PROCEEDINGS OF THE ECS WORKSHOP

PROTECTION AND MANAGEMENT OF SOCIABLE, SOLITARY CETACEANS

Held at the
European Cetacean Society's 22nd Annual Conference,
Hotel Zuiderduin, Egmond aan Zee, The Netherlands, 9th March 2008

Editor:

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Front Cover: Solitary bottlenose dolphin, Dave © Terry Whittaker

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INTRODUCTION

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Solitary dolphins should not be considered an unusual phenomenon within the cetacean community or indeed amongst social mammalian species as a whole. Individuals of many cetacean species have been shown to exhibit a solitary lifestyle at least for some period. In some species, individuals may perhaps spend the majority of their lives in a solitary existence and only meet conspecifics when foraging or finding a mate. In other species this may only be a temporary state (Müller & Bossley, 2002). These latter individuals may become habituated to human presence to the point where they become what are known as 'sociable, solitary cetaceans'. As yet we do not understand why some individual cetaceans live a solitary lifestyle, or indeed whether the choice is their own.

The incidence of solitary cetaceans across the world has generated considerable public interest and resulted in many human-dolphin interactions. These have raised management issues in relation to welfare of the individual animals and the conservation of cetacean populations – and it would appear that records of solitary cetaceans are on the increase.

Solitary individuals have also been reported in orca (*Orcinus orca*), beluga (*Delphinapterus leucas*), common dolphins (*Delphinus delphis*), Risso's dolphins (*Grampus griseus*), spotted dolphins (*Stenella attenuata*), dusky dolphins (*Lagenorhynchus obscurus*), tucuxi (*Sotalia fluviatilas*), false killer whale (*Pseudorca crassidens*) and even a narwhal (*Monodon monoceros*). There are several possible explanations for the occurrence of solitary cetaceans, which could lead to both a temporary and/or permanent solitary state, including:

- Socio-ecological variables such as food availability, predator disturbance or reproductive strategies (Müller & Bossley, 2002).
- Loss of a mate or companion.
- Adverse environmental conditions, such as rough seas or bad weather resulting in individuals becoming separated from their group.
- The animals may be social outcasts, or have behavioural problems, or some physical constraint.

The bottlenose dolphin is perhaps the best species to consider when discussing the phenomenon of solitary dolphins. Not only is it the species most frequently reported as being a sociable, solitary dolphin, but this behaviour may in part be explained by the species' social organisation. Rather than matrilineal groupings, bottlenose dolphins have a fission-fusion society, i.e. one in which group membership is constantly changing. Pods (dolphin groups) can be identified through photo-identification (Hammond et al., 1990) and membership of the pod may not change from year to year. However, there are circumstances in which individuals form new associations and their relationships, along with their pod affiliation, may change. Changes in the group can be the result of a variety of environmental cues but may also be age- and sex-related, e.g. bachelor males reaching sexual maturity, mothers and calves, nursery groups, all female groupings etc. (Müller & Bossley, 2002). Thus a lone bottlenose dolphin is not necessarily a "solitary dolphin", rather it may have been observed when scouting for predators or for food, or it may be "between pods".

The process through which some solitary animals become habituated to human presence has been divided into four stages (Wilke *et al*., 2005; Wilke, 2007):

- Stage 1: The cetacean appears and remains in a new home range, usually one providing abundant and accessible prey. Initially, the individual explores its new range but will sometimes restrict itself to a smaller part of the range often <1km^2. Sometimes there is an exclusive rest area within its range, often a moored vessel or buoy. The cetacean may follow boats (usually fishing boats) or inspect fishing gear, but does not yet approach humans.
- Stage 2: The individual becomes habituated to the new range and may start to regularly follow boats. Local people becoming aware of its presence may attempt to swim with the animal. The individual may appear curious but remains at a distance from swimmers. It may also bow ride or inspect ropes, chains and buoys, etc.
- Stage 3: The individual becomes familiar with the presence of one or more persons who may have deliberately attempted to interact with it. At this stage, the cetacean interacts with only a limited number of people in the water. Human-cetacean interactions may include physical contact. Aerial behaviour of various kinds is common during this stage.
- Stage 4: The presence of the animal becomes widely known, often assisted by media exposure. It becomes a local celebrity and tourist attraction. During this stage, inappropriate human behaviour may provoke unwanted and possibly dangerous behaviour in the dolphin, including dominant, aggressive and sexual behaviours directed at humans.

Wilke (2007) also defined five levels of "sociability" that may exist within stages 3 and 4, of the habituation process:

- Level 1: Interactions only with boats during the whole period of sociability
- Level 2: Interactions with humans without ever allowing direct contact
- Level 3: Interactions with direct contact, often with a select few, preferred people
- Level 4: Non-selective direct contact, without socio-sexual and/or dominance behaviours
- Level 5: Non-selective direct contact, regular socio-sexual and dominance behaviour

Past experience with solitary cetaceans has demonstrated a clear need to consider implications for their welfare. Where a solitary cetacean appears to take up residence, either on a temporary or permanent basis there will be people who discover the animal by accident and, in time, once its whereabouts are known, those who seek it out. As an individual cetacean becomes habituated to humans, it loses its natural wariness, making it susceptible to abuse and/or disturbance. These interactions could also place humans at risk. Whilst many people engage and interact with solitary dolphins with no obvious detrimental effects, there are risks to both the cetacean and humans and such interactions are therefore of concern to relevant authorities.

In many contexts in which animal welfare is an issue, there may be a need for statutory legislation and a system in place to monitor compliance. Cetacean conservation and welfare is enshrined in various international directives and national laws. For example, CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) regulates international trade and CMS (the Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention) aims to conserve species throughout their range. Furthermore all cetaceans are listed under Annex IVa of the European Community's Habitats Directive (92/43/EEC), as species in need of strict protection. In the UK, this directive was transposed into UK law by the Conservation (Natural Habitats) Regulations 1994, which protects cetaceans from deliberate killing and capture. Killing, capturing and disturbance of cetaceans is also prohibited under the UK´s Wildlife and Countryside Act (1981) and Nature Conservation (Scotland) Act (2004). Similar national legislation occurs throughout Europe, nevertheless, the level of legal

protection afforded to wild cetaceans may vary widely between countries and enforcement also remains an issue. Often, larger-scale conservation issues such as mortality due to fishery by-catches attract most attention from statutory bodies, thus in the majority of cases, protective measures for solitary cetaceans have generally been put in place by concerned welfare and/or conservation groups and/or local communities.

A clear need was identified to bring together scientists, stakeholders and decision makers within the setting of the European Cetacean Society to share information and experiences and to identify common issues and recommendations.

In this special edition workshop report, summaries are provided for all of the talks given on the day, including a detailed examination of current protective legislation, with a brief discussion and recommendations arising given at the end. A comprehensive account of all known solitary cetaceans (to date) is provided in the Appendix.

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PUBLIC PERCEPTION OF SOLITARY CETACEANS

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INTRODUCTION Dolphins (and whales) appear to hold an inexplicable attraction for humans and, like many people, from a young age I have been fascinated by dolphins in particular. However, being a child of the 1950s the only experience and knowledge I had of these animals was via the television (e.g. Flipper) and also from marine parks. I had never seen a dolphin or whale in its natural habitat. , In 1990, I went to Dingle in County Kerry, Ireland which was, as still is, the home range of a solitary, social bottlenose dolphin (*Tursiops truncatus*), which the locals call Fungie. This was my first experience with a solitary, social dolphin and I have monitored and studied these solitary, social cetaceans where and when they appear, since that time.

Over the last decade however, I began to notice a change in public attitudes towards cetaceans and solitary, social cetaceans in particular, and this has resulted in investigating just why this is.

CONDITIONS SURROUNDING SOLITARY/SOCIAL CETACEANS In my experience reaction to these animals is varied and subject to many conditions such as locality and ease of public access. Also what must be considered is the animal itself, its' individual nature, age, familiarity with human contact, boats etc. All of these factors vary in each individual situation and must be taken into account when assessing any potential threats to the animal. What may prove problematic for a young, quiet-natured animal may not prove so for an older, more boisterous animal. Furthermore, an area where the public has ease of access to the animal may not prove problematic in itself, however, if the area in question has many clubs, pubs and other entertainment facilities, there is the possibility of irresponsible human actions and/or interactions, and this of course can be a problem. If the animal is frequenting a busy port or marina this can be a danger for the animal itself (with the increased potential for boat strikes/injury) and can also disrupt the normal course of business, proving difficult for the harbour master to control.

When these solitary, social animals appear, the local public can afford them a certain amount of protection simply by being vigilant in relation to any irresponsible interactions around the animal. Whilst this happens in some cases, in others the animal has no protection other than that afforded by a few local people concerned for its welfare, working alongside NGOs and, in many cases wildlife officers, from the local police force. But why has it become necessary to intervene to protect these animals? What has changed public attitude so that many people now appear to have no understanding or appreciation of the fact that these animals are social creatures, which for whatever reason, sometimes appear to apparently seek out human company for varying amounts of time? We must remember that they are also powerful, wild animals that deserve respect.

THE CAPTIVITY LINK An anthropomorphic representation of dolphins as friendly, intelligent animals makes them appealing to many people and this appeal has resulted in a growing public desire to touch or swim with these animals.

As public attitudes towards dolphins and whales confined in captivity has changed – people no longer want to see the old format of dolphins and whales jumping through hoops - the captivity industry has had to look for other ways to attract the public. Quick to attune themselves to this

change in attitude, this resulted in dolphins being housed more frequently in sea pens, which the public appear to find more aesthetically and ethically pleasing - believing this to be a better option for the dolphin than a pool, but captivity is captivity, whether confined by a wall or a net - the animals do not remain there voluntarily.

One of the major changes in recent years with regard to captive dolphins has been the growing popularity and promotion of 'swim-with-dolphin' (SWD) programmes. This is a multi-billion dollar industry, attracting more tourists worldwide year on year and this demand has resulted in a huge increase in commercial companies offering dolphin interactions and has augmented demand for more animals to stock these facilities – many of which are captured from the wild.

EDUCATION OR MIS-EDUCATION? Large organisations such as SeaWorld in the USA promote captivity as an ideal platform for public education about these marine mammals. However, most visitors to marine parks do not go to learn more about the animals or efforts being made to conserve the species, they go for entertainment or recreational purposes (HSUS, 2006). It could be argued that visitors learn about the animals regardless of whether this was their original intention. However, HSUS (2006) also exposed how visits to zoos and aquaria, and exposure to captive animals, may actually reduce people's concerns about the treatment of animals. The president of the Zoological Society of Philadelphia stated, in a welcoming speech to a conference on education, that: "*The surveys we have conducted show that the overwhelming majority of our visitors leave us without increasing either their knowledge of the natural world or their empathy for it. There are even times when I wonder if we don't make things worse by reinforcing the idea that man is only an observer of nature and not part of it*" (HSUS, 2006).

When confronted with social, solitary cetaceans some members of the public appear to be either unwilling or unable to differentiate between captive animals they see in marine parks or encounter in SWD programmes, to those living in the wild. It is therefore my belief that, far from providing a public educational service, captive facilities are guilty of mis-education and desensitisation of people's appreciation of wild cetaceans.

MARKETING OF DOLPHINS & WHALES BY TOUR OPERATORS, THE CAPTIVITY INDUSTRY AND MEDIA In 2003, the British Broadcasting Corporation (BBC) ran a poll on the top 50 things people wanted to experience in their lifetime and swimming with dolphins came top of that list. However, the reality of the 'experience' often disappoints, with many tourists reporting that the encounter was too staged, too short and too expensive. Post-purchase dissatisfaction focused on concerns about the size of enclosures and about, captivity of these sentient species in general. Further complaints included too many tricks, limited interpretation and unfulfilled expectations of a quality interaction (Curtin & Wilkes, 2007).

Many people would be further concerned to learn that the dolphins with which they are interacting may have been captured from the wild simply to interact with paying customers, so that tour operators and the captivity industry could threaten the future of wild populations by their actions. Although the main species usually held in captivity, the orca or killer whale (*Orcinus orca*) and the bottlenose dolphin are not currently listed as endangered, they are protected by some national and international legislation and agreements (notably the bottlenose dolphin in European waters) and we must ask ourselves whether their local or regional status could be threatened if takes from the wild continue to grow to meet demand.

Swimming with dolphins and other interaction programmes offer very attractive financial returns as it is a very lucrative business. Reports showed that in 1990 around 40,000 people paid to swim with captive dolphins (Frohoff & Packard, 1995). This has since increased hugely with SeaWorld attracting 11 million visitors in 2003 alone. This increase may be attributed largely to increased

marketing by the captivity industry, which directly feeds on public interest and fascination for these animals.

As long as large tour operators, such as TUI/Thomson, Virgin and others continue to sell excursions to their customers to visit facilities which house captive cetaceans rather than promote seeing them in their natural habitat they will present a growing threat to cetaceans.

During shows and SWDs the public learn very little about the species in the wild, threats to their welfare and efforts being made to conserve them. The behaviour of cetaceans in a captive environment bears little resemblance to that in the wild. By desensitising people to the animal in its wild state, facilities housing captive cetaceans and tour operators may be affecting how people react to solitary, social, wild cetaceans and reinforce the perception that they are there to provide entertainment. Ideally, operators should take greater responsibility for the information and general way in which they promote cetaceans to the public, by emphasising the differences between animals seen at their facility and their wild counterparts – for example, it has to be made clear to the public that the animals they are seeing in a SWD or marine park show are behaviourally very different from wild dolphins or whales, not least in relation to how they interact with people. Activities such as dorsal towing or kissing, which are permitted in captivity with trained animals, should not be confused with actions which are suitable around wild cetaceans.

SUMMARY The promotion of cetaceans as entertainment by the captivity industry, tour operators and the media poses a risk to wild cetaceans in general, in particular to the solitary, social individual cetaceans, which appear worldwide. It is very difficult to successfully address these issues with the general public when they are receiving conflicting messages from other sources.

As solitary, social cetaceans appear to be on the increase there is growing need for extensive public education and outreach on how to react around these wild animals, to ensure the welfare of the animals in question and that of the general public.

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CONSIDERING THE BEHAVIOUR AND MANAGEMENT HISTORY OF 'MARRA', A YOUNG FEMALE BOTTLENOSE DOLPHIN (*TURSIOPS TRUNATUS*) WHO FREQUENTED THE CUMBRIAN COAST IN 2006

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INTRODUCTION In 2006, there were at least four 'solitary-sociable' bottlenose dolphins (*Tursiops truncatus*) in the UK and two others on the nearby adjacent French coasts (Simmonds & Stansfield, 2007). These animals presented very significant challenges for those attempting to manage their welfare, including preventing habituation to humans and injury to the animal, warning the public of the dangers of swimming with dolphins without 'demonising' the animals, distributing educational messages, patrolling the area, and responding to public enquires and any reported abuse of the animal. By the end of 2006, two of them (including Marra) had been killed, almost certainly as a result of the dolphins' unusual behaviour and, by late 2007, another had received a significant injury, subsequently disappearing from her home range of 19 months, and presumed to be dead. This paper considers the time-line of behaviours of Marra (a Cumbrian term meaning 'friend') and also the time-line of actions taken by the UK's Marine Animal Rescue Coalition (MARC[1]) to protect her.

It should be noted that although termed 'solitary-sociable' dolphins, studies have shown that some of these animals continue to have contact with conspecifics to differing degrees. Furthermore, it is still not known why individuals leave their family groups to lead a 'solitary' life, however, what is evident is that the more human contact a newly solitary animal receives, the more likely it is to become habituated, losing its natural caution of human activities and therefore often coming to harm (Frohoff, 2006), as seen with Marra.

Documented cases of solitary dolphins being befriended by humans in various parts of the world display common patterns of behaviour over time. Wilke *et al*. (2005) described a sequence of stages (Table 1), which occur when solitary dolphins become sociable with humans. The stages range from a solitary but non-human-habituated dolphin through to a human-habituated sociable dolphin. Eisfeld *et al*. (in press) shows that this pattern of behaviour was also witnessed in another dolphin in the UK in 2007.

In some cases, development proceeds only to stage 2 or 3. Alternatively, some individuals arrive in new locations already partly or completely habituated to humans from previous experiences in other parts of their home range, or due to extensions of their previous home range.

MARRA'S HOME RANGE Throughout 2006, Marra's home range apparently extended from 1 to 100 metres from shore and was approximately 30km long (Workington to Silloth), reducing to approximately 10km during the later half of 2006 (mainly between Workington and Maryport). Maryport is a coastal town in the county of Cumbria, northwest UK, and is the southernmost town on the Solway Firth estuary. It was once a major industrial port but tourism is emerging as the main business today. The River Ellen runs through Maryport, where Victorian docks use 'lock gate' systems to maintain water levels at low tide. Workington is a slightly larger town, south of Maryport, and also at the mouth of a river. Silloth is a village north of Maryport.

[1] The Marine Animal Rescue Coalition is a forum, which includes organisations and individuals, mainly based in the UK, who specialise in marine animal protection, welfare and rescue.

Table 1: Stages of habituation (from Wilke *et al*., 2005)

Stage	Description
1	The dolphin first appears and remains in a new home range which is sometimes a very small and restricted area (often less than 1 km^2). It may follow boats, in most cases fishing boats, or inspect fishing gear, but does not yet approach humans.
2	The dolphin may regularly follow boats. Locals become aware of the dolphin's presence and attempt to swim with it. The dolphin appears curious, but keeps its distance from the swimmers.
3	The dolphin becomes familiar with the presence of a limited number of people who have deliberately attempted to habituate it. Interactions may include swimming in close proximity or diving side by side and the dolphin now allows itself to be touched and allows its dorsal fin to be held for swimmers to be pulled along.
4	The presence of the dolphin becomes widely known, often assisted by significant media exposure. Visitors from outside the local area come to see and swim with the dolphin; it soon becomes a major tourist attraction. Inappropriate human behaviour may provoke unwanted and even dangerous behaviour in the dolphin, including dominant, aggressive and sexual behaviours directed at humans.

BOTTLENOSE DOLPHIN SIGHTINGS IN THE SOLWAY FIRTH Anecdotal reports from local coastal users suggest that Marra may have been part of a small group of bottlenose dolphins seen regularly in the Solway Firth since the summer of 2005. Reports also suggest that these animals may have been provisioned by fishermen. It was also later discovered that Marra had net marks on her rostrum, further suggesting that she had been interacting with nets. An individual dolphin, with very distinctive dorsal fin markings, was also photographed, seemingly alone, in the Workington harbour area, of Cumbria, in the summer of 2005.

Little is understood about the whales and dolphins seen in this area. Apart from incidental sightings, there have been no systematic cetacean research or population studies in the Solway Firth. Bottlenose dolphin sightings and strandings have been confirmed in and around the area[^]. However, it is unclear if the animals mentioned above (~ 20 plus[*]) are part of a semi-resident population in the Solway and adjacent areas, or if bottlenose dolphins occasionally visit the area from elsewhere.

MARRA'S ENTRAPMENT In January 2006, an apparently lone bottlenose dolphin was reported in Maryport harbour, exploring the inner docks at each high tide and following small boats. She was named Marra, a young, female, bottlenose dolphin, which was not heavily marked. She had a fascination with boats and was seen inspecting buoys and fishing gear. Recreational fishermen were also spotted throwing fish to her. According to Wilke *et al*., (2005), Marra was already a stage 1 dolphin at this point.

Less than a week later, she followed a local recreational boat into Maryport's lock-operated marina, where she remained, despite many non-invasive efforts to lure her back out at high tide when the lock gates were down. The biggest concern to the rescue groups involved was the

[^] - accessed Feb 2009
http://www.seawatchfoundation.org.uk/docs/North-westEngland.pdf
http://www.naturalengland.org.uk/ourwork/campaigns/nwundersealandscape.aspx
http://www.seawatchfoundation.org.uk/docs/EvansAnderwald2005LiverpoolBay%20CetUpdate.pdf
Barbara Cheney, Aberdeen University (pers. comms., Feb 09)

[*] Incidental sightings from local marine users given to the author in 2006

deterioration in her health. Over the three weeks of her entrapment this included weight loss and a decline in skin condition. Threats included the increasing number of people that came to view her - risking their own and Marra's health and safety (some throwing items at/for her, including a report of children using catapults), pollution from fuel and anti-fouling spillages, freshwater run-off from the estuarine area and road surfaces, plus litter; and, as the temperature dropped, ice began to form on the edge of the marina.

A coalition of interested groups formed to monitor the situation and help to protect Marra. This included animal welfare and rescue groups, human rescue organisations, representatives from Maryport Marina PLC and the local aquarium. The coalition also liaised with the RSPCA and English Nature (now Natural England) throughout Marra's entrapment. Unfortunately, due to lack of resources, it proved impossible to involve the local Police Wildlife Liaison Officer, although the Police provided some support when requested.

Marra had become a media star and attempts to keep her out of the media proved impossible. Much of the work carried out over this period included dealing with press enquiries and reports, designing and distributing information posters, mailings to berth holders in the marina and local schools, plus specific press releases regarding basic information about dolphins. Although many of the local residents wanted the best for Marra, she was still at risk of accidental or deliberate harm and from further habituation.

Thankfully, on the 30 January, she was successfully rescued from the confines of the marina and released at sea, where, amazingly, another dolphin was spotted in the vicinity. They were observed to swim off together.

HABITUATING MARRA In April 2006, Marra was spotted and photo-identified, swimming close inshore between Maryport and Silloth. She was also seen following a boat into Silloth harbour. As soon as the boat moored up she swam away again. Reports that she followed boats and fed from fishing nets coincided with the net marks observed around her rostrum at the time of her rescue and later fresh marks seen on her dorsal fin. Marra was also seen in the harbour in the company of another dolphin. It was reported that people were still purposely searching her out to interact with her.

By May, Marra was spending the majority of her time in between Workington and Silloth – an area identified as her home range. With the prospect of other dolphins in the vicinity and reports of the continued attempts to feed and interact with her, the coalition decided to disseminate further educational material in the area. Given the rise in worldwide captive 'swim-with dolphin' programmes, the messages given out by dolphinaria, and general lack of understanding of wild dolphin behaviour, plus the dangers of habituation and harassment to wild animals, it was considered important that awareness-raising activities were undertaken in the area.

On 15 May, Marra stranded on a beach near Beckfoot (between Maryport and Silloth). She was very fortunate to be located and successfully re-floated by a team of local British Divers Marine Life Rescue Marine Mammal Medics and a Royal National Lifeboat Institution (RNLI) rescue crew. It was unclear why she stranded and so beach watches were set up following her successful rescue. It was also decided that the main contact (a dedicated watcher in Maryport) and other coastguard and local RNLI members should train as marine mammal medics, to be able to respond should it be necessary. In August, a weekend of courses, which included information on solitary dolphins, were held to encourage people to learn more about dolphins.

One issue that arose was the difficulty in identifying who had authority to deal with the public and animal welfare issues that arose. The help of the HM Coastguard was extremely useful; however,

this was mainly due to the personal interest and dedication of one of their local representatives. 'Marine Mammal Medics' are dedicated, unpaid, volunteers trained in the basic first aid and rescue of marine animals. However, arguably due to the lack of resources (or commitment/understanding) from those with any official power to stop wildlife harassment, the volunteers took on more of an education and policing role, which at times did create volatile moments between those wanting to protect Marra and those wishing to interact with her. Throughout the year, the coalition wrote to various local organisations including local tourism bodies, councillors, the Maritime and Coastguard Agency, Police, Fire Brigade, Sea Cadets and other marine users in the area to ask for their help in better protecting Marra. However, occasionally, members of some of the above groups actively sought to interact with Marra, aiding the habituation process. The response from the local MP via Allerdale Borough Council was positive but of no real help. The Council was supportive of the plans and offered to get the message out to the public but no assistance was received from tourism bodies in the area. The option of enacting a bye-law to further protect Marra was rejected by the Council as it was deemed that the Wildlife and Countryside Act, 1981, was sufficient for protecting dolphins in the area[2]. It was suggested that the problem lay with enforcing the current wildlife law.

Throughout the summer months of 2006, more people arrived in Maryport or Workington to swim with Marra. Over 30 people could be in the water with her at any one time, often grabbing and vying for her attention. As more people interacted with Marra, she became further habituated and steadily became more boisterous in the water with swimmers. In August, several coalition members witnessed Marra charging two women in the water, possibly because they were not swimming with her in the way she wanted. There were also several reports that Marra had butted people and had prevented a teenage girl from leaving the water - the girl subsequently had to be rescued by friends. In addition to the potential danger of swimming with a large interactive (but not tame) mammal, well adapted to its environment, some individuals, in their eagerness to interact with Marra, would jump into the water (or even hang their children over safety rails) without taking into account the local conditions, such as weather (winds), tides and mud-flats[3], thus placing themselves at further risk. This caused concern for various people including the managers of Maryport Marina and the Maritime and Coastguard Agency, due to the increase in workload by trying to manage people in terms of prevention of accident.

At its annual meeting, MARC decided to form a working group specifically to deal with the welfare of solitary dolphins. Marra herself had by this time suffered significant injuries, including a deep wound around her tailstock, possibly from rope entanglement. She also received many nicks and scratches - some more significant than others. Her behaviour was causing sufficient concern for local Marine Mammal Medics, on advice from a leading marine mammal vet, to call out a local vet who administered antibiotics due to the number of injuries she had sustained. By November, as the weather became more windy and colder and with fewer (if any) people in the water, sightings of her began to significantly decrease.

A dolphin body was discovered on a beach near Silloth on 12 December, and was confirmed to be Marra. A post-mortem by veterinarians at the Institute of Zoology in London showed that the ultimate cause of death was septicaemia caused by a bacterial infection (*Erysipelothrix rhusiopathiae*). Otherwise her body was reported as being in good condition, with a good blubber layer.

[2] Byelaws are for good rule and government of the whole or any part of a borough. However, the letter received from the council points out that central government guidance states that byelaws cannot be made for any purpose if provision is already made by existing legislation. This is apparently emphasised by a consultation document that was circulating at the time (on the future of byelaws and local authorities' powers in general).

[3] The local Maritime and Coastguard Agency were specially trained in mud rescue due to the nature of the mud-flats in the area.

Erysipelothrix rhusiopathiae is a zoonotic that usually enters its host through scratches or puncture wounds on the surface of the skin and is likely to be found in environments with faecal contamination. Thus Marra's habit of living close inshore in polluted waters, combined with the wounds she received, is likely to have facilitated the infection and ultimately her death.

Fig. 1: Marra interacting closely with canoeists.

Unfortunately, in this case, the provisions of the Wildlife and Countryside Act regarding disturbance of wild animals were not enforced. However, in April 2008, two people were found guilty of recklessly disturbing another solitary, sociable dolphin in Kent under the Wildlife and Countryside Act. This test case was the first of its kind in the UK and was bought to court by the Crown Prosecution Service, including video evidence of harassment. . It is hoped that this will set a precedent in future cases.

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MANAGEMENT OF A SOLITARY BOTTLENOSE DOLPHIN – TECHNIQUES DEPLOYED IN THE PROTECTION OF DAVE

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INTRODUCTION This paper details the management strategy used by local Marine Mammal Medics (MMM) in an effort to protect a solitary bottlenose dolphin (*Tursiops truncatus*) residing in Folkestone (Kent, UK) between April 2006 and November 2007. Although the majority of the monitoring was undertaken by MMM, this dolphin was scientifically monitored by a member of the Whale and Dolphin Conservation Society (WDCS) for a period of three months during 2007 (Eisfeld *et al.*, In Press).

British Divers Marine Life Rescue (BDMLR) is the UK's largest marine animal rescue organisation and has volunteers in all coastal counties of the UK. It is an entirely voluntary, non-profit charity, dedicated to marine animal rescue. BDMLR, relying on donations, run training courses around the country for people that want to become MMM and use the donations to purchase essential rescue equipment.

The UK has recently been the location of several bottlenose dolphins that seem to spend most or, in some cases, all of their time away from conspecifics and seek instead the company of humans. Eisfeld *et al.* (in press) have noted that these solitary sociable animals, "spend long periods of time in shallow waters, facilitating encounters with people, who swim with or touch them."

THE ARRIVAL OF DAVE The young, solitary female bottlenose dolphin known as Dave (she was originally thought to be a male) arrived on the southeast coast of the UK during April 2006, and was first sighted in Seaford, Sussex. During her stay, she was seen to progress through the four stages of habituation described by Wilke *et al.*, (2005). Although the management and fieldwork activities associated with this particular mammal were overseen by the Marine Animal Rescue Coalition (MARC), monitoring and public outreach was primarily provided by BDMLR medics and it is this aspect that is the focus of this paper.

Dave arrived in Folkestone on 5 May 2006, being clearly identifiable through photographs taken by BDMLR medics from Seaford as she had distinctive dorsal markings. Subsequently she tended to move between Folkestone and Seabrook, often stopping at Sandgate for a few days for the first few months. In these initial stages, Dave was seen to mostly inhabit the public swimming coves in Folkestone but was apparently not interested in boats, swimmers or kayakers. Medics were deployed on beach patrols and information regarding solitary dolphins was distributed to members of the public, along with photographs for children and posters, which were erected along the coast of her known home range. Between May to September 2006, Dave's home range extended about 8km and she appeared to have a favourite buoy in Seabrook where she would rest; this was 180m from the shore.

HABITUATION AND MANAGEMENT The initial proposals regarding the management of this dolphin by the local management team were that the less publicity received the better. Medics wore BDMLR t-shirts to be identifiable but not high visibility jackets. They would not actively engage the public unless questions were asked. Bearing in mind that Dave was in the early stages of habituation (following Wilke *et al.*, 2005), the risk to her was not thought to be great. During

the summer months, although there were many people swimming in the water and kayaking, Dave was not particularly interested in interacting with humans.

In August 2006, a full-scale emergency response was instigated as Dave was reported to have been caught in nets. There was full co-operation from HM Coastguard and the Royal National Lifeboat Institution who led the search for Dave with local medics and a veterinarian. Despite the alarm, Dave appeared safe and well and was observed playing with kelp. By the end of September 2006, medics were receiving reports of a rigid inflatable boat (RIB) chasing the dolphin. This boat was identified and medics visited the local club where the boat owner was a member to hand out leaflets and talk with boat owners in general. At the same time, there was a meeting of MARC, which local medics attended, and the coalition subsequently decided to set up a Solitary Dolphin Working Group as there were three solitary dolphins known to be present in UK waters at that time. The aim of the Working Group was to bring together all interested parties to discuss the welfare of the "solitaries" being reported. This was done through electronic mail and conference calls on a regular basis.

In September 2006, a local wildlife photographer reported that Dave had an eye problem as all close-up photographs taken showed that her eyes were shut. This was coupled with reports that she had lost weight. A RIB was deployed to check the dolphin, with MMMs, a vet and WDCS on board. Dave was pronounced fit and well at that point. During September 2006, it was noted by medics that Dave was approaching swimmers, kayaks and boats but due to rough seas and the onset of winter, this interaction diminished until spring 2007. Dave remained in her home range during this time and was regularly observed by medics.

It was agreed by MARC that a public meeting should be set up to raise public awareness regarding responsible behaviour around this marine mammal. This occurred in March 2007 and was well attended by the public, local councils, businesses and voluntary organisations. By this point and through the public meeting, medics became aware that there were a number of regular swimmers and kayakers who sought Dave out on a daily basis. However, medics were also aware that Dave's response to such people was erratic. It was impossible to recognise particular individuals as it was not feasible to arrange a 24h watch. A code of conduct was introduced at the public meeting and was subsequently distributed through posters and flyers, which medics handed out whenever on the beach. Between April and June 2007, a rise in watercraft in the vicinity was noted, and this posed problems for the local management team, as boats were able to launch from a number of sites along the coast, which limited the value of having a presence at any one launch site.

Another interesting dichotomy during this time was the active promotion of Dave on a website organised by a local resident who was later identified as being the same RIB operator who had been observed actively encouraging Dave to interact in September 2006. This person was identified selling merchandise online related to Dave and giving specific information regarding Dave's whereabouts, something which local medics had sought to keep out of the media. Various events and meetings were arranged around this time such as the Chamber of Commerce Group and stalls at local festivals. Whether it was because of the website or the surge in visitors to the beach, there was also an increased media presence which again presented opposing views as to the management of the situation surrounding the dolphin. Despite efforts to engage the hosts of the website with scientific views of the situation, the difference of opinion continued throughout the summer of 2007.

Fig. 1: Example poster displays erected along Dave's home range

On the 9 June 2007, two men were arrested and charged with reckless or intentional disturbance of Dave. Both men were ultimately found guilty of reckless disturbance, which gave a positive outcome to this landmark case. During July 2007, there were repeated reports of swimmers hanging off Dave's dorsal fin, rubbing her abdomen and of watercraft chasing her. She received a superficial propeller mark to her dorsal fin during this time. This was interspersed with incidences when she prevented swimmers/divers from exiting the water and in which she nudged people with her rostrum.

LOCAL CHALLENGES Ultimately, the team faced several challenges at a local level. Firstly there was a view that MMM were only able to interact with those who already understood and stood by the code of conduct. When others were engaged in conversation, it was evident that they had chosen to ignore all warnings as the experience of swimming with such a wild creature outweighed the consequences. Secondly, there was a need for a local and combined approach to the situation, co-ordinated between all agencies. This was not possible due to the conflicting demands between tourism and the boost to the economy as opposed to protection of a solitary, sociable dolphin. This meant that during August 2007, there was an obvious lack of any regulation or enforcement of the legislation regarding disturbance of cetaceans (see Figure 2).

Fig. 2: August, national holiday weekend – people turn out to see Dave.

Although the holiday crowds were exceptional, Dave was the centre of attraction, bringing in people from outside the county to see her. During September, medics noticed that Dave was increasing her home range and was not always as evident as she had been before. On the 15 October, news was received that Dave had suffered major damage to her tail fluke. Although this was thought originally to be due to a boat propeller, it is almost certain that it was due to an incident in which she was caught in a fishing line at Sandgate. Interestingly, the aforementioned website owner made his boat available to MMM and the vet so that antibiotics could be given and a fishing hook removed from her dorsal fin.

Fig. 3: Removing the fishing hook from Dave's dorsal fin.

CONCLUSION Dave appeared to be recovering well from her injuries and was increasing her home range once again but she disappeared on the 7 November 2007 and has not been positively identified since that time.

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SOLITARY DOLPHINS INTERACTING WITH HUMANS IN IRELAND

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INTRODUCTION Since 1984, there have been a number of well-documented solitary dolphins interacting with humans in Ireland. Some of these have been over extended periods while others were shorter-duration associations. All individuals involved were bottlenose dolphins (*Tursiops truncatus*). Presented here is a summary of these interactions and discussion of some management issues. Emphasis is on the interactions in County Clare since 2000 as the author has more experience of this occurrence than the others reported.

SPECIES, GENDER AND LOCATION All solitary dolphins reported interacting with humans in Ireland were bottlenose dolphins. Gender is evenly divided between male (n=3) and female (n=3) with four adults and two apparently sub-adults involved (Table 1).

Table 1: Sociable, solitary dolphins interacting with dolphins in Ireland

Name	Gender and Age	Location	First reported	Last reported
Fungi	Adult male	Dingle, Co. Kerry	Winter 1983	Still present
Dony	Sub-adult male	Dunquin, Co. Kerry	April 2001	Apparently now in the UK
Sandy	Adult female	Inisheer, Co. Galway	May 2001	Winter 2001
Dusty/ Fáinne	Sub-adult female	Doolin-Fanore-Spanish Point, Co. Clare	Summer 2000	Still present at Spanish Point
Venus	Adult, female	Ventry, Co. Kerry	May 2005	Spring 2006
Duggie	Adult, male	Tory Island, Co. Donegal	April 2006	Still present

All occurrences were along the western seaboard of Ireland from Co. Kerry to Co. Donegal however, there was a concentration in Co. Kerry (n=3, 50%). This could be a consequence of the Dingle dolphin (*Fungi*), which has attracted many people interested in sociable dolphins to live on the Dingle peninsular. An important step, which is required before dolphins can interact with humans, is for people to enter the water to swim and thus accommodate the dolphin to a human's presence (Lockyer, 1990). The relatively high number of people now living in West Kerry who have an interest in sociable dolphins may have acted as a catalyst to the relatively high number of these incidents in this location. We might expect that these people would be more likely to enter the water to swim with a wild dolphin than people living in other locations. The presence of these dolphins near centres of traditional Irish music (Dingle, Doolin, Tory Island) or the Irish language (Dingle, Ventry, Inisheer, Tory Island) is less easy to explain!

BEHAVIOUR OF SOLITARY DOLPHINS The Dingle dolphin (*Fungi*) has been observed in the mouth of Dingle harbour, Co. Kerry since winter 1983 (Mannion, 1998). This male dolphin was a mature adult when it was first observed (Holmes, 1987) and is still in the same area 24 years later making it the longest current sociable dolphin-human interaction in the world today. Despite its almost continued presence in a relatively small area there have been very few quantified studies of the dolphin (Holmes, 1987) and relatively few popular accounts published (Mannion, 1998). The Dingle dolphin has a high level of interaction with people, boats, kayaks, jet-skis and other marine equipment. He occurs in a relatively small area and has been observed

giving fish (especially dogfish and pollock) to swimmers. He has also presented salmon *Salmo salar* to swimmers but would not relinquish this species.

A small, heavily scarred male bottlenose dolphin (*Dony*) was reported off Dunquin on the Dingle peninsula, Co. Kerry, from April to July 2001. He was relatively small and had very strong interactions with humans. He seemed to avoid other bottlenose dolphins, which frequently occur in the area. *Dony* often displayed his penis during swimming sessions with humans and often swam towards someone, turned on his back and came up under them in an approximation of a mating position. He seemed to be more interested in females than male swimmers when there was a choice. *Dony* rarely breached out of the water.

A young female dolphin (*Dusty*) first interacted with people in Doolin, Co. Clare in the summer of 2000. By spring 2001 she had moved north to Fanore, where she was resident for nearly four years. Since 2005 she has appeared in a number of local bays in the vicinity for short periods. She interacted very strongly with swimmers very quickly after being habituated to humans. She will tow people along and allow swimmers to rub her blowhole and dorsal fin. She is interested in foreign objects, including cameras, diving gear, surfboards and often tries take these items from the swimmer. She rarely breaches out of the water. This dolphin has occasionally presented swimmers with fish.

An adult female bottlenose dolphin (*Sandy*) frequently approached divers off Inisheer in the Aran Islands, Co. Galway, biting their fins but has only rarely allowed swimmers to touch her. She was filmed breaching on top of a Great Northern Diver (*Gavia* sp.) a number of times with damaging consequences for the diver.

In addition to these dolphins, a number of other sociable dolphins have been reported associating with people in various locations, including off the Blasket Islands, Co. Kerry (*Venus*) and off Tory Island, Co. Donegal (*Duggie*). The latter dolphin consistently interacts with a labrador dog owner by a local hotelier.

AGGRESSIVE BEHAVIOUR There are few reports of aggressive interactions. *Dony* opened his mouth during interactions with swimmers and one person suffered a hole in his wetsuit as a result. *Sandy* off Inisheer butted a swimmer on the shoulder and legs around 10 times as the swimmer attempted to swim ashore.

The most consistent and serious aggressive interactions involve the dolphin in Co. Clare (*Dusty*). She has shown her teeth to swimmers but there are no reports of biting although she has snapped her jaws at people. She has also been reported swimming aggressively at people with her mouth open. *Dusty* has pinned swimmers to the seabed, similar to attacks reported elsewhere (Lockyer, 1990). Sometimes this behaviour was pre-empted by aggressive tail-slapping next to the swimmer. There are a number of reports of ramming, with one woman having her ribs cracked, and a German tourist suffered internal haemorrhaging resulting in admission to a local intensive care unit. *Dusty* was also observed 'terrorising' an otter (*Lutra lutra*) by grabbing it by the tail and dragging it out to sea each time it attempted to swim ashore. This behaviour was observed for 15 minutes.

SITE FIDELITY Most of the dolphins reported here have moved short distances during their interactions with humans. *Dusty* moved from Doolin to Fanore, Co. Clare (15km) after two summers in Doolin and then a further 30km south to Spanish Point, Co. Clare, after four years in Fanore. Venus moved from Ventry to the Blasket Islands, a distance of around 10km. The most remarkable movements are of *Dony* who travelled nearly 1000km from Dunquin, Co. Kerry to La Rochelle in France before travelling 600km north to southwest England and another 600km east to

Rotterdam, Netherlands (www.irishdolphins.com). Some of these reports may be of a different dolphin but there are photographs to support many of these sightings, which suggests a remarkable peregrination for an individual dolphin.

OPPORTUNITIES PRESENTED BY SOCIABLE DOLPHINS The presence of sociable dolphins presents opportunities for objective scientific research but these are rarely realised. Information on the ecology of dolphins including diet, home range and inter- and intra-specific interactions may be obtained. They also provide opportunities to record and quantify behaviour. Lesions on the dolphins may provide information on wound healing which is relevant to the efficacy of photo-identification techniques. Information on parasites and disease may also be available. For example, external lesions around the tail-stock and flank were observed on *Dusty* in Co. Clare in October 2007. These lesions increased from three to eight in five days and burst leaving white scar tissue. The chronic, ulcerative granulomas were similar to those reported in belugas and were thought to be a result of *Nocardia* infection. If so, the animal may well also have had internal abscessation especially in the thoracic cavity.

Rarely are these research opportunities exploited, mainly due to concerns regarding the longevity of the interactions, thus compromising planning (including obtaining funding), and also concern regarding the 'normality' of the behaviour recorded. These interactions should be documented as thoroughly as possible to improve our understanding of the causes and consequences of interactions between cetaceans and humans.

MANAGEMENT ISSUES Most of these sociable dolphins have not resulted in any management issues. The extent of the dolphin-watching industry built around *Fungi* in Dingle harbour resulted in restrictions by the Dingle Harbour Authority on the number of boats permitted to use the harbour for this activity. A pontoon was constructed away from the berths which were allocated to fishing vessels to facilitate the dolphin-watching boats that operate a taxi-rank system, with each boat taking its turn to approach the pontoon to board passengers. An estimated 150-200,000 people visited Fungi annually on commercial vessels from the late 1980s (Hoyt, 2001) resulting in a huge income to Dingle town. Associated industries such as accommodation and dolphin memorabilia have also added to the economic impact of this single, sociable dolphin to the area.

PUBLIC MEETINGS In Co. Clare concerns were expressed by the Local Authority Water Safety Officer who was worried that the areas in which people were swimming with the dolphin were not designated bathing beaches and were dangerous for swimming. Some beaches in Co. Clare are characterised by strong currents and under-tows and lifeguards are stationed at designated swimming beaches to ensure water safety.

A public meeting was hosted by the Irish Whale and Dolphin Group (IWDG) in Doolin in September 2000, in an attempt to empower the local community to take "ownership" of the dolphin and mitigate against potential problems associated with large numbers of swimmers and observers visiting the dolphin. Some local residents wished the dolphin to leave the area but acknowledged that, as it was difficult to prevent people swimming with the dolphin, management should be considered to ensure safety to people, property and the dolphin. It was suggested that an area should be cordoned off for swimmers to prevent boat access, accompanied with guidelines displayed locally to inform people of the water safety issues and the correct procedures when swimming with wild dolphins. These could be promoted by local dolphin wardens. A Local Action Committee was established with representatives of the Local Authorities Heritage Office, National Parks and Wildlife Service (NPWS) and the IWDG as well as local residents and the Doolin Cliff Rescue. That winter the dolphin moved to Fanore and a similar public meeting was held in June 2001 in this locality in an attempt to empower the local community.

CODES OF CONDUCT Following the public meeting in Doolin the NPWS, which is the competent state body for the conservation of wild animals drafted guidelines, which included:

1. Dolphins are wild animals and deserve respect. Over-familiarisation with humans is detrimental to their long-term interest.
2. Do not swim with, manhandle or otherwise interfere with this truly wild species of animal
3. If in a boat do not approach or pursue but let it approach you. Maintain a steady course at a low rate of knots (3-4 knots)
4. Bottlenose dolphin is a protected species under Irish and EU legislation.
5. If you see anyone disturbing or interfering with dolphins contact NPWS.

NPWS Conservation Rangers visited the area and discussed the dolphin with local landowners and boat people. They confirmed they would prosecute anybody shown to be wilfully interfering with the dolphin. Similar guidelines were drafted for Fanore, which included:

1. Do not hang on her in particular to avoid touching her dorsal fin, which is a very sensitive area.
2. Do not attempt to feed her

During 2001, the situation in Fanore deteriorated quickly, with access to local residences blocked by cars, visitors witnessed urinating outside private houses, and damage to local property. However, as one local landowner had encouraged these visitors through courting national publicity it was hard to discourage the large number of people visiting the local area. The number of parked cars resulted in grid-lock at this important emergency access point on a number of occasions. An attempt to construct an access point and charge a "Dolphin Toll" by the aforementioned land-owner was not successful and local lifeguards sent to advise people not to swim in the area were verbally abused. This led to the local superintendent of An Garda Síochána (police) hosting a private meeting in April 2002 to discuss management options. The superintendent and the Water Safety Officer requested that the dolphin was removed from the area to prevent serious injury or death. This coincided with a similar attempt to translocate *George* (formerly *Dony*) from the Weymouth/Portland area of Devon, England following concerns about the dolphin's safety. This recommendation was resisted by IWDG and NPWS who requested the local authority to erect signs and provide appropriate advice.

RECOMMENDATIONS The IWDG policy is to discourage people from swimming with all wild cetaceans due to the risk to the animal(s), but also the risk to the swimmer. A review of sociable dolphins worldwide by Samuels *et al*. (2000) showed that around 80% of these incidents result in serious injury or death to the dolphin as a direct consequence of interacting with humans.

A joint international campaign should be implemented to strongly discourage people from swimming with wild cetaceans. However, in the short-term the issue is not going to go away, so a more pragmatic approach is required. An exploration of the legal framework for managing sociable cetaceans is required including identifying the competent authorities for managing and conserving cetaceans in these situations. This should include the role of Harbour and Local Authorities. A working definition of 'wilful interference' is required. On a local scale, consideration of dolphin wardens enforcing codes of conduct and guidelines may be effective providing they have the relevant authority.

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VAGRANT SOCIABLE MONODONTIDS IN NEWFOUNDLAND AND LABRADOR, CANADA

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SOLITARY MONODONTIDS Although the province of Newfoundland and Labrador (Atlantic Canada) is not considered to be part of the regular range of the beluga (*Delphinapterus leucas*) (COSEWIC 2004), solitary individuals are reported in this area in the summer months of almost every year (Kinsman *et al*., 2001; Kinsman and Frohoff 2003). Within the last decade, more than ten belugas and one narwhal (*Monodon monoceros*) have been reported in nearshore waters throughout the province (Fig.1). These rates are comparable to those reported by Curren and Lien (1998).

These animals were all juveniles or sub adults and almost always solitary, suggesting that they had lost their natal pods (one case involved three animals found several miles upriver in southern Labrador, one of which returned to the southwest coast of Newfoundland the following year). The stock identity of these whales is presently unknown, but historical assessments of contaminant loads in similar cases identified the various populations in the High Arctic as the most likely source (Béland *et al*., 1992). The present pattern of sightings is comparable to that described by Curren and Lien (1998), indicating that most belugas are likely to be Arctic in origin, although some may have originated from the small resident population in the gulf of St. Lawrence (Kingsley, 2002). Scar pattern analysis has allowed the identification of individuals, and has shown that some belugas have returned to Newfoundland waters for up to three consecutive years.

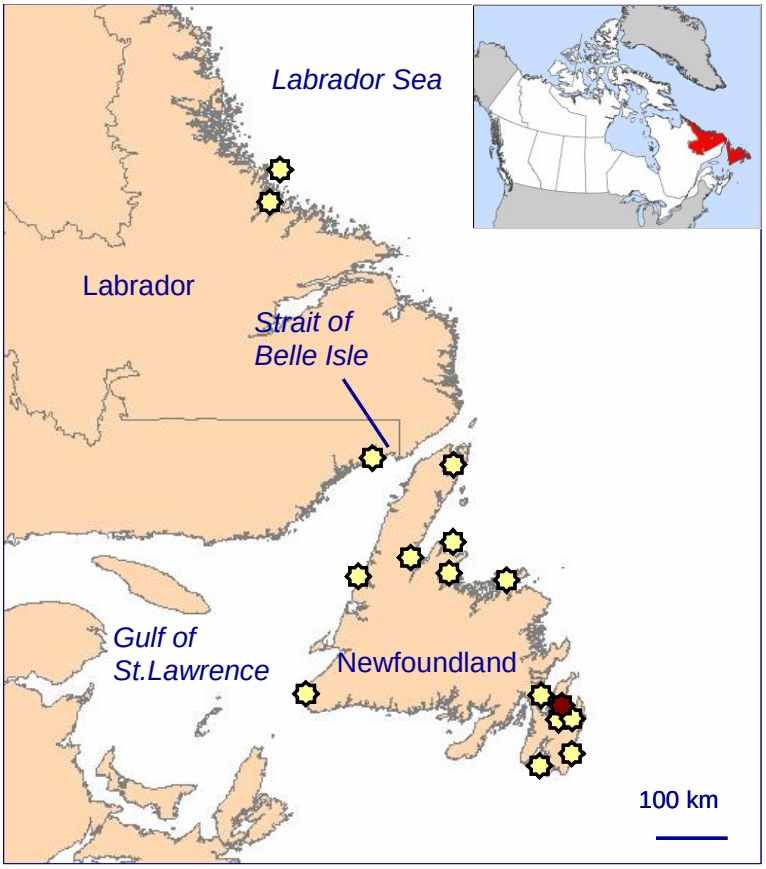

Fig. 1: Distribution of sightings of solitary belugas (yellow stars) and the single solitary narwhal (brown star) in Newfoundland and Labrador between 1998 and 2007.

Most animals appeared to remain in comparatively shallow, nearshore waters during their visit to Newfoundland. Residency patterns varied, with some animals remaining in an area for weeks or months, while others repeatedly moved along the coast. In 2003, a juvenile male narwhal was reported resident in a bay in south-eastern Newfoundland near a grounded iceberg, where it remained until the iceberg had mostly melted.

BEHAVIOUR AND INTERACTIONS Most of these animals exhibited an interest in interacting with humans to varying degrees (Wilke *et al*., 2005; Wilke 2007). Following the scale developed by Wilke et al. (2005), the entire range of habituation towards humans was observed among these belugas: Stage 1 (taking up residence near humans, and foraging around docks and inside harbours; Fig. 2), Stage 2 (mainly following and interacting with vessels), and in several cases Stage 3 or even 4 (allowing people to swim with them, and/or interacting with local scuba divers on a regular basis). Interactions with boats often took the form of rubbing parts of the body against the keel of stationary boats, as well as following boats out of or into the harbour. Some individuals remained resident near a community for weeks on end, becoming well known among the local population.

Fig. 2: Solitary juvenile beluga foraging around a harbour entrance in south-eastern Newfoundland. Copyright DFO, 2002.

Several individuals appeared fixated on ship engines, closely inspecting them and mimicking bubbles produced through cavitation when engines were running. Some whales were accidentally injured (in one case, killed) after being struck by propeller blades, despite typically widespread awareness amongst vessel operators of the whales' presence near their communities.

PUBLICITY Where historically the presence of a sociable beluga in a small fishing community might not become widely known, modern communication methods and an increased interest in marine mammals among the general public often ensure that the animal becomes an unexpected tourist attraction to the community soon after its discovery. In fact, this may in some cases be actively encouraged by local tourism operators and media outlets (e.g. Hempsall, 2003). Generally speaking, the current public perception is that these animals are tame and approachable. This, together with the enormous geographic scale (29,000 km of coastline) and thinly spread human population of Newfoundland and Labrador, as well as a lack of resources within the Department of Fisheries and Oceans (the responsible authority), provide a considerable challenge to formulating a successful policy to ensure both the survival and well-being of these animals and public safety.

PROTECTION Although harassment of marine mammals is illegal in Canada under the Marine Mammal Regulations of the Fisheries Act (Anonymous, 1993), a lack of resources and manpower among Fisheries Officers (the responsible enforcement agency operating under the Department of Fisheries and Oceans) may prevent adequate enforcement of these regulations.

In addition, there appears to be a general lack of appreciation for the risks that may be involved in interacting with these animals, particularly in the water. To date, nobody is known to have been injured as a result of these interactions. However, several belugas have been injured or killed as a result of their interacting with ship engines (see above). There are presently no requirements to fit outboard engines with propeller guards to prevent such injuries, and introducing such a measure would be expensive (and would likely generate opposition as a consequence) given the large number of small vessels operating in the province.

The situation in Newfoundland and Labrador highlights the difficulties encountered in trying to manage interactions between sociable cetaceans and members of the public in a rural setting. There is a need for improved public awareness about the hazards of interaction to both humans and whales. This could be achieved through expanding existing education programmes together with improving enforcement of existing regulations.

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SAVING LUNA

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I wanted to talk to you a little bit about the experience my wife Suzanne and I had with the solitary sociable orca that people called Luna, who lived in Nootka Sound, British Columbia, from July, 2001 until March, 2006. When we came to Nootka Sound the prevailing wisdom was that human beings were a danger to Luna, so people and Luna should be kept apart. Some of that philosophy came from Toni Frohoff's work.

> ***Toni Frohoff***[4]
> *"You see in the media a lot of the really beautiful aspects. That's the light side of it. But there is a very, very dark side. The dark side is the human side."*

To us Toni's work is critical to understanding this phenomenon.

> ***Toni Frohoff***
> *"In the long term, our research has shown that the more interaction dolphins and whales have with people, the more likely they are to suffer injury and death."*

Shortly after Luna first got there, a stewardship program was put in place. People with great sincerity and enthusiasm came to try to make it work.

> ***Louise Murgatroyd****, Marine Mammal Monitoring (off camera)*
> *"Hey guys! It's an offence under the Fisheries Act to touch this whale."*
>
> ***Unidentified man in boat***
> *"He came to us."*
>
> ***Louise Murgatroyd***
> *"Yeah, but you stopped and you actually came right out in the middle of the area. There has been a lot of public attention on this whale, it's up to a $100,000 fine under the Fisheries Act to disturb the animal."*
>
> ***Michael Parfit***
> *"The young women were idealistic, sincere, and determined."*
>
> ***Louise Murgatroyd***
> *"Please don't touch it!"*
>
> ***Michael Parfit***
> *"They had no actual law enforcement authority, but they sounded strict. And they changed the atmosphere on Nootka Sound. Suddenly, people who stopped in Mooyah Bay were told they were breaking the law. And Luna was an enthusiastic accomplice."*

[4] Italics are parts of the dialogue from the film "Saving Luna", that was shown during the workshop.

Louise Murgatroyd
"Folks, this is not a watchable whale. OK, I need you to exit the area. Watching this whale or interacting with this whale can be subject to a $100,000 fine under the Fisheries Act. This whale is not watchable. Just do not stop in this area altogether."

Unknown voice
"OK."

Louise Murgatroyd
"Watching can be considered disturbance under the Fisheries Act. Gradually increase speed."

Michelle Kehler, ***Meghan Hanrahan***, ***Erin Hobbs***, ***Louise Murgatroyd*** *(Marine Mammal Monitoring; all off camera)*
"*Get out of here at high speed."*
"Try and keep your speed up."

"High speed out of here. Increase your speed! Keep your speed up! Thank you! Faster! Don't slow down. Just increase your speed slowly"

The stewards worked hard, but Luna just wouldn't leave people alone. So the stewards ended up interacting with him. They believed that interaction was wrong but they had to interact with him in order to keep him from other interactions. People were very frustrated.

Michelle Kehler
"It would just rip your heart out. I don't want to be making your life miserable, but I know this isn't good for you. Or at least I think it's not, because what do we know? I don't know that we know that."

Kari Koski
"I mean, he is really persistent, and he tries lots and lots of things, and he is extremely charming!... You might know what is right, and what you think is right, and what you think you're going to do…"

Kristy Zeidner *(v.o.)*
"Here he comes. He likes my bracelet, sometimes, which is kind of…"

Kari Koski
"And then you get yourself in that situation with him there, and I think it's really tough. I think It's asking people too much, to restrict themselves, because people are dying for that kind of interaction."

Kristy Zeidner
"Oops, I'm not supposed to touch you, sweetie."

Kari Koski
"Oh, we were in a terrible situation. We weren't enforcement. He was intentionally going over and interacting with people when they weren't doing anything to entice him. We were supposed to be, doing what? It was pretty obvious from the get-go that this was not going to be a sustainable means of trying to prevent types of interactions. Because all we were doing was interacting with him in order to prevent more interactions."

The story of Luna is very complicated. After he had been there for a couple of years, the Department of Fisheries and Oceans decided to pick him up and move him, but the move was opposed by the Mowachaht/Muchalaht First Nations. The First Nations' members believed that Luna was a reincarnated chief and that the Department of Fisheries and Oceans' main objective in capturing him was to send him to an aquarium.

The band succeeded in preventing the move from occurring and, after that, Luna was basically left alone in Nootka Sound. The Department gave the First Nations a permit to try the same kind of stewardship that hadn't worked well during previous summers – to try to keep Luna and people apart. By now, however, Suzanne and I had seen enough to know this was impossible.

One of the really unfortunate pieces of the puzzle in this case was that when you had a very active education and stewardship program in place, people who cared about Luna accepted the information and said "*OK we'll stay away from him*." So you had all these people who cared about Luna staying away while other people, who didn't care as much or who actively disliked him or who were afraid of him, interacted with him because he was so determined to make contact. So the stewardship had almost the opposite effect from what it was supposed to have. The idea was that you could improve his chances of surviving by having the stewardship, but in fact you were reducing the chances because you were forcing him to interact with the kind of people who weren't good for him.

We saw this and wondered what we could do. Luna was not going to be stopped from interacting with people. However, Toni Frohoff's studies also showed that, in addition to the fact that the human-whale relationship is a troubled one, almost all the relationships people had with whales - with solitary sociables - were the same kinds of relationships people had with Luna. These relationships were chaotic and totally inconsistent – like Luna, these animals were loved one day, and shunned the next. No wonder these relationships failed.

Suzanne and I came to the conclusion that, if you wanted Luna to survive there were three points to consider:

A. You couldn't stop him from making contact with people.
B. Toni's work showed that chaotic, careless relationships led to injury and death.
C. Therefore, if you wanted to protect Luna the only choice appeared to be to take the chaos and carelessness out of the relationship, and in Luna's case that meant creating a program to actively engage him.

> ***Michael Parfit***
> *"It was like everything on this planet that we love and damage. We humans were a danger to Luna and we knew it. So we could either give up on Luna and ourselves, and let the worst of what we are bring tragedy, or we could find our best. As always we had the choice. Jamie had proved that if you gave Luna consistent interaction, he'd stay out of trouble. So Suzanne and I asked the department for a permit to work with Jamie and scientists and the public, to keep Luna safe with friendship."*

The next step for us was to give him what he needed, or at least what he appeared to need. And that was consistent, non-chaotic connection to people. We use the word friendship because it is a term humans know. As far as I am concerned it is a metaphor for something that he was looking for that we could recognise but not fully understand.

Something like this is not cheap. You have to have a boat on the water all the time. And you have to have people there. To do this you simply have to fund it with the public. We figured it would have to be based on a sort of Earth Watch kind of model, where people would buy into this for a

period of time, maybe for a week at a time. They would get some instruction, would get some education, they would get some cultural background from the First Nations, and they would pay.

You'd have some scholarships so people who couldn't afford it but were passionate about the animal could help. But in general people would pay for the privilege.

It would have to be a non-profit organisation. You could not privatise Luna. That would be terrible. But you could have a non-profit organisation. People love these animals. People will pay to help an animal survive. And to us the only way for these animals to make it, in a situation in which they are stuck and they insist on making contact with people, is for people to figure out a safe, consistent, real way of giving them what they appear to be trying very hard to get.

We ended up trying to protect Luna by being near him most of the time. We tried to prevent people from shooting him. We tried to prevent him from getting into a situation in which he would have been harmed. We were out on the water a lot. But we had to leave for four days in March, 2006. And during those four days he was killed by a tug.

Luna was a great life. He just came to humans for what we call friendship. That was all he needed.

And we killed him.

It didn't have to happen.

SOLITARY CETACEANS: A UNIQUE CASE FOR PROTECTIVE LEGISLATION

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INTRODUCTION Solitary cetaceans are unique and as such they present a number of distinctive situations and varying needs for protection. Whilst there are many theories behind the existence of the solitary cetacean it is recognised that the solitary state may be either temporary or permanent (Lockyer & Müller, 2003). Whilst some solitaries are not known to interact with other dolphins, others have been reported with fresh teeth rake marks on their skin, demonstrating recent interactions with conspecifics. At times this interaction with their own kind is thought to potentially result in their reintegration into dolphin society whereas on other occasions it may potentially only be a temporary engagement.

POTENTIAL THREATS As solitary individuals may in many cases interact on a more frequent basis with humans, boats etc., than other cetaceans, this altered state could result in more than one aspect of the behavioural repertoire altered, regardless of whether such changes are short or long-term and thus compromised (Morton & Griffiths, 1985).

For solitary individuals there are two behavioural states, which are crucial to the well-being of the animal: resting and feeding. Should either of these states be disrupted it is likely that the health and well-being of the animal will be reduced accordingly, placing them at greater risk from other threats. Indeed those exhibiting the highest degree of interaction are at the greatest risk of injury, illness and even death (Frohoff, 2003) from any of the potential threats listed below:

- Human disturbance, misconduct and harassment.
- Vessel-based disturbance, misconduct, harassment or accidental injury
- Fishing interactions. A direct threat from entanglement in fishing gear but also retaliation by fishermen who have had gear damaged, moved or altered by solitary individuals
- Anthropogenic impacts, such as pollution i.e. oil spillage, disposal of wastes or through underwater explosive work being conducted in the area without mitigating for the solitary cetacean in question (Müller et al, 1998)
- Disease transfer from humans to dolphins.

It must be remembered that even the most well-intentioned interactions with cetaceans initiated by humans are accompanied by unpredictable impacts/risks to the animals, some of which may be cumulative, long-term and life threatening (Frohoff, 2003). There are also risks to humans. A cetacean that appears healthy may carry parasites and diseases that can be passed onto humans e.g. *Brucella*. The more obvious risk is injury. Although rare, this may range from minor scratches to being badly bitten. In two separate incidents in the USA swimmers were taken to hospital for treatment of wounds to the hands and feet, some of which required stitches. In what, to date is an isolated incident a bottlenose dolphin in Brazil is known to have killed one swimmer and injured 29 others, when the attention from humans escalated to harassment (Santos, 1997). Lockyer and Morris (1986) have suggested that in situations where the cetacean is constantly surrounded by people, thereby disrupting crucial feeding and resting periods, the cetaceans temperament may become unstable.

Whilst these incidents may appear alarming, they have arisen from irresponsible interactions and a lack of respect for the cetacean, which remains a wild and extremely powerful animal. This highlights the need for precautionary management and protection legislation to regulate situations surrounding solitary cetaceans to ensure that incidents like that described above are not repeated.

CURRENT LEGISLATIVE PROTECTION Despite, what may appear to be comprehensive, worldwide, coverage of protective legislation, solitary cetaceans create unique problems, which in many cases are not adequately addressed by current legislation.

At an international level there are many laws, directives and agreements which aim to protect marine mammals from harm, including CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) and CMS (the Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention).

CITES is an international agreement between governments and aims to ensure that international trade in specimens of wild animals (and plants) does not threaten their survival. Whilst CITES is an agreement to which countries adhere to voluntarily, CITES is legally binding. It does not, however, replace National laws, rather Ministers and officials can be guided by it in forming National legislation. Twenty-one species of cetacean are currently listed across Appendices I and II of the agreement.

By contrast CMS is wider ranging, aiming to conserve terrestrial, marine and avian migratory species throughout their range. Under the United Nations Environment Programme, CMS was created out of concern for the conservation of wildlife and habitats on a global scale. Since the convention's entry into force, its membership has grown steadily, and as of 2008, includes 109 Parties from Africa, Central and South America, Asia, Europe and Oceania. Appendices I and II cover migratory species threatened with extinction and those that need or would significantly benefit from international co-operation, respectively. A unique detail of the convention is the development of models customised according to the conservation's needs throughout the migratory range. Agreements for cetaceans concluded to date under the auspices of CMS, include:

- Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area, (ACCOBAMS).
- Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS).

Both of these agreements discuss action required and draft management plans accordingly. Action may be instigated through advice from the agreements themselves, or in localised regions, may be taken forward by individual and/or groups of Parties. Often action is required at a European level and this can be harder to achieve.

In the European Union, other relevant instruments include the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), the Common Fisheries Policy and Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (better known as the Habitats & Wild Birds Directive). The latter aims to "*promote the maintenance of biodiversity requiring Member States to take measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species of European importance*".

In the UK the Habitats Directive has been transposed into national law by means of the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended), and the Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995 (as amended). Under the

Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007 it is an offence under regulation 39(1) to deliberately capture, injure, kill or disturb a European Protected Species (EPS). The amended Regulations make it potentially more difficult to protect the solitary cetacean, as, whilst the bottlenose dolphin, the most frequently occurring solitary cetacean is classified as a EPS, "*activities that cause low level deliberate disturbance that may be considered unlikely to have the effects covered by the Directive can continue within the law*". This does not consider the cumulative impact of recurrent low level disturbance events, and even if it did, the solitary dolphin may be considered such a minor effect on the survival, distribution or abundance of the species as a whole that disturbing a solitary dolphin is not considered an offence within the Regulations.

The UK Wildlife & Countryside Act 1981 consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive) in Great Britain. It is complimented by the Wildlife & Countryside Act 1985 and the Conservation (Natural Habitats & c.) Regulations (as amended above). The 1981 Act makes it "*an offence (subject to exclusions) to intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places*". This provides the legal basis to prosecute for disturbance or injury to a solitary dolphin. However, since the focus is on 'intentional' disturbance it has been notoriously difficult to prosecute. The law was amended in 2000, when the Countryside & Rights of Way Act received Royal Assent. Schedule 12 of the Act amends the Wildlife & Countryside Act 1981, strengthening the legal protection for threatened species. The provisions make certain offences 'arrestable', "*create a new offence of reckless disturbance, confer greater powers to police and wildlife inspectors for entering and obtaining wildlife tissue samples for DNA analysis and enable heavier penalties on conviction of wildlife offences*".

A second amendment, the Nature Conservation (Scotland) Act 2004, enables Scottish Ministers to make a "*Nature Conservation Order to protect a nature conservation feature which is of special interest, or which is contiguous with land containing such a feature, to ensure its protection. The Act also makes it an offence to intentionally or recklessly disturb a dolphin, whale (cetacean) or basking shark*".

The UK Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 fulfil the UK's duty to comply with European law (Habitats & Wild Birds Directive) beyond 12 nautical miles, but within British fishery limits (up to 200 nautical miles). The Regulations protect marine species and wild birds by forbidding certain environmentally damaging activities, for example, "*deliberately killing or significantly disturbing a protected species (such as dolphins) in the offshore area*". However, solitary dolphins (at least those that have been documented) tend to occupy coastal regions and inshore environments not covered by this piece of protective legislation.

It could be argued that solitary dolphins in the UK should be protected under the Animal Welfare Act 2006. However, this Act excludes wild animals and does not apply to the sea. Where irresponsible actions arising from interactions with solitary cetaceans occur, the impact on the welfare of the individual animal is the primary issue, but as the law currently stands in the UK, the Wildlife & Countryside Act 1981, the Countryside & Rights of Way Bill 2000 and elements of the Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007 represent the only legal basis to protect solitary cetaceans from harm and it has proved difficult to apply them in practice.

In the last two years we have seen the UK Government commit to providing a ground-breaking piece of legislation, The Marine Bill, which will deliver the Government's vision for "*clean*

healthy, safe, productive and biologically diverse oceans and seas". It aims to put in place a better system for delivering sustainable development of the marine and coastal environment and to address both the use and protection of our marine resources. There has been extensive public consultation on the Marine Bill but it is not likely to provide additional protection for cetaceans, as this is deemed adequate under the Wildlife & Countryside Act 1981, Countryside & Rights of Way Bill 2000 and the Conservation (Natural Habitats, & c.) (Amendment) Regulations 2007. Solitary cetaceans are even less likely to be given any extra protection under this new piece of legislation, although it is possible that secondary legislation will in the long-term provide mechanisms to protect them.

In other parts of the world, cetaceans have been offered protection separate to that for other marine species and habitats, being recognised through targeted legislation for marine mammals. This exists in the United States, Australia and New Zealand.

In the USA, under the Marine Mammal Protection Act, 1978 a person commits on offence if he/she "*a) except under the authority of enactment, places or leaves any structure or trap or chemical or other substance in any place where a marine mammal is or is likely to be and which injures or harms, or is likely to injure or harm, any marine mammal; b) uses any vehicle, vessel, aircraft, or hovercraft to herd or harass any marine mammal*". In addition to this, the Governor-General may, "*from time to time by Order in Council, make such regulations as the Governor-General in Council thinks necessary or expedient for the protection, conservation, or management of any marine mammal. Any regulations under this section may confer on the Minister or on the Director-General power to issue, in such a manner as may be prescribed, instructions, orders, requirements, permits, authorities, or notices for the purpose of ensuring that protection, management, or conservation of any marine mammal and, where the regulations so provide, any such instruction, order, requirement, permit, authority, or notice shall have effect according to its tenor and shall be complied with by all persons affected by it*". The Act was amended in 1994 to defined the term harassment as "*any act of pursuit, torment or annoyance which, a) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment), or b) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioural patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding or sheltering (Level B harassment)*".

In Australia, the National Parks & Wildlife Act 1974 makes it an offence to "*approach a marine mammal any closer than such distance as may be prescribed by the regulations or interfere with a marine mammal*". Additionally "*a reference in section 112F, 120, 129, 132C, 132D or 171 to harming any fauna includes, so far as is applicable in relation to a marine mammal, approaching or interfering with the marine mammal as referred to in subsection (1). In this section, "interfere with" includes harass, chase, herd, tag, mark and brand*". Further to this the Environment Protection and Biodiversity Conservation Act 1999 offers a permit system for regulating activities around cetaceans in the Commonwealth marine area (3-200 nautical miles from the coast). Any action that is likely to have a significant impact on the Commonwealth marine area requires approval, through a rigorous environmental assessment. Additionally, all interactions between people and cetaceans are required to be notified to the department within seven days. Two-tier national guidelines were developed in 2005 to regulate whale and dolphin watching activities. Tier 1 relates to general standards for protecting cetaceans and apply to all people, whereas Tier 2 relates to commercial operations that may require alternative levels of management.

New Zealand also offers cetaceans a system of targeted and focussed protective legislation, designed to deal with mobile species living in the marine realm. The Marine Mammal Protection Regulations 1992 (SR 1992/322) (as at 03 September 2007) not only aims to regulate whale and dolphin watching operations through a rigorous permit system, but also applies special conditions

to watching both whales and dolphins. Before a permit is issued the Director-General should be satisfied that there is substantial compliance with a number of criteria, including "*that the commercial operation should not have any significant adverse effect on the behavioural patterns of the marine mammals to which the application refers*". The permits themselves provide limits on the (minimum) distance any persons in the water are allowed to be from a cetacean (100m for whales, 200m for any female baleen or sperm whale accompanied by a calf or calves, no swimming with dolphins where juveniles are present), and limits for the vessels/aircraft also. Where two or more vessels or aircraft approach an unaccompanied individual or group the masters and pilots should co-ordinate their approaches to minimise disturbance. No vessel should approach within 50m of a whale or 300m of a dolphin group. Stipulations are also made on manoeuvring in the vicinity of cetaceans and on appropriate actions to prevent disturbance. It is an offence to disturb or harass any marine mammal. Furthermore, the "*Director-General may at any time suspend or revoke any permit, or restrict the operation authorised by any permit, where the holder – a) is convicted of any offence against the Act or is convicted under any other Act of any offence involving mistreatment of animals*". The Director-General may also "*suspend, revoke, restrict or amend permits where they believe on reasonable grounds that it is necessary for the protection, conservation or management of any marine mammal or marine mammals of any class*".

CONCLUSION Despite what may seem comprehensive protection for cetaceans, to date, in the majority of cases the protective measures introduced for solitary cetaceans have been voluntary, often enacted by concerned welfare and/or conservation groups and/or local people. More recently however (April, 2008), the UK Wildlife and Countryside Act was used successfully to bring about the prosecution of two individuals charged with disturbing a solitary dolphin, known as 'Dave' on the south coast of the UK. This test case was a breakthrough for protection of cetaceans as a whole in the UK, and will hopefully be upheld in future to demonstrate the legislative power, which can protect these vulnerable individuals.

Often it is the local liaison groups, conservation and welfare NGOs who provide educational, managerial and/or patrolling roles to protect solitary cetaceans. There is a limit to which any of these groups can go, however, especially when not supported by appropriate legislation and enforcement. Incidents may not be followed up either due to the lack of legal protection in the first place, or to the unwieldy and time consuming process required to bring about a prosecution.

The first step towards better protection for solitary cetaceans is better use of existing legislation to protect these individuals. Furthermore legislation (within the UK) could be improved by the creation of new measures such as emergency stop orders, byelaw making powers and fixed penalty notices issued for disturbance events, whether impacting on the favourable conservation status of the species, or having a negative impact on the solitary individual. These measures, would act as a deterrent, if properly enforced, and could support the education programmes put in place by local groups, offering manageable solutions to the problems which sometimes arise when solitary cetaceans appear.

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DISCUSSION AND RECOMMENDATIONS

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Following the presentations there was a general discussion of the challenges facing those involved in protecting solitary cetaceans and a number of actions were suggested. This section represents discussion on the day, rather than an agreed set of actions. It should be considered a *work in progress* since the actions are likely to be refined as further discussion, incorporating a wider audience, takes place. Furthermore, these actions should not be considered as *replacing* adequate legislative protection; rather the legislation is needed to support appropriate actions of local management groups. This should not be counter-productive to measures to protect cetaceans as a whole, rather it requires joined up thinking by managers and governments to ensure that the legislation has the ability to protect these individuals on welfare grounds as and when needed.

At the outset there are a number of management options, the suitability of which will depend on the sex, age and personality of the cetacean. The physical characteristics of the area, and the opportunities for human-dolphin interaction in the area in which the cetacean has established its range (Wilke *et al*., 2005), will also play a role in management. It has been suggested that a management plan is essential as soon as a cetacean progresses to stage 3 of habituation; however, the process should have been started before the cetacean has reached that stage. Ideally, suitable management of the situation should prevent further habituation and provide the opportunity for the individual to re-integrate with its conspecifics.

MANAGEMENT OPTIONS A successful management plan for sociable solitary cetaceans might well seek to achieve the following goals:

1. Minimise human interaction, to allow more opportunity for re-integration with conspecifics.
2. Establish a working group, committee or other forum to engage all stakeholders (public, fishermen, boat owners, water sports clubs and local businesses).
3. Devise a set of guidelines and rules to ensure cetacean welfare.
4. Devise a public education programme, including distribution of leaflets, pamphlets, posters, notice boards, public talks, etc.
5. If appropriate, nominate an exclusive guardian.
6. If appropriate, consider excluding swimmers, vessels and other potential stressors from particular areas using marker buoys, to permit the cetacean important feeding and resting areas. (NB. This is only possible where the home range is small.)
7. Undertake a full research and monitoring programme in order to document changes in the cetacean and/or situation.
8. Where required and practically feasible, render veterinary assistance to the cetacean, e.g. through removal of foreign objects such as fish hooks, assisting in disentanglements from fishing gear, administering antibiotics in response to injury, etc.
9. Work with local authorities, responsible government departments and regulatory agencies to enforce existing protective legislation, where available.

AREA AND HUMAN CONSIDERATIONS If a cetacean takes up residence in a busy port or harbour, the activities of both the animal and keen watchers may impede daily business. Similarly, if the cetacean moves into a heavily fished area, it may be at greater risk from

entanglement, and in-depth discussion of the situation with local fishermen may be required to reach a mutually beneficial outcome. In these cases management extends beyond those individuals directly interacting with the cetacean to include a greater number of people and institutions (e.g., government, business, law enforcement).

In cases where access to the cetacean is not restricted, human management guidelines to supplement those above may also need to be considered. Any one or more of the following procedures may be necessary, depending on the circumstances of each case:

1. Restriction on the number of swimmers/people in the water, as too many people can disrupt the animal's behavioural patterns, potentially eliciting a negative response (e.g. aggression towards swimmer, preventing swimmers leaving the water, pushing them further out to sea, etc.).
2. Restriction on the number of vessels and marine craft in the area.
3. Restriction on the type of boats, i.e. no high-speed or planning hulled vessels.
4. An understanding of dolphin etiquette may be required, i.e. describe the importance of no-touch areas such as blowhole, eyes, and genital areas.
5. A ban on feeding the cetacean should also be implemented.

As with the restriction on the number of vessels in the area, it may also be necessary to extend the educational programme to other users of the marine environment, by advising local clubs, groups and/or private owners to take into consideration the animal when on the water. The only such course in the UK, which currently offers guidance on responsible actions around solitary cetaceans is the WiSe scheme (www.wisescheme.org.uk).

The WiSe scheme has been set up to deliver training and accreditation for boat owners who wish to view marine wildlife responsibly. Nearly 500 operators/marine professionals have been trained to date. All WiSe-accredited operators have to have attended and passed a course designed to ensure they have an understanding of how to approach marine wildlife, and how to minimise any disturbance to those animals. All operators have, additionally, agreed to abide by appropriate Codes of Conduct to ensure that their operations are safe and sustainable.

FURTHER RECOMMENDATIONS It is important that a precautionary approach is taken to the protection and (where needed) management of solitary cetaceans. Management programmes should be comprehensive and well thought out, including education, monitoring, applied research and enforcement, supported by legislation.

With increasing numbers of solitary cetaceans being recorded worldwide there is a clear requirement for protective legislation to apply to solitary cetaceans where needed. This should include consideration of both short- and long-term measures that are both meaningful and enforceable for both solitary individuals and cetaceans as a whole. Such measures should include (applicable to the UK, however, equivalents should be sought elsewhere):

- Emergency STOP orders.
- Increased and streamlined byelaw making powers.
- Fixed penalty notices on acts of disturbance/misconduct.
- Recognised temporary, closed areas to fishing, boats and swimmers.
- Structured, strategic legislative protection for cetaceans.
- Adequate long-term resources should be allocated for successful enforcement of the above measures.

The management options described above should be implemented for every solitary cetacean, as appropriate, while remaining mindful of local circumstances that may favour particular approaches over others. Where there is no central organisation dedicated to the management of marine mammals, these tasks should be initiated and co-ordinated by researchers, NGOs and welfare organisations working in the field. For these to be truly effective however, it is important that they are supported by the short- and long-term legislative recommendations made above, along with appropriate enforcement.

REFERENCES

Wilke M., Bossley, M. and Doak, W. 2005. Managing Human Interactions with Solitary Dolphins. *Aquatic Mammals* 31(4): 427-433.

Workshop Programme

PROTECTION AND MANAGEMENT OF SOCIABLE, SOLITARY CETACEANS

13:00	Registration
13:15	Welcome and Introductions

PRESENTATIONS

13:20	Introduction to Solitary Dolphins & Public Perception *Margaux Dodds, Marine Connection*
13:35	The behaviour and management history regarding Marra, a young female bottlenose dolphin *Laura Stansfield, Whale and Dolphin Conservation Society*
13:50	Management of a Solitary Bottlenose Dolphin - techniques deployed in the protection of Dave *Alex Levine, British Divers Marine Life Rescue*
14:05	Solitary dolphins interacting with humans in Ireland *Dr Simon Berrow, Irish Whale and Dolphin Group*
14:20	Film Footage: The Dolphins' Gift
14:35	Vagrant sociable monodontids in Newfoundland and Labrador, Canada *Dr Steven Benjamins, Joint Nature Conservation Committee*
15:50	Film Footage: Saving Luna
15:05	Break
15:35	Solitary Cetaceans: A unique case for protective legislation *Dr Lissa Goodwin, Marine Connection*
15:50	General Discussion
16:50	Summary
17:00	Close

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APPENDIX

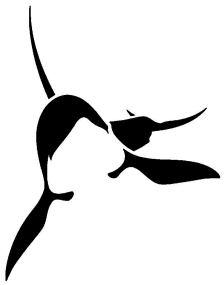
Table 1: All solitary cetaceans known, to date, 2008

No.	From	To	Name	Species	Sex	Location	Country	Current Status
1	109AD		Simo	?	?	Hippo	Tunisia	Dead
2	109AD		Simo's partner	?	?	Hippo	Tunisia	Dead
3	1814		Gabriel	Bottlenose dolphin	M	Stoke	UK	Dead
4	1888	1912	Pelorus Jack	Risso's dolphin	M	Cook Strait	New Zealand	Presumed dead
5	1953		Fish	Bottlenose dolphin	F		South Africa	Unknown
6	1953		Hoek	Bottlenose dolphin	F		South Africa	Unknown
7	1954	1955	Opo (Goldie/Dorrie)	Bottlenose dolphin	F	Hokianaa Harbour	New Zealand	Presumed dead
8	1955	1965	Carolina Snowball (Peaches)	Bottlenose dolphin	F	South Carolina	USA	Dead
9	1960	1967	Charlie	Bottlenose dolphin	F	Eyemouth, Scotland	UK	Unknown
10	1961	1962	Wallis (Wally)	Bottlenose dolphin	?		Australia	Unknown
11	1965		Nudgy	Bottlenose dolphin	M	Powell Lake, Florida	USA	Unknown
12	1970		Georgy Girl	Bottlenose dolphin	F	Florida	USA	Unknown
13	1972		Nina	Bottlenose dolphin	F	La Corogna	Spain	Dead
14	1972	1978	Donald (Beaky)	Bottlenose dolphin	M	Wales & Cornwall	UK	Unknown
15	1975		Dolly	Bottlenose dolphin	F	Florida Keys	Florida	Unknown
16	1975	1989	Big Momma	Bottlenose dolphin	M	Adelaide	Australia	Dead
17	1976	1978	Sandy	Spotted dolphin	M	San Salvador Island	Bahamas	Unknown
18	1976	1988	Jean-Louis	Bottlenose dolphin	F	Brittany	France	Unknown
19	1978		Elsa	Common dolphin	F	Ngunguru River	New Zealand	Presumed dead
20	1978	1979	Horace	Bottlenose dolphin	M	Hawkes Bay	New Zealand	Unknown
21	1979		Dobbie	Bottlenose dolphin	M	Eilat	Israel	Dead
22	1980		Bella	Beluga whale	F	New York	USA	Unknown
23	1980	to date	Jojo	Bottlenose dolphin	M	Providenciales	Turks & Caicos	In Turks & Caicos
24	1980	1985	Whitianga	Common dolphin	F	Whitianga	New Zealand	Unknown
25	1980	1985	Nicky	Common dolphin	F	Whitianga	New Zealand	Unknown
26	1981	1985	Percy	Bottlenose dolphin	M	Portreath, Cornwall	UK	Unknown
27	1982		Elsa	Orca	F	Provincetown, Cape Cod	USA	Unknown

No.	From	To	Name	Species	Sex	Location	Country	Current Status
28	1982	1983	Indah	Bottlenose dolphin	M	Kent Islands	Australia	Unknown
29		1983	The Costa Rican	Bottlenose dolphin	M	Chira Island	Costa Rico	Dead
30	1984		Rampal	Common dolphin	M	Whitianga	New Zealand	Unknown
31	1984		Tammy	Dusky dolphin	M	Auckland	New Zealand	Unknown
32	1984	to date	Fungie	Bottlenose dolphin	M	Dingle Bay	Ireland	In Ireland
33	1984	1985/6	Simo	Bottlenose dolphin	M	Solva, Wales	UK	Unknown
34	1985		Romeo	Bottlenose dolphin	M	Bay of Naples	Italy	Unknown
35	1985		BW	Beluga whale	F	New York	USA	Presumed dead
36	1987	1992	Freddie	Bottlenose dolphin	M	Amble, Northumberland	UK	Unknown
37	1987	1994	Fanny	Bottlenose dolphin	F	Marseille	France	Unknown
38	1987	1994	Marine	Bottlenose dolphin	F	Marseille	France	Unknown
39	1987	1995	Aihe	Bottlenose dolphin	F		New Zealand	Left area, unknown
40	1988		Billy	Bottlenose dolphin	M	Adelaide	Australia	Unknown
41	1988		Herbie	?	?		Bahamas	Unknown
42	1988		Un-named	?	?		Spain	Unknown
43	1988		Joca	Bottlenose dolphin	F		Montenegro	Unknown
44	1988	1993	Zero Three (Jock/Jacques)	Bottlenose dolphin	M	Adelaide	Australia	Dead
45	1988	1994	Pita (Sugar)	Bottlenose dolphin	F	Lighthouse Reef	Belize	Unknown
46	1989	1990	Jack	Bottlenose dolphin	M	Port Underwood, South Island	New Zealand	Left area, unknown
47	1989	1995	Dolphy (Dolly)	Bottlenose dolphin	F	Coiloure	France	Unknown
48	1989	2001	Françoise	Bottlenose dolphin	F	Arcachon	France	Dead
49	1990		Beggar (Dolphin 56)	Bottlenose dolphin	M	Sarasota	Florida	Unknown
50	1991		Jotsa	Bottlenose dolphin	F		former Yugoslavia	Unknown
51	1991	2002	Flipper	Bottlenose dolphin	M	Skudenshavn	Norway	Unknown
52	1992		Crispy	Bottlenose dolphin	M	Eilat	Israel	Unknown
53	1992	1992	Siany	Bottlenose dolphin	F	Bay of Islands	New Zealand	Left area, unknown
54	1992	1997	Maui (Woody)	Bottlenose dolphin	F	South Island	New Zealand	Unknown
55	1993	1999	Wilma	Beluga whale	F	Nova Scotia	Canada	Unknown
56	1993	2000	Elvis (aka Foster, Willy)	False killer whale	F?	Vancouver, British Columbia	Canada	Unknown
57	1994		Tião	Bottlenose dolphin	M	Sao Sebastião	Brazil	Unknown
58	1994	2004	Olin (Uleen/Holly)	Indo-Pacific Bottlenose	F	Sinai	Egypt	Dead

No.	From	To	Name	Species	Sex	Location	Country	Current Status
59	1995		Koko	Bottlenose dolphin	F	Toshima	Japan	Unknown
60	1995		Piko	Bottlenose dolphin	?	Toshima	Japan	Unknown
61	1995	1996	Kodo	Bottlenose dolphin	M	Ashdod & Ashkelon	Israel	Unknown
62	1995	1996	Scar	Bottlenose dolphin	M	Doubtful Sound	New Zealand	Dead
63	1997		Viola	Tucuxi	M?	Sao Vicente County	Brazil	Unknown
64	1998		Filippo	Bottlenose dolphin	M	Masfredonia	Italy	Unknown
65	1998		Un-named	Beluga whale	F	Chevery, Quebec	Canada	Unknown
66	1998	2005	Flint (Paquito)	Bottlenose dolphin	M	San Sebastian	Spain	Dead
67	1999		Kuus	Beluga whale	M	Newfoundland	Canada	Unknown
68	2000	to date	Dusty (Marra, Clare dolphin)	Bottlenose dolphin	F	Doolin	Ireland	In Ireland
69	2000	2002	Lenni	Beluga whale	F	Newfoundland	Canada	Unknown
70	2001	to date	Georges (Dony / Randy)	Bottlenose dolphin	M	Ireland, South England	UK, France, Belgium, Holland	In Brittany, France
71	2001	2002	Charlie-Bubbles	Beluga whale	F	Newfoundland	Canada	Dead
72	2001	2002	Echo (Casper)	Beluga whale	M	Newfoundland	Canada	Unknown
73	2001	2003	Sandy (Aran)	Bottlenose dolphin	F	Inisheer	Ireland	Unknown
74	2001	2006	Luna	Orca	M	Nootka Sound, Vancouver	Canada	Dead
75	2002	2004	Josephine	Bottlenose dolphin	F	French Polynesia	France	Left area, unknown
76	2002	to date	Springer	Orca	F	Seattle, Vancouver	USA, Canada	Reunited with pod
77	2003		Ce'Sea	Beluga whale	F	Newfoundland	Canada	Unknown
78	2003		Un-named	Beluga whale	?	Mingan Is, Quebec	Canada	Unknown
79	2003		Nar Billy	Narwhal	M	Conception Bay, Newfoundland	Canada	Unknown
80	2003	to date	Jean Floc'h	Bottlenose dolphin	M	Brittany	France	In Brittany
81	2004		Poco (Helis)	Beluga whale	?	Gloucester, Massachusetts	USA	Dead
82	2004	2005	Maurice	Bottlenose dolphin	?	Brandon, North Kerry	Ireland	Unknown
83	2004	2005	Un-named	Beluga whale	?	Musquaro,Quebec	Canada	Unknown
84	2004	2005	Chance	Beluga whale	?	Trinity Bay, Newfoundland	Canada	Unknown
85	2004	2007	Kyriake	Bottlenose dolphin	F	Loutraki, Corint	Greece	Unknown
86	2005	2006	Jet (Spinnaker)	Bottlenose dolphin	?	Portsmouth	UK	Dead
87	2005		Un-named	Bottlenose dolphin	M	Coulagh Bay, County Cork	Ireland	Unknown
88	2005		Un-named	Bottlenose dolphin	?	Santa Catarina	Brazil	Unknown

No.	From	To	Name	Species	Sex	Location	Country	Current Status
89	2005	2006	Venus	Bottlenose dolphin	F	Blasket Islands	Ireland	Unknown
90	2006		Un-named	Beluga whale	?	Eastern Newfoundland (various locations)	Canada	Unknown
91	2006	2007	Marra	Bottlenose dolphin	F	Maryport, Cumbria	UK	Dead
92	2006	to date	Dougal (Duggie)	Bottlenose dolphin	M	Tory Island, Co. Donegal	Ireland	In Ireland
93	2006	to date	Marco	Bottlenose dolphin	M	Eilat	Israel	In Israel
94	2006	2007	Dave	Bottlenose dolphin	F	Kent	UK	Unknown
95	2006	2007	Chas	Bottlenose dolphin	F	Canvey Island & The Thames	UK	Unknown
96	2007		Un-named	Beluga whale	?	Conception Bay, Newfoundland	Canada	Unknown
97	2007		Un-named	Beluga whale	?	Hopedale, Labrador	Canada	Dead
98	2007		Cookie (Findol)	Bottlenose dolphin	M	Cornwall & Devon	UK	Unknown
99	2007		Sleekie	Bottlenose dolphin	M	Cornwall & Devon	UK	Unknown
100	2007		Dolly	Bottlenose dolphin	?	South Coast	UK	Unknown
101	2007	to date	Moko	Bottlenose dolphin	?	Mahia	New Zealand	In New Zealand
102	2008	to date	George	Bottlenose dolphin	M	Abel Tasman National Park	New Zealand	In New Zealand



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