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Managing Human Interactions with Solitary Dolphins

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Abstract

Some solitary dolphins reorient part or all of their social behavior towards humans. Such dolphins often attract large numbers of people who wish to observe them at close quarters or even interact with them. These encounters may be rewarding for both the dolphin and the people concerned, but negative outcomes, particularly for the dolphin, are common.

This paper describes the pattern of development of human-friendly dolphin situations and proposes a "dolphin etiquette" and protocols for management options. The most critical of these is the development of a situation-specific management plan with official support for its implementation. The success of a management plan will depend on an effective education program and the support of local stakeholders.

Key Words: Odontocetes, bottlenose dolphin, *Tursiops truncatus*, solitary, social, human oriented behaviour, encounters with humans, management, worldwide

Introduction

Descriptions of dolphins interacting with humans date back at least two thousand years to ancient Greece. In the 20th century, solitary individuals of the family Delphinidae, particularly the bottlenose dolphin (*Tursiops* spp.), and a few individuals of other odontocetes species (*Delphinapterus leucas*, *Delphinus delphis*, *Grampus griseus*, *Lageno rhyncus obscurus*, *Sousa chinensis*, *Stenella plagiodon*, *Orcinus orca*) were documented in many countries (Lockyer, 1990; Doak, 1995; Müller, 1998). Possible reasons for solitary behaviours in an otherwise gregarious species were discussed by Müller & Bossley (2002).

In this paper, the term *solitary dolphin* is taken to apply to dolphins who have little or no contact with conspecifics and who regularly closely approach humans, often including touch, social, sexual, and play behaviours. We recognise that not all dolphins living in isolation from conspecifics have displayed human-oriented behaviours. These animals are excluded from the present analysis.

Circumstances which lead to the emergence of a solitary dolphin usually involve the presence of a dolphin in an area little frequented by other dolphins and, conversely, the regular presence of one or more humans. Initially, habituation to the presence of humans takes place, but this may evolve into the dolphin reorienting its social behaviour towards humans in its home range area. In most documented cases, this redirection of sociability is not mediated by food rewards (Doak, 1995; Müller, 1998).

Humans view dolphins as very charismatic, at least in western societies. The presence of a solitary dolphin usually results in large numbers of people being attracted to the area (Frohoff, 2000), with many wanting to swim with and to touch the animal. The resulting human-dolphin interactions are often emotionally significant to the people involved. The outcome from the perspective of the dolphin is more difficult to evaluate, but most dolphins in these situations actively seek out some level of interaction with humans. In totally solitary dolphins, it seems plausible to assume that humans are providing the important physical contact and social stimulation normally obtained from conspecifics. Both semisolitary dolphins (i.e., those experiencing some level of contact with conspecifics) and fully solitary dolphins may be using humans to compensate for reduced conspecific social contact, or perhaps, even finding humans "interesting" in their own right.

Where solitary dolphins are exposed to uncontrolled human access, however, it may result in negative consequences for the dolphin (Frohoff, 2000). These consequences may include harassment and injuries, or, in several cases may actually result in their death (Alpers, 1963; Lockyer, 1978; Dobbs, 1981; Doak, 1989). Several solitary dolphins may have died inadvertently as a consequence of human mismanagement, including two cases in New Zealand where oil spillage or an underwater explosion may have been involved

(Müller et al., 1998). Of the many solitary dolphins documented by Project Interlock (New Zealand) in various countries over the past fifty years, two died accidentally from underwater explosions (Alpers, 1963), several were shot (Dobbs, 1981; Doak, 1989), and three died after being placed in captivity (Caldwell & Caldwell, 1972; Doak, 1995).

Many solitary dolphins have been intentionally injured by humans through the use of guns (Lockyer, 1978; Pelletier, 1985), knives, harpoons, or lances (Burgess, 1982; Müller, 1998). Accidental injury or death may be caused by boat strike (Lockyer, 1978; Frohoff, 2000). Occasionally, humans have suffered from interactions with dolphins. In one case, a human fatality resulted when a dolphin responded to harassment by butting the proponent in the abdomen (Santos, 1997, 2003), but such events are extremely rare.

It is unlikely that the public's enthusiasm for solitary dolphins will subside. It is, therefore, important that effective and responsive management protocols be developed to maximise protection for dolphins and humans and to secure the potential benefits to humans available in these situations.

This paper outlines the common patterns in the development of solitary dolphin interactions with humans, identifies the main problems which develop, and outlines the general principles which are likely to underpin the development of a successful management plan for solitary dolphin situations.

Stages in the Development of Friendly Solitary Dolphins

Documented cases of solitary dolphins befriending humans in various parts of the world display common patterns of behaviour over time. This behavioural sequence is summarised below:

Stage 1—A solitary dolphin appears and remains in a new home range, usually providing abundant and accessible prey. Initially, the dolphin explores its new range but will sometimes restrict itself to a smaller, protected part of the range, often less than a square kilometre in size. Sometimes there is an exclusive rest area within its range, often a moored vessel or buoy. When human activities are present, the dolphin may follow boats, in most cases fishing boats, or inspect fishing gear or lobster cages, but does not approach humans.

Stage 2—The solitary, but not yet human-focussed, dolphin becomes habituated to the new range and may regularly follow boats. Local people who become aware of the presence of the dolphin attempt to approach the animal by swimming or diving. The dolphin appears curious but keeps its distance from people in the water. Behavioural patterns related to human activities may include bow-riding and exploratory behaviour directed at inanimate objects such as ropes, chains, and buoys.

Stage 3—The solitary dolphin becomes familiar with the presence of one or more people who have deliberately attempted to habituate it, a process possibly assisted or even initiated by the dolphin. The dolphin interacts at this stage with a limited number of people in the water. Human-dolphin interactions may include swimming in close proximity, diving side-by-side, or the dolphin being touched and having its dorsal fin held for people to "hitch a ride." Aerial behaviour of various kinds, including spy hops, are common during this stage.

Stage 4—The presence of the solitary dolphin becomes widely known, often assisted by media exposure. Visitors from outside the local area come to see and swim with the dolphin. It soon becomes a local celebrity and tourist attraction. In several places with solitary dolphins, visitor numbers have been sufficient to impact the local economy significantly. During this stage, inappropriate human behaviour may provoke unwanted and even dangerous behaviour in the dolphin, including dominant, aggressive, and sexual behaviours directed at humans.

In some cases, development proceeds only to Stages 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.

Several solitary sociable dolphins have ranged widely. "Beaky" (1972-1978) set up a series of home bases at small harbours along the Welsh and Cornish coast over a seven-year period (Lockyer, 1978). "Fanny" (1987-1994) moved her home base several times in the port environs of Marseille in France (Müller, 1998), "Maui" (1992-1997) had different ranges around the South Island of New Zealand (Müller et al., 1998), "Dolphy" (1989-1995) ranged widely along the Mediterranean coast from Spain to France (Müller, 1998; Lockyer & Müller, 2003), and "Jojo" (1980-1994) was based in the Bahamas (St. John, 1991) and used an extensive range, often mixing with other dolphins. Perhaps the most extensive traveling of any solitary dolphin is that displayed by an animal variously known as "Dony," "Randy," or "George" (since 2001), who moved between Ireland, the south of England, France, Belgium, and Holland (Chapelle, pers. comm.).

Many factors could interplay to cause a dolphin to shift its home base. These include variations in food supply, fear of killer whales or shark predation, the quality and frequency of human contact, or seasonal changes in access to human interaction. Some dolphins, for example, "Fungie" (since 1983) in Western Ireland (Fitzgibbon, 1989) and "Jean-Louis" (1976-1988) in France (Pelletier, 1985), remained in well-documented home ranges over an extended period of more than 12 years.

Problems Occurring in Solitary Dolphin Situations

Human Behaviour Directed Towards Dolphins—Many solitary dolphins have been intentionally or accidentally injured or even killed by humans (Frohoff, 2000). In several places, local people (particularly fishermen) have considered the dolphin to be a nuisance (Burgess, 1982).

People have often behaved in an inappropriate manner toward a solitary dolphin. This may be due to the anthropomorphic attribution of human desires to the dolphin (facilitated by many media representations of dolphins) or a fundamental lack of information on the natural needs of wild and free-living creatures. Similarly, people wishing to fulfil a desire to engage in an encounter with a dolphin may not consider the animal's needs (Müller, 1998). Such self-centred behaviour may lead to disturbance of the dolphin's resting or feeding activities. In some cases, humans accidentally or deliberately harassed or harmed a dolphin. Lack of knowledge can result in sensitive parts of the dolphin's body (e.g., blow hole and eyes) being touched. Inadvertent or even deliberate touching of the genital area may result in sexual arousal, particularly in male dolphins (Webb, 1978; Bloom, 1991). Sexual arousal also may occur in response to particularly energetic interactions.

Human Behaviour Directed Toward Other Humans—It is not uncommon for rivalry or even hostility to develop among humans who have formed a relationship with a solitary dolphin. Individuals may become possessive of a particular dolphin, either to monopolise social contact with the dolphin or to protect the dolphin from other people's attentions (Müller, 1998). This situation can be unfortunate for the dolphin as well as for the people involved because it can lead to a communication breakdown among the people coming in contact with the dolphin. Experience gained by individuals concerning the dolphin's preferences for various kinds of interaction is not disseminated, leading to inappropriate forms of interaction being repeated.

Dolphin Behaviour Directed Towards Humans—It is common for a kind of "reverse anthropomorphism" to develop in the dolphin's approach to humans: the dolphin appears to direct behaviour toward humans as if they were conspecifics (Frohoff & Packard, 1995; Lockyer & Müller, 2003). This phenomenon, relatively common in zoo animals isolated from conspecifics, was explored by Hediger (1964), who termed it "assimilation tendency." Behaviour between dolphins can be very boisterous, particularly in association with sexual activity and, if directed at humans, has the potential to cause severe injury or even death (Webb, 1978). Instances of sexual arousal toward humans and generally aggressive behaviour have been recorded for several solitary male dolphins. Examples include "Beaky" (Webb, 1978), "Freddy" (Bloom, 1991), "Percy," and "Simo" (Lockyer & Morris, 1986) in Great Britain; "Jojo" in the Bahamas (St John, 1991); and "Romeo" in Italy (Sifaoui, 1996). Similar behaviours in female dolphins are not common but have been reported—for example, "Jotsa" in ex-Yugoslavia (Sifaoui, 1996) physically attacked human females who attempted to intervene in her interactions with human males.

Past Management Approaches

Prior to the development of overarching marine mammal protection legislation, formal management of solitary dolphins was achieved primarily by providing them with the special protection status accorded by law. Thus, special laws were passed in New Zealand to protect "Pelorus Jack" in the early 20th century and "Opo" in the 1950s (Alpers, 1963), and similarly in Spain to protect "Nina" in 1972 (Cousteau & Diolé, 1975). In the latter part of the 20th century, most western countries developed legislation to protect marine mammals in their national waters, but these often need to be supplemented with local management plans. At Monkey Mia in Western Australia, dolphins were habituated to enter shallow water and accept fish gifts from the public (Gawain, 1981). The accessibility of these dolphins produced an immense public response (up to 800 visitors in a weekend), and two full-time rangers were appointed by the government to supervise and restrict feeding. No swimming with the dolphins or providing of play objects (e.g., balls) was permitted, and dogs were banned. Educational videos, pamphlets, and advice on dolphin interaction were made available (Wilson, 1994).

In a number of cases, local communities supplemented formal legislative protection by erecting notice boards and distributing pamphlets advising how the dolphin should be treated and/or by appointing guardians for the dolphins. In the cases of "Jojo," "Fanny," and "Dolphy," special guardians were appointed by local institutions to oversee their welfare (Müller, 1998). With Dolphy, a self-appointed guardian took measures to prevent people holding her dorsal fin for rides because he was convinced Dolphy's fin was suffering physical damage. With both Dolphy and Fanny, the guardians were supervised by a professor of the University at Marseille in conjunction with a local "friends of the dolphin" committee (Doak, 1993). In the case of Dolphy, who created a situation reminiscent of the beach encounters of "Opo," the local Mayor closely supervised and supported the guardian, who was equipped with a cell phone and instant police backup. Dolphy's rest area was beneath a boat alongside a jetty, and

her surreptitious breathing allowed her to remain there undetected by the public. Jojo has long been closely managed by a guardian, with the main problem being his aggressive sexual behaviours toward female tourists at the local Club Mediterranean (St. John, 1991).

"Jock," in Adelaide, Australia, was managed informally in the midst of a city of a million people for five years in a unique manner. All involved with the dolphin kept the situation a secret, thus ensuring the situation did not develop past Stage 3 (Doak, 1995). Regular scientific observations of Jock were maintained until his death (Bossley, unpublished). There has been no formal management of "Fungie." A fleet of small boats take the public to meet the dolphin, which has generated substantial tourist income for the community. This situation is one of the longest on record (Mannion, 1991). This mature male bottlenose dolphin has become very selective about permitting physical contact, allowing it only with those with whom it has an established relationship. He will usually only approach tourists when they visit en masse if they are holding a tow-line.

Protocols for the Development of a Management Plan

Management options in any new solitary dolphin situation depend on a number of issues. These include the sex, age, and personality of the dolphin, and the physical and social characteristics of the area in which the dolphin has established its range. Management of solitary dolphin situations normally occurs only in societies where dolphins are held in some esteem. In countries where dolphins are still hunted, an accessible dolphin probably will be killed before becoming sociable with humans. Management options also depend on behavioural characteristics of the individual dolphin. For example, the size of the animal's home range will influence the degree to which its behaviour, and that of people, can be monitored.

The history of friendly, sociable dolphins suggests the best approach for the dolphin is not to facilitate its social interactions with humans, and perhaps even to discourage them; however, the apparent enthusiasm most solitary dolphins display toward interacting with at least some humans suggests isolation from human contact is not the most humane option. It is also a reality that in many solitary dolphin situations, isolating the animal from human contact is not feasible. If a dolphin already has progressed to Stage 3 in the development of its social involvement with humans, it is imperative that a management plan be developed.

Providing appropriate protection for the dolphin will normally require the involvement of government officers with the authority to control people's access to the dolphin. These authorities should make it a priority to develop a management plan for the specific situation. The work of the authorities will almost always require the cooperation of commercial and recreational fishing groups and may be augmented by the establishment of a dolphin protection committee comprised of concerned local people. Such committees may become unofficial wardens of the dolphin and disseminate information to the public. This assistance may be particularly important if the dolphin has an extended range along the coastline. The involvement of officials in the protection of the dolphin mitigates against excessive possessiveness or self-aggrandisement on the part of self-appointed or unofficial guardians. Protecting a dolphin which is easily accessible to the public may be an extremely demanding and contentious task. The person in charge will require a solid grounding in the behaviour of friendly, solitary dolphins and the likely human response to such dolphins. They also will require considerable diplomacy and excellent communication skills.

A priority in the development of a management plan is the preparation and distribution of general information and interaction guidelines for the public. Such materials should stress the fact that, despite their friendliness, such dolphins actually are wild and, in extreme circumstances, potentially dangerous animals. Guidelines must outline which human behaviours are appropriate or inappropriate. Consideration of potential sexual advances from the dolphin, and the circumstances which might provoke these, should be included. It should be emphasised that, to protect the dolphin, many people will need to be content to observe the dolphin rather than actually interact with it. Basic information on the dolphin's home range and other behaviours should be collected as soon as possible, as well as a photographic record for identification purposes. Any friendly dolphin situation is likely to evolve over time, and close monitoring of the situation will be required to detect such changes. An effective management plan should be reactive to these changes.

Management of Humans

The first priority in managing a solitary dolphin situation is to ensure the well-being of the dolphin. This will almost always require the management of human access to the dolphin rather than the reverse. We believe carefully managed human interactions with the dolphin are more likely to be in the dolphin's best interest than excluding human contact. In the long term—depending on the individual and the situation—providing opportunities for the animal's reintegration into normal dolphin society should be given serious consideration.

From a study of solitary dolphin episodes, it is obvious that the most satisfying interactions for humans occurred with people who treated the dolphin thoughtfully, respectfully, and creatively, and in situations where they have been careful not to compete with each other but openly and generously shared the dolphin with others. Many have learned that it is as wonderful to watch an interaction as to participate. Spectators often contribute immensely by telling those engaged with the dolphin of things beyond their vision. People also come to learn how important it is to communicate about problems. With each episode, an appropriate interspecies etiquette is evolving.

Whenever possible, it is important that a management plan be developed while the friendly, solitary dolphin is still at Stage 3—before its presence becomes widely known (e.g., Frohoff, 2000; Kinsman & Frohoff, 2003).

"Dolphin Etiquette" Program—The implementation of a "dolphin etiquette" program is fundamental to efforts to manage a solitary dolphin situation to the benefit of both the dolphin and the humans. There are several ways human activity in the presence of the friendly dolphin may be managed:

1. Delineate specific areas by buoys or other markers to limit the areas permitted for human-dolphin interactions. This will only be effective if the dolphin has a limited home range. Alternatively, human "no-go" areas may be established to help ensure the dolphin is able to feed and rest unmolested. The provision of such areas will require mapping of the dolphin's normal behaviour routines. In the case of "Jean-Louis" (Pelletier, 1985), the presence of rough water around a reef provided a refuge from the attentions of swimmers, divers, and canoeists.
2. Limit the number of people interacting with the dolphin. Large groups of people in the water may produce transitory, interrupted interactions and prevent the development of trust based on establishing individual bonds. Extreme crowding situations may produce aggression in the dolphin (Alpers, 1963; Cousteau & Diolé, 1975; Lockyer, 1978). Observations of dolphin interactions with groups indicate they will usually be selective and limit the number of people with whom they interact (Dobbs, 1992; Müller, 1998).
3. Restrict the number and type of boats permitted to approach the dolphin, particularly with dolphins who seek stimulation from propeller wash. In general, jet boats are preferable because the absence of a propeller reduces the chance of injury, though this benefit may be offset if these vessels are loud and travel at high speed. Boat operators should be made aware if the dolphin shows a predilection for approaching propellers (e.g., Müller, 1998; Frohoff, 2000) so that they avoid rapid changes in speed or direction. Boat owners should also be warned of the dangers of releasing petroleum products into the water; these form a volatile scum on the water surface and can easily be inhaled by the dolphin.
4. Urge boat owners to act judiciously and with good manners around a solitary dolphin. Dolphins with a strong attraction to boats can be lured from a stationary boat with its engine turned off to a moving boat with its motor running. This can cause friction between boat owners and, ultimately, produce a negative environment for the dolphin. Rather than entice it away, other boats should approach quietly and drop anchor so their occupants can observe the interaction from a reasonable distance. Our experience with a number of solitary dolphins is that half an hour is an adequate period for humans to gain a satisfying experience and that the maximum number of people in the water with the dolphin at any time should not exceed four. In sensibly resolving potential human conflict with etiquette, boat owners can avoid stressing the dolphin.
5. Avoid the blow hole, eyes, and genital zones. Examination of advisory material from friendly, solitary dolphin situations worldwide reveals a consensus in recommended "dolphin etiquette" and "no touch" zones. Inadvertent (or sometimes even deliberate) touching of the genital area is likely to produce sexual arousal in the dolphin. It may be considered worthwhile to avoid fin tows, but this has not been a problem in off-beach encounter situations such as with "Maui" in which the dolphin had adequate control. When freely swimming, she could readily dislodge an unwelcome fin tow and avoid grasping hands. She seemed to "enjoy" the fin-tow game, and it may have been no problem if not excessive, although toward the end of her friendly phase (following parturition), she actively repelled swimmers.
6. Do not offer food to a dolphin. Problems with feeding include changing its diet and home ranging behaviours; problems associated with eating fish which are not fresh, the danger of malevolent poisoning, and being offered inappropriate foods; and encouraging the dolphin to beg for food from people who may take offence.
7. Fully explain and introduce proper dolphin etiquette with the maximum degree of diplomacy. Alienating people who use the same area as the dolphin may result in the animal becoming a target of their resentment, with potentially disastrous results.

Veterinary Issues—In many solitary dolphin cases, humans have rendered veterinary assistance. Such interventions have included the removal of fish hooks and entanglements, the administration of antibiotics following injury, and rendering assistance at a stranding. In such situations, it has been the acceptance of human touch that has made it possible to render such assistance.

Management of Dolphins

Wild dolphins are probably more difficult to manage than humans, and in most cases, this alone will not be a sufficient management strategy. In the case of "Jojo" off the Bahamas, for example, an attempt was made to teach the dolphin not to display sexual behaviour towards humans (St. John, 1991). Although there was some short-term success, the longer-term effectiveness of this strategy is unclear.

Dolphins do seem to learn what is "acceptable" behaviour quite quickly, however. For example, if sexual advances are discouraged by the humans immediately leaving the water, the incidence tends to decrease. Some dolphins also appear to mimic the tempo and tone of humans interacting with them, and this can also be used to influence their behaviour. Another option undertaken by one of the authors was to deliberately set up a program designed to resocialise a solitary dolphin into the local dolphin community. This project was not fully complete when the dolphin died (from unknown causes, perhaps pollution), but the dolphin was showing definite evidence of redirecting his social behaviour towards conspecifics (Bossley, unpublished).

Management of Environment

If a dolphin's home range is in a busy port, the activities of the dolphin watchers may impede shipping. Similarly, if a dolphin is in a popular fishing area, this places it at risk of being accidentally hooked. In these cases, a combination of managing the human activities with some management of the dolphin may be required. In countries where dolphins are held in high esteem, a high level of cooperation with potentially conflicting parties can usually be achieved.

National and International Legislation

No country appears to have enacted generic legislation specifically for the purpose of managing solitary dolphin situations; however, most developed countries do have regulations for watching and swimming with cetaceans, and these may be applied to the special cases of sociable solitaries. Every country (and often the states within countries) have regulations which differ in various respects but are generally based on not harassing the animals. More specifically, there are dictates against splitting groups, approaching very young calves, limiting the approach distance of vessels and aircraft, and not cutting across a group line of travel. It would be desirable for different countries/states to collaborate to achieve more consistency in these overarching regulations, and a case could be made for legislation providing the possibility of implementing special regulations in the form of a management plan for solitary sociable cetaceans on an as-required basis.

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Bottlenose dolphins, the genus Tursiops, are the most common members of the family Delphinidae, the family of oceanic dolphin. Molecular studies show the genus contains three species: the common bottlenose dolphin (Tursiops truncatus), the Indo-Pacific bottlenose dolphin (Tursiops aduncus), and the Burrunan dolphin (Tursiops australis). Bottlenose dolphins inhabit warm and temperate seas worldwide, being found everywhere except for the Arctic and Antarctic Circle regions. Dolphins and humans have shown a companionship for each other that has lasted for many years. This companionship is what has made it possible for the two species to communicate with each other. A simple observation of communication with humans is shown in the questioning of Lou Herman s dolphin, Ake. First, there are two paddles placed in the pool. One represents the answer no and the other represents yes.