Cetaceans of the Mediterranean and Black Seas: State of Knowledge and Conservation Strategies

SECTION 4

Conservation Problems: Overview

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Conserving cetaceans is becoming an increasing challenge in the face of expanding human activities at sea and in the coastal zone. While continued evaluation is necessary for protective measures already implemented, new conservation initiatives must often be devised to confront novel and previously unrecognised threats (Reeves *et al*. in press).

Human activities impact on cetaceans in several ways. For instance, actions may affect the individual, such as a fishing net causing the accidental drowning of a dolphin. If limited to rare instances, however, even such events, drastic as they are at the individual level, may have negligible consequences for the population. By contrast, subtle and often indiscernible effects causing progressive habitat degradation, and influencing the biotic communities at the ecosystem level, may have long-term, irreversible effects; these may cause the decline, displacement or even extirpation of cetacean populations from their critical habitats.

From a definition standpoint, it is important to distinguish between the **impacting factor** (e.g., the noise from an approaching vessel), a **short-term effect on the individual** (e.g., a startle reaction), a **long-term effect on the individual** (e.g., a serious behavioural disruption which, prolonged in time, may affect its survival), and a **long-term effect on the population** (if a large number of individuals is affected). Detecting long-term effects of human activities on populations is one of the principal concerns for cetacean conservation scientists, and remains today a formidable challenge.

Further useful definitions are provided in the recent policy document, "Whale and dolphin conservation in the Great Barrier Reef Marine Park", issued in 2000 by the Great Barrier Reef Marine Park Authority, Australia:

*"Impacts may be **direct**, meaning that they affect the animals directly, or **indirect**, meaning that they affect the animals through their effects on the environment. Impacts range in geographic scope from **localised**, affecting only animals in a limited area, to **global**, affecting cetaceans around the world. The duration of a particular impact may be **short-term**, ceasing within minutes or hours of the causal event or activity, or **long-term**, persisting for months or years. Similarly, effects may be **short-term, long-term** or **permanent** (e.g. permanent injury or death). Impacts that affect one or a few animals are of concern, but particular vigilance is required for impacts that affect many individuals, thereby threatening entire populations and possibly risking species extirpation (loss of a species in an area) or extinction (loss of a species worldwide). Global-level impacts are no less serious than those that operate at a smaller scale (indeed they may be more so) …"*

The ACCOBAMS region, of all the planet's marine environments, is one of the most affected by human activities. Concentration of human populations and activities around the Mediterranean basin presents considerable threats to the marine and coastal environment, impacting on the structure and function of natural ecosystems and on the quality and quantity of natural resources. The situation, however, is likely to be getting worse: "In the future, coastal areas are likely to face increasing pressures, particularly on habitats, natural resources (land, fresh/marine waters and energy), and growth of demand for infrastructures (ports/marinas, transport, wastewater treatment facilities, etc.). Urbanisation, tourism, agriculture, fishing, transport and industry are the major forces of change" (European Environment Agency 1999). The "Blue Plan" estimates that the current resident population of the Mediterranean riparian states (450 million) will rise to 520-570 million in 2030, and is expected to reach 600 million in the year 2050. The Mediterranean Sea, with a scant 0.8% of the world's ocean surface, is exposed to 15% of the world's commercial maritime traffic and to 30% of the world's total of ship-transported oil. The number of fishing vessels has increased by almost 20% from 1980 to 1992. Marine aquaculture production has grown from 78.000 tonnes in 1984 to 248.500 tonnes in 1996. About 60% of urban waste disposed in the Mediterranean is still untreated (European Environment Agency 1999), and it is commonly accepted that the rate of introduction of foreign, often noxious substances from land-based sources into this semi-enclosed basin cannot be overcome by its water turnover rate, estimated at approximately 100 years.

The Black Sea is widely recognized as one of the regional seas most damaged by human activities. The following is an excerpt from the website of the U.N. Black Sea Environment Programme[1]:

"Almost one third of the entire land area of continental Europe drains into this sea. It is an area which includes major parts of seventeen countries, thirteen capital cities and some 160 million persons. The second, third and fourth major European rivers,

[1] http://www.blacksea-environment.org/

the Danube, Dnieper and Don, discharge into this sea while its only connection to the world's oceans is the narrow Bosphorus Strait. The Bosphorus is as little as 70 meters deep and 700 meters wide but the depth of the Black Sea itself exceeds two kilometers in places. Contaminants and nutrients enter the Black Sea via river run-off mainly and by direct discharge from land-based sources. The management of the Black Sea itself is the shared responsibility of the six coastal countries: Bulgaria, Georgia, Romania, Russian Federation, Turkey, and Ukraine. In a period of only three decades (1960's-1980's), the Black Sea has suffered the catastrophic degradation of a major part of its natural resources. Particularly acute problems have arisen as a result of pollution (notably from nutrients, fecal material, solid waste and oil), a catastrophic decline in commercial fish stocks, a severe decrease in tourism and an uncoordinated approach towards coastal zone management. Increased loads of nutrients from rivers and coastal sources caused an overproduction of phytoplankton leading to extensive eutrophication and often extremely low dissolved oxygen concentrations. The entire ecosystem began to collapse. This problem, coupled with pollution and irrational exploitation of fish stocks, started a sharp decline in fisheries resources".

Cetaceans are long-lived vertebrates, confined to the highest levels in marine trophic webs, and have a very low reproductive rate. They are thus particularly vulnerable to the complex of threats deriving from a variety of human activities. These include direct exploitation and capture, by-catch in fisheries activities, competition and culls, habitat loss and degradation, contaminants, and disturbance from increased traffic. In addition to these well-known impacts, new factors, or factors previously unrecognised as significant, must be accounted for today, including: possible effects of global change, reduced prey availability, the contamination of the food web by algal bloom biotoxins, vessel collisions, noise pollution, and disturbance from unregulated, disrespectful whale-watching. Finally, many of such factors may interact positively, ultimately resulting in compound effects further adding to the overall burden.

Threats to cetacean survival deriving from human activities can be particulary severe in the Mediterranean and Black Seas, due to the enclosed and semi-enclosed nature of such basins, and to the human density and intensity of activities, particularly in the coastal zone. Pressure is thus most intense on coastal species, such as bottlenose and common dolphins and harbour porpoises. However, also pelagic species, such as sperm whales and striped dolphins, can be severely affected. However, one of the first difficulties encountered in the attempts to solve Mediterranean whale and dolphin conservation problems is the lack of adequate knowledge of population distribution, size, discreteness, trends, and dynamics for any of the cetacean species (Notarbartolo di Sciara and Gordon 1997; see also Table 17.1).

In the following Sections of this report, the different factors impacting on cetaceans of the Mediterranean and Black Seas will be addressed: direct killing and live capture (Sections 5 and 6), habitat loss and degradation (7 and 8), interactions with fisheries (9 and 10), disturbance (11, 12, 13 and 14), and natural mortality (15 and 16).

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