‘Out of Habitat’ Marine Mammals Workshop Report

30th September 2021 – 1st October 2021

Wally the walrus. Photo: Dan Jarvis

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Introduction

There are increasing reports from around the world of marine mammals appearing in areas where they are not typically present and where they end up in close contact with human activities. This could be a problem for the animals themselves or for the people attempting to carry out their normal activities alongside the animals. Sometimes these marine mammals find themselves in areas where their health and welfare are threatened. Examples of such situations include dolphins entering ports, pinnipeds hauling out on vessels or belugas entering river systems far from their normal range.

The term 'out of habitat' has been used to describe such animals implying that they are outside of the places where they are more usually found. This term perhaps also suggests that that they are in situations that are not optimal for their health and survival.

In 2020, Mark Simmonds and Laetitia Nunny started gathering examples of case studies to help in the consideration of when it may be necessary to intervene in such cases, which intervention techniques have been used and with what success. A report was made based on these investigations – "Cetaceans 'Out of Habitat'" - which is available here: https://wildanimalwelfare.com/reports/

They decided that it would be useful to bring together people with experience managing these apparently 'out of habitat' marine mammals to share information and to propose some definitions to help determine when an animal is out of habitat or range and when action needs to be taken.

The 'Out of Habitat' Workshop took place over two days (30th September and 1st October 2021) via Zoom. See Annex I for the list of attendees and Annex II for the agenda. In this report the case studies which were discussed are presented and a table compiling potential interventions is provided and this could be considered as a 'toolkit' offering ideas for how to respond in future situations (see Table 1). An ongoing dialogue was advocated between those involved in these matters which may range from federal agencies to scientific groups and also includes small voluntary organisations.

Box 1. Definitions

Habitat: this is the place where an animal makes its home. Ideally, it meets all the environmental conditions that an animal needs for its survival and good health, including food and water and appropriate physical, biological and chemical conditions. In some cases, human-caused change may mean that original habitats are now suboptimal for the species concerned.

Imminent: impending or ongoing threat.

Out of habitat: found outside of what is normally regarded as its usual/typical habitat.

For example: *A humpback whale far up a river would be out of habitat whilst, conversely, finding a bottlenose dolphin close inshore is not usually a cause for concern in itself.*

Out of range: found outside of what is regarded as its natural range – defined in geographical terms and taking into account historical records.

Poor health: meaning that the animal shows signs of disease, malnutrition and/or wounding.

Case Studies

During the workshop several case studies were presented and, following the conclusion of the workshop, some attendees shared further examples which they considered to be of relevance. The cetacean case studies are presented here first, followed by the pinniped case studies.

Recent examples of out of habitat cetaceans

Case Study 1: Northern bottlenose whales in Scotland – Colin McFadyen (BDMLR)

McFadyen presented a case involving northern bottlenose whales (*Hyperoodon ampullatus*) in Scotland. In August 2020 a group of seven northern bottlenose whales (NBWs) entered the harbour in Greenock on the Firth of Clyde, Scotland. They left several hours later without intervention and, from there, dispersed among the various sea lochs that open onto the wider Firth. Over the next 8 to 10 weeks, these animals remained within the wider area moving freely. An example of a given day could feature one animal seen in Holy Loch, three others near the village of Lochgilphead, two more at the top of Loch Long, and two over 40 miles south, between the isles of Arran and Ailsa Craig.

To try and make more sense of these movements, a Clyde NBW photo ID catalogue was

developed by observers and used to confidently identify six animals, which then helped to determine the movements and relationships between individuals.

Plans were made for how to deal with potential strandings, including physically moving animals by land route to the deeper and more remote Loch Fyne (10 minutes by road from Lochgilphead), and to carry out a herding manoeuvre to try and move the whales on. This last was, however, discarded at this time due to the dispersed nature of the animals and because they were not exhibiting a strong association with each other.

By the first week of October, at least three of the animals had been consistently sighted within Gareloch and with the upcoming Joint Warrior naval operation due that week, the concern was that if they were not moved soon, they would be corralled within the Clyde by sonar activities in the western seas. A fleet of 19 boats was therefore assembled and an operation was planned to herd the animals from Gareloch and out of the Clyde at least as far as the Isle of Cumbrae (this level of success was not expected but hoped for).

After several full loch herding runs on the first day the fleet was confident they had managed to get two of the five animals to leave the loch, but the other three were evasive and remained in the loch. The following day the NBWs left of their own accord, though it is unknown how much the herding activity influenced their leaving[1].

During the day several points arose;

- NBWs do not appear to have the same 'schooling' instincts of other social cetaceans such as pilot whales. Three whales, when identified, may stick together or separate, including at the moment of evading a herding attempt. This lack of consistency made it hard to try and manoeuvre a herding line given the animals speed and tendency to leave the surface.

- NBWs (or at least this group) did not appear to be fearful of boats and would approach or observe vessels (ranging from motor launches to warships) without showing signs of aversion. This limited the use of boats alone in the herding manoeuvre.

- While approaching at speed to make sufficient noise was effective in starting to move the animals, reduced engine noise as boats slowed once within range meant the animals appeared to lose interest and the drive response was lost.

- The banging of poles was more effective than simply using the boat engines for making noise, but this had to be done with energy and high tempo, as slow or intermittent banging had little effect.

- The loch itself is around 13 m deep for the most part but deepens rapidly towards the mouth to 40 m and, in this area, it was clear that the noise lost much of its effect and meant that, in many instances, if the animals were not fully driven before getting to

[1] https://bdmlr.org.uk/northern-bottlenose-whales-in-river-clyde-final-update

the deeper area they turned and swam under the line of boats. Other options would likely be needed in similarly deep waters.

Case Study 2: Out of habitat cetaceans in the Gulf of Trieste – Tilen Genov (Morigenos Slovenian Marine Mammal Society)

Genov presented a short overview of 'out of habitat' cetaceans in the Gulf of Trieste in the northern Adriatic Sea. The first case involved the occurrence of a young male humpback whale (*Megaptera novaeangliae*) in Slovenian waters over two months in 2009 (Genov *et al*., 2009). The animal appeared to have good body condition, and there was some evidence that it was feeding. Humpback whales are not considered a regularly occurring species in the Mediterranean Sea. It was presumed that the occurrence of the whale was related to the unusual presence of round sardinella (*Sardinella aurita*) in Slovenian waters at the time (Genov *et al*., 2009).

The second case pertained to the prolonged residency of a common dolphin (*Delphinus delphis*) adult-calf pair in an industrial port during 2010-2011 (Genov *et al*., 2012). The adult remained in the area even after the calf disappeared and presumably died (Genov *et al*., 2020). The adult was matched to a study area in western Greece, over 1000 km away (Genov *et al*., 2012). While this species used to be common and likely abundant in the northern Adriatic Sea (Bearzi *et al*., 2004) and the rest of the Mediterranean Sea in the past (Bearzi *et al.*, 2003), it is considered very rare in the Adriatic Sea today (Genov *et al*., 2020) and occurs in relatively low numbers in most of the Mediterranean Sea (Bearzi and Genov, 2021).

The third case, from 2012, involved two adult striped dolphins (*Stenella coeruleoalba*) occurring alongshore in different parts of the Gulf of Trieste, including the port of Koper (Slovenia) and along a public beach in Portorož (Slovenia). Striped dolphins are abundant in the deep waters of the southern Adriatic Sea but occur only occasionally in the shallow northern Adriatic Sea.

In 2013, an adult common bottlenose dolphin (*Tursiops truncatus*) was recorded entering a large lagoon and swimming approximately 8 km up the River Corno (Italy), passing under a road bridge and, subsequently, spending most of the day in a relatively restricted stretch of the river, limited by the same bridge. Tilen Genov and Sandro Mazzariol were both present at the location that day. Initially, due to the perception by the local responders that the dolphin might not be able to find its way back under the bridge, attempts were made to drive the dolphin back through the bridge by producing banging sounds on the sides of a motorboat, which was unsuccessful. After subsequent consultation on site, it was decided to cease further attempts to influence the animal. During the following night, the dolphin disappeared, with no subsequent strandings being reported along the river or around the river mouth.

The last case, in 2017, involved an adult common bottlenose dolphin seen over several days in the same industrial port as the previously mentioned common dolphin pair. Subsequently, the same dolphin was observed in a commercial marina in Trieste (Italy) and along various parts of the Slovenian coast. Underwater footage and photographs revealed that the animal

had sustained an injury of the upper jaw, resulting in an open wound of about 5 cm in length, which exposed the teeth in the upper jaw. The animal was also highly emaciated and featured several skin nodules of unknown origin, which may have been related to an infection resulting from the jaw injury.

Common bottlenose dolphins are regularly present in the Gulf of Trieste, with a well-known resident population inhabiting these waters (Genov *et al*., 2019), but neither of the two cases of this species presented here involved previously photo-identified individuals.

Genov further commented that apart from the initial attempts described earlier for the dolphin in the river, no attempts to influence the animals or other types of intervention were made. In most of these cases, particularly those related to common bottlenose dolphins, the animals were not truly considered 'out of habitat', but rather found in somewhat unusual circumstances. Genov added that he believes that in most of these cases, not intervening (by trying to affect the behaviour or movements of the animal) is the best course of action.

Case Study 3: Striped dolphins in Venice lagoon – Sandro Mazzariol (University of Padova)

Mazzariol presented a report on striped dolphins coming into the Venice lagoon.

Case Study 4: Orca-boat interactions off Spain – Ruth Esteban, Madeira Whale Museum

Esteban briefly presented the recent history concerning interactions between boats and orcas (*Orcinus orca*) along the Iberian Peninsula. Here several individuals of an endangered subpopulation of orca started to show a disruptive behaviour in 2020, interacting with boats. Most interactions involved sailing vessels but also fishing vessels, RHIBs and motorboats. Animals were reported and recorded bumping, pushing and rotating the boats. In some cases, those interactions caused damage at the stern of the boat, mainly to the fragile steering parts. Interactions were recorded all year around and mainly between the waters of the Strait of Gibraltar and Galicia, including along the coast of Portugal. A further two interactions have been recorded on the Atlantic coast of France and another in Morocco. Three interacting groups have been identified, accounting for thirteen individuals in total. Some mitigation actions were implemented such as temporally prohibiting the navigation of sailing vessels, when interactions intensified in specific areas of Spain and a recommendation for whale watching operators not to approach orcas in Portugal. A working group has been established under the Scientific Committee of the International Whaling Commission to look at this issue and a website has been created to provide information about the situation including safety recommendations and also to provide a platform where mariners can share their observations/interactions: https://www.orcaiberica.org/

Case Study 5: Seven orcas inside a shallow New Zealand harbour – Ingrid N. Visser (Orca Research Trust)

Visser presented on an incident when a group of orcas entered a shallow harbour in New Zealand. As background she described that New Zealand has had a wide range of 'out of habitat' cetaceans and that this occurs fairly regularly, including various species of cetaceans 20+ kms up various rivers/estuaries (e.g., common dolphins, bottlenose dolphins and Bryde's whale (*Balaenoptera brydei*)), as well as sperm (*Physeter macrocephalus*), southern right (*Eubalaena australis*), humpbacks and long-finned pilot whales (*Globicephala melas*) inside estuarine harbours. There have also been examples of species which are typically offshore or with more southern distribution spending time in highly urbanised areas (e.g., a dusky dolphin (*Lagenorhynchus obscurus*), typically found 1,000 km further south.

However, she focused her presentation on a recent orca event and explained that the coastal New Zealand (NZ) orca have been extensively documented entering shallow harbours to forage on elasmobranchs (e.g., Visser, 1998, 1999 & 2000). Due to this high-risk foraging method, these orcas also have one of the highest stranding rates for the species, in the world (e.g., Visser 2000 & 2013, Visser *et al*., 2021). In August 2021, a group of seven orcas (including a calf and a young juvenile) entered the shallow harbour of Pāuatahanui Inlet, Porirua, North Island. To enter they passed under both a railway and a vehicle bridge and via a narrow (less than 100m wide), shallow (maximum 5m at low tide) complex pathway (involving at least three doglegs). They remained in the harbour for five days, were documented foraging every day, sleeping and engaging in social behaviours.

The adult male orca became stranded for a short period (approximately two hours) during the first night inside the harbour and this resulted in some drooping of his dorsal fin. Concerns were discussed with the only local species-specific expert, the Orca Research Trust (ORT), about the potential for others to strand and the limited resources available for a rescue due to the NZ Government's highest level lockdown protocols for the Covid-19 pandemic. Based on these two concerns (stranding and limited resources), but without consultation with the ORT, an attempt was made by an NGO engaged by the Department of Conservation (DOC) to use Oikomi pipes (metal pipes placed in the water and hit with metal hammers) to try to drive the orcas out of the harbour. At times the pipes were hit whilst within 20 m of the orca, including the youngsters. This resulted in the orcas showing behavioural signs of stress (e.g., spy hopping) and the orca group becoming fractured, sending some individuals into extremely shallow (less than 2 m) waters as well as the orcas moving past the boats away from the harbour entrance. The attempt clearly failed, but it was proposed by the DOC and the NGO that they were working with, that further attempts would be made two hours later as the tide was dropping, and, if necessary, the following day with more boats and more pipes. Concerted opposition by the ORT (including media releases) resulted in the plans being abandoned. The orcas departed of their own accord during the night of the fifth day.

Visser commented that the effort to drive these orcas out of the harbour was ill-informed (e.g., it was the first method tried, rather than being the 'last resort' effort), was poorly managed (e.g., the boats were not coordinated and the attempts were made when too close to the animals), was conducted when the orcas were in the wrong part of the harbour (i.e., the furthest away from the entrance and in shallow waters) and was conducted too early in the event (e.g., on day four of the orcas being in the harbour and despite the orca showing only typical behavioural responses during their time in the harbour, including the male after his stranding). In summary, these orcas were harassed unnecessarily, and the actions taken

could have caused a mass stranding as well as, perhaps, causing hearing loss in the youngsters due to the poor use of the Oikomi pipes. The recommendation from ORT was to give the orca the time and space that they needed to engage in their normal behaviours and, once left alone, they did just that.

Map showing Pāuatahanui Inlet, North Island, New Zealand. Source: Ingrid N. Visser.

Case Study 6: North American belugas including the case of Nepi – Tonya Wimmer (Marine Animal Response Society) and Robert Michaud (GREMM)

Michaud highlighted the difference between 'vagrant' belugas (*Delphinapterus leucas*) which have travelled out of their natural range and 'out of habitat' belugas which have entered areas which are unsuitable for them, for example freshwater rivers. Vagrant belugas may end up as solitary animals and there was an example of one animal in the 1990s that was seen regularly for 6 summers. Intervention is not usually considered necessary in the case of vagrant animals but may be an option for 'out of habitat' belugas.

Wimmer provided an overview of a vagrant beluga, nicknamed Nepi, which was initially reported 2nd June 2017 in the Nepisiguit River off the Baie des Chaleur in northern New Brunswick, Canada. This location is ~140km from the open water of the Gulf of St. Lawrence. As in the case with any vagrant that is not in immediate danger, the animal was monitored for several days to determine if it would leave the river on its own without intervention.

By 7th June, the animal had not left the river but rather had moved 11 km up the river into a fully freshwater system. Because of the animal's lack of desire to leave and its deteriorating condition, a plan to capture and relocate the animal was developed and enacted by Fisheries and Oceans Canada (DFO), the Marine Animal Response Society (MARS), Quebec Marine Mammal Emergency Response Network, Group for Research and Education on Marine

Mammals (GREMM) and Whale Stewardship Project with the support of veterinarians from the Canadian Wildlife Health Cooperative, Université de Montréal, Vancouver Aquarium and Shedd Aquarium as well as local police and fire departments, airfields and harbour authorities.

As the animal was determined to be a member of the endangered St. Lawrence River population and due to its proximity to that location, it was decided to attempt to relocate the animal to this region. This is not normally undertaken as vagrant behaviour is not abnormal and may provide some unknown ecological function, however, because inaction would result in imminent death of the animal, this option was considered to ensure the long-term survival of the individual. It also presented an opportunity to test theories related to the reintroduction of a vagrant into its natal population.

On 15th June, the animal was captured using a net and several vessels following a highly coordinated and monitored response effort. After an examination by veterinarians, it was transported to the airfield in Bathurst, NB and flown ~1 hour to Riviere-du-Loop, Quebec. The animal was then driven ~30 minutes to Cacouna, Quebec for release via vessel utilizing whale rescue pontoons. The animal was monitored throughout all capture, transport and flight elements by veterinarians. Prior a successful release, the animal was affixed with a limpet satellite tag. The tag transmitted for ~2.5 weeks, showing the animal travelled 570km throughout the estuary. The last transmission was 4th July 2017.

One year later, on 4th July 2018, two belugas appeared in Ingonish Harbour off western Cape Breton Island, Nova Scotia. One of the animals was clearly identifiable as Nepi, having survived its ordeal the year before. A biopsy of the other whale was obtained, and it was shown to also be an endangered St. Lawrence Estuary beluga. The animals were monitored in the area for several weeks, after which they moved on. The final sighting of Nepi was in Charlottetown, Prince Edward Island in December 2018 and it has not been sighted since.

Case Study 7: A solitary beluga in the River Thames – Alan Knight (International Animal Rescue)

Knight provided an account of the solitary beluga which visited the River Thames, London in the United Kingdom between September 2018 and May 2019. It based itself around the Gravesend area of the Thames opposite Tilbury docks which is a very busy area for boat traffic.

British Divers Marine Life Rescue (BDMLR) approached the Port of London Authority (PLA), The Marine Animal Rescue Coalition (MARC) and the Royal Society for the Prevention of Cruelty to Animals (RSPCA) to draw up a plan for how to manage the animal. This worked well and it was decided to just observe and be ready to act if the whale stranded. Whale rescue pontoons were located at the PLA offices in Gravesend. A C-pod (a sensitive underwater microphone) was borrowed from Chelonia Ltd to listen to any vocalisations the beluga made to see if any feeding vocalisations could be isolated. Typical beluga vocalisation click trains were isolated from the recordings but, unfortunately, no feeding vocalisations were picked up. As the beluga seemed in good health, it was assumed that it was finding enough to eat. A contingency plan was drawn up to fly the beluga from City airport (just a few miles upriver)

to the north of Shetland in a Shorts sky taxi if it should strand and vets determined it was healthy enough to be transported, however this plan was never carried out as the beluga left of its own accord.

Other out of habitat belugas

Since the workshop Nunny has made a preliminary review of **'**out of habitat' and 'vagrant' belugas, showing how common this phenomenon is and this is provided for information in Annex III. This list is still being updated and improved.

Case Study 8: Two Arctic species in Belgium – Jan Haelters, Royal Belgian Institute of Natural Sciences (RBINS)

Haelters provided reports from Belgium. On 27th April 2016, a dead narwhal (*Monodon monoceros*) was found in the river Scheldt near Bornem, Belgium (Haelters *et al*., 2018). This was the first record of a narwhal in Belgium, the most southerly record ever in the North-East Atlantic region, and the first record of a narwhal in the North Sea for 70 years. The animal, a juvenile male of likely 5 to 6 years old, had already been observed alive in the river a few weeks earlier, but had not been recognised as a narwhal then.

Less than a year later, on 31st March and 1st April 2017, a bowhead whale (*Balaena mysticetus*) was observed a few hundred meters offshore in Ostend, Belgium (Haelters, 2017). This was the first record of a bowhead whale in the North Sea. The presence of the animal was notified to seafarers, and they were requested to keep a distance. On 2nd April, it was reported some tens of kilometres further to the northeast (unconfirmed), with heavy fog during the days afterwards preventing further sightings. Images taken on 1st April showed that the animal was entangled by its tail, probably by a bottom set gill net. BDMLR were contacted for advice (they might have crossed the Channel if they had not have been occupied with an entangled humpback further to the west), but no efforts were undertaken to disentangle it, given the adverse weather conditions the day after (2nd April) and the lack of experience and equipment available in Belgium.

Both cases received a lot of attention in the national and even international press. They were treated as 'ambassadors from the Arctic', with a link being made to climate change. Both cases were described in an editorial about the Arctic and climate change to the journal Lutra (Haelters, 2017).

Case Study 9: Wally the grey whale in the Mediterranean – Sandro Mazzariol

Mazzariol presented information regarding "Wally" the grey whale (*Eschrichtius robustus*) which was sighted in various locations in the Mediterranean in 2021. The animal was first spotted on 14th April 2021 off the coast of Ponza, Italy and on 21st April 2021 it was reported in the River Tiber Estuary (de Bonis, 2021).

A code of conduct was disseminated to sailors in the area to ensure that they behaved appropriately around the whale[2]. A management group was established initially including experts from Cetacean Strandings Emergency Response Team (CERT), the Tethys Institute and Oceanomare Delphis. Various other associations then joined to help monitor Wally's movements along the Italian coast with the constant support of the coastguard.

Wally was later sighted along the French coast and in Spanish waters being constantly monitored by local NGOs which joined the group, also with the support of Pelagos and ACCOBAMS in sharing information and acting as liaison. The last recorded sighting was in Mallorca in May 2021[3].

This was only the second record of a grey whale in the Mediterranean. In 2010, one was seen off the coast of Israel and, subsequently, in Spanish waters (Sheinin et al., 2011).

Case Study 10: "Freshwater" baleens in the USA – Sarah Wilkin (NOAA Fisheries Marine Mammal Health and Stranding Response Program)

Wilkin presented two case studies. The first was regarding two humpback whales that entered San Francisco Bay and swam up the Sacramento River. Abstract from Gulland *et al.* (2008):

*"A mother and female calf humpback whale (*Megaptera novaeangliae*) pair were observed at an atypical location, 72 nmi inland in the Port of Sacramento, California, on 16 May 2007. Sequencing of mtDNA from a skin biopsy showed the cow to be an E1 haplotype, which is common in the California feeding population. Both animals had lacerations, suggesting sharp trauma from a boat strike. Photographs taken over 11 d showed generalized deterioration of skin condition and necrotic wound edges. Behavioral responses were recorded during attempts to move the animals downriver to the Pacific Ocean. The attempts included playback of alarm tones, humpback and killer whale sounds, banging hollow steel pipes ("Oikami pipes"), spraying water from fire hoses on the water surface, and utilizing tug and power boat engine noise and movement. None of these deterrents resulted in significant, consistent downstream movement by the whales. Antibiotic therapy (ceftiofur) was administered by a dart, representing the first reported antibiotic treatment of free-ranging live whales. After 11 d, the animals swam downstream from fresh water at Rio Vista to brackish water, and their skin condition noticeably improved 24 h later. The animals followed the deep-water channel through the Sacramento Delta and San Francisco Bay, reaching the ocean at least 20 d after first entering the Sacramento River."*

The second case study involved two grey whales.

The special case of solitary-sociable dolphins

Introduction to solitary-sociable dolphins – Laetitia Nunny (Wild Animal Welfare)

[2] https://www.oceanomaredelphis.org/en/wally-a-gray-whale-in-the-mediterranean-sea/
[3] https://www.ecocultura.com/wally-ballena-gris-deambula-mar-mediterraneo/

Nunny presented an overview regarding a minority of dolphins which live mainly apart from their own kind and may come to associate with people. Whereas a dolphin that lives away from other dolphins is simply a solitary dolphin, the individuals that then interact with humans to some degree or another have come to be called 'solitary-sociable dolphins'. It is difficult to come up with one definition of what constitutes a solitary-sociable dolphin, as they are all unique individuals exhibiting different behaviours but, generalising a little, it can be said that they have limited or no contact with other dolphins and regularly closely approach humans often engaging in touch, social, sexual and play behaviours with the people they interact with.

Since 77AD, 136 solitary-sociable dolphins have been reported with the vast majority being bottlenose dolphins (*Tursiops truncatus /Tursiops aduncus*). Eleven *T. trucatus,* one common dolphin and one beluga are currently thought to be living solitary lives. Nunny presented the possible reasons for a dolphin becoming solitary as well as the various stages and levels of sociability. For more information see Nunny and Simmonds (2019). The various welfare issues facing solitary-sociable dolphins were highlighted including the fact that in the last two years, at least four animals have been killed by boat strikes. Nunny highlighted the work by Marine Connection on solitary sociable dolphins (see for example, Goodwin and Dodds, 2019).

Case Study 11: Dave the bottlenose dolphin in Kent, United Kingdom – Pine Eisfeld-Pierantonio (Whale and Dolphin Conservation)

Eisfeld-Pierantonio led a dedicated study of the solitary sociable bottlenose dolphin known as Dave, a young female, who was resident on the coast of Kent in 2007. Eisfeld *et al*. (2010) provides a report of the dolphin's behaviour and this was the first study of its kind. By the time of this study, this young female dolphin was highly interactive with people in the water. People accompanied the dolphin for 18.4% of the 100 hr of observation, and their presence changed her behaviour. The study recorded 39 different behaviours; feeding and resting behaviours declined in frequency in the presence of people. In addition, the dolphin exhibited behaviour possibly hazardous to people in the water, which included preventing swimmers from leaving the water. The dolphin received several wounds, at least one of which was life-threatening. This article discusses the welfare implications for such animals.

Dave the solitary bottlenose dolphin. Photo: Terry Whittaker

Solitary dolphin management plans – Mark P. Simmonds (OceanCare)

Simmonds noted that how a specific dolphin should be managed will depend on its sex, age and personality and that the size and character of the dolphin's home range will also influence what kind of management is needed and what is feasible. He noted that Nunny and Simmonds (2019) recommended that the stage of sociability needs to be considered when a management plan is being devised and specifically that dolphins in stages 0, 1 and 2 may be best protected by strictly discouraging and limiting interaction with them. For dolphins in later stages if human interactions are permitted, they clearly require very strict supervision to try to ensure that the dolphins are not disturbed or injured and, likewise, that human health and safety is guaranteed. Guidelines about how to interact with the dolphin are essential and Wilke *et al*. (2005) recommended the following in any management plan:

- An off-limits area where humans are not allowed to enter thus allowing the dolphin to feed or rest without being disturbed;
- A limit to how many people interact with the dolphin at any one time;
- Restricting the number and/or type of boats which can approach the dolphin, particularly considering the risk of propeller injury;
- Promoting good behaviour and respect between boat owners so that no conflict arises between those trying to approach the dolphin;
- No touching of the dolphin's sensitive spots (blowhole, eyes, genital area), and,
- No feeding of the dolphin.

The importance of using diplomacy and good communication skills at all points is essential. If conflict arises between those people who want to interact with the dolphin, or if people who use the area where the dolphin lives believe that their needs are not being taken into consideration, resentment can grow which can have negative consequences for the dolphin and the humans involved in the conflict.

Nunny and Simmonds (2019) also proposed that to adequately protect solitary-sociable dolphins through the implementation of a management plan, it is necessary to clearly define what constitutes disturbance and harassment, so that it is clear which human behaviours are acceptable and which are not.

Educational materials (typically signage) have been widely used to try to control human behaviour around these animals but it is not clear how effective these have been.

Attempts to manage these complex situations by NGOs and/or volunteers are clearly resource-limited, and the area occupied by a solitary-sociable dolphin can be wide, further stretching the resource.

Determining what the role is of the relevant authorities and what support they may give has proved to be another key issue. For example, can the police or other law-enforcement officers be called upon where there is a risk to human or dolphin life.

Out of habitat pinnipeds

Case Study 12: Elephant seals – Claire Simeone (Sea Change Health)

Southern elephant seals (*Mirounga leonina*) typically have a circumpolar distribution around the south pole. They visit the sub-Antarctic islands to breed from September, and then moult after breeding from December to February. Adults disperse widely across several thousand kilometres for the rest of the year, so long foraging trips are normal for them.

There are several published accounts of extralimital observations of southern elephant seals. Paez-Rosas *et al*. (2018) describes four observations of southern elephant seals in Ecuador, covering 8000 km from their typical range. This was during a La Niña event, where anomalous cold water and increased productivity in the south-eastern Pacific may have played a role in their movement. de Vos (2021) describes the first report of an elephant seal, and any phocid, in Sri Lanka. This animal underwent a catastrophic moult, losing and replacing its hair and top layers of epidermis abruptly, on the beaches around Colombo. A report of even further northern travel was a sighting in 1989 in Oman.

Elephant seals, and indeed all pinnipeds, may come ashore in areas outside of their typical range for a variety of reasons. Moulting is a common reason but is not the only physiological factor. Rapidly assessing an animal's body condition and health status is critical, as is assessing their normal life history and environmental observations.

Considering the needs and risks to native species should be a consideration as well. A northern elephant seal (*Mirounga angustirostris*) was observed in Hawaii in 2002, and a northern fur seal (*Callorhinus ursinus*) came ashore in 2012. The Hawaiian Islands are home to endangered Hawaiian monk seal (*Neomonachus schauinslandi*), which are naïve to diseases like phocine morbillivirus that have the potential to cause catastrophic mortality.

Simone commented that particularly in cases where pinnipeds arrive in areas where they have not been routinely observed before, ensuring that local responders and agencies have access to support and information is a priority. Rapid decision-making on whether intervention is necessary, how to best protect human and animal safety, and prioritizing public education are all topics for which referral to best practices and guidelines may be of benefit.

Case Study 13: Management of the wandering walrus of western Europe – Dan Jarvis (BDMLR), Lizzi Larbalestier (BDMLR) and Mel Croce (Seal Rescue Ireland)

Jarvis, Larbalestier and Croce presented on the recent history of Wally the walrus (*Odobenus rosmarus*). On 14th March 2021, a juvenile male walrus was spotted in Co. Kerry, Ireland. Over the next few months this animal became globally renowned as he travelled to Wales, Southwest England, France and Spain before returning along these coastlines again. Further adding to his fame was his habit of hauling out on man-made objects, usually boats, which were sometimes damaged or even sunk by the walrus. This inevitably caused conflict with members of the local communities regarding his presence, as well as issues around both his and the public's safety.

In three locations (Wales, Isles of Scilly and Ireland), active management of the walrus had to be conducted by wildlife rescue and conservation organisations and, where available, in conjunction with local authorities, statutory bodies, emergency services and others. Various techniques were employed at different locations depending on the nature of the issue and availability of resources to assist with management. In Wales this mostly centred on discouraging him from hauling out on a lifeboat slipway. In the Isles of Scilly genuine threats to the animal's life were issued as well as other threats to wildlife rescue and conservation personnel.

Six weeks of daily dawn to dusk monitoring was carried out along with a suite of other management measures including providing an alternative haul out and regular messaging to the public and media. In Ireland this was continued to an extent, although support from authorities and statutory bodies was almost non-existent and, instead, those managing the situation relied more on media and public support and pressure.

The walrus was last seen in Ireland on the 29th August and was next identified in south-east Iceland on the 19th September. Monitoring of his situation continues in case he returns south, though it is hoped that he will now return to the known native range of this species in either Svalbard or Greenland.

Wally on a specially made pontoon. Photo: Dan Jarvis

Note added during editing: a second walrus (a female nicknamed Freya) was reported in Denmark, Germany, the Netherlands and the United Kingdom after the workshop[4,5]. She received considerable media coverage when she rested on the deck of a submarine[6].

[4] https://www.bbc.com/news/uk-scotland-north-east-orkney-shetland-59636151

[5] https://www.berwick-advertiser.co.uk/news/people/walrus-moves-on-after-brief-visit-to-northumberland-harbour-3457926

[6] https://www.theguardian.com/environment/2021/nov/03/walrus-leaves-arctic-comfort-zone-for-snooze-on-dutch-submarine

Case Study 14: Owha the urban leopard seal – Ingrid N. Visser (LeopardSeals.org)

Visser recounted the story of Owha, an adult female leopard seal (*Hydrurga leptonyx*) who has made the harbours of Northland, NZ her home for the past six years (2015-2021). She typically hauls out, on a daily basis, onto marina pontoons, docks and wharves in areas with high-human traffic (both boat and pedestrian). She has been documented in creeks and mangrove forests, on beaches and at boat ramps.

Typically, leopard seals are considered by many to be an 'Antarctic' species, therefore the Department of Conservation (DOC), who are the NZ Government branch legally mandated to protect marine mammals, had proposed, based on complaints by a small number of people, that Owha should be 'returned home'. However, research has shown that leopard seals have been present in NZ waters since at least the 12th century and, recently, their status has been changed from 'vagrant' to 'resident' (Hupman *et al*., 2020). The translocation of Owha would be highly risky (anaesthesia of leopard seals often results in death, see Vogelnest *et al*., 2010, Pussini *et al*., 2012) and would also probably be unsuccessful (e.g., if transported by air, given the extreme change of climate between NZ and Antarctica water temperatures in just a few days (from 28°C to -3°C), she would be unlikely to survive and if she did, she has shown such strong site fidelity that she would be likely to return within weeks).

There are a range of human-wildlife conflicts occurring with respect to Owha, which expose her and human property to harm. Some of the threats are unsubstantiated (e.g., rumours abound that she attacks and eats dogs but in the analysis of 100 of her scats - as part of a diet study on this individual - there has been no evidence of dog fur, bones or teeth) and for others there is strong supporting evidence (e.g., she punctures and sinks small inflatable boats). Despite a comprehensive management plan prepared in 2017 by LeopardSeals.org (the only species-specific group of experts in New Zealand), the DOC has no publicly available management plan.

LeopardSeals.org has proposed mitigation actions such as Owha-specific pontoons, enrichment (e.g., toys) and simple and effective deterrents (e.g., buckets filled with water placed in a row as barriers to prevent haul-out onto critical sites such as public ferry terminals). Instead, DOC authorizes people to harass Owha (including the continued use of noise deterrents such as air-horns that have little to no effect) and the use of high-pressure water hoses (in attempts to get her to move and which have been used to squirt her in the face and may cause harm to her eyes). LeopardSeals.org believe such authorisations have emboldened others to take actions. For example, Owha has been shot in the face, attacked with oars and there have been threats to "feed her fish embedded with hooks".

In summary, Owha (and other leopard seals) 'belong' in NZ as much as the humans do and effective (and non-invasive) methods are available to help manage her and mitigate issues, but they are not being implemented successfully.

Owha the leopard seal hauled out on a pontoon in a marina, in Auckland, New Zealand's largest city. Photo: Ingrid Visser

Case Study 15: Steller sea lion in Sitka, Alaska – Kim Raum-Suryan, NOAA

Raum-Suryan presented the history of a large male Steller sea lion (*Eumetopias jubatus*) which was observed on the grass in the Southeast Alaska Regional Health Consortium campus in Sitka, Alaska, USA, approximately 200 m from the shoreline (Savage and Raum-Suryan, 2018). For four days, attempts were made to get the animal back to the water including waiting for the animal to relocate itself, hazing[7] (spraying with a hosepipe was successful whereas the use of noise did not elicit a response from the animal), herding with vehicles, and, finally, sedation and relocation using heavy equipment.

The relocation was successful due to the collaboration and cooperation of a variety of groups and individuals. It was unclear what prompted the animal to move inland in the first place and disease or health issues were a consideration. However, no evidence of ill health was apparent throughout the time that the sea lion was on land, and he was subsequently satellite tracked to a haul out >600 km away with no indication of ill health or re-stranding.

Case Study 16: Fur seal in Hobbiton, New Zealand – Ingrid Visser (Whale-Rescue.org)

Shortly after the workshop a case of a New Zealand fur seal (*Arctocephalus forsteri*), nicknamed Sammy, was reported by Visser. Sammy spent 18 days in a lake at the Lord of the Rings Hobbiton movie set in Matamata. The lake is approximately 90 km inland from the nearest ocean access and the seal likely arrived via the Waitoa River[8], passing through rolling hillsides with sheep and beef farmland on either side. However, for at least the last few kilometres it would have had to have walked over land as there is no stream access to the lake which is spring-fed. The lake was known to have a number of eels which Sammy was

[7] Hazing is a term used in North America to indicate the driving of an animal

[8] https://www.stuff.co.nz/waikato-times/news/126710127/friendly-seal-joins-hobbits-and-elves-for-a-piece-of-the-action-at-hobbiton
https://www.stuff.co.nz/waikato-times/news/126799867/sammy-the-seal-shows-no-sign-of-leaving-hobbiton-movie-set

observed feeding on. He departed via a neighbouring farm, on which he found a small waterway leading to the main river. There have been previous reports of NZ fur seals at least 100km up rivers in NZ[9], at cricket games[10], in city centres, on the road, in backyards,[11] in rose gardens and car parks (Visser, unpublished data).

Defining 'Out of Habitat'

Simmonds provided some draft definitions which were discussed and referred to a small drafting group. These were further developed by correspondence during the review of the report of this meeting and can be found in Box 1 above.

In discussion it was noted that in some cases, people may be quick to declare an animal as 'out of habitat' when, in fact, it is simply showing up irregularly at the edges of its range or reoccupying historic range from which its species was extirpated due to hunting or other anthropogenic impacts. However, they may still be perceived to be 'out of habitat' and, generally, they are considered nuisances and may need to be managed more in terms of a human-wildlife conflict.

Developing a toolkit

Following the workshop, attendees provided details of methods which have been used or which could be used to intervene. These are included in Table 1.

[9] https://www.stuff.co.nz/national/6682381/Seal-seen-100km-inland-at-Putaruru
[10] https://www.1news.co.nz/2021/01/25/howzat-sausages-used-to-lure-seal-from-sunning-itself-on-lower-hutt-cricket-pitch/
[11] https://www.stuff.co.nz/environment/126719827/the-weird-and-wonderful-places-sea-mammals-roll-up-in-new-zealand

Table 1: Interventions that have been used when a marine mammal is 'out of habitat'

We classified 'Outreach' as a level of intervention. We do not include here instances where the animals were just monitored and who subsequently departed the 'out of habitat' zone when they were ready.

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
Public Outreach and Educational Approaches	Signage	Deployment of signs with solitary dolphins in UK	https://marineconnection.org/wp-content/uploads/2020/06/2020-solitary-flyer-A5.pdf	
		Poster on northern side of Carlingford Lough to advise the public on how to behave around Finn the solitary dolphin.		
		Signage in harbour at St Mary's, Isles of Scilly, regarding the walrus and keeping a distance		
	Website info	'Typical' behaviour for an urban leopard seal	https://www.leopardseals.org/owha-nz-leopard-seal/	This individual has been in the area for 6 years. See Case Study 14
		Safety protocol for sailors in areas with Iberian orcas	https://www.orcaiberica.org/safety-protocol	
		Info in Italian, Spanish and French regarding Wally the grey whale		
		News updates/press releases and advice issued	https://bdmlr.org.uk/walrus-in-the-isles-of-scilly	Controlling the public and media narrative early was imperative to get key

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
		about the walrus situation on the Isles of Scilly	https://bdmlr.org.uk/walrus-moves-on-from-isles-of-scilly	messaging and advice into the public domain as quickly as possible, which enabled the organisations involved to become by default the go-to source of updates and accurate information
	Social media	Seal Rescue Ireland used social media extensively with Wally the walrus	https://twitter.com/seal_rescue/status/1373353384204468226	
		Extensive educational information about leopard seals in NZ	https://www.facebook.com/LeopardsealsightingsNZ/	
		News stories/press releases issues and advice shared widely about the walrus at the Isles of Scilly	https://www.facebook.com/150950398600504/posts/1428120074216857/ https://www.facebook.com/249604935134752/posts/4091250957636778/ https://www.facebook.com/249604935134752/posts/4063080950453779/ https://www.facebook.com/249604935134752/posts/4297940220301183/	Controlling the public and media narrative early was imperative to get key messaging and advice into the public domain as quickly as possible, which enabled the organisations involved to by default become the go-to source of updates and accurate information

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
Dissemination of information including links to international initiatives	The IWC Strandings Initiative helps to disseminate information globally and responds to cetaceans in difficult circumstances		https://iwc.int/strandings-initiative	
Cancelling / postponing of activities which could disturb animal(s)		Thames beluga (2018-2019) – survey work and fireworks display were stopped	https://www.theguardian.com/environment/2018/oct/19/benny-the-beluga-whale-forces-firework-display-postponement	
		Restriction of navigation for small sailing boats (killer whales, Spain)	https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/jue-01102020-0806	
		Fireworks display cancelled due to Southern right whale entering Wellington Harbour (New Zealand)	https://www.rnz.co.nz/news/national/361256/matariki-fireworks-postponed-due-to-whale-visit	
		Access to fuel dock restricted whilst leopard seal hauled out in NZ (use of 'danger' tape and high-viz cones at pedestrian and boat access points)	https://www.facebook.com/LeopardsealsightingsNZ/	
		Royal Navy ceased submarine testing due to presence of beaked whales in Clyde Lochs (esp Loch Goil)		

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
		Commercial fishing fleet asked to switch off onboard refrigeration (power generators) due to presence of juvenile minke whale in Fraserburgh Harbour		
		Atlantic white-sided dolphins in Stornoway Harbour, the Harbour Master restricted access to the harbour by boats whilst the dolphins were in the area.	http://www.hebrides-news.com/dolphins-strand-in-stornoway-harbour-9821.html	
		Minke Whale in Fraserburgh Harbour. Although only in situ for 3 days, significant public interest and engagement. Harbour master and crews in major fishing port to cease activity and cut power/noise levels. Public to stop attempts to swim with/lead animal out. Public Thank you event afterwards to acknowledge local efforts.	http://www.crru.org.uk/rescue_strories_article.asp?id=14	
Physical exclusion		Temporary barriers (buckets filled with water placed approximately 2m apart) put in place to prevent haul-out of leopard seal		Successful when used, but marina managers have stated that they 'can't be bothered' to fill and place buckets

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
		Pennant flags on a rope, tied to buckets filled with water, to stop leopard seal haul-out		Unsuccessful with potential risk of entanglement and inability of seals to surface if dragging buckets
		Boat owners advised to use obstructions along the sides of their vessels to prevent walrus in Scilly hauling out on them		Only a couple of boat owners attempted this, most others were either indifferent or claimed it was too much trouble for them or would be bad for their business
Scaring or deterring marine mammals	Pingers	Used with dolphins in Venice lagoon		
	Boat engines in reverse	Some reports of this deterring orcas in Straits of Gibraltar		
	Orca sounds	Used with Sacramento humpbacks	https://en.wikipedia.org/wiki/Delta_and_Dawn	Little to no evidence this worked
	Walrus vocalisations	Planned to be used with walrus in Scilly to deter it from hauling out on boats		Recordings of adult male and pup vocalisations sent, but not used in the end. Some discussion still needed over whether this would deter the walrus, make it react aggressively, or help it habituate further
	Polar bear scent and faeces	Planned to be used with walrus in Scilly to deter it from hauling out on boats		Objects used by polar bears in a zoo sent down, but not used in the end. No faeces allowed to be used due to

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
				potential of contaminating environment with non-native bacteria
	Poking with a pole	Used with walrus in Tenby to remove it from blocking lifeboat slipway		Risky for people having to get close to the walrus. Could cause more stress but did work sometimes
	Spraying water	Used with Sacramento humpbacks		
		Used with leopard seal in NZ		Could damage eyes
		Used with walrus in Tenby to remove it from blocking lifeboat slipway		Walrus habituated to it
	Air horns	Used with leopard seal in NZ		Ineffective. See Case Study 14.
		Used with walrus in Tenby to remove it from blocking lifeboat slipway		The Walrus habituated to it
	Underwater speakers	Suggestion to use noise sources to drive NBWs had been sought but SAMS had thought too risky without more data on sensitivity to volume and frequency.		
	Moving or blocking with a vessel	Used with the walrus in Tenby to remove it from blocking lifeboat slipway and in Scilly to deter it from hauling on boats		The most effective method used in Tenby after the walrus habituated to other forms of deterrent used there as the lifeboat was much larger. Also worked in

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
				Scilly with a smaller boat, although it briefly had a stand off
Acoustics used to attract animals	Humpback songs	Used with Sacramento humpbacks	https://en.wikipedia.org/wiki/Delta_and_Dawn	Little to no evidence this worked
	Sperm whale social sounds (codas)	Used to lure sperm whales out of Scapa Flow, Orkney, Scotland	Goold (1999)	Unsuccessful
	Orca calls	Used with lone orca juveniles, Pacific Northwest		
Translocation and handling		Springer the orca translocation in 2002	https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/orphan-killer-whale-a73-springer	
		Nepi the beluga 2017	https://gremm.org/en/le-beluga-de-la-riviere-nepisiguit-est-revu-bien-vivant/	
		Grey and common seals habituated to human contact via feeding (various)		Usually unsuccessful – animals often quickly returned to the same or other busy public areas even when moved to offshore islands. The problem is behavioural and requires management of people to stop interacting to give any chance of the animal rewilding. Signage, public messaging, proactive

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
				engagement with stakeholders all better options
		Fur seals (various)	https://archive.md/VPioQ	Some are effective translocations, in others the seal turns up again after a period of time
Approaches to driving marine mammals	Herding with kayaks including banging on fibreglass with paddles	Pod of 30 mature pilot whales in a bay on Sanday, Orkney, Scotland loitering in 2-3m of water. Herding with kayaks succeeded in moving whales away from shore. Larger boats were not used due to shallow depth and fear of pushing animals to strand.	https://bdmlr.org.uk/pilot-whales-herded-to-safety	Once out of the bay 4 larger boats (motor launch, fish farm supply and RIB) were able to take over and herd pod out to full open water. Animals remained on surface and while did seek to evade are much easier to drive than NBWs
	Herding with boats whilst beating on metal bars	Attempted in New Zealand with orcas in a narrow bay		Failed and raised concerns about possible stranding and hearing loss in orca as deployed too close to animals, all orca departed by themselves. See Case Study 5 details above
		Use of motorboats to herd NBWs in Scotland but due to depth of water (80m in points) this seemed to vary in effectiveness. Banger poles were added, this was more effective, but most		Limited success, while this works with other species, didn't appear to have the same effect on NBWs. In addition they appeared curious about the boats themselves unless a lot of

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
		when hit with high tempo (scaffolding poles and hammer combination) still lost effectiveness in deeper water. NBWs appear to react to driving by diving and turning laterally (in either direction) and swimming rapidly so a long well-disciplined line covering the full surface may offer best chance of success.		revs/noise energy were used.
	Herding with kayaks / small boats	In 2013, an adult common bottlenose dolphin (*T. truncatus*) in river Corno - attempts to drive it under a road bridge by banging on the side of a motorboat		Unsuccessful. The dolphin later disappeared and is believed to have found its own way out.
		Kyle of Durness Mass Stranding. Previously stranded pilot whales (approx. 20) driven out of the Kyle by use of Ribs shepherding at the 5 and 7o'clock positions. Going at reasonable speed to avoid risk of animals turning onto remote beaches.		At least 2 individuals videoed being assisted by pod-mates due to equilibrium issues following stranding.

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
		Atlantic white-sided dolphins in Stornoway Harbour, several kayaks and a small rib gently herded the dolphins out of the harbour		
		Used for driving two separated pilot whale pods that had spent over 24 hours in the shallows exhibiting signs of stress and increasing risk of stranding in Orkney. Then again a week later when one pod returned and came into a busy harbour		Worked well with having boats in a U or V formation behind the animals to shepherd them to more suitable areas further offshore away from land
		Used for driving a pilot whale pod post-stranding to deeper water in the Hebrides		Worked well with having boats in a U or V formation behind the animals to shepherd them to more suitable areas further offshore away from land
		Used to drive a lone harbour porpoise out of an intertidal river/busy waterway		Worked well with having boats in a U or V formation behind the animal to the river mouth into the main estuary channel and left to go on its way
	Herding with small boats/kayaks while stranded animals held in refloatation	Used in the common dolphin mass stranding in Fal Bay	https://bdmlr.org.uk/wp-content/uploads/2020/04/resources-bdmlr-cwtmsn-report-may09.pdf	Very successful: the dolphins in the pontoons were communicating with the free-swimming animals,

Type of intervention	Description	Further details / example	Published sources and links for further information.	Notes
	pontoons alongside boats to lead the other animals			who began following them as they were slowly moved down the river alongside boats to safe open water habitat for release. Further vessels kept up a U-shaped formation behind them to keep the pod together
Engagement with stakeholders and authorities	Multi-organisation management plans	Used with the walrus in Tenby and Scilly		Largely successful depending on opinions of those involved at the outset. Best attempted early in an incident to help the main rescue/conservation organisations involved to lead the narrative, otherwise it becomes difficult to control actions and messaging further down the line. Education and positive engagement and communication are key to getting partners on board to support what is best for the animal's welfare, paired with joint public communication to advise of the situation, key advice and action plans

Conclusions and Recommendations

The table presented here, and the case studies presented above provide examples of incidences of animals which may be considered by some to be 'out of habitat' and the responses made. The workshop discussed these matters and came to a number of conclusions and recommendations summarised below (please also see Box 1 above for definitions).

Guidelines for Action

Education and public outreach should be done where possible and resources allow, regardless of whether other interventions are being carried out. These situations may provide the opportunity for a 'teachable moment' and can help to gather public support for treating the animals, and the responding organisations, with respect based on an understanding of the situation and potential actions that may need to be taken, or not.

Managing people is as important as managing the animal (please see 'Dealing with the Public' below).

There are often calls to action where it is not needed – responses should not be 'knee-jerk' but based on careful expert assessment including, documenting, monitoring and reassessment. Case studies involving the same or other species, from local or other locations, should also be considered.

The decision to leave the animal alone can be, at times, the right management decision. This should, however, be based on expert opinion.

Where appropriate, management plans should be made in conjunction with local authorities, emergency services and others as required.

Climate change means distributions are shifting and this may affect the current interpretation of range and, therefore, may also mean that animals are appearing where they have not been seen before. An animal outside of its natural range is not necessarily out of its habitat and in distress (e.g., the beluga in the Thames River was observed exhibiting normal behaviours including foraging, although this was a very rare record of a beluga in this area).

Historical species populations and distributions have been affected, usually negatively, by human activity over many centuries but, in some cases, populations may now be recovering and returning to old habitat areas. One example being grey seals (*Halichoerus grypus*) in the UK which were once under threat of local extinction due to uncontrolled killing and culling in

the 1900s until the Conservation of Seals Act 1970 was brought in to prevent this, and the population is now recovering[12].

When to Intervene

The workshop considered at length the issue of when intervention might be justified and agreed the following guidelines:

Intervention does not necessarily mean physical action but can mean or include ongoing monitoring and status re-assessment, education and public outreach. Monitoring should inform further actions or escalation of intervention.

Intervention should be considered if one or more of the following is true:

- There is a real and imminent threat of the welfare of the animal being compromised;
- There is an imminent threat of harm from the animal;
- There is no or very little prospect of the animal freeing itself from the situation in the longer-term;
- There is a longer-term threat to the animal that looks unlikely to be resolved *(e.g. a cetacean staying in an area where it is unable to feed);*
- The animal is in poor health or its condition is deteriorating; or
- The animal is out of habitat/out of range (please see definitions in Box 1).

Additionally, the following should also be true:

- Adequate resources are available;
- Human safety can be addressed including via appropriate risk assessment; and
- Benefits to the animal, including its welfare, outweigh the risk to the animal.

Dealing with the public

The workshop noted that one of the biggest challenges in most issues affecting marine mammals that have strayed outside of their normal territories is managing public expectations and, also, that often it has been public concerns that lead to calls for animals to be moved on.

This raises the need for well-informed commentary to be provided when the public starts to show concern. Expert judgement about whether the animal is at risk or whether it is putting human welfare or enterprise at risk needs to be swiftly garnered and it is preferable if all the experts are of the same opinion.

The media play a key role in translating the reality of the situation to the public and should be briefed early in an event as well as provided with regular factual updates.

[12] https://www.legislation.gov.uk/ukpga/1970/30

In some events, members of the public have become abusive and even threatening to those trying to assist the situation, particularly when they do not believe appropriate actions are being taken. This is another reason why it is important that all bodies seeking to address the situation speak with 'one voice'.

As 'out of habitat' incidents appear to be becoming more frequent as sea conditions change as a result of climate change, having suitable materials and coalitions ready and primed in anticipation would be sensible.

Similarly, having an expert network in place around the world would be desirable to help with swift responses. Hopefully, this workshop and its report have helped to establish such a network.

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Annex I: Attendees

Organisation	Name
Animal Welfare Institute	Naomi Rose
British Divers Marine Life Rescue (BDMLR)	Dan Jarvis
BDMLR	Colin McFadyen
BDMLR	Natalie Arrow
BDMLR	Julia Cable
BDMLR	Molly Gray
BDMLR	Lizzi Larbalestier
BDMLR / ORCA	Stephen Marsh
Cetacean Strandings Investigation Programme (CSIP) / Institute of Zoology	Rob Deaville
European Cetacean Bycatch Campaign	Alan Stuart
European Cetacean Bycatch Campaign	Mary Stuart
Global Whale Entanglement Response Network / Technical Advisor to IWC Secretariat and CCS	David Mattila
Group for Research and Education on Marine Mammals (GREMM) / Quebec Marine Mammal Emergencies Response Network	Robert Michaud
GREMM / Quebec Marine Mammal Emergency Response Network	Anthony François
GREMM	Janie Giard
GREMM	Mélissa Tremblay
International Animal Rescue	Alan Knight
IFAW	Brian Sharp
Madeira Whale Museum / Atlantic Orca Working Group	Ruth Esteban
Marine Animal Rescue Coalition (MARC) solitaries working group	Lenni Sykes
Marine Animal Response Society	Tonya Wimmer
Marine Connection	Liz Sandeman
Marine Environmental Monitoring / Strandings coordinator for the Cetacean Stranding Investigation Programme	Matthew Westfield
Morigenos - Slovenian Marine Mammal Society and Sea Mammal Research Unit, University of St Andrews	Tilen Genov
NOAA	Kate Savage
NOAA/NMFS Protected Resources Division Stranding Network, Juneau, Alaska	Sadie Wright
NOAA / Pinniped Entanglement Group NOAA's Protected Resources Division in Juneau, Alaska	Kim Raum-Suryan
NOAA Fisheries Marine Mammal Health and Stranding Response Program	Sarah Wilkin
OceanCare	Mark P. Simmonds
Orca Research Trust, Whale Rescue, and LeopardSeals.org	Ingrid Visser
Royal Belgian Institute of Natural Sciences (RBINS)	Jan Haelters
RSPCA	Adam Grogan
Sea Change Health	Claire Simeone
Sea Change Health	Shawn Johnson
Seal Rescue Ireland	Melanie Croce
University of Padova	Sandro Mazzariol
Whale and Dolphin Conservation (WDC)	Pine Eisfeld-Pierantonio
WDC	Nicola Hodgins
British Isles & Republic of Ireland 'TURTLE' Database Manager / Marine Environmental Monitoring	Rod Penrose
Wild Animal Welfare	Laetitia Nunny

Annex II: Draft Agenda "Out of Habitat" Workshop

Day 1 - 30th September 2-5pm UK time

1. Introductions

2. Workshop aims and process

   i. review key examples and

   ii. Determine when we need to act and what have we got in our 'toolkit'

3. Review of agenda

4. Case study presentations (ten minutes each for individual cases and 15 for overviews)

   4.1 Recent Examples of Out Of Habitat small cetaceans
   - Beaked whales in Scotland – Colin McFadyen
   - Striped dolphins in Venice lagoon – Sandro Mazzariol
   - New Zealand seven orcas in a harbour - Ingrid Visser

   4.2 Wayward 'polar' species
   - North American Belugas – overview Tonya Wimmer and Canadian colleagues
   - Canadian beluga case study (Nepi) – Robert Michaud
   - Thames beluga – Alan Knight
   - Elephant seals - Claire Simone
   - Wally the walrus in the UK – Dan and Lizzi, BDMLR
   - Urban leopard seal – Ingrid Visser

   4.3 Baleen whales
   - Wally the gray whale in the Mediterranean– Sandro Mazzariol
   - USA examples – Sarah Wilkin and colleagues

5. The Special Case of solitary sociable dolphins
   - Brief overview of what they are, their current numbers and issues posed – Laetitia Nunny
   - Case Study – Dave in Kent, UK – Pine Eisfeld-Pierantonio
   - Solitary dolphin management plans – Mark Simmonds

Day 2 - 1st October 2-5pm UK time

6. Recap of day 1

7. When do you decide to act - when is the animal 'out of habitat'?

8. Developing a toolkit, including
    - Approaches to driving marine mammals
    - Approaches to scaring or deterring marine mammals
    - Physical exclusion
    - Translocation and handling
    - What kind of protocols are needed? Species specific? Or situation specific? Or both?
    - How to disseminate guidelines / make them widely available. Possibility of translating them into other languages.
    - Role of international initiatives in disseminating information/sharing toolkit

9. Dealing with the public
    a. Handling public expectations versus realistic outcomes
    b. Handling the media

10. Conclusions, actions and follow up

11. Close of meeting.

Annex III: Out of habitat belugas

North America

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
2019 – 20 Nov 2021	Clarenville, Newfoundland, Canada	1 animal (Bluey)	Spent a couple of years in the area. Died entangled in mooring rope.	https://www.cbc.ca/news/canada/newfoundland-labrador/bluey-beluga-update-1.6258510
3 Oct 2021	Puget Sound, USA	1 animal	From a population in Beaufort Sea. Last sighted 20 Oct 2021	https://www.fisheries.noaa.gov/feature-story/genetic-analysis-shows-beluga-whale-puget-sound-likely-arrived-arctic-waters
May 2021	Mount Stewart, Hillsborough River, Prince Edward Island, Canada	1 animal		https://www.cbc.ca/news/canada/prince-edward-island/pei-beluga-whale-colville-bay-1.6025378
May 2021	Colville Bay, Prince Edward Island, Canada	2 animals		https://www.cbc.ca/news/canada/prince-edward-island/pei-beluga-whale-colville-bay-1.6025378
3 Oct 2020	Baja California Sur, Mexico	Carcass washed up	Probably the animal seen in San Diego	https://www.mercurynews.com/2020/10/06/beluga-whale-unusual-for-west-coast-was-first-spotted-in-san-diego-but-now-found-dead-off-baja/
26 June 2020	Mission Bay, San Diego, California, USA	1 animal	Most southerly beluga ever recorded	https://www.nationalgeographic.com/animals/2020/07/lone-beluga-appears-off-san-diego-in-unprecedented-sighting/
Aug 2019	Witless Bay, Newfoundland, Canada	1 animal		http://ozfm.com/robert-rare-beluga-whale-spotted-in-witless-bay/
July – Aug 2019	Hatchet Cove, Newfoundland, Canada	1 animal (Sammy beluga)	Young animal	https://www.saltwire.com/newfoundland-labrador/news/updated-belugas-hanging-out-in-newfoundland-harbours-351319/
June 2017	Nepisiguit River near Bathurst,	1 animal (Nepi)	Translocated and survived – sighted 1 year later	https://gremm.org/en/le-beluga-de-la-riviere-nepisiguit-est-revu-bien-vivant/

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
	New Brunswick, Canada			
June 2015	Navesink River, New Jersey, USA (also seen off Rhode Island and Long Island)	3 animals	Juvenile or young adults	https://www.youtube.com/watch?v=AouLu9bJAfA https://newyork.cbslocal.com/2015/06/03/beluga-whales-new-jersey-shore/ https://eu.app.com/story/news/local/land-environment/2015/06/03/new-jersey-beluga-whales/28407861/ https://www.youtube.com/watch?v=zlVs2SjbEHQ
June 2014	Taunton River, Fall River, Massachusetts, USA	1 animal	Healthy adult	https://boston.cbslocal.com/2014/06/25/beluga-whale-spotted-in-taunton-river/
Sept-Oct 2012	Montreal, Canada	1 animal	In poor condition when last sighted	https://montrealgazette.com/news/local-news/montreals-errant-beluga-has-vanished
2010	Saratoga Passage, Puget Sound, USA	1 animal	Only 1 person saw it, no photo evidence	http://www.orcanetwork.org/Main/index.php?categories_file=BelugaQandA
12 April 2005	Delaware River, New Jersey, USA	1 animal (Helis)	From St Lawrence Estuary, Canada	https://loe.org/shows/segments.html?programID=05-P13-00017&segmentID=5
1985-1986	Long Island Sound, USA	1 animal (BW)	A solitary-sociable female who interacted with people. She was found dead in May 1986 with four bullets in her body.	https://www.nhregister.com/news/article/Mysterious-slaying-of-whale-in-Long-Island-Sound-11558834.php https://www.upi.com/Archives/1986/05/15/The-state-will-post-a-reward-for-information-leading/4763516513600/
Spring 1940	Puget Sound, Washington State, USA	1 animal	Animal seen for 4 months	http://www.orcanetwork.org/Main/index.php?categories_file=BelugaQandA

Europe

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
July 2021	Norwick and Lamba Ness, Unst, Shetland, Scotland, UK	1 animal		https://www.pressandjournal.co.uk/fp/news/highlands-islands/3328615/nature-lovers-believe-theyve-snapped-first-beluga-whale-in-shetland-waters-in-almost-25-years/
Sept 2018 – May 2019	Thames estuary, England, UK	1 animal (Benny)	Appeared to be foraging and was presumed to have left of its own accord	https://www.bbc.com/news/uk-england-kent-49199220
30 Aug – 1 Sept 2015	Warkworth, Northumberland and South Shields, Tyne and Wear, England, UK	2 animals		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
30 July 2015	Dunseverick, Co. Antrim, Northern Ireland, UK	1 animal		https://www.seawatchfoundation.org.uk/beluga-rare-arctic-visitor-to-the-british-isles/
5 May 2014	Lunan Bay, Montrose, Scotland, UK	Stranded carcass		https://www.seawatchfoundation.org.uk/beluga-whales-in-the-uk-seriously/
6 Oct 2012	Port Olpenitz, Germany and Aabenraa Bay, Denmark	1 animal	Possibly 2 different animals? Or the same animal travelled a long way and quickly on the same day?	https://www.shz.de/lokales/eckernfoerder-zeitung/weisswal-in-der-ostsee-gesichtet-id272508.html
29 Jan 2007	Between Robbery Head and Lybster, Caithness, Scotland, UK	1 animal		https://www.seawatchfoundation.org.uk/beluga-sighted-off-caithness/
15 July 2005	East of Westray, Orkney, Scotland, UK	1 animal	Spotted from a plane	https://www.seawatchfoundation.org.uk/beluga-whale-in-orkney/
Aug 1997	Lund Bay, Unst, Shetland, Scotland, UK	1 animal		https://www.pressandjournal.co.uk/fp/news/highlands-islands/3328615/nature-lovers-believe-theyve-snapped-first-beluga-whale-in-shetland-waters-in-almost-25-years/

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
Sept 1996	Hoswick Bay, Shetland, Scotland, UK	1 animal		https://www.pressandjournal.co.uk/fp/news/highlands-islands/3328615/nature-lovers-believe-theyve-snapped-first-beluga-whale-in-shetland-waters-in-almost-25-years/
April 1995	Loch Duich and off Applecross, Scotland, UK	1 animal		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
June 1988	Balintore, Ross and Cromarty, Scotland, UK	1 animal		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
June 1988	Cork Harbour, Ireland	1 animal		https://www.thejournal.ie/beluga-ireland-2256243-Aug2015/
Mar 1988	Hadston, Northumberland, England, UK	1 animal	Possibly the animal sighted in Scarborough and Whitby	https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
June 1987	Scarborough and Whitby, England, UK	1 animal		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
Nov 1965	Loch Long, Scotland, UK	1 animal		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
1964		Stranded carcass	Possibly the animal sighted in Gourock Bay	https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
1964	Arrochar, Loch Long, Scotland, UK	1 animal	Possibly the animal sighted in Gourock Bay	https://docplayer.net/134655246-Whales-porpoises-and-dolphins-order-cetacea.html
1964	Gourock Bay, Scotland, UK	1 animal		https://www.seawatchfoundation.org.uk/more-rare-beluga-whales-spotted-around-the-uk/
24 July 1964	Østnestangen ved Tofte, Norway	Bycaught animal	Found almost dead in fishing net. (Was this the animal seen in Drammen harbour?)	https://eikerarkiv.no/historien-om-hvithvalen-i-hokksund/
13 July 1964	Drammen Harbour, Norway	1 animal		https://eikerarkiv.no/historien-om-hvithvalen-i-hokksund/
30 May 1964	Hokksund, Norway	1 animal	Killed by local police with dynamite on 3 June 1964 over worries it was going to take salmon	https://eikerarkiv.no/historien-om-hvithvalen-i-hokksund/

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
Oct 1960	Between Orkney and Burray, Scotland, UK	1 animal		https://docplayer.net/134655246-Whales-porpoises-and-dolphins-order-cetacea.html
1950	Soay, Skye, Scotland, UK	1 animal		https://docplayer.net/134655246-Whales-porpoises-and-dolphins-order-cetacea.html
Dec 1948	Télindière, River Loire, France	1 animal bycaught in fishing net	Caught in net and died when the fisherman towed it to shore	Niort (1950)
Sept 1948	Clare Island, Co, Mayo, Ireland	1 animal		https://www.thejournal.ie/beluga-ireland-2256243-Aug2015/
Oct 1932	R. Forth, near Stirling, Scotland, UK	Stranding		https://docplayer.net/134655246-Whales-porpoises-and-dolphins-order-cetacea.html
1919	Ijmuiden, Netherlands	Stranded carcass	Female	https://www.walvisstrandingen.nl/search?search_api_views_fulltext=Beloega

Asia

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
May 2020	Partizanskaya River, Russia	1 animal	Possibly an animal released from the “whale jail”	https://twitter.com/Quad_Finn/status/1303456178601508864
February 2020	Omi Island, Nagato City, Yamaguchi Prefecture, Japan	1 animal		https://twitter.com/Quad_Finn/status/1303492181420732416 https://www.youtube.com/watch?v=NkjqaGuTu6s&t=22s
2016 – 4 June 2020	Lake Notoroko, Abashiri, Hokkaido, Japan	1 animal (Korin)	Lived in the area for many years. Washed ashore dead – injuries apparently from a boat’s propellers	https://www.asahi.com/ajw/articles/14392271
Sept 2012	Amga, Russia	1 animal ?		Melnikov and Seryodkin (2015)

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
4 Oct 2011	Lidovka, Dalnegorskiy district, Russia	5 – 6 animals	Videoed by local people	Melnikov and Seryodkin (2015)
Jan – Aug 2010, Mar – Aug 2009, May – Aug 2008	Shibetsu, Shibetsu-gun, Hokkaido, Japan	1 animal	Observed frequently near set nets by fishermen. Returned each year	Sato and Masaki (2011) https://marinemammalscience.org/facts/delphinapterus-leucas/#cite_ref-129 https://www.youtube.com/playlist?list=PLAILdeR3ZgA6yKDAbnv6wg2v0IefgSKTj
Oct 2008	Preobrazheniye Bay, Russia	1 animal	Photographed by a local person	Melnikov and Seryodkin (2015)
June 2006	Sarufutsu, Soya-gun, Hokkaido, Japan	Bycaught dead		Sato and Masaki (2011)
Apr 2006	Rausu, Menashi-gun, Hokkaido, Japan	1 animal	Photographed from Japan Coast Guard aircraft	Sato and Masaki (2011)
Sept 2005	Nemuro, Hokkaido, Japan	2 animals (mother and calf)	Bycaught and released alive	Sato and Masaki (2011)
May 2004	Shibetsu, Shibetsu-gun, Hokkaido, Japan	1 animal	Observed frequently by fishermen for a couple of weeks	Sato and Masaki (2011)
Sept 2001	Utoro, Shari, Shari-gun, Hokkaido, Japan	Bycaught dead	Shark tooth marks were observed on the carcass	Sato and Masaki (2011)
May 1999	Oshidomari, Rishiri-fuji, Rishiri-gun, Hokkaido, Japan	1 animal	Underwater video footage captured by the ROV of Wakkanai Fisheries Lab	Sato and Masaki (2011)
1998	Amga, Russia	4 animals	Belugas are regularly seen in this area especially in the summer when squid are present	Melnikov and Seryodkin (2015)

Date(s) seen	Location	Details of beluga(s)	Notes	Links / references
1997	Korean Peninsula	1 animal?		https://marinemammalscience.org/facts/delphinapterus-leucas/#cite_note-130 https://web.archive.org/web/20160304074416/http://www.whalelove.com/whale2_02.html
Summer 1996	Mouth of Rybnaya river (5-6km north of Amga), Russia	Stranded carcass	Adult	Melnikov and Seryodkin (2015)
May-Aug 1991	Muroran, Hokkaido, Japan	1 animal	Observed intermittently for several months	Sato and Masaki (2011)
Oct 1979	Amino, Takeno-gun, Kyoto, Japan	1 animal	Bycaught alive. Kept in captivity briefly	Sato and Masaki (2011)
Oct 1958	Odaito, Betsukai, Notsuke-gun, Hokkaido, Japan	1 animal	Stranded alive. Captured and killed by whalers	Sato and Masaki (2011)