

SHORT BEAKED COMMON DOLPHIN IN THE WATERS OF ISCHIA ISLAND: A RELIC POPULATION UNIT OF PRIMARY IMPORTANCE IN THE ITALIAN SEAS.

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HISTORY AND BACKGROUND: The short-beaked common dolphin, *Delphinus delphis* is a small cetacean species with a wide distribution. However, like most other cetaceans, it is not panmictic and occurs as a series of geographically separate populations (Heyning & Perrin, 1994; Perrin & Brownell, 1994; Jefferson & Van Waerebeek, 2002). In 1996, the short-beaked common dolphin was listed as a lower risk species, ‘conservation dependent’ in the IUCN Red List of Threatened Animals (Baillie & Groombridge, 1996).

By contrast in the Mediterranean Sea, conservation problems for the species have been recognized since the 1970s. The UNEP Mediterranean Action Plan (Barcelona, 1975) recommended strong conservation measures to protect the species but without specifying what these measures should be. Determining the conservation status of Mediterranean common dolphins was cited as a priority in past cetacean action plans of the IUCN Species Survival Commission (Perrin, 1988; Reeves & Leatherwood, 1994). The latest such plan notes state that they have declined dramatically in the central and eastern Mediterranean and that conservation action is urgently needed to prevent extirpation in this area of the species’ range (Reeves *et al.*, 2003). In 2003, the Mediterranean common dolphin ‘subpopulation’ was listed as endangered in the IUCN Red List of Threatened Animals based on criterion A2, which refers to a 50% decline in abundance over the last three generations, the causes of which ‘may not have ceased *or* may not be understood *or* may not be reversible’ (<http://www.redlist.org>).

Short-beaked common dolphins in the Mediterranean have undergone a remarkable reduction in their abundance during the last few decades, and have almost completely disappeared from large areas of their former range (Bearzi *et al.*, 2003). A number of interacting factors may have played a role in the decline of common dolphins in the Mediterranean, ranging from natural fluctuations to the impact of human activities. These human-induced threats – based on the available evidence – include factors as diverse as prey depletion, contamination by xenobiotics, direct killing, fishery bycatch and global climate change (Bearzi *et al.*, 2003).

Other potential threats to Mediterranean common dolphins include disturbance by recreational vessel traffic, noise from shipping, mineral prospecting (seismic) and military sonar (Notarbartolo di Sciara & Gordon, 1997; Gisinier, 1998; Jasný, 1999), and oil pollution (Geraci & St. Aubin, 1990; Engelhardt, 1987; Würsig, 1990). Although potentially pervasive, these threats remain poorly characterized or have yet to be linked with specific effects on common dolphins in the Mediterranean or elsewhere (Notarbartolo di Sciara *et al.*, 2002).

The situation in the Mediterranean Sea, underlines that the fate of the remaining animals will most likely depend upon precautionary actions and the adoption of precise conservation measures to prevent further decline. However, it is important that any long or short-term management decisions that have an impact on either the dolphins or their habitat, are made with the support of detailed and current scientific information (Rogan & Berrow, 1995). Field surveys on local groups of common dolphins are clearly needed in order to: a) obtain a better knowledge of the behavioural ecology of the species, b) give support to determine the current distribution and abundance in the Mediterranean, and c) suggest appropriate management strategies.

PRELIMINARY DATA: In the south-eastern Tyrrhenian Sea, the presence of a common dolphin population off the northern coast of the island of Ischia, Italy, has been consistently documented since 1997. The animals have been sighted on a seasonal basis, mostly in the summer, over the submarine canyon of Cuma, a highly productive marine area characterized by significant pelagic biodiversity and multispecies associations (Mussi *et al.*, 2004).

Based on preliminary photo-identification data, 46 recognizable individuals have been catalogued, 19 of these re-sighted in different years, suggesting significant levels of site fidelity. Breeding activities are often observed, and calves are always present in one or more of the group sub-units.

Sighted groups are relatively large (mean=65.5, SD=23.94, $n=41$, range 35–100 individuals) and often observed in association with striped dolphins (*Stenella coeruleoalba*), particularly during surface feeding targeting shoaling prey. Surface feeding occurs frequently and the Atlantic saury, *Scorpaenopsis saurus* (a seasonal fish that is highly valued on local markets) is a typical prey of common dolphins (Mussi & Miragliuolo, 2003).

Finally, acoustic data has been recorded since 2000, mostly during feeding and socializing behaviour (Mussi & Miragliuolo, unpublished data). Both whistles and clicks have been heard.

DIRECT THREATS:

Boats traffic and collisions: In the busy summer seasons pleasure boats and ferries crowd these waters. Commercial and passenger traffic in the Gulf of Naples and in the nearby Phlegrean Islands (Ischia, Procida and Vivara) exceeds 200,000 trips/year, and up to 2,000 recreational boats may be moored during the summer in Ischia’s harbours (Strada,

2000). Ship collisions in the area have been documented by the authors (Mussi & Miragliuolo, 2003) for four cetacean species including striped dolphins, bottlenose dolphins (*Tursiops truncatus*), sperm whales (*Physeter macrocephalus*) and fin whales (*Balaenoptera physalus*). A dramatic harassment event on Risso's dolphins (*Grampus griseus*) was reported by Miragliuolo *et al.* (2004). Despite the presence of vulnerable cetacean species, the waters around Ischia are commonly used for unofficial offshore races, and the implementation of coastal speed limits is virtually nonexistent.

Driftnetting: A potentially major threat for common dolphins and other cetaceans in the area is represented by the illegal driftnet fishery, sadly known for the heavy toll paid by Mediterranean cetaceans (Di Natale & Notarbartolo di Sciarra, 1994; IWC, 1994; Silvani *et al.*, 1999). This fishery threatens the local cetacean communities and bycatch events have been documented for striped dolphins, bottlenose dolphins, sperm whales and fin whales (Centro Studi Cetacei 1996, 1997, in press; Miragliuolo *et al.*, in press).

Notwithstanding the EU ban on driftnets since January 1st, 2002, and the publication of a report (Tudela *et al.*, 2003) that provided extensive documentation of ongoing, large-scale mortality of several cetacean species, followed by the ICCAT recommendation for the total ban of driftnets from the Mediterranean Sea, illegal fishing with driftnets is still an issue around Ischia. Annually, since 1995, swordfish boats equipped with driftnets have been observed daily in the area from May to August (Mussi *et al.* 1998, Mussi & Miragliuolo, 2003).

In Italy, a Decree by the Fishery Ministry (27 March 2003) authorizes the use of a kind of fishing gear called “ferrettare da posta”, i.e. a small driftnet anchored to the bottom. The term “da posta” (anchored) associated to a driftnet merely represents a means to bypass the existing regulations and allow the continued use of driftnets. The deliberate ambiguity of this decree allows fishermen (even those that benefit from the EU conversion plan and receive indemnity funds) to continue the use of driftnets.

The impact on the pelagic fauna of these “ferrettara” driftnets, is still unknown owing to a lack of studies and observations in the field. However, such impact is likely to be similar or equal to that of the normal driftnets.

INDIRECT THREATS

Overfishing and prey depletion: Fishermen claim that the fleet targeting the Atlantic saury (locally a key prey for common dolphins) has decreased by one order of magnitude due to the decline in fish stocks. Moreover, purse seiners and trawlers are not requested to comply with the regulations intended to prevent overfishing (Mussi & Miragliuolo, 2003), therefore producing clear environmental damage.

A recent review by Buia *et al.* (2003) reported a remarkable alteration in the structure of Neptunegrass (*Posidonia oceanica*) beds, related to the illegal and uncontrolled trawling. Neptunegrass beds - distributed all around the island of Ischia up to about 30 m of depth - have been monitored since 1975 (Colantoni *et al.*, 1982). Terlizzi (1991) analysed the fauna associated to the leaf stratum and found a notable diminution in biomass value in 1988-89, as compared to 1981-1982, as well as an important reduction of biodiversity. Finally, a general survey around the hard bottoms of Ischia conducted by Gambi *et al.* (2003) showed that fish stocks are generally scarce and dominated by non-commercial species.

Pollution: Ischia is close to the Gulfs of Gaeta and Naples, which receive the continuous inflow of three polluted rivers: Volturno, Garigliano and Sarno. These rivers include waters classified as “very bad” in the second report on environmental quality by ARPA Campania (2003); pollutant levels brought by the Sarno river, in particular, are unlikely to be sustainable. Sewage plants on the islands of the archipelago are totally inadequate and lack any kind of systems of purification. Zucco (2003) localised in the island of Ischia six highly polluted discharges and 11 pipes releasing sewage into the sea. Moreover, about 90 un-authorized outlet pipes were counted. The evidence provided above suggests that water pollution may be an issue in the waters surrounding Ischia.

CREATION OF A MARINE PROTECTED AREA(MPA): The territory of Ischia is divided into six municipalities. This administrative condition doesn't facilitate the developing of a common strategy to protect the marine environment around the island. This situation should be taken into account when discussing management strategies.

The fishery of Ischia is mainly artisanal. The local cooperative calls for a total protection of coastal marine waters, in order to avoid the current competition with industrial fisheries of the continental Campania and Lazio regions.

The island of Procida has only one municipality and hosts an industrial fleet of trawlers and purse seiners that oppose the creation of a MPA. To enact meaningful conservation strategies, the coastal waters of the Phlegrean Islands should be administered by a single committee, which should include representatives of the local stakeholders. Unfortunately, this view is opposed by political pressure in favour of a division of the protected territory into several areas to allow for further expansion of tourism.

The coastal waters of Ischia and the southern coast of the island of Procida with the islet of Vivara have been protected by a Ministerial Decree (3 April 2000) following the 92/43CEE and 79/409/CEE Directives dedicated to the conservation of biodiversity and natural habitats. Unfortunately, at the moment the maps with the location of the sites, retrieved from the Campania Environment Sector, are discordant. The Ministry is defining the exact location of the sites. The ambiguity of the exact position of the protected area, means that any protection is impossible to enforce (Zucco, 2003). The coastal waters of Ischia, Procida and Vivara are also protected by Coast Guard Ordinances that

regulate the movement of boat traffic (including anchoring) and swimming along the whole perimeter of the islands (04/1997 and 07/2000); despite these ordinances, the implementation is non-existent.

A coastal Marine Protected Area institution is expected (Law 394, 1991) for the Phlegrean Islands (Ischia, Procida and Vivara) by the Italian Ministry of Environment. Such an MPA should mitigate some of the direct threats in the coastal waters of Ischia, but the proposed perimeter does not include the dolphins' critical habitat which is mainly pelagic (Cuma's canyon). Another problem for the protection of the dolphins' home range in Ischia waters through the MPA institution is the lack of awareness, both in decision makers and in the general public, about the threats faced by common dolphins.

A MPA, partially devoted to cetacean fauna could enhance controls in the waters of Ischia. The MPA may restore ecosystem functioning and benefit marine food webs by providing shelter to threatened marine species, thus contributing to the recovery of depleted dolphin prey.

Management measures should include: 1) Stopping the industrial fishery (purse seiners, trawlers) in the area corresponding to the submarine canyon of Cuma and to the Bank of Forio; 2) Monitoring the uncontrolled and illegal fishery that continues undisturbed (including several methods of commercial fishing, also sporting and pleasure fishing, especially the use of explosives in the latter); 3) Reducing and controlling the speed limits around the islands, in particularly near Monte Vico, Punta Imperatore and Punta S.Pancrazio and creating dedicated routes for commercial and passenger traffic. This could be very useful in decreasing the speed of the tourist trips around the island, the fleet of which is composed of big and fast motorboats that normally drive at 25/30 knots; 4) Approving a code of conduct and rules on whale watching (today there are no commercial whale watching activities in Ischia, but this should be considered within the MPA to provide for any changes in the future).

The authors of this paper strongly advise the implementation of the above measures and especially the creation of an MPA in order to protect, and prevent any further declines in, the common dolphin population around Ischia.

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