

Observations of the Harbour Porpoise (*Phocoena phocoena*) on the Polish Baltic Coast

K. E. Skora¹, I. Pawliczka¹ and M. Klinowska^{2*}

¹*Institute of Oceanography, Hel Marine Laboratory, University of Gdansk, ul. Morska 9, 84-150 Hel, Poland*

²*Research Group in Mammalian Ecology and Reproduction, Physiological Laboratory, University of Cambridge, Downing Street, Cambridge CB2 3EG, UK*

Summary

Information on the harbour porpoise in Polish waters is reviewed and a corrected and updated list of catches, strandings and sightings given. The number of records per year has changed greatly from some hundreds, reported mainly from salmon drift net entanglements under a bounty scheme in the inter-War years, to an average of less than one encounter a year since the War. However, with the ending of the bounty, changes in fishing methods and the lack of a systematic recording scheme since the Second World War, these records may not reflect accurately the history of the porpoise population in this area.

Anecdotal evidence, mainly derived from recent enquiries in coastal areas does, however, confirm that there are far fewer porpoises today than there were in the inter-War years. There is also a suggestion in the older literature of a population reduction between the 1850's and 1880's, with some recovery by the 1920's.

Systematic studies are required to establish the current status of this mammal, which is now legally protected, in Polish waters, and to define and remedy any problems which may be adversely affecting the population.

Introduction

The harbour porpoise is a mammal which, although regarded as an integral component of the southern Baltic fauna (Ropelowski, 1954; Lomniewski, Mankowski and Zaleski, 1975; Pucek and Raczynski, 1983), is very rarely encountered in Polish waters today and is unknown to most of the current inhabitants of the coast. One major review of the species (Ropelowski, 1957), some short reports of encounters (Bernatt, 1963; Gorski 1968; Krzeptowski, 1971; Jakuczun, 1973; Kujawa, 1976) and several general biological papers have been published by Polish scientists (Bernatt, 1963; Wolk, 1969; Kujawa, 1976; Peczalska, 1981).

*Address for correspondence.

This paper summarizes the information currently available on the harbour porpoise in Polish Baltic waters.

Material and Methods

Data were obtained from the scientific literature, the press, personal conversations (mainly with fishermen) and our (KES and IP) own field observations. As many as possible of the authors mentioned in the Introduction were also contacted, to confirm and extend their published material. This work was supplemented by questionnaires distributed in 1986 by the Hel Marine Laboratory to Polish shipping companies operating in the Baltic, to branches of the Marine Office (the civilian coastguard service) and to individual fishermen. The questionnaires consisted of a single sheet, with a picture of a harbour porpoise, suitable for display. Details were requested of any sightings, strandings or by-catches, and a simple list of the kind of information required was given, as well as the address and 24-hour telephone numbers of the Laboratory.

Results and Discussion

The questionnaire resulted in only three positive reports (Nos 44 to 46, Table 1; Figure 1) from 100 sheets sent out.

A number of negative reports were received, mostly by telephone. It was also found, through many of these conversations, and through discussions with individual fishermen, that harbour porpoises are not generally known to the coastal and seafaring community. It was frequently necessary to explain first of all what kind of animal we were enquiring about. However, there have been great changes in the coastal population, with very many of the original inhabitants moving away during and just after the Second World War. Those unfamiliar with the harbour porpoise were mainly people who had moved in from other areas and people born since the War. The older original inhabitants do have

Table 1. Polish harbour porpoise records, 1922–1987

	Date	Number of animals			Remarks
		Caught	Stranded	Seen	
1.	1922	250	—	—	Bounty data (A)
2.	1923	16	—	—	Bounty data (A)
3.	1924	20	—	—	Bounty data (A)
4.	1925–27	no data	—	—	'insignificant numbers' (A)
5.	1928	48	—	—	Bounty data (A)
6.	1929	114	—	—	Bounty data (A)
7.	1930	23	—	—	Bounty data (A)
8.	1931	34	—	—	Spring, bounty data (A)
9.	1932	92	—	—	Bounty data (A)
10.	1933	120	—	—	Minimum, incomplete data (A)
11.	1934–35	no data	—	—	'some hundreds' (A)
12.	1936–38	no data	—	—	Statistics not published (A)
13.	1939–45	0	—	—	No fishing during the war (A)
14.	1946–49	—	—	—	No recording agency (A)
15.	23.05.50	0	1	0	1st post-war report, stranded near Sobieszewo (A)
16.	??.04.51	1	0	0	1st post-war catch report, cod net, Gdansk Bay (A)
17.	??.06.51	0	1	0	Near Wladyslawowo (A)
18.	??.05.52	0	0	3	In Gdynia harbour (B)
19.	??.10.52	1	0	0	Cod net, off south Bornholm, 143 cm, 41 kg, sex ? (A)
20.	??.05.53	1	0	0	Entangled in salmon net, found by boat from Wladyslawowo (A)
21.	??.06.53	1	0	0	Taken in net, very young, no teeth, male, 92 cm, 12 kg, (A)
22.	27.04.54	1	0	0	Caught near Leba, male, 158 cm, 51 kg, (A)
23.	1955–61	0	0	0	No reports (G)
24.	11.04.62	1	0	0	Drowned in pond net, near Uniescie, 100 cm, 32 kg, photo (C)
25.	??.04.62	1	0	0	Entangled in pond net, near Rowy, 150 cm (C)
26.	??.10.62	0	1	0	Skull fragment, beach near Swinoujscie (E)
27.	???.?.62	1?	—	1?	Near Dziwnow (F)
28.	1963	0	0	0	No reports (G)
29.	???.?.64	1?	—	1?	Near Leba (F)
30.	???.?.65	1?	—	1?	Near Sopot (F)
31.	1966–67	0	0	0	No reports (G)
32.	???.?.68	1?	—	1?	Near Dabki (F)
33.	???.?.68	1?	—	1?	Near Jaroslawiec (F)
34.	1969	0	0	0	No reports (G)
35.	04.10.70	0	1	0	Very old specimen, in poor condition, near Mrzezyno, 180 cm, photo of skull (E)
36.	???.?.70	1?	—	1?	Near Dzwirzyno (F)
37.	08.10.70	1	0	0	Entangled in nylon net, drowned night of 7/8 Oct., near Miedzzydroje, 110 cm, 25 kg, photo (D,E)
38.	???.?.70	1?	—	1?	Near Kolobrzeg (F)
39.	1971–75	0	0	0	No reports (G)
40.	25.05.76	1	0	0	Entangled in fishing net, 55°50' N, 17°50' E female, 165 cm, 59 kg (G) (outside Fig. 3 area)
41.	1977–78	0	0	0	No reports (G)
42.	18.04.79	1	0	0	Pond net, depth 2.5 m. near Puck, 144 cm, released alive (G)
43.	1980–84	0	0	0	No reports (G)
44.	??.08.85	1	0	2	One caught by herring net, released alive, two others seen near Rzucewo (G)
45.	???.?.86	1	0	0	Entangled in pond net near Puck, released alive (G)
46.	08.04.86	1	0	0	Salmon net, female, 126 cm, 37 kg, broken jaw, Puck Bay, near Jastarnia Fig. 1. (G)
47.	24.12.87	1	0	0	Salmon net, Puck Bay, near Jastarnia, male, 158 cm, Fig. 2. (G)

(A)—Ropelewski, 1954, 1957; (B)—Ropelewski, 1959; (C)—Bernatt, 1963; (D)—Gawlowska, 1972; (E)—Jakuczun, 1973; (F)—Pucek and Raczyński, 1983; (G)—Skora and Pawliczka (unpublished).

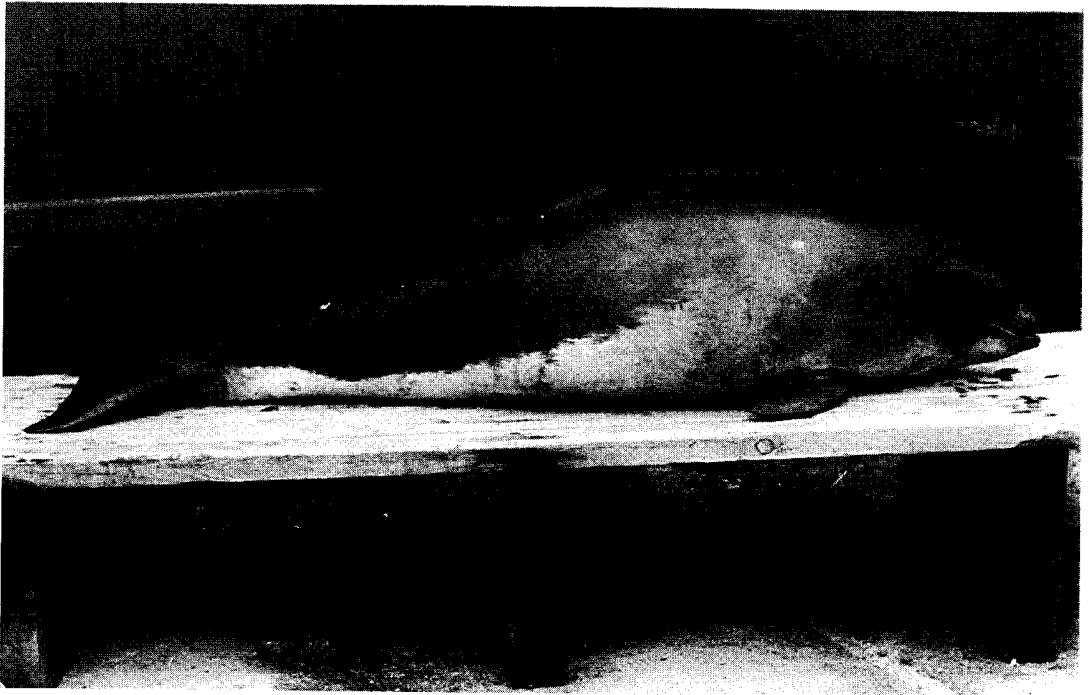


Figure 1. Female harbour porpoise, found drowned in salmon net 08.04.86 off Jastarnia (Record 46, Table 1, and Figure 3). Total weight 37 kg, whole stomach 1.1 kg, empty stomach 0.93 kg, heart 0.9 kg, lungs 2.31 kg, liver 1.31 kg, kidneys 0.9 kg, reproductive organs 0.93 kg, length 126 cm, maximum girth just before dorsal 90 cm, base of dorsal 21.5 cm, height of dorsal 9.5 cm, maximum width of fluke 28 cm. Stomach contents approx. 4 fish (unidentified). Left mandible broken, wound from net just in front of fluke, no parasites found. Photograph: K. E. Skora.

memories of porpoises, and in their recollections these animals were a common sight in inshore waters before the War. The removal of liver and muscle tissue from the 1987 animal (No. 47, Table 1; Figure 2) by local people in order to obtain oil for medicinal purposes (also described by Ropelewski, 1957 as a local custom) does indicate some continuation of traditional knowledge and practice, at least among the inhabitants of this part of the coast.

All the records of the harbour porpoise for 1922–1987 are shown in Table 1: the map (Figure 3) shows the catches and strandings from 1950–1987 for which positions are known. There are some scattered historical references to harbour porpoise catches in the Baltic off the Polish coast. The earliest is from the 1378 Statutes of the town of Hel, promulgated by Winrich von Kniprode, where it is stated that 'each porpoise boat (Meerschweinboot), that is boats hunting porpoises (dolphins) [Meerschweine (Delphine)], must pay a tax of two marks each year' (Ruhle, 1929). The marketing of porpoises (Meerschwein) in this area is also mentioned in Simon Grunau's Prussian Chronicles of 1526 and in a Royal fisheries statute of 1538 (Benecke, 1881). It

therefore seems clear that porpoises have been a reasonably well-known and common component of the local marine fauna until comparatively recently.

Most animals were recorded between 1922 and 1935. In 1922 the authorities introduced a bounty for porpoise catches because the animals were considered to be harmful to fisheries—damaging nets as well as fish stocks. The bounty was paid from State funds, and the records of these payments provide catch statistics for the Bay of Gdansk and neighbouring waters. (The Polish Baltic coast comprised only this area before the Second World War). The bounty was originally 2 zloties per specimen, and was later increased to 5 zloties. In comparison with the 15–25 zloties per week which seems, from our enquiries, to have been the level of income of fishermen at that time, the bounty payments were large, and must have been a considerable incentive for reporting catches.

Detailed information for 1925–27 and for 1934–35 is no longer available: it is only known that in the former period insignificant numbers were captured, and in the latter period up to several hundred individuals were involved. The data for 1933 are quoted by Ropelewski (1957) from a press report: 'This season

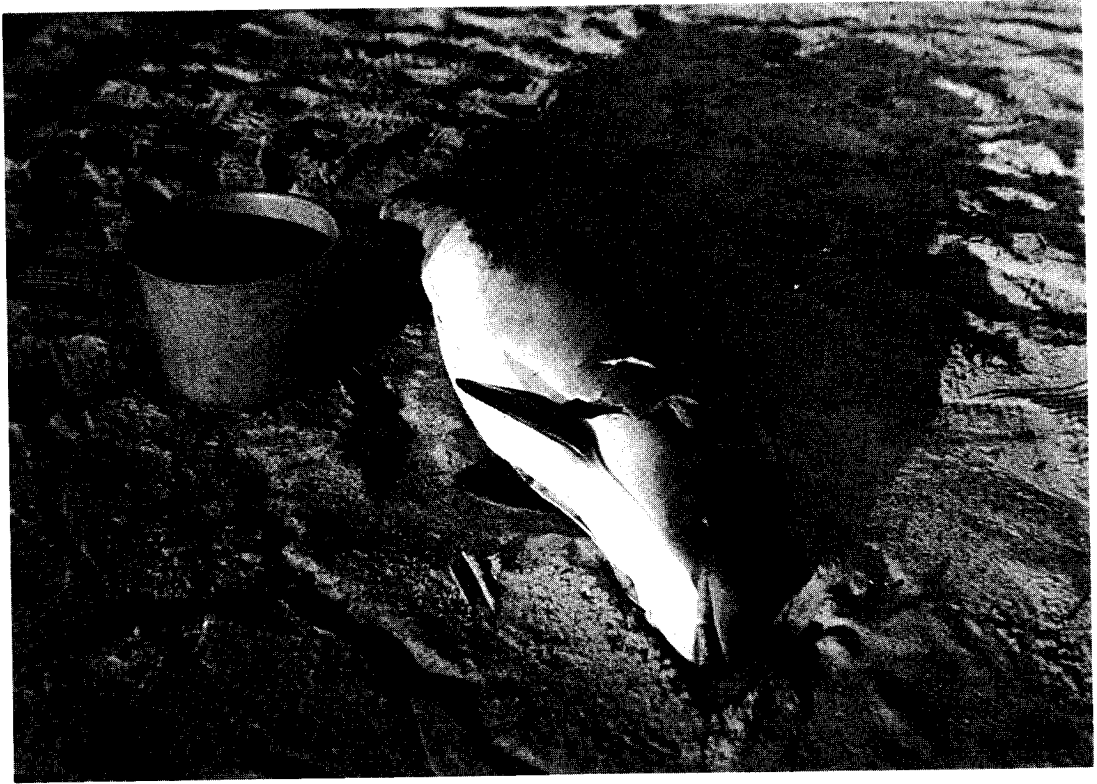


Figure 2. Male harbour porpoise, stranded dead on the night of 23/24 December 1987 at Puck Bay near Jastarnia, after entanglement in a salmon drift net with mesh size 80 mm (Record 47, Table 1, and Figure 3). The tail was removed by a local fisherman as a souvenir, but was later recovered. Length of body 140 cm, length of tail 18 cm, giving a total length of 158 cm; height of dorsal 9 cm; base of dorsal 24 cm; length of pectoral 23 cm; width of pectoral 9 cm; width of fluke 34 cm; 48 teeth; stomach empty except for two *Mesidotea entomon*.

The body was damaged before it could be recovered. It appears that the liver and some muscle tissue were removed by local fishermen for the preparation of oil for medicinal purposes, a traditional use of porpoise oil mentioned by Ropelewski (1957). This is the first documented record of a harbour porpoise in Polish waters in winter. Photograph: I. Pawliczka.

there have again been large catches of porpoises. During the past five weeks fishermen from Hel, Kuznica, Jastarnia and Bor caught about 120 specimens in their drift nets' (Ryba, April 1933). He attributes the very high catches in 1922 and 1929 to the severe winters 1921–22 and 1928–29, when unusually large areas of the Baltic were frozen, forcing the animals into the restricted ice-free zones (Ropelewski, 1957). After 1935 no data regarding Polish fisheries in general were published, and there is thus no information on any porpoise catches. Apart from the catches by Polish fishermen, it is known that there were several finds of dead stranded animals, but systematic records of such events were not kept during this period.

The lack of information for the years 1939–45 and for the post-war years to 1950 is directly attributable to the War and its aftermath. During World War II

Polish fishing activities ceased and there were therefore no by-catches. In the early post-War years there was no suitable data collecting institution in Poland. The Marine Fisheries Institute was set up in Gdynia in the late 1940's, and through the personal interest of Dr Andrzej Ropelewski (recently retired as Director), records again began to be collected. However, because these animals are of no commercial value, recording has not been systematic, but relies on individual initiatives: for example, the distribution map presented in the Atlas of Polish Mammals (Pucek and Raczynski, 1983) is based on data collected by Dr Krzysztof Wolk between 1965 and 1975. In recent years reports have been received by the Hel Marine Laboratory.

The most obvious feature of the records in Table 1 is the great contrast between the number of by-catches in the pre- and post-War years. The

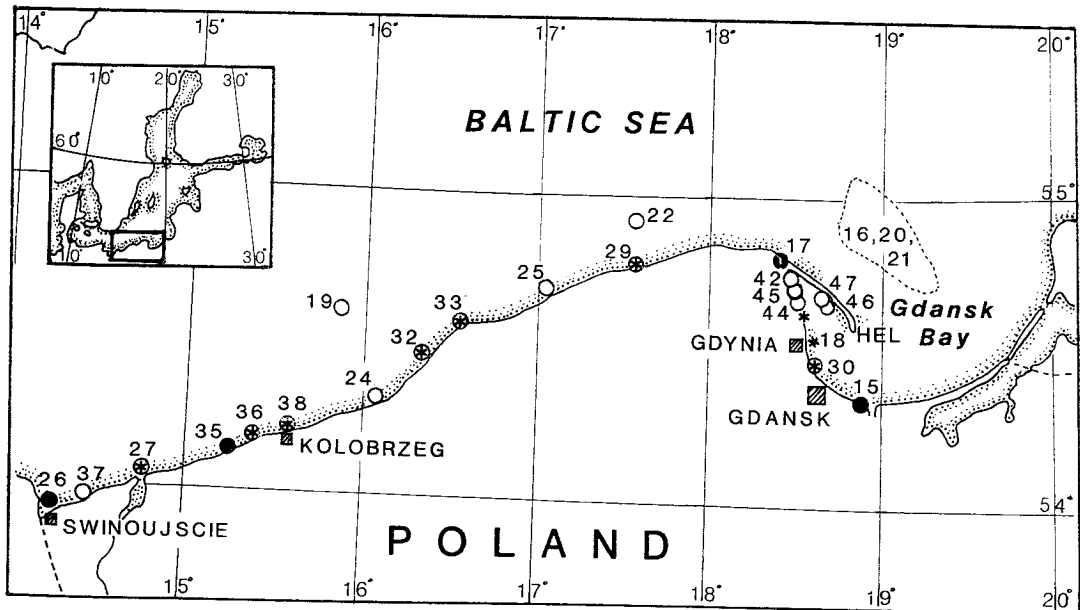


Figure 3. Map showing the positions of harbour porpoise encounters 1950–87 (where known). The numbers refer to those in Table 1. Filled circles represent dead strandings, open circles by-catches and stars sightings. Reports which are not clearly by-catches or sightings are shown as stars within circles. The general area of catches 16, 20 and 21 is indicated by a dotted line.

pre-War by-catches (it appears that despite the bounty there was no directed catching) were taken almost exclusively by salmon drift nets which operated mainly in April and May. This fishery was resumed after the War, using similar techniques but with somewhat reduced effort. Ropelewski (1957) remarks that the reduction in effort does not fully explain the considerable decrease in by-catches.

The fact that the bounty was not reintroduced after the War might be taken as further evidence for a reduction in the local harbour porpoise population.

Since 1951 only sporadic captures of harbour porpoises are recorded, in contrast to the average of 75 a year (range 16 to 250) in the early period. In 23 of these years (1955–61, 1963, 1966–67, 1969, 1971–75, 1977–78, 1980–84) there are no records at all. The introduction of synthetic fibre nets in the 1960's and 1970's, an increase in fishing effort in recent years and some changes in techniques do not appear to have had major effects on the level of by-catches. The fact that our 1986 enquiries revealed only three cases, and that only one was reported in 1987 indicates that the level of by-catching is indeed low, and that this is not simply the result of under-reporting.

Salmon drift nets still appear to be the major cause of entanglement. These nets have a mesh size of 80–95 mm, and extend 6 m below the surface. In former times they were usually attached to boats, but today they are often anchored to the bottom. Beach seines were also frequently used for salmon fishing,

particularly before the 1960's. There are only two cases where porpoises were caught by trawls, and a few incidents involving other gear. Because this salmon fishery took place mainly in spring, almost all porpoise catches occurred in April–May. There are some cases in other months, indicating the presence of porpoises for much of the year, but the data are not sufficient to determine whether porpoises are in fact only present seasonally or whether they are resident throughout the year. The animal reported in December 1987 is the first confirmed winter observation of the harbour porpoise in Polish waters. The 1987/88 winter was unusually warm, although the average December sea water temperature was 1 degree C lower in 1987 than in the previous two years.

Ropelewski (1957) suggested that the populations may have been reduced by high natural mortality in 1921–22, 1928–29, 1939–40 and 1946–47, when ice in the Baltic reached its maximum extent, and may be expected to recover. He quotes Benecke (1881) in support of the possibility of recovery. Benecke (1881) believed that the porpoise population had diminished during his lifetime. He recalled seeing an average of five or six porpoises which had been caught in nets by fishermen from one village during the month he spent at the seaside every year in the 1850's, but says that at the time of writing (late 1870's) it was rare for even a single animal to be caught along the entire coast. Since the population

obviously recovered sufficiently from the 1880's for porpoises to be seen as a problem by the 1920's, and to provide the large catches of the inter-War years, there may be some support for the idea that there are natural long-term fluctuations in numbers, particularly since there is no evidence for major changes in fishing practices from the 1880's to the First World War.

Wolk (1969) put forward the idea that heavy ice years delayed the migration of porpoises into the Baltic Sea through the Danish Straits. He thought that this might be the reason for the sharp decline in catches and strandings on the Polish coast, not by-catching and mortality due to heavy ice years. Mitchell (1975) and others have not found the arguments supporting this idea very convincing. It is also now known that, at least in Danish waters, not all porpoises leave the Baltic during the winter. Many remain, exploiting whatever open water is available (Kinze, 1985).

All wild cetaceans are protected in Poland under a Decree of 30 December 1983 (Dz. U. Nr 2, poz. 11) further to Article 15 of the environment protection law of 7 April 1949 (Dz. U. Nr 25, poz. 180). It is forbidden to kill, catch, harass, install equipment designed to kill or catch, destroy nests, resting places or immature animals, or perform any other acts aimed at taking possession of or damaging protected species. Possession, trade and export of protected species, and their parts and derivatives is forbidden, as is photography and filming during the breeding season. The ministry of Forestry and the Woodworking Industry is responsible for enforcement, and for issuing permits for actions which are otherwise forbidden, on condition that these are for scientific, educational or environmental protection reasons. We have not found evidence for the repeal of the 1922 bounty law, but even if it still exists, it would probably not be inconsistent with Article 6 of the 1983 Decree, which provides for the reduction, under permit, of protected species where their numbers are so great as to cause damage. Under Article 7, if changes in habitat caused by human actions give rise to threats to protected species, the local authorities are charged with the task of taking appropriate action to safeguard the species, and to prevent or limit any damage.

Conclusion

It is not possible to reach any absolute conclusions about the Polish porpoise populations from this data, simply because the records are so diverse. However, it does seem clear that there was at least a spring population of some hundreds of animals in the Gdansk Bay area in the inter-War years. There is very little evidence for such a population in the post-War years, and, although without the stimulus of a

bounty there has been no comparable incentive for reporting encounters, it seems unlikely that a modern population of any size would give so little indication of its existence. The anecdotal evidence we have collected, including the general lack of knowledge of the species among the coastal inhabitants today, tends to confirm that the harbour porpoise population is very low in Polish waters at present.

The bounty catches of harbour porpoises in Polish waters ceased almost 50 years ago, and even if, as seems likely, these catches severely damaged the local population, some recovery might be expected by now, or at least recolonization by animals from other areas. (From Benecke's 1881 remarks, it appears that recovery from that low population took of the order of 40 years). However, almost throughout the Baltic the harbour porpoise seems to be far less common than in former years (e.g. Andersen, 1982). This situation is often attributed to the detrimental effects of human activities on the natural environment, in particular to organochlorines, which are known to impair reproduction in many species (reviewed by Kayes, 1985). But except in Denmark (e.g. Kinze, 1985), very few ecological studies of the harbour porpoise in the Baltic have been made and it is therefore not possible at present to attribute the population decline to any specific causal factor(s).

In order to define the true status of this mammal in Polish waters a population survey is required, as well as systematic biological and environmental studies to identify any factors which may be inhibiting the recovery of the population. It is hoped that the 1986 enquiry will mark the beginning of improved record collection, including detailed examination of carcasses. The increase in public awareness of the harbour porpoise, through the 1986 study and similar work planned for the future, should greatly assist this task.

Acknowledgements

We are most grateful to all those who have provided information for this review and also thank Mrs D. Hughes of the Cambridge University Physiology Laboratory for drawing the map (Fig. 3).

References

- Andersen, S. H. (1982). Change in the occurrence of the harbour porpoise *Phocoena phocoena* in Danish waters as illustrated by catch statistics from 1934 to 1970. *Mammals in the Sea* (FAO), **4**, 131–133.
- Benecke, B. (1881). *Fische, Fischerei und Fischzucht in Ost- und Westpreussen*. Hartungsche Verlagsdruckerei, Königsberg in Preussen. 514 pp.
- Bernatt, S. (1963). *Rekiny i delfiny*. Wydawnictwo Morskie, Gdynia. p. 50–51.
- Gawlowska, J. (1972). *Wieloryby i proby zabezpieczenia ich zasobow*, *Chronmy Przyrode Ojczysta*. **4**: 44–46.

- Gorski, W. (1968). Morswin *Phocoena phocoena* (L.) pod Uniesciem. Notatki Przyrodnicze 2, Uniwersytet Adama Mickiewicza, Poznan.
- Jakuczun, B. (1973). Morswiny *Phocaena phocaena* (L.) na Zachodnim Wybrzeżu Polski. Przegląd Zoologiczny. **17(1)**, 121–124.
- Kayes, R. J. (1985). The decline of porpoises and dolphins in the southern North Sea: a current status report. Political Ecology Research Group, Oxford. Research Report **RR-14**, 109 pp.
- Kinze, C. C. (1985). Et ars observationer af Marsvin (*Phocoena phocoena*) fra danske faergeruter. Flora og Fauna. **91(3-4)**, 21–27.
- Krzeptowski, M. (1971). Morswin *Phocoena phocoena* (L.) w okolicy Swinoujścia. Przyroda Polska Zach. **9**, 96.
- Kujawa, S. (1976). Morswin *Phocoena phocoena* (L.) u wybrzeży południowego Bałtyku. Biuletyn Morskiego Instytutu Rybackiego. **4(36)**, 45–46.
- Lomniewski, K., Mankowski, W. and Zaleski, J. (1975). Morze Bałtyckie. Państwowe Wydawnictwo Naukowe, Warszawa. p. 321.
- Mitchell, E. D. (1975). Porpoise, Dolphin and Small Whale Fisheries of the World. IUCN, Morges. 129 pp.
- Peczalska, A. (1981). Wedrowki zwierząt. Wydawnictwo Morskie Gdansk. p. 20–23.
- Pucek, Z. and Raczynski, J. (Eds) (1983). Atlas rozmieszczenia ssaków Polski. Państwowe Wydawnictwo Naukowe, Warszawa. p. 131.
- Ropelewski, A. (1950). Ssaki Bałtyku. Chronmy Przyrodę Ojczyzny. **9(11)**, 19–22.
- Ropelewski, A. (1954). O morswinach. Wszechswiat. **2**, 41–43.
- Ropelewski, A. (1957). Morswin (*Phocaena phocaena* L.), jako przyłów w polskim rybolowstwie Bałtyckim. Prace Morskiego Instytutu Rybackiego w Gdyni. **9**, 427–437.
- Ropelewski, A. (1959). Ssaki Morskie. Państwowe Wydawnictwo Naukowe, Warszawa.
- Ruhle, S. (1929). Die Stadt Hela im Mittelalter. Zeitschrift des Westpreussischen Geschichtsvereins. **69**, 109–173.
- Wolk, K. (1969). Migracyjny charakter bałtyckiej populacji morswina, *Phocoena phocoena* (L.). Przegląd Zoologiczny. **13(4)**, 319–351.