 2$   
 \* these values  
 The sound velocity used was 1430m s, Goold *et al.*, (1996).

**Tab. 1, Inter Pulse Interval measurements**

Possibly, another animal than the group of five was in the area. Chirrupings were described as brief rapid trills of 10 – 50 clicks, produced at high rate (220 clicks/s) and lasting for 10-25s (Goold, 1999; Gordon, 1995). A chirruping rate was calculated as  $\text{chirruping rate} = \text{Nchirrupings} / \text{T.Nwhale}$  where Nchirrupings is the number of chirrupings heard, T the duration of the recording sequence (in min) and Nwhale the number of whales. CR value was 1.5. Chirrupings and codas were heard mainly during tail shake and open mouth behaviours.

Despite international and national regulation banning driftnets from the Mediterranean, driftnetting continues in sperm whale habitat, thereby continuing to threaten the species' survival in the region. While no one knows exactly how many sperm whales are resident in the Mediterranean Sea, most estimates number in the hundreds. With such a small number there are concerns over the impact of this illegal fishery on this isolated population.

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