The harbour porpoise in the Netherlands: will it get the care it deserves? An urgent conservation plan

Conservation plan for the Harbour Porpoise *Phocoena phocoena* in The Netherlands: towards a favourable conservation status.
Kees (C.J.) Camphuysen & Marije L. Siemensma 2011. NIOZ Report 2011-07. Royal Netherlands Institute for Sea Research, Texel, the Netherlands. 183 pp.

In the past few decades, several reports and recommendations concerning the status and conservation of the harbour porpoise in Dutch waters have been issued; and in numerous publications, both scientific and popular, the plight of the only truly indigenous cetacean in the southern North Sea has been discussed. As usual regarding species that were once common, not much attention had been paid to the harbour porpoise by (marine) biologists in the past, until an alarming decline became apparent in the 1950s and particularly the 1960s, culminating into the near disappearance of the species from Dutch coastal waters. The alarm having been raised, it turned out that there were hardly any useful references to the situation in the first half of the 20th century, let alone further back in time. The harbour porpoise had always been considered commonplace, its occurrence taken for granted, and nobody could foresee that this might ever change. But then, all of a sudden, the animals were gone.

Thus, in the 1970s and 1980s interest in the harbour porpoise increased and, slowly and haltingly, research came off the gound: field observations started, at first as a by-product of bird-watchers, and stranded animals were registered, collected and studied. Gradually, field recordings became organised in a more systematic way, so that they could be corrected for effort; and the scope of activities extended from watching animals from coastal sites to dedicated surveys from ships and aeroplanes. The Dutch strandings network was intensified, and the study of carcasses gradually developed into a multi-disciplinary affair, with attention being paid to food, reproduction, age composition, pathology, parasitology, bacteriology, virology, toxicology, genetics and, very importantly, to evidence of by-catch in fisheries. Live-stranded porpoises were taken to marine mammal parks, where studies on behaviour, physiology and acoustics could be carried out. Similarly, researchers in other countries also turned their attention to the harbour porpoise and other small cetaceans. And now, at the beginning of the 21st century, a great amount of knowledge has accumulated, though at the same time we have come to realise how little we still understand of the life of this elusive species.

On many occasions, scientists and conservationists have expressed concern about the harbour porpoise in Dutch waters, seen in the light of the deteriorated ecological state of the North Sea, particularly with respect to pollution and (over)fishing. However, little action has been taken, and it seemed that reports and recommendations tended to disappear into the proverbial drawers, physical or electronic. One of the main obstacles to a consistent and sustainable management of the Dutch marine environment and its biodiversity is that several different ministries and other administrative bodies in the Netherlands are or were at different times responsible for different aspects of such management, with often contradictory short-term interests and goals. Another drawback has always been the fact that, within those various authorities, the responsible departments and officials were and still are subject to frequent reorgan-

isations and reshuffling of staff, which time and again resulted into a stunning loss of collective memory, repeated shifts of priorities, and consequently into a weak, fragmented and inconsistent policy. Compared to several other North Sea countries, the Netherlands has been lagging far behind in setting up serious research and taking other action aimed at a better understanding and conservation of the harbour porpoise.

Therefore, the initiative by the Dutch Ministry of Economy, Innovation and Agriculture (another novelty – also responsible for nature conservation) for this conservation plan has been timely and most welcome. The task was commissioned to the Royal Netherlands Institute for Sea Research (NIOZ) and carried out by Kees Camphuysen and Marije Siemensma; a great many others were involved in its preparation. They have done an excellent job. In the preface, the circumstances that led to this initiative are briefly mentioned. Among those are the various international conventions and agreements signed and ratified by the Netherlands, under which the participating countries are obliged to take conservation measures for the marine environment at large and small cetaceans in particular. Then there is the problem of fisheries, with the by-catch of porpoises, which is causing great concern. Added to this are the continuing problems of pollution and, in recent decades, of acoustic disturbance by underwater noise generated by industrial activities. And finally, quite another, seemingly contraditory, phenomenon has appeared: the spectacular increase in the numbers of harbour porpoises visiting Dutch waters, which started in the 1990s and resulted in peak numbers in the first decade of the 21st century. Just like the earlier disappearance of the species, nobody had foreseen its "return".

The conservation plan lying before us is a very thorough publication, in which all aspects of porpoise biology and conservation are treated. On the whole, it is well written and edited (there are few typing errors) and nicely illustrated, and gives an admirably complete overview of the state of our knowledge. It starts with three summaries (chapter 1): a short one in English and in Dutch, followed by an extensive full summary of eleven pages. After the preface and the introduction (chapters 2, 3) there are sections reviewing the current knowledge of the harbour porpoise, the observed threats, the existing mitigation meaures, the policy and legislative context of the situation in the North Sea and particularly in Dutch waters, a "stakeholder" consultation (some management jargon seems unavoidable), and a chapter containing proposals for action, such as further, directed research and "concrete" conservation measures. The report ends with a final discussion and conclusions, after which there are the acknowledgements and, very important, a most impressive list of references, covering 23 pages.

For those who do not readily have the time or patience to read through more than 150 pages of text, the full summary gives an excellent condensation of the contents. Here, officials and politicians pressed for time can find virtually everything they need for grasping the matter, for proper policy-making and taking the right action, though one may hope that many will read further for gaining a sound background knowledge and deeper understanding of the problems. It is there to be used! In the following, some comments on each chapter will be given.

Chapters 3 and 4 (Introduction; Current knowledge) draw a clear picture of the history and present situation. The decline of the harbour porpoise off the Dutch coast since the middle of the 20th century is illustrated by the very low numbers of animals washed ashore during the period 1970-1985 (p. 22); it should be emphasised that these are in reality low numbers of *reported* animals, as the strandings network ("observer effort") was still poorly developed in this period and only improved during the 1980s. Nonetheless, the species had indeed become quite rare in those days. The authors calculate a world population

of at least 700,000 harbour porpoises, by adding up the results of estimates made in various parts of the world (p. 31). Of course, "at least" is inflatable, but given the lack of information from many areas, this outcome seems far too low. The two SCANS-surveys in 1994 and 2005 arrived at an estimated 231,000-268,500 porpoises in the North Sea alone (though within very wide confidence limits), which in this light would amount to roughly one third of the world population. Further on (p. 33), an estimate of 150,000 is given for the southwestern North Sea (management unit 9: see figure 8, p. 32), which is now flatly stated to represent one fifth of the world population. This is not credible. The hypothesis that two populations may be distinguished in the North Sea: a northeastern and a southwestern one (management units 8 and 9) is interesting, though the evidence is still rather weak and the borders are not clear (pp. 32-33). If true, this would be consistent with the authors' view that the recent increase in Dutch waters is largely the result of migration of animals from the northwestern North Sea to the Southern Bight, possibly caused by a depletion of food resources in Scottish waters. On the whole, strandings records and field observations from coastal sites run nicely parallel over the years, both showing a gradual increase since the 1990s, with a particularly sharp rise during the first decade of the 21st century. But then, the authors suggest that strandings data are biased towards younger animals and/or either sex, probably meaning as compared to the assumed natural mortality, mainly basing themselves on differences in Danish samples obtained from strandings and by-catches, respectively (pp. 47, 55). This is not elaborated and hence not convincing: one should realise that in any animal population, (natural) mortality among young individuals is much greater than in adults. If anything, it would seem that samples from by-catches are more biased than those from strandings, though in a different direction.

Chapter 5 (Observed threats) deals with all thinkable factors that may have adverse effects on the harbour porpoise in the North Sea. The authors lay a very strong emphasis on the by-catch problem, particularly the suspected by-catches in bottom-set gillnets. But here they have a serious problem. In all countries around the North Sea and elsewhere in the North Atlantic (Norway, Iceland, Canada), data on by-catches of harbour porpoises are being or have been collected in close co-operation with fisheries. The only striking exception is the Netherlands, where such co-operation has proved impossible till now, for whatever reason, but the weak policy of the responsible ministry seems the main cause of this inexcusable omission. This has the unfortunate consequence that all discussions on by-catches in Dutch waters are based on indirect evidence obtained during autopsies of stranded animals. The percentage of by-catches among these carcasses is high: most studies specifically directed at identifying by-catch, carried out by different teams using varying methods, have arrived at close to or even far over 50% by-caught or probably by-caught animals among the stranded samples (pp. 61-63). One study, published in 2008, arrived at a much lower percentage (table 4, p. 61). The authors discuss that outcome without questioning (p. 62). Therefore, it may be said here that this particular study was unprofessional in many respects: it was carried out by an institute that chose not to co-operate with other teams despite promises and obligations, used inadequate methods and references which made the results incomparable with those of others and, moreover, the by-catch study was partly financed by the Dutch Fisheries Association. The mere fact that such a thing was allowed to happen in the Netherlands is another consequence of the lack of a firm policy and implementation of regulations and agreements by the Dutch authorities. But whatever the outcome of the various studies, it is clear that by-catch is a serious problem off the Dutch coast, as it is elsewhere, though exact numbers and proportions and

hence the effects of this mortality on the population can only be guessed.

The lack of direct reports on by-catches in Dutch fisheries has caused that the (thorough) discussion of this topic remains somewhat speculative, with no firm proof and with rather unsatisfactory conclusions (pp. 70-72). The authors regard bottom-set gillnets as the main culprits, but for this had to base themselves on studies in other countries. The emphasis on bottom-set nets has distracted their attention from other types of fisheries such as bottom-trawling, which they consider less dangerous to porpoises. This may be so, but the many documented cases of by-catches in beam-trawls do warrant a closer look into that kind of fishery: one should not exclude this beforehand (as the authors repeatedly state: one should go by facts and not by preconceived ideas). Without proper and obligatory monitoring of all types of fisheries, hard as this may be to organise, the opportunies for denying or belittling the problem by the "stakeholders" remain too favourable. Fishermen and the authorities have thus manœuvered themselves into the comfortable position that proof lies with the scientists, who are handicapped as long as necessary data are withheld to them, or not even collected. The realms of cetacean researchers and fisheries thus remain wide apart, and the authors realise that no "concrete" measures can be taken if this hide-and-seek game will continue. Shame upon the Netherlands!

Many other things are put forward as "observed threats", which give reason for some remarks. Ample attention is paid to signs of acoustic disturbance caused by shipping and all kinds of industrial activities (pp. 75-80) but, apart from local and temporary effects, these do not seem to affect the North Sea population as a whole to a significant extent. Nonetheless this should indeed be closely monitored, as of some small cetaceans it is known or suspected that favourable areas for feeding and calving are (temporarily) deserted if they become too noisy. Depletion of potential food resources would seem more detrimental, but this is discussed only summarily (pp. 85-86). The supposed effects of climate change on the stocks of sandeels (Ammodytidae) in the northwestern North Sea do receive attention, since the decrease of these fish is suspected to lie at the base of the recent invasion of porpoises into Dutch waters. But nothing is said about possible (over)fishing of this and other prey species, though the effects of earlier overexpoitation of sandeels on seabird populations in Scottish waters has been well documented, and has been suspected for porpoises. The authors express concern over the fact that many stranded porpoises are in poor nutritive condition. However, natural selection among young individuals is heavy in any animal population, and usually takes effect through starvation. Disease and parasites (pp. 87-90) too, are natural phenomena and hence tools of natural selection. But then, contamination with organic and inorganic pollutants, and particularly pcb's, has been proved to have serious negative effects on the immune system and reproduction of marine mammals, and can lead to more diseases than would naturally occur. However, the important subject of pollution is discussed rather briefly (pp. 83-85). All these factors are treated as seemingly independent threats, and the probable and complicated interaction between them is not sufficiently taken into account. It is good to realise that strandings samples may be biased in one way or another and may not exactly mirror the mortality that occurs farther at sea. But to call them "a suspect subset of material" (p. 93) is taking things too far. And, whatever the drawbacks, this is what we have.

It is obvious that future research on stranded or by-caught porpoises should consist of an integral, multidisciplinary study by an international team of specialists, in which all the above-mentioned factors and their interactions are thoroughly investigated. Close co-ordination and co-operation with all countries neighbouring the Netherlands

is imperative. The authors are right in stating that current research of dead porpoises in the Netherlands has been too fragmentary. The summary of missing information (p. 93) clearly illustrates these shortcomings. Lack of funds is given as one of the principal obstacles. There should be no misunderstanding that in-depth research will have to be long-term and expensive.

Chapter 6 gives an overview of the mitigation meaures in the North Sea and elsewhere that have become available up to now. This is thoroughly done. The chapter concentrates on efforts to reduce by-catch and the adverse effects of industrial activities. Regarding by-catch: "pingers", devices that are set on nets and produce acoustic signals meant to scare off porpoises, are regarded as promising, though there are still many doubts and problems and unwanted side-effects. Thus, one could imagine that porpoises may leave good feeding grounds if pinger-noise would become overriding. Once more the authors emphasise that first of all, one has to identify the type of fishing gear in which most by-catch occurs, before expensive measures are imposed. Fortunately, experiments in Dutch waters have now started, with the co-operation of fishermen, which is one positive thing. Elsewhere, modification of gear or change to less detrimental fishing methods have proved effective. As for industrial activities: these consist mainly of seismic surveys for oil- and gas-prospecting and the construction of windfarms; concerning the latter, particularly the phase of pile-driving is disturbing. Less detrimental methods are discussed; some of those have already been implemented in German waters, so it is hard to understand why these have not become standard practice throughout the North Sea.

Chapter 7 (Policy and legislative context) gives a most useful review of the truly amazing jungle of international, European and national treatises, laws, regulations and action plans that touch upon management and conservation of the North Sea, its natural resources and biodiversity. In all these, the harbour porpoise and other small cetaceans are given the highest protective status. Naturally, however, many of those regulations contain contradictory elements and discrepancies, making it all too easy to evade impopular and politically sensitive measures. Thus, though it would seem that no marine area in the world is better managed than the North Sea, there is a shrill contrast with reality. The Netherlands does not heed many of its obligations and commitments including its own national laws, regulations, action plans or whatever. This is no wonder in the light of this legal and administrative chaos, involving so many different and often antagonistic authorities, even within the same ministry (e.g., fisheries versus conservation), and with a government that gives little or no priority to habitat and species protection. The discussion on the legality or illegality of by-catch (pp. 124-125) poses a staggering and kafkaesk example; it would be hilarious, if the matter were not so sad. It is one of the reasons why fishermen are not really encouraged (to put it mildly) to bring in by-caught porpoises.

Chapter 8 (Stakeholder consultation: two pages) shows the prudent way in which this plan has been composed: all parties involved received ample opportunity to contribute and criticise during the process.

Chapter 9 (Concrete measures) summarises all things that are being done or should be done, in the way of research and protective (mitigation) measures. After an explanation of the needs and problems, research activities and proposals are summarised in a table (pp. 138-139) and given priority marks ranging from 1 to 4, each followed by a brief statement explaining the need. Priorities 1 are (letters given by the reviewer):

a. Better and regular population assessments by "state of the art" (jargon again) aerial surveys.
b. Research into hearing damage caused by underwater noise.
c. Assessing by-catch rates in various types

of fishing gear and evaluating mitigation measures.

d. A study of the interaction between nutritive status of animals and pollution levels. Here we come upon a stumbling block. This will only be meaningful if it includes studies of the age, health and reproductive condition of each animal which, very strangely, are given priority 2, though all of these will interact. The authors seem to overlook that the purpose of a thorough necropsy should not be restricted to establishing the cause of death (a common misconception, even among veterinarians), but rather to give an overall picture of the health and reproductive status of an animal, to be followed by analyses of samples in various laboratories. Nutritive condition and pollution burden are necessary components of this integral approach. It is evident that this should be combined with identifying by-catch and, perhaps, hearing damage. Of course, such a study will be difficult, time-consuming, long-term, will have to involve several disciplines and institutes within and outside the Netherlands, and hence will be expensive. But only that is the very kind of research we need and, considering what they say on pp. 134-135, the authors appear to realise this very well. What should be avoided is that one or more links in a chain of partial and interdependent studies would break by lack of finances, and thus obstruct the whole research process. One may then end up with freezers or jars full of the finest samples, which cannot be studied; see again the list of "missing information" given on p. 93. Finally, *all* institutes in the Netherlands should be forced to co-operate in such a programme: there can be no place for withholding material or data for petty private interests and hidden agendas.

e. Formation of a national scientific research steering group, which should develop and oversee research projects. This is very important in the light of what has been said above. But it should be stressed once more that only national *and* international co-ordination and co-operation will be able to raise research on the harbour porpoise to a sound scientific standard. At present, too many projects in the North Sea countries seem to be carried out on a national level only (or not even that!), and too many researchers work in isolation. However, porpoises have no knowledge of borders, and we are dealing with "management units" that extend over several jurisdictions, which are all equally responsible for the care of the very same animals. Research and conservation should be truly, well co-ordinated international affairs.

There will, of course, always be debate on priorities, and inexpected problems may suddenly appear. The practical feasibility of the ideas and proposals listed in this chapter is not always considered and, with the present lack of finances and co-ordination, some things may not be realistic, at least not for now. This section ends with a list of main action points (p. 140) which, however, do not quite follow the priority ranking given before.

The second part of chapter 9 reviews the existing and recommended mitigation measures. These too, are summarised in an excellent concluding table, for each point indicating which authorities are responsible: a bewildering assortment. Again, this is followed by a list of main action points, concentrated on reducing by-catch and underwater noise (pp. 150-151).

Chapter 10 (Discussion and conclusions, six pages) is in fact a good and useful recapitulation of the contents of the report. One might even start reading this before plunging into the other chapters. This too, culminates in a re-iteration of the main action points regarding research and mitigation measures, the latter once more covering by-catch and underwater noise. One striking point: despite the authors' doubts about samples obtained from strandings, the importance of safeguarding data and material from stranded animals is stressed here as an important goal: no valu-

able material should get lost; even a special "strandings co-ordinator" is recommended. Collection of by-caught animals too, should be organised, as has been done in other countries.

This will do. Despite the few critical comments given above, this conservation plan is to be praised and highly recommended, and the authors are to be congratulated. Although the report necessarily concentrates on the situation in the Netherlands, it can be a great stimulus to upgrade the work that is already done here and, above all, must be done, to a more international level. The Netherlands is still far behind in many respects and should make a truly Olympic effort to gain an honourable postion in the international team of cetacean scientists and conservationists. We can only hope that this plan will generate further action, and that the various Dutch authorities will join forces without squabbling over budgets and responsibilities.

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