

Agenda Item 5.4: Bycatch Issues

**German part-time fishermen in the Baltic Sea and
their by-catch of harbour porpoise**

Submitted by: Germany



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German part - time fishermen in the Baltic Sea and their by - catch of harbour porpoise

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Abstract

By - catch is the most serious threat to harbour porpoise (*Phocoena phocoena*) in the western and the central Baltic. By – catch of harbour porpoise occur primarily in bottom set gill nets. Part - time fishermen work less than full - time fishermen. They have smaller boats (rarely longer than 8 m) and smaller catches. Most part - time fishermen in the German Baltic set gill nets. They endanger harbour porpoise because they set nets in shallow coastal waters which harbour porpoise do prefer. It is unclear how many harbour porpoises are taken incidentally each year. This paper estimated evidence that fishing with bottom set gill nets result in a total of 57 harbour porpoise being taken incidentally in the western Baltic and 25 in the central Baltic. Based on these estimates part - time fishermen are responsible for 27 % of the estimated by - catch.

1. Introduction

Harbour porpoise (*Phocoena phocoena*, LINNÉ 1758) is the only native cetacean in the Baltic Sea (Siebert et al. 1996, Benke et al. 1998, Koschinski 2000, Kock et al. 2003). Since the early 1980s, it has become obvious that harbour porpoise in the Baltic Sea is threatened with respect to by – catch. These by-catches occur during commercial fishing activities, primarily in bottom set gill nets (Kock & Benke 1996, Lockyer & Kinze 2000, WWF 2001; Dorrien and Vesper 2003).

Current knowledge distinguishes three populations of harbour porpoise in central European waters:

- North Sea
- Kattegat - Belt Seas and Western Baltic to the Darss sill in the east
- central Baltic (east of the Darss sill)

(Tiedemann et al., 1996, IWC 2000, Huggenberger et al. 2002). Subpopulations within these populations have been suspected but have not identified to date (Kaschner 2003).

The only abundance estimate available for the North Sea and Kattegat – Belt Sea populations was obtained during SCANS (Small Cetaceans in the Baltic and the North Sea) in 1994: 309,000 (237,000-381,000) harbour porpoise were estimated to live in the North Sea and 36,046 (20,276-64,038) individuals in the Kattegat, Belt Seas and the Western Baltic (Hammond et al. 2002). Abundance in the Baltic was declining towards the east: abundance of porpoises in the western Baltic (Kiel and Mecklenburg Bights) in the early 1990's which are considered to be part of the larger Kattegat – Belt Sea population was 600 – 1,000 porpoises (Heide-Jørgensen et al.1993).

The situation becomes more precarious further to the east. Harbour porpoise east of the Darss sill to a line from the island of Gotland to the Lithuanian border which formed a large population of some 10,000 animals 80 years ago (Kock et al. 2003) and were distributed to the Gulf of Bothnia and the Gulf of Finland in the north were estimated to consist of only 600 animals in the mid-1990's (Berggren et al. 2002). The International Union for the Conservation of Nature (IUCN) warned already in 1996 that this population was on the brink of extinction. In 2003, member countries of the Agreement on Small Cetaceans in the Baltic and the North Sea (ASCOBANS) adopted conservation measures which aimed at better protecting the central Baltic population and restore it on the long term ('Jastarnia Plan', ASCOBANS, 2003).

The number of harbour porpoise taken incidentally each year in the western and central Baltic is unknown. World Wide Fund for Nature (WWF) (2001) estimated that 83 harbour porpoises are incidentally taken in several fisheries in the western Baltic each year. By – catch estimates in the central Baltic range from 7 to 15 – 25 (IFAW 2003; WWF 2001; ASCOBANS 2003; Kock et al. 2003).

Two federal states border the German part of the Baltic: Schleswig – Holstein south from the Danish border to Mecklenburg Bight and Mecklenburg – Vorpommern from Mecklenburg Bight to the Polish border. Harbour porpoise are endangered by activities both by professional fishermen and part – time fishermen from both of these states. The activities of part – time fishermen which commonly have small boats of 3 – 8 m length only are restricted to the

relatively sheltered coastal waters of the Baltic. They fish mostly with bottom set gill nets and to some extent with traps at certain times of the year.

It is difficult to assess the catch and by - catch of part – time fishermen. The small size of their boats makes it difficult to place scientific observers on board their vessels. The sheer number of part – time fishermen, their comparatively low by - catch and the considerable number of observers needed to come up with a statistically sound by – catch estimate would make an observer scheme in this fishery very expensive. As a first step to study the by–catch problem in this fishery we sent questionnaires around the part - time fishermen to obtain a picture as comprehensive as possible on the structure of the fishery, on their year – round activities in terms of effort, their preferred fishing grounds, their catches and their by - catch. We report here on results from our investigations.

2. Material and Methods

The following data sources were available:

- Number of registered fishermen and their boats: Departments of Fisheries in Kiel (Schleswig-Holstein) and in Rostock (Mecklenburg – Vorpommern)
- Catches and sales of fishermen: Federal Department of Agriculture and Nutrition in Hamburg
- Fishery laws of Schleswig-Holstein and Mecklenburg-Vorpommern

By - catch in the Baltic Sea have been collected:

- for Schleswig-Holstein by Forschungs- und Technologiezentrum Westküste, Büsum
- for Mecklenburg-Vorpommern by Deutsches Meeresmuseum Stralsund

Whenever a harbour porpoise was found stranded on the shores of Schleswig-Holstein and Mecklenburg – Vorpommern, its carcass was necropsied and examined by scientists of the Forschungs- und Technologiezentrum Westküste in Büsum. All by - catches and strandings are collated by the Institut für Seefischerei of the Federal Research Centre for Fisheries in Hamburg and submitted to the International Whaling Commission (IWC) on an annual basis.

Each German part - time fishermen in the Baltic Sea received a questionnaire to which they were asked to respond anonymously. The questionnaire asked to provide the following information:

- the fishing methods used,
- fishing grounds,
- start of their fishing activities,
- their fishing effort in a given year,
- the magnitude of by - catch in terms of small (under - sized, non – marketable) fish
- the magnitude of by - catch of harbour porpoise, and
- the magnitude of by - catch of birds

179 (46 %) of 387 part – time fishermen responded In Schleswig-Holstein while 46 (31%) of 147 fishermen filled in the questionnaire in Mecklenburg – Vorpommern.

In addition to the questionnaire, several meetings with individual fisherman took place which provided further information on the fishery. Most part - time fishermen in Schleswig-Holstein are organized in the association "Fishereischutzverband Schleswig-Holstein e.V.". Their annual meeting proved to be a useful opportunity to obtain as many responses to the questionnaire as possible. No such organization exists in Mecklenburg – Vorpommern.

3. Results

3.1. Operation of the Part - time Fishery

Part – time fishermen in Schleswig – Holstein have a longer tradition than in Mecklenburg – Vorpommern. After World War II, retired fishermen continued fishing on a much smaller scale and with much less effort as during their working life as professional fishermen and term themselves part – time fishermen. Since the 1970s, all part – time fishermen have to be registered officially. Since 1996, all part - time fishermen are required to have an appropriate level of training. They have to submit composite catch statistics each month. Part – time fisheries in Mecklenburg - Vorpommern only developed after the re-union of Germany in 1990 took place.

In Schleswig-Holstein, part - time fishermen are registered in 50 harbours along the coast. 54 harbours in Mecklenburg - Vorpommern host part - time fishermen. Table 1 shows the number of registered fishermen in both states

Tab.1: Registered part – time and professional fishermen in Schleswig – Holstein and Mecklenburg - Vorpommern (as on 31 December 2002)

	Part - time	Professional
Schleswig - Holstein	473	323
Mecklenburg -Vorpommern	148	442

Many fishermen have worked as part - time fishermen for a large number of years. Since many of them will soon reach the age of retirement, the number of part – time fishermen is likely to decline in the near future.

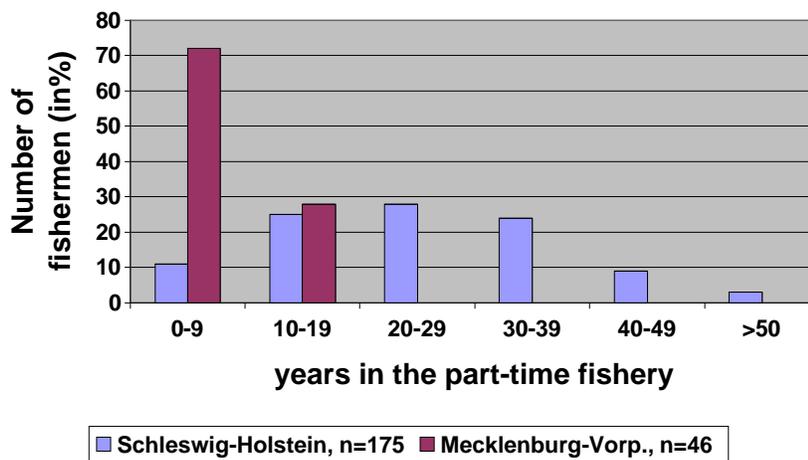


Figure 1: The number of years part - time fishermen have worked up to now.

Part - time fishermen work individually and are free to choose when they are going to work. More fishermen are working in the summer months than in winter. In November to February, only about 50% of the part – time fishermen were actually fishing. Most part – time fishermen were active in August and September.

The number of days part - time fishermen work in the course of a year was slightly higher in Mecklenburg – Vorpommern compared to Schleswig – Holstein. Very few fishermen fished for more than 200 days/year.

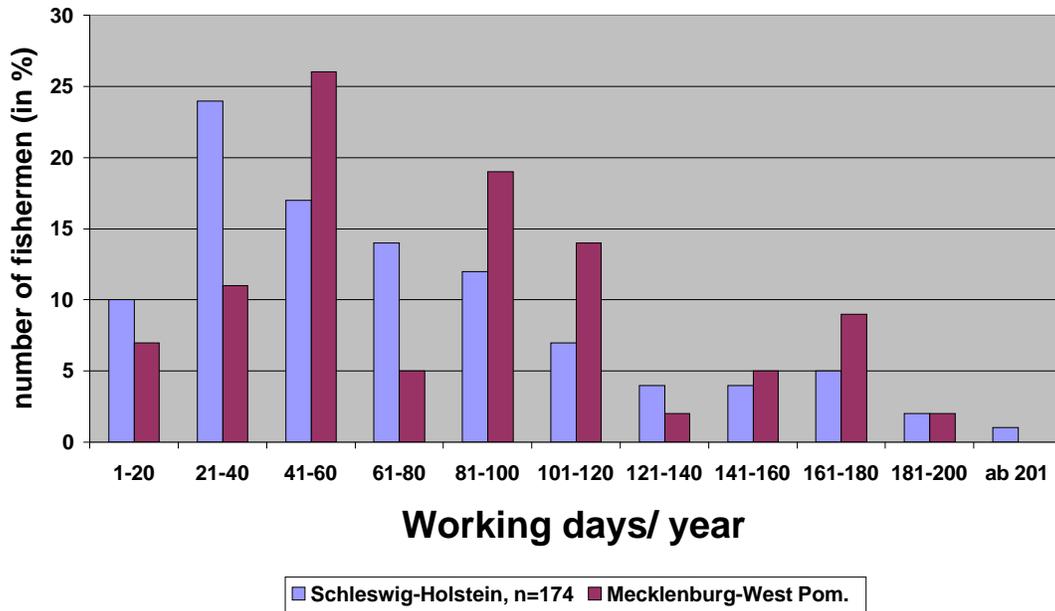


Figure 2: The number of days part - time fishermen work/ year

Part - time fishermen are mostly fishing individually and have only occasionally a second hand on board. Their boats are rarely longer than 8 m. Their engines have a power between 4 and 22 KW.

Most part - time fishermen in Schleswig-Holstein target cod which achieves the highest price on the market. Most fishermen in Mecklenburg – Vorpommern fish herring although cod has gained more importance in recent years.

Tab.3: Fish catches in the Baltic Sea in 2002 (in t)

	Schleswig-Holstein	Mecklenburg-Vorpommern	total
Part - time	221	109	330
Professional	10 201	21 613	31 814

Catch in the part – time fishery was considerably less than in the professional fishery (Table 3). Prizes obtained at the market by part – time fishermen, however, were higher than in the professional fishery (Table 4/5).

Tab.4: Sales of fish in the Baltic Sea in the year 2002 (in €)

	Schleswig-Holstein	Mecklenburg-Vorpommern	total
Part - time	438 132	166 172	604 304
Full - time	10 484 489	11 660 332	22 144 821

Tab.5: Prices obtained at the market (in €/kg)

	Schleswig-Holstein	Mecklenburg-Vorpommern	total
Part - time	1,98	1,52	1,83
Full - time	1,02	0,54	0,70

More than 90 % of all part - time fishermen use gill nets. Traps are also a common method for more than 80 % of the part - time fishermen, while long - lines are utilized by only 40 % of them. In Mecklenburg - Vorpommern, each part - time fisherman is allowed to set 300 m of gill net. In Schleswig-Holstein, however, there is no such restriction. The law of Schleswig - Holstein does not distinguish between professional and part - time fishermen.

3.2. By –catch of harbour porpoise

In Schleswig-Holstein, 11 (6 %) of the 179 part - time fishermen which had responded to the questionnaire did not provide information on by – catch. Another 11 (6 %) claimed that they had no by – catch at all. In Mecklenburg - Vorpommern, 5 (11 %) of the 46 part - time fishermen responding to the questionnaire did not answer the question with respect to by - catch.

185 dead harbour porpoises were registered along the Baltic coast of Germany from 1996 to 2002. 89 of them were found in Schleswig-Holstein and 28 (31 %) of them had net marks and were identified as by - catch. In Mecklenburg - Vorpommern, 96 dead harbour porpoises were washed ashore. 14 of them (15 %) were identified as by - catch. 24 harbour porpoises in Mecklenburg - Vorpommern were found at the coast of the Central Baltic (i.e. east of the Darss sill). Three individuals proved to be by - catch.

In our questionnaire, no fisherman from Mecklenburg - Vorpommern confirmed that a by – catch had been taken. In Schleswig-Holstein, 13 (7 %) of all fishermen agreed that they had taken at least one harbour porpoise as by - catch. One fisherman, who conceded in a personal meeting that he had caught two harbour porpoises, denied to have taken any in the questionnaire. Another fisherman admitted to have taken harbour porpoise. He did not dare, however, to admit to it in the written statement of a questionnaire.

Part - time fishermen reported 20 harbour porpoises taken as by - catch, spread over several years. The fishermen, who reported these by - catches, have been working as part – time fishermen from 5 to 41 years. 75 % of them went fishing for more than 60 days/year, and 35 % even for more than 100 days. The by - catch originated mainly from Lübeck Bight and Flensburg Fjord, but occurred also in Kiel-, Gelting and Hohwacht Bights.

The number of fishermen who reported by - catches (n=15), their composite working years (n=247) and the number of harbour porpoises taken (n=20) added up to a mean by – catch of one harbour porpoise per fisherman every 12 years. In order to calculate the overall by – catch of harbour porpoise taken by part – time fishermen along the Baltic coast of Germany every year we restricted our calculations to those fishermen who

- fished for more than 40 days/year
- fished with bottom – set gill nets
- fished in marine areas (excluding riverine fjords, such as the Schlei Fjord)

222 (57%) of all part – time fishermen in Schleswig-Holstein fit into this scheme. Each year, every 12th fisherman took one by - catch: that means 19 (222:12) harbour porpoises each year are incidentally taken in the part - time fishery in Schleswig-Holstein.

In Mecklenburg- Vorpommern, we have only taken those fishermen into consideration who did not operate east of the island of Rügen, where porpoise have been observed only occasionally. 79 fishermen (49 %) fit into this scheme. Since less harbour porpoise occur further to the east, we assumed that the probability to encounter a harbour porpoise was only 50% of that off Schleswig-Holstein. If 79 fishermen have one by - catch each every 24 years, there are still 3 harbour porpoises taken each year. Since 81 % of the fishermen in Mecklenburg - Vorpommern are working in the central Baltic, by - catch has been allocated to two harbour porpoises in the central Baltic and one in the western Baltic.

A professional fisherman fishing in the Baltic Sea with gill nets reported that he took one harbour porpoise as by – catch each year. He confirmed that his colleagues were likely to take the same number of harbour porpoise. 36 professional fishermen were regularly fishing with gill nets in the western Baltic while 47 were fishing in the central Baltic. In the western Baltic, fishermen are considered to catch one harbour porpoise each year while in the central Baltic

due to the lower porpoise abundance fishermen were considered to take one porpoise every other year.

Tab.11: Calculation of the number of by - catches in the German fisheries of the Baltic Sea each year:

	Part - time	Professional	Both types of fisheries
Western Baltic	21	36	57
Central Baltic	1	24	25

The part - time fishery is responsible for about 27 % of the (estimated) by - catch of harbour porpoise in the German part of the Baltic (western Baltic 37 %, central Baltic 4 %).

In 1995, the population of harbour porpoise in the central Baltic was estimated at 599 individuals (Hiby & Lovell 1996). 25 by – caught porpoises per year would add up to 4.2 % of the population. 817 harbour porpoises were estimated to live in the Kiel and Mecklenburg Bights in 1995 (Hiby & Lovell 1996). 57 by – caught porpoises per year would add up to 6.9 % of this part of the population which, however, is part of a larger western Baltic – Kattegat - Belt Sea population.

4. Discussion

Part - time fishery

Part – time fishery is a typical development in coastal areas of relatively sheltered partly enclosed ocean areas, such as the Baltic. Part – time fishermen work mostly on their own. They have comparatively small boats and are unable to leave the immediate vicinity of the coast.

The economic importance of the part - time fishery is small compared to the professional fishery in both states. However, their small boats convey a picturesque image of an artisanal fishery to tourists frequenting the Baltic coast in summer. As a result, many tourists are attracted by little harbours and fishermen cleaning their nets on the jetty selling fish directly to the people. Part – time fishermen are viewed as an integral part of life in small coastal towns and villages.

The number of part - time fishermen is declining in Schleswig-Holstein. 16 to 20 fishermen give up fishing each year. Few new part – time fishermen enter the fishery. The main reason is that less and less young people decide to work as fisherman. In Mecklenburg -

Vorpommern, more fishermen have started part - time fishing in recent years. However, due to the fact that fishermen retire in almost equal numbers, the number of part - time fishermen has remained fairly stable.

Bycatch of harbour porpoise

Four to six harbour porpoises are found dead on the beach along the German coast of the central Baltic each year. Given that 43 % of the carcasses washed ashore are considered to be by - catch (Hartmann & Smeenk 2003), an estimate of two or three by - catches/year in the central Baltic has to be considered as a minimum estimate.

Bottom set gill nets are the threat to harbour porpoise in the Baltic. Part – time fishermen set gill nets in coastal regions of the Baltic albeit on a much smaller scale than professional fishermen. They are restricted to 300 m net in Mecklenburg – Vorpommern while no such regulations exist in Schleswig – Holstein. Like professional fishermen they are a potential threat to harbour porpoise. Few part – time fishermen admitted that they had ever taken harbour porpoise as by – catch.

We estimated that one harbour porpoise/year was taken by part – time fishermen in the central Baltic. In addition, 24 harbour porpoises were probably incidentally taken in the professional fishery. 25 harbour porpoises have also estimated as by – catch in the central Baltic by Kock et al. (2003). The International Fund for Animal Welfare (IFAW) and the World Wide Fund for Nature (2003) expected this number to be smaller: they estimated 7-13 by – caught porpoises. All estimates have in common that they exceed the number of one or two by - catches a year, which is the highest number the stock has been estimated to stand (Berggren et al. 2002).

Based on Hartmann & Smeenk's estimate (2003), the number of harbour porpoises calculated to have been incidentally taken in 2002 should have been 12. However, even the by – catch in the part - time fishery of 21 exceeded this estimate. Together with by- catches taken in the professional fishery, we estimate that 57 porpoises end up in German gill nets in the Baltic.

Fishermen receive a bond of 50 € if they report a by – catch and ancillary information where and how the porpoise was taken. Our investigations clearly showed that some fishermen who had taken harbour porpoise denied to have taken any. Other part – time fishermen admitted

that they would return by –caught harbour to the sea as soon as possible in order to avoid possible complications ashore later. No part - time fisherman has recently reported a by - catch.

Part - time fishermen are responsible for about 37 % of the by – catch of harbour porpoise in the German part of the Baltic. Since part – time fishermen catch one harbour porpoise only every 12th year, they do not consider by – catch to be a problem. Our investigations, however demonstrated, that the part – time fishery as a whole appears to be much more dangerous for harbour porpoise than previously thought.

In the Jastarnia Plan, ASCOBANS provides guidelines for a reduction of the number of by - catch (ASCOBANS 2003). Most of the suggestions are immediately relevant to the German part – time fishery. Bottom-set gill nets for cod are the most dangerous nets for harbour porpoise. Unfortunately, it is those nets which most of the part - time fishermen use. In Schleswig-Holstein, the number of fishermen is declining and as a result, the kilometres of gill nets set will decline. However, a reduction to 300 m of gill net for each part - time fisherman, like in Mecklenburg-Vorpommern, as an immediate measure to be introduced could reduce the amount of by - catch. Acoustic deterrent devices, such as pingers, have been successfully employed in other areas. Their potential, however, to exclude harbour porpoise from large areas of the Baltic, suggests that pingers should be considered carefully and should only be introduced as a short – term measurement to alleviate by – catch problems. The most efficient way to reduce by - catches is a change to porpoise friendly fishing gear, such as longlines.

5. Literature

- ASCOBANS (2003). What is the ASCOBANS Recovery Plan for Baltic Harbour Porpoises (Jastarnia Plan). ASCOBANS Factsheet No1/ 03: 1 -3
- Benke, H., U. Siebert, R. Lick, B. Bandomir and R. Weiss (1998). The current status of harbour porpoises (*Phocoena phocoena*) in German Waters. Archive of fishery and marine research, 46(2):97 - 123
- Berggren, P., P.R. Wade, J. Carlstöm and A.J. Read (2002). Potential limits to anthropogenic mortality for harbour porpoises in the Baltic region. Biological Conservation 103: 313 -322.
- Dorrien, C. and H. Vesper (2003). Fischerei und EU-Fischereipolitik in Nord- und Ostsee aus Sicht eines Umweltschutzverbandes. Meer und Museum, Stralsund. 17: 186 -193
- Hammond, P.S., P. Berggren, H. Benke, D.L. Borchers, A. Collet, M.P. Heide -Jørgensen, S. Heimlich, A.R. Hilby, M.F. Leopold and N. Øien (2002). Abundance of the harbour porpoise and other cetaceans in the North Sea and adjacent waters. Journal of Applied Ecology. 39: 361-376
- Hartmann, M.G. and C. Smeenk (2003). Diagnosis of by - catch in stranded harbour porpoises from the Dutch coast. ASCOBANS paper, Duisburg/Leiden, August 2003.

- Heide-Jørgensen, M.-P., J. Teilmann, H. Behnke and J. Wulf (1993). Abundance and distribution of harbour porpoises *Phocoena phocoena* in selected areas of the western Baltic and the North Sea. Helgoländer Meeresuntersuchungen 47: 335 -346
- Hiby, L. and P. Lovell (1996). Baltic/ North Sea aerial surveys – final report. Unpublished report.
- Huggenberger, S., H. Benke and C.C. Kinze (2002). Geographical variation in harbour porpoise (*Phocoena phocoena*) skulls: support for a separate non -migratory population in the Baltic Proper. Ophelia 56 (1): 1-12
- IFAW (2003). Bald ausgestorben: Der Schweinswal in der Ostsee. Internationaler Tierschutz -Fonds, Hamburg.
- IWC (2000). Report of the IWC -ASCOBANS working group on harbour porpoises. Journal of Cetacean Research Management (Supplement) 2: 297 -305
- Kaschner, K. (2003). Review of small cetacean bycatch in the ASCOBANS area and adjacent waters – current status and suggested future actions. ASCOBANS, unveröffentl.
- Kock, K.H. and H. Benke (1996). On the by - catch of harbour porpoise (*Phocoena phocoena*) in German fisheries in the Baltic and North Sea. Arch. Fish. Mar. Res. 44(1/2): 95 -114
- Kock, K.H., U. Siebert and K. Harder (2003). Wale und Robben in den Küstengewässern der Ost - und Nordsee und ihre Gefährdung durch den Menschen. Meer und Museum, Stralsund, 17:150 -159
- Koschinski, Sven (2000). Current knowledge on harbour porpoises (*Phocoena phocoena*) in the Baltic Sea. Ophelia 55 (3):167 – 197
- Lockyer, C. und C.C. Kinze (2000). Status and life history of harbour porpoises (*Phocoena phocoena*) in Danish Waters, ICES, Copenhagen, 37pp
- Schleswig-Holsteinischer Landtag (2002). Fischerei. In: Agrarreport Schleswig -Holstein 2002, Kiel. Pp 116/117
- Siebert, U., H. Benke, G. Schulze and R.P. Sonntag (1996). Über den Zustand der Kleinwale. In: Lozán, J.L. (Hrsg.). Warnsignale aus der Ostsee. Parey Buchverlag, Berlin. Pp 242-249
- Tiedemann, R., J. Harder, C. Gmeiner and E. Haase (1996). Mitochondrial DNA sequence patterns of harbour porpoise (*Phocoena phocoena*) from the North and the Baltic Sea. Zeitschr. Säugetierwerk. 61: 104-111
- WWF (2001). Frische Fische – Tote Wale. World Wide Fund for Nature Deutschland, Frankfurt/M. 27pp