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Perception of a cetacean mass stranding in Italy: the emergence of compassion

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ABSTRACT

1. The view that whales are malicious monsters has been pervasive throughout history. Conversely, the idea that these animals experience suffering has emerged only recently. One way of investigating perceptual, as well as behavioural, shifts is assessing general public reactions to mortality events involving wild, rare and charismatic animals.

2. Here, the responses of 118 individuals to questions regarding the mass stranding of seven sperm whales (*Physeter macrocephalus*) along the Adriatic Sea coast of Italy in December 2009 are reported through interviews taken at the stranding site and in the direct proximity of the dead animals.

3. When asked why the whales were stranded, 44.1% of the respondents suggested anthropogenic causes and 21.2% non-anthropogenic. The remaining 34.7% mentioned a generic 'disorientation' or stated they did not know. When asked how they felt about the whales, 68.6% expressed feelings of compassion or care towards the animals. Clearly non-compassionate attitudes accounted for only 4.1% of the sample. Finally, 21.2% expressed feelings that were ambiguous in terms of being suggestive of compassionate or non-compassionate attitudes, including 11.9% amazement, 4.2% deprecation and 5.1% powerlessness.

4. These results are in stark contrast with information obtained from accounts of similar events that have occurred in historical times, up until the first half of the 20th century. For centuries, responses to cetacean live strandings—typically including killing and harming of the animals—were either utilitarian or characterized by feelings including fear and a desire to 'subjugate the beast', with no apparent concern for their suffering and death.

5. It is concluded that attitudes towards whales—today strikingly revolving around sadness, compassion and a sense of loss—have changed dramatically over time, with a steep turnaround in the 1970/1980s. Full appreciation of the ongoing evolution in public perception can channel marine conservation efforts and assist in the design of response strategies to marine mammal strandings.

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INTRODUCTION

The full scientific realization that animals suffer is relatively new, and still lively debated (e.g. Singer, 1975; Regan, 1983; Hawkins, 2002; Chandroo *et al.*, 2004; Dawkins, 2006, 2008; Bekoff, 2007). Although the concept has been at the core of some philosophies and religions for thousands of years (e.g. Buddhism; Lecso, 1988; Phelps, 2004), in strictly scientific terms the realization that animals can experience feelings including distress and pain has come much later in human history. Such a view has been around since the times of Charles Darwin and was clearly expressed by Darwin himself (1871): 'the lower animals, like man, manifestly feel pleasure and pain, happiness and misery'. In parallel to a progressive change of human perception of nature in western societies during the past 150 years, largely through the influence of writers such as Henry David Thoreau (1854) and Aldo Leopold (1949), a new kind of environmental ethics developed (Attfield, 1983; Nash, 1989), which also embraced the animal world. Wilson (1986) argued that our natural affinity for life ('biophilia') is the very essence of our humanity and binds us to all other living species. The idea that animals – particularly large ones living

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in the wild – are 'intrinsically' valuable is increasingly appreciated by sectors of human society (Dol *et al*., 1999). A formerly utilitarian view of wildlife has therefore evolved towards an appreciation of at least some of the most charismatic species, and hence towards calls for their preservation, irrespective of the potential use we can make of a given animal (Hargrove, 1989; Bjerke *et al*., 1998; Bekoff, 2009).

Attitudes towards marine mammals have been relatively well studied in the USA (Kellert, 1999; Lavigne *et al*., 1999), where a few studies have focused on how such attitudes have evolved. For instance, public appreciation of the West Indian manatee (*Trichechus manatus*) shifted dramatically in just two decades, starting from the 1970s, and the animals turned from ugly and grotesque targets of casual slaughters to harmless and endangered social creatures characterized as shy, placid, inoffensive, gentle, curious, intelligent, friendly and peace-loving (Goedeke, 2004). Thus, in the USA, West Indian manatees went from stirring acts of cruelty to inspiring dedication and admiration. In the Mediterranean region, attitudes towards marine mammals remain poorly documented. In Italy, utilitarian attitudes have been widespread throughout historical times and the idea that animals experience suffering, or have rights, has emerged only recently (Notarbartolo di Sciara and Schweitzer, 2005; Tonutti, 2007). The homeland of Francis of Assisi (1181–1226), and a nation where the tenets of Christian faith are still widely spread, Italy has long neglected compassionate attitudes toward animals such as those advocated and embodied by Saint Francis – at least until recent times.

Assessing the evolution over time of the general public reactions to suffering and mortality events involving wild, rare and large animals is one way by which perceptual and behavioural shifts can be assessed. While public opinion surveys addressing attitudes towards cetacean conservation (Barney *et al*., 2005; Scott and Parsons, 2005; Howard and Parsons, 2006) and whaling issues (Stoett, 1993; Hamazaki and Tanno, 2001; Hirata, 2004; Bowet and Hay, 2009) are not new, we are unaware of public opinion surveys conducted at cetacean stranding sites. Here, the response of 118 individuals to questions regarding the mass stranding of seven sperm whales (*Physeter macrocephalus*) along the Adriatic Sea coast of Italy is reported through interviews taken at the stranding site and in the direct proximity of the dead animals. Information obtained from scientific accounts, reports, press clippings, video clips, prints and photos of similar events that have occurred in the past, starting from the 16th century are then presented. Answers given during the mass stranding in 2009 cannot be directly compared with historical reports, neither can they be matched with similar sets of answers given in historical times (because such information does not exist). Nevertheless, responses to interviews in this study as well as information spread by the Italian media following the mass stranding event are indicative of the extent of change in the public perception of wild cetaceans that has occurred in Italy over the past decades. For centuries, perception of cetacean mortality events was utilitarian or characterized by feelings including fear and a desire to 'subjugate the beast'. Yet, a rapid change occurred in the second half of the 20th century, when whales, their suffering and their death came to be viewed in a new light. Whereas human responses to live-stranding events have typically and for a long time involved whale killing, attitudes recorded during the mass stranding in 2009 strikingly revolved around sadness, compassion and a sense of loss.

METHODS

Context

Between Thursday 10 and Friday 11 December 2009, a group of seven sperm whales stranded along the northern coast of the Gargano Peninsula (Apulia, Italy), between Capoiale and Foce Varano, in the Adriatic Sea. The animals, all subadult males 10.5–12.2 m long, were scattered along a 3.3 km stretch of beach. All the animals were alive at the time of stranding, but only two had survived by 12 December and all were dead by 13 December. Observers reported that on 10 December, before stranding, the group was present in shallow coastal waters and comprised nine animals, of which two were apparently able to regain offshore waters. Early attempts made by locals to prevent the stranding and help the animals to regain deep waters were unsuccessful. The causes of the mass stranding remain unknown at the time of writing. By 13 December at 9 AM, when interviews began, all animals had been dragged to the beach and the two necropsies scheduled for that day had begun.

The event had extraordinary and unprecedented media coverage. In the following two weeks, approximately 433 web sites in Italian (82 online news sites, 287 blogs and 64 discussion forums) reported the news and provided considerable coverage. In the days following the mass stranding there was consistent prime-time reporting on national and local TV channels and newspapers. The news was also reported by several TV channels and a large number of web sites abroad. Two weeks after the mass stranding, 50 videos of the event had been posted on YouTube. Another proxy of interest shown by the media would be the number of requests for information received by recognized cetacean experts in Italy. For instance, in the week following the mass stranding one of us (GNS) received over 40 email messages by journalists, colleagues and other interested people and was invited to three TV, two radio and three news agencies and newspaper interviews.

Following the spreading of news about the stranding event, a number of people came to visit the site, including many families with children. On 13 December at 11 AM (peak visit hour), approximately 300 cars were parked along the stretch of coast where the sperm whales were stranded. Over 200 cars were still parked there at 1 PM, before the coastal road was closed by the police for safety reasons. These figures suggest that roughly 500–1000 people may have visited the stranding site on that day. A considerable number of scientists and experts from several universities, research centres and NGOs throughout Italy reacted promptly to the stranding event and were on site from 11 December to coordinate operations and conduct scientific investigations.

Interviews

Interviews were conducted on the beach in the proximity of dead sperm whales, on 13 December, between 9 AM and 3 PM, by two independent interviewers. Adult respondents

were approached informally, irrespective of their gender, and asked if they were willing to answer a few questions about the whales. While interviews targeted single individuals, because of the informal settings other people could occasionally approach out of curiosity; in these cases, interviewers maintained eye contact with individual respondents and only their answers were recorded. Interviews were short and based on a set of three to four simple questions (see below), which were straightforward and easy to understand to maximize sample size and minimize the number of non-respondents (therefore reducing response bias; White *et al.*, 2005). Because this was an unexpected event, and there was limited time to perform the interviews (the whole area was actually closed to public access for safety reasons in the early afternoon of 13 December), meaningful pilot studies (as recommended by White *et al.*, 2005) could not be conducted. For the same reason, and because answers given in the context of such a rare event could not be predicted, the questions were open-ended. If multiple answers were given, all the answers were recorded by the interviewer, but only the first answer was considered in the analyses. Care was taken to ensure that questions were asked in an identical manner and freely answered with no prompt or influence. Children and individuals professionally involved in the stranding event were not interviewed. Age, profession and gender of the respondent were recorded at the end of the interview. The following questions were asked: (1) 'In your opinion, why are these whales stranded?'; (2a) 'What could be done to the whales that stranded alive?' If answer to this question was try to rescue (or 'save') them, the interviewer asked: (2b) 'How, in your opinion, could this be done?'; (3) How do you feel about these stranded animals?

In total, 119 individuals were interviewed. Of these, 118 answered all questions: 76 males and 42 females between 17 and 72 years old (mean age 43.0 years, SD = 12.88). The response rate of the survey was 99.2% (i.e. only one participant declined). Responders declared a variety of professions, of which 44.1% implied some kind of manual work (e.g. builder, fisherman) and 9.3% a higher-education degree (e.g. lawyer, engineer). All respondents spoke Italian and were assumed to reside in Italy.

An additional eight interviews were made by a third interviewer in the nearby village of Foce Varano (about 200 adult inhabitants). In this case, in addition to the questions above, the respondents were asked whether they had seen the whales, and whether the animals were alive or dead when seen.

Overview of historical information

To investigate the evolution of responses to whale strandings in Italy, a content analysis was conducted of the scientific and other literature – as well as engravings, prints, press clippings, video clips and photos – starting from the 16th century. While a number of cases were considered, the focus was on whale strandings that had occurred in Italy, particularly near the stranding location, together with a comprehensive review of live strandings of sperm whales in the Adriatic Sea. When coding, emerging themes were looked for and public responses (or lack thereof) were classified according to occurrence of killing, killing circumstances, use of animals as resources or for display, and rescue attempts. The number of animals involved, whether they stranded dead or alive, location, date and any other relevant information were also noted.

RESULTS

The way interviews were conducted has limitations that may hamper interpretation to some extent. Because the mass stranding near Foce Varano could not be predicted, interviews were made opportunistically to gain an insight into the public perception of an extraordinary and rare event. There was limited time to conduct the interviews, due to rapid decomposition of the animals and the subsequent closure of the beach to public access for safety reasons. Because this study was performed under short-lasting, unique and unforeseeable circumstances, the findings may not be generalizable beyond this stranding event or Italy. These limitations should be taken into account in any subsequent interpretation.

When asked why the whales were stranded (question 1), respondents suggested a variety of causes, of which 44.1% can be interpreted as anthropogenic and 21.2% as non-anthropogenic. The remaining 34.7% of respondents mentioned a generic 'disorientation' of the animals (20.3%) or stated that they did not know (14.4%; Table 1). When asked what could be done to the whales that stranded alive (question 2a), 82 respondents (69.5%) answered that the animals could have been saved, 24 (20.3%) that they could not have been saved, and 12 (10.2%) did not know. Two persons (1.7% of the respondents), among those who did not know, suggested later in the interview that euthanasia should have been used to prevent suffering of whales that stranded alive. Those who claimed that the animals could have been saved were further asked how, in their opinion, this could be done. The responses to this (question 2b) are reported in Table 2. In addition to their reply to the question, 32.9% of this sub-sample of respondents expressed deprecation and dissatisfaction for the lack of rescue attempts or, more generally, for the way in which operations were conducted. When asked how they felt about the animals (question 3), the

Table 1. Responses to question 1: In your opinion, why are these whales stranded?

	n	%	Reason for stranding interpreted as
Pollution	9	7.6	Anthropogenic (44.1%)
Naval sonars	9	7.6	
Anthropogenic noise	9	7.6	
Unknown anthropogenic causes	6	5.1	
Climate change	6	5.1	
Magnetic pollution from military land base	5	4.2	
Magnetic pollution	3	2.5	
Naval operations	2	1.7	
Habitat degradation	2	1.7	
Aquaculture (shellfish) plant	1	0.8	
Stormy sea	9	7.6	Non-anthropogenic (21.2%)
Natural causes (*generic*)	7	5.9	
Disease	4	3.4	
Gregarious instinct	2	1.7	
Shallow waters	2	1.7	
Blizzard	1	0.8	
Disorientation (*generic*)	24	20.3	Either anthropogenic or non-anthropogenic (34.7%)
Does not know	17	14.4	
Total	118	100.0	

majority of respondents ($n = 81$, 68.6%) used words that can be interpreted to express feelings of compassion and/or care towards the animals. A small proportion of the respondents said they did not experience any particular feeling ($n = 3$, 2.5%) or reported disgust ($n = 1$, 0.8%) or fatalism ($n = 1$, 0.8%). These feelings, interpreted as non-compassionate, accounted for only 4.1% of the sample. Finally, 21.2% expressed feelings that were ambiguous in terms of being suggestive of compassionate or non-compassionate attitudes, including 11.9% reports of amazement, 4.2% of deprecation (largely towards perceived human mismanagement of the stranding event) and 5.1% of a sense of powerlessness (Table 3). There was no significant difference between male and female responders in terms of compassionate versus non-compassionate answers (Fisher's exact test, $P > 0.05$).

Five persons mentioned that these animals are at risk of extinction (sperm whales are globally classified as Vulnerable in the IUCN Red List, and proposed as Endangered in the Mediterranean Sea; Notarbartolo di Sciara *et al*., 2006; Taylor *et al*., 2008). Five persons saw the stranding event as a sign of broken relationship between humans and nature, one mentioned that sperm whales have their own culture, one that these animals have a soul, four likened the death and suffering of these animals to that of people, and two were moved to tears while speaking. Individuals walking on the beach – whether children or adults – were never seen trying to climb on top of a dead sperm whale, even when the carcass was still relatively fresh and there were no authorities or technical personnel in sight. Few people (mostly children) dared to touch the animals.

While the sub-sample of interviews ($n = 8$) made in the village of Foce Varano was too small to allow meaningful analyses, answers suggested attitudes similar to those of people walking on the beach. Three persons stated that they did not want to see the animals because this would be too sad a sight. Those who had seen the animals ($n = 5$) consistently reported sorrow and sadness. All the respondents stated the animals could and should have been saved.

Table 2. Answers by 82 respondents who claimed that the live-stranded sperm whales could have been saved (question 2a) when asked how, in their opinion, this could be done (question 2b)

	n	%
Drag them offshore with boats	41	50.0
Lift them with helicopters	13	15.9
Drag them offshore	5	6.1
Use specific means (*generic*)	5	6.1
Prevent stranding (*generic*)	4	4.9
Drag them offshore with boats or lift them with helicopters	3	3.7
Involve Greenpeace	2	2.4
Involve the military	1	1.2
Use floaters and dig away sand around whales	1	1.2
Does not know	7	8.5
	82	100.0

Table 3. Responses to question 3: How do you feel about these stranded animals?

	n	%	Attitude interpreted as
Sadness	30	25.4	Compassionate (68.6%)
Sorrow	29	24.6	
Grief	16	13.6	
Bewilderment	4	3.4	
Tragedy	1	0.8	
Tenderness	1	0.8	
No feelings	3	2.5	Non-compassionate (4.1%)
Fatalism	1	0.8	
Disgust	1	0.8	
Amazement	14	11.9	Other (21.2%)
Powerlessness	6	5.1	
Deprecation	5	4.2	
Answer unclear	7	5.9	
Total	118	100.0	

DISCUSSION

Perception of whales in historical times

In the Classical literature there is a wealth of references to both fantastic sea monsters and real whales, with a rich and long tradition of iconographic representations in ancient art. The Mediterranean iconography of whales as Classical sea monsters – particularly in Greek, Etruscan, and Roman representations – has been a popular subject of modern scholarship (Papadopoulos and Ruscillo, 2002). These animals were consistently portrayed and perceived as monstrous beasts until the 16th century, with a rich and imaginative iconography (e.g. Belon, 1551; Olaus Magnus, 1565; Aldrovandi, 1608; Figure 1), albeit some representations were relatively more realistic (Gesner, 1558; Saenredam, 1602; Figure 2). In the following centuries the iconography became progressively more biologically accurate and less fanciful (Bonnaterre, 1789; de Lacépède, 1804; D'Orbigny, 1849), and whales shifted from the status of monsters and freaks to that of resources or animals worthy of scientific interest.

The image of the monstrous whale pervades most medieval textual traditions on cetaceans, where these animals were consistently perceived as aggressive and dangerous creatures, but also lucrative and worth the dangers of pursuit. Cetaceans were seen as creatures to fear and avoid, but at the same time of considerable value. The earliest Classical descriptions of cetaceans depict whales as forces of nature, great 'fish' to be battled with and, with fortune, overcome (Szabo, 2005).

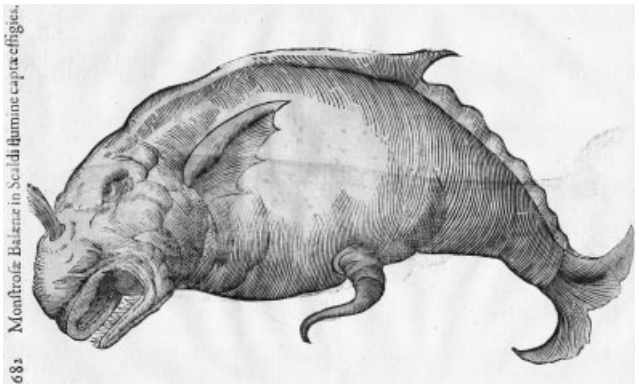

Figure 1. A table by Ulisse Aldrovandi (Bologna, Italy, 1522–1605) likely depicting a sperm whale, here called 'monstrous whale'. Notable are the fish-like tail and pectoral fin, water coming out of the nostril (blowhole), the extruded penis (caused in stranded males by the inflation of body by decomposition) and the malicious look. This kind of representation, with variations, was common at the time.

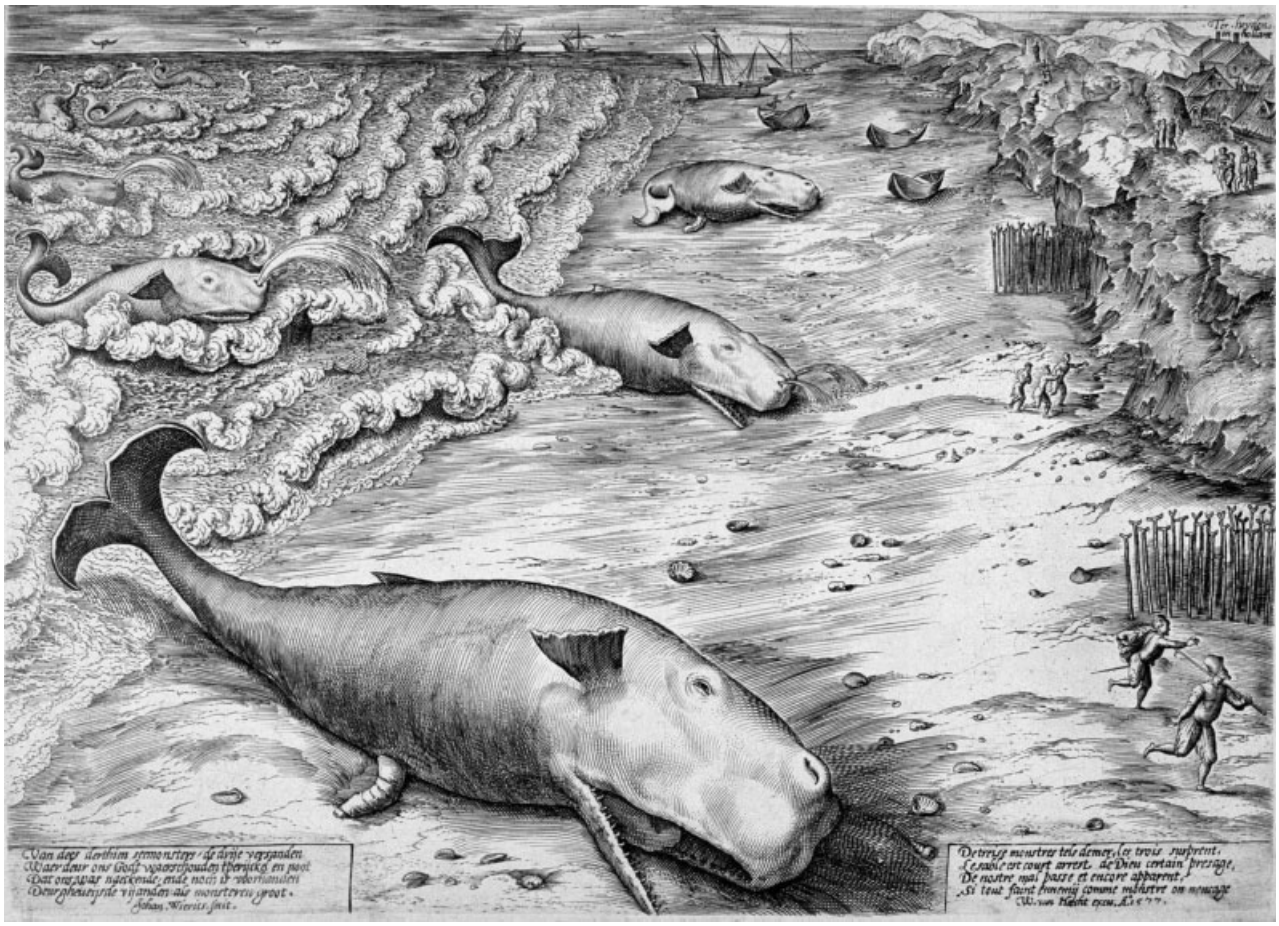

Figure 2. A strikingly realistic 1577 engraving by Johannes Wierix (Flemish, 1549–1615) portraying three stranded sperm whales (the middle one depicted while breathing). Ten other animals can be counted in nearby coastal waters. While the circumstances are similar to those of the mass stranding event that occurred in Italy in 2009, people on the beach are depicted running away. The caption on the left, in ancient Dutch, says: 'Three of these thirteen sea monsters are beached: in this way God warns us about the dangers and suffering that have come upon us and are still present because of the dissimulation of enemies great as monsters' (with reference to the ongoing war against the Spanish authority; Schama, 1987).

Moreover, until the 17th century and beyond, cetacean stranding events were sometimes viewed as divine messages and given moralistic and prophetic interpretations, often being considered as a bad omen and linked to all sorts of disasters and tragedies (Saenredam, 1602; Cohen, 1994; Szabo, 2005; Figure 2).

Response to sperm whale strandings: historical times

Live-strandings involving several sperm whales have been relatively rare in Adriatic waters, and before the event reported here only five cases, three of which along the Italian coast, are known to have occurred (Table 4). Individual live strandings, by contrast, have been relatively more frequent, with at least 14 cases between 1555 and 1984 (nine along the Italian coast; Table 4). Although commercial whaling never took place within the Mediterranean Sea (Notarbartolo di Sciara and Bearzi, 2002), the majority of sperm whales live-stranded in historical times were reportedly killed (Table 4).

Typically, the animals were seen as resources and used to extract oil. For instance, the stranding of a 14 m sperm whale near Ancona on 25 February 1601 was described as a 'great fortune' and the animal was promptly cut into pieces (engraving and caption, Barthelmess Whaling Collection ♯846; Parona, 1908). A large whale (unknown species, but reported as sperm whale) stranded near Rodi Garganico on 14 March 1774, described as 'horrendous sea monster', had oil extracted from the carcass as well as two bones (one vertebra and one rib), which were preserved at the Monastery of Santa Maria of Stignano and ascribed with magical properties and objects of pilgrimage (Fraccacreta, 1828; Tardio, 2006). Six sperm whales having approached the shore near Novigrad, Croatia, on 15 August 1853 were welcomed with great enthusiasm by the locals, who 'assaulted' the animals with guns, encircled them and prompted them to strand. The animals were roped and dragged ashore, where four of the largest (about 12 m long) were slaughtered and butchered to obtain blubber. Two juvenile whales were reportedly still alive while this happened (Parona, 1896).

In the 19th century live-stranded sperm whales were similarly killed and used as resources, their skeletal parts being preserved more systematically for scientific purposes or display (Table 4). A strikingly detailed 19th century report, among others, confirms that species of large cetaceans other than sperm whales were not given a different treatment. The report concerns a North Atlantic right whale *Eubalaena glacialis* – one of two records for the Mediterranean in 150 years – found moving slowly close to the coast near Taranto

Table 4. Cases of sperm whales stranded alive or coming close to shore, and human responses, reported for the Adriatic Sea between 1555 and 2009

Date	Location	Human response	Use as resource	Other use	*n* of animals	Source
1 June 1555	Piran, Slovenia	Killed	Spermaceti sold		1	Gesner, 1553* (http://tinyurl.com/yzu8sem), 1575; Kryštufek, 1991; Kryštufek and Lipej, 1985, 1993; Faust *et al.* 1999
29 July 1584	Ancona, Italy	Killed	Unknown		7 or 8	Anonymous manuscript of 16th century, Archivio di Stato of Ancona; hand-made watercolours (two tables) by Ulisse Aldrovandi (1522-1605), Biblioteca Universitaria of Bologna 'Fondo Ulisse Aldrovandi' 001-2, Animali (pp. 149–150, http://tinyurl.com/yconnc2)
10 or 18 April 1713	Pesaro, Italy	Killed	Unknown		1	Procaccini Ricci, 1825; Nardo, 1854; Cornalia, 1872 (reported date: 19 April 1713); De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896, 1908; Faust *et al.* 1999
18 April 1715	Pesaro, Italy	Killed	Oil extracted		1	Engraving by Domenico Franceschini; engraving by Bartolomeo Griffo; Ranzani, 1821; Nardo, 1854; Cornalia, 1872 (reported location: Gulf of Venice); De Sanctis, 1879 (two different strandings, reported locations: Pesaro and Gulf of Venice); De Marchesetti, 1882 (reported location: Gulf of Venice); Brusina, 1889; Trois, 1894 (reported location: Gulf of Venice); Parona, 1896, 1908; De Nicolò, 1999; Faust *et al.* 1999
About 1715	Ascoli Piceno, Italy	Killed	Unknown		1	Ranzani, 1821; Brusina, 1889; Parona, 1896
About 1750	Peleš, Rogoznica, Sibenik, Croatia	Killed	Oil extracted		1	Nardo, 1854; Cornalia, 1872; De Sanctis, 1879; De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896, 1908
27 November 1764	Rovinj, Croatia	Killed	Oil extracted		1	Griselini, 1765; Cornalia, 1872; De Sanctis, 1879; De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896, 1908; Kryštufek and Lipej, 1993; De Nicolò, 1999
31 January 1767	Turanj, Zadar, Croatia	Killed	Unknown	Skeletal parts preserved	1	Nardo, 1854; Ronconi, 1857; Cornalia, 1872; Kolombatović, 1882, 1885 (reported yr: 1867), 1894; Brusina, 1889; Trois, 1894; Parona, 1896, 1908; Langhoffer, 1917
8 June 1767 (reported by most authors as 1768)	Osteria Nova or Torrette, Fano, Italy	Killed	Oil extracted		1	Engraving and report by Giuseppe Benedetto Calvani (Faust *et al.*, 1999); canvas by Sebastiano Ceccarini, Civic Art Gallery of Fano; engraving by Giuseppe Ceccarini, Biblioteca Federiciana of Fano; Nardo, 1854; Cornalia, 1872; De Sanctis, 1879; De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896, 1908; De Nicolò, 1999; Faust *et al.* 1999
Early autumn 1775	Marotta, Senigallia, Italy	Killed	Unknown		1	Procaccini Ricci, 1825; Nardo, 1854; Cornalia, 1872; De Sanctis, 1879; De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896, 1908; De Nicolò, 1999
1791	Duino, Italy	Killed	Unknown		1	Nardo, 1854; Parona, 1896
1802, 1803 or 1805	Porto Sant'Elpidio, Civitanova Marche, Italy	Killed	Unknown	Skeletal parts preserved	3	Procaccini Ricci, 1825; Nardo, 1854; Cornalia, 1872; De Sanctis, 1879; De Marchesetti, 1882; Brusina, 1889; Trois, 1894; Parona, 1896; Franzoi, 1898 (reported date: 30 December 1802); Parona, 1908; Bolognari, 1949, 1950; De Nicolò, 1999 (includes copy of engraving reporting 30 December 1802)
15 August 1853	Novigrad, Croatia	Killed	Oil extracted	Skeletal parts preserved	6	Heckel, 1853; Nardo, 1854; Cornalia, 1872; De Sanctis, 1879; Brusina, 1885, 1889; Trois, 1894; Parona, 1896, 1908; Langhoffer, 1917; Kryštufek, 1991; Kryštufek and Lipej, 1993; De Nicolò, 1999
10 March 1874	Porto San Giorgio, Italy	No response	No	Skeletal parts and organs preserved	1	De Sanctis, 1879; Brusina, 1889 (date misreported as 10 September 1879); Trois, 1894; Parona, 1896, 1908
February 1919	Bay of Modrić, Jasenice, Croatia	Killed	No		1	Hirtz, 1921, 1922, 1929
12 April 1938	Marzocca, Senigallia, Italy	Some killed	Oil		7	Corriere Adriatico 13–14 April 1938; Istituto Luce, 1938a; Luca Celidoni, pers. commun.
4 April 1943	San Giuliano a Mare, Rimini, Italy	Killed	Soap, cosmetics	Skeletal parts preserved	1	Ghirardelli, 1944; Bolognari, 1949; Matteini, 1977
June 1956	Mounth of river Mat, Shengjin, Albania	No response	Unknown		8	Puzanov and Lamani, 1956; Hajderi, 1994
1 May 1984	Silvi Marina, Pescara, Italy	Rescue attempts	No		1	Il Messaggero d'Abruzzo 3-4-8-20 May 1984; Il Tempo d'Abruzzo 3 May 1984; Giaccio and Cichelli, 1984; Cagnolaro *et al.*, 1986
11 December 2009	Between Foce Varano and Capoiale, Italy	Rescue attempts	No	Skeletal parts preserved	7	This study; Bearzi *et al.*, in press

on the morning of 9 February 1877 (Gasco, 1878). The whale, occasionally referred to as 'sea monster', was shot several hundred times, as well as harpooned and repeatedly hit with explosives over four hours in an attempt to kill it. When the whale eventually stranded, it was roped and a pole 1 m long and 10 cm diameter was stuck into one of its blowholes. The other blowhole was deeply wounded with axes. The whale survived in these conditions until midnight. As the main concern of scientists and authorities was to recover the skeleton, fishermen were not allowed to cut off blubber and the whale was put on display to the general public, for a fee, until it became too decomposed. Eventually, the animal was dismembered for scientific purposes (its skeleton is mounted in the zoological museum of the University of Naples) as well as used to extract oil (Gasco, 1878).

Response to sperm whale strandings: 20th century

In the first half of the 20th century the behaviour towards large cetaceans stranded alive had not substantially changed. In the mass stranding of sperm whales that occurred on 12 April 1938 in Marzocca, near Ancona, animals that were still alive about 100 m from shore were harpooned, shot, and roped. Fishermen hid the penis of the largest male under a sheet, and made some income by showing it for a fee. The animals were then used to extract oil (Corriere Adriatico 13–14 April 1938; Luca Celidoni, pers. commun.). A 10 m male sperm whale was sighted in shallow waters about 100 m off the coast of San Giuliano a Mare, near Rimini, on 4 April 1943. After repeated and unsuccessful attempts to drag the animal ashore with ropes, the locals, frustrated by its forceful reactions, advocated the intervention of the army and the whale was machine-gunned. The blubber was used to extract oil and the skeleton is preserved at the Museum of Rimini (Ghirardelli, 1944; Bolognari, 1949; Matteini, 1977).

Behaviour towards sperm whales along the Adriatic Sea coast during this period did not differ from that shown in other parts of Italy. For instance, a 12 m sperm whale was reportedly captured 'casually' off Lipari in 1938. This animal, referred to as a 'monster', had still not died after being shot 12 times with guns (Istituto Luce, 1938b). The Italian zoologist Arturo Bolognari published a number of accounts of sperm whales killed off Sicily as they stranded alive or when seen in the waters adjacent to the Strait of Messina (Bolognari, 1949, 1950, 1951, 1957), although there was no reference as to how the animals were utilized. The carcasses were often left decomposing on the beach. Sperm whales were injured and killed by a variety of means: tied and dragged ashore, shot and injured by explosives (TNT) that local fishermen often carried on board and used in blast fishing. Presence of nursing calves was not seen as a reason for compassion, since calves were the first to be slaughtered (Bolognari, 1949, 1950, 1951, 1957).[1]

In the first half of the 20th century it was customary to pose for group or individual photos on top of dead sperm and other whales (Istituto Luce, 1938a and see Figure 3), an attitude that also can be seen in contemporary photos from North America. Individuals photographed on top of sperm whales in Italy were typically smiling or posing fiercely. One of several photos

Figure 3. A sperm whale stranded in Torrette near Fano, Italy, in 1936 (photo courtesy of Foto Eusebi, Fano). Posing on top of dead whales was customary in the first half of the 20th century.

portraying people posing on or near sperm whales following the Marzocca mass stranding (1938) portrays a young member of the Opera Nazionale Balilla, the Italian Fascist youth organisation, as he raises his right arm in the typical Fascist salutation while he stands on the back of one of the stranded sperm whales, which was still alive. The photo caption said (our translation from Italian): 'The sperm whale that can be seen semi-submerged (…) was still moving; however, a *balilla* climbed it defying the water spray that, from the nostrils, the now powerless cetacean threw with evident rage' (Corriere Adriatico 14 April 1938).

Articles and iconography from Italian magazines and newspapers published until the 1960s still portray large cetaceans as animals to be harassed and killed whenever possible and by all means, sometimes only to show bravery or be praised as those who defeated a beast (e.g. La Domenica del Corriere 19 March 1933 and 21 July 1961). In most of these documents there is still no expression of concern for the animals or the species, nor an understanding of their suffering. However, attitudes changed dramatically in the following years. On 1 May 1984, a 13 m male sperm whale stranded in Silvi Marina, near Pescara. The fisherman who first saw the animal managed to rescue him by towing him offshore, an operation that took 7 h to complete. The whale, closely monitored by the Coast Guard, travelled for several hours before stranding again in Ortona, 35 km away, later that day. The animal was in a critical condition and died within a few hours of stranding, and thus a second rescue attempt was not possible. This event generated considerable attention among the public and the media, with thousands of people reportedly flocking to see the animal during the first rescue. Hundreds of people as well as scientists hastened to Ortona when the whale stranded again. The animal was described as a 'nice' and 'intelligent' creature in local newspapers, one of which covered the story for over two weeks, expressing sadness for the death of this 'king of the seas' (Il Tempo d'Abruzzo 3 May 1984, Il Messaggero d'Abruzzo 3–20 May 1984).

[1]Arturo Bolognari himself, incidentally, questioned the idea that sperm whales were ferocious sea monsters and implacable enemies of man. In addition to noting that sperm whales were beautiful animals and 'a highly significant artwork of Nature', capable of altruistic behaviours, Bolognari (1957) even formulated a compelling wish that these animals – notwithstanding the ruthless hunting – may avoid extinction and rightfully keep thriving undisturbed throughout the world oceans.

Increasingly accurate information and portrayals of cetaceans have certainly been a factor in changing public appreciation and reducing fear and antipathy towards cetaceans, as partly documented in this study. Scientific knowledge informed this process through the discovery of whale songs (Payne and McVay, 1971), research into cognitive abilities (Marino, 2002), migratory patterns (Stone *et al.*, 1990) and several other aspects of cetacean behaviour (Holt, 1978). Inference of high levels of intelligence (Lilly, 1967) and attribution of supernatural abilities to dolphins and whales (Wyllie, 1993) have also influenced public perceptions. Televised documentaries started portraying whales as mostly peaceful and harmless, as well as highly evolved and intelligent. Appreciation was further enhanced by popular books and nature magazines showcasing awe-inspiring photos and articles featuring whales in their natural environment. Campaigns by animal rights movements and environmental organizations also played a role in increasing public and institutional awareness. As a consequence of these and other factors, rather than undergoing a progressive change, responses to the stranding of large cetaceans exhibited an extraordinary turnaround in the 1970/1980s, possibly promoted by a combination of increased awareness, decreased utilization of cetaceans as a resource, and the emergence of some level of 'biophilia' (Wilson, 1986). A combination of national and international pressures on the Italian Government also resulted in the legal protection of cetaceans in those years (Ministerial Decree of 21 May 1980).

Mass stranding of sperm whales in December 2009

Interviews were conducted while two of the sperm whale carcasses were being dismembered and the other carcasses where starting to decompose (Figure 4). This was a rather unpleasant or even horrific view that could be expected to elicit disgust among non-specialists, especially considering the smell of decomposing carcasses pervading the area. Nevertheless, bystanders mostly expressed feelings such as sadness or amazement, rather than revulsion, even when they were interviewed in the proximity of stinking dismembered carcasses. Compassionate feelings were expressed by almost 70% of the respondents, which when combined with statements that express a sense of powerlessness for being unable to rescue the animals, and amazement towards these creatures, tell a story of strong emotional involvement, as opposed to a fearful attitude. Disgust (probably related to decomposition and dismembering) and non-compassionate feelings, such as fatalism and a reported lack of emotional involvement, were expressed by a small minority of respondents.

Some limitations of the survey results must be acknowledged. Interviews targeted people who demonstrated interest in the stranding event, whatever that interest might have been. People who did not bother coming to the beach to witness the stranding might have felt differently from those who did, and might have different attitudes. While interest and coverage by the national media is also reflective of attitudinal change, the sample of 118 individuals attending a stranding should not be seen as representative of 'average' attitudes in Italy. The survey captured the opinions and perceptions of individuals on the beach during a mass stranding, which were compared with recent and historical information to infer changes occurred over time. Historical documents, however, may contain images and information reflective of factors other than the opinions and attitudes of individual people at a stranding site. For instance, those documents may be influenced by the views of the reporter

Figure 4. Four of the seven sperm whales stranded in southern Italy, as they appeared while interviews were under taken (13 December 2009). Two individuals were being dismembered, while the other five were at different phases of decomposition. Photos: Silvia Bonizzoni/Tethys Research Institute.

or engraver. Even considering these possible (and likely minor) biases, the extent of change emerging from the available information is remarkable (Table 4).

CONCLUSION

Considered as malicious monsters or consumer goods for centuries, whales in many countries have come to be seen as valuable components of the natural and national heritage, charismatic animals that elicit awe and compassion. This study calls attention to a transformation in public perception in Italy, which can positively influence support for conservation efforts. This work is also indicative of the value and potential of taking advantage of stranding events to perform social sciences surveys, as well as conduct impromptu education and outreach to increase public knowledge about marine mammals and their conservation.

Full appreciation of the extent of change in emotional and behavioural attitudes towards whale strandings can not only help modulate conservation efforts generally, but also assist in the design of response strategies to stranding events (Moore *et al*., 2007), whether or not such responses are consistent with public expectations. Understanding public attitudes can help direct government-driven management of live-stranding events, so that considered decisions can be made in regard to rescue attempts, the option of euthanasia, or the appropriate disposal of carcasses. Finally, assessment of public responses can help understand whether efforts by scientists and environmental organizations have been successful in communicating concern for the animals as well as the main threats affecting them and the most appropriate mitigation measures.

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