

The welfare of dolphins in captivity

1. Introduction

As a species, dolphins are extremely popular and have been the focus of intense human interest for the past century. They have attracted attention for many reasons including their behaviour in the wild, in performances at marine parks, direct interactions with humans and use in research, especially regarding echolocation capabilities. Humans also find their appearance attractive and intriguing. Therefore, the opportunity to closely interact with them is very appealing and keenly pursued by some people.

Dolphins belong to the order *Cetacea* which includes two sub-orders *Mysticeti* (baleen whales) and *Odontoceti* (toothed whales). Dolphins and orcas are toothed whales within the most diverse and largest group of cetaceans, the *Delphinidea* family, which has about 37 species.

The bottlenose dolphin (*Turciops* sp.) is believed to be the most commonly displayed cetacean on all continents, held in 89% of marine mammal facilities in 42 countries around the world according to the most recent and comprehensive survey undertaken (Couquiaud 2005). In Australia, the number of marine parks housing dolphins has declined over the past 20 years from about eight to now only two, one in Queensland and one in New South Wales. The reason for this decrease is unclear but is likely to be a combination of financial constraints, declining audiences and pressure from animal advocacy groups.

From the 1960s, dolphinariums have based their business model on captive dolphins performing shows for audiences for entertainment. In addition to performances, since the 1990s, there has been an increased focus on interactive programs including swimming with dolphins and assisted therapy, where people have direct contact with dolphins.

Dolphins may also be brought into captivity following rescue due to injury or illness. Rescued dolphins may be retained temporarily for rehabilitation before being returned to the wild, or can continue to remain in captivity. Dolphins have also been used for research and potential detection work by the military but little information is available on this.

Consistent with an expanding awareness and concern about the welfare of animals, there are heightened community expectations regarding the needs of animals used in entertainment. Given that dolphins are highly intelligent animals with complex social structures who swim vast distances in open oceans, the state of their welfare in a captive environment, where they are used for performances and interactions, is being increasingly questioned.

2. Dolphins in the wild

To understand the full impact of confining dolphins in captivity, it is essential to consider observed normal behaviour in their natural environment. Numerous studies have been done, particularly in relation to biology and behaviour. Up until 2009, over two thirds of the publications on cetaceans involved wild populations with the remainder focused on captive dolphins and a few comparing captive and wild dolphins (Hills & Lackup 2010). Studies undertaken on wild dolphins may assist in improving conditions that dolphins are kept in captivity to help meet their behavioural needs. However, there are unlikely to be many direct benefits to wild populations from research involving captive dolphins.

2.1 Longevity

In the wild, dolphins can live for 45-50 years with predation and human impacts, including pollution, food scarcity due to overfishing and injury from boats and fishing nets, posing the greatest threats to survival in adulthood. Preventing and minimising further impacts of human interference on wild dolphins should be a global priority.

Some individual dolphins have lived for over 50 years in captivity but given they have a constant food supply and no predators, pollution, nets or boats, this would be expected. Thus, it is difficult to compare longevity for captive and wild dolphins in a purely natural environment without removing the negative impact of human influence. In addition, the question has been raised as to what the true impact of stress is on the average longevity of dolphins in captivity, especially as stress can increase susceptibility to disease (Rose 2004). Dolphinariums often promote the age of individuals in their care who live beyond 40 years as being an indication that captivity is not harmful but virtually no data is released regarding sickness and mortalities, so the average life span of captive dolphins is difficult to determine.

2.2 Travelling

A study of dolphins in coastal waters off northern New South Wales found dolphins spent 38% of their time travelling compared to socialising, milling and feeding/foraging (Hawkins & Gartside 2008). Consistent with other studies, travelling was found to be a significant activity and one which would be severely thwarted by captivity, irrespective of the motivation. The home ranges for the two groups studied were 177km² and 320km² with the authors commenting that the actual home ranges were likely to be larger than reported.

Limited data are available on the swim speed of bottlenose dolphins. One study recorded maximum speeds of 24 km/hour in the wild compared with trained captive dolphins attaining 29 km/hour in a restricted pool (Rohr et al. 2002). These are considered 'burst' speeds, faster than normal swimming and occurring for short periods to catch prey or evade predators but are an important part of normal swimming behaviour.

2.3 Foraging and feeding

Foraging, or the search for food, is an important day-to-day activity which is both stimulating and rewarding. Depending on local availability and preference, dolphins may travel long distances, in excess of 100km, in search of food. Their diet varies but generally mainly consists of fish, octopus, and squid. Hunting for food in the wild is a significant behaviour and may involve establishing alliances with other dolphins to capture prey. Expression of these behaviours is virtually impossible in a captive environment as well as the ability to choose different food sources.

2.4 Diving and surfing

It is unclear how important the depth of a pool or tank is for captive dolphins, especially as some populations inhabit relatively shallow areas. Where dolphins have access to deep water, diving is a common behaviour, thus keeping dolphins in pools less than 10 metres deep may not be in their best interests. One researcher has stated that it is important to provide animals with habitats as large and deep as possible to encourage diving and rapid swimming (Couquiaud 2005). Some wild dolphins will also actively seek the opportunity to wave surf, particularly on pressure waves produced by boats, or even whales (Paulos et al. 2010), suggesting that this is a pleasurable activity.

2.5 Social interactions

An Australian study of wild coastal dolphins found that the mean pod size was 13 individuals, with the mean size of mother and calf pods comprising 21 individuals. This study also reported that social interactions are dynamic and flexible with some individuals having only loose associations within their group whilst others interacted with a number of individuals in several social groups (Hawkins & Gartside 2008). It appears that that bottlenose dolphins live in complex fission-fusion

societies where the composition of groups or pods may change within an hour or over a number of days, and may depend on the abundance and distribution of prey, foraging techniques, habitat type, behaviour, reproductive state, time of day and season, complexities which are unable to be expressed in a captive environment.

A three-year study observing over 2,100 encounters of 52 free-living dolphins in the Shark Bay area of Western Australia revealed that the majority of associations across different behavioural states (e.g. rest, travel, social, foraging etc) were of an acquaintance type where preferred associations are not formed (Gero et al. 2005). However, nearly 30% of interactions, of mainly juveniles, involved preferred associations in several behavioural states. Out of the possible 51 dolphins, the average individual was observed to associate with 34.7 (SD = 9.68) individuals, of which 17.7 (SD = 7.52) were preferred. On average, each dolphin had approximately six behavioural associates in all behavioural states. The remaining dolphin formed only an affiliate-type association. The study concluded that a large number of individuals have different preferred partners in different behavioural states. This study adds to the body of evidence that demonstrates the complexity and fluid nature of dolphin associations in a wild state, where they can choose to interact with different individuals depending on the context.

3. Assessing intelligence and cognition

As has been identified by many studies, dolphins are recognised as being extremely intelligent with significant cognitive abilities.

3.1 Brain size and complexity

Anatomical research has identified that the structure of the cetacean brain is very complex, allowing advanced information processing enabling intelligent, rational behaviour (Marino et al. 2007). Furthermore, dolphins have a very complex neocortex, a neurological feature associated with problem solving, self-awareness and processing emotions in humans.

Interestingly, a comparison of brain mass, body mass and encephalisation quotient (a value which describes relative brain mass across species with varying body mass) of 630 mammalian species, showed that the relationship between brain and body mass in odontocete cetaceans is not consistent with the evolutionary pattern (Boddy et al. 2012). In other words, in dolphins, the brain size is relatively larger than would be expected for body size and this is considered to be indicative of increased cognitive ability.

3.2 Self awareness

Many studies that have demonstrated that, in addition to general intelligence and emotional complexity, dolphins are self-aware. One such study showed that dolphins display a similar capacity for self-recognition as great apes and humans, through observing two captive bottlenose dolphins in a 'mirror' study (Reiss & Marino 2001). Despite dolphins being unable to use a hand to touch a marked part of the body, both dolphins spent a significant amount of time engaging in self-directed behaviours at reflective surfaces in order to view parts of their body that had been marked with non-toxic temporary black ink compared to being sham-marked, where the action of applying a mark was made but no mark was left. Both dolphins also swam quicker to the mirror to view the marked or sham-marked area compared to when they were not marked. These results provided the first clear evidence of mirror self-recognition in dolphins. This suggests that dolphins are likely to be very aware of their surroundings, including limitations posed by a captive environment.

3.3 Learning, language and play

There is abundant evidence that play is an important behaviour for both captive and wild dolphins and that dolphins play in many different ways (Paulos et al. 2010). A five-year study of dolphin behaviour categorised captive dolphin play behaviours as follows: motor play, bubble play, human

play, ball play and object play (with objects other than balls) (Kuczaj et al. 2006). During the course of this study 270 novel play behaviours were documented.

Another study of cognitive capacity in one dolphin revealed that this dolphin was able to discriminate in relation to the 'more' or 'less' magnitude for numerical competence (Yaman et al. 2012). Not only was numerosity represented as an abstract category but the dolphin in question was required to complete single reversal learning to participate in the experiment, thus providing evidence of high cognitive capacity. Other research has also demonstrated the high level of intelligence of dolphins by revealing that dolphins can mimic sounds and behaviours as well as understand specific aspects of human-made symbolic language (Marino et al. 2008).

4. Dolphins in a captive environment - welfare concerns

During the 1960s and 70s, the number of dolphinariums and marine parks where dolphins performed for entertainment on a daily basis, increased dramatically, particularly in the United States. The vast majority of these dolphins were taken from their natural marine environment. Attempts to breed captive dolphins soon followed with marine parks in Australia, the USA and Europe now largely maintaining their numbers this way. However, many marine parks in other parts of the world, particularly Asia, continue to source dolphins from the wild.

There are two main types of captive environments in which dolphins are kept - semi-natural environments comprising sea enclosures and lagoons or artificial environments, where pools and tanks are commonly used. Most marine parks which retain dolphins have pools or tanks which are made from concrete, plastic or fibreglass. Where pools are used, there may be several available which provide different functions. The largest pool is generally used for performances, while smaller pools are used for holding, training and temporary separation of individuals. Ideally, there should be two holding pools to allow individuals to be isolated where behavioural problems are recognised and a quarantine and/or treatment pool where new animals and sick animals can be isolated. Where breeding is undertaken, there should be an additional 'maternity' pool where birthing and nursing females can be segregated, if required.

When comparing a dolphin's natural environment to this captive situation, there are a number of obvious differences which are likely to have an impact on dolphin welfare. These include the available space, the complexity of the environment, the number of dolphins with which an individual can interact, and the impact of human activity on dolphins.

4.1 Restricted space

Where dolphins are maintained in an artificial environment, space will always be limited due to cost factors to construct and maintain such facilities. Captive dolphins endure severe space restrictions compared to the open ocean or even an estuarine environment.

A review of stressors posed by captivity, especially those which are uncontrollable, helps to identify areas which may have adverse effects on captive populations of different species (Morgan & Tromberg 2007). Stressors include loud or aversive sound, uncomfortable temperatures, lighting variation, restrictive movement and forced restrictions on behavioural expression.

A study of seven dolphins at a US zoo facility where dolphins could choose their location, showed that most time was spent in the moderate depth pool compared to the deeper performance pool which had a larger surface area and volume (Shyan et al. 2010). However, although interesting, this study had a number of limitations including the inability to control factors such as underwater noise differences, ambient light and conditioned associations with the pools that may have influenced the dolphins' choices. A more definitive study comparing closed and open captive environments showed that dolphins maintained in an open facility which had the greatest length compared to the other facilities had cortisol levels (0.09 nmol/L) which were at least 15 times lower than dolphins kept in the smallest closed facility (1.40 nmol/L) (Ugaz et al. 2013).

The need to address issues such as circular (repetitive) swimming and the limited time spent underwater of captive dolphins has also been identified, with further research needed on appropriate environmental enrichment (Clark et al. 2013). In addition to behaviour observations, other researchers have compared salivary cortisol levels in dolphins maintained in either a closed or open facility. One study found that dolphins in open facilities spent more time swimming (overall and in a linear rather than a circular orientation), less time floating and had significantly lower cortisol levels compared to dolphins in closed facilities with the conclusion that this may be due to open facilities providing more space and diverse stimuli (Ugaz et al. 2013).

4.2 Barren environment

As described above, most dolphin facilities have little variety or complexity in the underwater environment. This type of design is driven in part by the need for facilities to filter and circulate the tank water and maintain water hygiene. However, in recent times there has been an increased recognition of the importance of providing environmental enrichment to captive dolphins. Some newer facilities are designed with more natural and varied features including coves and islands as well as sandy bottoms and boulders. However, whilst making some progress to provide a less sterile environment, these facilities are still limited in their capacity to reflect the natural marine landscape.

Training for performances and human interaction have been shown to help alleviate the boredom of captivity but it is recognised that considerable and ongoing effort is required to provide sufficient mental stimulation for such intelligent animals. A review of cognition and current marine mammal enrichment has identified that captive dolphins need appropriate cognitive challenges which are relevant, motivating, controllable and possible to master (Clark 2013). Most dolphinariums only provide floating toys for environmental enrichment and this is insufficient to meet their cognitive needs. Providing appropriate mental stimulation for captive dolphins requires a commitment to vary cognitive challenges on a regular basis and so enrichment objects need to be designed to allow changes to maintain motivation and interest. Once mastered, the challenge and therefore motivation to continue to engage with a specific environmental enrichment tool is likely to decline. Stereotypical behaviours, such as circular swimming, could be reduced by providing varied shapes and an enriched environment to allow forage, play and socialising with conspecifics (Couquiaud 2005).

4.3 Impact on social behaviour

Social grouping has been recognised as one of the most important issues affecting health and welfare of captive cetaceans. Although in many cases an effort is made to mimic the nature of social groupings in captivity, it is impossible to provide for the varied complex interactions that occur in the wild due to the limit on the number of individuals maintained in captive groups and the restricted physical environment.

Research conducted in the 1980s and 1990s identified that in a controlled environment certain aspects of normal social dynamics may be impeded and cause disruptions to social groupings as well as risk harm to some individuals. Male dominance was cited as a common source of social and behavioural problems which has been reported to lead to hostility resulting in stress, and psychological and physical trauma. Since 2000, very few scientific articles have been published relating to aggression in captive dolphins suggesting that research in this area is not being conducted. However, three cases of illness and mortality attributed to stress resulting from social instability and subsequent aggressive interactions indicates this is an important health and welfare consideration for captive dolphins (Waples & Gales 2002).

As mentioned previously, studies in the wild show that social interactions are complex, flexible, may involve many different individuals, and may change very quickly. Where small numbers of dolphins are kept in a limited space, there is little or no opportunity to experience such dynamic interactions.

4.4 Impact of sound

It is difficult to assess the impact of sound on captive dolphins, although it is recognised as being potentially aversive, mainly in relation to sonar and shipping movements (Mooney et al. 2012). Despite the possibility that dolphins have mechanisms to protect their sensitive ears from their own loud echolocation clicks, these may not be sufficient to avoid negative effects of human-made sound. Life in a dolphinarium will expose dolphins to a range of different sounds both above and below water, including the human voice, loudspeaker music, crowd noise, traffic noise and construction sound. Further studies on the impact of sound on dolphin behaviour are warranted.

4.5 Health

Studies have shown that dolphins in captivity can suffer stress resulting in appetite loss, ulcers, and increased susceptibility to disease due to changes in their social grouping, competition for resources and unstable social structures (Waples & Gales 2002). However, there is very limited information in the public domain on disease conditions in captive dolphins, or the measures to prevent and treat them. Details of administration of drugs to limit bacterial infection or modify behaviour are not available. Health records including clinical assessments and outcomes as well as treatment details would provide essential information to assist with determining the health status of dolphins held in captivity.

4.6 Effect of human-dolphin interactions

Direct human-dolphin interactions are a common activity in many dolphinariums and include swim-with-dolphin programs, fin-riding, and animal-assisted therapy sessions for people with special needs such as autism and developmental disabilities.

A number of studies have been undertaken that have shown conflicting findings for the effects of human-dolphin interactions. For example, a New Zealand study of captive dolphins found some behaviour changes after swim-with-dolphin programs, including increased use of the refuge area, and relatively more time spent on the surface, with some slaps, charges and abrupt behaviours being observed (Kyngdon et al. 2003). However, other studies have reported increased play after such interactions, which is deemed to indicate positive welfare (Miller et al. 2011). A study of three dolphins before and after interactive programs found no adverse effects, with some dolphins displaying increased locomotory behaviour following interactions (Sew & Todd 2013).

Facilities which conduct dolphin interactions promote the benefits derived from such encounters to justify such programs. However, a review of five published papers espousing health improvements of human participants in dolphin assisted therapy programs has described the methodologies, and therefore the conclusions, as being flawed (Marino & Lilienfeld 2007). The key flaws identified include inadequate experimental controls and non-specific effects (e.g. placebo and novelty effects) as well as small sample sizes. It is essential that any claims about the purported benefits of human-dolphin interactions are based on rigorous scientific methodology to ensure the data are robust and the interpretation and conclusions are valid.

Furthermore, a comparative study which examined the impact on behaviour of human-dolphin interactions in a small marine enclosure and a larger marine park, with the latter being deeper, more than 20 times the surface area (600 m² versus 14,000 m²) and with a refuge area, revealed that dolphins in the larger enclosure did not display avoidance behaviours whereas those in the smaller enclosure did (Brensing et al. 2005).

Another study of tourists participating in a swim-with-dolphins program reported that, despite initially reporting being in awe of the grace, size and power of dolphins, participants subsequently had concerns about the size of enclosures and that too many tricks were performed (Curtin & Wilkes 2007).

In the UK there has been a notable shift from tourist-based businesses promoting captive dolphins to those promoting wild dolphin experiences, primarily as a result of advocacy from animal welfare

and animal rights groups (Hughes 2001). This study highlights the need for the tourism industry and researchers to consider the ethical implications where animals are involved in tourist-based activities. Given the growing popularity of these programs, but the apparent lack of operating guidelines and conflicting research findings, the development of consistent mandatory guidelines to safeguard the welfare of dolphins and humans in these situations is warranted.

5. Legal protection

There are significant international differences regarding the capture and keeping of dolphins. Some countries prohibit the taking of wild dolphins for commercial purposes, whilst others freely permit this. Bottlenose dolphins are internationally listed as a CITES Appendix II animal, where they are not considered threatened with extinction but it is considered that trade needs to be closely controlled. However, there are isolated populations of some dolphin species which are threatened, including the Australian snubfin dolphin. In 2007, the Australian government declared that all cetaceans would be listed as CITES Appendix 1 animals which prohibits the import or export of cetaceans or cetacean products. It is believed that this declaration was introduced to restrict trade rather than dolphins being considered a threatened species.

There is a call from a number of cetacean scientists for greater global legal protection for dolphins. In 2010, a group of cetacean scientists, philosophers and advocates published a *Declaration of Rights for Cetaceans - Whales and Dolphins* which states that 'no cetaceans should be held in captivity or removed from their natural environment'. The aim is to present the declaration to the United Nations.

In the UK, following the findings of a parliamentary inquiry, stringent laws were introduced regarding the keeping of dolphins in captivity. Essentially, these tough laws combined with lobbying from animal welfare groups, led to all dolphinariums closing down in the UK.

In Australia, legal protection to safeguard animal welfare is a state responsibility under animal welfare legislation. Being mammals, dolphins are recognised under state-based animal welfare legislation and any cruelty, ill-treatment or neglect of captive dolphins would be prosecutable. In addition, some states have welfare standards or a code of practice relating to animals used for display or exhibition which would apply to captive dolphins.

In 1988, Victoria prohibited the keeping of cetaceans, including dolphins, under the *Wildlife Act 1975*. Prior to this, the capture of live cetaceans for commercial purposes was also prohibited in Victoria but this has now been superseded by commonwealth legislation. Queensland and New South Wales are the only two states which each currently have a facility with captive dolphins for entertainment purposes.

In New South Wales, the dolphin facility at Coffs Harbour is licensed by the NSW government and must comply with the provisions of the General Standards for Exhibiting Animals in NSW (2004) and the Standards for Exhibiting Bottle-nosed Dolphins (1994). However, these standards are now over 23 years old and no longer reflect current knowledge of dolphin behaviour and social structures.

In Queensland there are no specific welfare standards for dolphins, however, the dolphin facility on the Gold Coast must be granted a wildlife exhibitors licence from the Queensland Department of National Parks, Sport and Racing to operate. In addition, the facility must also retain a wildlife rehabilitation licence to be able to rescue, treat and retain injured dolphins from the wild.

Currently, there is no legal prohibition on breeding dolphins in captivity in either New South Wales or Queensland.

6. Community attitudes

As we continue into an era where the community is increasingly questioning our treatment of animals in general, the breeding and use of captive cetaceans for entertainment is of particular interest. While some of this attention has focused on orcas, such as with the documentary film *Blackfish* which raised questions about the keeping and treatment of orcas by SeaWorld in the US, concern over the welfare of captive dolphins has also increased. Another documentary by US filmmaker Stan Minasian, [By All Rights](#), released in early 2016, is the first film to focus on the issue of the rights of whales and dolphins, including the right to freedom from captivity. Over the past decade, animal welfare groups have campaigned strongly to raise concerns regarding the keeping of cetaceans in captivity as understanding of the needs of these complex animals and the difficulty to adequately provide for them in captivity has grown.

As a result, audience attendances at marine shows in some parts of the world have declined significantly with associated business enterprises suffering financially. In 2016, the [US National Aquarium announced](#) it would transfer their remaining eight dolphins to an ocean refuge by 2020 which will provide a much more natural environment. This follows a commitment by SeaWorld in early 2016 to cease breeding orcas in captivity. Pressure continues to release captive orcas into sea sanctuaries.

This change in community attitude is also reflected in the announcement that a proposed \$100 million aquarium to be built in Queensland will not house dolphins, a decision welcomed by animal advocacy groups.

7. Justifications for the keeping and breeding of dolphins

7.1 Comparisons with other species

Some proponents of dolphinariums claim that keeping dolphins in captivity can be justified on the basis that it is deemed acceptable to retain other species with high levels of intelligence, large natural range and complex social relationships in zoos. However, the capacity for any confined environment to meet all needs of these types of animals is also questionable. Preventing natural behaviour patterns for some species with a large natural home range can give rise to stress and frustration and that the only option to address this is to either expand captive space considerably or cease maintaining these species in zoos (Clubb & Mason 2003). Other studies have also identified numerous stressors associated with confinement (Morgan & Tromborg 2007).

7.2 Conservation

Bottlenose dolphins, the most common species held in captivity, are not threatened in the wild and are listed as of least concern on [IUCN's Red List](#), with an estimated wild population of at least 600,000. There is no evidence that global populations of dolphins are declining that would justify the keeping and breeding of dolphins in captivity. This is in contrast to the conservation work that some zoos undertake to breed and release endangered species. Some scientists see benefits in collating findings from both captive and wild population studies to further conservation efforts. However, until 2009, of the 50 papers published relating to conservation of cetaceans, only four involved captive populations with dolphins being the main species studied (Hills & Lackerby 2010). In order to justify the keeping of a highly intelligent animal with complex social structures and long natural range for conservation, the species would need to be severely threatened. In addition, active rescue, breeding and release programs would need to be undertaken to help re-establish natural populations. None of these activities are being undertaken in relation to dolphins. It appears that the only reason dolphins are being bred in captivity in Australia is to perpetuate their use for entertainment.

Where injured dolphins are rescued and rehabilitated, as with other species, if animals are unable to be returned to the wild, appropriate open enclosures should be established for their long-term care and management, rather than retaining them for entertainment performances or interactions.

7.3 Education

Some dolphinariums claim that dolphin performances are framed to educate audiences about marine conservation and dolphin behaviour. However there is no evidence that live dolphin shows are necessary to achieve this outcome. People can experience and appreciate the natural environment as well as the animals who live within it by patronising ecologically sensitive and sustainable charter tours to observe dolphins in the wild. Messages about marine conservation can be successfully extended through community education programs as well as beach walks and other activities to promote all sea life, not just through interaction with captive animals.

7.4 Research

The keeping of dolphins in captivity is supported by some scientists who argue that experimental subjects are needed to continue research into dolphin behaviour and physiology. However, there are no formal scientific research programs associated with dolphinariums in Australia.

Research on captive dolphins has a number of serious limitations including restricted social groupings, confined space, small sample sizes, the impact of passive feeding and medical treatments (hormones) on behaviour and questionable capacity of captive dolphins to represent wild populations (Perelberg et al. 2010). There are challenges with studying dolphins in the wild as well as in captivity. One of the major impediments with 'wild' studies is that controlled experiments are difficult; other challenges include varying and unsuitable sea conditions, poor visibility and unpredictability in being able to observe subjects. However, these problems are common to field research on other marine species and scientists are achieving increasing success studying free-living populations of cetaceans in their natural environment with the use of technological advances such as remote telemetry and DNA analysis (Nowacek et al. 2016).

Studying synchrony and alliances in male dolphin behaviour has been an important area of research on wild populations and is virtually impossible in captive environments. Caution has to be taken when interpreting social relationships of captive, artificially grouped animals, and validation via comparisons to wild populations (Connor et al. 2006). One study supporting continued research on both captive and wild dolphins claims that there are advantages to pooling findings from wild and captive dolphin studies (Dudzinski 2010). However, the report is somewhat contradictory in that there is extensive overlap between observed behaviours of both populations, raising the question of the need for captive studies to be conducted at all. In addition, these findings were derived from surveys conducted on trainers who watched underwater footage of wild dolphins, with many confirming similar behaviours seen in captive dolphins. Unfortunately, the converse was not conducted where wild population researchers observed captive dolphin behaviour which may have revealed behaviours not seen in the wild.

Large whales cannot be studied in captivity due to the physical limitations of retaining them in a restrictive environment. Unfortunately human curiosity and our ability to breed dolphins in captivity have taken precedent over fulfilling the needs of these individual animals. While in some countries, predominantly the US, studies continue on captive dolphins, other researchers are focusing efforts on wild population studies to demonstrate that the former is neither necessary nor ethically sound (Grimes 2011).

If wild dolphins were at risk of extinction, and there was no other option but to retain individuals for scientific purposes, then this could be the only acceptable grounds for dolphins to be kept in captivity. However this is not the case. The argument to maintain captive dolphins on the basis that some aspects cannot be obtained from wild studies, is difficult to defend.

7.5 Breeding

The exact number of dolphins bred in captivity in Australia is not available, however both facilities holding dolphins rely on breeding to ensure ongoing performances, as it is illegal to capture dolphins from the wild in Australian waters. Young dolphins are born and raised in an artificial environment, destined to live in pools and tanks where space is limited and the opportunity to express many natural behaviours being denied.

The only potential justification to breed dolphins in captivity is for conservation purposes, where the ultimate goal is for release into the wild to replenish diminishing populations. However, as discussed above, bottlenose dolphins are not endangered, therefore captive breeding on this basis is ethically questionable.

8. Conclusions

Dolphins are extremely intelligent, self-aware marine mammals with complex cognitive capacities. They have a large brain relative to their body mass, and a highly developed neocortex, associated with problem solving and processing emotions, and a sense of self. They are highly social, with dynamic group structures and affiliations where they choose to interact with different individuals, depending on the context. In the wild they swim vast distances in open oceans, spend significant amount of their time foraging and hunting, seek out pleasurable activities and enjoy several forms of play.

Our ability to meet these needs in a captive environment is compounded by a range of factors. Captive dolphins endure severe space restrictions compared to their wild counterparts, which can lead to stress and behaviours associated with boredom and lack of stimulation. Dolphin facilities have little variety or complexity in the underwater environment. Training and human interaction can help alleviate the boredom of captivity but providing sufficient mental stimulation for captive dolphins requires considerable and ongoing effort to vary cognitive challenges on a regular basis. There is conflicting evidence on whether human-dolphin interactions have an overall positive impact on dolphin welfare, indicating that such programs should be implemented with caution and carefully monitored and evaluated. Captive dolphins are also restricted in terms of social interactions, both in terms of the number of individuals they can interact with, and the flexibility and choice who they interact with. There is little or no opportunity for the type of dynamic interactions they would experience in the wild. Cumulatively, these restrictions can lead to health issues associated with chronic stress, including increased susceptibility to disease.

It is no longer possible for dolphinariums in Australia to capture dolphins from the wild, however, where such facilities are licensed for dolphin rescue and rehabilitation they can retain wild dolphins that are unable to be released. Legal protection for captive dolphins in Australia vary from state to state, with Victoria being the only state that has prohibited the keeping of dolphins and other cetaceans in captivity. NSW is the only jurisdiction with specific standards for the exhibition of dolphins, but these do not reflect current knowledge of dolphin biology.

Community concerns over the keeping of cetaceans in captivity appear to be increasing, with leading scientists, philosophers and animal welfare organisations supporting the concept of a [declaration of rights for cetaceans](#) including the right to freedom from captivity. In addition, twenty scientists from around the world have [signed a statement](#) that based on the current evidence, dolphins should not be maintained in captivity for entertainment. As a result, some institutions have disassociated themselves from keeping cetaceans.

There appears to be little evidence to support the main claims made by proponents of dolphin captivity. Bottlenose dolphins, the most common species held in captivity, are not threatened in the wild and there are no active conservation programs being undertaken in association with Australian dolphinariums. Furthermore, there is no evidence that the keeping or breeding of

dolphins in Australia has educational or scientific benefits. The only reason dolphins are being bred and kept in captivity in Australia is to perpetuate their use for entertainment.

The RSPCA is opposed to the keeping of animals for exhibition or entertainment where scientific evidence indicates that their needs cannot be adequately met in a captive environment. The evidence presented here strongly indicates that the keeping of dolphins in captivity has the potential to cause adverse effects on health and welfare. In our view, legislation should be enacted in all states and territories to end the breeding and keeping of dolphins and other cetaceans in Australia.

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