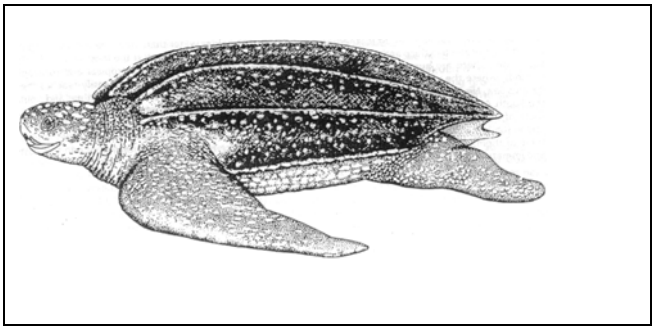
Nomination

Dermochelys coriacea,
Leatherback Turtle



Geographical extent

OSPAR Region; All
OSPAR Biogeographic zones: All
Region & Biogeographic zones specified for decline and/or threat: as above

D.coriacea is a highly pelagic species with a global distribution that extends across temperate and tropical latitudes. Today, the largest populations are in the Atlantic and Caribbean . The major breeding grounds for this species are in the eastern Pacific and western Atlantic. There are no nesting beaches in the OSPAR Maritime Area. Adult leatherbacks have been recorded in the Barents Sea, the North Sea and the NE Atlantic (Brongersma, 1972; Márquez, 1990). These are not considered to be vagrants and hence the OSPAR Maritime Area is within the natural foraging range of this species.

Application of the Texel-Faial criteria

D.coriacea was nominated for inclusion on the OSPAR list with particular reference to decline and sensitivity with information also provided on threat.

Decline

Using data from nesting beaches, the global population of adult female leatherback turtles was estimated to be around 115,000 in the early 1980's and the population as a whole was considered to be endangered (Pritchard, 1982). A more recent estimate gives a figure of around 34,500 (with confidence limits giving lowest and highest estimates between 26,200– 42,900) of which the eastern Atlantic population of nesting females was estimated to be around 4,638 (±763) (Spotila *et al* 1996). These figures point to a possible decline of around 60% in the intervening period. There are no estimates of the likely population size in the OSPAR Maritime Area.

Losses of entire nesting colonies and dramatic declines at other colonies, compared to fluctuations and increases at others, have raised concern about the status of this species. A first attempt at mathematical modelling suggests that the Indian Ocean and western Pacific cannot withstand even moderate levels of adult mortality and that even the Atlantic populations are being exploited at a rate that cannot be sustained (Spotila *et al* 1996). It has been suggested that leatherback turtles are being exploited at an unsustainable levels and are "on the road to extinction" however the precise situation remains unclear at the present time because of the difficulties of developing and running population models for this species (Pritchard, 1996).

Sensitivity

Mathematically modelling of population dynamics suggest that an increase in adult mortality of more than 1% above background levels in a stable population cannot be sustained (Spotila *et al.,* 1996). There is also the view that the leatherback is a vigorous and dynamic species and able to show quite rapid response to protection (Pritchard, 1996). The sensitivity of *D.coriacea* to pollutants such as crude oil and pesticides has yet to be determined.

Threat

Legal and illegal, commercial and subsistence, exploitation in some parts of the world, targeting both adult turtles and their eggs, is a significant threat to the leatherback and has led to massive declines in the number of adult females on some well-studied nesting beaches (e.g. Spotila *et al.,* 1996). The other main threats are from habitat damage to nesting beaches, incidental capture and entanglement in fishing gear, ingestion of persistent marine debris and marine pollution (e.g. Lutcavage *et al*., 1997).

In the OSPAR Maritime Area, the main threats to this species come from fisheries activity and marine litter. There are records of leatherbacks captured in driftnets, trawls, set gill nets, purse seines, long line fisheries and lines of pot fishing gear (e.g. Brongersma, 1972; Godley *et al*., 1998; Pierpoint, 2000). The ingestion of plastic bags, presumably mistaken for jellyfish, can also be fatal and has been reported from post-mortem examinations on stranded turtles (e.g. Duron & Duron 1980; Berrow & Rogan, 1995). There is also a possibility that some turtle mortality is caused by collisions with vessels (Haelters *et al*., 2001). It can be concluded that there has been and continues to be a threat to this species across its range within the OSPAR Area.

Relevant additional considerations

Sufficiency of data

Estimates of the world population of leatherback turtles rely on information about the number of adult females at the major nesting sites. In many cases the data set covers more than a decade. There are also data on the incidental capture of turtles (including leatherback), strandings, and sightings records.

Modelling the population dynamics of *D.coriacea* is in the early stages of development with the main input data being records of the number of nesting adult females. Important areas of uncertainty include knowledge about the intermediate life-stages, the longevity of the species, and the limited number of years of available data to examine for trends.

Changes in relation to natural variability

Leatherback numbers on nesting beaches are known to fluctuate greatly from year to year (e.g. Girondot & Fretey, 1996), with the possibility of long-term natural cycles of considerable amplitude (Pritchard, 1996). This may be due to variations in reproductive cycles, food supply, environmental conditions on their foraging grounds and effects of mortality at various stages of their life histories. Natural fluctuations also occur in relation to the success rate of hatching. Storm events and seasonal erosion can degrade or destroying nesting beaches and result in egg losses for example. Females digging into nests constructed earlier in the season may also destroy eggs. These factors mean that there is some uncertainty about how the scale of the current declining trend relates to natural variability of the population.

Expert judgement

Current population estimates are derived from figures of the number of nesting adults and it is not clear how much, if any of this, can be attributed to a natural fluctuation (perhaps related to El Nino) or a warning that the population is in serious jeopardy (Eckert, 1995). Some nesting populations have been virtually extirpated however. This is the case in Mexico which has the largest breeding colony of leatherback turtles in the western hemisphere, and where there have been enormous losses of both adults and eggs in recent decades (Pritchard, 1982; Eckert, 1993).

ICES evaluation

The ICES Advisory Committee on Ecosystems (ICES 2003) concluded that the data for loggerhead turtles meets the Texel-Faial criteria for declining and threatened species, although some available data for by-catch.

Threat and link to human activities

Cross-reference to checklist of human activities in OSPAR MPA Guidelines
Relevant human activity: Fishing, hunting, harvesting; land-based activities, tourism & recreational activities; *Category of effect of human activity:* Physical – visual disturbance, litter; Biological – removal of target and non-target species

Both direct and indirect links between human activities and the threat to leatherback turtles are well known. The clearest of these are harvesting of eggs which has been recognised as the main cause for the collapse in some areas (e.g. Chan & Liew, 1996). Incidental capture of adult turtles in fishing gear is also well reported, although the mortality rate of individuals that are subsequently released is not known. Links have also been made between activities on the High Seas and the decline in numbers of leatherbacks nesting on particular beaches (Eckert, 1997). An indirect cause of mortality is the ingestion of plastic debris.

Management considerations

Management measures that would aid the conservation of *D.coriacea* are protection of nesting sites including from egg collection, reduction in the direct and incidental capture of adults, and improvements in water quality (litter and pollution). All but the first of these is relevant to turtle conservation in the OSPAR Maritime Area.

The leatherback turtle is classified as Critically Endangered by the IUCN (Hilton-Taylor, 2000). This species is also listed for protection on the EC Habitats & Species Directive, the Bern Convention and the Bonn Convention. International Trade in sea turtle products and sub-products is also forbidden under CITES except for certain countries where they are considered to be part of internal traditional customs or rituals.

Further information

Nominated by:
United Kingdom

Contact person:
Mark Tasker, Joint Nature Conservation Committee, Monkstone House, Peterborough, PE1 1UA, UK.

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