Harbour porpoise follows herring

Distribution and abundance of harbour porpoise and their prey in the southern North Sea (51°-56°)

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2000

1500

1000

500

'90 '91 '92 '93

'94

'95

'96

Bio

INTRODUCTION MORE HARBOUR PORPOISE

The Harbour porpoise (*Phocoena phocoena*) is protected by a variety of national and international agreements. Harbour porpoises are most abundant in the northern Atlantic Ocean. In the southern North Sea, they belong to a mixture from migrating porpoises, likely from the British and Danish North Sea. (Andersen et al., 2001)

Since the 1990's every year more harbour porpoises are observed in aerial (RIKZ), coastal (Camphuysen) and boat surveys (Project Rugvin) and strandings of both dead (Naturalis) and living porpoises (SOS Dolfijn Harderwijk). In many studies it is suggested that this increase is possibly related to food fluctuations. In a Dutch sample (n=62) Santos Vázquez found in 1998 that Whiting (*Merlangius merlangus*) was the main prey consumed (75% of the total estimated prey weight). Other fish species consumed were Sand eel (*Amydytidae* spp) and Gobies (*Gobiidea* spp). Other populations feed mainly on Herring (*Clupea harengus*) and Sprat (*Sprattus sprattus*). However whiting decreased in our waters and herring increased.

HYPOTHESIS PREDATOR FOLLOWS PREY

The yearly abundances of both herring and harbour porpoise seem to coincide. Therefore it is hypothesized that there is a relationship between the abundances of these two species. This is important to show the effectiveness of regulation on fisheries.

YEAR TREND PREDATOR FOLLOWS PREY



Dramatic increase of harbour porpoise observed in Dutch coastal since 1990 from incidental sightings and systematic seawatching results

Harbour porpoise

Source: Kees Camphuysen, NIOZ, 2004

Herring

Herring disappeared from our waters in the early 1970's due to overfishing. The fishery was closed from 1977-1981 to allow stocks to recover. Since 1995 herring is recovering again. Herring is also an energy-rich fish species.

Source: ICES, Fishmap online, 2006

METHOD DATA ANALYSIS

Data of ICES (International Council for the Exploration of the Sea) are used to get insight in the population of fish species. To study the abundance and distribution of harbour porpoise various data sources are used: NIOZ (Netherlands Institute for Sea Research; Kees Camphuysen), Project Rugvin (Nynke Osinga, Frank Zanderink), RIKZ (Royal Institute for Coast and Sea; Nynke Osinga), SOS Dolfijn (Jolanda Meerbeek), Nationaal Natuurhistorisch Museum Naturalis (Marjan Addink, Okka Jansen). Furthermore a detailed literature study has been done which can be read in the final report (in progress).

ALTERNATIVE THEORY OVERFISHING, MIGRATION

An alternative theory that could explain the increase of harbour porpoise in the southern North Sea has been proposed by the German biologist Kai Abt. When fish populations decrease elsewhere due to overfishing, cetaceans migrate southwards to find alternative prey.

SUPPORTING DATA SEASONAL TREND

Although this alternative theory of migrition due to overfishing elsewhere cannot be excluded, other data strongly underline our theory. Next to the trend of increasing porpoise and herring populations since 1995 a seasonal trend can be observed: both species occur most abundantly in the southern North Sea from January till March.

SEASONAL TREND PEAKS FROM JANUARY-MARCH

'99

'98

'00 '01 '02 '03 '04





October

November

December

Herring catch '83-'04 According to these figures, it is clear that in the first quarter most herring can be found in the southern North Sea (January-March).

Source: ICES, Fishmap online, 2006



Harbour Porpoise '72-'04 It is very interesting to see that during the same months, a peak in the observations of harbour porpoises can be observed.

Source: Kees Camphuysen, NIOZ, 2004

CONCLUSION MORE HERRING, MORE PORPOISE

We propose that the increase of harbour porpoise in the southern North Sea can be related to the increase of herring. As whiting decreased due to overfishing and herring recovered after a fishery ban we conclude that regulating fisheries results in a positive effect on both predator and prey. Sustainable fishery should be promoted in order to recover Atlantic ecosystems. Stomach analysis (work in progress at the University of Aberdeen as well as at Naturalis) will give extra information.



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