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

SECTION 17

Overview of Known or Presumed Impacts on the Different Species of Cetaceans in the Mediterranean and Black Seas

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Two main approaches exist for the evaluation of the status of cetaceans with respect to human threats: the threat-based approach and the population-based approach (Whitehead *et al.* 2000). Both approaches have at the same time merits and drawbacks. We suggest that by combining the available information together into a species-impact table, a comparison between the two approaches and the types of indication that can be derived can provide useful insight.

Table 17.1 (the "species-impact" table) was created with the intent of providing an overview of the impacts from the various threat factors on the different species in the Agreement area. Impacts were subdivided into two main categories: those liable to be causing "mortality and damages inflicted by human activities", and the components of "habitat degradation and loss". Four possible scores were given: (1) impacts known or presumed to be of primary importance, (2) impacts known or presumed to be of secondary importance, (3) impacts likely to be insignificant, and (4) impacts for which there is insufficient data, thus needing further research. Scores in each cell were contributed separately by each of us on the basis of published knowledge integrated by our personal experience and opinion, and where divergences existed consensus was reached through discussion. Obviously the procedure that was followed to construct the table could not rest on objective data. Therefore, the information provided should be only viewed as a first indication having an orientation value, deriving from our collective judgement, to be replaced as soon as possible with data collected according to rigorously designed protocols.

The following definitions were used:

Intentional and direct takes: killing or capture of cetaceans for use of products for human consumption or other, live capture, hostile acts provoked by actual or perceived damage to fishing activities, sport, and no apparent reason.

Accidental takes in fishery activities: mortality or damage[1] inflicted through the accidental entanglement in fishing gear of all types (including passive and active nets, longlines, traps, discarded or lost nets and lines, gear accessories, etc.) and illegal fishing practices (e.g., use of dynamite).

Collisions and accidents with vessels: mortality or damage inflicted through collisions with the hull, prow, propeller blades, rudder or any other part of a vessel.

Prey depletion: depletion of food resources caused by the direct and indirect effects of fishing activities and overfishing.

Contamination by xenobiotic compounds: accumulation in the body tissues (mostly through the food web) of xenobiotics (including POPs and trace elements) known to adversely affect mammalian functions and health.

Oil pollution: mortality or damage deriving from contamination, contact or ingestion of hydrocarbons deriving from oil spills and oil derivates at sea.

Ingestion of solid debris: mortality or damage deriving from the ingestion of foreign objects and materials, such as plastic, wood, textiles, etc. (in general obstructing part of the digestive tract).

Acoustic pollution: mortality or damage deriving from exposure to impulsive or prolonged man-made sound reaching noxious intensity and/or frequency levels.

Disturbance: behavioural disruption through intentional or non-intentional approaches, likely to induce long-term effects in the population.

Ecosystem and climate change: likeliness that the population will be affected by changes in the ecosystem, which may be deriving from climate change or from other man-made factors, including eutrophication, harmful algal blooms, prey depletion resulting from habitat degradation, alien species invasions, etc.

Epizootics: susceptibility of the population to mass mortality events deriving from the spread of epizootic disease.

By examining table 17.1 along the species rows, we can see that for some species (e.g., striped, bottlenose and common dolphin in the Mediterranean, harbour porpoise in the Black Sea) the number of factors having a known or presumed impact of primary importance is high (=2). For other species the number of factors for which data are insufficient is too high to enable any reasonable inference (e.g., sperm whale, Cuvier's beaked whale, pilot whale, Risso's dolphin, harbour porpoise in the Mediterranean).

It is important to note that it is impossible to derive from the table an indication on which species is most endangered, given that a single factor for one species may have a greater impact on its survival than a sum of factors on another. We must thus warn against a potential misuse of the information contained in the table. It is of paramount importance to consider, while attempting to assess and evaluate the complex of impacts

[1] For "**damage**" we intend physical trauma, pathological effects, physiological disruption, behavioural disruption, or displacement/extirpation from the species' critical habitat in the Agreement area.

any single species is subjected to in the study area, a multiplicity of elements, including the status of the population itself based on data on population size, trends and parameters, and the biological and ecological effects that each impact, alone and in conjunction with the others, has on the survival of the individuals and of the population as a whole. The importance can never be stressed enough of considering the composite effects deriving from the combination of different impacting factors, and thus the need of adopting a holistic approach when considering threats. Furthermore, we note that many impacting factors (e.g., bycatch, disturbance, direct kills, etc.) are quite patchily distributed throughout the Agreement area, being present and possibly acute locally, and inexistent in other portions. Conditions, however, are dynamic and may change rapidly across the region as human activities evolve and modify. Although single impactors may be only significant for a portion of a population today, we have chosen to emphasize their potential importance at the regional scale. This population-based approach is very useful for the establishment of management priorities on a regional basis, and will be again discussed in Section 18 of this report.

Examining the single impacts in table 17.1, it is clear that for some impacts the available information is sufficient to provide an initial idea of their relative importance (e.g., intentional takes, collisions, solid debris, disturbance), whereas in other cases our ability to make any assessment is nil due to lack of information or to the intrinsic complexity of the considered factor (e.g., oil pollution, noise, ecosystem and climate change, epizootics). For some of these factors their inclusion in the table is thus largely justified as a means of emphasizing our state of ignorance, thereby attracting attention on research needs and priorities. This problem can be exemplified by the complexity of the threat posed by epizootics. Both Mediterranean striped dolphins and Black Sea common dolphins suffered morbillivirus epizootic some years ago. On this basis, these species can be considered at risk as far as this threat is concerned. However, since almost all individuals in these populations were probably infected by the virus, those which survived overcame the disease by producing antibodies. Taking this into account we can thus arrive to the opposite conclusion, i.e. that these populations are currently protected against suffering another morbillivirus epizootic (although not against an epizootic caused by another agent), so their risk could be scored as lower than for other species. The matter, however, is further complicated considering that the individuals that survived the epizootic years ago are now progressively being replaced by younger individuals that were never exposed to the morbillivirus; so the risk for these populations is again steadily increasing; eventually, when the "old" generation will be completely replaced, the risk of suffering a morbillivirus epizootic will be again high. Furthermore, other aspects connected with epizootics, including for example the incidence of triggering factors (immunosuppressing pollutants, decreased food availability, etc.), are very difficult to assess and probably very different among species or even populations.

Impacts like accidental takes in fishery activities, contaminants, and disturbance are perceived as very diffused across species, both in the Mediterranean and in the Black Sea. Other impacts, by contrast, seem to be more limited, such as collisions (only affecting the largest species), and direct takes (only for the smaller species). Fishery bycatches and contamination by xenobiotics are perceived as primary factors impacting a greater number of species, while intentional takes, ingestion of solid debris and disturbance are seen as been largely of secondary importance.

The massive number of cells for which we felt that insufficient data are available, however, makes most first-glance assessments an ineffectual exercise, and points forcefully towards the urgent need for targeted research. In particular we want to emphasize that among the types of information which are still unavailable, and yet of paramount importance for an accurate assessment of the levels of each threat, a prime position is occupied by knowledge on population sizes. The need to obtain at least an order of magnitude for the sizes of the cetacean populations of all species in the Agreement area is strikingly evident. Such knowledge should eventually enable the evaluation of possible population declines due to the different impacting factors, and ultimately elucidate the relative importance of such factors by applying criteria analogous to those adopted by IUCN for evaluating species status and assess extinction risks (Anon. 2000).

List of references

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Table 17.1 - The "Species-Impact" Table

SPECIES		KNOWN OR PRESUMED IMPACTS										
		Mortality and damages inflicted by human activities			Habitat degradation and loss							
		Intentional and direct takes	Accidental takes in fishery activities	Collisions and accidents with vessels	Prey depletion	Contamination by xenobiotic compounds	Oil pollution	Solid debris	Noise	Disturbance	Ecosystem and climate change	Epizootics
Fin whale				■	?		?		?	▒	?	?
Sperm whale			■	■	?	?	?	?	?	▒	?	?
Cuvier's beaked whale			?		?	?	?	▒	■	▒	?	?
Long-finned pilot whale			■		?	?	?	?	?	▒	?	?
Risso's dolphin			?		?	?	?		?	▒	?	?
Striped dolphin		▒	■		▒	■	?	?	?	▒	?	?
Common bottlenose dolphin	MED. S.	■	▒		■	■	?		?	▒	?	?
	BLACK S.	▒	▒			▒	?	▒	?	▒	■	?
Short-beaked common dolphin	MED. S.	?	▒		■	■	?		?	▒	?	?
	BLACK S.		▒		▒	▒	?		?		▒	?
Harbour porpoise	MED. S.	?	?		?	?	?	?	?	?	?	?
	BLACK S.	?	■		▒	■	?		?	■	■	?

■ Impact known or presumed to be of primary importance

▒ Impact known or presumed to be of secondary importance

Impact likely to be insignificant

? Insufficient data, need for targeted research