Foraging humpback whale *(Megaptera novaeangliae)* in the Marsdiep area (Wadden Sea), May 2007 and a review of sightings and strandings in the southern North Sea, 2003-2007

Kees (C.J.) Camphuysen

Royal Netherlands Institute for Sea Research, P.O. Box 59, NL-1790 AB Den Burg, Texel, The Netherlands,
e-mail: camphuys@nioz.nl

Abstract: A humpback whale (Megaptera novaeangliae) was observed in the Marsdiep area (western Wadden Sea, The Netherlands), 10-13 May 2007, triggering great media interest and attracting large crowds of spectators to the shore. The animal was foraging in strong tidal currents in a deep gully very close to the dike of Den Helder and in shallow areas of the sandy beach of the island of Texel. Unique characteristics of its dorsal fin are described to facilitate future individual identification of this animal. The feeding techniques, the foraging conditions, feeding areas and the possible prey targeted in the Marsdiep area are described. Humpback whales are very rare in the southern North Sea and have never been before encountered in the Wadden Sea. Recent strandings and sightings along the Dutch and Belgian coasts are summarized. These suggest an increase in numbers frequenting these waters. Historical material suggests that humpback whales have always been very rare and that the recent occurrences are unprecedented.

Keywords: humpback whale, Megaptera novaeangliae, sightings, behaviour, habitat, Wadden Sea, strandings, North Sea.

Introduction

A solitary humpback whale (*Megaptera novaeangliae*) was observed and briefly studied while foraging in tidal currents of the Marsdiep area (western Wadden Sea) during 10-13 May 2007. Humpback whales are rare in the southern North Sea and there have been no previous reports of large whales foraging in the Wadden Sea. This, plus the fact that four other individuals were reported in The Netherlands over the last four years following a period of ca. 250 years without a single documented sighting or stranding anywhere near this coastal area, formed the inspiration for this contribution. Individual characteristics of the animal are documented to facilitate future reports and sightings of the same whale elsewhere and the foraging behaviour and feeding habitats in the Marsdiep area are described. The paper includes a summary of recent sightings and strandings in the southern North Sea. A wider context is provided by adding a brief discussion on recent sightings elsewhere within the North Sea and population developments in the north eastern Atlantic.

Observations, May 2007

On 10 May 2007, coastguard reports were received by the author, as co-ordinator of the Dutch Seabird Group (NZG) Marine Mammal Database, suggesting that between one and three large whales were seen in the Marsdiep area, between Den Helder and the island Texel (western Wadden Sea; figure 1). Initial descriptions were vague, but a photo by Hans Verdaat, taken on 11 May showed the presence of at least one humpback whale. On 12 May 2007, a small boat ('*Het Sop*') was put on standby. When seawatchers, stationed at Huisduinen, relocated the

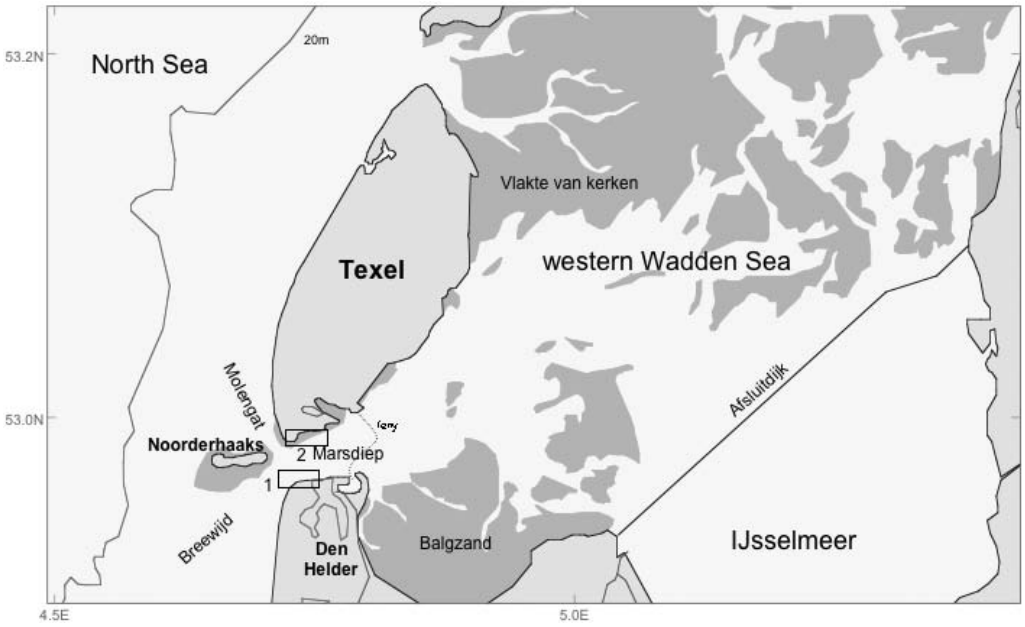

Figure 1. The Marsdiep area and locations mentioned in this article. Dark shadings around Noorderhaaks, in the Balgzand area and off Texel are intertidal mudflat areas, exposed during low tide. Two boxes indicate the main feeding sites: (1) Helsdeur off Kaap Hoofd near Den Helder and (2) the shallow zone off the southern tip of Texel.

whale during their daily systematic watches, at around 10:00 in the morning, the standby team from Texel was called out to assess the condition of the whale, confirm the identification, document its characteristics for identification and study its behaviour. The whale was followed at close range for three quarters of an hour. It appeared to be feeding and showed no signs of discomfort. It was trailed from the side and behind to avoid disturbance and seemed completely unconcerned about the present of the small boat. When the animal stopped feeding and swam towards the centre of the sound, the trailing was abandoned and the ship returned to Texel. A subsequent trip later that afternoon did not provide a sighting.

In the course of the next morning (13 May), the whale was spotted in the Breewijd area, off Huisduinen. At that time, it was performing rather deep dives, submerging for 5-10 minutes at a time. After just over half an hour of diving in that area, it suddenly moved towards the coast and started surface skimming close to the shore, as on the previous day. Three small boats were present in the area, keeping a fair distance so as not to hinder the animal in any sense. It was clearly the same animal, characterised by a partly whitish dorsal fin. Later that afternoon, the same whale was reported swimming off the south coast of Texel, bottom-feeding in very shallow waters and slowly working its way westwards. After having obtained sufficient photographic evidence of the identity of this animal, the whale was left alone, undisturbed. These were the last views obtained of the animal which has not been seen in the area since.

Individual identification

The whale's dorsal fin (figure 2) was broad-based but sickle shaped with a rather sharp tip and a fairly gentle hump in front. The ventral side of the dorsal fin was yellowish-white over the entire length, as was the tip. The right side of the dorsal fin was dark grey, with a fairly extensive whitish area along the front of the fin

Figure 2. Right (a) and left side (b) of the dorsal fin of the humpback whale in the Marsdiep area, showing a characteristic yellowish-white area over the entire top of the fin, which is more extensive on the left side. The other whitish scratches and scars around the dorsal fin may be of additional use for the individual recognition of this individual during future close encounters. *Photographs: Kees Camphuysen.*

and a distinct whitish scar pointing down/backwards at the front near the fin base. On the back and right side of the animal, just ahead of the bump, two whitish scars were visible at a distance of twice the finbase length in front of the fin (figure 2a). When seen from the left, much of the dorsal fin was whitish, even near the tip of the fin, with a distinct pattern of scars in the dark part of the fin. At the hump in front of the fin two clear white spot markings were visible. Slightly behind and below the dorsal, at the tailstock, a clear white scar pointed upwards

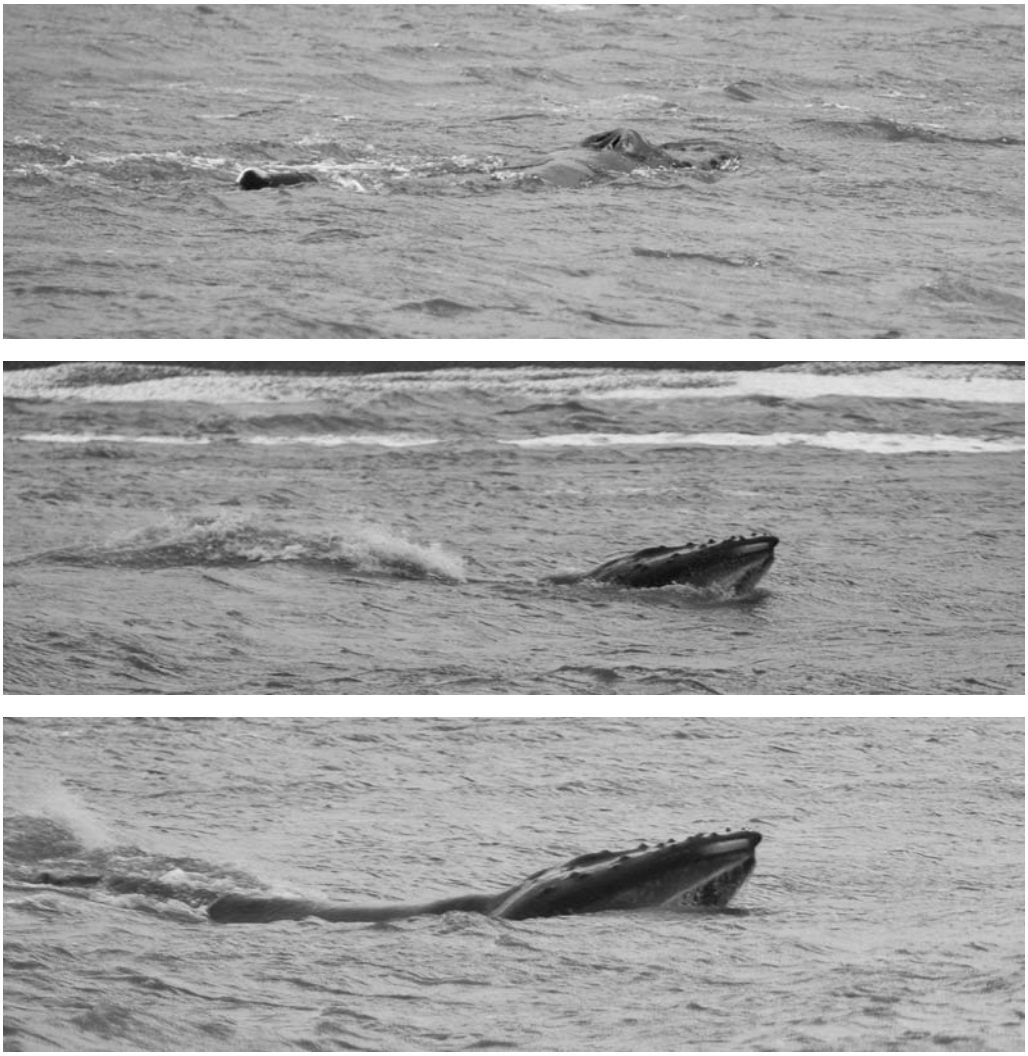

Figure 3. Surface skimming humpback whale. Swimming at the surface, with open mouth against the four knots flood current in an area later identified as a frontal zone between murky Wadden Sea water (background area) and clearer North Sea water (foreground area). The top photo shows the animal from behind, with the blowholes prominently visible and with the upper jaw fully level with the water surface. *Photographs: Kees Camphuysen.*

(figure 2b). The whitish area was clearly visible from the front, but even from behind the whitish pattern could be noted. The flukes of this whale were never seen above the surface.

Behaviour

Four different types of behaviour were observed, apart from travelling between areas: surface skimming, engulfment feeding, deep diving, and bottom feeding in shallow waters. Along the dike of Den Helder, the animal was *surface skimming* (figure 3): slowly swimming at the surface, with its mouth open against the four knots flood current. These feeding bouts lasted about 10-20 seconds, after which the throat was greatly expanded and water filtered out through the baleens. The animal followed a

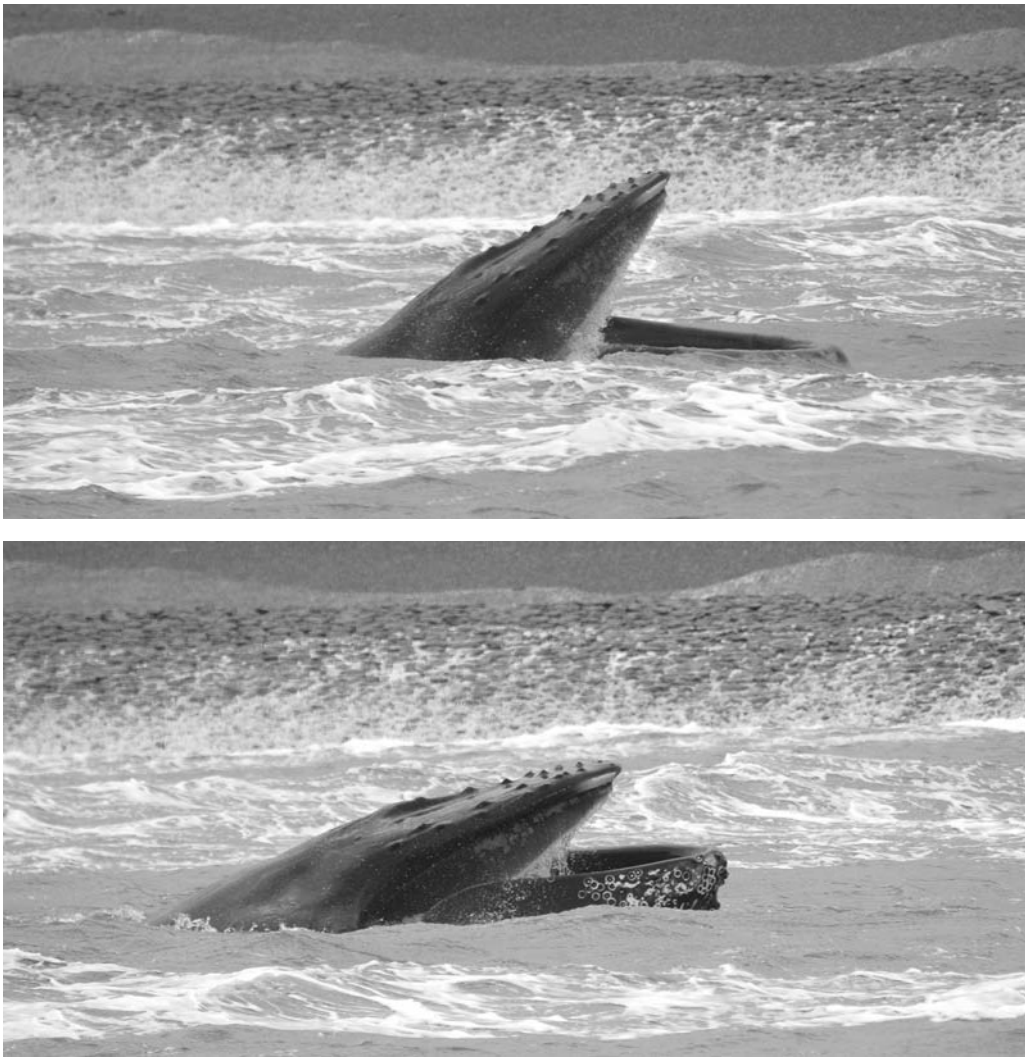

Figure 4. Rising higher out of the water, the humpback whale is surface feeding. With a water-filled mouth it is preparing to filter. *Photographs: Kees Camphuysen.*

zig-zag course, frequently returning to its starting position from where it would resume swimming slowly against the current.

Secondly, and partly as a variant on the surface skimming behaviour, the upper jaw appeared much more prominently above the surface (with the mouth wide open) and the lower jaw became visible as the mouth filled with water (figure 4). This followed a fairly steep upward move of the whale after a dive to some depth, behaviour that can be described as *engulfment feeding* which is typical for the rorquals (fin whales), although it is normally performed while swimming quickly towards a shoal of fish (Berta & Sumich 1999). This behaviour was commonly seen on 12 May, but rarely on the next day, when the whale was feeding in the same area but under calmer conditions. Both feeding techniques, surface skimming and engulfment feeding, aimed at

sampling the surface water. The animal worked a frontal zone of two water types, leaving and entering each zone in a regular fashion by following a zig-zag course that ran against the current.

The third technique was much less visible. The animal worked a very shallow (<5 m water depth), sloping area off a sandy beach at the southern tip of Texel, following a frontal zone indicated by accumulated flotsam and jellyfish. It dived frequently and fairly rapidly given the shallow water probably to the bottom to feed. The area was rich in surface feeding common terns (*Sterna hirundo*), sandwich terns (*Sterna Sandvicensis*), black-headed gulls (*Larus ridibundus*), common gulls (*Larus canus*) and some herring gulls (*Larus argentatus*), dipping for small sand eel (*Ammodytes* sp.). Local fisherman on board the trailing boat knew the area as a sand eel area (A. Vonk, personal communication).

In the fourth technique the whale conducted deeper dives in the central sound, which lasted many minutes at a time (following a period of 3-4 surfacings at a time). It is unclear what the animal was doing in this area, but it was probably either searching for prey at depth, or was awaiting another near shore foraging opportunity.

Feeding success and prey availability

There is no doubt that the animal was actively foraging, but there are no indications that this feeding was very profitable. When surface skimming the animal virtually failed to attract gulls and terns, and there were no visible prey leaping out of the water or the whale's mouth when the water was gulped through the baleen. It was obviously impossible to evaluate foraging success (if any) in the deep diving or bottom feeding whale, but while working that sandy bottom, (successful) foraging seabirds in the area at least indicated the presence of sandeels as prey in the top layers of the water column. Fish fyke catches in the Mokbaai area (a fish catching constant effort monitoring site of the Royal Netherlands Institute for Sea Research at Texel) revealed very low fish biomass during the whale visit (NIOZ, unpublished data).

Feeding habitat

The surface skimming behaviour was observed during (early) flood along the dike near Kaap Hoofd (Helsdeur, Den Helder). This nearshore area borders a gully of up to 50 m deep and the tidal current is particularly strong in that area. The Helsdeur is by far the deepest part of the Marsdiep area, which is otherwise between 12 and 30 m deep in the main shipping lanes. Later during flood, the animal worked waters off Texel between the TESO ferry terminal and the Molengat sea strait to the North Sea. This area is very shallow and the whale mostly frequented an area of 5-7 m water depth, apparently targeting sandeels as prey. The flood is two hours later in that area than the Helsdeur region as a result of water entering the Wadden Sea through the Molengat strait. Thus concentration of prey by tidal currents would occur at different times in the two regions.

The animal disappeared for considerable lengths of time. It should be noted that its presence in Molengat would easily go unnoticed as only few people frequent the southernmost tip of Texel and vantage points are few and far between in that area. Behind the sandy island of Noorderhaaks, the whale would be missed by coastal observers. Seawatchers at Huisduinen observed the animal at Schulpengat and Breewijd, Marsdiep, and Helsdeur. The humpback whale travelled some distance into the Wadden Sea (given the encounters with the Texel ferry), but not very far and probably not for very long.

Humpback whales in the Netherlands and Belgium

In Belgium, there is a single historical stranding of what is currently believed to have been a humpback whale (Blankenberge 1751, from a painting made in 1755; Camphuysen

Table 1. Recent sightings and strandings in the southern North Sea

Year	Month	Where	Event
2003	September	Nieuwe Waterweg-Maasvlakte (NL)	Carcass floating in Nieuwe Waterweg, misidentified and dragged back into the sea, stranded 7 October 2003 at Maasvlakte
2003-4	Dec-Jan	Katwijk-Scheveningen (NL)	Adult female and calf foraging in near shore waters; calf died presumably from drowning in fishing gear and washed ashore
2004	June	Vlieland (NL)	Stranding of dead immature female, total length 8 m, killed by strangulation from a line around the neck
2006	March	Lombardsijde, Nieuwpoort (B)	Stranding of dead female, total length 10.5 m, probably killed after being hit by a ship's propeller
2007	May	Marsdiep-western Wadden Sea (NL)	Subadult foraging in tidal inlet for a period of at least 3

& Peet 2006), but that was previously listed as a northern right whale (*Balaena glacialis*) (DeSmet 1974). This is the only likely historical case of a humpback whale known to have stranded along the coast of The Netherlands and Belgium, despite a long record of documented large whale strandings dating back to about 1250 (van Deinse 1931, Sliggers & Wertheim 1992).

The first humpback whale record in the Netherlands dates back to just September 2003 (table 1), when a whale corpse floating in Nieuwe Waterweg (the entry to Rotterdam harbour) was originally misidentified as a minke whale (*Balaenoptera acutorostrata*). It was dragged back into the North Sea but the corpse washed ashore at Maasvlakte one week later, but was too decomposed to be of much use for a museum collection (Smeenk et al. 2003).

It took only a few months before the next two humpback whales turned up. A mother and calf were seen off the mainland coast near Scheveningen, on the 18th of December 2003. Given the diet and exceptional abundance of foraging piscivorous seabirds in that area they were possibly attracted to these near shore waters because of rich stocks of small clupeids and other fish.. Unfortunately, the calf got caught in fishing gear and drowned before being cut loose by a fisherman. It washed ashore the next day, with the flukes and part of a flipper chopped off (C. Smeenk, personal communication; Camphuysen & Peet 2006). The adult female continued to utilise the coastal waters at least during January 2004, through was seldom seen and not hindered by anyone.

Within half a year, the fourth humpback whale was recorded. A freshly dead young female, about eight metres in length, was found washed ashore at Vlieland, with a rope around her head that had grown into the vital organs (death through strangulation). Goose barnacles on the rope suggested its oceanic origin and the material of the line suggested the rope had served to retrieve lobster pods (A. Vonk, personal communication; this type is not in use anywhere in the southern North Sea). There were reasons to believe that this whale had been swimming around with the loop around the body for a long time during maturation and growth, probably long before in entered the North Sea (van der Meij & Camphuysen 2006).

The most recent animal to wash ashore, in March 2006, was a 10.5 m long female humpback whale, at Lombardsijde, close to Nieuwpoort (Belgium). This had bled to death after a hit, presumably by a ship's propeller, although the corpse was in an otherwise good condition (Haelters 2006).

Discussion

Individual identification

Whale catalogues usually focus on the ventral side of the flukes when documenting the indi-

vidual characteristics of humpback whales (Katona & Whitehead 1981). Even although the individually unique markings may change during a whale's lifetime (Blackmer et al. 2000), the colour patterns and contours are usually sufficiently robust and consistent to facilitate subsequent individual re-identifications with a high degree of certainty, sometimes even on the basis of rather poor photographs. Unfortunately, no fluke shots were obtained during any of the observations in the Marsdiep area. Kaufman et al. (1990) have used lateral body markings of humpback whales and tail fluke markings to document the movements of individual whales around Australia. Many other studies (in other cetaceans) have used the unique characteristics of dorsal fins to describe individuals and to facilitate recognition during re-sightings of the same individual whale or dolphin (e.g. Similä et al. 1995, Mazzoil et al. 2004). There is no doubt that the dorsal fin of this particular individual is peculiar and that that future sightings and positive identifications can be expected from this.

There were witness reports, also made by skilled observers, of at least two individuals seen simultaneously but not together. However there is no evidence of a second animal from the accumulated photographic material. This might be because most pictures were taken from Den Helder, and that a second animal may not have frequented this specific part of the Marsdiep. However, in the absence of any proof, it seems sensible to log the event as a single, solitary (immature) whale working the Marsdiep area for a period of four days (10-13 May 2007).

Foraging behaviour

The foraging behaviour observed may be considered typical for humpback whales in their more traditional areas. Even though surface skimming is characteristic for right whales *Balaena* spp., is also a well known technique among humpback whales (Croll & Tershy 2002). Zonfrillo (1996) described a similar encounter with an extra-limital young humpback whale patrolling an area of the upper Clyde (west Scotland), which on occasion approached within 20m of the public esplanade of the small town of Greenock. This individual was bubble netting and shoals of small fish, probably young herring, could be seen showering from its open mouth as the humpback surfaced. Unusually large numbers of auks, grebes and divers were also present in the Clyde estuary during the same period, suggesting an abundant food supply. The Marsdiep humpback entered the estuary when food was far from abundant. No prey was seen to escape from its mouth when it was surface feeding and there were few foraging seabirds in the area. It is estimated that the individuals require around one tonne of small fish as a daily requirement (Zonfrillo 1996) so it is no surprise that the individual quickly abandoned the area. Only four weeks after the whale had left the area, small herring became overabundant in the Marsdiep area and feeding frenzies of seabirds could be seen everywhere. Had the visiting whale arrived late May or early June, there would have been plenty of profitable feeding opportunities, and the whale might have stayed longer.

Humpback whales in the North Sea

With this most recent sighting, there have now been six occurrences of humpback whales in the south eastern North Sea within four years, following a period of centuries during which not a single case could be documented. Three of these arrived dead, three were seen alive and one of those drowned in fishing gear. Most sightings from the North Sea were until recently from the Shetland Islands, where the first humpback whale since 1929 was sighted in June 1992 (Osborn 1993), with subsequent sightings in May and September 1993, and up to three individuals seen annually throughout the summers of 1994-98 (Evans 2006). Most of the summering individuals were seen around Sumburgh Head (south Mainland,

Shetland Islands) and were presumably feeding on sand eels (Harrop 1995). Since the mid 1990s, scattered sightings and strandings of humpback whales have occurred in various locations around the North Sea, including off of Aberdeen (summer 1997), the Moray Firth (July 2001 and July 2002), in the Danish coast (2002), the Firth of Forth (February 2003), and several other sightings off the east coast of Scotland in recent years (Camphuysen 1998, Anonymous 2003, Kinze et al. 2003, MacDonald 2007, Cetacean Research and Rescue Unit (Banff), unpublished data). Many, but not all, humpbacks in the North Sea were rather young immatures. The six reports in the Southern Bight in the early 21st century fit quite well with the apparent increase in sightings in the North Sea at large in recent years. The explanation for this should be sought for in the Atlantic Ocean, where the humpback whale naturally occurs.

Humpback whales in the North Atlantic

Humpback whales are highly migratory, spending spring through to autumn in their feeding areas in the mid- to high latitude waters and winter at calving grounds in the tropics (Clapham 2002). In the eastern part of the north Atlantic humpback whales are common in summer in the waters off Iceland and in the Norwegian and Barents Seas (Christensen et al. 1992, Smith et al. 1999, Stevick et al. 2006). Very few are seen farther south but they are occasionally sighted in the northern North Sea, to the west of the UK, to the south and southwest of Ireland and in the Bay of Biscay. The frequency of sightings involving small numbers around the UK and Ireland has increased since the 1980s (Evans et al. 2003, Evans 2006). Sightings from around the British Isles occur in three main areas: (1) Northern Isles, south to eastern Scotland, (2) northern Irish Sea to South-west Scotland; and Celtic Sea between southern Ireland, South Wales and South-west England. In UK shelf waters, the species occurs mainly from May-September, with some sightings in winter (November-March) and this is supported by acoustic recordings from hydrophone arrays in the north and west of Scotland and Ireland (Clark & Charif 1998, Charif & Clark 2000, Charif et al. 2001). Sightings in Ireland (mainly from the south coast) increase through the summer, reach a peak in September with a rapid decline thereafter (Evans et al. 2003).

Migratory destinations of humpback whales in the eastern part of the north Atlantic were investigated using natural markings. In the winter the whales migrate to areas around the West Indies (Stevick et al. 2003a) or the Cape Verde Islands (Jann et al. 2003). The southern North Sea is not on a migration route and most migration appears to occur further offshore (Charif et al. 2001). Long-distance foraging movements appear to be more prevalent in the eastern rather than the western north Atlantic, reflecting the abundance and predictability of prey and this may influence occasional longer movements (Stevick et al. 2006). The recent presence of humpbacks in the southern part of the North Sea may thus be a response to recent changes in preferred prey elsewhere. Small numbers, particularly of young animals, have been reported as occurring outside of traditional feeding or breeding areas. It is also possible, indeed likely, that the increase in the population of humpback whales in the Atlantic Ocean (a rate of increase of 0.031 is presented by Stevick et al. 2003b) has led to an expansion to new habitats.

Conclusions

An immature humpback whale visited the Marsdiep area (western Wadden Sea) for a period of four days in May 2007. This represented the sixth case of strandings and sightings in the Netherlands and Belgium since 2003, following a 250 year period without a single occurrence. This visit was also the first documented case of a foraging baleen whale in the Wadden

Sea area. Feeding conditions were poor and the whale soon abandoned the area. The sighting follows an increase in sighting frequency in the North Sea at large since 1992, which is presumably due to a general increase in stocks in the Atlantic Ocean, leading to expansion to new habitats.

Acknowledgements: Numerous people contributed in one way or the other to this article, mainly by supplying information during the brief visit of the humpback whale in the Marsdiep area. Rutgert Oosterhuis, skipper of *Het Sop*, has to be thanked in particular for his enthusiasm and willingness to drive scientists around at short notice. G. Tijsma and R. Stekelbos (coastguard), Dominiek de Jong (VC Brandaris), and Oscar Bos (Ecomare) were among the first to report the whale. My thanks also go to the personnel from the 'Verkeerstoren Den Helder' (coastguard), workers at Animedics (Den Helder), Adrie Vonk, Arnoud van den Berg, Ben Schrieken, Ben Wielstra, Chris van der Vliet, Frank van Duivenvoorde, Hans Verdaat, Ineke Vonk, Jan Haelters, Kees de Graaf, Kees Rebel, Mardik Leopold, Rinse van der Vliet, Sytske Dijksen, teh TESO ferry bridge personnel and Tim van de Nus. Jan Boon was a great help in handling the excessive media attention. Two anonymous referees and Kees Canters kindly and extensively commented on an earlier version of this text, as a result of which substantial improvements were made.

References

Anonymous 2003. Having a whale of a time in the Firth of Forth? URL: http://www.crru.org.uk/rescue/news/forth.htm; viewed 16 February 2003.

Berta, A. & J.L. Sumich 1999. Marine Mammals: Evolutionary Biology. Academic Press, San Diego, USA.

Blackmer A.L., S.K. Anderson & M.T. Weinrich 2000. Temporal variability in features used to photo-identify humpback whales (*Megaptera novaeangliae*). Marine Mammal Science 16: 338-354.

Camphuysen, C.J. & G. Peet 2006. Walvissen in de zuidelijke Noordzee. Fontaine Uitgevers, Kortenhoef, The Netherlands.

Camphuysen, C.J. 1998. Shetland's Humpback Whale off the coast of Aberdeen in 1997? Shetland Seamammal Group Newsletter 8: 2-3.

Charif, R.A. & C.W. Clark 2000. Acoustic monitoring of large whales off north and west Britain and Ireland: a two-year study, October 1996-September 1998. JNCC Report 313. Joint Nature Conservation Committee, Aberdeen, UK.

Charif, R.A., P.J. Clapham & C.W. Clark 2001. Acoustic detections of singing Humpback Whales in deep waters off the British Isles. Marine Mammal Science 17: 751-768.

Christensen, I., T. Haug, & N. Øien 1992. Seasonal distribution, exploitation and present abundance of stocks of large baleen whales (Mysticeti) and sperm whales (*Physeter macrocephalus*) in Norwegian and adjacent waters. ICES Journal of Marine Science 49: 341-355.

Clapham, P.J. 2002. Humpback whale *Megaptera novaeangliae*. In: W.F. Perrin, B. Würsig & J.G.M. Thewissen (eds.). Encyclopedia of Marine Mammals: 589-592. Academic Press, San Diego, USA.

Clark, C.W. & R.A. Charif 1998. Acoustic monitoring of large whales to the west of Britain and Ireland using bottom-mounted hydrophone arrays, October 1996-September 1997. JNCC Report 281. Joint Nature Conservation Committee, Aberdeen, UK.

Croll, D.A. & B.R. Tershy 2002. Filter feeding. In: W.F. Perrin, B. Würsig & J.G.M. Thewissen (eds.). Encyclopedia of Marine Mammals: 428-432. Academic Press, San Diego, USA.

DeSmet, W.H.A. 1974. Inventaris van de walvisachtigen (Cetacea) van de Vlaamse kust en de Schelde. Bulletin de l'Institut Royal Scientific Naturelle de Belgique 50, Biologie 1: 1-156.

Evans, P.G.H. 2006. Whales and dolphins in Shetland waters. URL: http://www.nature-shetland.co.uk/seamammal/cetaceans.htm, viewed 17 May 2007.

Evans, P.G.H, P. Anderwald & M.E. Baines 2003. UK Cetacean Status Review. Report to English Nature & Countryside Council for Wales. Sea Watch Foundation, Oxford, UK.

Haelters, J. 2006. Bultrug op Belgisch strand. Zoogdier 17 (2): 3-5.

Harrop, H. 1995. Humpback Whale off Compass Head. In: K. Osborn & P. Harvey (eds.). Shetland Cetacean Report 1994: 7. Shetland Cetacean Group, Burravoe, UK.

Jann, B., J. Allen, M. Carrillo, S. Hanquet, S.K. Katona, A.R. Martin, R.R. Reeves, R. Seton, P.T. Stevick & F.W. Wenzel 2003. Migration of a humpback whale (*Megaptera novaeangliae*) between the Cape Verde Islands and Iceland. Journal of Cetacean Research and Management 5: 125-129.

Katona, S.K. & H.P. Whitehead 1981. Identifying Humpback Whales using their natural markings. Polar Record 20 (128): 439-444.

Kaufman, G.D., M.G. Osmond, A.J. Ward & P.H. Forestell 1990. Photographic documentation of the migratory movement of a Humpback Whale (*Megaptera novaeangliae*) between East Australia and Antarctic area V. In: P.S. Hammond, S.A. Mizroch & G.P. Donovan (eds.). Individual recognition of cetaceans: use of photo-identification and other techniques to estimate population parameters. SC/A88/ID41, Special Issue 12: 265-267. International Whaling Commission, Cambridge, UK.

Kinze, C.C., T. Jensen & R. Skov 2003. Fokus på hvaler i Danmark 2000-2002. Biologiske Skrifter 2. Fiskeri- og Sofartsmuseet, Esbjerg, Denmark.

MacDonald, P. 2007. Moray Firth News. URL: http://www.marineconnection.org/archives/general/moray_firth_news_04-02-19.html, viewed 18 June 2007.

Mazzoil, M., S.D. McCulloch, R.H. Defran & M.E. Murdoch 2004. Use of digital photography and analysis of dorsal fins for photo-identification of bottlenose dolphins. Aquatic Mammals 30 (2): 209-219.

Osborn, K. (ed.) 1993. Shetland bird report 1992. Shetland Bird Club, Lerwick, UK.

Similä, T., J.C. Holst & I. Christensen 1995. Occurrence and diet of killer whales in northern Norway: seasonal patterns relative to the distribution and abundance of Norwegian spring-spawning herring. Canadian Journal for Fisheries and Aquatic Sciences 53: 769-779.

Sliggers, B.C. & A.A. Wertheim 1992. Op het strand gesmeten. Vijf eeuwen potvisstrandingen aan de Nederlandse kust. Walburg Pers, Zutphen, The Netherlands.

Smeenk, C., M. Addink & C.J. Camphuysen 2003. De eerste bultrug voor Nederland. Zoogdier 14: 3-4.

Smith, T.D., J. Allen, P.J. Clapham, P.S. Hammond, S. Katona, F. Larsen, J. Lien, D. Mattila, P.J. Palsbøll, J. Sigurjónsson, P.T. Stevick & N. Øien 1999. An ocean-basin-wide mark-recapture study of the North Atlantic humpback whale (*Megaptera novaeangliae*). Marine Mammal Science 15: 1-32.

Stevick, P.T., J. Allen, M. Bérubé, P.J. Clapham, S.K. Katona, F. Larsen, J. Lien, D.K. Mattila, P.J. Palsbøll, J. Robbins, J. Sigurjónsson, T.D. Smith, N. Øien & P.S. Hammond 2003a. Segregation of migration by feeding ground origin in North Atlantic humpback whales (*Megaptera novaeangliae*). Journal of Zoology, London, 259: 231-237.

Stevick, P.T., J. Allen, P.J. Clapham, N. Friday, S.K. Katona, F. Larsen, J. Lien, D.K. Mattila, P.J. Palsbøll, J. Sigurjónsson, T.D. Smith, N. Øien & P.S. Hammond 2003b. North Atlantic humpback whale abundance and rate of increase four decades after protection from whaling. Marine Ecology Progress Series 58: 263-273.

Stevick, P.T., J. Allen, P.J. Clapham, P.S. Hammond, S.K. Katona, F. Larsen, J. Lien, D.K. Mattila, P.J. Palsbøll, R. Sears, J. Sigurjónsson, T.D. Smith, G.A. Vikingsson & N. Øien 2006. Population spatial structuring on the feeding grounds in North Atlantic humpback whales. Journal of Zoology, London, 270: 244-255.

van Deinse, A.B. 1931. De fossiele en recente Cetacea van Nederland. PhD thesis, Universiteit van Utrecht. H.J. Paris, Amsterdam, The Netherlands.

van der Meij, S.E.T. & C.J. Camphuysen 2006. Distribution and diversity of whales and dolphins (Cetacea) in the Southern North Sea: 1970-2005. Lutra 49 (1): 3-28.

Zonfrillo, B. 1996. Humpback Whale (*Megaptera novaeangliae*) in the Clyde estuary. The Glasgow Naturalist 23: 60-61.

Samenvatting

Foeragerende bultrug (*Megaptera novaeangliae)* in het Marsdiep (Waddenzee), mei 2007, en een overzicht van waarnemingen en strandingen in de zuidelijke Noordzee, 2003-2007

Een bultrug (*Megaptera novaeangliae*) werd waargenomen in het Marsdiep (westelijke Waddenzee), van 10 tot en met 13 mei 2007. Het dier foerageerde in sterke getijdestromen op de rand van een bijzonder diepe plek in het Marsdiep voor de Helderse zeewering en langs het strand van Texel in uitgesproken ondiep water. De bijzondere kenmerken van de rugvin zijn gedetailleerd beschreven, om eventuele vervolgwaarnemingen elders in Europa van dit

individu mogelijk te maken. De wijze van foerageren, de omstandigheden waaronder naar voedsel werd gezocht, de bezochte gebieden en de mogelijke prooidieren in het Marsdiep worden beschreven. Bultruggen zijn buitengewoon zeldzaam in de zuidelijke Noordzee en werden tot dusverre nog nooit in de Waddenzee gezien. Het artikel besluit met een overzicht van de recente gevallen in Nederland en België en een overzicht van de klaarblijkelijke toename van meldingen in de Noordzee en Europa in de afgelopen tientallen jaren. Historische gegevens suggereren dat bultruggen hier altijd bijzonder schaars zijn geweest. De recente toename in de Noordzee zou kunnen zijn veroorzaakt door een zeker herstel van de Atlantische populatie.

Received: 17 May 2007
Accepted: 25 August 2007