

The Case Against Marine Mammals in Captivity



**THE HUMANE SOCIETY
OF THE UNITED STATES.**

WSPA

World Society for the Protection of Animals

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This document was originally prepared for The Humane Society of the United States by Naomi A. Rose, PhD, and Richard Farinato.

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Overview

In the debate over marine mammals in captivity, the public display industry maintains that marine mammal exhibits serve a valuable conservation function, people learn important information from seeing live animals, and captive marine mammals live a good life. However, animal protection groups and a growing number of scientists counter that the lives of captive marine mammals are impoverished, people do not receive an accurate picture of a species from captive representatives, and the trade in live marine mammals negatively impacts populations and habitats. The more we learn of marine mammals, the more evidence there is that the latter views are correct.

The public display industry has asserted for many years that the display of marine mammals serves a necessary educational purpose and that the animals' welfare need not necessarily be compromised to achieve this. Mostly, this assertion has gone unchallenged. But as news gets out about traumatic captures, barren concrete tanks, high mortality rates, and aberrant—even dangerous—animal behavior, people are changing the way they “see” animals in captivity.

Some facilities promote themselves as conservation enterprises; however, few such facilities are involved in substantial conservation efforts. Rather than enhancing wild populations, facilities engaged in captive breeding tend merely to create a surplus of animals who may never be released into the wild and are therefore only used to propagate the industry.

Contrary to popular perception, captures of wild marine mammals are not a thing of the past. Live captures, particularly of dolphins, continue around the world in regions where very little is known about the status of populations. For smaller stocks, live capture operations are a significant conservation concern. Even for those stocks not currently under threat, the lack of scientific

assessment or regard for welfare makes the proliferation of these operations an issue of global concern.

The public display industry maintains that it enhances the lives of marine mammals in captivity by protecting them from the rigors of the natural environment. The truth is that marine mammals have evolved physically and behaviorally to survive these rigors. For example, nearly every kind of marine mammal, from sea lion to dolphin, travels large distances daily in a search for food. In captivity, natural feeding and foraging patterns are completely lost. Stress-related conditions such as ulcers, stereotypical behaviors including pacing and self-mutilation, and abnormal aggression within groups frequently develop in predators denied the opportunity to forage. Other natural behaviors, such as those associated with dominance, mating, and maternal care, are altered in captivity, which can have a substantially negative impact on the animals.

Wild-caught marine mammals gradually experience the atrophy of many of their natural behaviors and are cut off from the conditions that allow the expression of cultural traits such as specialized vocalizations (“dialects”) and unique foraging techniques. Viewing captive animals gives the public a false picture of the animals' natural lives. Worse yet, it desensitizes people to captivity's inherent cruelties—for virtually all captive marine mammals, the world is a tiny enclosure, and life is devoid of naturalness.

Public display facilities often promote themselves as stranding and research centers. In fact, most stranded marine mammals die after they are rescued; few survive rehabilitation to be released to the wild; many releases are not monitored for success; and some animals, despite their suitability for release, are retained for public display. As for research, most studies using marine mammals in public display facilities are focused on improving captive

care and maintenance practices—very few of them address crucial conservation questions.

With any marine mammal exhibit, the needs of the visiting public come before the needs of the animals. Enclosures are designed to make the animals readily visible, not necessarily comfortable. Interactive programs such as swim-with-the-dolphins encounters and so-called petting pools do not always allow the animals to choose the levels of interaction and rest they prefer. This can elicit submissive behavior toward humans, which can affect the dominance structure within the dolphins' own social groups. Furthermore, petting pool dolphins, who are fed continuously by the visiting public, can become obese and are at risk of ingesting foreign objects.

The display industry fosters a benign—albeit mythical—reputation of marine mammals, particularly dolphins. This constitutes a form of miseducation. These species are—for the most part—carnivores with complex social hierarchies and are perfectly capable of injuring fellow group members, other marine mammals, and humans. The risk of disease transmission in both directions (marine mammal to human and human to marine mammal) is also very real. Marine mammal handlers have reported numerous health problems related to their work.

The ethical concerns raised by marine mammal captivity are especially marked for dolphins, as they may well merit the same moral stature as young human children. Although public display advocates will argue that claiming dolphins have “rights” is based solely on emotion and that these marine mammals are no different from other wildlife species in captivity, in fact the behavioral and psychological literature abounds with examples of the sophisticated cognition of dolphins. Their intelligence appears at least to match that of the great apes and perhaps of human toddlers—they are self-aware and capable of abstract thinking.

Fierce debate continues over the issue of mortality rates and longevity, especially of whales and dolphins, in captivity. The most conclusive data are for orcas; their



The social environment of captive marine mammals is severely limited. No captive facility can adequately simulate the vast ocean or provide for their complex behavioral needs. Photo: WSPA

annual mortality rates are significantly higher in captivity than in the wild. The mortality data related to live captures are more straightforward—capture is undeniably stressful and, in dolphins, results in a six-fold increase in mortality risk during and immediately after capture.

In this document, The Humane Society of the United States (The HSUS) and the World Society for the Protection of Animals (WSPA) employ scientific and ethical arguments to debunk the myths about marine mammals in captivity. And while humans can subdivide the captive experience and even conclude that one aspect is more or less damaging to the animals than another, the totality of the captive experience for marine mammals is so contrary to their natural experience that it should be rejected outright. The HSUS and WSPA believe it is wrong to bring marine mammals into captivity for the purpose of public display.

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Introduction

When drafting the Marine Mammal Protection Act of 1972 (MMPA), members of the U.S. Congress believed, or were lobbied into promoting, the long-accepted view that the public display of animals (at facilities such as zoos and aquaria) serves a necessary educational and conservation purpose. Subsequently, many domestic statutes and regional and international agreements incorporated a similar viewpoint, and wherever “take”—such as capture—was prohibited, an exemption for education and conservation was included.¹ These domestic laws and international agreements include specific provisions that support the holding of marine mammals in captivity for the purpose of public display.

This platform was adopted without the benefit of scientific research. In fact, it has only been in the last decade or so that research efforts have caught up with and begun to rebut the claims made by those who are marketing and making a profit from captive marine mammals. With this greater understanding of the needs of marine mammals and the conditions of their captivity, the public has become skeptical of assertions that the display of captive marine mammals, particularly cetaceans (whales, dolphins, and porpoises), fosters an understanding of these species and whether facilities are able to meet even the most basic needs of these complex creatures. Indeed, many believe that public display is no more than commercial exploitation of captive animals and that traumatic captures, concrete tanks, and forced confinement are inhumane. Rather than having a positive effect on education and conservation, some consider the effect of marine mammal displays to be negative. The HSUS and WSPA agree.

In the United States, the MMPA requires the National Marine Fisheries Service (NMFS) to maintain life history records on most marine mammals held in dolphinariums—facilities that use captive dolphins and other marine mammals primarily in shows—and aquaria—facilities that use captive marine mammals primarily in exhibits—in the United States and in foreign facilities that trade with U.S. facilities.² These records chart a history of disturbing causes of death, high mortality rates, and low

birth rates. The public display industry claims that this history reflects the learning curve involved in understanding marine mammal care and that future scientific analyses of life history parameters will show an improvement in these statistics. The HSUS, WSPA, and other animal protection advocates maintain that this history clearly indicates that marine mammals do not adapt well to captivity. Internationally, there is disturbingly little information about life history parameters of captive marine mammals, as there are no international oversight mechanisms, and very few countries have any requirements for maintaining adequate animal records. The information that is available suggests that survival of captive marine mammals outside North America and Europe is very poor indeed.

However, there is more to consider in this debate than life history statistics. Length of life is one thing and quality of life is another. At issue is not simply whether marine mammals live as long in captivity as they do in the wild. What must also be considered are, first, whether the lives marine mammals lead in captivity are merely different from those they lead in the wild or worse; second, whether public displays of marine mammals are educating people about these animals; and third, whether public display fosters or actually impedes conservation efforts. The public display industry maintains that captive marine mammals live good lives, people learn valuable information from seeing live animals, and dolphinariums and aquaria serve a valuable conservation function. However, animal protection groups and a growing number of scientists say that the lives of captive marine mammals are impoverished, people do not receive an accurate picture of a species from captive representatives, and the trade in live marine mammals negatively impacts populations and habitat. The more we learn of marine mammals, the more evidence there is that the latter view is correct.

U.S. records chart a history of disturbing causes of death, high mortality rates, and low birth rates.



Tricks such as tossing balls to trainers are typical “stunts” in dolphin performances. This demonstrates a dolphin’s dexterity but is hardly a natural behavior.

Education, Conservation, and Research

EDUCATION

Education is one of the most important methods of ensuring the humane treatment of the myriad other species with which we share the planet. Despite being under a legal obligation in several countries to provide an educational component in displays,³ there is little objective evidence to indicate that the public display industry is furthering the public's knowledge of marine mammals and their habitats. While a few zoos, dolphinariums, and aquaria among the more than 1,600 licensed animal exhibitors operating in the United States are involved in serious education and conservation efforts, the main purpose of these operations is to display animals for entertainment rather than to convey information.

Traditional marine mammal exhibits center on animals such as sea lions, dolphins, or whales performing “tricks” that are exaggerated variations of their natural behaviors. These tricks prevent the audience from contemplating the stark concrete and Plexiglas® enclosures, so different from the environment from which these animals were taken. Despite arguments that such entertainment makes the experience of seeing marine mammals more memorable, in a survey of 1,000 U.S. citizens by researchers from Yale University, respondents overwhelmingly preferred to see captive marine mammals expressing natural behaviors rather than performing tricks and stunts.⁴ In fact, four-fifths of the public in this survey stated that marine mammals should not be kept in captivity unless there are major educational or scientific benefits. In a 2003 survey of members of the Canadian public, 74 percent of respondents thought that the best way to learn about the natural habits of whales and dolphins is by viewing them in the wild, either directly through whale-watching tours or indirectly through television and cinema or on the Internet. Only 14 percent felt that viewing cetaceans in captivity was educational.⁵

Almost nothing is taught about natural behaviors, ecology, demographics, or population distribution during marine mammal shows. Indeed, the one thing that virtually all marine mammal public display facilities consistently avoid is providing in-depth educational material concerning marine mammal natural history or how the animals live and behave in their natural habitats.⁶ Furthermore, it has been demonstrated that the information facilities present is sometimes scientifically incorrect or distorted to portray the facility in a better light.⁷ The deliberate distortion—or ignoring—of current scientific knowledge is well illustrated by certain dolphinariums when representatives explain the so-called “drooping fin” syndrome⁸ and the life spans of captive orcas (*Orcinus orca*, also known as killer whales)⁹ to visitors.

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Traditional dogma states that the display of live animals is required to educate people about a species (and therefore to care about the species and its habitat). But animatronics (robots), DVDs, videotapes, IMAX® theaters, interactive and traditional museum-type displays, and virtual reality simulations could and should replace dolphin and sea lion shows and, in many cases, live exhibits altogether. It is true that people may respond on a basic emotional level to seeing a live animal on display, and performances may also reinforce the bond with an individual animal felt by members of the audience. But because of the nature of these performances, the perceived bond is not with an actual creature but with an idea of that creature that has been crafted by the facility.



Stranded cetaceans who do not die on the beach or are not pushed back into the ocean alive may be taken into captivity for rehabilitation, where survival is uncertain. Photo: WSPA

The HSUS and WSPA maintain that exposure to live captive animals does exactly the opposite of what the industry rhetoric claims: instead of sensitizing visitors to marine mammals and their habitat, it desensitizes humans to the cruelty inherent in removing these animals from their natural habitats and holding them captive.

Evaluation of the performances' scripts and settings, as well as observation of the audiences' reactions reveal that a performance is not an educational vehicle but a show in which miseducation (in the form of inaccurate representation of such things as normal behavior, life span, appearance, and social structure) occurs more often than not.¹⁰ To illustrate, many actions performed by dolphins in shows that are portrayed as "play" or "fun" are actually displays that in wild animals would be considered aggressive, akin to a dog growling or snarling.¹¹

When public display facilities assert their educational effectiveness, they frequently cite annual attendance figures, apparently convinced that visitors learn about marine mammals simply by walking through a turnstile. But the response that is elicited by mere exposure to live captive animals does not translate directly into practical action or even heightened ecological awareness, as public display rhetoric claims.¹² Some in the display industry recognize this; the president of the Zoological Society of Philadelphia stated in a welcoming speech to a conference on education: "The surveys we have conducted ... show that the overwhelming majority of our visitors

leave us without increasing either their knowledge of the natural world or their empathy for it. There are even times when I wonder if we don't make things worse by reinforcing the idea that man is only an observer of nature and not a part of it."¹³

In fact, The HSUS and WSPA maintain that exposure to live captive animals does exactly the opposite of what the industry rhetoric claims: instead of sensitizing visitors to marine mammals and their habitat, it desensitizes humans to the cruelty inherent in removing these animals from their natural habitats and holding them captive.¹⁴ Repeated exposure to a dolphin swimming in a pool or a polar bear (*Ursus maritimus*) pacing in a concrete enclosure encourages people to consider wildlife as isolated objects or as servants to human needs and desires¹⁵ rather than as integral elements of an ecosystem with their own intrinsic value.

THE CONSERVATION FALLACY

Public display facilities have increasingly promoted themselves as conservation centers, in some cases changing their names to reinforce this image. Through skillful marketing and public relations, they miss no opportunity to emphasize their role as modern arks, hedges against the extinction of endangered species in the wild. Most public display facilities, however, do no more than produce multiple generations of a limited group of species and do not maintain true conservation programs at all.

While several zoos have programs to breed endangered species in captivity with the intention that these animals be used in restocking depleted populations, this is not the case with cetaceans. At present there are no facilities engaged in the captive breeding of critically endangered cetacean species such as the baiji or Yangtze river dolphin (*Lipotes vexillifer*) or the vaquita (*Phocoena sinus*), despite these animals being two of the most endangered mammal species in the world.¹⁶ In fact, only one member of the Alliance of Marine Mammal Parks and Aquariums (AMMPA)—the main industry association that represents captive dolphin facilities—routinely provides funding or grants to promote the conservation of critically endangered river dolphin species.¹⁷

Public display facilities with the financial resources, staff capability, and commitment to engage in or support conservation programs for any animal species have always been few in number. The requirements of providing the public with a satisfying recreational experience are often incompatible with those of operating a research

or breeding facility (this is the reason for the development of the off-premises breeding facilities associated with a handful of zoos). The claim that conservation is a primary purpose of the captivity industry as a whole is highly misleading at best. Fewer than five to 10 percent of zoos and dolphinaria are involved in substantial conservation programs either *in* or *ex situ*, and the amount spent on these programs is a mere fraction of the income generated by the facilities.¹⁸

Dolphinaria and aquaria still acquire several species of marine mammals directly from the wild. Contrary to conservation principles, little serious work has been done to ascertain what effect these captures have on the populations from which these animals are taken¹⁹ or on the individuals who may be captured but then immediately released because they are deemed unsuitable. The U.S. government requires some environmental impact analyses to be made before captures are permitted, but the analyses are generally considered inadequate, and the same restrictions do not even hold in foreign waters, where only vaguely defined “humane methods” may be required.

If dolphinaria and aquaria were truly concerned about conserving species in the wild, they would be dedicated to determining the effects of their capture activities on the animals left behind and to improving disruptive and stressful capture techniques (see “Live Captures”). They would also willingly submit to strict national and international regulations. They do none of these things.

In fact, the public display industry has actively lobbied to prevent the International Whaling Commission (IWC) from adopting measures to regulate directed hunts of small cetaceans (a group that includes dolphins, porpoises, and beaked whales). Currently there are few international agreements or laws protecting these vulnerable and, in some areas, heavily exploited species; many activists, scientists, and politicians believe that the IWC should regulate the hunts and fisheries involving small cetaceans.²⁰ However, the public display industry opposes this extension of IWC authority, apparently because this much-needed oversight might interfere with the display industry’s ability to capture animals for its collections in various locations around the world.²¹

LIVE CAPTURES

Most cetacean capture methods are extremely traumatizing, involving high-speed boat chases and swimmers violently wrestling animals into submission before hauling them onto a boat in a sling and then dumping them

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into shallow temporary holding tanks. All cetacean capture methods are invasive, stressful, and potentially lethal, although the method generally considered the most humane by natural resource managers is seine-netting. During a seine-net capture, dolphins are chased by small boats and then herded together and encircled by the net. Chasing and net encirclement of dolphins is extremely stressful by itself and has led to the decline or hindered the recovery of some dolphin populations.²² Accidents have also occurred, causing the deaths of entangled animals.²³ The whole process is so traumatic that mortality rates of bottlenose dolphins (*Tursiops truncatus*) captured from the wild shoot up six-fold in the first five days of confinement.²⁴ The dolphins not selected and released from the net may experience a similar risk of dying once the capture operators have left the area.

A capture method commonly used on oceanic cetaceans, such as Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), is “hoop netting.” This method takes advantage of the species’ tendency to “bowride,” or swim at the front of boats. The captor lowers a pole attached to a collar from the front of the capture vessel over the head of a swimming dolphin. This collar is attached to a



Holding pools of newly captured animals may be quite primitive—no more than boxes lined with plastic tarps, with no filtration. Photo: WSPA



Standards for marine mammal care are woefully inadequate, if they exist at all. In Latin America, the Caribbean, and Asia, where captive marine mammal programs are opening at an unchecked rate, animals are often kept in deplorable conditions. Two dolphins were kept in this filthy, fresh-water swimming pool for three months and were on the brink of death when discovered. Photo: WSPA



Drive fishermen haul on a bloody net used to entrap bottlenose dolphins. Photo: Elsa Nature Conservancy

break-away net, and as the dolphin swims away, the animal becomes entangled. The dolphin is pulled to the side of the vessel and then hoisted aboard.

The most violent and cruel method of collecting cetaceans for captive facilities is the drive fishery, used primarily in Taiji and Futo, Japan. This hunt involves a flotilla of small boats that—through producing loud noises when the crews bang on hulls, or clang metal pipes together underwater—herd cetacean groups into shallow water. Some of the animals are set aside for sale to captive display facilities, while the remainder are killed with long knives or spear-like tools and butchered.²⁵

In 2003, 78 cetaceans were sold to aquaria and dolphinaria by hunters in Taiji.²⁶ In 2005, a hunt involving about 100 bottlenose dolphins in Futo was revived (no hunt had taken place there since 1999 and dolphin watching is now a growing industry), apparently solely to acquire animals for public display facilities in Japan.²⁷ Fourteen dolphins were sold to aquaria, five were killed for “scientific studies,” and at least four (and almost certainly more) were drowned in the panic and chaos of the entrapment in Futo port. The remainder were released to an uncertain fate. Each dolphin slaughtered in these hunts is worth only a few hundred U.S. dollars on the open market as meat or fertilizer, but live animals fetch up to tens of thousands—the large profits from the few animals sold from each hunt help to subsidize and maintain the drive fishery and the hunters’ employment.

Many drive-hunted animals, of several species, are found in Japanese and other Asian dolphinaria. Ocean Park in Hong Kong obtained animals from drive fisheries in Japan while Hong Kong was governed by the United Kingdom.²⁸ Ocean Adventures, a facility in Subic, the Philippines, received a shipment of false killer whales (*Pseudorca crassidens*) from a Taiji drive hunt in March 2004. The person who procured these animals for Ocean Adventures is an American.²⁹ The problem, however, is not confined to Asia—at least 20 false killer whales caught by this method have been imported into the United States. However, since 1993 no permits have been issued to U.S. facilities to import cetaceans collected from Japanese drive fisheries.³⁰

Although drive-hunted animals have not been imported into the United States for more than a decade, the government has allowed the exporting of marine mammals caught in U.S. waters to facilities in Japan that hold drive-fishery-caught animals.³¹ Sea World

Incorporated has also applied for permits that would have allowed it to collect reproductive and other tissues from animals captured and killed in drive fisheries.³²

Aside from humane considerations, removal of animals from wild populations can have a substantial negative impact on the animals left behind. Research on bottlenose dolphins shows that certain individuals play a crucial role in holding dolphin communities together.³³ If these individuals are removed, the dolphin group might lose cohesion and disperse. This could have serious survival implications for the remaining animals, as having a well-organized group is crucial when dolphins forage for food or have to defend themselves against competitors and predators.

In a survey of the U.S. public, 60 percent of respondents disapproved of aquaria capturing marine mammals from the wild, and nearly 90 percent supported government restrictions on exporting marine mammals to facilities that do not meet U.S. educational or treatment standards.³⁴ Even the broader captive-animal industry disapproves of live capture³⁵ yet does little or nothing to stop the practice. Captures of non-cetacean marine mammals occur only rarely today, as these species either breed relatively well in captivity (e.g., California sea lions, *Zalophus californianus*) or are acquired when dependent young are orphaned in hunts or through strandings (e.g., polar bears). Thus, deliberately organized live captures for public display remain a significant problem primarily for cetaceans.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the treaty organization that governs international trade in wildlife species, requires an exporting country to provide a “non-detriment finding” (NDF) to support wildlife captures and trade involving certain species (including many cetaceans).³⁶ An NDF is supposed to be based on scientific studies of the abundance and status of the wild stock from which exported animals were taken, as well as a scientific assessment that shows that removing the animals will not cause the stock’s depletion.

Despite this requirement, over the past few years there have been increasing numbers of captures of cetaceans from the wild for public display facilities, accompanied by weak or insubstantial NDFs. These captures have been very controversial, in part because no consideration was given to the impact of these removals on the wild populations. This is now considered a critical conservation issue; the World Conservation Union (IUCN)



Bottlenose dolphins panic and thrash in their own blood, as snorkelers search for young, uninjured animals for sale to dolphinaría. Photo: Elsa Nature Conservancy



These false killer whales are destined for the slaughterhouse. They are still alive, although their spines are probably damaged from being suspended in the air. Photo: Elsa Nature Conservancy

2002–2010 Conservation Action Plan for the World's Cetaceans states, “As a general principle, dolphins should not be captured or removed from a wild population unless that specific population has been assessed and it has been determined that a certain amount of culling can be allowed without reducing the population's long-term viability or compromising its role in the ecosystem. Such an assessment, including delineation of stock boundaries, abundance, reproductive potential, mortality, and status (trend) cannot be achieved quickly or inexpensively, and the results should be reviewed by an independent group of scientists before any captures are made. Responsible operators (at both the capturing end and the receiving end) must show a willingness to invest substantial resources in assuring that proposed removals are ecologically sustainable.”³⁷ Virtually everywhere cetacean captures happen today, no such investment has occurred.

This is one of the glaring loopholes of the current CITES NDF structure—as long as the exporting country certifies that the trade follows scientific principles (with no independent verification) and breaks no national or local laws, no CITES violation occurs. The fact that CITES does not have any oversight or review mechanisms to determine the validity of an NDF—many of which are often revealed as faulty or at least questionable after the trade has taken place—is one of the reasons an increasing number of member nations are calling for an end to trade with nonmember countries.

Bottlenose dolphins

A primary “hot spot” for bottlenose dolphin captures is the Caribbean. Cuban authorities have issued capture quotas of—on average—15 bottlenose dolphins per year from national waters.³⁸ To date, there have been no reported population estimates or completed assessments of the stocks of cetaceans in the coastal waters of Cuba, nor any studies to determine whether these removals are sustainable or whether they are having an impact on Cuban cetacean populations. Many of these animals have been sold to other facilities in the Caribbean (with others being exported to Europe and Mexico), yet clearly any NDF Cuba has issued to support this trade has no substance behind it. Therefore, exports of dolphins from Cuba should theoretically be precluded under international regulations; however, they continue unchallenged.

The IUCN Cetacean Specialist Group (CSG) has identified the investigation of live-captures of bottlenose dolphins from Cuba as one of its priority projects, due

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to concerns about the potential for depletion of coastal stocks of these animals. Similar concerns are also voiced for catches of coastal bottlenose dolphins in Mexican waters in the Gulf of Mexico. The IUCN CSG has recommended that, at a minimum, 50 genetic samples (through biopsy darting) and at least three complete surveys (using appropriate scientific methods) must be done before the status of these animals can be determined, and therefore before any captures should be considered.³⁹

Many members of the general public believe captures of wild cetaceans are a thing of the past, encouraged in this mistaken belief by the display industry. Indeed, in the United States there have been no captures of bottlenose dolphins from the wild since 1989.⁴⁰ However, captures are increasing in other parts of the world—recent examples include one in December 2000, when eight bottlenose dolphins were captured off the Pacific coast of the Baja California Sur peninsula. They were then transported to the Dolphin Learning Center dolphinarium at the La Concha beach resort in La Paz, Mexico, on the peninsula's Sea of Cortez side. In another incident, in August 2002, eight bottlenose dolphins were captured from the coastal waters of the Parque Nacional del Este (National Park of the East) in the Dominican Republic and sent to a local facility, Manatí Park. A third capture occurred over several months in 2003, when entrepreneurs in the Solomon Islands took advantage of a



Many captures in the developing world are carried out from small boats, using home-made equipment (nets and slings) that can injure dolphins. Photo: COMARINO



Dolphin mortality shoots up six-fold during and immediately after capture. The ordeal is stressful and can cause physical injuries. Photo: COMARINO

period of government instability and caught a minimum of 94 bottlenose dolphins for international trade to dolphinarium (there were at that time no local public display facilities in the Solomon Islands).⁴¹

On a more positive note, at the 2002 CITES Conference of the Parties, the nation of Georgia managed to get a zero quota adopted for the commercial export of wild-caught Black Sea bottlenose dolphins.⁴² Between 1990 and 2001, about 120 live Black Sea bottlenose dolphins were traded across national borders for public display, with Russia being the main exporter. This is in addition

to an estimated 25 to 50 animals who are caught every year to supply local dolphinarium and aquaria in countries bordering the Black Sea. Georgia had been motivated to introduce this proposal due to concerns about the impact of these trades on a dolphin population that had been depleted by historical culling and, in the present day, by high levels of pollution and other human activities. Because exports of wild-caught animals for the lucrative international trade are now effectively prohibited (although enforcement of the export ban continues to be an issue), one stress factor on this declining population has been reduced.

Orcas

The detrimental impacts of removing animals from a population might be most clearly seen in the case of orcas in Washington State. From 1962 until it was made illegal under state law in 1976, 45 orcas were taken from the “Southern Resident” population in Washington State. At least 11 animals died during capture, and the surviving 34 were shipped to aquaria and dolphinarium, of which only one animal is currently alive.⁴³ The current population is believed to have been effectively halved by these removals.⁴⁴

Historically, another hot spot of activity was Iceland—dozens of orcas were captured for foreign trade in a live-capture fishery sanctioned by the Icelandic government in the 1970s and 1980s. These captures stopped in the late 1980s, when the controversy surrounding live orca captures increased. They also occurred historically in the waters off Japan but ended due to local depletions in the late 1980s. Orcas had not been seen off Wakayama Prefecture in Japan for 10 years when a pod was sighted in February 1997. Ten animals were captured by fishermen from Taiji, of which five, all juveniles or sub-adults, were sold to aquaria and the remainder released. The animals were captured under a 1992 Japanese fisheries agency permit that allowed the take of five animals per year for “research” purposes. Within five months, two of the animals had died.⁴⁵ A third member of the so-called “Taiji Five” died in September 2004.

In another example of live captures of orcas, in 2001 and 2002 Russian authorities gave permission to capture up to 10 orcas from waters off Kamchatka for the purpose of public display. Although initial attempts at captures were unsuccessful, in September 2003, a five-meter female was successfully captured, initially for transfer to one of the Utrish Aquarium’s facilities. One juvenile drowned during the capture; the female died

30 days later.⁴⁶ The agencies involved in these captures have done nothing to assess what impact the takes might have had on the wild population. There is a major international collaborative project being conducted to ascertain how many orcas inhabit this region, but at present, there is still no definitive population estimate.⁴⁷

Belugas

Since May 1999, Marineland in Canada has imported 10 wild-caught Black Sea bottlenose dolphins (a practice recently prohibited—see above) and 20 wild-caught beluga whales (*Delphinapterus leucas*) from Russia, for a total of 30 wild-caught animals in just five years.⁴⁸ As with other live captures, appropriate scientific surveys to assess the impact of the removals were not conducted.

Marineland is still importing live-caught cetaceans, at a time when the practice of keeping cetaceans in captivity in Canada is controversial. In a recent poll, approximately two-thirds of those surveyed did not support the captivity of whales and dolphins and thought that the use of captive whales and dolphins for commercial purposes in Canada should be stopped. In addition, more than half of those interviewed said they would support laws that prohibit the importation of live whales and dolphins into Canada.⁴⁹

There is a notable lack of conservation-priority species being bred in dolphinarium, which does not support the claim that their captive breeding programs are for conservation purposes.

Belugas have also recently been imported (primarily from Russia) by China, Thailand, Egypt, Taiwan, Bahrain, and Turkey.⁵⁰ Most of these countries do not have facilities capable of keeping this Arctic species at an appropriate temperature. As with Cuba and its bottlenose dolphins, Russia sees its belugas as a resource for generating hard currency—the sustainability of its capture program and the welfare of the animals are distant considerations at best.

SPECIES ENHANCEMENT PROGRAMS

One way dolphinarium and aquaria try to justify their existence is by claiming that they are aiding in the conservation of species through species enhancement

programs; that is, breeding endangered species in captivity to someday supplement depleted wild populations.⁵¹ Species enhancement programs have become the focus of many zoos in the developed world, and, in fact, zoos in Europe are legally required to undertake such programs with the aim of releasing captive-bred animals into the wild.⁵²

If species enhancement programs were truly a primary purpose of dolphinarium, they would be targeting species that are at risk in the wild or are from depleted populations. However, most captive cetaceans in U.S. facilities are nonendangered orcas or bottlenose dolphins, whose populations, if depleted, may in fact owe their reduced numbers to removals by the captive display industry!⁵³ There is a notable lack of conservation-priority species being bred in dolphinarium, which does not support the claim that their captive breeding programs are for conservation purposes.

It has been estimated that if dolphinarium were serious about breeding a captive population for conservation purposes, they would need many more animals than they typically hold for most species to keep the appropriate amount of genetic diversity.⁵⁴ The captive display industry appears to be attempting to produce a “captive adapted” population of marine mammals that would over time become unfit for release to the wild.⁵⁵ This is counter to the stated purpose of most captive-breeding programs, which is usually linked to species enhancement.⁵⁶

We reiterate—the core of any successful species enhancement program is the ability to reintroduce captive-bred progeny into the wild.⁵⁷ In comparison, the actions of the public display industry in managing and breeding captive marine mammals, and their efforts to prevent captive animals from being released, expose their claims as being mere lip service to conservation.

As the capture and import of animals have become problematic from economic, logistical, and image standpoints, dolphinarium and aquaria have made captive breeding a central objective, which they dress up in terms of species enhancement or conservation. However, the way in which this is done is completely inappropriate. Rather than for conservation, the species that are bred usually reproduce readily in the wild (i.e., their numbers are not limited in natural habitat by low reproductive rates), and the animals are bred merely to provide replacement stock for public display—an ongoing need given the high rate of mortality in captivity.⁵⁸

Most captive-breeding programs simply ensure a supply of animals for display or trade, creating in many cases a growing number of surplus animals of questionable genetic backgrounds.

MIXED BREEDING AND HYBRIDS

Contrary to the conservation myth proffered by the public display industry, the captive birth of an animal does not necessarily enhance its species' prospects for survival. For example, the birth of an orca of mixed Atlantic and Pacific genetic stock is an event that has virtually no connection to the conservation of orcas or their habitat, because, among other things, the animal is genetically mixed and cannot be released into either population. Animals from populations that could not breed together in the wild due to geographic separation regularly have offspring in captivity. Even worse, cetaceans belonging to completely different species have been bred together to produce unnatural hybrids,⁵⁹ which could not be released and have absolutely no value in terms of species conservation. Most captive-breeding programs simply ensure a supply of animals for display or trade, creating in many cases a growing number of surplus animals of questionable genetic backgrounds. These animals are poor candidates for release into the wild or, for that matter, future breeding efforts, and face uncertain futures at best.

CAPTIVE CETACEANS AND CULTURE

It is becoming increasingly clear that culture exists within many marine mammal populations. By "culture," we mean specialized behaviors that are taught to, and learned by, animals within the group or population, many of which are important for the survival of the animals in the wild, such as specialized foraging techniques that allow successful prey capture in a particular ecosystem and unique vocalizations—dialects, in effect—that apparently serve to enhance group cohesion and recognition.⁶⁰ Recent research has highlighted the importance of culture in the conservation of marine mammals, calling it "the source of survival skills fundamental to the daily lives of these animals."⁶¹ It has long been known that whales and dolphins learn essential life skills from their mothers and also other group members. This is one of the reasons that cetaceans in particular, but also other marine mammal species such as walruses (*Odobenus rosmarus*), stay so long with their mothers—



Most pinniped species breed readily in captivity, but few of those held are endangered or threatened. These breeding programs thus serve no obvious conservation purpose.

Unfortunately, captive facilities routinely separate cetacean calves from their mothers and move them to other facilities or enclosures long before they would accumulate the skills necessary to fend for themselves in the wild.

for a lifetime in the case of male orcas in several populations, for example.

Despite the importance of culture in marine mammals, captive facilities do not take this into account in the husbandry (care and maintenance practices) of their animals.⁶² This fact yet again refutes the arguments that captive facilities are breeding marine mammals for conservation purposes. If animals cannot maintain these essential survival skills, they have little or no hope of being released into the wild. Also, because the skills are passed from adults to calves, the animals' offspring will also be doomed to lifetimes in captivity.

Unfortunately, captive facilities routinely separate cetacean calves from their mothers and move them to other facilities or enclosures long before they would accumulate the skills necessary to fend for themselves in the wild. For example, Sumar, a male orca born at Sea World Orlando, was separated from his mother at only

six months of age and was moved to California when he was less than 10 months old. Similar cases have been recorded for other orcas.⁶³

But it is not just in orcas that cultural behaviors are an issue; bottlenose dolphins in captivity have actually been reported to adopt and produce sounds such as their trainers' whistles,⁶⁴ another clear example of their natural culture being supplanted by an artificial one. The development of such aberrant behavior may preclude these animals, or their offspring, from being released into the wild—at a minimum, it makes their rehabilitation more challenging. If captive facilities were serious about the concept of species enhancement programs, they would isolate whales and dolphins from animals who are not from the same population or area and would not expose them to human-made sounds. Marine mammals would also be isolated from human contact. Wildlife veterinarians and biologists would agree that animals to be rehabilitated or reintroduced to the wild should have minimal contact with humans, should live in an environment as close to their native habitat as possible,⁶⁵ and certainly should not be trained to perform “tricks.”

Another problem with this loss of culture in captive cetaceans is the associated increase in marine mammal mortality. Female cetaceans learn essential nursing skills from their mothers and also from other females in their population, sometimes acting as baby-sitters for the calves of other mothers. Separating calves from their mothers or other females from their population at an early age, or forcing animals to become pregnant when too young to have learned essential skills or achieved the maturity to rear a calf,⁶⁶ can lead to high levels of infant mortality.⁶⁷

THE CAPTIVE DISPLAY INDUSTRY “DOUBLE STANDARD”

While on one hand the captive display industry publicly touts its species enhancement programs as being a reason for its continued existence, its actions (as illustrated above) and words refute this argument. Many members of the public display industry have consistently maintained that wild-caught cetaceans held in long-term captivity, let alone captive-bred progeny, cannot be rehabilitated and returned to the wild.⁶⁸ Husbandry and training methods and the constant exposure of the animals to humans lessen animals' chances of being released—a self-fulfilling prophecy.

If the industry's principal justification for captive breeding is to develop successful enhancement programs for current or future endangered or threatened cetacean species, then the industry should foster rehabilitation and reintroduction research rather than oppose it.

To put marine mammal facility actions in this regard into context, an inter-zoo species enhancement program for the golden lion tamarin resulted in a nearly 20 percent increase of the wild tamarin population within the first 10 years of the program. Thus, a total of 16 percent of all wild golden lion tamarins are reintroduced captive-born animals or their descendants.⁶⁹ However, through the decades that bottlenose dolphins have been kept in captivity, very few captive-bred animals have been released into the wild by the captive display industry. In fact, we were able to document only six: four as part of a larger Australian release project on 13 January 1992,⁷⁰ and two animals released in the Black Sea in 2004. However, the release of these latter two animals was controversial, to say the least.⁷¹

Few captive whales and dolphins have been deliberately rehabilitated and released after long-term captivity.⁷² In several countries, animals have been released after the closure of facilities, including one bottlenose dolphin in Brazil,⁷³ three bottlenose dolphins from U.K. facilities,⁷⁴ nine dolphins in Australia,⁷⁵ two dolphins in Guatemala,⁷⁶ and two dolphins in Nicaragua.⁷⁷ In the United States, four bottlenose dolphins have been released from captive research facilities,⁷⁸ with one of the releases involving a considerable effort to monitor the fate of the animals after their release. This latter effort demonstrated scientifically that wild-caught dolphins kept in captivity can be returned to the wild. Probably the best-known released captive cetacean was Keiko, the whale from *Free Willy*.⁷⁹

However, the releases above have primarily been from research facilities or as the result of the closure of public facilities, with the majority of the cost of rehabilitation and release being funded by academic institutions and animal protection groups rather than public display facilities themselves. The complete lack of industry-backed rehabilitation and release programs for captive cetaceans or industry funding for the development of such is very marked.



Keiko, star of the movie Free Willy, was captured very young before he was able to acquire the cultural knowledge of Icelandic orcas. Photo: The HSUS

In fact, the public display industry has actively hindered the efforts of those who wish to conduct the work necessary to determine successful and safe methods of returning captive cetaceans to the wild.⁸⁰ If the industry's principal justification for captive breeding is to develop successful enhancement programs for current or future endangered or threatened cetacean species, then the industry should foster rehabilitation and reintroduction research rather than oppose it.

There is an economic motive for the public display industry's opposition to the rehabilitation and release of captive-bred cetaceans. Research might prove that cetaceans who have been long-term captives can be successfully rehabilitated, returned to the wild, and reintegrated into a social group—or even the specific families from which they were removed. If so, for humane reasons, the general public may object even more strongly to the maintenance in captivity of these intelligent, long-lived species and may advocate the release of all eligible candidates.

Two typical arguments the industry makes against subjecting captive cetaceans to the admitted risks of reintroduction are that (1) it would be unethical, inhumane, and unfair to the individual animals chosen, and (2) reintroduction has never been done before with systematic and scientific methodology and monitoring.⁸¹ Neither of these arguments stands up to scrutiny.

It seems clear that what the captive industry says and what it does are two entirely different things. “Captive breeding” and “conservation” are simply buzzwords used to gain the approval of an unsuspecting public.

The first argument is hypocritical: the industry did not show the same reluctance when, for example, dozens of orcas were originally brought into captivity 35 to 40 years ago. Those animals were exposed to unknown (and in many cases fatal) risks, treated as subjects in an ongoing trial-and-error experiment. The second argument, aside from being factually incorrect, implies an industry position against all new scientific research that poses health or survival risks to living creatures, even when there may be substantial benefits to the individual or to the species. On the contrary, however, the industry promotes a pro-research position, even when there are risks, arguing the benefits outweigh the costs. So once again, there is a double standard.

In the case of cetaceans in particular, the behavior of the public display industry makes a mockery of alleged intentions to foster the conservation of species through species enhancement programs and captive breeding. It seems clear that what the captive industry says and what it does are two entirely different things. “Captive breeding” and “conservation” are simply buzzwords used to gain the approval of an unsuspecting public.

ETHICS AND CAPTIVE BREEDING

Along with the substantive arguments outlined above, one must also weigh the ethical considerations of captive breeding programs. Taking an individual from the wild for captive breeding purposes obviously raises ethical concerns. Individuals are denied freedom and exposed to stress and other risks in order to preserve an entire species. To make such programs even remotely morally justifiable, the animals being placed in captivity should be better off, or no worse, than they would be in the wild.⁸² This is not possible with regard to captive marine mammals, as exemplified by orcas, who experience far shorter lives in captivity when compared to the wild (see “Mortality and Birth Rates”).

If habitat is being destroyed and no viable options are available for a natural migration to a protected area, then there may be an ethical justification for bringing animals into captivity. However, this again is not the case with marine mammals. Little—if any—research is conducted



Stranding networks, to which many dolphinaria and aquaria belong, collect valuable data from living and dead animals. Animals rescued alive are sometimes kept for display.
Photo: Regina Asmutis-Silvia

on the habitats from which marine mammals are removed, so it is impossible to determine their status. In addition, most marine mammals currently in captivity are, or descend from, animals from relatively undisturbed or protected habitats (such as the waters around Iceland in the case of orcas, or U.S. coastal waters in which marine mammals enjoy a variety of legal protections like the MMPA). So the argument that species enhancement programs are ultimately for the benefit of marine mammals as a whole fails on moral and ethical grounds as well as in practice.

STRANDING PROGRAMS

The one area of activity in which dolphinaria and aquaria can legitimately claim to serve a conservation function is work involving the rescue, rehabilitation, and release of stranded marine mammals. Indeed, there are some very good stranding rehabilitation programs (although not all are associated with public display

The public receives a skewed picture in which an animal's natural environment is hostile and captivity is a benign alternative, a picture that is implicitly contrary to both conservation and welfare principles.

facilities); for example, the Sea Life Centre franchise in the United Kingdom takes pains to rehabilitate stranded young seals, teaching them to forage for live fish, while minimizing direct exposure to humans. The seals are eventually released back into the areas where they were originally found (or as close to these areas as possible).

But even stranding programs, as they are now conducted, give cause for concern, especially in the United States. Often the rescue efforts of the industry seem motivated by the desire to create better public relations. By saving injured manatees (*Trichechus manatus*) or by rehabilitating stranded dolphins, often spending many thousands of dollars in the process,⁸³ facilities persuade the public that they are altruistic and that they care for marine mammals in the wild—a public relations benefit worth the large investment of funds. While rescues are frequently heavily advertised in the media and releases even more so, failed rescues (when an animal dies while in a facility's care) are played down.

A more subtle facet of the issue is that the public display industry takes every opportunity to use a stranding as proof that marine mammals' natural habitat is a dangerous place full of human-caused and natural hazards. The public receives a skewed picture in which an animal's natural environment is hostile and captivity is a benign alternative, a picture that is implicitly contrary to both conservation and welfare principles.⁸⁴

Also disturbing is the fact that public display facilities that rescue stranded animals appear to evaluate each animal in terms of display potential. Species that are highly desirable, such as orcas, or rarely observed in captivity, such as spotted dolphins (*Stenella frontalis*), manatees, or Risso's dolphins (*Grampus griseus*), may be determined to be unsuitable for release; these determinations are made with little oversight from either independent or government agencies. By rescuing these animals, a facility acquires an exotic exhibit at little cost, either financial or in terms of public relations.⁸⁵

RESEARCH

As mentioned previously, the majority of the public, as evidenced in opinion polls such as those conducted in the United States and Canada, believes that marine mammals should not be kept in captivity unless there are major educational or scientific benefits.⁸⁶ As a result, dolphinaria and aquaria often claim that they foster research and scientific study of marine mammals, thereby contributing to both education and conservation. However, much of what can be learned from cap-

Captive studies have been known to give erroneous and misleading information, not borne out by comparative studies on wild animals, and researchers using captive animals have admitted that the constraints put on cetaceans, such as small pool sizes limiting natural behaviors, lead to biases in their results.

tive marine mammals has in fact already been learned. Reproductive physiology, such as length of gestation, and general physiology, such as visual acuity, have already been examined in some detail. Furthermore, using reproductive information from captive cetaceans may actually be detrimental to conservation and management due to unnatural and atypical breeding behavior in the artificial groupings of captive animals.⁸⁷

There may be some research questions that the study of captive animals can answer most directly (such as questions regarding cognition or the impacts of human-caused noise on hearing), but research programs that are not part of the entertainment industry could address those questions. Indeed, due to advancements in technology, such as biopsy darts, electronic tags, and underwater video, as well as improvements in capture and release techniques, in-depth study of the behavior and physiology of wild, free-ranging marine mammals is now possible, adding to the redundancy of captive animals as research subjects.

Captive animals can answer few of the many questions scientists have about natural social interactions. Most of the current behavioral research using captive animals relates to husbandry concerns,⁸⁸ does little to benefit wild animals,⁸⁹ and can provide some dubious results.⁹⁰ Behavioral ecologists do not in general look to public display facilities to conduct their studies. The future in behavioral research lies indisputably in the wild. In fact, captive studies have been known to give erroneous and misleading information, not borne out by comparative studies on wild animals,⁹¹ and researchers using captive animals have admitted that the constraints put on cetaceans, such as small pool sizes limiting natural behaviors, lead to biases in their results.⁹²

Even more alarming is the tendency by some public display facilities to market themselves as research organizations and gain nonprofit tax status, although their primary function is to provide entertainment and tourist attractions. The Dolphin Research Center (originally named the Flipper Sea School) in the Florida Keys calls



The social environment for captured dolphins is radically changed. Individuals who might never socialize in the wild are forced into close proximity, which can lead to stress and injury. Photo: WSPA

itself an education and research facility and in 2003 made US\$3.4 million, primarily through admissions and fees charged for in-water encounters with captive dolphins.⁹³ Despite having an annual income that would rival some marine laboratories, the actual research conducted is minimal, primarily relying on outside researchers to use the captive animals as test subjects.⁹⁴

To illustrate the relative paucity of marine mammal research contributed by public display facilities, papers presented at the 2003 Society for Marine Mammalogy biennial conference included 469 studies dealing with aspects of cetacean biology; only four percent of these were the result of work with captive animals. Of these few studies, more than a third were conducted through dedicated scientific institutions that are not open to the public. There were no abstracts submitted by some of the larger public display facilities (such as Sea World Incorporated).⁹⁵

Research on captive animals can only be justified in circumstances where it is necessary to resolve critical questions to benefit the animals themselves or animals in the wild. It should be conducted through research-sabbatical programs, in which animals are held only for brief periods. Such programs have been pioneered successfully by several marine mammal researchers.⁹⁶ Dolphinariums are not essential to continued research on marine mammals.



Most cutting-edge behavioral research is being conducted on wild populations, with the aid of innovative technologies and methodologies. Captive marine mammals can offer only limited views of natural behavior and social structure.

The Physical and Social Environment

The preceding discussion illustrates the fallacies and inconsistencies in various arguments used to justify the holding of marine mammals in captivity for public display. In the discussion that follows, physical, environmental, and behavioral factors, as well as life-history parameters, are examined and compared for marine mammals living in captivity and in the wild to more concretely illustrate the fundamental inhumanity of holding these species in confinement.

In any design of a dolphinarium or aquarium, satisfying the needs of the visiting public and the facility's budget comes before meeting the needs of the animals. If every measure were taken to create a comfortable, safe, and appropriate habitat, then the size, depth, shape, surroundings, props, colors, and textures of enclosures would be different from those seen now. The tanks speak for themselves. Their overall size, shape, and depth are determined by the need for maximum visibility from the surrounding bleachers. The design is also influenced by economics (it becomes prohibitively expensive to build larger enclosures) and management concerns (the control of large, dangerous animals becomes infinitely more difficult as the space allotted to them increases, and efficiency of maintenance and disinfection dictates slick surfaces as opposed to intricate textures and naturalistic substrates, which would simulate the natural marine environment).

Sea pens are enclosures that are fenced-off portions of open seawater or lagoons, and are generally thought to be preferable to a tank. Marine mammals are held in natural seawater, as opposed to chemically treated, filtered, and artificial saltwater. The surroundings may often be more "natural" or complex and thus more "interesting" for the marine mammals than a typically featureless tank.

However, sea pen conditions can lead to problems with, and even the death of, marine mammals kept within them. For example, pens may be close to a source of pollution (such as runoff from roads, sewage outfalls, or water leached from land-based septic tanks).⁹⁷ Also, the animals may be exposed to high levels of sound, which can cause distress or hearing damage. Noise from boat traffic and coastal development may echo off the shallow seabed, creating sound levels well above those in the open ocean.

Many of these sea pen facilities are also in areas subject to hurricanes or typhoons. Penned animals cannot escape storms, and facilities frequently do not evacuate animals (and contingency plans are often wholly inadequate). The aftermath of a hurricane can leave sea pens clogged with debris and contaminants, with dolphins suffering severe injuries, disease, and even death.⁹⁸ Hurricanes can also lead to animals escaping from the enclosures. This may seem like Mother Nature giving the dolphins their freedom, but releasing nonnative dolphins into foreign waters is generally believed to amount to a death sentence for the animals.⁹⁹

Another issue with respect to sea pens is their impact on "natural barriers." Natural barriers are physical structures such as barrier islands or biological structures such as mangrove stands and coral reefs, which help to buffer and shield coastal areas from the impact of storms, hurricanes, or tsunamis. Removal of these barriers by human coastal development has been blamed for increasing the damage and destruction caused by hurricanes and other natural disasters, such as the 2004 Asian tsunami.¹⁰⁰ Concern has been raised about the impact of dolphin sea pens on natural barriers, through the dredging and physical removal of barriers to make space for them. In addition, the pollution from coastal dolphin enclaves



Sea pen facilities may not have adequate tidal flow to keep the water properly circulated and replenished. Some need periodic dredging, which may disrupt and stress the dolphins. Photo: WSPA

The widespread expansion of dolphin sea pens in the Caribbean is a particular cause for concern, as these further diminish natural barriers that have already been degraded by high levels of coastal development; moreover, the Caribbean is considered to be an area particularly at risk from hurricanes and tsunamis.

tures, such as fecal waste and the detritus from decomposing, uneaten fish (as well as waste from associated tourist infrastructure, such as toilets) can have a significant impact on coral reefs in particular.¹⁰¹ The widespread expansion of dolphin sea pens in the Caribbean is a particular cause for concern, as these further diminish natural barriers that have already been degraded by high levels of coastal development; moreover, the Caribbean is considered to be an area particularly at risk from hurricanes and tsunamis.¹⁰²

In the South Pacific, another area frequently impacted by tsunamis, construction of dolphin sea pens is now a major cause of mangrove destruction, joining coastal shrimp ponds and other aquaculture projects. This also means that sea pens are often in close proximity to aquaculture sites, which are frequently dosed with pesticides and pharmaceutical treatments, producing sewage as well as waste effluent. These all pose toxic risks to the health of cetaceans penned nearby.¹⁰³

PINNIPEDS AND OTHER NON-CETACEANS

Many pinnipeds (seals, sea lions, and walruses) are migratory. Although they tend to be relatively sedentary on land, they have evolved to make annual journeys of hundreds or thousands of kilometers through the oceans. Even if they are not migratory, as is the case with most harbor seals (*Phoca vitulina*), the coastal environments that pinnipeds inhabit are rich in biodiversity.¹⁰⁴ Public display facilities that house pinnipeds generally provide them with only a small pool filled with chlorinated freshwater.¹⁰⁵ Chlorine precludes live plants and fish in the pool and can cause serious skin and eye complications for marine mammals.¹⁰⁶ The small “land” area of the enclosure is usually a concrete simulation of bare rock. One or two facilities, rich in financial resources, have designed saltwater enclosures with wave machines to simulate the rhythm of tides and waves. This superficial advance, which most facilities cannot afford, serves more to appeal to the sense of propriety among the viewers than to benefit the captive animals. It also highlights the fact that no facility can simulate the vast reaches of the ocean that these animals traverse when they migrate, or can include in the enclosure oceanic flora and fauna. In short, in physical terms, the captive environment of these animals is profoundly limited and impoverished.

Most pinnipeds form large social groups. California sea lions congregate in groups of dozens of animals when on land, occasionally achieving aggregations of hundreds

No facility can simulate the vast reaches of the ocean that these animals traverse when they migrate, or can include in the enclosure oceanic flora and fauna. In short, in physical terms, the captive environment of these animals is profoundly limited and impoverished.

of individuals. When in the water, they float together in large “rafts” to regulate their body temperatures. Walruses also form herds of hundreds of individuals, entirely covering small islets with their bodies. Many pinniped species are territorial or maintain dominance hierarchies; relationships with conspecifics (members of the same species) are often very complex and can take years to develop.¹⁰⁷ In captivity these gregarious species are forced to exist in small groups, sometimes of no more than two or three individuals. Thus, in social terms, too, the captive environment is barren and artificial.

Polar bears are the perfect example of a species whose habitat and range cannot be even remotely simulated in captivity. They live in the demanding Arctic ecosystem and are physiologically, anatomically, and behaviorally suited exclusively for this harsh habitat. These animals can cover a home range of thousands of square kilometers of land in their hunt for food; they can also swim for hundreds of kilometers between ice floes.¹⁰⁸

A 2004 study in the international science journal *Nature* described how wide-ranging predators more frequently exhibited poor health, stereotypical behavior,¹⁰⁹ and higher infant mortality rates in captivity.¹¹⁰ Polar bears were highlighted as a species that reacts poorly to captivity, showing signs of stress and physiological dysfunction. The researchers suggested, as one way to address this problem, that “zoos could stop housing wide-ranging carnivores” such as polar bears. However, polar bears are not the only marine mammals to show stereotypical behaviors; they are also common in pinnipeds and cetaceans.¹¹¹

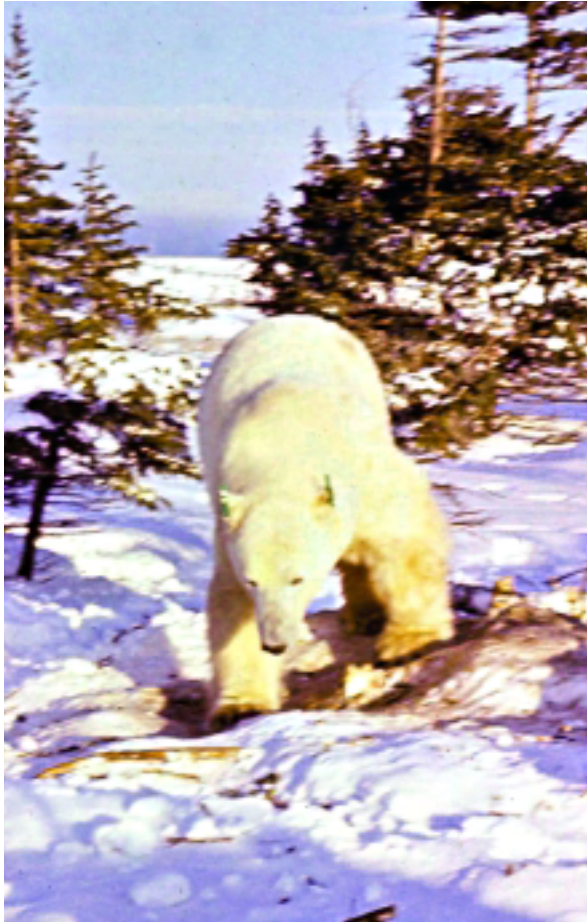
Aquaria and zoos that display polar bears argue that their facilities provide less rigorous living conditions and are therefore better for the bears; they claim that providing freely available and plentiful food eliminates the bears’ need for a large area in which to roam. But to use the rigors of the wild as a justification for the conditions of captivity is misleading and disingenuous. This argument implies that the natural state is an evil to be avoided and that the captive environment is the preferred state. The



Sea pen facilities in tropical areas are vulnerable to severe weather. Hurricanes, typhoons, and tsunamis can completely destroy such structures, as well as contaminate them with debris and pollutants. Photo: COMARINO



Housing conditions for pinnipeds are often very basic, with small pools and small “haul-out” areas of concrete or wood. Socially and environmentally, these conditions are barren compared to natural habitat. Photo: WSPA



The behavior and physiology of polar bears are ideally suited to their vast and rugged Arctic habitat. These adaptations become burdens in captivity. Photo: WSPA



The slow-moving, herbivorous manatee may be the only marine mammal whose needs can be adequately met in captivity. However, it is an endangered species and breeds well in the wild—its primary conservation need is protected habitat.

suggestion is that animals must be protected from the very surroundings that sustain them. This misrepresentation of the natural environment as threatening to the health of these animals will certainly not encourage people to protect, respect, or understand the animals' natural habitat. Moreover, to suggest that the lives of polar bears are better because they have been spared—or in truth prevented—from having to do exactly what evolution has shaped them to do is absurd.

The specialized needs and reproductive behavior of polar bear mothers and cubs—such as denning, in which female polar bears build dens out of ice and snow in which to give birth and protect their young for the first few months of their lives—are difficult to accommodate in captivity. Polar bears are routinely maintained in small concrete enclosures with tiny freshwater pools.¹¹² Being exposed to hot, temperate-climate summers and sharing the same space with the same few bears for life expose polar bears to a set of physical and psychological stresses with which they are poorly equipped to cope—an issue that even the captive display industry recognizes.¹¹³ Moreover, as mentioned above, the development of stereotypical behaviors is often found in these large carnivores when in captivity. The conditions in which captive polar bears are maintained around the world are often woefully inadequate.¹¹⁴

The Canadian government has been involved in a controversial trade in wild-caught adult polar bears and cubs, primarily from Manitoba, to captive facilities worldwide. In 1995, the Wildlife Branch of Manitoba Natural Resources exported two polar bear cubs to a zoo in Thailand. This brought international attention to a government department that was found to have traded more than 30 polar bears to a number of zoos. The animals traded were primarily adult “nuisance” bears—bears who repeatedly come close to towns and human habitation—and orphaned bear cubs— orphaned when their mothers were shot in hunts, in self-defense, or as nuisances.¹¹⁵

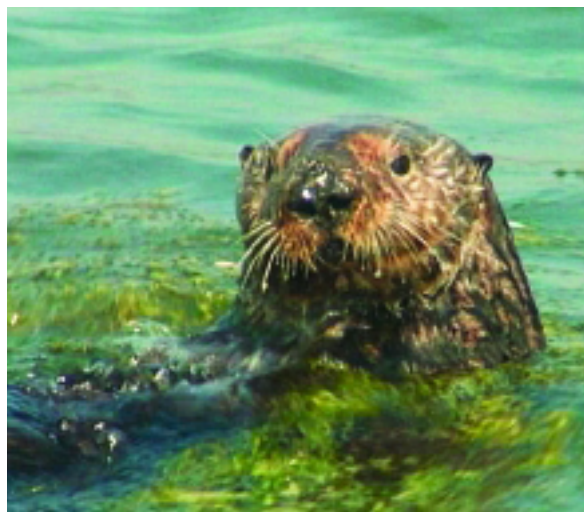
Inspections of the receiving zoos showed that conditions at many of them were very poor, and often dire. For example, Aso Bear Park in Japan had 73 bears kept in underground cells only one meter by two meters in size. Its enclosures for the polar bears it received from Manitoba were hardly better: an eight-square-meter concrete cage for two animals. Dublin Zoo, which also received Manitoba bears, provided a larger but still wholly inadequate space—310 square meters for two bears. In contrast, Sweden's 1982 space requirement for two adult polar bears was approximately 1,200 square

meters, and the standard for two adult polar bears in Newfoundland is 4,500 square meters.¹¹⁶

As a result of the polar bear trading controversy, the Wildlife Branch, through a Polar Bear Facility Standards Advisory Committee, examined the polar bear export program and introduced recommendations in late 1997 to address some of the problems. Not surprisingly, these recommendations had many flaws, including weak guidelines for enclosure temperatures and no recommendation for bears to be placed in facilities with improved enclosure sizes and soft-substrate floor space.¹¹⁷ Finally, in 2002 Manitoba's Polar Bear Protection Act was passed.¹¹⁸ The act restricted the capture of polar bears to orphaned cubs only (i.e., no "nuisance" adults) and then only under certain conditions.¹¹⁹ However, many of the regulations governing the placement of these orphan cubs are still woefully insufficient—for example, two bears can be placed in an enclosure only 500 square meters in size and the regulations only require a "comfortable" temperature rather than the Arctic temperatures to which the bears are adapted.

Manatees are the only marine mammals who sometimes are displayed in enclosures that simulate their natural habitat.¹²⁰ Because manatees are herbivores and have slow metabolisms, it appears to be easier to keep their enclosures hygienic without resorting to sanitation methods that kill vegetation and fish. Manatees are also physically slow and, for wholly aquatic animals, relatively sedentary, which appears to mitigate to some degree the restrictiveness of the small tanks in which they are held. Manatees are a special case: very few are held in captivity (most of the permanent captives are animals who have been injured and deemed unable to be returned to the wild), they are herbivorous marine mammals, and they are so critically endangered throughout their range that their treatment has been unique. In many ways the treatment of manatees exemplifies how dolphinaria and aquaria should treat all species of marine mammals, endangered or not: only beached or injured individuals should be held (pending release), only those who cannot be released should be displayed (without the requirement of performing or enduring interactions with the public), and every effort should be made to create enclosures that are as close to natural habitats as possible.

Sea otters (*Enhydra lutris*) should logically be even easier to keep in captivity under conditions that simulate the natural environment, given their small size and similarly "sedentary" habits. However, they are known to be particularly vulnerable to fatal shock as the result of handling and during transportation.¹²¹ Information on



Sea otters are unusually vulnerable to stress when handled and transported. Photo: The HSUS

To use the rigors of the wild as a justification for the conditions of captivity is misleading and disingenuous. This argument implies that the natural state is an evil to be avoided and that the captive environment is the preferred state. The suggestion is that animals must be protected from the very surroundings that sustain them. This misrepresentation of the natural environment as threatening to the health of these animals will certainly not encourage people to protect, respect, or understand the animals' natural habitat.



This tank offers only rudimentary shade, but that's more than most tropical enclosures. Wild dolphins can retreat to deep water when the sun is high, but in shallow tanks and pens, the water temperature can rise dangerously high without shade.
Photo: WSPA

mortality rates of sea otters in U.S. facilities has not received as much attention as those of cetaceans and pinnipeds, but these rates, particularly for pups, have been very high.¹²² The majority of captive sea otters are currently being held in Japan (more than 100), where there is no reliable information on survival rates, but Japanese aquaria and zoos have stated that there has been poor success in captive breeding—resulting in requests for permits to capture sea otters in Alaska.¹²³

SMALL CETACEANS

The small cetaceans typically held in captivity, such as bottlenose dolphins and orcas, are wholly aquatic, far-ranging, fast-moving, deep-diving predators. In the wild they may travel as many as 150 kilometers in a day, reach speeds as high as 50 kilometers an hour, and dive several hundred meters deep. Small cetaceans are highly intelligent, extraordinarily social, and behaviorally complex.¹²⁴ Their perception of the world is largely acoustic, a difference in mode of perception that makes it virtually impossible for humans to imagine what they “see.”

Dolphinaria and aquaria cannot even begin to simulate the natural habitats of these species, any more than they can that of the polar bear.¹²⁵ The water in their tanks is often chemically treated and filtered to prevent the animals from swimming in their own waste. Smooth concrete walls usually surround these sound-sensitive creatures and inhibit the natural use of their acoustic abilities. As in pinniped pools, if chlorine is added to the water, live plants and fish cannot be placed in the pools. Nothing is further in composition from the coastal environments of Florida, the Hudson Bay, or Iceland—with their algae, fish, storms, rocks, sand, ice, and mud—than the small, empty, chlorinated, smooth-sided tanks of many dolphinaria and aquaria. The natural activity levels, sociality, hunting behaviors, acoustic perceptions, and—indeed—the very texture of small cetaceans’ natural environments are all severely compromised by the circumstances of captivity. As noted earlier, sea pens, while providing natural sea water and avoiding the use of chemicals, are in many ways no better than tanks and have their own significant drawbacks.

Bottlenose dolphins often have home ranges exceeding 100 square kilometers—it is impossible for captive facilities to provide space even remotely comparable to that used by these animals in the wild. The difficulty faced by captive bottlenose dolphins in expressing their natural behavior was illustrated in a 1996 study conducted at Long Marine Laboratory in California.¹²⁶ At the

Even in the largest facilities, a captive dolphin's room to move is decreased enormously, allowing the animal access to less than one ten-thousandth of one percent of its normal habitat size!

time of this study (and still today), the legal minimum horizontal dimensions in the United States for tanks holding two bottlenose dolphins were 7.32 meters for length and 1.83 meters for depth.¹²⁷ The researchers looked at the behavior of two bottlenose dolphins in two pools, one that was roughly 9.5 meters long and a second that was approximately 16 meters long. The dolphins' behavior in the large pool more closely resembled (while still not matching) natural behavior, whereas the animals were more often inactive in the smaller pool.¹²⁸ It is widely known in the public display industry that larger pools decrease aggression and increase breeding success,¹²⁹ yet the industry continues to lobby against any regulatory revisions that would increase the minimum pool size standards. This effort was reflected through a lack of consensus on the pool size standards issue during the 1995–1996 APHIS-negotiated rulemaking process to amend the U.S. care and maintenance regulations.¹³⁰

Even in the largest facilities, a captive dolphin's room to move is decreased enormously, allowing the animal access to less than one ten-thousandth of one percent of its normal habitat size! In an attempt to deflect attention from this fact, public display facilities argue that captivity, with its reliable and plentiful food supply, eliminates cetaceans' need to range over large distances daily.¹³¹ An observation that refutes this claim is that of orcas in British Columbia's Johnstone Strait, a small, salmon-rich section of the Canada's Inside Passage that orcas frequent during the summer months. Orcas leave Johnstone Strait daily, often traveling 40 kilometers north or south of this area in one night.¹³² It may be that at one point in their evolutionary history these whales traveled such distances only for foraging purposes, but their physiology has adapted to this level of exertion, and now, regardless of the availability of food, they may require this amount of exercise for good health.

Clearly, whatever the principal reason for their ranging patterns, confining cetaceans in a pool that is at best only six or seven times their body length guarantees a lack of aerobic conditioning and brings on the endless circling and stereotypical behaviors seen in other large carnivores in captivity. Such confinement is inhumane at a nearly inconceivable level.



Side enclosures such as these are meant to hold animals only temporarily, usually for medical reasons. However, many animals end up confined in these small spaces for weeks, months, and even years. Photo: WSPA



Enclosures holding only two or three dolphins are not uncommon. In the wild, dolphin groups containing dozens of animals frequently form bonds that can last a lifetime. Photo: Susan Croft

The situation is equally unacceptable and perhaps even worse in regard to the social environment provided for these animals in captivity. Small cetaceans are not merely gregarious; they form a complex society that is frequently based on kinship. Certain cetacean species are known to retain family bonds for life. In some populations of orcas, family ties are so persistent and well-defined that all family members are usually within a four-kilometer radius of each other at all times.¹³³ Captive facilities, with their logistical constraints, commercial considerations, and space limitations, cannot provide conditions that allow natural social structures to form. In captivity, social groups are wholly artificial. Facilities mix Atlantic and Pacific stocks, unrelated animals, and, in the case of orcas, races (transient and resident), which have disparate diets, habits, and social structures. As noted earlier, calves are typically removed from their mothers to separate quarters after only three or four years, if not sooner.¹³⁴

A prime example of the inappropriateness of captive cetacean environments is the Dolphinella dolphinarium in Sharm el Sheikh, Egypt. This facility holds three bottlenose dolphins and, until recently, two beluga whales. Beluga whales are an Arctic species, adapted to living in frigid waters almost at the point of freezing. Yet in Sharm el Sheikh they were being kept in an outdoor facility on the edge of a desert. In addition, the facility has two pools; the three dolphins are held in the larger pool, while the two larger belugas¹³⁵ were held in a tiny medical pool and were never allowed into the bigger pool. A campaign by animal protection groups persuaded the owners to transfer the belugas to a larger enclosure in Cairo, but these polar animals are still languishing in desert heat.

CONCLUSION

Unlike that of some terrestrial mammals, the habitat of marine mammals is difficult and frequently impossible to re-create or simulate, even in microcosm. Pinnipeds, if provided with a very large, texturally varied saltwater tank and a rocky haul-out area, would probably be the most commonly held marine mammals to tolerate the circumstances of captivity. Even migratory pinniped species spend much of their time on land resting, and captivity does not specifically compromise this characteristic. What is compromised, however, is the opportunity for the intense physical activity and crucial interactions with conspecifics that typify pinnipeds when mating or at sea. The social environment is not re-created; it is artificially reconfigured. In many cases, species such as Atlantic gray seals (*Halichoerus grypus*) and Pacific California sea lions, who, living in their separate oceans, would never interact in the wild, are housed together. Certain marine mammal species that are from remote, specialized habitats, such as polar bears, are severely compromised physiologically and can suffer immensely.

Cetaceans are in all ways severely compromised by captivity. The reduction in their horizon represented by a tank, even a large one, is extreme. Neither their physical nor their social environment can be simulated or re-created. Tanks are frequently effectively sterile, and social bonds are artificial. Life for captive cetaceans is indeed "different," as many facilities admit. Given that this different life has nothing in common with the life for which cetaceans have evolved and for which they are suited, it can only be regarded as worse than life in the wild.

Husbandry and Health Care

Most captive marine mammals receive regular vitamin and mineral pills in their ration of fish. This implies that their diet of a limited variety of frozen fish is deficient in some manner, and the nutritional quality of frozen fish is in fact markedly lower than that of living fish.¹³⁶ The constant administration of pills is often referred to as a benefit of captivity; the fact that wild animals do not require such supplements is never mentioned. The limited choices offered to captive animals in regard to food and its methods of provision are cause for concern. The lack of behavioral and physical stimulation (when foraging is eliminated from the behavioral repertoire) and the lack of dietary variety may contribute to behavioral disturbances and health problems.

Medical isolation enclosures are frequently much smaller than primary enclosures; facilities claim that medical tanks are only temporary quarters and insist this distinction makes their restrictiveness acceptable.¹³⁷ However, some animals, such as sexually mature males or aggressive individuals of both genders, are often sequestered in these tiny pools on a routine basis.¹³⁸ In some facilities, animals are frequently held in such secondary enclosures during tank-cleaning procedures. They may also be left in the primary enclosure in only a few inches of water during the cleaning process (this experience is similar to stranding, which is harmful to marine mammals and, in large and wholly aquatic animals such as cetaceans, can lead to a series of physiological changes that end in death if refloating does not occur). Cleaning may last for up to an hour (and animals have been known to be overlooked and left stranded for several hours when their tanks were being drained)¹³⁹ and must be considered a stressful experience at the very least, if not also directly physically damaging.

Another abnormally stressful procedure for marine mammals, for cetaceans in particular, is transport from



For marine mammals used in shows, food is usually associated with training or performances, leading to the complete elimination of natural foraging patterns. Photo: WSPA



The dolphin's perpetual smile is often taken as a sign of contentment; in truth, it is just an anatomical characteristic that has no relation to health or emotional state. This dolphin appears to smile but is actually injured and gravely ill. Photo: WSPA



Dolphins are not scavengers. When wild-caught, they must learn to eat dead fish. If they refuse, they may be force-fed. If they continue to starve, they may be released to an uncertain fate. Photo: WSPA

Cetaceans are difficult to diagnose; their lack of mobile facial expressions and body language with which humans can empathize (such as shivering or cowering) make developing health problems difficult to recognize. An all too common pattern is for facility personnel to find an animal lacking in appetite and for that animal to die within one or two days of this discovery—long before any treatment program can be determined, let alone administered.

one location to another, whether it is between tanks within a single facility or between facilities. It is unnatural for cetaceans to remove themselves wholly from the water; even when beached, contact with the water is partially maintained. However, captive cetaceans are routinely placed on stretchers, loaded onto vehicles, typically either trucks or airplanes, and subjected to an alien environment for as many as 24 or more hours.¹⁴⁰ Some marine mammals are seasonally shipped between various facilities each year, for commercial rather than husbandry purposes. They are subjected to chronic, cumulative, unnecessary, and unacceptable levels of stress.

Dolphinaria and aquaria routinely administer prophylactic antibiotics and ulcer medication to captive cetaceans.¹⁴¹ Bacterial infections are a common cause of death in these animals. Pneumonia, which is generally brought about by some other condition, such as stress or a compromised immune system,¹⁴² is the most commonly cited cause of death in the NMFS's *Marine Mammal Inventory Report*. Rarely do necropsy (animal autopsy) reports identify the cause of the pneumonia. Approximately 10–20 percent of the deaths stem from undetermined causes. Cetaceans are difficult to diagnose; their lack of mobile facial expressions¹⁴³ and body language with which humans can empathize (such as shivering or cowering) make developing health problems difficult to recognize. An all too common pattern is for facility personnel to find an animal lacking in appetite and for that animal to die within one or two days of this discovery—long before any treatment program can be determined, let alone administered.¹⁴⁴ Veterinary care for cetaceans is still relatively primitive; for instance, although it has become possible to administer anesthesia to cetaceans, it is extremely risky, and usually anesthesia is administered for surgical procedures as a last resort.

Interactive Programs

SWIM-WITH-THE-DOLPHINS PROGRAMS

Outside the United States, there is little oversight of swim-with-the-dolphins (SWTD) programs—even when captive marine mammal care and management regulations exist, they often do not include specific provisions to govern SWTD programs. The following section therefore focuses on the U.S. regulatory regime for interactive programs (whose enforcement is currently suspended),¹⁴⁵ as it has served as the model for those few countries with SWTD regulations and guidelines. It should be emphasized that the conduct of interactive programs in most countries is largely unregulated, leading to wide variation in their relative quality and safety—for humans and dolphins.

The NMFS is the agency in the U.S. Department of Commerce with specific authority to implement and enforce the MMPA for certain species.¹⁴⁶ The NMFS commissioned a study, completed and published as an agency report in April 1994, on the effects of SWTD programs on dolphin behavior.¹⁴⁷ The report identified several areas of concern, including a number of behaviors and situations that were high risk for both the dolphins and the swimmers.¹⁴⁸ The agency report concluded that to ensure the safety of dolphins and swimmers, SWTD programs should be strictly controlled.¹⁴⁹

It should be emphasized that the conduct of interactive programs in most countries is largely unregulated, leading to wide variation in their relative quality and safety—for humans and dolphins.



High-energy behaviors from swimmers and dolphins can lead to human injuries. SWTD participants receive bites and bruises from dolphins more often than is reported. Photo: Toni G. Frohoff



Too many people and too many (or too few) dolphins in an enclosure together is simply asking for trouble. Photo: WSPA



Dorsal fin and pectoral fin "tows" can lead to human or dolphin injury. Photo: WSPA

According to the NMFS study, the short-term risk to dolphins is primarily that under certain uncontrolled circumstances, dolphins routinely behave submissively toward swimmers. This disturbing dynamic has potentially serious implications. It could affect the dominance hierarchy within the dolphins' social group, resulting in increased injury to the submissive dolphin; it may also indicate a general and persistent level of stress to which the submissive dolphin is being subjected, which could in turn affect his or her long-term health.

The agency report noted an additional concern regarding the dolphins used in SWTD programs. The NMFS required that these dolphins be given some area within the swim enclosure that served as a refuge from swimmers; swimmers were not allowed to enter the area and dolphins were supposed to be free to enter the area whenever they felt the need to avoid the attentions of swimmers. It has been shown that dolphins greatly increase their use of such refuge areas when exposed to the public in SWTD programs.¹⁵⁰ However, the NMFS report noted that at one facility the refuge area was neither easily accessible nor attractive to the dolphins, so they would not use it even if they wanted respite from swimmers. At the other facilities, while the refuges were accessible and attractive, the dolphins were routinely recalled from them, thus negating their purpose as a voluntary haven.

From the facilities' point of view, recalling dolphins from the refuges during swims makes sense: customers pay to swim with dolphins, not to watch dolphins avoid them. From the dolphins' point of view, however, being recalled from a refuge means that they are not allowed to choose the level of interaction that they find tolerable. If the dolphins' need for respite is thwarted often enough, it could lead directly to increased levels of stress and to injurious interactions with swimmers. The case of refuges is an example of the economic basis of the public display industry directly conflicting with the needs of the dolphins. This is a recipe for disaster.

The agency report also expressed concern for dolphins who are unsuited to SWTD programs. If these programs proliferate, the number of animals who become unusable in SWTD programs (either because they act aggressively toward or do not readily interact with swimmers) would increase accordingly. The potential to develop a population of dolphins who are not wanted in SWTD programs or standard public display facilities is alarming.

This begs the question, “What becomes of these dolphins?” Given the lack of rehabilitation and release programs, the absence of “retirement” facilities for marine mammals, and the enormous cost of maintaining dolphins in captivity—particularly those who do not “pay their own way”—this question is of great concern.

SWTD programs do not educate the public; they exploit both dolphins and people.¹⁵¹ The HSUS and WSPA believe that they should be unconditionally prohibited. However, the relevant authorities in all countries where such programs operate have allowed their continued operation, in most cases without regulation.¹⁵² The growing number of SWTD programs in the Caribbean is a particular concern. There are at least 20 facilities in countries such as Jamaica, Anguilla, Honduras, and the Dominican Republic. Ten or 12 more are being proposed or are in the planning stages on islands such as the Caymans, Sint Maarten, and Aruba. Almost none of these jurisdictions have appropriate controls for the health or safety of either the dolphins or human participants in these programs.¹⁵³ Several of these facilities have even been involved in illegal activities.¹⁵⁴ We have submitted critical comments to various authorities in an effort to ensure the strictest possible standards for these programs, but clearly the goal must continue to be prohibition.

PETTING POOLS

Petting pools are presently found at four facilities in the United States (Sea World Orlando, San Antonio, and San Diego, and Six Flags Marine World in Vallejo, California). There is one in Canada (Marineland Ontario), at least one in Japan, and a petting pool has recently been built at Marineland Antibes in France. These attractions allow visitors to feed and touch animals (often bottlenose dolphins, but also belugas, sea lions, and even orcas) from pool-side. For more than six years, the Whale and Dolphin Conservation Society (WDCS) and The HSUS have been monitoring petting pools in the United States and the risks they pose to both humans and dolphins.¹⁵⁵

In the summer months, dolphins in petting pools can be exposed to humans 12 hours a day, every day, with the public often splashing water or slapping the sides of the tank to get the dolphins’ attention, adding to an already noisy environment.¹⁵⁶ In addition, although feeding of dolphins is regulated by law and is only



Above and below: Dolphins in petting pools, in direct contact with visitors unaware of the potential harm they can do, are in danger of ingesting foreign objects. Photos: WDCS





Touching a dolphin as part of a show is encouraged, but this behavior with wild dolphins constitutes harassment and is illegal. Children can be confused by these mixed messages.

Although feeding of dolphins is regulated by law and is only supposed to be done under strict supervision, there have been observations of dolphins in petting pools who were regularly fed popcorn, bread, french fries, sandwiches, and the contents of drink containers. This inappropriate feeding was either not seen by so-called “supervisors,” or no attempt was made to stop it.

supposed to be done under strict supervision,¹⁵⁷ there have been observations of dolphins in petting pools who were regularly fed popcorn, bread, french fries, sandwiches, and the contents of drink containers. This inappropriate feeding was either not seen by so-called “supervisors,” or no attempt was made to stop it.¹⁵⁸

Many of the petting pool dolphins were also noticeably obese, clearly indicating that supervision of feeding was ineffective and that competition among the animals left some dolphins overfed (and conversely, some possibly underfed). Perhaps most alarming were observations of the public placing objects such as glasses, paper, stones, coins, bottle tops, metal souvenirs, and even a baby’s pacifier into the mouths of dolphins or offering them wristwatches and even cigarettes.¹⁵⁹ If such objects are swallowed, they could quickly cause intestinal injuries, poisoning, and even death.

In addition, the risk of disease transfer from people to captive marine mammals posed by direct contact between the two is ever present. Although members of the public are requested to wash their hands before touching dolphins or sea lions, this does not always occur, and even this would not be sufficient if someone coughed or sneezed over an animal. Diseases could also be spread to humans; there are a number of pathogens found in marine mammals that can be, and have been, transferred to humans.

Risks to Human Health

DISEASES

In a report to the U.S. Marine Mammal Commission (MMC), researchers from the University of California highlighted the potential health risks to which humans are exposed through contact with marine mammals. In an internationally distributed survey of people who come into contact with marine mammals (primarily those who work with these animals), 23 percent of respondents reported contracting a skin rash or similar ailment.¹⁶⁰ As with marine-mammal-inflicted injuries, workers in the captive display industry are in a high-risk group for infection.¹⁶¹

Respiratory diseases were also reported in nearly a fifth of marine mammal workers, including diseases such as tuberculosis.¹⁶² Clearly, exposure to marine mammals can involve a health risk to people working with the animals, but it can also threaten the health of the public. Diseases contracted from marine mammals are difficult to treat and diagnose, as they may be overlooked or even ignored by physicians who are not aware of the risks—or range—of potential infectious diseases.¹⁶³ Facilities that allow direct human contact with marine mammals, such as dolphinariums with petting pools or SWTG programs, are exposing their customers to possible infection and injury. The reverse is also true—such facilities are exposing their animals to possible human diseases or injury as the result of inappropriate behavior by the public.

INJURY AND DEATH

The risks faced by swimmers in SWTG programs are alarming, as is made evident by an examination of the injury reports submitted to the NMFS from 1989 to 1994. The NMFS received more than a dozen reports of injuries to people who participated in U.S. SWTG programs, ranging from lacerations to broken bones and shock. One man suffered a cracked sternum when

butted by a dolphin, and a woman received a broken arm when similarly rammed. Several dolphin biologists have noted that few, if any, dolphin-inflicted human injuries could be truly accidental,¹⁶⁴ yet all the injuries in SWTG accident reports were so labeled. Broken bones and broken face masks were described as the result of “accidental bumps.”

It is disturbing that the personnel at SWTG programs claim that almost all injurious human-dolphin interactions are accidents when experts on dolphin behavior express skepticism about their accidental nature. Clearly the public has an image of the dolphin as friendly and gentle, and in several SWTG injury reports the victims expressed a feeling of responsibility for the incidents in question. However, marine mammals are clearly capable of inflicting injuries and even killing humans. It seems a wise precaution before the beginning of a swim session to disabuse participants of the myth that dolphins would never deliberately harm a person, yet this does not seem to be occurring.

The fact is that at any time during a swim session, especially one that is not controlled, dolphins may inflict minor to serious injuries on swimmers for various reasons, some of which are neither obvious nor predictable. Even in controlled swim sessions, the risk is always present and is potentially lethal. It is probable that a

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Cetaceans have many sharp teeth and are capable of inflicting serious lacerations and wounds on humans with little effort.



Interactive programs frequently put too many people in close proximity to too many dolphins, often without adequate trainer oversight. Photo: WSPA

Members of the public have been observed holding children and babies over the heads of dolphins at petting pools, oblivious to the fact that dolphins are also predators and carnivores.

human will eventually be killed in these programs. This has significant implications for the dolphins as well. Should an animal be involved in a seriously injurious or fatal interaction, he or she would certainly be removed from the program and would face an uncertain fate.

There is also a risk that petting pool dolphins will inflict injuries on members of the public. Frequent teasing by visitors and other inappropriate behavior, such as touching sensitive areas of the dolphin's body, like the eyes or blowhole, increase the likelihood of aggression by the dolphins. Members of the public have even been observed holding children and babies over the heads of dolphins at petting pools, oblivious to the fact that dolphins are also predators and carnivores.¹⁶⁵

Despite their portrayal by the public display industry as happy, friendly, and playful animals, marine mammals are—with the exception of the manatee and dugong (*Dugong dugon*)—predators. Moreover, in the wild, their behavior to conspecifics and other marine mammals is often aggressive—and sometimes violent. For example, bottlenose dolphins, the most commonly kept cetacean species in captivity, have been regularly reported attacking and killing members of other cetacean species,¹⁶⁶ and even attacking and killing conspecifics' calves.¹⁶⁷ Orcas, another commonly kept cetacean, are well known for their predatory behavior and have been recorded killing a wide variety of marine mammal species.¹⁶⁸

The MMC survey from the University of California discovered that more than half of marine mammal workers had been injured by the animals.¹⁶⁹ Those in regular contact with marine mammals or involved with cleaning and repairing enclosures were more likely to be injured.

The aggression and violence of which orcas are capable were clearly witnessed at Sea World San Diego in August 1989, when an Icelandic female (Kandu V) rammed a northeastern Pacific female (Corky II) during a show. Although trainers tried to keep the show going, blood began to spurt from a severed artery near Kandu's jaw. Sea World staff then quickly ushered away the watching crowd. Forty-five minutes after the blow, Kandu V died. It should be noted that two orcas from different oceans

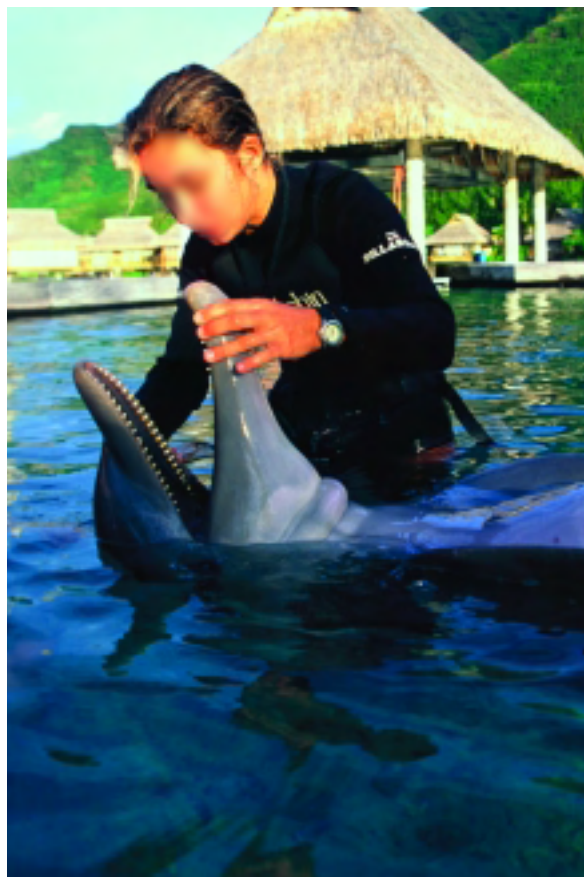
would never have been in such proximity naturally, nor is there any record of an orca being killed in a similarly violent encounter in the wild.¹⁷⁰

Given their size, strength, and clear ability to be violent, it is hardly surprising that cetaceans have been known to exhibit aggression toward humans in the wild. Most commonly this aggression is exhibited toward humans trying to swim with cetaceans. Such aggressive behavior includes bottlenose dolphins trying to prevent swimmers from leaving the water, especially when the swimmers had also been trying to feed the animals, as well as biting members of the public.¹⁷¹ In Hawaii, a short-finned pilot whale (*Globicephala macrorhynchus*) grabbed hold of a human swimmer, pulling her down 10–12 meters underwater before letting her go. Although the swimmer was lucky to not have been drowned, she suffered a bite wound that required nine stitches.¹⁷²

To date there has only been one record, in Brazil, of a bottlenose dolphin killing a person.¹⁷³ The animal who caused the incident was a solitary male, named Tiao by locals, with a history of approaching human swimmers as well as of inflicting injuries: 29 swimmers had reported injuries, mostly as a result of the humans “harassing” the dolphin by grabbing his fins or trying to jump on his back. Arguably these people were only trying to do the very things that dolphin trainers are regularly observed doing to and with dolphins at dolphinariums. Eventually, on 8 December 1994, the dolphin rammed a man (who was reported to have been attempting to put objects into the dolphin’s blowhole), rupturing his stomach and causing his death.

Injuries to trainers and dolphinarium staff are also frequently caused by captive dolphins; however, these incidents are not widely reported. As mentioned above, the MMC survey found that 52 percent of the surveyed marine mammal workers reported some form of traumatic injury caused by a marine mammal (251 cases altogether).¹⁷⁴ In another incident, on 7 October 2004, a 49-year-old man was admitted to Jackson Memorial Hospital, having sustained injuries from a captive female dolphin at the Miami Seaquarium. The injuries were severe enough that surgery was required.¹⁷⁵

Despite the bottlenose dolphin’s ability and propensity for aggression, captive orcas are the marine mammals most associated with human injuries and deaths. In 1991, a group of orcas killed trainer Keltie Byrne at Sealand of Victoria, Canada. In front of a shocked audience, the orcas held Byrne underwater until she drowned. Eight



Even trained caretakers must exercise extreme care to avoid being bitten by their charges.



The irony of the ocean beckoning just beyond the wall of a SWTD enclosure is lost on the participants. Better education is needed to impress upon those who love dolphins that we wish to be with them more than they wish to be with us.
Photo: Toni G. Frohoff

years later, one of those same orcas, Tillikum, was discovered one morning with the dead body of a man, named Daniel Dukes, draped on his back at Sea World Orlando. Dukes had also drowned and suffered a host of minor injuries incurred both pre- and postmortem, suggesting that Tillikum had once again held a person underwater until he died. Dukes had apparently either snuck into the facility at night or stayed in the park after closing in an attempt to swim with the whale, calling into question the park's security procedures.¹⁷⁶

The potential for violence in orcas was also seen when a young orca called Ky attacked his trainer, Steve Aibel, at Sea World San Antonio in July 2004. During a show, the animal hit the trainer, pushed him underwater, and positioned himself between the trainer and the exit ramp

of the pool. The trainer was rescued from the whale by another staff member only after several minutes of being unable to bring the animal under his control.¹⁷⁷

Cetaceans routinely kill mammals in the wild—even members of their own species. Humans are also mammals, equal in size or typically smaller than many of the mammals killed by bottlenose dolphins or orcas. It is extremely foolish to think that somehow the rules do not apply to humans. We are not immune to aggression or injury by cetaceans. As the number of swim-with-marine-mammal trips and facilities increases, particularly in regions where there are few or no safety regulations, safeguards, or reporting requirements, so the likelihood of more human injuries and deaths also increases.

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It would never be acceptable for zoos to allow visitors to interact freely in an enclosed space with chimpanzees, gorillas, lions, or elephants.¹⁷⁸ It is folly to regard interactions with marine mammals as safer than those with other large wildlife species.

Behavior

The natural foraging behaviors of most predators in captivity are severely compromised.¹⁷⁹ While all species of marine mammals held in captivity (with the exception of manatees and dugongs) are predators, none are allowed to exercise that part of their behavioral repertoire that is related to hunting and foraging. For display-only animals, such as polar bears and most seals, boredom is a serious concern. Stereotyped behaviors, severe aggression toward conspecifics and humans, and other behavioral problems frequently arise in predators denied their natural foraging behavior.¹⁸⁰

Public display facilities claim that for those marine mammals who perform in shows, training adequately replaces the stimulation of hunting. This claim is absurd. Performing animals are trained to demonstrate a series of conditioned behaviors. Some of these behaviors are also naturally occurring behaviors, but many are merely *based* on natural behaviors that have been performed out of context and exaggerated and altered almost beyond recognition. The most common training method, called operant conditioning, uses food as positive reinforcement. For many animals this means that satisfaction of hunger is dependent on performing tricks; for others, hunger is deliberately induced so the reinforcer will be effective. This is not food deprivation per se, for a complete food portion is ultimately provided each day, but the use of food as a reinforcer reduces some animals to little more than beggars. Their lives obsessively revolve around the food presented during shows and training sessions. Patrons of any captive marine mammal show can easily observe the animals' attention fixed on the buckets of food. For these animals, natural feeding and foraging rhythms and cycles, as well as independence of any kind, are lost. It is impossible to accept the self-serving argument put forward by the public display industry that training provides an adequate substitute for the stimulation of natural foraging or the other actions exhibited by wild animals.

Most pinniped shows are entertainment spectacles in which animals perform in a burlesque, exhibiting a

Natural behaviors and interactions, such as those associated with mating, maternal care, weaning, and dominance, are altered significantly in captivity. In most cases, these behaviors are strictly controlled by the needs of the facility and the availability of space. The needs of the animals are secondary.

series of wholly artificial tricks, such as “handstands” and balancing a ball, in the context of a cartoon story in which raucous music is played and jokes are told. Many dolphin and whale shows incorporate circus tricks such as trainers propelled into the air by an animal's snout or animals taking fish from a trainer's mouth. The animals are presented as clowns, and almost no effort is made to educate the audience about their natural behavior.

Natural behaviors and interactions, such as those associated with mating, maternal care, weaning, and dominance, are altered significantly in captivity. In most cases, these behaviors are strictly controlled by the needs of the facility and the availability of space. The needs of the animals are secondary. For instance, weaning is timed to suit the needs of the facility, as opposed to the needs of the pup, cub, or calf, because the offspring may be disruptive to the social group or because space is limited. Dominance interactions can be aberrant and abnormally violent,¹⁸¹ as the animals must adjust their behaviors in response to the small living space and the artificial age and sex composition of the captive social group.

Wild-caught captive marine mammals gradually experience the atrophy of many of their natural behaviors. Many are caught too young to have learned how to socialize properly and form relationships. For sea lions and cetaceans in particular, socialization and learned behavior and skills are undoubtedly crucial to normal and natural development.



This dolphin has been fitted with a transmitter for research purposes. The trauma of capture and the brutal attachment of this large tag will undoubtedly compromise any data collected. Photo: Elsa Nature Conservancy

Stress

Stress has been recognized and discussed in this report as a factor that can severely affect the health of captive wildlife, including marine mammals.¹⁸² Stress in mammals can manifest in many ways, including weight loss, lack of appetite, antisocial behavior, reduced calving success, arteriosclerosis (hardening of the arteries), stomach ulcers, changes in blood cell counts, increased susceptibility to diseases, and even death.¹⁸³ Short-term acute stress will occur as the result of pursuit, confinement, and physical handling experienced during capture or the transport process.¹⁸⁴ Long-term chronic stress will result once an animal is permanently confined in captivity.

The pursuit, handling, and disturbance marine mammals endure when first captured from the wild and whenever they are being transported from one location to another are highly traumatic.¹⁸⁵ Scientific studies have noted significant physiological impacts from pursuit and handling, particularly in cetaceans.¹⁸⁶ A strong piece of evidence showing that dolphins never become accustomed to these causes of stress is seen in the greatly increased mortality rate they demonstrate immediately after every transport. As noted earlier, the risk of dying increases six-fold in bottlenose dolphins during the first five days after a capture, and a similar mortality spike is seen after every transport between facilities.¹⁸⁷ In other words, every transport is as traumatic to a dolphin as a capture from the wild. They never get used to being restrained and moved between enclosures, and the stress considerably increases their risk of dying. It is notable that when researchers have calculated mortality rates for cetaceans in captivity, this period of sharply increased mortality has been excluded from their calculations, resulting in an overall captive survival rate that is artificially inflated.¹⁸⁸

Confinement exacerbates stressful situations for marine mammals in many ways. Captive animals are in artificial social groupings determined by humans, in small restricted areas, and the social pressures and stress they experience can escalate when they have no avenue for escape. In dolphins, for example, adding new members to a captive group—such as young animals reaching

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maturity—or placing incompatible animals into groups can upset the group's social dynamics and dominance hierarchies, as can isolating individual animals or separating them from their associates.¹⁸⁹ These circumstances can lead to increased aggression, illness, poor success in calf rearing, and even death.

The effects of socially inflicted stress in captivity were illustrated in a 2002 study, which described how seemingly innocuous changes in dolphin groupings and associations could actually cause extreme stress, leading to chronic illness and death.¹⁹⁰ In an attempt to mitigate these problems, the researchers suggested that dolphin enclosures should be expanded to allow less restricted movement of animals.¹⁹¹ This recommendation was particularly important for one animal, who had exhibited chronic illness believed to be stress-related and had been subjected to considerable aggression by other dolphins. In a larger enclosure, this individual's symptoms subsided to some degree, as it could more easily avoid aggressors.

Similar stress is suffered by other social marine mammal species, such as most pinnipeds, but also more solitary species, like polar bears. In captivity, polar bears are often placed in highly unnatural groupings—in the wild, they are usually solitary except when breeding or with young (and in some locations when waiting for ice to form).¹⁹² The forced intimacy faced by three or four (or more) polar bears in a small zoo enclosure inevitably leads to stress.



The very traits that make dolphins easy to train and fascinating for audiences—their intelligence and self-awareness—arguably make confining them for entertainment purposes unethical. Photo: WSPA

Cetacean Intelligence

One of the primary foundations for the moral and ethical arguments against keeping cetaceans in captivity is that they are intelligent. Ironically it is their intelligence that has made these animals desirable for public display—their ability to understand human commands and learn complex behaviors or tricks have been exploited to provide humans with entertainment. Likewise their intelligence increases people's rapport with and interest in these animals. But exactly how intelligent are cetaceans?

Most studies demonstrating cetacean intelligence have been conducted on captive animals, albeit primarily in dedicated research facilities or nonprofit public display facilities. Yet as these captive animals increasingly provide information to their captors about their sentience and intelligence, the ethical and moral arguments opposing cetacean captivity become increasingly convincing.

Several studies have tried to assess marine mammal intelligence by looking at the ratio between the size of the brain and the mass of the animal.¹⁹³ Although dolphins have smaller brains relative to their size than modern humans, they would be at least as intelligent as prehistoric man according to this measure. However, these studies do not take into account several issues, one being that the structure of the dolphin brain is very different from that of humans. If anything, those parts that deal with sophisticated thought and cognition are more complex and have a relatively greater volume than similar tissues in humans.¹⁹⁴ Another issue is that these calculations do not take into account the high proportion of a cetacean's mass that is blubber, a tissue that needs no brain mass dedicated to its maintenance. Upon consideration of these factors, the potential for intelligence in dolphins then becomes far more comparable to that of humans.¹⁹⁵



The alert expression on this dolphin's face is almost certainly a true reflection of the active mind behind it.

The behavior of cetaceans also implies high intelligence; for example, bottlenose dolphins are widely believed to possess individual, or signature, whistles,¹⁹⁶ which are thought to be important for individual recognition or keeping groups together.¹⁹⁷ Animals in the wild will make their specific whistles, which will be copied by nearby dolphins. This is an example of dolphins “addressing each other individually,”¹⁹⁸ i.e., using the whistles in a way similar to humans using names. Dolphins are the only nonhuman animals known to communicate in such a way, which in itself is believed to have been a key step in the evolution of human language.¹⁹⁹ Similar calls, although not as obviously specific to individuals, have also been reported in comparable contexts in orcas.²⁰⁰

The complexity of cetacean communication has often been used as a potential indicator of intelligence, and a recent study examining the complexity of cetacean vocalizations has discovered that the “communication capacity,” or the ability to carry information, of dolphin whistles is similar to many human languages.²⁰¹ This suggests that cetaceans could potentially be speaking their own language, which would make them the only animals besides humans to do so.

In addition, studies have shown that cetaceans have the capability for vocal learning.²⁰² Other research has demonstrated that bottlenose dolphins can be taught to imitate computer-generated sounds and to use these sounds to label or “name” objects.²⁰³

However, one of the most successful and illuminating cetacean linguistic studies was conducted by Louis Herman, who taught bottlenose dolphins a simple sign language and a computer-generated sound language.²⁰⁴ This study determined that, using these artificial symbolic languages, dolphins could understand simple sentences and novel combinations of words, but most importantly that cetaceans comprehended sentence structure (syntax)—an advanced linguistic concept. Interestingly, while we have been able to teach dolphins relatively sophisticated artificial languages, we have been unable to decode their many vocalizations, which may very well be a language. This begs the question of which species is “smarter”—dolphins, who can learn and understand what people want of them, or humans, who have yet to learn or understand what dolphins might be telling us.

Scientists have also shown that cetaceans are able to grasp abstract concepts.²⁰⁵ One of the most intriguing discoveries is that dolphins are able to discriminate between numbers of objects. Initial tests showed that



Orcas are the largest—and possibly the most intelligent and culturally varied—of the dolphin species.

dolphins can, at the very least, distinguish between a “few” and “many” objects.²⁰⁶ Being able to distinguish between numbers of items is believed to be a uniquely human attribute that is possibly linked to the possession of a complex language.²⁰⁷

Perhaps the most compelling evidence for a high level of intelligence in cetaceans is the recent demonstration that cetaceans are self-aware. These studies involve cetaceans recognizing their image in a mirror and, in addition, using that image to investigate their body.²⁰⁸ Researchers marked bottlenose dolphins with zinc oxide cream or marker pens in locations the dolphins could see only with a reflection, and the dolphins immediately swam to inspect themselves in a mirror placed in their pool. This showed that the dolphins were able to deduce that the images they saw in the mirror were actually of themselves and not simply another dolphin (or nothing relevant to “real life” at all, for that matter—some species have no reaction to two-dimensional mirror reflections). The dolphins used the mirrors as tools to view themselves, positioning themselves so that they could use the mirror

In his book *The Ethics of Science*, David Resnik highlights eight factors potentially possessed by animals. The more of these factors a species possesses, the more it should be considered morally and ethically equivalent to humans. It could be argued that bottlenose dolphins have demonstrated—or have demonstrated the potential for—at least seven of these eight factors, more than any other animal species.

to view the parts of their body that had been marked. These are all indicators of self-awareness.

Previously only the great apes had demonstrated self-recognition, and these results were not consistent for all subjects.²⁰⁹ In humans the ability to recognize one's own image in a mirror does not appear until the age of two.²¹⁰ Therefore, bottlenose dolphins have a level of understanding comparable to that of a two-year-old child,²¹¹ although the linguistic skills of cetaceans hint at intelligence far more developed. Locking two or three young children in a small room 24 hours a day—even one with a window and a dog for a companion during the day—would be considered child abuse. Yet confining dolphins in an equivalent space for their lifetime—with a human caretaker to interact with during business hours—is standard practice for dolphinarium and aquaria.

In his book *The Ethics of Science*, David Resnik highlights eight factors potentially possessed by animals.²¹² The more of these factors a species possesses, the more it should be considered morally and ethically equivalent to humans. It could be argued that bottlenose dolphins have demonstrated—or have demonstrated the potential for—at least seven of these eight factors, more than any other animal species.²¹³ Therefore, actions that would be considered unethical, immoral, illegal, or inappropriate for humans should be considered unethical to a similar extent for bottlenose dolphins (at a minimum) as well.

It should be noted that dolphins are held in captivity not only for entertainment and research purposes, but also for military uses. The U.S. Navy has maintained a marine mammal program, at one time holding more than 100 dolphins, some belugas and orcas, and dozens of pinnipeds, since the 1960s. The present program holds about 75 dolphins and 25 sea lions. Initially held to study their streamlined body shape—in an effort to improve hydrodynamics of Navy torpedoes—and echolocation, eventually the dolphins and sea lions were



Beluga whales make an amazing range of sounds (they are known as “sea canaries”) and most of the “tricks” they learn in captivity are related to this ability.

trained to perform tasks otherwise considered difficult, impossible, or unsafe for human divers, such as retrieving objects from deep water or tagging mines.²¹⁴ These animals have been deployed around the world, during combat conditions (in Vietnam and the Persian Gulf) and during peacetime maneuvers and exercises. As with public display, it is the dolphins' intelligence that makes them desirable to the military, but their reliability as soldiers is questionable.²¹⁵ More to the point, the ethical questions raised by using creatures who may merit the moral stature of human toddlers for military purposes are profound. Human divers know they are in danger in combat zones; dolphins do not.



Most zoos and aquaria currently obtain polar bears from captive-bred stock. Nevertheless, these creatures are supremely well-adapted to the Arctic climate, even when they've never experienced it directly.

Mortality and Birth Rates

PINNIPEDS AND OTHER NON-CETACEANS

The annual mortality rates of seals and sea lions in captivity range from 2.23 percent for Steller sea lions (*Eumetopias jubatus*) to 11.6 percent for northern fur seals (*Callorhinus ursinus*).²¹⁶ There is little information from the wild with which to compare the mortality rates of captive seals and sea lions, but from limited data, captive Steller sea lions seem to show mortality rates similar to or lower than their wild counterparts.²¹⁷ Mortality rates of captive-born pups for some species, such as the California sea lion, are lower than in the wild,²¹⁸ but for others, captive pup mortality rates are relatively high. Two-thirds of captive South American sea lions (*Otaria byronia*) and northern fur seals die in their first year,²¹⁹ a rate that may be higher than experienced in the wild. Comparatively, captive sea otters appear to fare better in terms of life expectancy.²²⁰

Few, if any, of the pinniped species typically held in dolphinariums (notably harbor seals and California sea lions) are captured from the wild anymore. Surplus captive-bred animals, in fact, have now become a problem in many cases, and facilities are concerned with reducing the fecundity of these species.²²¹ Many of the currently available methods used to control reproduction may have long-term detrimental effects, and further research is needed to develop less-harmful contraceptive methods.²²²

As noted earlier, most aquaria and zoos currently obtain polar bears from captive-bred stock. However, sea otters, walrus (as noted earlier), manatees, and a handful of other pinniped species, such as northern elephant seals (*Mirounga angustirostris*) and Steller sea lions, are still acquired from the wild for the most part. All of these species have had relatively small populations in captivity, and data on their life history parameters are limited.



Few of the California sea lions now held in dolphinariums were captured from the wild.

Surplus captive-bred animals have now become a problem in many cases, and facilities are concerned with reducing the fecundity of these species. Many of the currently available methods used to control reproduction may have long-term detrimental effects, and further research is needed to develop less-harmful contraceptive methods.



For most pinniped species in captivity, captive breeding has been successful and the goal now is to limit pregnancies.



Too few manatees are held in captivity to determine mortality or birthrates.

BOTTLENOSE DOLPHINS

Some studies indicate that captive bottlenose dolphins live as long as and have the same mortality rates as their counterparts in the wild.²²³ Other studies, however, continue to indicate a higher year-to-year mortality rate for animals in captivity than for those in the wild (Table 1). The failure of captive dolphins to exhibit a higher survival rate in spite of 70 years of maintaining this species in captivity disputes the public display industry's oft-stated contention that captivity enhances survival by keeping animals safe from predators, parasites, and pollution and by providing animals with regular feeding and ever-improving veterinary care.

The reproductive history of bottlenose dolphins shows a similar pattern. Although calves are now born routinely in captivity, captive-born calf mortality rates fail to show a clear improvement over the wild.²²⁴ As predation—a significant source of calf mortality in the wild—is not a risk factor in captivity and veterinary supervision is intensive when a calf is born, this failure to demonstrate higher calf survivorship is disturbing. Causes of death for captive-born calves include lack of maternal skill, lack of proper fetal development, and abnormal aggression from other animals in artificial social environments and confined spaces.²²⁵

SMALL WHALES

Several small whale species are commonly held in captivity, and their mortality rate is much higher than that of bottlenose dolphins. Orcas and beluga whales are the small whales most often seen in captivity; false killer whales are also popular. Of at least 185 orcas held in captivity since 1961 (wild-caught or captive-born), 139 (75 percent) are now dead. Almost all of the orcas in the United States, and more than half of the captive orcas kept worldwide, are owned by Sea World Incorporated. For years, this corporation persistently and erroneously maintained that the maximum life span of orcas was 35 years.²²⁶ In fact, a peer-reviewed study using established methods of photo-identification and conducted since the early 1970s has identified several orcas in Washington State and British Columbia who are at least 45 years of age.²²⁷ First observed in 1973 as adults (at least 15 years of age), they are still alive today. This study determined that, on average, the mean life expectancy of orcas in the wild, for those who survive the first six months of life (which all whales captured from the wild have done), is 50 years for females and 29 years for males. The

The display industry engages in hypocritical reasoning. On the one hand, it claims that captivity is safer than the wild, in which case the mortality rates of captive-born calves (and captive adults, for that matter) should be lower than in the wild. On the other hand, after every failed birth, it states that captive infant mortality rates similar to those in the wild should be acceptable.

maximum life span for orcas is currently estimated to be 60 years for males and 80 or 90 years for females.²²⁸

Various analytical approaches have demonstrated that the overall mortality rate of captive orcas is at least two and a half times as high as that of wild orcas (see Table 1), and age- and sex-specific annual mortality rates range from two to six times as high.²²⁹ Nineteen orcas have died at Sea World parks since 1985: three were young calves, and the others were in their teens and twenties. To date, only 25 orcas are known to have survived more than 20 years in captivity, and only two have survived in captivity for more than 35 years.²³⁰ As stated earlier, captivity eliminates the uncertainties of foraging and the pressures of avoiding predators, pollution, and parasites while it provides veterinary care. Nevertheless, captive orcas continue to experience a greatly and significantly increased risk of dying at any given time in life than do wild orcas. Their size and complex physical and social requirements clearly cause them to suffer serious negative consequences when they are confined in tanks.

As for birth rates, after more than 40 years in which at least 185 orcas have been held in captivity, with 74 known pregnancies, only 33 viable calves (surviving past one year) have been produced (a 44.6 percent survival rate).²³¹ Therefore, orca birth rates and infant mortality rates have been at best no better in captivity than in the wild and have almost certainly been far worse.²³² This parallels the high infant mortality rates observed for other wide-ranging predator species in captivity, a situation that scientists have ascribed to stress and physiological dysfunction.²³³

The public display industry often states that the high infant mortality rate in captivity is unsurprising, given the high infant mortality rate in the wild, but this position contradicts the industry's argument that captivity shields wildlife from the rigors of the harsh natural environment. The display industry engages in



Of the orcas held in captivity since 1961—both wild-caught and captive-born—75 percent are dead. Few would be considered old by wild standards if they were still alive.

hypocritical reasoning. On the one hand, it claims that captivity is safer than the wild, in which case the mortality rates of captive-born calves (and captive adults, for that matter) should be lower than in the wild. On the other hand, after every failed birth, it states that captive infant mortality rates similar to those in the wild should be acceptable.

Not enough is known about the life history parameters of wild belugas or false killer whales to make a legitimate comparison between wild and captive populations of these species at this time. However, preliminary analyses of the small database for beluga whales indicate that this species may demonstrate increased mortality in captivity.²³⁴ The captive-birth rates for these two species are not impressive either; there was only one surviving captive-born false killer whale and eight living captive-born belugas as of October 2000.²³⁵

OTHER CETACEAN SPECIES

Other dolphins and whales—such as Pacific and Atlantic white-sided dolphins (*Lagenorhynchus* spp.), common dolphins (*Delphinus delphis*), and pilot whales (*Globicephala* spp.)—have been maintained in captivity with varying levels of success.²³⁶ Most have not been successfully bred. All have comparatively small captive populations, and a significant increase in numbers would be required to support any kind of breeding population.

What replaces, with equal impact, predators, food shortages, storms, ship strikes, fishing gear entanglement, and other causes of death in the wild once a marine mammal is in captivity?

One obvious culprit is a degree and form of stress that is uniquely suffered by confined animals.

As most of these species are not known to be endangered, it would be biologically inappropriate and unjustified from a conservation standpoint, as well as inhumane, to increase the number in captivity, especially when success at maintaining them in captivity has been inconsistent at best.

CONCLUSION

The relative success of a captive-breeding program should not be considered evidence of the suitability of any particular species to captivity. Most animals, even those held in suboptimal conditions, will breed if given the chance. While unsuccessful attempts at breeding may indicate that a species is not adjusting to captivity, successful breeding in itself does not indicate the opposite. California sea lions are a good case in point: in many ways, captive sea lions literally have nothing else to do but breed if the opportunity presents itself.

The scientific community has been reluctant to draw conclusions about the mortality patterns of cetaceans in captivity. It maintains that the limited data sets both from wild and captive populations make it impossible to determine definitive differences in mortality and life spans. The scientific community also invokes differences

between facilities, sex- and age-related factors, the differing sources of mortality in the two environments, and the methods and criteria for recording data, implying that comparing life history parameters from the two environments may be like comparing apples to oranges.

In fact, it is true that causes of death in captivity are quite different from those in the wild; however, the mortality data, at least for bottlenose dolphins and orcas, indicate that the former are at least as efficient as (and probably more efficient than) the latter. What replaces, with equal impact, predators, food shortages, storms, ship strikes, fishing gear entanglement, and other causes of death in the wild once a marine mammal is in captivity? One obvious culprit is a degree and form of stress that is uniquely suffered by confined animals.

In the end, the arguments of the scientific community dismissing life history comparisons between wild and captive marine mammals are in many ways irrelevant. Regardless of whether it can yet be definitively, statistically determined that mortality and life spans differ between captivity and the wild, it is a fact that seemingly healthy and normal captive cetaceans die at relatively early ages on a regular basis, usually with little or no warning. The cited causes of death are frequently indeterminate, such as pneumonia (which can be caused by many different circumstances) or drowning.

But according to the industry's own arguments, cetaceans should experience vastly improved survivorship profiles, both for adults and calves, when exposed to modern veterinary care and safety from natural and human-caused hazards. Yet this has not happened for cetaceans, even after decades of exposure to this technology.

Conclusion

The tide may be turning for captive marine mammals, particularly cetaceans. In the United States, at least 10 dolphin exhibits have closed in the last decade, while during the same time frame only three new exhibits have opened.²³⁷ In early 2005, Chile became the first country to ban outright the public display of most marine mammal species (as well as some sea birds), and also their import, export, and capture from the wild. Costa Rica joined it soon after, prohibiting the capture and public display of all cetaceans.²³⁸ In September 2005, the Netherlands Antilles determined that it will allow no more dolphin exhibits in its territories (it already has one and has issued a permit for another). Some countries have banned the live import or export of cetaceans; these include Cyprus (imports are prohibited), Hungary (imports), India (imports), Argentina (imports from the Russian Federation), the Solomon Islands (exports), and Malaysia (exports are prohibited, as are imports of marine mammal species already found in Malaysia).

Other nations have banned or enacted moratoriums on the live capture of cetaceans in their waters. These include Mexico, Argentina (orca captures are prohibited), Nicaragua, Australia, China (including Hong Kong), Indonesia (live captures of Irrawaddy dolphins in the Mahakam River are prohibited), Laos (live captures of Mekong Irrawaddy dolphins are prohibited), Malaysia, the Philippines, Singapore, and Thailand. The government of Antigua and Barbuda, after issuing a permit to a foreign company to capture as many as 12 dolphins annually from local waters, rescinded this permission after activists filed a lawsuit arguing the quota was unsustainable and that it violated regional conservation agreements.²³⁹ Furthermore, some countries have implemented strict legislation for the keeping of cetaceans in captivity. Among these are the United Kingdom and Brazil, neither of which holds cetaceans in captivity, and Italy, which bans swim-with-the-dolphins and other interactive programs.

All of these developments suggest that a paradigm shift may be underway—a slow shift, given the financial investment in the captive industry. It is one that may take a step back for every two forward, but nevertheless, it is discernible. The media attention on controversial captures, unnecessary deaths, and inhumane transports is having an impact on the general public's perception of marine mammals in captivity. The impression of happy animals performing for treats is giving way to recognition of behind-the-scenes suffering.

In the preceding pages, The HSUS and WSPA have presented the case against capturing marine mammals and keeping them in captivity. Yet while humans can separate out and analyze each aspect of the existence of captive marine mammals, one fact must remain paramount: to the marine mammals, the experience of captivity is not a set of aspects that can be perceived separately. Instead, it is a whole, inescapable life. Therefore, while humans can subdivide the captive experience and even conclude that one aspect is more or less damaging to the animals than another, The HSUS and WSPA believe that the entire captive experience for marine mammals is so sterile and contrary to even the most basic elements of compassion and humaneness that it should be rejected outright. It is unacceptable for marine mammals to be held in captivity for the purpose of public display.²⁴⁰

Table 1

Annual Mortality Rates (Mean Percentage of Population Dying Each Year) of Bottlenose Dolphins and Killer Whales in Captivity vs. in the Wild.^a

SPECIES	MORTALITY RATE IN CAPTIVITY				MORTALITY RATE IN THE WILD
	Study 1	Study 2	Study 3	Study 4	Studies 5 and 6
Bottlenose Dolphins	7.0% ^{b*}	7.4%*	5.6% ^{b**}	5.7% ^{b***}	3.9% ^b
Killer Whales	7.0%*	—	6.2% ^{b**}	6.2% ^{b***}	2.3% ^b

Notes: Studies are as follows: (1) D. P. DeMaster and J. K. Drevenak, "Survivorship patterns in three species of captive cetaceans," *Marine Mammal Science* 4 (1988): 297–311; (2) D. A. Duffield and R. S. Wells, "Bottlenose dolphins: comparison of census data from dolphins in captivity with a wild population," *Soundings* (spring 1991): 11–15; (3) R. J. Small and D. P. DeMaster, "Survival of five species of captive marine mammals," *Marine Mammal Science* 11 (1995): 209–226; (4) T. H. Woodley, J. L. Hannah, and D. M. Lavigne, "A comparison of survival rates for free-ranging bottlenose dolphins (*Tursiops truncatus*), killer whales (*Orcinus orca*), and beluga whales (*Delphinapterus leucas*)," Draft Technical Report No. 93–01 (Guelph: International Marine Mammal Association, Inc., 1994); (5) R. S. Wells and M. D. Scott, "Estimating bottlenose dolphin population parameters from individual identification and capture-release techniques," *Report of the International Whaling Commission*, Special Issue 12 (1990); and (6) P. F. Olesuik, M. A. Bigg, and G. M. Ellis, "Life history and population dynamics of resident killer whales (*Orcinus orca*) in the coastal waters of British Columbia and Washington State," in *Report of the International Whaling Commission*, Special Issue 12 (1990)

^a Presented in original texts as survivorship rates. All statistics are presented as reciprocal mortality rates in this table.

^b Only non-calves were used to calculate this statistic.

* No statistical comparisons were made between captive statistics and any wild statistics.

** These captive-mortality rates are higher than the given wild-mortality rates (dolphins, marginal significance, $p=0.07$; whales, highly significant, $p<0.001$). Please see the original text for a description of the statistical analysis used.

*** These captive-mortality rates are higher than the given wild-mortality rates (dolphins, marginal significance, $0.10<p<0.05$; whales, highly significant compared to an all-animal mortality rate of 2.0 percent, $p<0.005$). Please see the original text for a description of the statistical analysis used.

Appendix I

Case Studies of Live Captures

LA PAZ, MEXICO

The history of the La Paz dolphins is a dismal one. After their December 2000 capture, they were transported to the Dolphin Learning Center (DLC), a hastily constructed sea pen enclosure owned by an entrepreneurial local doctor, in front of a beach resort hotel. Dolphin advocates warned Mexican authorities and the DLC facility owner that the sea pen's location (near a sewage outfall and relatively heavy vessel traffic) and shallowness were substandard and could create serious problems for the dolphins. A video released of the transport of the animals, much of which was in wooden crates, showed footage of one of the animals being repeatedly dropped while being carried in a stretcher across a beach. One of the dolphins died (not the animal who was dropped—she managed to survive this treatment) within a few weeks of being brought into the facility. In response to the capture, and the fact that the capturing facility did not possess the appropriate permits for a live capture of cetaceans, the Mexican Environmental Enforcement Agency ordered the DLC dolphinarium shut down. However, the Mexican courts ruled against this closure in June 2001, and so the dolphins remained in captivity.

The situation was looking more hopeful when, in January 2002, Mexican authorities enacted a moratorium against capturing marine mammals in Mexican waters for commercial purposes. However, the captive dolphin industry has considerable influence in Mexico, and Mexican Environment Secretary Victor Lichtinger, a key opponent of the live captures, was replaced, his stance over the dolphin issue playing a part. Also, Victor Ramirez, the environmental protection official who had tried to shut down the dolphinarium, was fired. So the infamous “La Paz Seven” still remained in captivity, despite continued threats by the Mexican authorities to confiscate the illegally captured animals.

In September 2003, La Paz was hit by a hurricane, and although the human population prepared against the onslaught of the storm, nothing was done to similarly protect, or evacuate, the La Paz dolphins. Due to contamination of the dolphins' pen—from the sewage outfall, just as dolphin advocates had predicted—the large amount of storm-tossed debris, and the stress associated with the event, three of the seven remaining dolphins died within days of the hurricane's passing. In November 2003, a fourth dolphin died, reportedly from storm-inflicted health problems, following which Mexican authorities ordered the removal of the final three dolphins being held at the park to a nearby dolphinarium. Despite the urging of animal protection organizations, the transfer of the dolphins, rather than their rehabilitation and release, was carried out that same month.²⁴¹

BAYAHIBE, DOMINICAN REPUBLIC

No surveys or other research had been conducted on the status of bottlenose dolphins inhabiting Dominican Republic waters prior to the capture of eight individuals near Bayahibe (off the southeast coast of the country) in August 2002. The captors told locals, however, that they were merely going out to conduct research on the dolphins—by attaching tags. The captures caused a furor locally, as community groups objected to “their” dolphins being taken, and to the lack of consideration of the impact the takes would have on the economically important local dolphin-watching industry. The capture also was severely criticized by the Dominican Republic Academy of Sciences.

The dolphins were taken to Manatí Park, a captive dolphin facility that operates dolphin shows and a SWTD program. This facility had already courted controversy and coverage on European television over

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the state of the facilities and an attack on a child by one of the dolphins in the park. Although there are no known records of dolphin mortalities at Manatí Park, local workers at the facility informed a WSPA representative that one day in 2000, four dolphins suddenly died, to be replaced the very next day by five new, but undocumented, animals.²⁴²

Although a permit had been issued for the August 2002 capture by governmental officials, this permit was invalidated by the fact that the National Park's waters were legally considered to be a marine mammal sanctuary, and such captures were prohibited.²⁴³ The captures were also in violation of international treaties, namely the Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (SPAW), to which the Dominican Republic is a party.²⁴⁴

Since the capture of the eight dolphins, it is believed that at least one of the animals has died. To date, even in the face of a lawsuit filed by local environmental groups in 2003, there has been no action by the Dominican

government to remove the dolphins from Manatí Park—even in view of the clear illegality of their capture. Ironically, despite undermining national and international environmental regulations and earning the ire of the nation's leading scientific organization, Manatí Park tries to portray itself as a conservation, research, and education facility in its publicity materials (much like its cousin dolphinaria in the United States).²⁴⁵

SOLOMON ISLANDS

In April 2003, the international animal protection community was alerted by reports circulated on the Internet of an ongoing capture of a large number of Indo-Pacific bottlenose dolphins, *Tursiops aduncus*, in the waters off the Solomon Islands, near Australia. After some investigation, it became known that at least 94 animals were captured by local fishermen on behalf of foreign entrepreneurs and placed in makeshift pens, awaiting export. However, it was unknown how many other dolphins were injured or died during the capture process—anecdotal accounts suggested at least nine died, for an almost 10 percent mortality rate. The plan was to sell these dolphins to international buyers, with the first sale of 28 dolphins to Mexico completed in July 2003. As Mexico is a CITES signatory, it should only have purchased and imported the dolphins if the takes of dolphins were proven to be sustainable—but no population assessment had been carried out.

After international outcry about the capture, in September the IUCN Cetacean Specialist Group sent a fact-finding mission to the Solomon Islands to investigate the situation and subsequently reported:

“No scientific assessment of the population-level effects of the removals of bottlenose dolphins in the Solomon Islands was undertaken in advance of the recent live-capture operations. Without any reliable data on numbers and population structure of bottlenose dolphins in this region, it is impossible to make a credible judgment about the impacts of this level of exploitation. Until such data are available, a non-detriment finding necessary under CITES Article IV is not possible. Therefore CITES Parties should not issue permits to import



Above and below: These dolphins were captured in a massive round-up of at least 94 dolphins, the largest single live capture operation recorded in history. Photos: WSPA



dolphins from the Solomon Islands. Unfortunately, this episode of live-capture was undertaken with little or no serious investment in assessing the conservation implications for the affected dolphin population(s).²⁴⁶

The 28 dolphins destined for Mexico were exported on 21 July 2003 to a dolphinarium in Cancun, where one animal died within a week of transport. Mexican CITES officials subsequently declared that they would not accept any more dolphins from the Solomon Islands (though permits had been granted to import 100 animals) and, indeed, had reservations about *any* wildlife trade with a country not a party to CITES.²⁴⁷ To date, there have been no further imports of dolphins into Mexico from the Solomon Islands. The Solomon Islands government announced a provisional ban on any more exports in January 2005. About 30 dolphins are still captive in a complex of enclosures in Gavutu, performing for any tourists and locals willing to pay a fee. The IUCN report suggests that 27 dolphins were released at one time or other, but this was merely reported by the facility operators—it was not independently confirmed.

Notes

INTRODUCTION

¹ Examples of such agreements include the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region's Protocol Concerning Specially Protected Areas and Wildlife (the SPAW Protocol of the Cartagena Convention). However, it is notable that these agreements generally fail to define what is meant by "educational" or specifically how public display furthers conservation.

² Life-history data on seals, sea lions, whales, dolphins, and porpoises are maintained by the Department of Commerce's National Marine Fisheries Service (NMFS) in its *Marine Mammal Inventory Report* (Silver Spring), which is updated periodically. Dolphinarium, aquaria, and zoos are not required to submit such inventory records on polar bears (*Ursus maritimus*), sea otters (*Enhydra lutris*), walrus (*Odobenus rosmarus*), manatees (*Trichechus manatus*), and dugongs (*Dugong dugon*); these species are under the authority of the Department of Interior's U.S. Fish and Wildlife Service (FWS). The United States is one of the only countries to require such an inventory.

EDUCATION, CONSERVATION, AND RESEARCH

Education

³ In 1988, the U.S. Marine Mammal Protection Act of 1972 (MMPA) was amended to require that permits for possessing marine mammals for public display purposes would be given only to applicants that used the animals in a conservation or education program that adhered to "professionally recognized standards of the public display community" and was acceptable to the U.S. Secretaries of Commerce and Interior. Another amendment in 1994 removed the need for secretarial approval, but the need to adhere to "professionally recognized standards" was maintained. At the time, such standards did not exist in a published form; therefore, the NMFS asked the American Zoo and Aquarium Association (AZA) and the Alliance of Marine Mammal Parks and Aquariums (AMMPA), two industry associations, to draft such standards. These standards emphasize that the "best current scientific knowledge" must form the basis for education programs but are offered merely as guidelines rather than requirements, and many are ignored by dolphinarium anyway—in some cases, all are. These industry guidelines are often used by facilities in other countries as a "best practices" template for their own guidelines—few nations have education program requirements.

⁴ S. R. Kellert, *American Perceptions of Marine Mammals and Their Management* (Washington, DC: The Humane Society of the United States, 1999).

⁵ A telephone poll of 350 greater Vancouver residents was conducted 13–24 August 2003 by R. A. Malatest and Associates, Limited, Victoria, British Columbia, on behalf of Zoocheck Canada Incorporated.

⁶ As a result of the 1999 European Union Zoos Directive (Council Directive 1999/EC), all zoos and captive animal facilities in Europe (including dolphinarium) are legally obliged to provide educational materials on the natural habitats of displayed animals. This is not the case for facilities in North America and other parts of the world.

⁷ For example, the website for Indiana's Indianapolis Zoo used to state that the average life expectancy for bottlenose dolphins (*Tursiops truncatus*) in the wild was 37 years. When it was pointed out that none of the facility's animals had to date survived past 21 years of age, the website was changed to report a life expectancy in the wild of only 17 years (S. Kestin, "What marine attractions say vs the official record," *South Florida Sun-Sentinel*, 17 May 2004).

⁸ All captive adult male orcas (*Orcinus orca*) and a large number of captive females have collapsed dorsal fins. Observations from the wild (for example, in British Columbia) show that only one to five percent of animals have drooping fins. J. K. B. Ford et al., *Killer Whales* (Vancouver: University of British Columbia Press, 1994). In their educational materials, talks, and shows, dolphinarium suggest that drooping fins are genetic, heritable traits, like eye color. Yet only in captivity is there such a high prevalence of collapsed fins. If the drooping fin syndrome were primarily genetic, one would expect animals in the populations from which the captive orcas were taken to exhibit such fins with relatively high frequency, but they do not.

⁹ In 1995, an unpublished review investigated statements made by the public display industry about the life span of orcas in the wild. Miami Seaquarium and Sea World Incorporated, in a variety of educational materials and interviews, maintained that wild orcas live a maximum of 25 to 35 years. However, scientific research indicates a maximum estimated life span of about 80 years for female orcas and 60 years for male orcas. E. Hoyt et al., "Observations of disparity between educational material related to killer whales (*Orcinus orca*) disseminated by public display institutions and the scientific literature," unpublished report, 1995. Killer whale life span data from P. F. Olesiuk et al., "Life history and population dynamics of resident killer whales (*Orcinus orca*) in the coastal waters of British Columbia and Washington State," in *Report of the International Whaling Commission*, Special Issue 12, 1990: 209–242.

¹⁰ If cetaceans were displayed in a traditional, nonperformance, zoo-like exhibit, they would not elicit the same unmatched enthusiasm as they do in shows. The exhibit (now defunct) with two Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) at the San Francisco Steinhart Aquarium is a perfect example. There was no

show, and most patrons became bored after only minutes of watching the two dolphins float or swim aimlessly in the small, barren tank; simply eliminating exploitative performances is therefore not a solution to the problems of public display.

- 11 Bottlenose dolphin actions that are considered to be aggressive in a natural environment but are portrayed as "play" behavior in captivity include: rapid opening and closing of the mouth and the slapping of the water surface with the tail flukes or flippers. S. Shane, "Behavior and ecology of the bottlenose dolphin at Sanibel Island, Florida," in *The Bottlenose Dolphin*, edited by S. Leatherwood and R. R. Reeves (San Diego: Academic Press, 1990): 245–265; J. Östman, "Changes in aggression and sexual behavior between two male bottlenose dolphins (*Tursiops truncatus*) in a captive colony," in *Dolphin Societies*, edited by K. Pryor and K. S. Norris (Berkeley: University of California Press, 1990): 305–317.
- 12 In a study on learning at American zoos, researchers showed that only about a third of visitors specifically went to the zoo to learn about animals and even fewer to learn about wildlife conservation (most went for entertainment and recreation). The study found that the typical zoo visitor's concern for and interest in the biology and ecology of animals actually decreased after a zoo visit. An attitude of dominion and mastery/control over animals increased in visitors, as did negative attitudes toward animals (avoidance, dislike, or indifference). The study also found that people who were more interested in learning about conservation issues were also more concerned about the ethical treatment of animals—a result suggesting that those most interested in learning about conservation would probably avoid or be uncomfortable with visiting a zoo due to ethical considerations. Finally, far from leaving with higher levels of knowledge about animals and their biology, visitors actually seemed to experience a decrease in their level of knowledge as the result of a visit to the zoo. S. R. Kellert and J. Dunlap, "Informal learning at the zoo: A study of attitude and knowledge impacts," *Report to the Zoological Society of Philadelphia* (1989).
- 13 W. V. Donaldson, "Welcome to the conference on informal learning," in *Conference on Informal Learning*, edited by P. Chambers (Philadelphia: Philadelphia Zoological Garden, 1987): 3. In a study on children encountering animal exhibits, it was noted that comprehension of how an animal was adapted to and interacted with its environment and its role in the ecosystem (as portrayed by the animal's prey or the kind of vegetation it ate) was actually greater when children looked at animal dioramas in museums than when they observed exhibits of living animals at a zoo. Children visiting museums also had a greater understanding of threats to the animals, in particular problems caused by human activities. B. A. Birney, "Children, animals and leisure settings," *Animals and Society* 3 (1995): 171–187.
- 14 This was shown in the Kellert and Dunlap study on how zoo visits changed public attitudes. The researchers noted that "moralistic values," i.e., concern about the right and wrong treatment of animals, actually decreased after exposure to captive animals in a zoo. As an example of how the display industry facilitates this desensitization, zoos and aquaria constantly refer to the marine mammals' pool, enclosure, or cage as a "habitat," as if such enclosures were natural. For example, a Sea World brochure, *The Real Story on Killer Whales*, states that "Sea World is committed to maintaining the largest and most sophisticated marine mammal habitats in the world." Yet the sterile environment of an orca pool is extremely different from what is truly "the largest and most sophisticated" habitat—the ocean—in terms of both physical and ecological complexity and size.
- 15 See D. A. Dombrowski, "Bears, zoos, and wilderness: The poverty of social constructionism," *Society and Animals* 10 (2002). The author states "Ultimately, zoos are for us rather than for animals:

Zoos entertain us, they help to alleviate our guilt regarding what we have done to bears and other wild animals."

The Conservation Fallacy

- 16 R. R. Reeves et al., *Dolphins, Whales, and Porpoises: 2002–2010 Conservation Action Plan for the World's Cetaceans* (Gland, Switzerland: IUCN, 2003), <http://iucn.org/dbtw-wpd/edocs/2003-009.pdf>.
 - 17 The Ocean Park Conservation Foundation, based in Hong Kong, provides funds for research, conservation, and education projects on critically endangered species in Asia, such as the baiji, Indus, and Ganges river dolphins.
 - 18 A 1999 study showed that aquaria (and zoos) belonging to the AZA, despite recent increases in conservation expenditure, only spent a tenth of one percent of their operating budgets on direct and indirect conservation-related projects. T. Bettinger and H. Quinn, "Conservation funds: How do zoos and aquaria decide which projects to fund?," in *Proceedings of the AZA Annual Conference* (St. Louis: AZA, 2000): 52–54. Sea World Incorporated, one of the largest and wealthiest captive display franchises, spends a stated US\$3 million a year on conservation-related projects, which sounds like a large amount of money until one realizes that this is less than one percent of the revenue generated by Sea World Orlando alone: in 2001, Sea World Orlando attracted 5.1 million visitors (information from www.amusementbusiness.com). When one considers that admission fees range from approximately US\$45 for children to US\$54 for adults, this comes to more than US\$250 million a year from entrance fees alone, without factoring in merchandising and sales of food and drink. When one adds in the income of Sea World facilities in Texas and California, the contribution to conservation is a mere fraction of one percent of revenues. In contrast, it has been stated that if a zoo or aquarium is to make a serious contribution to conservation, at least 10 percent of its operating income should go toward conservation and research. J. D. Kelly, "Effective conservation in the twenty-first century: The need to be more than a zoo," *International Zoo Yearbook* 35 (1997): 1–14. For some zoos this is actually the case—for example, Jersey Zoo in the United Kingdom's Channel Islands dedicates 23 percent of its gross income to conservation, approximately 100 times the relative contribution of Sea World Incorporated. A. Tribe and R. Booth, "Assessing the role of zoos in wildlife conservation," *Human Dimensions of Wildlife* 8 (2003): 65–74.
 - 19 See Reeves et al., *Dolphins, Whales, and Porpoises*, for a good discussion of this concept.
 - 20 One dramatic example is the drive fishery conducted in the Faroe Islands (a Danish protectorate) for the long-finned pilot whale (*Globicephala melaena*). This species has been hunted by the Faroese for generations (Reeves et al., *Dolphins, Whales, and Porpoises*), and it is unknown if the population can continue to sustain the loss of hundreds of individuals each year.
 - 21 The U.S. public display industry presented testimony advocating this position through one of its representatives, John Hodges, at the 1992 IWC meeting in Glasgow, Scotland.
- ## Live Captures
- 22 For example, U.S. government scientists measured strong stress reactions in pantropical spotted dolphins (*Stenella attenuata*), measured by changes in blood chemistry, stress protein levels, and other factors, as the result of being encircled by speed boats and entrapped by purse-seine nets in the eastern tropical Pacific Ocean tuna fishery. In addition, heart lesions were found in dead animals, which the researchers linked to stress. K. A. Forney et al., "Chase encirclement

- stress studies on dolphins involved in eastern tropical Pacific Ocean purse seine operations during 2001," Southwest Fisheries Science Center Administrative Report LJ-02-32, La Jolla, California (2002), http://swfsc.nmfs.noaa.gov/idcpa/tunadol_rep/LJ_02_32.pdf. Researchers also found suppressed immune systems, making animals more susceptible to subsequent disease. T. Romano et al., "Investigation of the effects of repeated chase and encirclement on the immune system of spotted dolphins (*Stenella attenuata*) in the eastern tropical Pacific," Southwest Fisheries Science Center Administrative Report LJ-02-35C, La Jolla, California (2002), http://swfsc.nmfs.noaa.gov/idcpa/tunadol_rep/LJ_02_35C.pdf.
- 23 Reeves et al., *Dolphins, Whales, and Porpoises*, 17.
- 24 R. J. Small and D. P. DeMaster, "Acclimation to captivity: A quantitative estimate based on survival of bottlenose dolphins and California sea lions," *Marine Mammal Science* 11 (1995): 510–519.
- 25 This method of hunting various dolphin species has a long and bloody history in Japan and the Faroe Islands. Reeves et al., *Dolphins, Whales, and Porpoises*.
- 26 As reported by P. Kenyon, "Taiji's brutal dolphin drive hunt begins again," *The Independent*, 9 November 2004.
- 27 S. Hemmi, *Japan's Dolphin Drive Fisheries: Propped up by the Aquarium Industry and "Scientific Studies"* (Tokyo, Japan: Elsa Nature Conservancy, 2005). This report contains eye-witness accounts of the brutality of these hunts, as well as detailed information on the quotas, actual numbers killed, and the efforts to which the fishermen go to prevent the public from witnessing the killing.
- 28 R. R. Reeves et al., "Survivorship of odontocete cetaceans at Ocean Park, Hong Kong, 1974–1994," *Asian Marine Biology* 11 (1994): 107–124.
- 29 In 2004, Paul Kenyon described his encounter with Tim Desmond, the American procurer of drive-fishery-captured cetaceans for Ocean Adventure. Kenyon wrote that Desmond claimed that "he's the conservationist" as opposed to "the demonstrators trying to stop the drive-hunts." Kenyon goes on to say of Desmond: "He argues that Taiji is the most environmentally friendly place to acquire dolphins. If he ordered them from elsewhere—Cuba for instance, which is a major supplier—the dolphins would be caught specifically for him: in other words, he would be guilty of interfering with the species." Kenyon, "Taiji's brutal dolphin drive hunt begins again."
- 30 In 1993, Marine World Africa USA in California and the Indianapolis Zoo in Indiana attempted to import drive-hunted cetaceans from Japan, but animal protection groups discovered their source. When the NMFS was confronted with this fact, it denied the imports—not because the method used was inhumane (a violation of the MMPA), but because it was not the method specified in the capture permits' conditions (seine-netting). In other words, the agency denied the imports on a technicality in an effort to avoid making a definitive determination that drive fisheries were an inhumane collection method.
- 31 On 16 July 1998, 17 December 1999, and 14 August 2001, permit application requests to the FWS (PRT-018197, 844287, 844288, 844289, and 043001) were published in the *Federal Register*; they were for the capture of wild Alaskan sea otters by capture operators working for public display facilities in Japan. Most of these facilities, including Kagoshima City Aquarium, Suma Aqualife Park, Izu-Mito Sea Paradise Aquarium, and Oarai Aquarium, had participated in drive fisheries. At the time of its application, Oarai Aquarium had actually stated its intention to do so again the following year. Despite the controversial, inhumane, and anticonservation nature of drive fisheries, Izu-Mito Sea Paradise Aquarium, Oarai Aquarium, Suma Aqualife Park, and many other Japanese facilities that support drive fisheries (e.g., the Taiji Whale Museum) are members of the IUCN Conservation Breeding Specialist Group (www.cbsg.org/directory/index.scd?scdfa-270200351-show-regionzq310=true).
- 32 See the *Federal Register* 68 (2003): 58316.
- 33 D. Lusseau and M. E. J. Newman, "Identifying the role that individual animals play in their social network," *Ecology Letters, Proceedings of the Royal Society, London B* (Supplement), doi:10.1098/rsbl.2004.0225 (2004).
- 34 Kellert, *American Perceptions of Marine Mammals and Their Management*.
- 35 On 29 March 2004, Miranda Stevenson, PhD, the director of the Federation of Zoos, stated that members of the federation are obliged to follow their "Animal Transaction Policy," which states: "When acquiring animals Federation collections are responsible for ensuring that the source of animals is primarily confined to those bred in captivity and that this is best achieved through zoo-to-zoo contact." Also, any animal transactions must "comply with national and international laws (relating to animal transport, trade, health and welfare)" such as CITES, which certainly has not happened in the case of many cetacean live captures.
- 36 See www.cites.org for treaty text and definitions.
- 37 The Action Plan also states that "Removal of live cetaceans from the wild, for captive display and/or research, is equivalent to incidental or deliberate killing, as the animals brought into captivity (or killed during capture operations) are no longer available to help maintain their populations. When unmanaged and undertaken without a rigorous program of research and monitoring, live-capture can become a serious threat to local cetacean populations. All too often, entrepreneurs take advantage of lax (or non-existent) regulations in small island states or less-developed countries, catching animals from populations that are already under pressure from by-catch, habitat degradation, and other factors." In other words, many countries are "fishing" themselves out of dolphins. Reeves et al., *Dolphins, Whales, and Porpoises*, 17.
- 38 This statistic was reported in a document submitted by the Cuban delegation to the European Union CITES Scientific Review Group in 2003, entitled "General Report of Research and Development Programs regarding the Tonina dolphin (*Montagu, 1821*) in Cuba."
- 39 Reeves et al., *Dolphins, Whales, and Porpoises*, 72.
- 40 The NMFS called for a voluntary moratorium in this year for the capture of bottlenose dolphins in the Gulf of Mexico and along the U.S. Atlantic coast, due to a lack of information about stock structure and poor population estimates in some areas. The last capture from U.S. waters of any cetacean species was in 1993, when three Pacific white-sided dolphins were taken off the coast of California for the John G. Shedd Aquarium in Chicago. The ensuing public outcry was intense, and no captures in U.S. territorial waters have occurred since. However, it should be noted that public display facilities continue to explore the possibility of capturing cetaceans from U.S. waters—it is the potential controversy, not the law, that has held them back to date.
- 41 See Appendix I for a detailed account of these captures and subsequent events.
- 42 Black Sea bottlenose dolphins are considered to be a unique subspecies of bottlenose dolphin: *Tursiops truncatus ponticus*. The initial proposal was to have Black Sea bottlenose dolphins moved from CITES Appendix II to Appendix I, which would have granted

stricter controls and prohibitions against the trade in these animals. Although this proposal failed (the dolphins are still listed under Appendix II), a compromise was successful: The quota for Black Sea bottlenose dolphin exports was reduced to zero.

- 43 This whale is Lolita, a female orca currently kept at Miami Seaquarium. Lolita is one of only four captive orcas known to have surpassed 30 years of age.
- 44 An analysis by the Center for Whale Research estimated that if the Southern Resident captures had not taken place, the number of reproductively active orcas in the population would be 44 percent greater. These individuals would have given birth to approximately 45 surviving calves. The number of captured animals (all of whom theoretically could have survived to the present day), plus these “potential” calves, suggests that the population has approximately 90 fewer orcas than it might have had without the captures. The population today is approximately 90 whales. S. Jacobs, “Impact of the captures between 1962 and 1973 on the Southern Resident killer whale community” (Friday Harbor, WA: Center for Whale Research, 2003), <http://orcahome.de/impact.htm>.
- 45 W. Rossiter, “The Taiji Five Revolution and Action Alert,” *Whales Alive* 6(2) (1997); W. Rossiter, “Two Taiji orcas have died,” *Whales Alive* 6(3) (1997).
- 46 Born Free, “Russian orca whale dies one month after capture,” www.bornfree.org.uk/dolphin/dolphnews037.shtml.
- 47 More than 120 animals have been identified in the region by researchers, but by the researchers’ own admission they have not yet been able to calculate the region’s population size (“We are not discussing the estimation of total numbers of killer whales in [the region], because of lack of data”). To produce a population estimate, and to even start to weigh the impacts of live captures, will take more research and analysis. For information on orcas in Kamchatka coastal waters, see www.russianorca.narod.ru/Project/reseng.htm.
- 48 Zoocheck, “Has Marineland imported 6 more belugas?,” www.zoocheck.com/action/index.php?showall=yes; 27 November 2003.
- 49 According to the survey, 68 percent of Canadians “feel it is not appropriate to keep whales and dolphins in captivity,” 58.3 percent are “supportive of laws banning the commercial use of captive whales and dolphins in Canada,” and 55.1 percent are “supportive of laws prohibiting the importation of live whales and dolphins into Canada.” A mere 29.7 percent were in support of the “commercial use” of cetaceans in Canada, and only 31.2 percent were against laws prohibiting the importing of live-caught cetaceans. Malatest & Associates Ltd.
- 50 Various newspapers and organizations have reported on these transfers in the last decade—see, e.g., <http://english.eastday.com/epublish/gb/paper1/1206/class000100005/hwz185537.htm> (China); and www.marineconnection.org/news/general/sharm_campaign_latest_jan05.htm (Egypt).

Species Enhancement Programs

- 51 For example, in a technical report endorsed by the public display industry, the U.S. Naval Command, Control, and Ocean Surveillance Center acknowledged that rehabilitation and reintroduction of long-term captive cetaceans could potentially benefit endangered-species enhancement programs. R. Brill and W. Friedl, executive summary of *Technical Report 1549—Reintroduction into the Wild as an Option for Managing Navy Marine Mammals*, U.S. Navy, Naval Command, Control, and Ocean Surveillance Center,

October 1993. Others make a similar case in a journal for biologists. M. H. Ames, “Saving some cetaceans may require breeding in captivity,” *Bioscience* 41 (1991): 746–749.

- 52 The European Union Zoos Directive (Council Directive 1999/EC) states that “Member States shall take measures ... to ensure all zoos implement ... research from which conservation benefits accrue to the species, and/or training in relevant conservation skills, and/or the exchange of information relating to species conservation and/or, where appropriate, captive breeding, repopulation or reintroduction of species into the wild.”
- 53 By 1980, more than 1,500 bottlenose dolphins had been removed from the wild for captive display, research, or military purposes from the coastal waters of Mexico, the Bahamas, and the United States. These captures were conducted without any consideration given to whether these removals were sustainable or harmful to the wild population. S. Leatherwood and R. R. Reeves, “Bottlenose dolphin (*Tursiops truncatus*) and other toothed cetaceans,” in *Wild Mammals of North America: Biology, Management, Economics*, edited by J. A. Chapman and G. A. Feldhammer (Baltimore: Johns Hopkins University Press, 1982), 369–414.
- 54 S. Mayer, *A Review of the Scientific Justifications for Maintaining Cetaceans in Captivity*, edited by F. Clarke (Chippenham, U.K.: Whale and Dolphin Conservation Society, 1998).
- 55 Some cetacean researchers have considered dolphins in captive research facilities to be definitively not wild, but “semi-domesticated”—using a definition of “domesticated” from the seventh edition of *Webster’s Dictionary*: “adapted to life in intimate association with and to the advantage of man.” D. J. St. Aubin et al., “Dolphin thyroid and adrenal hormones: circulating levels in wild and semidomesticated *Tursiops truncatus* and influence of sex, age, and season,” *Marine Mammal Science* 12 (1996): 2. The HSUS and the WSPA do not necessarily agree that captive-bred dolphins should be considered semi-domesticated or unfit for release.
- 56 A recent proposal for a captive dolphin breeding program in Jamaica, used to justify a captive dolphin facility on the island, reveals how little at least some captive breeding programs at marine mammal facilities have to do with conservation. In this proposal, the justification for captive breeding is not to help repopulate dolphin populations in the wild, but rather to provide a source of replacement animals for this and other captive facilities in Jamaica. To do this the facility proposes to import 10 dolphins from Cuba plus capture at least 18 (and possibly as many as 40) animals from Jamaican waters between 2004 and 2007, from populations for which numbers and other vital stock parameters are unknown. The proposal states further that any animals bred in this program will not be released back into the wild. “Proposed development of dolphin breeding programme in Jamaica,” Dolphin Cove Ltd., Jamaica, September 2004.
- 57 See E. Hoyt, *The Performing Orca—Why the Show Must Stop* (Bath, U.K.: Whale and Dolphin Conservation Society, 1992), 56–59, for a discussion of this concept.
- 58 This was actually alluded to in an article on captive breeding of cetaceans, where it was pointed out that “captive population growth from successful births (recruitment rate) does not equal to or exceed the population’s mortality rate.” M. H. Ames, “Saving some cetaceans may require breeding in captivity,” *Bioscience* 41 (1991): 748.

Mixed Breeding and Hybrids

- ⁵⁹ Four bottlenose dolphin and long-beaked common dolphin (*Delphinus capensis*) hybrids were bred at Sea World San Diego, although two of these animals died very soon after birth. One of the surviving hybrids was subsequently mated with a bottlenose dolphin to produce a calf who also died soon after birth. H. R. Zornetzer and D. A. Duffield, "Captive-born bottlenose dolphin x common dolphin (*Tursiops truncatus* x *Delphinus capensis*) intergeneric hybrids," *Canadian Journal of Zoology* 81 (2003): 1755–1762. Other examples of hybrids who have been bred in captivity include a rough-toothed (*Steno bredanensis*) and bottlenose dolphin hybrid at Sea Life Park, Hawaii (T. P. Dohl et al., "A porpoise hybrid: *Tursiops* x *Steno*," *Journal of Mammalogy* 55 (1974): 217–221); a pregnancy resulting from a bottlenose dolphin and a long-finned pilot whale (*Globicephala macrorhynchus*) at Sea World San Diego (J. E. Antrim and L. H. Cornell, "Globicephala-Tursiops hybrid," abstract from *Fourth Biennial Conference on the Biology of Marine Mammals* (San Francisco: Society for Marine Mammalogy, 1981), 4); and 13 Risso's dolphin (*Grampus griseus*) and bottlenose dolphin hybrids, as well as four bottlenose dolphin and false killer whale (*Pseudorca crassidens*) hybrids at Enoshima Marineland, Japan (J. P. Sylvestre and S. Tasaka, "On the intergeneric hybrids in cetaceans," *Aquatic Mammals* 11 (1985): 101–108).

Captive Cetaceans and Culture

- ⁶⁰ See L. Rendell and H. Whitehead, "Culture in whales and dolphins," *Behavioral and Brain Sciences* 24 (2001): 309–382, for a detailed description of culture and its importance in whale and dolphin populations. To look at the importance of culture in orcas, see H. Yurk et al., "Cultural transmission within maternal lineages: vocal clans in resident killer whales in southern Alaska," *Animal Behaviour* 63 (2002): 1103–1119.
- ⁶¹ See H. Whitehead et al., "Culture and conservation of non-humans with reference to whales and dolphins: review and new directions," *Biological Conservation* 120 (2004): 431–441.
- ⁶² An example of the problems that occur when captive facilities neglect the importance of culture is illustrated by Keiko, the orca made famous by the *Free Willy* movies. Keiko had been removed from his family group in Iceland at the age of one or two years. He was eventually sold to a facility in Mexico (after spending periods in an Icelandic enclosure and a dolphinarium in Canada), where he had no other orcas for company; his only companions were the occasional bottlenose dolphin. Scientists analyzing Keiko's calls (his "language") found them underdeveloped. He also mimicked and incorporated into his vocalizations both bottlenose dolphin calls and strange rhythmic sounds that were believed to be imitations of pool machinery. Consequently, when Keiko was being prepared for release, not only did he have to be retaught how to catch fish, but he was not able to communicate with wild whales until he had relearned how to "speak orca." V. L. G. Turner, "The underwater acoustics of the killer whale (*Orcinus orca*)," Master's thesis, University of Southampton, U.K./Woods Hole Oceanographic Institution, MA (1997).
- ⁶³ For example, Keto was moved from Sea World Orlando to Sea World San Diego when less than four years old (and eventually was transferred to Sea World San Antonio). Keet, another Sea World San Antonio animal, was separated from his mother at only 20 months of age, and Splash (who died in April 2005) was moved from Marineland Ontario to Sea World San Diego when only 2.5 years old. See <http://orcahome.de/orcastat.htm> for additional details.
- ⁶⁴ J. L. Miksis et al., "Captive dolphins, *Tursiops truncatus*, develop signature whistles that match acoustic features of man-made

model sounds," *Journal of the Acoustical Society of America* 112 (2002): 728–739.

- ⁶⁵ For an example of the problems caused in wildlife rehabilitation efforts as the result of contact with and habituation to humans, see S. Bremner-Harrison et al., "Behavioural trait assessment as a release criterion: Boldness predicts early death in a reintroduction programme of captive-bred swift fox (*Vulpes velox*)," *Animal Conservation* 7 (2004): 313–320.
- ⁶⁶ As an example, Kalina, a female orca kept at Sea World Orlando, was impregnated at only six years of age. In the wild, female orcas have their first calf between 11 and 16 years of age, with an average first pregnancy at 15 years of age. J. K. B. Ford, "Killer whale, *Orcinus orca*," in *Encyclopedia of Marine Mammals*, edited by W. F. Perrin et al. (San Diego: Academic Press, 2002), 669–676. Apart from lacking cultural knowledge, these females may also suffer physiological damage from the stress placed on their bodies by having a calf so young, similar to that seen in humans.
- ⁶⁷ A study by researchers at Harderwijk Marine Mammal Park in The Netherlands mentions the high rate of calf mortality in captive display facilities and how a female dolphin in Harderwijk's care had successively drowned three calves born in captivity. As a result, a training program was launched to try to train the female not to reject her calf and to accept simulated suckling behavior from a model calf. Despite the training, the next calf who was born to the trained female died 15 days after birth as the result of an infection that the authors' paper suggests resulted from a wound inflicted by the mother immediately after the calf's birth. R. A. Kastelein and J. Mosterd, "Improving parental care of a female bottlenose dolphin (*Tursiops truncatus*) by training," *Aquatic Mammals* 21 (1995): 165–169.

The Captive Display Industry "Double Standard"

- ⁶⁸ For more information on the captive display industry's arguments against rehabilitation, see the Frequently Asked Questions section of the AMMPA website, specifically www.ammpa.org/faqs.html#10. This entry references a November 1992 report prepared for the Minister of Fisheries and Oceans by the Advisory Committee on Marine Mammals, entitled *Capture and Maintenance of Cetaceans in Canada*, which concluded that "the release to the wild of cetaceans that have been in captivity for extended periods is inappropriate" (p. iv). This report's conclusion was also referenced by the executive director of the AZA when responding to a request from The HSUS's former president to end the public display of small whales. S. J. Butler, letter to Paul G. Irwin, 23 July 1993.
- ⁶⁹ B. Beck et al., "Reintroduction of captive-born animals," in *Creative Conservation: Interactive Management of Wild and Captive Populations*, edited by P. J. S. Olney et al. (London: Chapman-Hall, 1994), 265–286.
- ⁷⁰ A total of nine dolphins, five of whom had been caught from local waters and kept at Atlantis Marine Park, in Perth, were released. Four of these, including a calf, were captive-bred. Three of the captive-born animals were subsequently recaptured, and one (the calf) is presumed to have died. N. Gales and K. Waples, "The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia," *Aquatic Mammals* 19 (1993): 49–59.
- ⁷¹ Two captive-born bottlenose dolphins (Shandy and Pashosh), who had been reared in Dolphin Reef Eilat, a facility on the Red Sea, were released on 26 August 2004 in the Black Sea. There were concerns, as it was believed that at least one of the parents of these animals was not a Black Sea dolphin, but rather an animal from a

- completely different ocean system (and probably a completely different species, *Tursiops aduncus*). When the animals were released, there were no plans for tracking or tagging to monitor their health, reintegration, or survival. One of the released animals (Pashosh) was believed to be pregnant at the time of the release.
- 72 In a 1995 compilation of cetacean releases into the wild, 58 bottlenose dolphins and 20 killer whales are mentioned, although most of these were accidental releases or escapes. There are only 13 reports that involve animals who had been in long-term captivity, the majority of whom (12) were bottlenose dolphins. K. C. Balcomb III, *Cetacean Releases* (Friday Harbor, WA: Center for Whale Research, 1995).
- 73 As the result of a project funded by the WSPA, Flipper, a bottlenose dolphin who had been captured in Brazil in 1981, was released in Brazilian waters in 1993. The release seems to have been successful, as Flipper was regularly sighted for several years after his release and was seen in the company of other dolphins. M. M. Rollo, "The last captive dolphin in Brazil: a project of rehabilitation, releasing, and monitoring in the natural environment," abstract from *Tenth Biennial Conference on the Biology of Marine Mammals* (Galveston, TX: Society for Marine Mammalogy, 1994).
- 74 The first of these animals was a Florida bottlenose dolphin named Rocky, who was held in captivity for 20 years and was the last captive cetacean held at Morecambe Marineland in England. After extensive public demonstrations against cetacean captivity and a resulting drop in park attendance, the facility sold Rocky to the U.K.-based charity Zoo Check, which subsequently paid for his transport and rehabilitation in a Caribbean facility (in the Turks and Caicos islands). This release was followed, as the result of public pressure and campaigns, by the release of two more dolphins, from the Brighton Aquarium (Missie, a bottlenose dolphin from Texas held in captivity for 22 years, and Silver, possibly an Indo-Pacific bottlenose dolphin [*Tursiops aduncus*] from Taiwan, held in captivity for 15 years). This information comes from *Into the Blue*, a documentary produced in 1991. However, it should be stressed that the two *T. truncatus* dolphins released in the Caribbean were not native to that region, and Silver was from a completely different ocean system. Moreover, he may have been from a species not found in the Atlantic Ocean (*T. aduncus*), although this species was not officially identified until several years after the release.
- 75 Gales and Waples, "The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia."
- 76 In June 2001, two bottlenose dolphins (Ariel and Turbo) were being held in a small pool in the mountains of Guatemala. When questions were raised regarding the animals' origins and the lack of proper permits, the dolphins' trainers abandoned the animals, taking their food and the pool's filtration system. When WSPA rescue specialists arrived, the dolphins were malnourished and stressed. Once stabilized, the animals were moved to a rehabilitation pen off the Guatemala coast, not far from what was believed to be their home range, and were released several weeks later. Local fishermen reported sighting both dolphins in area waters for some time after their release. www.wspa-usa.org/pages/549_aug_01_turbo_enjoys_his_freedom_.cfm.
- 77 In Nicaragua in 2002, two dolphins (Bluefield and Nica) captured from local waters for eventual use in a private exhibit had been confined in a small fresh-water swimming pool for three months when animal protection investigators found them. The Ministry of Environment took immediate custody of the animals and called in WSPA experts to aid the failing dolphins. They rebounded after only a few weeks of rehabilitation and were released into their home range, with help from the Nicaraguan military. www.wspa-usa.org/pages/747_dolphins_delight_in_their_new_ocean_home.cfm.
- 78 In June 1987, two Mississippi bottlenose dolphins (Joe and Rosie), who had been kept at a research facility, were released in Georgia. The dolphins had been in the research facility for four years before being transferred to Florida and spent the last two years before their release at a swim-with-the-dolphins (SWTD) facility in the Florida Keys. The animals were seen several times in the months immediately after their release. www.time.com/time/archive/preview/0,10987,965236,00.html. Two bottlenose dolphins (Echo and Misha) who had been held in captivity for two years were released in Tampa Bay, Florida, on 6 October 1990. Prior to release, the animals were kept in a sea pen and retrained to eat live fish for three and a half weeks. They were only released after they had demonstrated the ability to catch live fish on their own. The dolphins were observed apparently healthy several years after release, and observations demonstrated normal interactions and reintegration with wild dolphins. This was the first detailed and systematic rehabilitation and monitoring study of its kind and serves as a model for subsequent release efforts. R. S. Wells et al., "Experimental return to the wild of two bottlenose dolphins," *Marine Mammal Science* 14 (1998): 51–71.
- 79 After the release of the film, Keiko's fame resulted in a powerful public campaign to return him to the wild. A collaborative effort among animal protection groups, the filmmakers, a private benefactor, commercial and nonprofit sponsors, and scientists resulted in Keiko's repatriation to Iceland in September 1998. He lived for some months in a specially built sea pen, where he underwent extensive rehabilitation and was fitted with a radio/satellite tag on his dorsal fin. He began supervised forays into the open ocean in May 2000. These "walks," during which he followed a research vessel, continued each summer for three years. For several weeks each season, he interacted at a low level with the local orca pods who came to the area to feed. In July 2002, Keiko, after several weeks of interaction with the local wild whales, began a five-week unsupervised journey across the Atlantic, monitored the entire distance by satellite telemetry. He arrived in Norway in September 2002 in good health but clearly having failed to reintegrate into a wild pod. His caretakers moved their operation to Norway, where he lived unconfined but supervised for more than a year. Keiko died suddenly, probably from pneumonia, in December 2003.
- 80 Examples include Ulises, a young male orca who was living alone in Barcelona, Spain; Keiko; and dolphins surplus to the U.S. Navy marine mammal program in San Diego, California, where dozens of dolphins and other marine mammals are used as subjects in research programs and trained to perform tasks unsuited, for physical or safety reasons, to human divers. Both whales were put up for sale by their owners; the Navy offered 25 to 30 of its dolphins free to any licensed public display facility. Animal advocates lobbied in all three cases to place these animals in reintroduction-research programs; in all three cases the AMMPA and its member aquaria publicly recommended keeping the animals in captivity within the industry system. Ulises was bought by Sea World Incorporated (he is now performing in San Diego). Keiko entered a release program (see note 78). After animal protection groups appealed directly to Navy officials, the Navy transferred three dolphins to a release program in Florida, but the executive director of the AMMPA strongly urged the Navy not to allow the transfer. M. Keefe, letter to Rear Admiral Walter Cantrell, 2 November 1994.
- 81 See, for example, S.J. Butler, letter to Paul G. Irwin, 23 July 1993, in which he states "[AZA] members would never subject the animals under their care to such risky and ill-conceived [release] experiments."

Ethics and Captive Breeding

- ⁸² See P. V. Moriarty, "Zoo and conservation programs," *Journal of Applied Animal Welfare Science* 1 (1998): 377–380, for a discussion of this concept.

Stranding Programs

- ⁸³ A good example of this was the rehabilitation and release of JJ, a gray whale, in 1998 by Sea World San Diego. This effort was extremely expensive, yet the release was technically unsuccessful—JJ dislodged her tracking tags within two days of release into the ocean and was never seen again (and she could easily have died from starvation or been killed by predators soon after) (www.seaworld.org/animal-info/gray-whale/news-main.htm). Yet the entire process was presented as a huge success in the media and on Sea World Incorporated's website, and as completely justified on conservation and scientific grounds, even though the science gained from her time in captivity was minimal, at least as suggested by the small number of subsequent publications. This is in sharp contrast to the industry's response to Keiko's release. M. Hutchins, "Keiko dies: Killer whale of *Free Willy* fame," *Communiqué* (Silver Spring, MD: American Zoo and Aquarium Association, February 2004), 54–55. The industry portrayed it as a total failure, even though Keiko spent five healthy years in a semi-independent state in Iceland and was tracked for five weeks with complete success by satellite while he crossed the Atlantic to Norway.
- ⁸⁴ A dramatic variation on this scenario occurs when a facility claims it is rescuing animals from certain death by bringing them into captivity; an example is the group of orphaned walrus acquired from the native hunts in Alaska. These so-called rescues may in fact act as incentives to Inuit hunters to kill walrus mothers and thus create orphans, as money is exchanged to acquire these animals. The Cincinnati Zoo acquired three walrus orphans in 1996. When one of them died in 1998, the Cincinnati *City Beat* newspaper conducted an investigation that revealed that the zoo paid a substantial sum of money to the native hunters. One hunter admitted to the reporter that the hunters went out specifically to acquire the walrus pups for the zoo and returned immediately after obtaining them (the mothers were killed and eaten). The pups were not in fact "surplus" to the subsistence hunt; they were the objectives. N. Firor, "Redefining rescue," *Cincinnati City Beat*, 8–14 October 1998.
- ⁸⁵ Again, a more dramatic variation on this theme is when an animal is forced to strand, by facility staff or local fishermen, to provide an exhibit animal to a dolphinarium. An orca in Argentina named Kshamenk (pronounced "shah-menk") seems to have been a victim of such a forced stranding in 1992, when he was a calf. Argentina prohibits live captures of marine mammals—it hardly seems a coincidence that almost all the animals in the collection of Mundo Marino dolphinarium are "unreleasable" stranded animals, including Kshamenk. His stranding report suggests he was not injured and was at worst mildly sunburned, yet he was not floated along with the adult orcas with whom he was found (they swam away) but was instead brought to Mundo Marino for rehabilitation. By the time he was pronounced healthy in 1993, he was considered to have been held too long for a successful release.
- Research**
- ⁸⁶ Kellert, *American Perceptions of Marine Mammals and Their Management*; Malatest & Associates, Ltd.
- ⁸⁷ In the wild, dominance hierarchies, segregation of the sexes, and other social behavior do much to affect the breeding of marine mammals. The artificial groupings, small enclosures, and husbandry practices experienced by captive cetaceans may lead to animals breeding at younger ages and at shorter intervals than wild animals. The constant and abundant food supply may also lead to faster maturation. Using data gathered from captive animals to estimate reproductive rates of wild populations would therefore give an incorrect estimate. If these data were used to calculate how quickly a population would recover from depletion, or to address some other similar conservation issue, the answer would also be incorrect and could compound the conservation problem. For a discussion of this issue, see S. Mayer, "A review of the scientific justifications for maintaining cetaceans in captivity."
- ⁸⁸ P. A. Rees, "Will the EC Zoos Directive increase the conservation value of zoo research?" *Oryx* 39 (2005): 128–136.
- ⁸⁹ Sea World Incorporated has recently been publicizing its artificial insemination program for orcas, saying that the techniques used would be invaluable to help conservation of endangered species such as the baiji, a highly dubious claim, to say the least. See Robeck et al., "Reproductive physiology and development of artificial insemination technology in killer whales (*Orcinus orca*)," *Biology of Reproduction* 71 (Aug. 2004): 650–660. What works for an orca is not necessarily appropriate for a dolphin who is not even in the same taxonomic family. There may also be behavioral issues that invalidate the technique. To illustrate, beluga whales (*Delphinapterus leucas*) kept in captivity had very poor reproductive success for many years, until it was discovered that keeping the belugas in groups with multiple males was necessary to promote conception, as physiological changes in competing males led to higher sperm counts and fertility and possibly induced ovulation in females. If this is also the case for the baiji, artificial insemination techniques would probably be unsuccessful. Sea World parks and other dolphinariums should be trying to save endangered species *in situ*, by, among other actions, contributing to the protection of habitat. For a discussion of how inappropriate such captive-based reproductive research could be for wild and endangered marine mammals, see S. Mayer, "A review of the scientific justifications for maintaining cetaceans in captivity."
- ⁹⁰ In the orca artificial insemination study, for example, three females were successfully impregnated in two years, but one of the females died while pregnant, together with her 129-day-old fetus—hardly a glowing advertisement for the technique. Robeck et al., "Reproductive physiology and development of artificial insemination technology in killer whales (*Orcinus orca*)." The Sea World paper also states that 26 orcas have been born in captivity, lauding this as a success. However, this is a major misrepresentation of the facts; there have actually been at least 66 known pregnancies, but most fetuses miscarried, were stillborn, or died soon after birth (with one newborn calf dying soon after the paper was accepted for publication). Therefore, at least 61 percent of captive orca pregnancies have been unsuccessful, due to the death of the calf before or just after birth.
- ⁹¹ For example, when studies on the hearing abilities of captive beluga whales were used to calculate the distance at which the whales could detect shipping traffic, a distance of 20 kilometers was estimated. However, observations on wild animals showed that beluga whales were detecting vessels at distances of well more than 80 kilometers and were actively avoiding shipping at distances up to three times farther away than the captive studies would have estimated. This clearly demonstrates that at least some studies on captive animals are not directly applicable to wild cetaceans. K. J. Findley et al., "Reactions of belugas, *Delphinapterus leucas*, and narwhals, *Monodon monoceros*, to ice-breaking ships in the Canadian high Arctic," *Canadian Journal of Fisheries and Aquatic Sciences* 224 (1990): 97–117. In another study, researchers noted that captive bottlenose dolphins do not show the same variability in whistles as wild animals and may have abnormal whistle patterns, potentially resulting in incorrect conclusions about natural acoustic behavior. S. L. Watwood et al., "Whistle sharing in paired male bottlenose dolphins, *Tursiops truncatus*," *Behavioral Ecology and Sociobiology* 55 (2004): 531–543. As a nonacoustic example, captive animals

- swim at speeds that are not comparable to those exhibited in the wild. J. J. Rohr et al., "Maximum swim speeds of captive and free-ranging delphinids: Critical analysis of extraordinary performance," *Marine Mammal Science* 18(1) (2002): 1–19.
- 92 Researchers studying the behavior of captive river dolphins noted among other issues that "Within the captive environment, pool size, shape and structure are considered to be important in influencing the behaviour of these dolphins." L. Renjun et al., "Comparative studies on the behaviour of *Inia geoffrensis* and *Lipotes vexillifer* in artificial environments," *Aquatic Mammals* 20 (1994): 39–45.
- 93 S. Kestin, "Captive marine animals can net big profits for exhibitors," *South Florida Sun-Sentinel*, 18 May 2004.
- 94 On the Dolphin Research Center's website (www.dolphins.org/Learn/drc-rsch.htm), there are only three research papers listed that are the result of work exclusively conducted at the center and have been published in international, peer-reviewed journals. This is not an impressive output for a dedicated "research center" receiving an income of tens of millions of U.S. dollars over the last two decades. It should also be noted that at least one of these studies was highly controversial—the experiment involved deliberately exposing dolphins to toxic pollutants in the form of oil slicks. The website also lists two graduate student theses resulting from research that was conducted at the center. However, the website neglects to mention that one of these theses was actually critical of the captive facility. T. G. Frohoff, "Behavior of captive bottlenose dolphins (*Tursiops truncatus*) and humans during controlled in-water interactions," Master's thesis, Texas A&M University (1993).
- 95 Of 469 abstracts for (wholly or partially) cetacean-related studies submitted to the Fifteenth Biennial Conference on the Biology of Marine Mammals (Greensboro, NC: Society for Marine Mammalogy, 2003), seven reported on studies of cetaceans kept in naval or private research facilities (1.5 percent), with only 2.6 percent reporting on studies of cetaceans held at dolphinaria or aquaria. However, one percent of all the abstracts dealt with the rehabilitation and release of stranded wild cetaceans, which involved aquarium staff. The majority of the aquarium/dolphinarium-based cetacean research represented by the conference abstracts was conducted by the New York, Baltimore, and Vancouver aquaria. The studies conducted were typically related to cognition (e.g., do beluga whales exhibit mirror self-recognition), or diseases, with one of these studies even acknowledging "Captivity conditions represent a qualitatively new noogenic environment [sic], where dolphins collide with a multitude of unknown stress factors." O. V. Sokolova et al., "Peculiarities of phagocytosis in the Black Sea bottlenose dolphin (*Tursiops truncatus*) in correlation with microbial indexes of Gr+ Coccus in upper respiratory tract of these animals during their adaptation to noogenic environment," abstract from *Fifteenth Biennial Conference on the Biology of Marine Mammals* (Greensboro, NC: Society for Marine Mammalogy, 2003), 153. For pinniped-related studies, a larger proportion (nine percent) was conducted on captive animals, although the majority of these studies were on pinniped biochemistry in a U.S. government-subsidized facility (the Alaska Sea Life Center), or they were in private facilities or rehabilitation centers. Less than one percent of the pinniped-related studies were conducted in dolphinaria, zoos, or aquaria, and it was notable that 25 percent of the seals used in one of these studies died during the period of the research.
- 96 As an example, see R. S. Wells et al., "Experimental return to the wild of two bottlenose dolphins," *Marine Mammal Science* 14 (1998): 51–71.
- ## THE PHYSICAL AND SOCIAL ENVIRONMENT
- 97 In November 2004, dolphins kept in a sea pen in Antigua by the Mexican company Dolphin Discovery were threatened by sewage and contaminated water from a nearby salt lagoon. The facility illegally blocked the lagoon's drainage to address this threat, an action that resulted in the flooding of houses and businesses bordering the lagoon. After considerable delay and disregard for orders issued by the Antiguan Government to unblock the drainage, the company was finally forced to close the facility and evacuate the dolphins (to avoid exposure to the flood waters) to a sister facility in Tortola (*Daily Observer*, Antigua, 29 November 2004).
- 98 As noted in Appendix I, in September 2003, dolphins kept in a sea pen facility in La Paz, Mexico, were hit by a hurricane. The pen became filled with debris and contaminants. Three dolphins died within days of the storm (www.cdninfo.com/eco/031012/031012.htm)—by November, a fourth animal had died from a storm-induced condition.
- 99 In 1996, Anthony's Key Resort, in Roatan, Honduras, was hit by a hurricane-level storm. At least eight bottlenose dolphins, imported from Florida by the Institute for Marine Studies (a SWTD facility), escaped as a result of the barrier around their pen collapsing in the storm. All were captive-born or had been captured in Florida waters for Ocean World dolphinarium in Fort Lauderdale, which went bankrupt and closed in 1994, sending all of its dolphins to Anthony's Key. Seven of these animals were never recovered—given their complete lack of familiarity with the area, it is unlikely they survived (Associated Press, 19 January 1996).
- 100 The IUCN's chief scientist described the effect of natural barriers: "When a tsunami comes in, it first hits the coral reef which slows it down; then it hits the mangroves which further slow it down. It may get through that, but by then, a lot of the energy has already been dissipated." He then described the impacts that human development had on these natural barriers: "The mangroves were all along the coasts where there are shallow waters. They offered protection against things like tsunamis. Over the last 20–30 years they were cleared by people who didn't have the long-term knowledge of why these mangroves should have been saved, by outsiders who get concessions from the governments and set up shrimp or prawn farms" (<http://dsc.discovery.com/convergence/tsunami/news/asiacoasts.html>). To guard their coasts from further tsunami damage, many countries bordering the Indian Ocean have embarked on an extensive mangrove restoration and replanting project (for an article on this restoration project, see <http://msnbc.msn.com/id/6826505>).
- 101 T. J. Goreau, "Dolphin enclosures and algae distributions at Chankanaab, Cozumel: Observations and recommendations," Global Coral Reef Alliance (2003). <http://globalcoral.org/Dolphin%20enclosures%20and%20algae%20distributions%20at%20Chankanaab,%20Cozumel.htm>.
- 102 F. Griffiths, "Caribbean vulnerable to killer tsunamis," 20 January 2005, http://poseidon.uprm.edu/Caribbean_Vulnerable_to_Killer_Tsunamis.pdf. More detailed information can also be found in U. Brink, W. Dillon, A. Frankel, R. Rodriguez, and C. Mueller, eds., "Seismic and tsunami hazard in Puerto Rico and the Virgin Islands," USGS Open-File Report 99-353, U.S. Geological Survey (1999), <http://pubs.usgs.gov/of/99-353/>.
- 103 There are many reports on the negative impact of aquaculture on the environment—see, for example, www.efoundation.org/shrimp/shrimp.html. For a report that specifically mentions the impacts of aquaculture waste on cetaceans, see V. Grillo et al., "A review

of sewage pollution in Scotland and its potential impacts on harbour porpoise populations," SC53/E13, International Whaling Commission, 3–16 July 2001, London, (available from www.iwcoffice.org).

Pinnipeds and Other Non-Cetaceans

- 104 A good general overview of pinniped natural history is provided in J. E. King, *Seals of the World* (Ithaca, NY: Cornell University Press, 1983); M. L. Riedman, *The Pinnipeds: Seals, Sea Lions, and Walruses* (Berkeley: University of California Press, 1989).
- 105 In the United States, the regulatory standards for captive marine mammal enclosures, which set the minimum requirements for such things as chlorination and the use of freshwater or saltwater, are established by the Animal and Plant Health Inspection Service (APHIS). U.S. Department of Agriculture, Animal and Plant Health Inspection Service, "Subchapter A—Animal Welfare" and "Subpart E—Specifications for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals," in *Code of Federal Regulations, Title 9* (Washington, DC: U.S. Government Printing Office, 2005), 93–116. APHIS announced its intentions to revise its regulatory standards in 1993, an implicit acknowledgment that the standards were inadequate. Several sections were revised and published in 2001, but key sections remain outdated. The display industry actively endorses APHIS as the regulatory agency in charge of captive standards, which was demonstrated during the reauthorization of the Marine Mammal Protection Act in 1994. At that time an effort was made by animal protection organizations to shift regulatory authority to the NMFS, but the industry defeated this effort. The display industry continues to lobby to keep enclosure size and water quality standards at their current outdated levels, which indicates that economic well-being rather than animal well-being is the industry's first priority.
- 106 For a discussion of chlorine and its effects on marine mammals, see J. R. Geraci, "Husbandry," in *Zoo and Wild Animal Medicine*, 2d ed., edited by M. E. Fowler (Philadelphia: W. E. Saunders Company, 1986), 757–760; K. D. Arkush, "Water Quality," in *CRC Handbook of Marine Mammal Medicine*, 2d ed., edited by L. A. Dierauf and F. M. D. Gulland (New York: CRC Press, 2001), 779–787.
- 107 King, *Seals of the World*; Riedman, *The Pinnipeds*.
- 108 For general background information on the polar bear's natural history and excellent photographs of wild polar bears, see D. Guravich and D. Matthews, *Polar Bears* (San Francisco: Chronicle Books, 1993).
- 109 Stereotypies are generally negative behaviors that manifest in captive animals whose movements or natural behavioral expressions are restricted. They include pacing, swaying, and self-mutilation and are often found in large species in captivity, such as elephants, polar bears, orcas, and big cats.
- 110 R. Clubb and G. Mason, "Captivity effects on wide-ranging carnivores," *Nature* 425 (2003): 463–474.
- 111 One study noted that up to 95 percent of captive harbor porpoises' time was spent engaged in stereotypical behavior. M. Amundin, "Occupational therapy in harbor porpoises," *Aquatic Mammals* 2 (1974): 6–10. For other reports of stereotypical behavior in marine mammals, see R. A. Kastelein and P. R. Wiepkema, "A digging trough as occupational therapy for Pacific walruses (*Odobenus rosmarus divergens*) in human care," *Aquatic Mammals* 15 (1989): 9–18; J. A. E. Grindrod and J. A. Cleaver, "Environmental enrichment reduces the performance of stereotypical circling in captive common seals (*Phoca vitulina*)," *Animal Welfare* 10 (2001): 53–63.
- 112 In a report on Canada's polar bear export program, the animal protection organization Zoocheck Canada made an assessment of various polar bear captive facilities around the world. The report noted several areas of concern, including: (1) undersized enclosures (e.g., enclosures of only a few hundred square meters housing one or more polar bears); (2) absence of soft substrates (polar bears used to walking on snow frequently are housed in enclosures with concrete floors); (3) lack of environmental enrichment (enclosures were often completely barren with few objects with which polar bears could interact to reduce their boredom or keep active); (4) inadequate and/or contaminated swimming pools (polar bears are natural swimmers and pools also help the bears regulate their body temperature); and (5) abnormal stereotypical behaviors (pacing, head nodding, and self-mutilation are common behaviors that are indicative of stress and poor welfare). R. Laidlaw, *Canada's Forgotten Polar Bears: An Examination of Manitoba's Polar Bear Export Program* (Toronto: Zoocheck Canada Incorporated, 1997).
- 113 In an article discussing a controversy about inappropriate captivity practices for elephants, the conservation and science director of the AZA, in mentioning the new polar bear enclosure at the Detroit Zoo, noted that polar bears traveled extensively in the wild and would never experience summertime temperatures found in Detroit: "Using [the Detroit Zoo's] logic polar bears really shouldn't be in Detroit, either" (M. Kaufman, "Seeking a home that fits: Elephant's case highlights limits of zoos," *The Washington Post*, 21 September 2004).
- 114 As an example, in May 2001, despite strong opposition by animal protection groups, the U.S. Fish and Wildlife Service (FWS) granted a permit for the Mexico-based Suarez Brothers Circus to import seven polar bears into Puerto Rico. Temperatures reached as high as 112°F/44°C, yet the bear enclosures often lacked air conditioning and pools of cold water. This species is highly adapted to life in a polar environment and has many anatomical and physiological specializations to retain heat. Forcing the bears to exert themselves and perform tricks in tropical heat was physically harmful, and the bears suffered from a variety of skin and other health problems. After considerable controversy and legal protests from animal protection groups and others, the FWS seized one bear in March 2002, citing falsified CITES documents, and she was sent to the Baltimore Zoo. The agency confiscated the remaining six bears in November 2002, citing violations of the Marine Mammal Protection Act and the circus's public display permit as the reasons for the seizure. Unfortunately, one of the animals, a bear called Royal, died en route to a zoo in Atlanta. The other five bears survived and were sent to zoos in Michigan, Washington, and North Carolina.
- 115 In the 1997 Zoocheck report on this trade (Laidlaw, *Canada's Forgotten Polar Bears*), the Manitoba Wildlife Branch claimed to thoroughly investigate target facilities before bears were exported. However, when Zoocheck ordered copies of this documentation through the Freedom of Information Act, it only received eight pages of brief notes from two facilities. The Wildlife Branch also maintained that all facilities to which the bears were sent must meet the standards of the Canadian Association of Zoological Parks and Aquaria (CAZPA) and Canadian Agriculture. The Zoocheck report pointed out that this was meaningless, as CAZPA guidelines made no mention of polar bear husbandry and Canadian Agriculture standards did not actually exist.
- 116 Laidlaw, *Canada's Forgotten Polar Bears*. The Wildlife Branch was also supposed to have a six-month "check-up" on traded bears, but this did not take place, and frequently bears were retraded and documentation lost. As an example, three polar bears exported

to the Ruhr zoo in Germany were retraded to the Suarez Brothers Circus in Mexico.

- 117 R. Laidlaw, "Zoocheck Canada's response to the polar bear facility standards advisory committee draft recommendations" (Toronto: Zoocheck Canada Incorporated, 1998).
- 118 See <http://web2.gov.mb.ca/laws/statutes/ccsm/p094e.php>.
- 119 See <http://web2.gov.mb.ca/laws/regs/pdf/p094-210.02.pdf>.
- 120 The manatee exhibit at Sea World Orlando apparently does not use chemicals to maintain water clarity or sanitation; therefore, sea grasses and a variety of fish are maintained in the enclosure. The number of manatees in the exhibit varies; all are acquired through rescues, and most are in the process of being rehabilitated for eventual release.
- 121 After the 1989 Exxon Valdez oil spill in Alaska, 347 oiled sea otters were captured and treated in rehabilitation centers. Of these treated otters, 33 percent died, with 81 percent of those doing so within 10 days of capture. It was noted by veterinarians dealing with these animals that some of these deaths may have occurred due to "confinement and handling in the rehabilitation centers." H. Rebar, T. P. Lipscomb, R. K. Harris, and B. E. Ballachey, "Clinical and laboratory correlates in sea otters dying unexpectedly in rehabilitation centers following the Exxon Valdez oil spill," *Veterinary Pathology* 32 (1995): 346–350. In a sea otter translocation program conducted in California between 1987 and 1996, 147 healthy sea otters were captured and transported from the coast to San Nicholas Island. Of these animals, eight died during the translocation process, and six were later found dead—three shortly after the release, and the other three later. The fate of 61 of these released otters was unknown. Thus nearly 10 percent of the otters were known to have died during or soon after the translocation, almost certainly from the effects of handling (as they were healthy otherwise), although the mortality rate may have been even higher. C. Benz, "Evaluating attempts to reintroduce sea otters along the California coastline," *Endangered Species Update* 13(12) (1996): 31–35.
- 122 The annual mortality rate of adult sea otters held in captivity between 1955 and 1996 was about 10 percent, with that of pups more than 70 percent. E. J. Brennan and J. Houck, "Sea otters in captivity: the need for coordinated management as a conservation strategy," *Endangered Species Update* 13(12) (1996): 61–67. At least 18 sea otter pups have been born at Sea World San Diego—all have died before reaching sexual maturity. By taking in orphaned California sea otters, "those that were deemed non-releasable have been added to the captive population" (Brennan and Houck, "Sea otters in captivity," 65), thus replenishing their numbers. Captive facilities have adopted "a strategy to incorporate orphan pups into the captive population, or to preferentially select animals to establish a self-sustaining captive sea otter population." Brennan and Houck, "Sea otters in captivity," 65. This transforms a project to help conserve the California sea otter into a rather cynical method of easily obtaining new otters for a dwindling captive population.
- 123 On 16 July 1998, a request for the capture of 24 sea otters in Alaska was published in the *Federal Register* (1998), Volume 63, 38418. The permit applications stated that six of the captured otters would then be chosen and transported to Japanese aquaria and dolphinaria. The justification for this capture was a lack of breeding success of Japanese sea otters. For this planned capture, after a maximum acclimation period of three days, the otters were to be taken on a 22-hour journey to Japan. It should be noted that for other marine mammals the acclimation period (during which mortality is higher) is approximately 45 days. Small and DeMaster, "Acclimation to captivity." Three of the animals were destined for

the Ishikawa Zoo, which had acquired sea otters through another capture in Alaska in 1986. By 1994, half of these otters had died—by 1998, the rest were dead also (sea otters can live up to 20 years in captivity).

Small Cetaceans

- 124 For a good general overview of cetacean natural history, see J. Mann et al., eds., *Cetacean Societies: Field Studies of Dolphins and Whales* (Chicago: The University of Chicago Press, 2000); P. G. H. Evans, *The Natural History of Whales and Dolphins* (New York: Facts on File, 1987).
- 125 Most government standards for the maintenance of these animals, where they exist, are minimal and, particularly regarding tank size, wholly inadequate and are not specific with regard to species (for instance, species that are from tropical and temperate climates may be housed together). See, for a typical example, Animal and Plant Health Inspection Service, *Code of Federal Regulations*.
- 126 M. K. Bassos and R. S. Wells, "Effect of pool features on the behavior of two bottlenose dolphins," *Marine Mammal Science* 12 (1996): 321–324.
- 127 Animal and Plant Health Inspection Service, *Code of Federal Regulations*.
- 128 Many animal welfare agencies consider that if an animal cannot perform "behavioral needs" then "the individual's welfare may be compromised." T. Friend, "Recognising behavioral needs," *Applied Animal Behavior Science* 22 (1989): 151. A paper on behavioral needs of captive marine mammals includes among these the need to mate, forage, capture prey, or patrol an area. A. Goldblatt, "Behavioral needs of captive marine mammals," *Aquatic Mammals* 19 (1993): 149–157. The paper goes on to say that exaggerated play behavior by marine mammals with items in their pool, misdirected behaviors (such as sexual behavior directed toward trainers and other species), play behavior with other (non-cetacean) species in their tanks, and high levels of stereotypical behavior are all attributable to a lack of behavioral stimulation, or boredom. The paper concludes that marine mammals need to receive behavioral stimulation and to have some control over their environment, or they will "show signs of stress such as exaggerated stereotyped behaviour." Goldblatt, "Behavioral needs of captive marine mammals," 154.
- 129 Observations of increased breeding success in larger pools and increased aggression in smaller pools are from E. Asper et al., "Observations on the birth and development of a captive-born killer whale," *International Zoo Yearbook* 27 (1988): 295–304; W. A. Myers and N. A. Overstrom, "The role of daily observation in the husbandry of captive dolphins (*Tursiops truncatus*)," *Cetology* 29 (1978); and M. C. Caldwell et al., "Social behavior as a husbandry factor in captive odontocete cetaceans," in *Proceedings of the Second Symposium on Diseases and Husbandry of Aquatic Mammals* (St. Augustine, FL: Marineland Research Laboratory, 1968), 1–9.
- 130 The HSUS was an appointed member of the negotiated rule-making panel to revise the Animal and Plant Health Inspection Service, *Code of Federal Regulations*.
- 131 In apparent contrast to Bassos and Wells, "Effect of pool features on the behavior of two bottlenose dolphins," the Indianapolis Zoo sponsored a study that suggested that because dolphins spent more time in two side pools that were smaller and shallower than the main display/show pool, large pool sizes were not necessary for bottlenose dolphin welfare. However, the dolphins did not have free access to all areas of the enclosure complex at all times,

and there were different observers, leading to high inter-observer variability. In addition, the study did not consider that the dolphins might be avoiding the main pool area (perhaps due to high levels of noise associated with the main pool) or seeking shelter in the small side pools—the surveys were only conducted in the evening, and the dolphins may have retreated to side pool areas to rest. M. R. Shyan et al., “Effects of pool size on free-choice selections by Atlantic bottlenose dolphins at one zoo facility,” *Journal of Applied Animal Welfare Science* 5 (2002): 215–225. In comparison, Bassos and Wells had a more standardized methodology and, as the facility was not open to the public and the dolphins did not have to perform shows, their study was not compromised by these confounding factors.

- 132 For an introduction to the natural history of the northeast Pacific populations of orcas, see Ford et al., *Killer Whales*.
- 133 For a detailed technical description of the social structure of the northeast Pacific populations of orcas, see M. A. Bigg et al., “Social organization and genealogy of resident killer whales (*Orcinus orca*) in the coastal waters of British Columbia and Washington State,” in *Report of the International Whaling Commission*, Special Issue 12 (1990): 383–405.
- 134 For a discussion of captive orca social structure and breeding husbandry, see Hoyt, *The Performing Orca*, in particular, 56–59. For a discussion of the captive breeding of bottlenose dolphins, see Leatherwood and Reeves, eds., *The Bottlenose Dolphin*. In particular, see the chapter by J. P. Schroeder entitled “Breeding bottlenose dolphins in captivity,” 435–446.
- 135 Bottlenose dolphins can grow up to 3.8 meters, although coastal animals such as those kept in the Sharm el Sheikh facility are often closer to 2.5 meters. Beluga whales can grow up to 5.5 meters, nearly twice the length and several times the weight of the average bottlenose dolphin.

HUSBANDRY AND HEALTH CARE

- 136 For information regarding the nutritional value of the food provided to captive marine mammals and the need for nutritional supplements, see Hoyt, *The Performing Orca*, 42–43; Geraci, “Husbandry,” 760–764.
- 137 U.S. government regulations allow for substandard dimensions in temporary quarters. Animal and Plant Health Inspection Service, *Code of Federal Regulations*. Recent revisions clarify the definition of “temporary,” but still allow maintenance in such enclosures at the discretion of the facility veterinarian.
- 138 For information on the use of temporary holding pools, see Hoyt, *The Performing Orca*, 31–36. One example of this practice involved Finna, the male orca at the Vancouver Public Aquarium in Canada. He was sequestered in a medical side pool in early March 1995 during the days preceding the labor of his mate, Bjossa, to allow the mother and calf “privacy” in the main display tank. The calf died minutes after birth, but the body was not removed from the tank for five days; Finna remained in the side pool throughout this period. There is little obvious evidence that this prolonged “temporary” maintenance in small holding tanks has been curtailed in any country, despite the example set by the U.S. regulatory revisions.
- 139 Two incidents at Sea Life Park, a dolphinarium on the island of Oahu, Hawaii, illustrate this risk. In the first incident, five dolphins were left stranded for an unspecified length of time in May 1991 when a drain in their tank was left open without supervision. One animal died several days later of pneumonia apparently

exacerbated by this stressful event. In the second incident, three sea lions were left stranded for two hours in October 1992 while their tank was being cleaned. One sea lion died immediately from heat exhaustion. E. C. Lyons, *Government Inspection Report*, prepared for the Animal and Plant Health Inspection Service, U.S. Department of Agriculture, 21 January 1994.

- 140 An analysis from 1995 clearly demonstrates the negative effects of this stress. Small and DeMaster, “Acclimation to captivity.” The paper indicates that mortality rates for bottlenose dolphins increase six-fold over the captive norm directly after capture or a transport. It takes a month before their mortality rates return to normal.
- 141 For information on the practice of administering routine medications, see J. Sweeney, “Clinical consideration of parasitic and noninfectious diseases,” in *Zoo and Wild Animal Medicine*, 2d ed., 785–789.
- 142 Melanie Adcock, D.V.M., conversation with N. Rose, 5 April 1995.
- 143 The “dolphin’s smile” is merely an anatomical quirk—a fixed expression regardless of the animal’s mood. A dolphin smiles even when dead.
- 144 Examples of this in the United States are Nootka, Quitz, and Kotar. Nootka, a 13-year-old female orca held by Sea World Orlando, died in September 1994. She was reported by Sea World personnel to be “doing fine,” appeared lethargic and uninterested in food one morning, and died by that evening (T. Leithauser, “Female killer whale dies at Sea World,” *Orlando Sentinel*, 14 September 1994). Quitz, a five-year-old male Pacific white-sided dolphin, died at the John G. Shedd Aquarium in Chicago in February 1995. He was reported by Shedd personnel as appearing healthy, exhibited subtle changes in behavior one evening, did not eat normally the next morning, and died by that night (T. Puente, “Young dolphin dies after one year in Oceanarium,” *Chicago Tribune*, 26 February 1995). Kotar, a 19-year-old male orca, died at Sea World San Antonio in April 1995. He is reported to have died “unexpectedly,” exhibiting only subtle changes in behavior in the days leading up to his death (J. Coburn, “Sea World loses a veteran as Kotar dies unexpectedly,” *Express News*, 11 April 1995). Keiko, the orca from *Free Willy*, died in Norway in a similar fashion—he was reported as lethargic and “off his feed,” then died within 36 hours.

INTERACTIVE PROGRAMS

Swim-with-the-Dolphins Programs

- 145 See note 150 for a history of the U.S. SWTĐ regulations, ending in the suspension of their enforcement.
- 146 As noted earlier, this authority is shared with the FWS. The NMFS has authority over seals, sea lions, whales, dolphins, and porpoises. The FWS has authority over polar bears, sea otters, walrus, manatees, and dugongs.
- 147 A. Samuels and T. Spradlin, *Quantitative Behavioral Study of Bottlenose Dolphins in Swim-with-the-Dolphin Programs in the United States*, a final report prepared for the National Marine Fisheries Service, Office of Protected Resources, 25 April 1994. This report was later published, after peer review, in *Marine Mammal Science* 11 (1995): 520–544.
- 148 Another scientific examination of SWTĐ programs concluded that SWTĐ programs are dangerous to humans and dolphins and recommended against their expansion and the capture of dolphins

from the wild to stock them. T. G. Frohoff, "Behavior of captive bottlenose dolphins (*Tursiops truncatus*) and humans during controlled in-water interactions," Master's thesis, Texas A&M University (1993). For a review article that examines SWTD programs, see T. G. Frohoff and J. M. Packard, "Human interactions with free-ranging and captive bottlenose dolphins," *Anthrozoös* 3 (1995): 44–53.

- 149 Control was defined as supervision by trainers who direct the type of interactions that occur between dolphins and swimmers.
- 150 A behavioral study on captive common dolphins (*Delphinus delphis*) in an SWTD program at Marineland in Napier, New Zealand, found that the dolphins increased their use of the refuge area (an area where human swimmers were not permitted to enter) when swimmers were in the water with them. During periods without swimmers, there was no difference in the amount of time the dolphins spent in the refuge area and the main enclosure area. The study also noted that many inter-animal social behaviors decreased with the presence of humans, but the rate of animals touching each other with flippers, and some other behaviors (e.g. synchronous swimming) increased, as did the number of surfacings. Despite this evidence of a significant impact on dolphin behavior from the presence of swimmers, the study's authors inexplicably dismissed these observations, stating that SWTD activities did not have any negative effect on the dolphins. D. J. Kyngdon et al., "Behavioural responses of captive common dolphins *Delphinus delphis* to a 'Swim-with-Dolphin' programme," *Applied Animal Behaviour Science* 81 (2003): 163–170.
- 151 A particularly exploitative variation on SWTD programs is dolphin-assisted therapy (DAT). Many new commercial facilities claim they are conducting DAT, to put a positive, altruistic spin on a money-making venture. DAT is a form of animal-assisted therapy, directed by a health service professional, where touching or swimming with dolphins is used as a means to motivate or reward a disabled child or adult. A critical evaluation of DAT was published by L. Marino and S. O. Lilienfeld ("Dolphin-assisted therapy: Flawed data, flawed conclusions," *Anthrozoös* 11 (1998): 194–200), in which the authors noted that positive results cited by proponents of DAT did not necessarily persist in patients. In fact, DAT at best appears no more effective than using domesticated animals such as puppies or kittens, and is far more expensive and clearly carries higher risks. The founder of DAT, Betsy Smith, Ph.D., in fact concluded that DAT was exploitative of dolphins and people and has discontinued its practice and now only works with domesticated animals. B. Smith, "The discovery and development of dolphin-assisted therapy," in *Between Species: A Celebration of the Dolphin-Human Bond*, edited by T. Frohoff and B. Peterson (Berkeley, California: Sierra Club Books, 2003).
- 152 On 23 January 1995, APHIS published proposed regulations for SWTD programs in the *Federal Register* (1995), Volume 60, 4383. After more than three years, APHIS published final regulations on 4 September 1998. *Federal Register* 63 (1998): 47128. The regulations included requirements for refuge areas, swimmer-to-dolphin ratios, swimmer-to-staff ratios, staff training, maximum interaction times, and provisions for addressing unsatisfactory, undesirable, or unsafe behavior—all measures to promote the welfare of the animals. Almost immediately, on 14 October 1998, APHIS exempted "wading programs" from these regulations until further notice, as there was confusion as to whether standards for space and attendant supervision meant for swimming programs should apply also to programs where participants remain essentially stationary and nonbuoyant. *Federal Register* 63 (1998): 55012. On 2 March 1999, a small article was published in the *Washington Legal Times* stating that an influential casino owner, Stephen Wynn (then owner of the Mirage Hotel in Las Vegas), who also had

bottlenose dolphins on display and wanted to start an SWTD program, had hired an attorney to lobby the federal government to "seek a nullification" of the SWTD regulations. On 2 April 1999, APHIS published a notice suspending enforcement of the SWTD regulations. *Federal Register* 64 (1999): 15918. At the time of this edition's publication (2005), SWTD programs are still effectively unregulated in the United States.

- 153 The rash of SWTD facilities seems to have sprung up largely in response to pressure from the cruise ship industry. The large vessels carry thousands of tourists who disembark for brief excursions in Caribbean ports. Due to the brevity of a visit (typically only several hours), passengers are offered short-duration excursions, and visits to SWTD facilities are a popular choice from the cruise line's perspective. However, there has been no obvious effort by the cruise lines to inspect the facilities to which passengers are sent, to ensure that they are safe for visitors, that the dolphins are being well-treated, or even that the dolphins are being kept legally. There has been no active effort by cruise lines to offer passengers noninvasive, sustainable marine mammal tourism activities, such as watching wild whales and dolphins from boats run by responsible tour operators. The SWTD facilities gain substantial revenue from each influx of tourists, making these operations highly profitable (and the cruise lines receive a commission for each excursion sold on board)—thus more facilities spring up, often run by entrepreneurs with no experience in maintaining captive marine mammals. Were cruise lines to issue guidelines for their vessels that they should only offer their passengers noninvasive and sustainable whale and dolphin-tourism activities, it would reduce the risk of passenger injury and the pressure on wild populations from the need to supply animals for these operations.
- 154 As noted earlier, Manati Park, which offers a captive SWTD program in the Dominican Republic, conducted a capture of bottlenose dolphins that was illegal under both national and international law. Also as noted earlier, in November 2004, Dolphin Discovery was expelled from Antigua after willfully breaking laws and ignoring the orders of governmental officials when its activities led to the flooding of a nearby lagoon and risks to human health near its facility.

Petting Pools

- 155 In 1999, initial research findings were sent to the U.S. government, which forwarded this information to Sea World Incorporated. Subsequently, some improvements were noted at the petting pool facilities, but many problems still remained.
- 156 In comparison, the regulations for SWTD programs called for each dolphin to be exposed to public interaction for no more than two hours a day. In addition, the regulations stipulated that dolphins must have unrestricted access to a refuge area to which they could retreat to avoid human contact. One of the petting pool attractions currently has no refuge area at all, and at two others this area is often closed off during open hours—denying dolphins escape from unwanted attention during the noisiest periods. At Sea World Orlando the refuge area has a window, through which the public tries various methods to get the dolphins' attention, such as by banging on the glass. See the Whale and Dolphin Conservation Society and The Humane Society of the United States, *Biting the Hand That Feeds: The Case against Dolphin Petting Pools* (Washington, DC: 2003), www.hsus.org/web-files/PDF/Biting_The_Hand_That_Feeds.pdf.
- 157 Under the Animal and Plant Health Inspection Service, *Code of Federal Regulations*, giving of food to marine mammals by members of the public can only be done under the supervision of a uniformed employee who must ensure that the correct type and

amount of food is given, which in turn can only be supplied by the captive facility. Furthermore, under these regulations food for captive cetaceans should be prepared and handled “so as to minimize bacterial or chemical contamination and to assure the wholesomeness and nutritive value of the food.” Animal and Plant Health Inspection Service, *Code of Federal Regulations*, section 3.105.

158 WDCS and The HSUS, *Biting the Hand That Feeds*

159 In addition to these foreign objects, dolphins were also fed fish that had been broken up, exposing bones with which dolphins could be injured when swallowing, or fish that were contaminated—for example, fish that had been dropped on the ground and then stepped on.

RISKS TO HUMAN HEALTH

Diseases

160 Of this group of respondents, 64 percent stated that their skin lesions occurred after physical contact with a marine mammal, and 32 percent noted that their infections were associated with marine mammal bites. When specific diseases were reported, these included poxvirus and herpesvirus infections, and bacterial dermatitis (caused by *Staphylococcus aureus*, *Mycobacterium marinum*, or *Pseudomonas* spp.). Ten percent of respondents noted the contraction of so-called “seal finger,” an infection caused by *Mycoplasma* spp. or *Erysipelothrix rhusiopathiae*. In one case this infection was so severe as to be considered “life threatening,” ultimately requiring amputation of the infected finger. This particular infection occurred as the result of exposure to a marine mammal carcass, and not a captive display animal, although it should be noted that several instances of “seal finger” infections have arisen from bites given to captive marine mammal workers. J. A. K. Mazet et al., “Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public: Survey of occupational risks,” Final report—Research Agreement Number K005486-01 (Davis: Wildlife Health Center, University of California, 2004).

161 Long-term (more than five years) or frequent (more than 50 days a year) exposure to marine mammals, or being engaged in activities related to cleaning or repairing enclosures, were all statistically likely to increase the risk of infection. Mazet et al., “Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public.”

162 Eighteen percent of survey respondents reported respiratory illnesses contracted while working with marine mammals, although only 20 percent believed that the disease was the result of marine mammal contact. Six percent also noted long-term malaise (with symptoms similar to those found with chronic fatigue syndrome or multiple sclerosis) that a third attributed to marine mammal contact. Workers being exposed to marine mammals more than 50 days per year were three times more likely to contract a respiratory infection. Mazet et al., “Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public.”

163 Several cases are noted in the report by Mazet et al., where physicians were unable to diagnose long-term and recurrent infections. Some physicians refused even to acknowledge that there was a possible risk of infection, with one doctor quoted as saying that there were “no diseases that could be transmitted from whales to humans—so don’t worry about it.” Mazet et al., “Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public,” 15. There are, however, several published papers and case studies documenting evidence of transmission of diseases from marine mammals to humans. See Eadie et al., “Seal finger in

a wildlife ranger,” *Irish Medical Journal* 83 (1990): 117–118; P. J. Thompson et al., “Seals, seal trainers and mycobacterial infection,” *American Review of Respiratory Disease* 147 (1993): 164–167; Smith et al., “In vitro isolation and characterization of a calicivirus causing a vesicular disease of the hands and feet,” *Clinical Infectious Diseases* (1998): 434–439.

Injury and Death

164 For example, a report to the U.S. Marine Mammal Commission considered aggressive contact behaviors between dolphins and humans, such as strikes or blows, never to be accidental. K. Pryor, “Attachment C: Dolphin-swim behavioral observation program: Suggestions for a research protocol,” in *Final Report on the Workshop to Develop a Recommended Study Design for Evaluating the Relative Risks and Benefits of Swim-with-the-Dolphin Programs*, edited by R. S. Wells and S. Montgomery (Washington, DC: Marine Mammal Commission, 1990).

165 WDCS and The HSUS, *Biting the Hand That Feeds*

166 In an analysis of stranded harbor porpoises in the Moray Firth, Scotland, 63 percent of the animals showed evidence of being attacked and seriously injured or killed by bottlenose dolphins. H. M. Ross and B. Wilson, “Violent interactions between bottlenose dolphins and harbour porpoises,” *Proceedings of the Royal Society of London, Biological Sciences* 263 (1996): 283–286.

167 Bottlenose dolphins have been reported killing at least five dolphin calves in the Moray Firth, Scotland, and have killed at least nine calves in a two-year period in the coastal waters of Virginia, in the United States. I. A. P. Patterson et al., “Evidence for infanticide in bottlenose dolphins: An explanation for violent interactions with harbour porpoises?” *Proceedings of the Royal Society of London, Biological Sciences* 265 (1998): 1167–1170; D. G. Dunn et al., “Evidence for infanticide in bottlenose dolphins of the western North Atlantic,” *Journal of Wildlife Diseases* 38 (2002): 505–510. Calves have been killed in captivity as well—for example, in September 2004, a four-month-old female bottlenose dolphin calf was repeatedly attacked by two adult male dolphins at the National Aquarium in Baltimore while her mother was performing—the calf, also suffering from pneumonia, died soon after. A. B. Swingle, “Fish stories,” *Dome* 55 (2004), at www.hopkinsmedicine.org/dome/0410/newsreport2.cfm.

168 “Killer whales” historically got their name from having been observed killing other marine mammals, namely baleen whales. Observations in Monterey Bay, California, have noted that orcas in this area attack and kill at least seven species of marine mammals, including pinnipeds and cetaceans. There is also evidence of attacks (i.e., scarring and injuries) on two species of baleen whale in the bay, although such attacks have not been directly observed. R. L. Ternullo and N. A. Black, “Predation behavior of transient killer whales in Monterey Bay, California,” abstract from *Fifteenth Biennial Conference on the Biology of Marine Mammals* (Greensboro, NC: Society for Marine Mammalogy, 2003).

169 Fifty-two percent of respondents reported marine-mammal-inflicted injuries, with 89 percent of injuries on the hands, feet, arms, or legs; eight percent on the torso or abdomen; and four percent on the face. More than a third of the injuries were severe (90 cases)—either a deep wound, with some requiring stitches, or a fracture. Statistically, those in regular contact—more than 50 days a year—with enclosed marine mammals were several times more likely to suffer a traumatic injury. Mazet et al., “Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public.”

- 170 While bottlenose dolphins have been observed attacking and even killing conspecific calves, orcas have never been seen violently attacking conspecifics in the wild (aggressive interactions have never been seen to escalate to injury)—only other marine mammal species.
- 171 As examples see K. Dudzinski et al., "Behaviour of a lone female bottlenose dolphin (*Tursiops truncatus*) with humans off the coast of Belize," *Aquatic Mammals* 21 (1995): 149–153; D. Seideman, "Swimming with trouble," *Audubon* 99 (1997): 76–82.
- 172 S. H. Shane et al., "Life threatening contact between a woman and a pilot whale captured on film," *Marine Mammal Science* 9 (1993): 331–336.
- 173 M. C. de O. Santos, "Lone sociable bottlenose dolphin in Brazil: Human fatality and management," *Marine Mammal Science* 13 (1997): 355–356.
- 174 Mazet et al., "Assessment of the risk of zoonotic disease transmission to marine mammal workers and the public."
- 175 See www.local10.com/news/3791739/detail.html for a description of this incident.
- 176 B. Liston, "Florida whale victim a drifter who likely drowned," *Reuters North America*, 7 July 1999.
- 177 See www.abc.net.au/news/newsitems/200407/s1163433.htm for a description of this incident.
- 178 While elephant rides are conducted, they occur under the strict direct control of a caretaker armed with an elephant hook—and these rides are considered by many to be highly risky and unwise, as well as inhumane and unethical.

BEHAVIOR

- 179 This point is emphasized in Clubb and Mason, "Captivity effects on wide-ranging carnivores."
- 180 For examples and discussions of the behavioral problems experienced by marine mammals in captivity, particularly cetaceans, see N. Carter, "Effects of psycho-physiological stress on captive dolphins," *International Journal for the Study of Animal Problems* 3 (1982): 193–198; D. Ellis, "Pets, zoos, circuses, and farms: personal impacts on animal behavior" in *Animal Behavior and Its Applications*, edited by D. Ellis (Chelsea, MI: Lewis Publishers, 1985), 119–139; J. Sweeney, "Marine mammal behavioral diagnostics," in *CRC Handbook of Marine Mammal Medicine: Health, Disease, and Rehabilitation*, edited by L. A. Dierauf (Boston: CRC Press, 1990), 53–72.
- 181 The extreme example of this was the fatal 1989 interaction between Kandu V and Corky II at Sea World San Diego. Kandu had a dependent calf at the time, and Corky had shown interest in the calf—Kandu had apparently repulsed her interest previously, in a show of dominance. Her final, excessively violent attack on Corky, which led to her own death, was fatal precisely because it occurred in restricted space, where tensions were exacerbated, and neither whale had an escape route.

STRESS

- 182 For examples and discussion of how stress can affect the health of marine mammals, see L. A. Dierauf, "Stress in marine mammals," in *Handbook of Marine Mammal Medicine: Health, Disease*

and Rehabilitation, edited by L. A. Dierauf (Boca Raton, FL: CRC Press, 1990), 295–301; P. Fair and P. R. Becker, "Review of stress in marine mammals," *Journal of Aquatic Ecosystem Stress and Recovery* 7 (2000): 335–354.

- 183 For extended discussions of these stress effects, see M. E. Fowler, "Stress," in *Zoo and Wild Animal Medicine*, edited by M. E. Fowler (Philadelphia: W. B. Saunders, 1978), 33–34; G. P. Moberg, "Influence of stress on reproduction: A measure of well-being," in *Animal Stress*, edited by G. P. Moberg (Bethesda, MD: American Physiological Society, 1985), 245–268; H. Weiner, "The concept of stress and its role in disease onset," in *Perspectives on Stress and Stress-Related Topics*, edited by F. Lolas and H. Mayer (New York: Springer-Verlag, 1987), 96–103; R. M. Sapolsky, *Why Zebras Don't Get Ulcers: A Guide to Stress, Stress Related Diseases and Coping* (New York: W. H. Freeman, 1994); B. Apanius, "Stress and immune defense," *Advances in the Study of Behavior* 27 (1998): 133–153.
- 184 L. Nielsen, *Chemical Immobilization of Wild and Exotic Animals* (Ames: Iowa State University Press, 1999).
- 185 The following quotation from a study on otters illustrates the connection between stress and capture/transport in mammals: "The capture, handling, transport, and confinement inherent to [the translocation of wild mammals] inflict a substantial amount of anxiety and fear on animals, particularly when free-ranging wild or semi-wild individuals who have had little previous exposure to humans are to be translocated. Being pursued, caught, and physically manipulated constitute stressful events for these animals." J. Fernández-Morán et al., "Stress in wild-caught Eurasian otters (*Lutra lutra*): Effects of a long-acting neuroleptic and time in captivity," *Animal Welfare* 13 (2004): 143.
- 186 An excellent 1999 review of the literature on stress in dolphins caused by chase and handling, by the NMFS's Southwest Fisheries Science Center, is available at http://swfsc.nmfs.noaa.gov/prd/congress/Curry%20Lit%20Review/Lit_Rev.html. This review concludes that the chase and capture (handling) of dolphins can have significant negative impacts on individuals.
- 187 Small and DeMaster, "Acclimation to captivity."
- 188 R. J. Small and D. P. DeMaster, "Survival of five species of captive marine mammals," *Marine Mammal Science* 11 (1995): 209–226.
- 189 Papers with examples of this include A. F. McBride and D. O. Hebb, "Behavior of the captive bottlenose dolphin, *Tursiops truncatus*," *Journal of Comparative Physiology and Psychology* 41 (1948): 111–123; M. C. Caldwell and D. K. Caldwell, "Social interactions and reproduction in the Atlantic bottlenosed dolphin," in *Breeding Dolphins. Present Status, Suggestions for the Future*, edited by S. Ridgway and K. Benirschke (Washington, DC: Marine Mammal Commission, 1977), 133–142; and A. Samuels and T. Gifford, "A qualitative assessment of dominance relations amongst bottlenose dolphins," *Marine Mammal Science* 13 (1997): 70–99.
- 190 K. A. Waples and N. J. Gales, "Evaluating and minimizing social stress in the care of captive bottlenose dolphins (*Tursiops aduncus*)," *Zoo Biology* 21 (2002): 5–26.
- 191 "Enclosures should be as large as feasible and should be designed to allow individuals to, at least, be out of the sight of others and not be trapped in corners. This can be achieved by a series of connecting pools or a single large enclosure containing barriers." Waples and Gales, "Evaluating and minimizing social stress in the care of captive bottlenose dolphins," 22. The researchers also suggested that captive facilities have behavior experts on hand to identify possible social and grouping problems in dolphins as soon

as possible. They called for monitoring of dolphin behavior to "be as standard as water testing in maintaining the health and well-being of captive marine mammals" and stated that "It is imperative when dealing with captive social animals to attempt to maintain a group structure that resembles that found in the wild." Waples and Gales, "Evaluating and minimizing social stress in the care of captive bottlenose dolphins," 23.

192 Guravich and Matthews, *Polar Bears*

CETACEAN INTELLIGENCE

193 This is called the encephalization quotient, or EQ. Most animals would be expected to have an EQ of 1. However, dolphins have a much larger brain than would be expected for their size, with EQs ranging from 3.24 to 4.56. In comparison humans have an estimated EQ of 7.0, and the human ancestor *Homo habilis* had an EQ of 4.4. H. J. Jerison, *Evolution of the Brain and Intelligence* (New York: Academic Press, 1973).

194 H. H. A. Oelschläger and J. S. Oelschläger, "Brain," in *Encyclopedia of Marine Mammals*, edited by Perrin et al., 133–158.

195 An analogy might be to look at an obese person compared to a normal-weight person—the obese person would have a much lower EQ than the other, but this does not mean overweight people are less intelligent!

196 M. C. Caldwell et al., "Review of the signature whistle hypothesis for the Atlantic bottlenose dolphin," in *The Bottlenose Dolphin*, edited by Leatherwood and Reeves, 199–234.

197 For discussions of these hypotheses and the evidence supporting them, see L. S. Sayigh et al., "Signature whistles of free-ranging bottlenose dolphins *Tursiops truncatus*: Stability and mother-offspring comparisons," *Behavioral Ecology and Sociobiology* 26 (1990): 247–260; R. A. Smolker et al., "Use of signature whistles during separations and reunions by wild bottlenose dolphin mothers and infants," *Behavioral Ecology and Sociobiology* 33 (1993): 393–402; L. S. Sayigh et al., "Sex differences in signature whistle production in free-ranging bottlenose dolphins," *Behavioral Ecology and Sociobiology* 36 (1995): 171–177; and V. M. Janik and P. J. B. Slater, "Context-specific use suggests that bottlenose dolphin signature whistles are cohesion calls," *Animal Behaviour* 29 (1998): 829–838.

198 V. M. Janik, "Whistle matching in wild bottlenose dolphins (*Tursiops truncatus*)," *Science* 289 (2000): 1355–1357.

199 H. S. Terrace, "In the beginning was the name," *American Psychologist* 40 (1985): 1011–1028; W. K. Wilkins and J. Wakefield, "Brain evolution and neurolinguistic preconditions," *Behavioral and Brain Sciences* 18 (1995): 161–226.

200 P. J. O. Miller et al., "Call-type matching in vocal exchanges of free-ranging resident killer whales, *Orcinus orca*," *Animal Behaviour* 67 (2004): 1099–1107.

201 B. McCowan et al., "Quantitative tools for comparing animal communication systems: Information theory applied to bottlenose dolphin whistle repertoires," *Animal Behaviour* 57 (1999): 409–419.

202 D. A. Reiss and B. McCowan, "Spontaneous vocal mimicry and production by bottlenose dolphins (*Tursiops truncatus*): evidence for vocal learning," *Journal of Comparative Psychology* 107 (1993): 301–312.

203 D. G. Richards et al., "Vocal mimicry of computer generated sounds and vocal labeling of objects by a bottlenosed dolphin, *Tursiops truncatus*," *Journal of Comparative Psychology* 98 (1984): 10–28.

204 See L. M. Herman, "Cognition and language competencies of bottlenosed dolphins," in *Dolphin Cognition and Behavior: A Comparative Approach*, edited by R. Schusterman et al. (Hillsdale, NJ: Lawrence Erlbaum Associates, 1986), 221–252.

205 L. M. Herman et al., "Bottlenose dolphins can generalize rules and develop abstract concepts," *Marine Mammal Science* 10 (1994): 70–80.

206 S. Yaman et al., "Preliminary results about numerical discrimination in the bottlenose dolphin (*Tursiops truncatus*)," *European Research on Cetaceans* 15 (2004): 118–122.

207 For example, studies have shown that members of the Pirahã tribe in the Amazon, which has a relatively simple language, have difficulty coping with numbers beyond two; it has been suggested that this difficulty is due to the lack of complexity in their language. C. Holden, "Life without numbers in the Amazon," *Science* 305 (2004): 1093.

208 K. Marten and S. Psarakos, "Evidence of self-awareness in the bottlenose dolphin (*Tursiops truncatus*)," in *Self-Awareness in Animals and Humans: Developmental Perspectives*, edited by S. T. Parker et al. (Cambridge: Cambridge University Press, 1995), 361–379; D. Reiss and L. Marino, "Mirror self-recognition in the bottlenose dolphin: A case for cognitive convergence," *Proceedings of the National Academy of Sciences* 98 (2001): 5937–5942.

209 G. G. Gallup Jr., "Chimpanzees: Self-recognition," *Science* 167 (1970): 86–87; G. G. Gallup Jr., "Self-awareness and the emergence of mind in primates," *American Journal of Primatology* 2 (1982): 237–248; S. D. Suarez and G. G. Gallup Jr., "Self-recognition in chimpanzees and orangutans, but not gorillas," *Journal of Human Evolution* 10 (1981): 173–188; J. Anderson, "Monkeys with mirrors: Some questions for primate psychology," *International Journal of Primatology* 5 (1984): 81–98.

210 B. Amsterdam, "Mirror self-image reactions before age two," *Developmental Psychobiology* 5 (1972): 297–305.

211 What makes the mirror studies even more remarkable is that vision is not the primary sense of dolphins—hearing is. Their ability to use mirrors is like a person being able to recognize his or her own voice on a recording (which many people cannot do). In addition, dolphins do not normally encounter reflective surfaces at all—that is, they have no natural familiarity with seeing two-dimensional images of the world, as do terrestrial mammals whenever they look at the surface of a calm body of water.

212 D. B. Resnik, *The Ethics of Science: An Introduction* (London: Routledge, 1998).

213 Resnik lists these factors as (1) the ability to feel pain; (2) consciousness; (3) the ability to grasp concepts or form beliefs; (4) the ability to form abstract concepts or self-concepts; (5) reasoning; (6) language use; (7) the ability to experience moral emotions such as sympathy, love, and guilt; and (8) the ability to understand and follow moral rules. Resnik, *The Ethics of Science*. Bottlenose dolphins clearly can feel pain and have consciousness. Arguably they can reason (figure things out) and show emotion. Many studies have noted cetaceans attending and supporting dead companions

or calves, long after the animals have died, and sometimes for a period of several days. For example, see D. Fertl and A. Schiro, "Carrying of dead calves by free-ranging Texas bottlenose dolphins (*Tursiops truncatus*)," *Aquatic Mammals* 20 (1994): 53–56. This is interpreted by several scientists as a sign of grief. The mirror-recognition and signature whistle studies strongly suggest that bottlenose dolphins understand the concept of self and abstract concepts and may have linguistic ability. Only the last factor—the ability to understand and follow moral rules—is still a complete unknown.

- 214 W. Gasperini, "Uncle Sam's dolphins," *Smithsonian*, September 2003. The Soviet navy also maintained a dolphin program, but it was disbanded after 1991 and the dolphins were sold or otherwise transferred to public display facilities.
- 215 At least nine have gone "absent without leave" (also called "inadvertent escape") during open-water training or exercises, in all cases in areas far from their original habitat, making their survival unlikely. See NMFS, *The Marine Mammal Inventory Report*.

MORTALITY AND BIRTH RATES

Pinnipeds and Other Non-Cetaceans

- 216 Average annual mortality rates for pinnipeds in captivity (older than one year of age) have been calculated to be: 2.23 percent (Steller sea lion, *Eumetopias jubatus*); 4.3 percent (South American sea lion, *Otaria byronia*, and gray seal, *Halichoerus grypus*); 4.9 percent (South African fur seal, *Arctocephalus pusillus*); 5.5 percent (Californian sea lion and harbor seal); 8.2 percent (northern elephant seal, *Mirounga angustirostris*); and 11.6 percent (northern fur seal, *Callorhinus ursinus*). Small and DeMaster, "Survival of five species of captive marine mammals"; S. P. Roberts and D. P. DeMaster, "Pinniped survival in captivity: Annual survival rates of six species," *Marine Mammal Science* 17 (2001): 381–387.
- 217 For a discussion of the survival rates of Steller sea lions, see Small and DeMaster, "Survival of five species of captive marine mammals." Further information on Steller sea lion mortality rates can be found in A. E. York, "The population dynamics of northern sea lions, 1975–1985," *Marine Mammal Science* 10 (1994): 38–51.
- 218 California sea lion pup mortality in captivity is 14.2 percent (on average), while mortality rates in the wild are up to 44.2 percent—the result of a high level of hookworm parasites in pups. See <http://nmml.afsc.noaa.gov/CaliforniaCurrent/Cals/Northfs.htm>, Small and DeMaster, "Survival of five species of captive marine mammals."
- 219 South American sea lions and northern fur seals in captivity have a pup mortality rate of 66.2 percent and 66.8 percent, respectively. Roberts and DeMaster, "Pinniped survival in captivity: annual survival rates of six species."
- 220 The average annual sea otter mortality rate in captivity was calculated to be 5.5 percent (varying from 11.8 percent to zero percent depending on the facility), whereas mortality rates of 11 to 48 percent were recorded for wild otters in California. However, due to the differences in how data were collected, it was impossible to determine whether mortality rates were significantly lower in captive sea otters. B. A. Jones and D. P. DeMaster, "Survivorship of captive southern sea otters," *Marine Mammal Science* 17 (2001): 414–418.
- 221 Christopher Andrews, PhD, conversation with N. Rose, 21 July 1993.

- 222 The HSUS is working on several projects using a contraceptive method known as immun contraception, which is a promising method of controlling reproduction in wildlife, both in the field and in captive situations. A small number of dolphinaria and aquaria have inquired about and experimented with this contraceptive method.

Bottlenose Dolphins

- 223 These studies include D. P. DeMaster and J. K. Drevenak, "Survivorship patterns in three species of captive cetaceans," *Marine Mammal Science* 4 (1988): 297–311; and D. A. Duffield and R. S. Wells, "Bottlenose dolphins: Comparison of census data from dolphins in captivity with a wild population," *Soundings* (spring 1991): 11–15.
- 224 One analysis determined that calf mortality in captivity was much higher than in the wild, but the mortality data from the wild population were probably incomplete. T. H. Woodley et al., "A comparison of survival rates for free-ranging bottlenose dolphins (*Tursiops truncatus*), killer whales (*Orcinus orca*), and beluga whales (*Delphinapterus leucas*)," Technical Report No. 97–02 (Guelph, Ontario: International Marine Mammal Association, Inc., 1997).

- 225 For information on causes of death of newborn calves, see also NMFS, *The Marine Mammal Inventory Report*.

Small Whales

- 226 Two documents from Sea World Incorporated made this claim. Sea World Corporate Zoological Department, *The Facts about Sea World's Killer Whales* (Sea World Incorporated, 1993), and Sea World Corporate Zoological Department, *A Discussion of Killer Whale Longevity* (Sea World Incorporated, 1994). The Sea World website still offers data from sectioning teeth (a method that gives a maximum life span of 35 years), a method long since considered inaccurate for aging orcas. However, the website also acknowledges that *some* scientists *believe* that *some* orcas may have average life spans of 50 years (females) and 30 years (males)—see www.seaworld.org/ask%2Dshamu/marine%20mammals/whales/toothed/dolphins/killer%2Dwhale.htm.
- 227 For a complete list of individual whales in the Pacific Northwest populations with known or estimated ages, see Olesiuk et al., "Life history and population dynamics of resident killer whales (*Orcinus orca*) in the coastal waters of British Columbia and Washington State," and Ford et al., *Killer Whales*.
- 228 These data on orca longevity and life expectancy are most recently cited in J. K. B. Ford, "Killer whale, *Orcinus orca*," in *Encyclopedia of Marine Mammals*, edited by Perrin et al., 669–676.
- 229 These analyses include K. C. Balcomb, *Analysis of age-specific mortality rates of Puget Sound killer whales versus Sea World killer whales* (The HSUS, 1994); The Humane Society of the United States, *Small Whale Species: The Case against Captivity* (Washington, DC: 1993); Small and DeMaster, "Survival of five species of captive marine mammals"; and Woodley et al., "A comparison of survival rates." It should also be noted that the calculated mortality rates of captive orcas do not include stillbirths, deaths due to breeding complications, or the 12 orcas who are known to have died during the capture process.
- 230 These two are females—Lolita at the Miami Seaquarium and Corky II at Sea World San Diego.
- 231 See <http://orcahome.de/orcastat.htm> for a complete list of all known captive orcas and pregnancies—this website is regularly updated

and is compiled from official government records (primarily from the United States, as other countries do not require inventories), media reports, and information submitted by animal protection activists around the world. The list is almost certainly incomplete regarding pregnancies, unborn fetuses, spontaneous abortions (miscarriages), and stillbirths, making the calculated calf survival rate generous. A particularly unlucky female, Corky II at Sea World San Diego, has had at least seven unsuccessful pregnancies. There are two living calves, at Sea World San Diego and Marineland Ontario, who were less than one year of age at the time of this edition's publication and were therefore not included in this analysis. Eight of the viable calves are now dead (aged two to 12 years at death), leaving 27 living captive-born orcas.

- ²³² On average, it is estimated that 43 percent of orca calves in the wild die during the first six months of life. Ford, "Killer whale, *Orcinus orca*," in *Encyclopedia of Marine Mammals*, edited by Perrin et al.
- ²³³ Clubb and Mason, "Captivity effects on wide-ranging carnivores."
- ²³⁴ Woodley et al., "A comparison of survival rates."
- ²³⁵ NMFS, *The Marine Mammal Inventory Report*.

Other Cetacean Species

- ²³⁶ NMFS, *The Marine Mammal Inventory Report*.

CONCLUSION

- ²³⁷ Closures: Oklahoma City Zoo (dolphin exhibit only closed), Cedar Fair in Ohio (dolphin exhibit only closed), Six Flags in Ohio (acquired by Cedar Fair, dolphin and orca exhibits only closed), Worlds of Fun in Missouri (seasonal dolphin show discontinued), Knots Berry Farm in California (seasonal dolphin show discontinued), Paramount Great America in California (seasonal dolphin show discontinued), Six Flags Over Texas (seasonal dolphin show discontinued), Six Flags in Missouri (seasonal dolphin show discontinued), Ocean World in Florida (entire attraction closed), and Marine Life Aquarium in South Dakota (entire attraction closed). Openings: Discovery Cove (separate Sea World Orlando attraction), the Texas State Aquarium (new exhibit), and the Georgia Aquarium (new attraction). Other dolphinariums, amusement parks, and aquaria have expanded or contracted already existing marine mammal exhibits and are not included in this list.
- ²³⁸ South Carolina is the only U.S. state to prohibit the public display of cetaceans.
- ²³⁹ J. C. Hillhouse, "ABITPC awaiting day in court," *The Daily Observer* (Antigua), 21 February 2004.
- ²⁴⁰ The only exceptions would be the rescue and rehabilitation of stranded marine mammals and the maintenance of animals who cannot be released.

APPENDIX I

- ²⁴¹ L. Diebel, "Trapped in an underwater hell, Mexico pressed to free dolphins," *Toronto Star*, 12 October 2003.
- ²⁴² See WSPA, Letter: WSPA Calls on Travel Industry to Pull Support for Captive Dolphin Program, www.wspa-usa.org/pages/510_letters_manati_park.cfm, 30 November 2001. The sudden appearance of these ready-trained animals suggests that Manatí Park had another facility in the Dominican Republic that was holding "spare," already trained animals. As these animals do not appear on any CITES documentation, the assumption is that they were either illegally imported or taken from Dominican waters without proper permitting prior to the incident reported here.
- ²⁴³ Captures had been prohibited since 2000, under Dominican Republic Environment Law 64-00, article 175.
- ²⁴⁴ Under Article 11 of the Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (SPAW), it is required that "Each Party shall ensure total protection and recovery to the species of fauna listed in Annex II," which includes cetaceans, "by prohibiting: the taking, possession or killing (including, to the extent possible, the incidental taking, possession or killing) or commercial trade in such species, their eggs, parts or products; to the extent possible, the disturbance of such species, particularly during periods of breeding, incubation or migration, as well as other periods of biological stress." Therefore, capturing wild cetaceans for commercial public display is a clear violation of this regional treaty, also known as the Cartagena Convention. www.cep.unep.org/pubs/legislation/spaw.html.
- ²⁴⁵ On Manatí Park's website, it is stated that "Manatí Park, in collaboration with various National and International Institutions, develops educational, research and reproduction programs on the autochthonous species of the Dominican Republic that are in danger of extinction." www.manatipark.com. This is yet another example of a dolphinarium or aquarium trying to camouflage its unethical activities with a conservation and education veneer.
- ²⁴⁶ G. Ross et al., "Report of a fact-finding visit to the Solomon Islands," 9–12 September 2003, IUCN Report (2003). www.iucn-vsg.org/Solomons%20Report%20VSG-CSG.pdf.
- ²⁴⁷ Besides being in violation of the CITES agreement, the Solomon Islands dolphins are being held in conditions in Cancun that violate the conditions of the import permit granted by Mexican authorities. One of the conditions was to keep the imported "exotic" dolphins (which belong to the species *Tursiops aduncus*, as opposed to *Tursiops truncatus*—the species that was already being held in the Cancun dolphinarium) separate from the park's existing dolphin population—this was not done. The dolphins were never properly quarantined and have been kept in adjacent pens, allowing the possible transmission of nonendemic pathogens and diseases.

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