



THE HUMANE SOCIETY
OF THE UNITED STATES

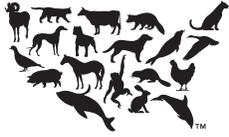


World Society for the Protection of Animals

THE CASE AGAINST

Marine Mammals in Captivity





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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, for which the animals' welfare need not be compromised. 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 hunt. Other natural behaviors, such as those associated with dominance, mating, and maternal care, are altered in captivity, which can have a substantial 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 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 so many captive marine mammals, the world is a tiny enclosure, and life is devoid of naturalness.



Children learn to view dolphins as dependent on humans—rather than as competent and independent—when their only exposure to these animals is in captivity. Photo: ©iStockphoto.com/Zak Brown

Public display facilities often promote themselves as stranding and research centers. In fact, most stranded marine mammals, especially whales and dolphins, 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. Human-dolphin interactions 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 or need. This can result in 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 public 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



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: BigStockPhoto/Brian J. Abela

most conclusive data are for orcas; their 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.

Table of Contents

Introduction	1
---------------------------	---

Chapter 1

Education, Conservation, and Research	3
Education	3
The Conservation Fallacy	4
Live Captures	5
Species Enhancement Programs	10
Mixed Breeding And Hybrids	10
Captive Cetaceans And Culture	10
The Public Display Industry “Double Standard”	11
Ethics And Captive Breeding	13
Stranding Programs	13
Research	14

Chapter 2

The Physical and Social Environment	17
Pinnipeds And Other Non-Cetaceans	18
Small Cetaceans	21
Conclusion	22

Chapter 3

Husbandry and Health Care	23
---------------------------------	----

Chapter 4

Human-Dolphin Interactions	25
Dolphin-Assisted Therapy	25
Swim-With-The-Dolphins Attractions	25
Petting Pools	27

Chapter 5

Risks to Human Health	29
Diseases	29
Injury And Death	29

Chapter 6

Behavior	33
----------------	----

Chapter 7

Stress	35
--------------	----

Chapter 8

Cetacean Intelligence	37
-----------------------------	----

Chapter 9

Mortality and Birth Rates	41
Pinnipeds And Other Non-Cetaceans	41
Bottlenose Dolphins	42
Orcas And Other Small Whales	42
Other Cetacean Species	43
Conclusion	43

Chapter 10

Conclusion	45
------------------	----

Table 1	46
----------------------	----

Appendix I	47
-------------------------	----

Notes	51
--------------------	----

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 often 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 two 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 has begun to ask if facilities are able to meet even the most basic needs of these complex animals. Indeed, many believe that public display is no more than commercial exploitation of captive ani-



The grace and beauty of orcas are showcased when they perform in captivity, but the setting is artificial and stifling for them. The true magnificence of these animals is fully realized only in their natural habitat. Photo: BigStockPhoto/Sergey Karpov

mals 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 Department of Commerce's National Marine Fisheries Service (NMFS) to maintain life history records on most marine mammals held in dolphinar-ia—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

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

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 care³ 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.



Dolphins are easily trained because they are intelligent, but too often their intelligence is used to turn them into clowns. Photo: BigStockPhoto/Philip Lange

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. Marine mammals, including a wide variety of cetacean species, are held in a growing number of countries in the developing world, where



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. Photo: ©Painet, Inc./Spencer Grant

money, technology, and expertise are often lacking.⁴ 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 display of marine mammals is 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 dolphinar-ia 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.

CHAPTER 1

Education, Conservation, and Research

EDUCATION

Education is one of the most important methods of ensuring the humane treatment and conservation 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 exhibits,⁵ there is little objective evidence to indicate that the public display industry is furthering the public's knowledge of marine mammals and their habitats.⁶ 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 display centers 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 these species' natural habitat.

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.⁷ 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. A survey conducted in 2007 found that only 30 percent of the U.S. public believed there is a scientific benefit to keeping dolphins in captivity.⁸ 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.⁹ In fact, zoo and aquarium visitors want to be entertained, with those seeking an education in the minority.¹⁰

In general, almost nothing is taught at dolphinariums during marine mammal shows about natural behaviors,¹¹ ecology, demographics, or population distribution.¹² The show "Believe," recently devel-

oped for SeaWorld, focuses more on emotional showmanship and the bond between the animal and her trainer than the biology of orcas (*Orcinus orca*, also known as killer whales). 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.¹³ Furthermore, it has been demonstrated that the information facilities present is sometimes scientifically incorrect or distorted to portray the facility in a better light.¹⁴ Examples of the deliberate distortion—or ignoring—of current scientific knowledge include SeaWorld's directive to staff not to use the word "evolve," as many visitors consider the theory of evolution to be controversial;¹⁵ its explanation of the so-called "drooping fin" syndrome;¹⁶ and its description of the life spans of captive orcas.¹⁷

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,

Four-fifths of the public in a survey stated that marine mammals should not be kept in captivity unless there are major educational or scientific benefits.

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.¹⁸ 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 animal but with an idea of that animal that has been crafted by the facility.

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.¹⁹ To illustrate, many actions performed by dolphins in shows or observed being directed toward visitors or trainers that are portrayed as "play" or "fun"—such as the rapid opening and



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

closing of the mouth and the slapping of the water surface with the tail flukes or flippers—are actually displays that in wild animals would usually be considered aggressive,²⁰ akin to a dog growling or snarling.

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. In fact, the actual provision of educational materials is often limited. A recent study found that less than half of dolphinariums exhibiting orcas provided any information on conservation. More worrying, less than half provided educational materials for children or teachers.²¹

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.²² 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 con-

The HSUS and WSPA maintain that exposure to captive marine mammals 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.

ducted ... 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.”²³

In fact, The HSUS and WSPA maintain that exposure to captive marine mammals 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.²⁴ 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 desires²⁵ rather than as integral elements of an ecosystem with their own intrinsic value.²⁶

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.

The claim that conservation is a primary purpose of the public display industry as a whole is highly misleading at best. Fewer than five to 10 percent of zoos, dolphinariums, and aquaria are involved in substantial conservation programs either in natural habitat or in captive settings, and the amount spent on these programs is a mere fraction of the income generated by the facilities.

While several zoos have programs to breed endangered species in captivity with the intention that these animals be used in restocking depleted populations,²⁷ this is not the case with cetaceans. In recent years, only one facility attempted a captive breeding program for baiji or Yangtze river dolphins (*Lipotes vexillifer*),²⁸ a species that recently became the first cetacean to be declared extinct.²⁹ There have been no attempts at captive breeding for the vaquita (*Phocoena sinus*),³⁰ a small porpoise found in Mexico that is now the world's most endangered cetacean species.³¹ In fact, only one member of the Alliance of Marine Mammal Parks and Aquariums (AMMPA)—an industry association that represents selected dolphinariums—routinely provides funding or grants to promote the conservation of critically endangered river dolphin species.³²

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 public display industry as a whole is highly misleading at best.³³ Fewer than five to 10 percent of zoos, dolphinariums, and aquaria are involved in substantial conservation programs either in natural

habitat (known as *in situ*) or in captive settings (*ex situ*), and the amount spent on these programs is a mere fraction (often less than one percent) of the income generated by the facilities.³⁴

Many dolphinaria and aquaria state that they are actively involved in conservation and use this as a marketing tool or as a way to justify imports of animals.³⁵ However, these conservation claims rarely stand up to scrutiny. The portrayal of captive breeding of marine mammals to meet conservation objectives is misleading; the overwhelming majority of marine mammal species currently being bred in captivity is neither threatened nor endangered.³⁶

What is worse is that many dolphinaria and aquaria, including facilities that actively market themselves as centers for conservation, are actually depleting wild populations of cetaceans. Many facilities still acquire several marine mammal species directly from the wild.³⁷ 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 taken³⁸ 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 done before captures are permitted, but the analyses are generally inadequate from a scientific standpoint, 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). The IWC was originally established to regulate hunting of large cetaceans (primarily baleen and sperm whales). Currently there are few international agreements protecting small cetaceans, species that are vulnerable and, in some areas, heavily exploited; many activists, scientists, and politicians believe that the IWC should regulate the hunts and fisheries involving small cetaceans.³⁹ 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.⁴⁰

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 into shallow temporary holding tanks. All cetacean capture methods are invasive, stressful, and potentially lethal,⁴¹ 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 are extremely stressful and have led to the decline or hindered the recovery of some dolphin populations.⁴² Accidents have also occurred, causing the deaths of entangled animals.⁴³ 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.⁴⁴ 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 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 dolphinaria 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 public display facilities, while the rest are killed with long knives or spear-like tools and butchered for human and pet food and other products.⁴⁵



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

In the 2003/2004 season, 78 cetaceans were sold to aquaria and dolphinaria by hunters in Taiji.⁴⁶ 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



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, freshwater swimming pool for three months and were on the brink of death when discovered. (See endnote 113.) Photo: WSPA

industry), apparently solely to acquire animals for public display facilities in Japan.⁴⁷ 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 rest 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 thousands⁴⁸—the large profits from the few animals sold from each hunt help to subsidize and maintain the drive fishery and the hunters’ employment.⁴⁹

“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.” Virtually everywhere cetacean captures happen today, no such investment has occurred.

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.⁵⁰ Ocean Adventures, a facility in Subic, 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 was an American.⁵¹ The problem, however, is not confined to Asia—at least 20 false killer whales caught by this method were 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.⁵²

Although drive-hunted animals have not been imported into the United States for more than 15 years, the government has allowed the exporting of marine mammals caught in U.S. waters to facilities in Japan that hold drive-fishery-caught animals.⁵³ In addition, it considered a research permit request by SeaWorld to collect reproductive and other tissues from animals captured and killed in drive fisheries.⁵⁴

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 and modeling of orca societies show that certain individuals play a crucial role in holding communities together. If these individuals are removed, the group might lose cohesion and disperse.⁵⁵ This dispersal could have serious survival implications for the remaining animals, as



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

having a well-organized group is crucial when dolphins and orcas forage for food or have to defend themselves against competitors or predators.

In a 2007 survey of the U.S. public, only 11 percent of respondents believed that capturing wild dolphins for display was acceptable.⁵⁶ Even the broader captive-wildlife industry disapproves of live capture,⁵⁷ yet is able to provide little evidence of action to stop the practice. Captures of non-cetacean marine mammals occur only rarely today, as these species either breed relatively well in



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

An NDF is supposed to demonstrate that “export will not be detrimental to the survival of that species” and is meant to be based on scientific studies of the abundance and status of the wild stock from which animals are 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 cetaceans captured from the wild for public display facilities, accompanied by NDFs that are not scientifically substantiated and do not satisfy the intent of CITES in requiring NDFs.⁵⁹ 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 International Union for Conservation of Nature’s (IUCN) 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.⁶⁰

Virtually everywhere cetacean captures happen today, no such investment has occurred.



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

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 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).⁵⁸

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 a minimum for an end to trade with non-member countries.

Bottlenose dolphins

A primary “hot spot” for bottlenose dolphin captures is the Caribbean. Cuban authorities have issued capture permits for, on average, 15 bottlenose dolphins per year from national waters and for as many as 28 dolphins in one year.⁶¹ 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 dolphin populations.⁶² Many of these animals have been sold to other facilities in the Caribbean (with others being exported to Europe and Mexico),⁶³ 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 prohibited under international regulations; however, they continue unchallenged.

The issue of the Cuban dolphin trade raised concerns at the IWC, where the Scientific Committee stated that “there is currently no basis for assessing the sustainability of these takes as no abundance data were available for Cuba.”⁶⁴ The IUCN Cetacean Specialist Group (CSG) has also identified the investigation of live-cap-



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

tures of bottlenose dolphins from Cuba as one of its priority projects, due to concerns about the potential for depletion of coastal stocks of these animals. Similar concerns were also voiced for catches of coastal bottlenose dolphins in Mexican waters in the Gulf of Mexico.⁶⁵ 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.⁶⁶

Even members of the public display industry have expressed their concerns about the trade in Cuban dolphins. The director of the Dolphin Academy, a dolphinarium on the island of Curaçao in the Caribbean, expressed outrage when her co-tenants on the island, Curaçao Sea Aquarium, proposed an import of six Cuban dolphins. She called the import “immoral” and worried that association by proximity with these captures would bring her facility into disrepute. However, the imports went ahead, with one dolphin dying soon after transfer, and newspaper articles reported that the director was fired for speaking out against the trade.⁶⁷

Many members of the general public believe captures of wild cetaceans are a thing of the past, encouraged in this mistaken belief by the public display industry. Indeed, in the United States there have been no captures of bottlenose dolphins from the wild since 1989.⁶⁸ 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 Solomon Islands



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

took advantage of a 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 Solomon Islands). The last known large-scale bottlenose dolphin capture was in summer 2007, again in Solomon Islands, which has issued capture permits to several operators and established a capture/export quota of 100 dolphins per year.⁶⁹

Other recent bottlenose dolphin captures in the Caribbean region include eight taken in Haiti (six survivors were released almost immediately, after public protest) and 10–14 captured in Guyana, both captures occurring in 2004.⁷⁰ Researchers attending the 2006 meeting of the Small Cetaceans Sub-Committee of the IWC's Scientific Committee reported illegal trade and capture activities involving 12 dolphins in the Gulf of Paria, Venezuela, in May 2004 (some of the dolphins captured in Guyana were almost certainly among the animals confiscated in Venezuela) and 15 dolphins in March 2005 near Roatán Island, Honduras; the ultimate disposition of these 27 animals (released, died, retained, or exported) was not reported.⁷¹ The sustainability of these captures was not assessed before they took place.⁷²

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.⁷³ 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's motivation for introducing this proposal was a growing concern about the impact of these trades on a dolphin population that had been depleted by historical culling, current 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.⁷⁴ The current population is believed to have been effectively halved by these removals⁷⁵ and was recently listed as endangered under the U.S. Endangered Species Act, partially because of the impacts from these removals.⁷⁶

Historically, another hot spot for capture 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 contro-

versy 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 dolphinarium and aquaria and the remainder released. The animals were captured

Marineland Ontario in Canada is still importing live-caught cetaceans, at a time when the practice of keeping cetaceans in captivity there is controversial.

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. A third member of the so-called “Taiji Five” died in September 2004 and the remaining two died in September 2007 and 2008 respectively.⁷⁷ All five of these young animals were dead after less than 12 years; this outcome is appalling in a species known to live as long as humans do.

In Russia, authorities have issued quotas for live captures off Kamchatka for the purpose of public display in every year since 2001—these annual quotas ranged from six to 10 animals (the 2008 quota was for 10 whales). 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 23 days later.⁷⁸ No other successful captures have been recorded. 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, among other things, how many orcas inhabit this region, but at present, there is still no definitive population estimate.⁷⁹

Belugas

From 1999 to 2005, Marineland Ontario in Canada imported 10 wild-caught Black Sea bottlenose dolphins (a practice recently prohibited—see “Bottlenose dolphins”) and 28 wild-caught beluga whales (*Delphinapterus leucas*) from Russia, for a total of 38 wild-caught animals in just six years.⁸⁰ Eight more wild-caught belugas from Russia, all females, were imported in December 2008.⁸¹ As with other live captures, appropriate scientific surveys to assess the impact of the removals were not conducted, and the taking of so many females is a special cause for concern.

Marineland Ontario 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.⁸²



These newly captured Russian belugas are crowded into a barren holding pen like guppies in a pet store aquarium. Photo: Lloyd Hannemann

Belugas have also recently been imported (primarily from Russia) by China, Thailand, Egypt, Taiwan, Bahrain, and Turkey.⁸³ 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 dolphinaria 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.⁸⁴ 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.⁸⁵

If species enhancement programs were truly a primary purpose of dolphinaria, 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 non-endangered orcas or bottlenose

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

dolphins, whose populations, if depleted or endangered, may in fact owe their reduced numbers to removals by the public display industry!⁸⁶ These species breed readily in the wild—their numbers are not limited in natural habitat by low reproductive rates but by habitat loss and other factors. There is a notable lack of conservation-priority species being bred in dolphinaria; thus, the facts do not support their claim that their captive breeding programs are for conservation purposes.

It has been estimated that, if dolphinaria were serious about breeding a captive population for conservation purposes, they would

need many more individuals of most species than they typically hold to maintain the appropriate amount of genetic diversity.⁸⁷ Rather than for conservation, cetaceans are bred merely to provide replacement stock for public display⁸⁸—an ongoing need given the high rate of mortality in captivity.⁸⁹

Finally, the core of any successful species enhancement program is the ability to reintroduce captive-bred progeny into the wild,⁹⁰ a technique that has actually had scant success in the recovery of any threatened species⁹¹ and is especially unlikely to be effective for cetaceans.⁹² However, the efforts of the public display industry to prevent captive cetaceans from being released expose their conservation claims as being mere self-promotion. Indeed, the public 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.⁹³

As the capture and import of animals have become problematic from economic, logistical, and image standpoints, dolphinaria and aquaria have made captive breeding a central objective. However, if captive dolphin facilities were serious about trying to conserve the species that they possess, they would be focusing on protecting the habitats of wild populations and would actively be trying to ensure that their captive-bred animals could be reintroduced, and survive, in the wild.⁹⁴

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 hybrids,⁹⁵ 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

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.

group or population, within and across generations. Many of these behaviors 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.⁹⁶ Recent research has highlighted the importance of culture in the conservation of marine mammals, calling it a source of fundamental survival skills.⁹⁷ 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 walrus (*Odobenus rosmarus*), stay so long with their mothers—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.⁹⁸ This fact yet again refutes the arguments that captive facilities are breeding marine mammals for conservation purposes. If animals cannot learn or 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 SeaWorld Orlando, was separated from his mother at only 6 months of age and was moved to California when he was less than 10 months old. Similar cases have been recorded for other orcas.⁹⁹

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,¹⁰⁰ 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. Most wildlife veterinarians and biologists agree that animals to be rehabilitated or reintroduced to the wild should have minimal contact with humans and should live in an environment as close to their native habitat as possible.¹⁰¹ Clearly, this also means they 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,¹⁰² can lead to high levels of infant mortality.¹⁰³

THE PUBLIC DISPLAY INDUSTRY "DOUBLE STANDARD"

While the public 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 consis-



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.

tently maintained that wild-caught cetaceans held in long-term captivity, let alone captive-bred progeny, cannot be rehabilitated and returned to the wild.¹⁰⁴ Husbandry and training methods and the constant exposure of the animals to humans lessen animals' chances of being released—a self-fulfilling prophecy.

To put marine mammal facility actions in this regard into context, an inter-zoo species enhancement program for a small primate, 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 free-ranging golden lion tamarins are reintroduced captive-born animals or their descendants.¹⁰⁵ 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 public display industry. In fact, we were able to document only six: four as part of a larger Australian release project on 13 January 1992,¹⁰⁶ and two animals released in the Black Sea in 2004. However, the release of these latter two animals was controversial, due to several factors, including poor post-release monitoring.¹⁰⁷

Few captive whales and dolphins have been deliberately rehabilitated and released after long-term captivity.¹⁰⁸ In several countries, animals have been released after the closure of facilities, including one bottlenose dolphin in Brazil,¹⁰⁹ three bottlenose dolphins from U.K. facilities,¹¹⁰ nine dolphins in Australia,¹¹¹ two dolphins in Guatemala,¹¹² and two dolphins in Nicaragua.¹¹³ In the United States, four bottlenose dolphins have been released from captive research facilities,¹¹⁴ 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 orca from the movie *Free Willy*.¹¹⁵

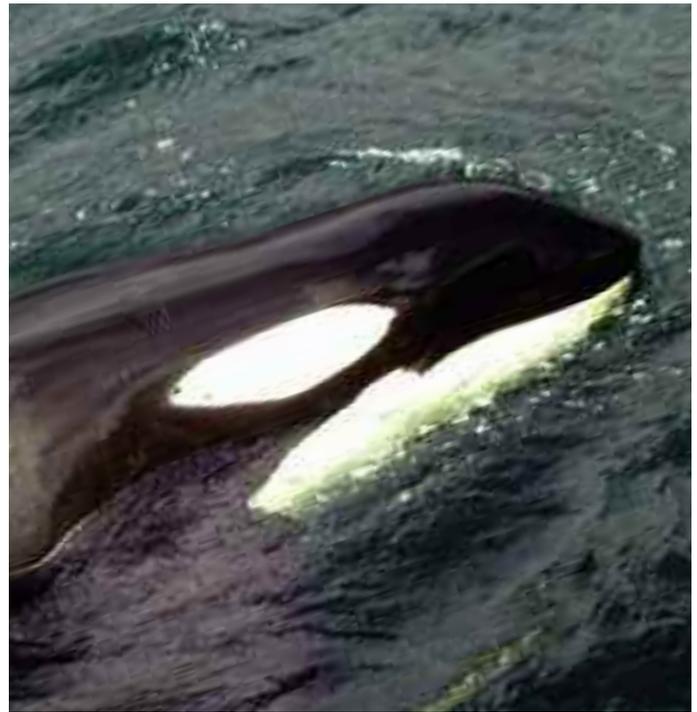
However, the releases above have primarily been from research facilities or as the result of the closure of public facilities, with the majority of the cost of rehabilitation and release being funded by

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.

academic institutions and animal protection groups rather than public display facilities. The lack of industry-backed rehabilitation and release programs for captive cetaceans or industry funding for the development of such is very marked.

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.¹¹⁶ 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 or long-term captive 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



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

humane reasons, the general public might 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.¹¹⁷ Neither of these arguments stands up to scrutiny.

The first argument is hypocritical: the industry did not show the same reluctance when, for example, dozens of orcas were originally brought into captivity 40 to 45 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 argu-

It seems clear that what the public display 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.

ment, aside from being factually incorrect, implies an industry position against all new scientific research that poses health or survival risks to living animals, 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 (on most topics other

than this one), even when there are risks, arguing the benefits outweigh the costs. So once again, there is a double standard.

In the case of marine mammals, and 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 public display 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 morally justifiable, the animals being placed in captivity should be better off, or no worse, than they would be in the wild.¹¹⁸ 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 “Chapter 9: 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 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,



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

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 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).¹¹⁹

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 thou-

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.

sands of dollars in the process,¹²⁰ 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 or soon after release) 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.¹²¹ 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.¹²²

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,¹²³ or rarely observed in captivity, such as spotted dolphins (*Stenella frontalis*) 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.¹²⁴



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.

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 captive 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.¹²⁶

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,¹²⁷ in-depth study of the behavior and physiology of free-ranging marine mammals is now possible, adding to the redundancy of captive animals as research subjects.

One of the most famous critics of using the behavior of cetaceans in captivity as a model for animals in the wild was the environmen-

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

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.¹²⁵



Research results from captive beluga studies have frequently been poor predictors for wild populations. In addition, despite years of holding this species in captivity, much of beluga biology remains a mystery. Photo: BigStockPhoto/Shawn Roberts



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.

talist and film-maker Jacques Cousteau, who said, “There is about as much educational benefit to be gained in studying dolphins in captivity as there would be studying mankind by only observing prisoners held in solitary confinement.” Keeping marine mammals in captivity 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,¹²⁸ does little to benefit wild animals,¹²⁹ and can provide some dubious results.¹³⁰

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,¹³¹ 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.¹³²

Even more alarming is the tendency by some public display facilities to market themselves as research organizations and gain non-profit tax status, although their primary function is to provide entertainment and serve as tourist attractions. The Dolphin Research Center (originally named the Flipper Sea School) in the Florida Keys calls 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.¹³³ Despite having an annual income that would rival some marine laboratories, the actual research conducted is minimal, and relies primarily on outside researchers to use the captive animals as test subjects.¹³⁴

To illustrate the relative paucity of marine mammal research contributed by public display facilities, papers presented at the 2007 Society for Marine Mammalogy (SMM) Biennial Conference on the Biology of Marine Mammals included 571 presentations dealing with aspects of cetacean biology; only 5.1 percent of these were the result of work with captive animals. Of these few studies, more than a third were conducted through institutions that are not open to the public. There were only two abstracts submitted by SeaWorld, the largest holder of captive marine mammals in the world.¹³⁵ At several previous SMM biennial conferences, no major North American facility made a presentation.

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.¹³⁶ Dolphinariums are not essential to continued research on marine mammals.

CHAPTER 2

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 illustrate more concretely 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 come before meeting the needs of the animals. If every measure were taken to create comfortable, safe, and appropriate conditions, 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.¹³⁷ The design is also influenced by economics (it becomes prohibitively expensive to build larger enclosures)¹³⁸ and management concerns (the control of large, dangerous animals becomes infinitely more difficult as the space allotted to them increases, and

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.

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/or 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 pens have their own unique problems and their conditions can compromise the health of, and even lead to 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).¹³⁹ 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



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

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.¹⁴⁰ Hurricanes can also lead to animals escaping from the enclosures.¹⁴¹ This may seem like Mother Nature giving the animals their freedom, but releasing non-native species into foreign waters is generally believed to amount to a death sentence for the animals.¹⁴² Probably the best known incident involving captive marine mammals and hurricane impacts occurred during the aftermath of Hurricane Katrina in 2005, when eight dolphins were left behind in Marine Life Oceanarium in Gulfport, Mississippi. All were carried out into the Gulf of Mississippi in the storm surge, which led to a rescue that cost at least several tens if not hundreds of thousands of U.S. tax dollars.¹⁴³ Hurricane Wilma hit the Yucatán Peninsula only a few weeks later and devastated several dolphinariums in Cancún and Cozumel.¹⁴⁴

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 coastal development has been blamed for increasing the damage and destruction caused by hurricanes and other natural disasters, such as the 2004 Asian tsunami.¹⁴⁵ Concern has been raised about the impact of dolphin sea pens on natural barriers, through the dredging and physical removal of barriers to make



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

space for them. In addition, the pollution from coastal dolphin enclosures, 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.¹⁴⁶ The widespread expansion of dolphin sea pens in the

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.

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.¹⁴⁷

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.¹⁴⁸

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 for species that are not migratory, as is the case with most harbor seals (*Phoca vitulina*), the coastal environments that pinnipeds inhabit are rich in biodiversity.¹⁴⁹ Public display facilities that house pinnipeds generally provide them with only a small pool filled with chlorinated freshwater.¹⁵⁰ Chlorine precludes live plants and fish in the pool and can cause serious skin and eye complications for marine mammals.¹⁵¹ The small “land” area of the enclosure, provided to allow the animals to “haul-out” (come out of the water to rest), is usually a concrete simulation of bare rock. Most facilities provide disproportionately for the land portion of the animals’ existence (where the public can see them) and not enough for the animals’ aquatic needs. 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 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.¹⁵² 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.¹⁵³

Recent analyses show that wide-ranging predators more frequently exhibit poor health, stereotypical behavior,¹⁵⁴ and high infant mortality rates in captivity.¹⁵⁵ Polar bears are among those species that react poorly to captivity, showing signs of stress and physiological dysfunction. The authors of the analyses suggested, as one way to address this problem, that zoos might consider no longer exhibiting wide-ranging carnivores such as polar bears. However, polar bears

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.

are not the only marine mammals to show stereotypical behaviors when kept in captivity; some pinnipeds and most cetaceans also commonly respond to captivity with such behaviors.¹⁵⁶

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 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 captive polar bears are better than those of polar bears in the wild 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.¹⁵⁷ Being



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

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 stressors with which they are poorly equipped to cope—an issue that even the public display industry recognizes.¹⁵⁸ 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.¹⁵⁹

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.¹⁶⁰

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



The behavior and physiology of polar bears are ideally suited to their vast and rugged Arctic habitat. These adaptations become burdens in captivity. Photo: ©2009 JUPITERIMAGES Corporation

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.¹⁶¹

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.¹⁶² Finally, in 2002 Manitoba’s Polar Bear Protection Act was passed.¹⁶³ The act restricted the capture of polar bears to orphaned cubs only (i.e., no “nuisance” adults) and then only under certain conditions.¹⁶⁴ However, many of the regulations governing the placement of these orphaned 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.¹⁶⁵ 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 dolphinariums and aquaria should treat all species of marine mammals, whether or not they are endangered or threatened: only beached, injured, or rescued 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.¹⁶⁶ Mortality rates of sea otters in U.S. facilities have not received as much attention as those of cetaceans and pinnipeds, but these rates, particularly for pups, have been very high.¹⁶⁷ 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.¹⁶⁸ A program in California to rescue orphaned pups of the threatened southern sea otter population



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.



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

has increased its success at returning these animals to the wild by minimizing human interaction with them.¹⁶⁹

SMALL CETACEANS

The small cetaceans typically held in captivity, such as bottlenose dolphins and orcas, are wholly aquatic, wide-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.¹⁷⁰ 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.¹⁷¹ 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 animals and inhibit or discourage 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.¹⁷² At the 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.¹⁷³ The researchers looked at the behavior of two bottlenose dolphins in two pools, one that was roughly 9.5 meters in diameter and a second that was approximately 16 meters in diameter (the pools were not perfectly circular). 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.¹⁷⁴ It is widely known in the public display industry that larger pools decrease aggression and increase breeding success,¹⁷⁵ 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 issue of pool size standards during a negotiated rule-making process in 1995–1996 to amend the U.S. care and maintenance regulations.¹⁷⁶

Even in the largest facilities, a captive dolphin’s room to move is decreased enormously, allowing the animals access to less than one ten-thousandth of one percent of their 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.¹⁷⁷ An observation that refutes this claim is that of orcas in British Columbia’s Johnstone Strait, a small, salmon-rich section of 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.¹⁷⁸ 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

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

of food, they may require this amount of exercise for good health.¹⁷⁹ 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 wide-ranging carnivores in captivity. Such confinement is inhumane at a nearly inconceivable level.

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.¹⁸⁰ Captive facilities, with their logistical constraints, commercial considerations, and space limitations,



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

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.¹⁸¹

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 belugas¹⁸² were held in a tiny medical pool and were never allowed into the bigger pool. A campaign by animal protection groups per-



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

sueded the owners to transfer the belugas to a larger enclosure in Cairo, but these polar animals are still languishing in desert heat.

CONCLUSION

Unlike the habitat of some terrestrial mammals, the habitat of marine mammals is difficult and frequently impossible to re-create or simulate, even in microcosm. If provided with a large and rocky enclosure, most pinnipeds, even those that are migratory, do not find their need to haul-out specifically compromised by captivity. What is compromised, however, is the opportunity for the intense physical activity, expression of natural foraging behaviors, 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



This tank offers only rudimentary shade, but that is 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

remote, specialized habitats, such as polar bears, are severely compromised physiologically and can suffer immensely.

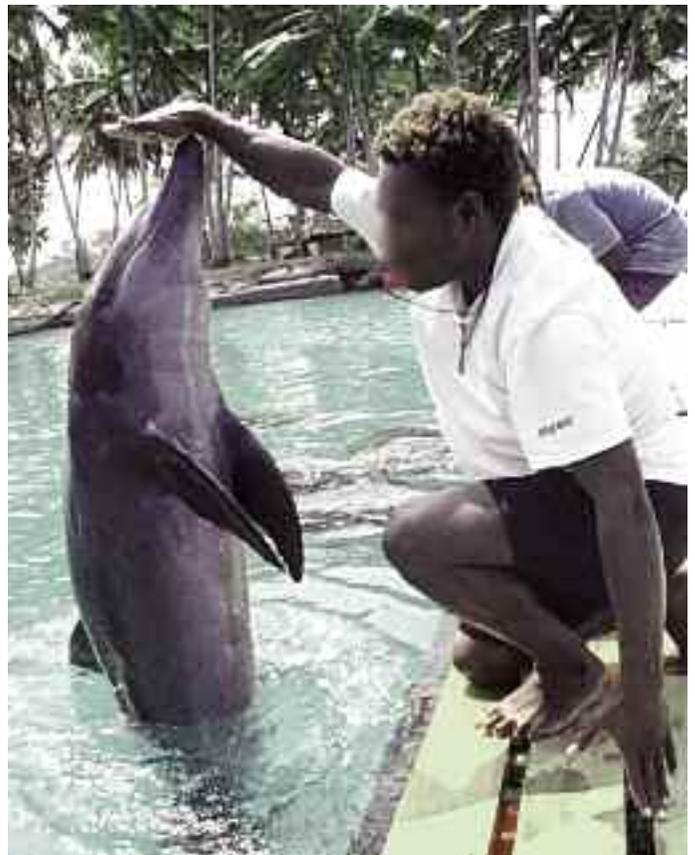
Cetaceans are in all ways severely compromised by captivity. The reduction in their horizon represented by a tank, even a large one, is extreme. Neither their physical nor their social environment can be simulated or re-created. Tanks are frequently effectively sterile, and social bonds are artificial. 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.

CHAPTER 3

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.¹⁸³ 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.¹⁸⁴ However, some animals, such as sexually mature males or aggressive individuals of either sex, are often sequestered in these tiny pools on a routine basis.¹⁸⁵ In some facilities, animals are frequently held in such secondary enclosures during tank-cleaning procedures. In older facilities (or new ones built cheaply), 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 promptly). 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)¹⁸⁶ and must be considered a stressful experience at the very least, if not also directly physically damaging.



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

Another abnormally stressful procedure for marine mammals, and for cetaceans in particular, is transport from 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 almost always 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.¹⁸⁷ Some marine mammals are sea-



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

sonally shipped between various facilities each year, for commercial rather than husbandry purposes. In so doing, they are subjected to chronic, cumulative, unnecessary, and unacceptable levels of stress.

Dolphinaria and aquaria routinely administer prophylactic antibiotics and ulcer medications to captive cetaceans.¹⁸⁸ 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,¹⁸⁹ 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 expressions¹⁹⁰ and body language with which humans can empathize (such as shivering or cowering) make developing health problems difficult to recognize.¹⁹¹ 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.¹⁹² 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.

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.



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: BigStockPhoto/Kobby Dagan

CHAPTER 4

Human-Dolphin Interactions

DOLPHIN-ASSISTED THERAPY

There are a growing number of public display facilities, both in the United States and internationally, that allow tourists to swim with captive dolphins. One of the justifications for such interactions is so-called Dolphin-Assisted Therapy (DAT). DAT is a form of animal-assisted therapy, usually 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. The idea behind DAT is that swimming with dolphins can have a variety of health benefits (both mental and physical), an idea that is heavily promoted by dolphinariums that offer dolphin swims.¹⁹³ These so-called therapeutic effects do not, however, hold up well under scrutiny, with researchers in a variety of medical and cognitive disciplines and dolphin protection advocates concluding that studies conducted by facilities were methodologically flawed and questioning the scientific validity of claims for therapeutic effectiveness.¹⁹⁴

Many new commercial facilities around the world claim they are conducting DAT, seeking to put a positive, altruistic spin on a money-making venture. Many of these, however, are staffed by individuals with questionable credentials.¹⁹⁵ In fact, DAT appears no more effective than using domesticated animals such as puppies or kittens, and is far more expensive and clearly carries higher risks for the patients (see “Chapter 5: Risks to Human Health”). In fact, the founder of DAT, Dr. Betsy Smith, ultimately concluded that DAT was exploitative of dolphins and people and has discontinued its practice; she now only works with domesticated animals.¹⁹⁶

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

SWIM-WITH-THE-DOLPHINS ATTRACTIONS

Outside the United States, there is little oversight of swim-with-the-dolphins (SWTD) attractions—even when captive marine mammal care and management regulations exist, they often do not include specific provisions to govern SWTD attractions. The following section therefore focuses on the U.S. regulatory regime for SWTD interactions (whose enforcement is currently suspended),¹⁹⁷ as it has



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

served as the model for those few countries with SWTD regulations and guidelines. It should be emphasized that the conduct of human-dolphin interactions 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.¹⁹⁸ The NMFS commissioned a study, completed and published as an agency report in April 1994, on the effects of SWTD interactions on dolphin behavior.¹⁹⁹ 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.²⁰⁰ The agency report concluded that to ensure the safety of dolphins and swimmers, SWTD interactions should be strictly controlled.²⁰¹

According to the NMFS study, the short-term risk to dolphins is primarily that under certain uncontrolled circumstances, dolphins



Dorsal fin and pectoral fin “tows” can lead to human or dolphin injury. Photo: ©iStockphoto.com/Karen Roach

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 interactions. The NMFS required that these dolphins be given some area within the swim enclosure that served as a refuge from swimmers; swimmers were not



There is nothing spontaneous about the interactions between swimmers and captive dolphins—to minimize injury risk, the dolphins must be strictly controlled. Photo: BigStockPhoto/ Paul Paddison

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 significantly increase their use of such refuge areas when exposed to the public in SWTD attractions.²⁰² 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 stress²⁰³ and to injurious interactions with swimmers. The case of refuges is

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.

an example of the economic basis of the public display industry directly conflicting with the needs of the dolphins.

The agency report also expressed concern for dolphins who are unsuited to SWTD interactions. If these attractions proliferate, the number of animals who become unusable in SWTD interactions (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 attractions 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 attractions do not educate the public;²⁰⁴ they exploit both dolphins and people. The HSUS and WSPA believe that SWTD attractions should be unconditionally prohibited. However, the relevant authorities in all countries where such facilities operate have allowed their continued operation, in most cases without regulation.²⁰⁵

The growing number of SWTD attractions in the Caribbean is a particular concern. There are at least 25 facilities in the region, with one or more in countries such as Jamaica, the Bahamas, Honduras, Cuba, and the Dominican Republic. Ten or 12 more are being pro-



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

posed or are in the planning or building stages on islands such as the Caymans and Aruba. Almost none of these jurisdictions have appropriate controls for the health or safety of either the dolphins or human participants in these interactions.²⁰⁶ Two of these facilities



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

have reportedly been involved in illegal activities.²⁰⁷ We have submitted comments to various authorities in an effort to ensure the strictest possible standards for these programs to minimize potential hazards for both dolphins and people, but clearly the goal must continue to be the prohibition of these exploitative operations.

PETTING POOLS

Petting pools are presently found at four facilities in the United States (SeaWorld Orlando, San Antonio, and San Diego, and Six

Flags Discovery Kingdom in Vallejo, California). There is one in Canada (Marineland Ontario), at least one in Japan, and at least one in Europe, 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. Dolphinaria argue that such interactions attract more tourists to their parks, thus enhancing public education about marine mammals, but this is not supported by research.²⁰⁸ In fact, petting pools and feeding sessions are actually leading to more conservation problems in natural habitat, as members of the public assume that touching and feeding wild dolphins is acceptable—the petting pools are setting a bad example.²⁰⁹

For more than a decade, WDCS (the Whale and Dolphin Conservation Society) and The HSUS have been monitoring petting pools in the United States and the risks they pose to both humans and dolphins.²¹⁰ 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.²¹¹ In addition, although feeding of dolphins is regulated by law in the United States and is only supposed to be done under strict supervision,²¹² there have been repeated observations of dolphins in petting pools being 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.²¹³ 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.²¹⁴ If such objects are swallowed, they can cause intestinal injuries, poisoning, and even death.

A detailed survey of public display facilities, conducted in 1989, presented interesting insights into why many dolphinaria did not have a petting pool or, if they did, why they closed it.²¹⁵ The survey recorded the following statements: “We abandoned the practice because of overfeeding, difficulties regulating amounts fed, and potential injury to the public,” and “My objections are hygiene (the state of the public’s hands), the possibility of foreign bodies being placed in the fish...and the staffing commitment that would be necessary to police such a facility.” The concerns we express above are strongly reflected in these statements from industry representatives.



Dolphins swallow fish whole. If fish offered by members of the public have been split open and broken up, exposed bones can damage an animal's digestive tract. Photo: BigStockPhoto/Finlay Long



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. Photo: ©Painet, Inc.

In addition, the risk of injury to people from being bitten or hit and 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;²¹⁶ there are a number of pathogens found in marine mammals that can be, and have been, transferred to people (see “Chapter 5: Risks to Human Health”).

CHAPTER 5

Risks to Human Health

DISEASES

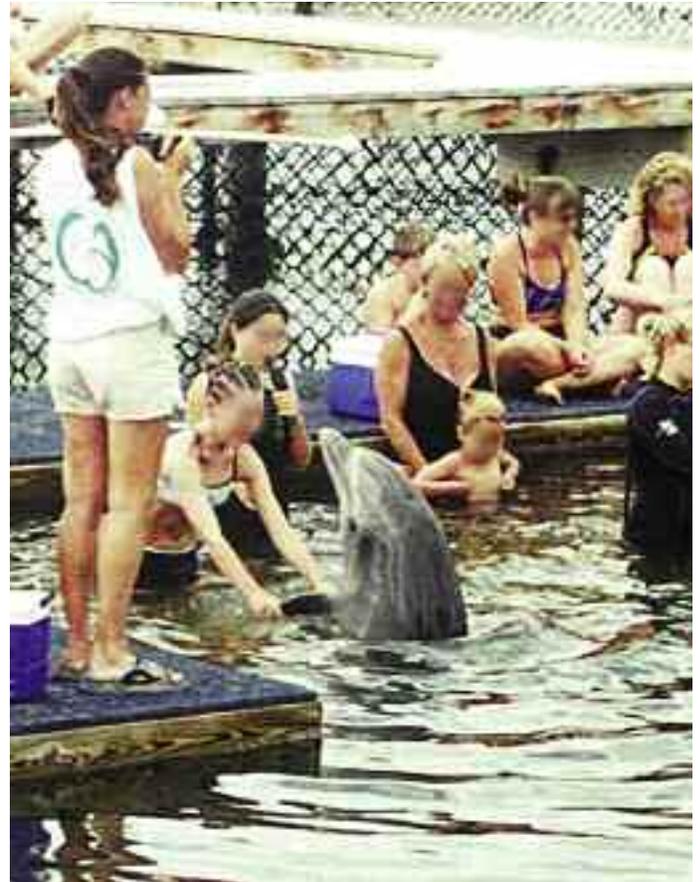
In a 2004 report to the U.S. Marine Mammal Commission (MMC), researchers from the University of California highlighted the potential health risks to which humans are exposed through contact with marine mammals. In an internationally distributed survey of people who come into contact with marine mammals (primarily those who work with these animals), 23 percent of respondents reported contracting a skin rash or similar ailment.²¹⁷ As with marine-mammal-inflicted injuries, workers in the public display industry are in a high-risk group for infection.²¹⁸

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.

Respiratory diseases were also reported in nearly a fifth of marine mammal workers, including diseases such as tuberculosis.²¹⁹ 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.²²⁰ 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.²²¹ Facilities that allow direct human contact with marine mammals, such as dolphinariums with petting pools or swim sessions, are exposing their customers to possible infection and injury.²²² 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 SWTD attractions 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. swim sessions, 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



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

dolphin biologists have noted that few, if any, dolphin-inflicted human injuries could be truly accidental,²²³ yet all the injuries in SWTD injury reports were so labeled. Broken bones and broken face masks were described as the result of “accidental bumps.”

In a more recent 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.²²⁴ Such incidents have happened outside the United States as well; for example, in early 2008 three tourists were injured at a SWTD facility in

Curaçao. The facility tried to downplay this incident and described it to local media as a “bump”; however, a digital recording by a bystander showed the dolphin breaching (a breach is a leap out of

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 can and will bite, not to mention the risk of falling into the pool.

the water, with the animal landing on his or her side on the water’s surface) in a manner that seemed quite deliberate. The dolphin landed directly on the swimmers, resulting in a significant impact.²²⁵

It is disturbing that the personnel at SWTD attractions 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 SWTD 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



Orcas and dolphins have many sharp teeth and are capable of inflicting serious wounds on humans with little effort.
Photo: ©Painet, Inc./Ann Purcell

always present and is potentially lethal. It is probable that a person will eventually be killed in these programs, more likely in one of the many new facilities in the developing world being built and operated by entrepreneurs who know little about dolphins but anticipate a large profit from this lucrative tourist activity. 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 attraction 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 can and will bite, not to mention the risk of falling into the pool.²²⁶

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,²²⁷ and even attacking and killing conspecifics’ calves.²²⁸ Orcas, another commonly kept cetacean, are well known for their predatory behavior and have been recorded killing a wide variety of marine mammal species.²²⁹

The MMC survey from the University of California discovered that more than half of marine mammal workers had been injured by the animals (251 cases altogether).²³⁰ Those in regular contact with marine mammals or involved with cleaning and repairing



Some facilities are now inviting customers to swim with belugas, despite the animals’ large size and the cold temperatures of their pool water. Photo: BigStockPhoto/Vladimir Wrangel

enclosures were more likely to be injured. Trainers and dolphinarium staff are frequently injured, but these incidents are rarely reported publicly.

The aggression and violence of which orcas are capable were clearly witnessed at SeaWorld 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. SeaWorld staff then quickly ushered away the watching crowd. Forty-five minutes after the blow, Kandu 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.²³¹

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.²³² In Hawaii, a short-finned pilot whale (*Globicephala macrorhynchus*) grabbed hold of a human swimmer, pulling her 10–12 meters underwater before letting her go. Although the swimmer was lucky not to have been drowned, she suffered a bite wound that required nine stitches.²³³

To date there has only been one record, in Brazil, of a bottlenose dolphin killing a person.²³⁴ The animal involved in 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 dolphinaria. 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 the man's stomach and causing his death.

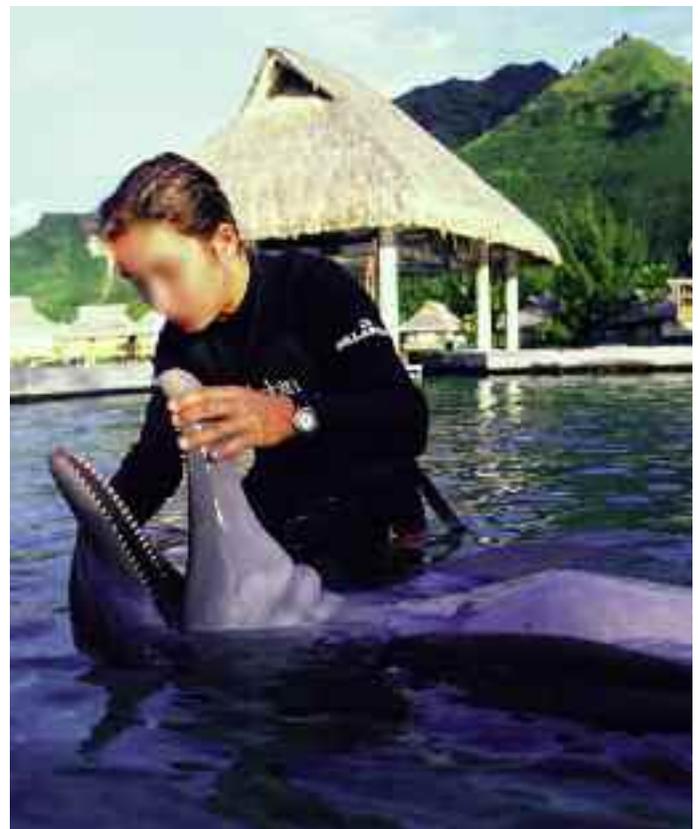
Despite the bottlenose dolphin's ability and propensity for aggression, captive orcas are the marine mammals most associated with human injuries and deaths. In 1991, a group of orcas killed trainer Keltie Byrne at Sealand of Victoria, Canada. In front of a shocked audience, the orcas held Byrne underwater until she drowned. Eight 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 SeaWorld 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.²³⁵

The risks to people posed by interactions with orcas were also seen when a young orca called Ky attacked his trainer, Steve Aibel, at SeaWorld San Antonio in July 2004. During a show, the animal hit Aibel, pushed him underwater, and positioned himself between the trainer and the exit ramp of the pool. Aibel was rescued from the whale by another staff member only after several minutes of being

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

unable to bring the animal under his control.²³⁶ In November 2006, the orca Kasatka held trainer Ken Peters underwater by his foot, at SeaWorld San Diego.²³⁷ On 6 October 2007, trainer Claudia Vollhardt was injured by an orca named Tekoa at the dolphinarium Loro Parque, in Tenerife, Canary Islands. The whale broke the trainer's forearm in two places and inflicted chest injuries.²³⁸

The risks to trainers posed by captive orcas were thoroughly considered and summarized in the narrative summary and information memorandum initially prepared by an inspector for California's Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) after the incident with Kasatka and Ken Peters in 2006. SeaWorld managers had notified Cal/OSHA of the



Even trained caretakers must exercise extreme care to avoid being bitten by their charges. Photo: ©Painet, Inc.



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

November incident the next day as a matter of routine, due to the serious nature of the injury. However, routine is a matter of perspective. SeaWorld saw the incident as a minor employee injury, but after a thorough review of this and other trainer-orca incidents (see above), the state inspector came to a different conclusion: “[I]n the simplest of terms...swimming with captive orcas is inherently dangerous and if someone hasn’t been killed already it is only a matter of time before it does happen.”²³⁹

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 facilities increases,²⁴⁰ 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.

It would never be acceptable for zoos to allow visitors to interact freely in an enclosed space with chimpanzees, gorillas, lions, or elephants.²⁴¹ It is folly to regard interactions with marine mammals as safer than those with other large wildlife species.



Dolphins rarely leave the water to “beach” themselves like this in nature—this common feature of dolphinarium performances is therefore misleading rather than educational. Photo: ©iStockphoto.com/Hannu Liivaar

CHAPTER 6

Behavior

The natural foraging behaviors of most predators in captivity are severely compromised.²⁴² 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.²⁴³

Public display facilities claim that for those marine mammals who perform in shows, training adequately replaces the stimulation of hunting. This claim is without proof or indeed logic. 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 a primary positive reinforcer. For some 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

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 considered secondary.

tion 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



The sheer joy of this dolphin's leap in the air is lost when the behavior is controlled by a trainer's command and repeated on cue in a performance. Photo: ©iStockphoto.com/Kristian Sekulic

feeding and foraging rhythms and cycles, as well as independence of any kind, are lost. It is difficult 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 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.



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

Natural behaviors and social 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.²⁴⁴ The needs of the animals are considered 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,²⁴⁵ 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.



Sea lions are usually found in large groups. This natural tendency can rarely be accommodated in captivity and in some cases captive social groups are completely artificial. This can cause stress. Photo: BigStockPhoto/Eric Gevaert

CHAPTER 7

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.²⁴⁶ Stress in mammals can manifest in many ways, including weight loss, lack of appetite, anti-social behavior, reduced calving success, arteriosclerosis (hardening of the arteries), stomach ulcers, changes in blood cell counts, increased susceptibility to diseases (reduced immune response), and even death.²⁴⁷ Short-term acute stress will occur as the result of pursuit, confinement, and physical handling experienced during capture or the transport process.²⁴⁸ 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.²⁴⁹ Scientific studies have noted significant physiological impacts from

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. In other words, every transport is as traumatic to a dolphin as a capture from the wild.

pursuit and handling, particularly in cetaceans.²⁵⁰ 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.²⁵¹ 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.²⁵² 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.²⁵³

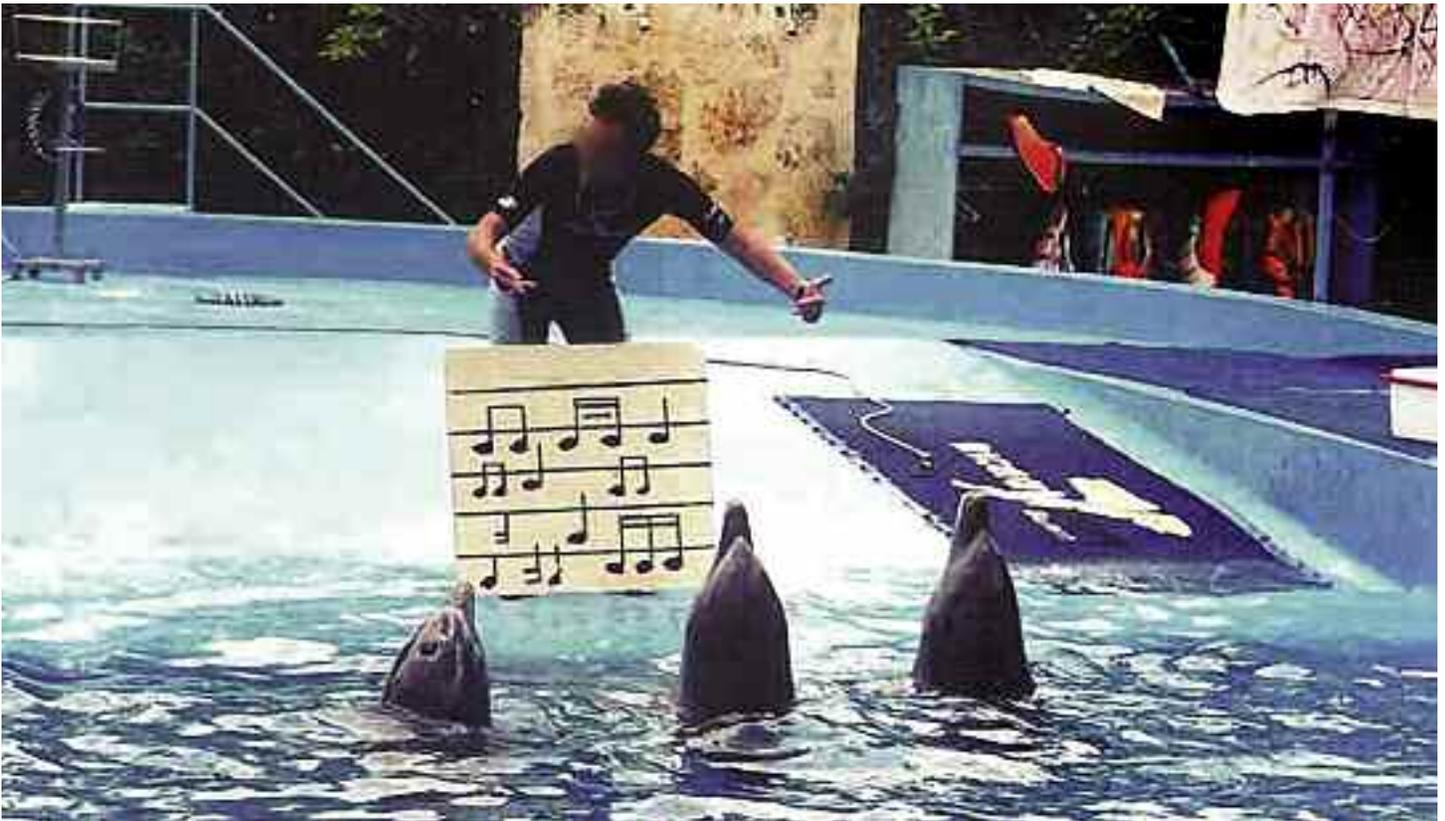
Confinement exacerbates stressful situations for marine mammals in many ways. Captive animals are in artificial social groupings determined by humans, in small restricted areas, and the social pressures and stress they experience can escalate when they have no avenue for escape. In dolphins, for example,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



Sea otters are particularly susceptible to stress during transport. Many die after being handled, whether during a capture from the wild or a move between facilities. Photo: BigStock Photo/Iris Abbott

ty—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.²⁵⁴ 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.²⁵⁵ In an



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

attempt to mitigate these problems, the researchers suggested that dolphin enclosures should be expanded to allow less restricted movement of animals.²⁵⁶ 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 she 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).²⁵⁷ The forced intimacy faced by three or four (or more) polar bears in a small zoo enclosure inevitably leads to stress.



This polar bear sits alone on the ice—physically and socially the norm for this species in the wild. In captivity too many bears in too-warm enclosures is far too often their lot. Photo: ©2009 JUPITERIMAGES Corporation

CHAPTER 8

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 has 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?

A recent debate on this topic resulted when a researcher named Paul Manger postulated that the dolphin’s large brain could have evolved for physiological reasons having to do with body temperature regulation.²⁵⁸ In his paper, he offered what he considered substantial evidence that dolphins were no more intelligent than many terrestrial ungulates (to which cetaceans are evolutionarily related). However, a rebuttal to this hypothesis from several prominent cetacean biologists summarized far more thoroughly the large and growing body of literature examining small cetacean intelligence and social sophistication.²⁵⁹ In addition, these researchers noted the temperature regulation hypothesis required a series of geologic events during the dolphin’s evolution that did not match the paleontological record. Essentially Manger’s hypothesis requires either misinterpreting or ignoring a considerable amount of the science addressing cetacean intelligence, reducing its legitimacy.

Most studies demonstrating cetacean intelligence have been conducted on captive animals, albeit primarily in dedicated research facilities or non-profit 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.²⁶⁰ Although dolphins have smaller brains relative to their size than modern humans have, they would be at least as intelligent as prehistoric humans according to this measure.



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

However, this measure does 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.²⁶¹ 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.²⁶²

The behavior of cetaceans also implies high intelligence; for example, bottlenose dolphins are widely believed to possess individual, or signature, whistles,²⁶³ which are thought to be important for individual recognition or keeping groups together.²⁶⁴ 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,”²⁶⁵ i.e., using the whistles in a way similar to humans using names. Dolphins are the only non-human animals known to communicate in such a way, which in itself is believed



Orcas are the largest—and possibly the most intelligent and culturally varied—of the dolphin species. Photo: Tatiana Ivkovich, Far East Russia Orca Project (FEROP)

to have been a key step in the evolution of human language.²⁶⁶ Similar calls, although not as obviously specific to individuals, have also been reported in comparable contexts in orcas.²⁶⁷

The complexity of cetacean communication has often been used as a potential indicator of intelligence, and a study examining the complexity of cetacean vocalizations discovered that the “communication capacity,” or the ability to carry information, of dolphin whistles is similar to many human languages.²⁶⁸ This suggests that cetaceans could potentially be speaking their own language, which, as far as we currently know, would make them the only animals besides humans to do so.

In addition, research has shown that cetaceans have the capacity for vocal learning.²⁶⁹ 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.²⁷⁰



Dolphin mothers are devoted to their offspring, teaching them everything they need to know to survive and thrive. Photo: ©2009 JUPITERIMAGES Corporation

One of the most successful and illuminating cetacean linguistic studies²⁷¹ was conducted by Louis Herman, who taught bottlenose dolphins a simple sign language and a computer-generated sound language.²⁷² 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.²⁷³ One of the most intriguing discoveries is that dolphins are able to discriminate between numbers of objects. Initial tests showed that dolphins can, at the very least, distinguish between a “few” and “many” objects²⁷⁴ and numerically “less.”²⁷⁵

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.

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.²⁷⁶

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.²⁷⁷ 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 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.²⁷⁸ In humans the ability to recognize one’s own image in a mirror does not appear until the age of two.²⁷⁹ Therefore, it can be argued that bottlenose dolphins have a level of understanding comparable to that of a two-year-old child,²⁸⁰ 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



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.

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 dolphinaria and aquaria.

In his book *The Ethics of Science*, David Resnik highlights eight factors potentially possessed by animals.²⁸¹ 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.²⁸² 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 trained to perform tasks otherwise considered difficult, impossible, or unsafe for human divers, such as retrieving objects from deep water or placing location beacons on mines.²⁸³ 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.²⁸⁴ More to the point, the ethical questions raised by using animals 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 animals are supremely well-adapted to the Arctic climate, even when they have never experienced it directly. Photo: ©2009 JUPITERIMAGES Corporation

CHAPTER 9

Mortality and Birth Rates

Animals die, in captivity and in the wild. The simple fact that an animal dies in a zoo or aquarium is not notable in itself. The questions to ask are: What was the cause of death? How old was he or she? Many animal protection advocates who oppose captivity believe every death demonstrates that captivity kills, but this is overly simplistic. On the opposite end of the spectrum, zoo officials usually label every death “natural.” The truth is obviously somewhere in between, but the public display industry, with its proprietary access to the relevant data, has been lax in defining where that truth lies. Veterinary record-keeping and research into causes of death have lagged behind the public’s interest in the welfare of captive wildlife.²⁸⁵

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*).²⁸⁶ 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.²⁸⁷ Mortality rates of captive-born pups for some species, such as the California sea lion, are lower than in the wild,²⁸⁸ 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,²⁸⁹ a rate that may be higher than experienced in the wild. Comparatively, captive sea otters appear to fare better in terms of life expectancy, although how this compares to wild populations is unknown.²⁹⁰

Few, if any, of the pinniped species typically held in dolphinariums, aquaria, and zoos (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.²⁹¹



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

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.²⁹²

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,

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.

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.



For most pinniped species in captivity, captive breeding has been successful and the goal now is to limit pregnancies.
Photo: BigStockPhoto/Glenda Powers

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.²⁹³ 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.²⁹⁴ 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.²⁹⁵

ORCAS AND OTHER SMALL WHALES

Several small whale species are commonly held in captivity, and their mortality rates are much higher than the rate for bottlenose dolphins. Orcas and beluga whales are the small whales most often seen in captivity; false killer whales are also popular.

Of at least 193 orcas held in captivity since 1961 (wild-caught or captive-born), 151 (78 percent) are now dead.²⁹⁶ Almost all of the orcas in the United States, and about half of the captive orcas kept worldwide, are owned by SeaWorld. For years the corporation persistently and erroneously maintained that the maximum life span of orcas was 35 years,²⁹⁷ but its website now states instead that “no one knows for sure how long killer whales live,” and that they live “at least” 35 years.²⁹⁸ 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 50 years of age now. First observed in 1973 as adults (at least 15 years of age), they are still alive today.²⁹⁹ The maximum life span for orcas is currently estimated to be 60 years for males and 80 or 90 years for females.³⁰⁰

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.³⁰¹ Twenty-two orcas have died at SeaWorld parks since 1985: four were young calves, and the others were in their teens and



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

twenties. To date, less than 20 orcas are known to have survived more than 20 years in captivity, and only two have survived in captivity for more than 35 years.³⁰² 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.

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.

As for birth rates, after more than 45 years in which at least 193 orcas have been held in captivity, with 83 known pregnancies, only 40 viable calves (surviving past one year) have been produced (a 51.8 percent mortality rate).³⁰³ Therefore, orca birth rates and infant mortality rates have been at best the same or slightly better in captivity than in the wild, but, given that some captive data are almost certainly missing, are likely to have been worse.³⁰⁴ 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.³⁰⁵

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 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 expected and 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.³⁰⁶ Recent re-evaluation of ageing techniques suggests, in fact, that beluga whales may have maximum life spans far greater than previously thought. Sectioning teeth and counting growth rings, the previously accepted method by which beluga ages were determined, may underestimate age by a factor of two, meaning wild beluga whales, previously thought to have a maximum life span of 30 years, can actually live as long as 60 years.³⁰⁷ In captivity, beluga whales routinely die before they reach 30 years of age—very few have surpassed this milestone.³⁰⁸ The captive-birth rates for these two species are not impressive either; there was only one surviving captive-born false killer whale and six living captive-born belugas recorded in the June 2006 *Marine Mammal Inventory Report*.³⁰⁹

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.³¹⁰ 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.

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 mate if given the chance. While unsuccessful attempts at



Of the orcas held in captivity since 1961—both wild-caught and captive-born—78 percent are dead. Few would be considered old by wild standards if they were still alive.

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.³¹¹

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 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 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.



New research shows that previous methodologies halved the true ages of belugas—captive animals should live 50–60 years, but they rarely make it past 30 and most die in their teens and twenties. Photo: BigStockPhoto/Aleksey Trefilov

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 captive maintenance.



In the wild, dolphins face many threats. In captivity, they do not, yet at best they live only as long as in the wild. Despite this dolphin's "smile," she may be suffering from stress—enough stress to shorten her life. Photo: BigStockPhoto/Brenda Irigoyen

CHAPTER 10

Conclusion

The tide may be turning for captive marine mammals, particularly cetaceans. In the United States, at least 13 dolphin exhibits have closed in the last decade and a half, while during the same time frame only four new exhibits have opened.³¹² 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.³¹³ In September 2005, the Netherlands Antilles determined that it would allow no more dolphin exhibits in its territories (it already has one and has issued a permit for another). Cyprus denied a request to set up a DAT facility in 2006. 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), Vietnam (exports) and Malaysia (exports are prohibited, as are imports of marine mammal species already found in Malaysia). Mexico has prohibited the import and export of marine mammals.

Other nations have banned or enacted moratoriums on the live capture of cetaceans in their waters. These include Mexico, New Zealand, Brazil, Peru, Argentina (orca captures are prohibited), the Dominican Republic, 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.³¹⁴ In a number of cases, municipal, provincial, and national governments have decided not to allow a dolphinarium or a cetacean exhibit

to be built.³¹⁵ 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 SWTD attractions and other human-dolphin interactions.

In August 2008, Travelife, an initiative of International Tourism Services and the European Union, published a handbook for tourism providers on what to look for in tourism enterprises that utilize animals. Its purpose was to maximize the sustainability of the enterprises and the welfare of the animals involved. The handbook included a separate section on dolphinarium, a reflection both of the growing public interest in captive marine mammal welfare and a growing acknowledgment that marine mammals, especially cetaceans, do stand apart from many other species of captive wildlife. The handbook offered an extensive checklist for tourism providers to evaluate whether a dolphinarium was, at a minimum, following “best practices” for the public display industry. Although Travelife stopped short of recommending against offering excursions to dolphinarium, it recommended “that this



Swimming in endless circles is actually causing this orca's dorsal fin to collapse to one side—in the wild, an orca's fin grows upright, as the whale swims in a straight line through the ocean. Photo: BigStockPhoto/Mike Liu

only occurs in areas where there is not the possibility of substituting this excursion with a whale/dolphin watching experience in the wild.”³¹⁶

All of these developments suggest that a paradigm shift may be underway. 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 humanity that it should be rejected outright. It is unacceptable for marine mammals to be held in captivity for the purpose of public display.³¹⁷

Table 1

ANNUAL MORTALITY RATES (MEAN PERCENTAGE OF POPULATION DYING EACH YEAR) OF BOTTLENOSE DOLPHINS AND ORCAS 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	
Bottlenose Dolphins	7.0% ^{b*}	7.4% [*]	5.6% ^{b***}	5.7% ^{b***}	3.9% ^b
Orcas	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, 1994); (5) R. S. Wells and M. D. Scott, “Estimating bottlenose dolphin population parameters from individual identification and capture-release techniques,” in *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. Although the animal who was dropped managed to survive this treatment, another dolphin died 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,



Some of the dolphins held in this most-recently opened facility in the Dominican Republic, known as Dolphin Island, are believed to be from the capture in 2002. Photo: FUNDEMAR

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.³¹⁸

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 boat tours, which often included dolphin-watching. The capture also was severely criticized by the Dominican Republic Academy of Sciences.

The dolphins were taken to Manatí Park in Bávaro, a captive dolphin facility that presents dolphin shows and conducts SWTD ses-

sions. This facility had already courted controversy and coverage on European television over 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.³¹⁹

Although a permit had been issued for the August 2002 capture by governmental officials, this permit was invalidated by the fact that the waters of the national park (Parque Nacional del Este) where the capture took place were legally considered to be a marine mammal sanctuary, and such captures were prohibited.³²⁰ The captures were also in violation of international treaties, namely the Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention), to which the Dominican Republic is a party.³²¹

Since the capture of the eight dolphins, it is believed that at least one of the animals has died, although it may be as many as three.³²² In 2006, Manatí Park applied to import four more dolphins from Cuba (to replace animals that appear to have died at the facility in Bávaro), but was denied permission by the Dominican Republic government. In December 2007 Manatí Park's second facility, Parques Tropicales (also called Dolphin Island), was accused of importing four dolphins from Cuba illegally, and was prosecuted by the Environment Minister. Ironically, despite acting in a manner that essentially undermines national and international environmental regulations, earning the ire of the nation's leading scientific organization, and being prosecuted for illegal importation of dolphins, Manatí Park tries to portray itself as a conservation, research, and education facility in its publicity materials.³²³

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 Solomon Islands, an island state near Australia. Investigation led to the discovery that at least 94 animals were captured by local fishermen on behalf of foreign entrepreneurs and placed in makeshift pens, awaiting export to other countries,³²⁴ even though Solomon Islands was not a Party to CITES at that time.³²⁵ However, it was unknown how many other dolphins were injured or died during the capture process—aneecdotal 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. Even veterinarians that attended the capture admitted, “The dolphin population is unknown due to the civil war when

“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 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).”

neither the government nor the rebels permitted people to study *Tursiops* for the purpose of estimating their numbers.”³²⁶

After international outcry about the capture, in September the IUCN Cetacean Specialist Group (CSG) sent a fact-finding mission to 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 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).³²⁷

Accompanied by a non-detriment finding (NDF) that was unsubstantiated by any scientific information, the 28 dolphins destined for Mexico were exported on 21 July 2003 to a dolphinarium in Cancún, where one animal died within a week of transport. Mexican CITES officials subsequently declared that they would not accept any more dolphins from Solomon Islands (though permits had been granted to import 100 animals) and, indeed, these officials had misgivings about any wildlife trade with a country not a party to CITES.³²⁸ To date, there have been no further imports of dolphins into Mexico from Solomon Islands.

In January 2005, the Solomon Islands government announced a provisional ban on exports of live dolphins. However, in mid-2007 Solomon Islands became a Party to CITES and lifted the ban. On 17 October 2007, 28 *T. aduncus* were exported to Dubai in the United Arab Emirates (UAE). This export was accompanied by considerable media attention, especially after three bottlenose dolphin carcasses were found in a public garbage dump in Solomon Islands soon after the export, near the pen where the dolphins had been held before transport.³²⁹



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

Prior to the export, experts again advised against it on scientific grounds (or lack thereof) to authorities in Solomon Islands and the UAE, as well as to the CITES Secretariat.³³⁰ After the Mexican import, the next CITES Conference of the Parties had passed yet another resolution emphasizing that “decision-making regarding the level of sustainable exports must be scientifically based.”³³¹

As a Party to CITES, Solomon Islands was obligated to issue a scientifically-based NDF. On 10 October 2007, the Solomon Islands government issued a supplement to its original (unsubstantiated) NDF in which it stated (without basis) that assessing the validity of this NDF was beyond the scope of the IUCN CSG.³³² Moreover, an annual export quota of 100 dolphins a year was proposed. The Solomon Islands government claimed that the new NDF was science-based and referred to the relevant research in its documentation: four days of boat trips in 2005 and eight days in 2007, during which 31 miles of coastline were surveyed. Animals encountered were photographed and identified individually: 52 were identified in 2005 and 46 in 2007, of which seven (i.e., 15 percent of the second sample) were the same animals. Such a high re-sighting rate suggests a relatively small, resident population in this location (approximately 350 animals), using an appropriate analysis known as “mark-recapture.” However, the Solomon Islands government did not use this analysis method; instead, it took the estimated number of animals sighted on these trips, divided by the amount of coastline traversed, deriving 4.1 dolphins per mile traveled. It then multiplied this number by the total length of coastline of Solomon Islands, giving an extrapolated estimate of 13,530 animals. To say the least, this is an invalid methodology, as there is no available scientific information to show that Indo-Pacific bottlenose dolphins occur anywhere in Solomon Islands other than the small area surveyed or at what densities.

Despite the concerns expressed by the IUCN CSG, Willem Wijnstekers, the Secretary-General of CITES, issued a statement on 15 October 2007, as follows: “the Secretariat has not been presented with any evidence [for Solomon Islands dolphins] which demon-

strates that non-detriment findings are not being adequately made before exports are authorized.”³³³ This directly dismisses and ignores statements made by the world’s foremost cetacean authorities, including experts from the Indo-Pacific region. Non-governmental organizations issued a joint rebuttal to the Secretary-General’s statement.³³⁴ Several Parties to CITES also expressed their concerns about the export to the Secretariat.

In 2008, another proposed export was announced, this time to a facility in Singapore. The experiences of the Mexican government during the 2003 export, and concerns for the welfare of the animals sent to Dubai and to be exported to Singapore, led the Chairman of the Mexican Congressional Committee of Environment, Natural Resources and Fisheries to send a letter to the relevant authorities in Singapore. He highlighted the high mortality rates suffered by the animals traded in 2003 and the adverse publicity suffered by the Mexican government over this trade.³³⁵

In addition, the government of Israel expressed its concerns about the Solomon Islands trade in dolphins to the CITES Animals Committee in April 2008. This Committee, which provides scientific advice and guidance on animal species in trade, undertakes a process called the Significant Trade Review.³³⁶ Israel recommended that *T. aduncus* be included in the Significant Trade Review.³³⁷ As the question is whether or not Solomon Islands is issuing valid NDFs for its trade in *T. aduncus*, it seemed a logical candidate for the Review. However, the Animals Committee deferred consideration of Israel’s recommendation until after a planned IUCN Species Survival Commission/Cetacean Specialist Group workshop in Samoa³³⁸ to discuss and review the capture and export of *T. aduncus*. The Committee’s decision to postpone an examination of the Solomon Islands NDF, given the obvious problems, may be seen as politically sensitive, but it is also a dismissal of the importance of science in CITES decision-making. The subsequent characterization of this postponement by the Solomon Islands government as “CITES approval” of its dolphin trade demonstrates the pitfalls of delaying a frank assessment of the situation.³³⁹

The Solomon Islands government has issued at least five licenses for dolphin exports. At least one of these is in the hands of the original capture operator, whose pens continue to hold several dolphins. Another company is also holding several dolphins, in a separate location. It has been reported that Asian trainers have been in the country seeking animals.³⁴⁰

In November 2008, a NDF workshop was held in Mexico, where the situation with Solomon Islands dolphins was presented as a case study.³⁴¹ Despite the conclusion by the workshop (echoing the participants of the Samoa workshop in August 2008) that no valid, credible NDF can currently be issued for Solomon Islands *T. aduncus*, yet another trade occurred on 8 December 2008, when seven Solomon Islands dolphins were shipped to the Philippines, reportedly to be trained at Ocean Adventure, a dolphinarium in Subic Bay, before being sent on to Singapore. Another 11 dolphins were shipped to the Philippines in January 2009, after one cargo company cancelled its contract to transport the animals and another then agreed to do the job. At the time of this edition's publication, Singapore had not made a final decision regarding the import of Solomon Islands dolphins, directly from Solomon Islands or via the Philippines.

The fate of some of the 28 dolphins who were sent to Dubai's Atlantis Palm Resort in late 2007 remains unknown (24 have been reported to be on display), as there is little transparency there. The dolphinarium opened to the public in November 2008.

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.

3 "Husbandry and medical care were learned empirically over the years by trainers and veterinarians," 283. L. Couquiaud, "A survey of the environments of cetaceans in human care: Introduction," *Aquatic Mammals* 31 (2005): 283–287.

4 Whales, dolphins, and porpoises (cetaceans) are exhibited in at least 49 countries. Couquiaud, "A survey of the environments of cetaceans in human care: Survey of international cetacean facilities," 311–319. Activist reports also record dolphin displays in countries such as Cambodia, Vietnam, and Mauritius, which were not listed in Couquiaud's 2005 publication.

CHAPTER 1: EDUCATION, CONSERVATION, AND RESEARCH

Education

5 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 both 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—now known as the Association of Zoos and Aquariums) and the

Alliance of Marine Mammal Parks and Aquariums (AMMPA), two industry associations, to draft such standards. These standards (see, for example, <http://www.aza.org/Accreditation/Documents/AccredStandPol.pdf>) emphasize that "current scientific knowledge" must form the basis for education programs but are offered merely as guidelines rather than requirements, and many of the standards are ignored by dolphinarium—in some cases, all are. These industry standards are often used by facilities in other countries as a "best practices" template for their own guidelines—few nations have education program requirements.

6 A report on the impacts of zoos and aquaria on visitors stated, "Little to no systematic research regarding the impact of visits to individual zoos and aquariums on visitor conservation knowledge, awareness, affect, or behavior has been conducted and presented at conferences and/or subsequently published." L. D. Dierking et al., *Visitor Learning in Zoos and Aquariums: A Literature Review* (Silver Spring, Maryland: American Zoo and Aquarium Association, 2001–2002), vi. A peer-reviewed article noted that "the educational impact that the zoo environment exerts on a typical visitor's awareness and understanding of other animal species has been poorly explored." L. S. Reade and N. K. Waran, "The modern zoo: How do people perceive zoo animals?" *Applied Animal Behaviour Science* 47 (1996): 109–118. A recent study by the Association of Zoos and Aquariums noted that zoos "have done little to assess [their] impact... While there is some evidence of zoo experiences resulting in changes in visitors' intention to act, there are few studies demonstrating actual changes in behavior." J. H. Falk et al., *Why Zoos & Aquariums Matter: Assessing the Impact of a Visit* (Silver Spring, Maryland: Association of Zoos and Aquariums, 2007), 5. This 2007 study was an attempt to address this data gap; however, the results suggested that very few (10 percent) zoo visitors increased their conservation-related knowledge base, while only about half were prompted to increase their conservation-related behavior. Over time, far fewer than half (20–40 percent) of visitors could still recall any animals or exhibits they had seen and the study did not even examine whether these visitors had actually increased their conservation-related behavior after their zoo visit.

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

8 Harris Interactive fielded this web-based survey on behalf of WSPA from 7–9 November 2007, interviewing a nationwide sample of 2,628 U.S. adults aged 18 years and older.

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

10 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. The majority of visitors cited that they were visiting for entertainment and recreation.

- S. R. Kellert and J. Dunlap, "Informal learning at the zoo: A study of attitude and knowledge impacts" (Zoological Society of Philadelphia, 1989). Another study found that viewing displayed animals and watching marine mammal performances were the main reason why people visited a dolphinarium, rather than education. Y. Jiang et al., "Public awareness and marine mammals in captivity," *Tourism Review International* 11 (2008): 237–250.
- 11** Captive facilities often emphasize unnatural behavior. In a survey, college students viewed animals as being tame, unnatural, unhappy, and dependent on their keepers when caged or in semi-natural settings. D. Rhoades and R. Goldworthy, "The effects of zoo environments on public attitudes towards endangered wildlife," *International Journal of Environmental Studies* 13 (1979): 283–287.
- 12** In her book on SeaWorld's corporate culture, Susan Davis, professor of communications at the University of California, San Diego, notes that "the Shamu show reveals very little actual scientific or natural historical information, and discussions of research goals and discoveries are hazy. True, not much can be packed into a twenty-minute performance, but a look at what is included is revealing. The audience is asked whether Shamu is a fish or a mammal and is told that it is a mammal—but the definition of mammals, or the significance of mammalian status, or the importance of differences between marine mammals and fish is never discussed." S. G. Davis, *Spectacular Nature: Corporate Culture and the Sea World Experience* (Berkeley: University of California Press, 1997), 298.
- 13** As a result of the European Union Zoos Directive (Council Directive 1999/22/EC), all zoos and captive animal facilities in Europe (including dolphinariums) are legally obligated 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. Indeed, in a survey of members of the public near Marineland Ontario in Canada, only 28 percent agreed with the statement: "I have the feeling that aquariums or marine parks portray a real image of marine ecosystems." Jiang et al., "Public awareness and marine mammals in captivity," 245.
- 14** 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.
- 15** Davis, *Spectacular Nature*.
- 16** Virtually all captive adult male orcas (*Orcinus orca*) have fully collapsed dorsal fins and a large number of captive adult females have fully or partially collapsed dorsal fins. However, observations from the wild (for example, in British Columbia) show that only one to five percent of animals have fully collapsed fins. J. K. B. Ford et al., *Killer Whales* (Vancouver: University of British Columbia Press, 1994). Collapsed or missing dorsal fins are rare for any cetacean species and in wild orcas all reported fully collapsed fins have been on males and may be related to poor health or stress. R. W. Baird and A. M. Gorgone, "False killer whale dorsal fin disfigurements as a possible indicator of long-line fishery interactions in Hawaiian waters," *Pacific Science* 59 (2005): 593–601. Nevertheless, in their educational materials, talks, and shows, many dolphinariums suggest that collapsed fins are genetic, heritable traits, like eye color. 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.
- 17** SeaWorld has long stated or implied in its educational materials that wild orcas live no more than 35 years. For example, in its Killer Whale Animal InfoBook, SeaWorld states "that killer whales in the North Atlantic may live at least 35 years." <http://seaworld.org/animal-info/info-books/killer-whale/longevity.htm>. However, scientific research indicates a maximum estimated life span of about 80 years for female and 60 years for male orcas. 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. See endnote 298 for more on this issue.
- 18** For example, a public aquarium commissioned a virtual beluga whale (*Delphinapterus leucas*) exhibit; computer-generated beluga whales responded as living whales would, using artificial intelligence programs that process live whale behavioral data. The researchers noted that "the simulation was realistic enough that it could influence even expert opinions on animal behavior," 108. S. DiPaola et al., "Experiencing belugas: Action selection for an interactive aquarium exhibit," *Adaptive Behavior* 15 (2007): 99–112.
- 19** 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.
- 20** 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.
- 21** Of 13 marine parks holding orcas captive in 2004, five provided information on whale and dolphin conservation. Five provided educational information for teachers, six provided information for children, and six had online information about whales. Only three facilities offered educational materials for sale. Yet 10 of these same 13 facilities offered photographs of visitors taken in close proximity to an orca and six allowed visitors to feed orcas. M. Lück and Y. Jiang, "Keiko, Shamu and friends: Educating visitors to marine parks and aquaria?" *Journal of Ecotourism* 6 (2007): 127–138.
- 22** In a study on learning at American zoos, researchers 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. Kellert and Dunlap, "Informal learning at the zoo." In a survey of members of the public near Marineland Ontario (both those who had visited the dolphinarium and those who had not), researchers found that only 27 percent thought the facilities provided information about marine mammal conservation and the dolphinarium did little to make visitors aware of conservation of marine mammals. Jiang et al., "Public awareness and marine mammals in captivity."

- 23** 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 his or her environment and role in the ecosystem (as portrayed by the animal's prey or the kind of vegetation eaten) 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.
- 24** 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 SeaWorld brochure, *The Real Story on Killer Whales*, states that "SeaWorld 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. In their study of dolphinarium visitors, Jiang et al. noted that nearly a quarter of the general public who had not visited the facility agreed with the statement: "Animals are not always treated decently/humanely at aquariums or marine parks." As a result, the researchers concluded, "Some people are aware of problems associated with keeping marine mammals in captivity, and they have strong feelings against the animal capture and display industry." Jiang et al., "Public awareness and marine mammals in captivity," 244.
- 25** See D. A. Dombrowski, "Bears, zoos, and wilderness: The poverty of social constructionism," *Society and Animals* 10 (2002): 195–202. 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," 201. People who visited Marineland Ontario, and who considered what they learned as the result of their experience, "were more likely to agree with the notion that humans were created to rule over the rest of nature." Jiang et al., "Public awareness and marine mammals in captivity," 246.
- 26** In their study on education provision by a dolphinarium, Jiang et al. noted that members of the public who did not visit the facility were more aware of the environment than people who did visit the facility. This finding was taken to imply that "higher awareness of environmental issues could be one of the reasons for not visiting a marine park." Jiang et al., "Public awareness and marine mammals in captivity," 246.

The Conservation Fallacy

- 27** A study in *Conservation Biology* summarized the limitations of captive breeding: "Problems with (1) establishing self-sufficient captive populations, (2) poor success in reintroductions, (3) high costs, (4) domestication, (5) preemption of other recovery techniques, (6) disease outbreaks, and (7) maintaining administrative continuity," 338. The authors emphasized the need for *in situ* conservation (in natural habitat) and that captive breeding should be a "last resort in species recovery," stating that it "should not displace habitat and ecosystem protection nor should it be invoked in the absence of comprehensive efforts to maintain or restore populations in wild habitats," 338. N. F. R. Snyder et al., "Limitations of captive breeding in endangered species recovery," *Conservation Biology* 10 (1996): 338–348.
- 28** One baiji (called Qi-Qi) was kept in a captive facility in Wuhan, China, from 1980 to his death in 1993. Other river dolphins were captured in the hopes of setting up a captive breeding program, but all of the animals died soon after capture or transfer to the captive facility. The facility was criticized as inappropriate for a serious attempt at rescuing this species; the author of a review of baiji conservation attempts stated "a very substantial facility would be needed to maintain a captive population of baiji, but the Wuhan dolphinarium was not designed for this purpose," 107. D. Dudgeon, "Last chance to see...: *Ex situ* conservation and the fate of the baiji," *Aquatic Conservation* 15 (2005): 105–108.
- 29** S. T. Turvey et al., "First human-caused extinction of a cetacean species?" *Biology Letters* 3 (2007): 537–540.
- 30** In 2007 the SeaWorld and Busch Gardens Conservation Fund did give a grant worth US\$15,000 to fund a project on vaquita distribution in the Gulf of California.
- 31** 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>.
- 32** 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 Ganges and Indus river dolphins (*Platanista gangetica gangetica* and *P. g. minor*, respectively). The Chinese Academy of Sciences has been working to preserve the critically endangered finless porpoise (*Neophocaena phocaenoides*), a freshwater porpoise that shared the Yangtze with the baiji but still has a potentially viable population. The Wuhan dolphinarium that held Qi-Qi (see endnote 28) also holds finless porpoises. In contrast to its efforts with baiji, the facility has recently seen the successful birth of a finless porpoise calf. D. Wang et al., "The first Yangtze finless porpoise successfully born in captivity," *Environmental Science and Pollution Research* 5 (2005): 247–250. The dolphinarium touted this successful birth (a male) as a major conservation breakthrough, but also noted that "Efforts to preserve the natural habitats within the river are the primary concern," 248. Five natural reserves have been established along the Yangtze, in which intensive efforts to decrease human-caused mortality are ongoing. In addition, a "semi-natural" reserve (an ox-bow in the Yangtze River) has been set aside for the porpoise (and the baiji, although no baiji were ever found to relocate there) and now holds approximately 30 of the animals, a managed population that produces about two calves a year. Wang et al., "The first Yangtze finless porpoise successfully born in captivity." These efforts to protect the finless porpoise in its natural river habitat are the real hope for saving this species; the captive breeding attempts in Wuhan's concrete tanks are no more than good public relations.
- 33** In a review of attempts to conserve the baiji, the author points out that "if captive-bred individuals cannot be released, then founder breeding stock taken from the wild become 'living dead,' unable to contribute to the genetic future of populations in nature or in *ex situ* reserves." Dudgeon, "Last chance to see...", 107.
- 34** 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. In April 2007, the SeaWorld and Busch Gardens Conservation Fund allocated US\$1.3 million to conservation projects (not just to marine mammal programs), the highest amount it has given to date. This sounds like a large amount of money until one realizes that this is less than one percent of the revenue generated by SeaWorld Orlando alone. In 2001, SeaWorld Orlando attracted 5.1 million visitors (information from www.amusementbusiness.com, prior to the website closing down

- in May 2006). When one considers that admission fees range from approximately US\$40 for children to US\$65 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. SeaWorld San Antonio attendance neared 3 million visitors in 2008 (W. S. Bailey, "SeaWorld GM says the local park is making a big splash," *San Antonio Business Journal*, 29 August 2008, <http://seattle.bizjournals.com/sanantonio/stories/2008/09/01/story2.html>), with ticket costs ranging from US\$38.99 for children to US\$48.99 for adults. This would have brought in a further US\$90 million or so in ticket sales. Unfortunately more exact incomes are not readily available, nor are visitor numbers from other Anheuser-Busch facilities featuring marine mammals (such as SeaWorld San Diego, Busch Gardens and Discovery Cove), but the conservation expenditures come to less than one percent of the estimated ticket sale revenues of these two facilities. 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 SeaWorld. A. Tribe and R. Booth, "Assessing the role of zoos in wildlife conservation," *Human Dimensions of Wildlife* 8 (2003): 65–74.
- 35** For example, as a result of the 1996 EU Council Directive CE 338/97, "On the protection of species of wild fauna and flora by regulating trade therein," facilities importing threatened species (including cetaceans) into Europe have to ensure that removals are sustainable and also that the animals will be used "for breeding or propagation purposes from which conservation benefits will accrue to the species concerned" (Art. 8, §3(f)) or will be used "for research or education aimed at the preservation or conservation of the species" (Art. 8, §3(g)). Portraying a dolphinarium (legitimately or not) as a conservation or captive breeding facility would thus allow imports of animals to and from Europe.
- 36** The most frequently displayed marine mammal species in dolphinarium and aquaria are common bottlenose dolphins, California sea lions (*Zalophus californianus*) and orcas, none of which are, as a species, endangered or threatened (although some populations are).
- 37** This is especially a problem in developing nations, such as Caribbean and South Pacific island states. In the 2007 WSPA survey, only 30 percent of respondents believed that capturing dolphins from the wild for public display had negative impacts on wild dolphin populations; the harmful conservation impacts of wild captures are well hidden by the public display industry.
- 38** See Reeves et al., *Dolphins, Whales, and Porpoises*, for a good discussion of this issue.
- 39** One dramatic example of a small cetacean hunt occurs in the Faroe Islands (a Danish protectorate), targeting 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. However, government medical officers in the Faroe Islands recently recommended that Islanders stop eating pilot whale meat altogether, as it is now too toxic for safe consumption by humans. D. MacKenzie, "Faroe Islanders told to stop eating 'toxic' whales," *New Scientist*, 28 November 2008, <http://www.newscientist.com/article/dn16159-faroe-islanders-told-to-stop-eating-toxic-whales.html>. At the time of this edition's publication, the Faroese whalers had not altered plans for the hunt as a result of this recommendation.
- 40** The U.S. public display industry presented testimony advocating this position through one of its representatives, John Hodges, at the 1992 International Whaling Commission (IWC) meeting in Glasgow, Scotland.
- ## Live Captures
- 41** There are many physiological changes associated with capture-related stress, including capture myopathy or shock (an acute reaction that can cause heart stoppage); these include immune system depression, reproductive dysfunction, and hyperthermia (overheating). B. Curry, "Stress in mammals: The potential influence of fishery induced stress on dolphins in the eastern tropical Pacific Ocean," NOAA Technical Memorandum 260 (1999); L. M. Romero and L. K. Butler, "Endocrinology of stress," *International Journal of Comparative Psychology* 20 (2007): 89–95; J. L. Stott et al., "Immunologic evaluation of short-term capture-associated stress in free-ranging bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay," abstract from *ECOUS Symposium* (San Antonio, Texas: Environmental Consequences of Underwater Sound, 2003), 80. Stress responses resulting from capture may also affect survival after capture and indirectly cause mortality. Chases and capture can also have negative psychological or social impacts, including aggression. P. Fair and P. R. Becker, "Review of stress in marine mammals," *Journal of Aquatic Ecosystem Stress and Recovery* 7 (2000): 335–354.
- 42** 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.noaa.gov/uploadedFiles/Divisions/PRD/Programs/ETP_Cetacean_Assessment/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.noaa.gov/uploadedFiles/Divisions/PRD/Programs/ETP_Cetacean_Assessment/LJ_02_35C.pdf.
- 43** Reeves et al., *Dolphins, Whales, and Porpoises*, 17.
- 44** 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.
- 45** 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*; C. S. Vail and D. Risch, *Driven by Demand: Dolphin Drive Hunts in Japan and the Involvement of the Aquarium Industry* (Chippenham, United Kingdom: WDCS, 2006).
- 46** This is the last year for which reliable numbers of animals sold live are available. Vail and Risch, *Driven by Demand*, 11.
- 47** 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.

- 48 Solomon Islands' *Solomon Star News*, a newspaper closely following the controversial capture and sale of dolphins in this South Pacific island state for sale to dolphinarium (see Appendix I and endnote 59), reported that export papers accompanying a recent shipment of seven dolphins to the Philippines recorded a single dolphin selling for US\$60,000. E. Palmer, "What the dolphins cost," *Solomon Star News*, 11 December 2008, http://solomonstarnews.com/index.php?option=com_content&task=view&id=5353&change=71&changeown=78&Itemid=26.
- 49 Vail and Risch, *Driven by Demand*. The situation in Japan continues to evolve. In 2007, two municipal officials in Taiji spoke out about the levels of mercury found in meat from the dolphin drives, publicly expressing concern for the first time about this long-known contamination problem. D. Adams, "Toxic Japanese school lunches: Assemblymen from Taiji condemn practice and sound warning," *Whales Alive!* 16(4) (2008), <http://www.csiwhalesalive.org/csi07402.html>. While the hunts (and sales to dolphinarium) continue, the cruelty inherent in the hunt, the lack of sustainability, and the evidence of mercury contamination in dolphin meat have led to growing opposition, from the international community, scientists, and even the public display industry itself. See statement opposing acquiring dolphins from drive fisheries by the AMMPA at <http://www.ammpa.org/faqs.html#11>.
- 50 R. R. Reeves et al., "Survivorship of odontocete cetaceans at Ocean Park, Hong Kong, 1974–1994," *Asian Marine Biology* 11 (1994): 107–124.
- 51 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, "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." P. Kenyon, "Taiji's brutal dolphin drive hunt begins again," *The Independent*, 9 November 2004.
- 52 In 1993, Marine World Africa USA in California (now Six Flags Discovery Kingdom) 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.
- 53 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.
- 54 See the *Federal Register* 68 (2003), 58316.
- 55 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); R. Williams and D. Lusseau, "A killer whale social network is vulnerable to targeted removals," *Biology Letters*, doi:10.1098/rsbl.2006.0510 (2006).
- 56 WSPA survey.
- 57 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." This sentiment is shared by the World Association of Zoos and Aquariums, in its code of ethics. <http://www.waza.org/ethics/index.php?main=ethics&view=ethics>, Acquisition of Animals (#4). Also, both associations hold that any animal transactions must be in compliance with national and international laws relating to animal transport, trade, health, and welfare, including CITES, which certainly has not happened in the case of many cetacean live captures.
- 58 See www.cites.org for treaty text and definitions and for resolutions and other documentation clarifying the requirements for non-detriment findings.
- 59 Controversy on the substance of NDFs erupted when more than two dozen Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) were exported from Solomon Islands to Mexico in 2003 and again when the same number were exported from Solomon Islands to Dubai, United Arab Emirates, in 2007 (see Appendix I). Information on dolphin populations in these South Pacific waters is lacking, yet the Solomon Islands government issued NDFs for both exports. The IUCN/Species Survival Commission Cetacean Specialist Group organized a workshop in August 2008 at the Secretariat of the Pacific Regional Environment Programme (SPREP) to discuss this trade situation and concluded that "there is an urgent need to assess Indo-Pacific bottlenose dolphin populations around any island where human-caused removals or deaths are known to be occurring" and that the state of knowledge for Solomon Islands was insufficient to support the current quota of 100 dolphins a year. See SPREP press release at http://www.sprep.org/article/news_detail.asp?id=456.
- 60 The Action Plan also states:
- 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.
- 61 The average 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." In fact, from 1986 to 2004, an average of 13 dolphins was exported each year. Twenty-four were exported in 2000, nine in 2001, 28 in 2002, 20 in 2003, and 25 in 2004. K. Van Waerebeek et al., "Live-captures of common bottlenose dolphins *Tursiops truncatus* and unassessed bycatch in Cuban waters: Evidence of sustainability found wanting," *Latin American Journal of Aquatic Mammals* 5 (2006): 39–48.
- 62 Van Waerebeek et al. reviewed any documents that could be found on the population status of bottlenose dolphins in Cuban waters. Only one

- paper, from 1954, could be found that was published in a bona fide peer-reviewed journal. The researchers concluded that “the available documentation is insufficient for the international community of marine mammal scientists to assess the sustainability of current capture levels of *Tursiops truncatus* in Cuban waters. Therefore, we strongly recommend the international trade of common bottlenose dolphins from this area ceases until evidence of no detriment can be authenticated.” Van Waerebeek et al., “Live-captures of common bottlenose dolphins *Tursiops truncatus* and unassessed bycatch in Cuban waters,” 45.
- 63** Nine bottlenose dolphins were exported from Cuba to Italy (in 1987, 1988, 1989), six to France (in 1988), six to Malta (2003), six (although two soon died) to Portugal (1999), eight to Switzerland (1990, 1991), and 40 to Spain (1988, 1990, 1993, 1995, 1999, 2000, 2001, 2002) (data from Van Waerebeek et al. “Live-captures of common bottlenose dolphins *Tursiops truncatus* and unassessed bycatch in Cuban waters”). The Portuguese imports and 25 of the Spanish imports effectively contravened the 1996 EU Council Directive CE 338/97, “On the protection of species of wild fauna and flora by regulating trade.” Under this directive, importers must ensure that removals are scientifically verified to be sustainable (Art. 5, §2(a)). Similar requirements for conservation are required by the European Union Zoos Directive (Council Directive 1999/22/EC), which entered into Spanish law in October 2003 (Spanish Parliament Act 31/2003). The ease and frequency with which these unsustainably caught animals have been exported from Cuba to Europe illustrate the lack of enforcement of European law with respect to captive wildlife.
- 64** International Whaling Commission, “Report of the Sub-Committee on Small Cetaceans,” *Journal of Cetacean Research and Management* 9 (Supplement) (2007): 303.
- 65** On 10 January 2002, Mexico amended Article 60 BIS of the Wildlife Law to prohibit the capture of marine mammals in its territorial waters. In June 2007, the first successful prosecution of this statutory prohibition occurred, when eight dolphins were confiscated from a company that had captured these animals illegally the month before. Six of the dolphins were secured by authorities where they were captured; they were released immediately in the same location. Two dolphins had already been sent to a dolphinarium in Mexico City, but they too were confiscated and it is believed that they were returned to the capture site and also released. Dr. Y. Alaniz Pasini, personal communication, 2007.
- 66** Reeves et al., *Dolphins, Whales, and Porpoises*, 72.
- 67** The director of the Dolphin Academy, Laetitia Lindgren-Smith van Oyen, was reportedly fired by shareholders of the facility because “Lindgren had made her opposition to the import of the so-called ‘newly caught dolphins’ from Cuba known to the government and also the media.” Lindgren said after her firing that she would dedicate herself to opposing “this immoral and unnecessary dolphin business.” *Amigoe*, “Critical director Dolphin Academy dismissed,” *www.amigoe.com*, 24 December 2007 (in Dutch and English).
- 68** The NMFS called for a voluntary moratorium in 1989 on 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.
- 69** See Appendix I for a detailed account of these captures and subsequent events.
- 70** S. J. Fisher and R. R. Reeves, “The global trade in live cetaceans: Implications for conservation,” *Journal of International Wildlife Law and Policy* 8 (2005): 315–340.
- 71** International Whaling Commission, “Report of the Sub-Committee on Small Cetaceans.” The Venezuelan activities, involving “massive irregularities” in CITES and other permit documentation, are currently being prosecuted by a district level court in the state of Sucre. The owners of the local dolphinarium are on trial as the alleged perpetrators of the felonies (under Article 59 of the Criminal Environmental Act 1992). A. Villarroel (as translated by J. Bolaños), “A Venezuelan court has ordered the start of trial against Waterland Mundo Marino Dolphinarium,” *Whales Alive!* 17(4) (2008): 3–4.
- 72** The lack of scientific data to assess the sustainability of these takes was emphasized by the Small Cetaceans Sub-Committee of the IWC’s Scientific Committee. International Whaling Commission, “Report of the Sub-Committee on Small Cetaceans.”
- 73** 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. (Appendix I includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival.) 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.
- 74** This whale is Lolita, also known as Tokitae, a female orca currently kept at Miami Seaquarium. Lolita is one of only four captive orcas known to have surpassed 30 years of age and one of only two who are believed to have survived past 40 (she was captured in 1970, when she was estimated to be 4–5 years of age; the other over-40 orca is Corky of SeaWorld San Diego).
- 75** 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, Washington: Center for Whale Research, 2003), <http://orcahome.de/impact.htm>.
- 76** The Southern Resident population of orcas was listed as endangered in November 2005. See <http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/killerwhale.htm>.
- 77** 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); all orca deaths recorded at <http://www.orcahome.de/orcadead.htm>.
- 78** The animal died of bacterial pneumonia; the scientists who performed the necropsy (animal autopsy) concluded that “the stress situations that the captured orca went through may have compromised its immune status, and, as a consequence, resulted in infection,” 323. E. I. Rozanova

et al., "Death of the killer whale *Orsinus* [sic] *orca* from bacterial pneumonia in 2003," *Russian Journal of Marine Biology* 33 (2007): 321–323. The annual quotas for 2001–2008 come from WDCC (the Whale and Dolphin Conservation Society) and the death of the juvenile during the capture operation was reported in Fisher and Reeves, "The global trade in live cetaceans."

79 In its 2007 review of global orca populations, the Small Cetaceans Subcommittee of the IWC's Scientific Committee noted that the captures of orcas in Russia had been conducted without any scientific evaluation of the population prior to the captures taking place, and called for a halt to further captures until such an assessment was done. International Whaling Commission, "Report of the Sub-Committee on Small Cetaceans," *Journal of Cetacean Research and Management* 10 (Supplement) (2008): 302–321. More than 120 animals have been identified in the region by researchers, but they have not yet been able to calculate the region's population size. To produce a population estimate, and to even start to weigh the impact of live captures, will take more research and analysis. For information on orcas in Kamchatka coastal waters, see <http://www.russianorca.com/indexeng.htm> and http://www.wdcs.org/submissions_bin/crp-soo-nwp-000085.pdf, as well as the 2007 review in the IWC Scientific Committee report.

80 This information was collated from various sources by The HSUS during the public comment period for an import permit application submitted by SeaWorld Orlando for three captive-born male beluga whales from Marineland Ontario. The permit, despite strong opposition, was granted in November 2006. Although inventory records from Marineland are publicly unavailable, of the 12 belugas the facility imported in 1999, it is believed that eight (75 percent) had died by July 2007.

81 M. Kilchling, "Eight new belugas welcomed at Marineland," *Tonawanda News*, 10 December 2008, http://www.tonawanda-news.com/local/local_story_345232714.html/resources_printstory.

82 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.

83 Various newspapers and organizations have reported on these transfers in the last decade—see, e.g., www.marineconnection.org/news/general/sharm_campaign_latest_jan05.htm (Egypt).

Species Enhancement Programs

84 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 made a similar case in a scientific journal. M. H. Ames, "Saving some cetaceans may require breeding in captivity," *Bioscience* 41 (1991): 746–749.

85 The European Union Zoos Directive (Council Directive 1999/22/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."

86 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. See endnote 75 regarding orcas.

87 S. Mayer, *A Review of the Scientific Justifications for Maintaining Cetaceans in Captivity*, edited by F. Clarke (Bath, United Kingdom: Whale and Dolphin Conservation Society, 1998).

88 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 was 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 proposed to import 10 dolphins from Cuba plus capture at least 18 (and possibly as many as 40) animals from Jamaican waters over a three-year time period (2004–2007), from populations for which numbers and other vital stock parameters are unknown. The proposal stated further that any animals bred in this program would not be released back into the wild. "Proposed development of dolphin breeding programme in Jamaica," Dolphin Cove, Jamaica, September 2004.

89 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 or exceed the population's mortality rate." Ames, "Saving some cetaceans may require breeding in captivity," 748.

90 See E. Hoyt, *The Performing Orca: Why the Show Must Stop* (Bath, United Kingdom: Whale and Dolphin Conservation Society, 1992), 56–59, for a discussion of this concept.

91 In a review of 145 reintroduction programs for captive-bred species, only 11 percent achieved any degree of success. B. 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), 265–284. Many of the failures are the result of improper behavior of captive animals when reintroduced into the wild, such as an inability to forage, avoid predators, or appropriately interact with wild members of the same, or different, species. Snyder et al., "Limitations of captive breeding in endangered species recovery."

92 See Dudgeon, "Last chance to see..." which noted "There are good reasons why captive breeding in a dolphinarium is no substitute for *ex situ* conservation in a reserve...there is no evidence that captive-bred cetaceans can be released to the wild," 107.

93 Some cetacean researchers have considered dolphins in captive facilities to be definitively not wild, but rather "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 semi-domesticated *Tursiops truncatus*, and influence of sex, age, and season," *Marine Mammal Science* 12 (1996): 1–13. However, "adapted to life" is a vague phrase; domestication actually involves the deliberate selection of desirable

traits (e.g., docile disposition, smaller or larger size) in breeding stock, to develop descendants that are different in some fundamental way from their wild ancestors. J. Diamond, *Guns, Germs, and Steel* (New York: W.W. Norton & Company, 1997). However, dolphinarium are a long way from this stage in any of their captive breeding efforts—they may wish to create a “captive adapted” cetacean, but for now, they are still seeking simply to maximize the probability of successful births and working to avoid inbreeding. According to Diamond, it may in fact be impossible to domesticate cetaceans, because the various species share a number of characteristics that have by and large prohibited successful domestication in other taxa, including a diet high on the food chain (they are not herbivores, as are most domesticated animals, and it is energy- and cost-intensive to feed them); a slow growth rate (it takes about a decade for most species to reach social and/or physical maturity—animals that have been successfully domesticated tend to mature in two years or less); and problems with captive breeding (see above). Diamond, *Guns, Germs, and Steel*.

The HSUS and WSPA do not necessarily agree that captive-bred dolphins should be considered unfit for release, but recognize that evidence supporting the likelihood of a successful reintroduction to the wild of dolphins bred in captivity is currently lacking. However, we reiterate that there is evidence to support the likelihood of a successful return to the wild of wild-caught dolphins held long-term in captivity.

- 94 World experts on captive breeding strategies emphasize that “captive breeding should be viewed as a last resort in species recovery and not a long-term or prophylactic solution” and “it should not displace habitat or ecosystem protection nor should it be invoked in absence of comprehensive efforts to maintain or restore populations in wild habitats,” efforts that are remarkably lacking in the so-called conservation and research strategies or programs of dolphinarium and aquaria. Snyder et al., “Limitations of captive breeding in endangered species recovery,” 338.

Mixed Breeding and Hybrids

- 95 Four bottlenose dolphin and long-beaked common dolphin (*Delphinus capensis*) hybrids were bred at SeaWorld 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 SeaWorld 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

- 96 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.

- 97 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.
- 98 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 back into the wild, his caretakers understood that not only did he have to be retaught how to catch fish, but he would not be able to communicate with wild whales until (and unless) he relearned how to “speak orca.” V. L. G. Turner, “The underwater acoustics of the killer whale (*Orcinus orca*),” Master’s thesis, University of Southampton, United Kingdom/Woods Hole Oceanographic Institution, Massachusetts (1997). Clearly, “Behavioral traits that are learned or culturally transmitted are especially prone to rapid loss in captivity.” Snyder et al., “Limitations of captive breeding in endangered species recovery,” 341.
- 99 For example, Keto was moved from SeaWorld Orlando to SeaWorld San Diego when less than four years old (and eventually was transferred to SeaWorld San Antonio). Keet, another SeaWorld 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 SeaWorld San Diego when only 2.5 years old. See <http://orcahome.de/orcastat.htm> for additional details.
- 100 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.
- 101 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.
- 102 As an example, Kalina, a female orca kept at SeaWorld 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.
- 103 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 successfully 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 Public Display Industry “Double Standard”

- 104** For more information on the public 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 Canadian 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,” 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.
- 105** Beck et al., “Reintroduction of captive-born animals.”
- 106** 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.
- 107** 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. For Dolphin Reef’s brief description of the release, see <http://www.dolphinreef.co.il/Default.aspx?tabid=63>.
- 108** 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, Washington: Center for Whale Research, 1995). In 1997, The HSUS, through its international arm Humane Society International, worked with a local dolphinarium owner near Cartagena, Colombia, to release Dano (a young male) and Kika (an older female), two tucuxi dolphins (*Sotalia guianensis*) he had captured about eight years previously. After five months of rehabilitation, the two dolphins were released together in Cispatá Bay on 15 June 1997, but Dano was found dead, entangled in a gill net, only 11 days later. Kika was never re-sighted. The tragic ending of this release effort highlights the risk involved in both bringing dolphins into captivity and attempting to return them to the wild. Great care is needed to ensure the safety of any animals involved in such an effort. N. A. Rose, “Dolphin release is bittersweet,” *HSUS News* 42 (1997): 29–30.
- 109** As the result of a project funded by 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, Texas: Society for Marine Mammalogy, 1994), 92.
- 110** 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 to 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 from Taiwan, held in captivity for 15 years). V. McKenna, *Into the Blue* (San Francisco: Harper, 1992). 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 recognized until several years after the release.
- 111** Gales and Waples, “The rehabilitation and release of bottlenose dolphins from Atlantis Marine Park, Western Australia.”
- 112** 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 Guatemalan 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.
- 113** 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 freshwater 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. No reports of re-sightings were made, so their fate is unknown. www.wspa-usa.org/pages/747_dolphins_delight_in_their_new_ocean_home.cfm.
- 114** 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.
- 115** 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, commer-

cial and non-profit 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. K. Brower, *Freeing Keiko: The Journey of a Killer Whale from Free Willy to the Wild* (New York: Gotham Books, 2005).

116 Examples include Ulises, a young male orca who was living alone in Barcelona, Spain; Keiko; and dolphins who were considered 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 SeaWorld (he is now performing in San Diego). Keiko entered a release program (see endnote 115). 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.

117 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

118 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

119 The seal rescue operations of the Sea Life Centre franchise are known as sea life or seal sanctuaries; see <http://www.sealsanctuary.co.uk>.

120 A good example of this was the rehabilitation and release of JJ, a gray whale, in 1998 by SeaWorld 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 SeaWorld'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, Maryland: 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. M. Simon and F. Ugarte, "Diving and Ranging Behavior of Keiko During July–September 2002," report to The Humane Society of the United States (2003); M. Simon et al., "From captivity to the wild and back: An attempt to release Keiko the killer whale." *Marine Mammal Science*, doi:10.1111/j.1748–7692.2009.00287.x (2009).

121 See <http://www.ammpa.org/faqs.html#2> for an example of this industry characterization of the natural environment as full of hazards.

122 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 calves for the zoo and returned immediately after obtaining them (the mothers were killed and eaten). The calves were not in fact "surplus" to the subsistence hunt; they were the objectives. N. Firor, "Redefining rescue," *Cincinnati City Beat*, 8–14 October 1998. Apparently in the same year the zoo acquired these walrus, the FWS began making it a permit condition that no money be exchanged when acquiring walrus orphans for public display. R. R. Reeves and J. Mead, "Marine mammals in captivity," in *Conservation and Management of Marine Mammals*, edited by J. R. Twiss, Jr. and R. R. Reeves (Washington DC: Smithsonian Press, 1999), 412–436.

123 An attempt to acquire a stranded orca for public display occurred in April 2007. A calf believed to be no more than a few days old was found stranded on a beach in Mexico. It was never determined how she was separated from her mother. Named Pascuala, or Pascualita, she was taken to a local dolphinarium, which voiced concern from the outset that the enclosure (designed for bottlenose dolphins) was unsuitable for an orca and that the staff was not trained in orca care. However, others pointed out that moving her any distance would have caused her considerable stress and probably hastened her death. Nevertheless, an American dolphinarium sought to acquire her, despite the fact that cetacean exports have been illegal in Mexico since 2006. Her deteriorating condition, the plan to transfer her, and the conflict with the law caused considerable controversy, but before it could be resolved, Pascualita died in June 2007. Many blamed Mexico's environmental authorities and animal protection advocates who opposed the transfer, but her survival, regardless of treatment, was always unlikely, without a mother's care in the crucial first months. The public display industry, rather than face this tragic reality and make her welfare its first priority, instead pursued a plan whose first priority was to add a new female orca to the captive gene pool. A Reuters article from May 2007 describes some of the details of this situation: <http://www.reuters.com/article/latestCrisis/idUSN16270035>.

124 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, 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, a dolphinarium on the Argentine coast, are "unreleasable" stranded animals, including Kshamenk. His stranding report suggests he was not injured and was at worst mildly sunburned, yet he was not refloated along with the adult orcas with whom he was reportedly found (they swam away). Instead, he was

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. Gabriela Bellazi, personal communication, 2001.

Research

- 125** Kellert, *American Perceptions of Marine Mammals and Their Management*; Malatest & Associates; WSPA survey.
- 126** 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 those typical of wild animals. The constant and abundant food supply may also lead to faster maturation than occurs in the wild. 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 Mayer, *A Review of the Scientific Justifications for Maintaining Cetaceans in Captivity*.
- 127** Despite these improvements, it should be noted that capture and release of wild dolphins is a stressful experience, as the situation in the tuna fishery in the Eastern Tropical Pacific has long attested. In this fishery, dolphins are encircled with large nets to capture the tuna swimming underneath and then released. Decades of this treatment have led to stress-related physiological damage and other negative effects. Forney et al., "Chase encirclement stress studies on dolphins involved in eastern tropical Pacific Ocean purse seine operations during 2001." Even carefully conducted capture-and-release of wild dolphins for research purposes (including health assessments) can result in stress responses (A. Mancía et al., "A transcriptomic analysis of the stress induced by capture-release health assessment studies in wild dolphins (*Tursiops truncatus*)," *Molecular Biology* 17 (2008): 2581–2589; Stott et al., "Immunologic evaluation of short-term capture-associated stress in free-ranging bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay"), so this is not necessarily a benign research methodology. This latter study clarifies that capture (and release of unsuitable animals) for public display will cause stress, which may be a contributing factor in post-capture mortalities. Indeed, long-term acclimation to captivity and frequent handling does not eliminate this stress response. A study with captive porpoises concluded that whenever a small cetacean is handled (in this case, removed from the water for husbandry/medical procedures, versus training the animals to submit voluntarily to such procedures in-water), significant stress responses occur, even over the course of several years. G. Desportes et al., "Decrease stress; train your animals: The effect of handling methods on cortisol levels in harbour porpoises (*Phocoena phocoena*) under human care," *Aquatic Mammals* 33 (2007): 286–292. See Chapter 7 ("Stress") and Chapter 9 ("Mortality and Birth Rates") for additional discussion of stress in captivity and the lack of habituation in cetaceans to transport and removal from the water over time.
- 128** P. A. Rees, "Will the EC Zoos Directive increase the conservation value of zoo research?" *Oryx* 39 (2005): 128–136.
- 129** SeaWorld has recently been publicizing its artificial insemination program for orcas, saying that the techniques used would be invaluable to help conservation of endangered species, a highly dubious claim to say the least. See T. R. Robeck et al., "Reproductive physiology and development of artificial insemination technology in killer whales (*Orcinus orca*)," *Biology of Reproduction* 71 (2004): 650–660. For one thing, what works for an orca is not necessarily appropriate for other species. For another, there may be behavioral or physiological issues that invalidate the technique. To illustrate, beluga whales 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 an endangered species such as the vaquita, artificial insemination techniques would probably be unsuccessful. SeaWorld facilities 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 Mayer, *A Review of the Scientific Justifications for Maintaining Cetaceans in Captivity*.
- 130** 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 SeaWorld paper also states that 26 orcas have been born in captivity, lauding this as a success. However, this is a significant 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.
- 131** As examples, 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 of 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 show 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 non-acoustic 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 (2002): 1–19.
- Studies using the hearing abilities of captive animals to predict the behavior of wild animals are a particular problem. Data from such studies have been used to develop guidelines for sound levels considered to be safe for cetaceans. But as noted above, animals in the wild have been observed reacting to sound hundreds or even thousands of times quieter than predicted by captive animal studies. Findley et al., "Reactions of belugas, *Delphinapterus leucas*, and narwhals, *Monodon monoceros*, to ice-breaking ships in the Canadian high Arctic"; see also J. C. Gould and P. J. Fish, "Broadband spectra of seismic survey air-gun emissions, with reference to dolphin auditory thresholds," *Journal of the Acoustical Society of America* 103 (1998): 2177–2184. Part of the problem may be that captive dolphins are continuously exposed to high levels of background noise, which may lead to hearing loss (V. V. Popov et al., "Audiogram variability in normal bottlenose dolphins (*Tursiops truncatus*)," *Aquatic Mammals* 33 (2007): 24–33; S. H. Ridgway and

CHAPTER 2: THE PHYSICAL AND SOCIAL ENVIRONMENT

- D. A. Carder, "Hearing deficits measured in some *Tursiops truncatus*, and discovery of a deaf/mute dolphin," *Journal of the Acoustical Society of America* 101 (1997): 590–594) or simply habituation to higher levels of noise. These and other factors lead to a situation where noise exposure standards based only or primarily on captive animal studies might be inappropriate for wild populations.
- 132** 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," 39. R. Liu et al., "Comparative studies on the behaviour of *Inia geoffrensis* and *Lipotes vexillifer* in artificial environments," *Aquatic Mammals* 20 (1994): 39–45.
- 133** S. Kestin, "Captive marine animals can net big profits for exhibitors," *South Florida Sun-Sentinel*, 18 May 2004.
- 134** Based on information found on the Dolphin Research Center's website (www.dolphins.org), the staff appear to have produced only two peer-reviewed journal papers and a book chapter, only one of which was published recently (K. Jaakkola et al., "Understanding of the concept of numerically 'less' by bottlenose dolphins (*Tursiops truncatus*)," *Journal of Comparative Psychology* 119 (2005): 296–303; D. E. Nathanson and S. de Faria, "Cognitive improvement of children in water with and without dolphins," *Anthrozoös* 6 (1993): 17–29; D. E. Nathanson, "Using Atlantic bottlenose dolphins to increase cognition of mentally retarded children," in *Clinical and Abnormal Psychology*, edited by P. H. Lovibond and P. H. Wilson (Amsterdam: North-Holland, 1989), 233–242). 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. Six other papers are listed on the website, although one has no authors belonging to the center, nor does it specifically acknowledge the center (R. Walker et al., "Environmental correlates of cetacean mass stranding sites in Florida," *Marine Mammal Science* 21 (2005): 327–335). Moreover, three were published more than 20 years ago and involved an experiment that was highly controversial—it deliberately exposed dolphins to toxic pollutants in the form of oil slicks (J. R. Geraci et al., "Bottlenose dolphins, *Tursiops truncatus*, can detect oil," *Canadian Journal of Fisheries and Aquatic Sciences* 40 (1983): 1516–1522; T. G. Smith et al., "Reaction of bottlenose dolphins, *Tursiops truncatus*, to a controlled oil spill," *Canadian Journal of Fisheries and Aquatic Sciences* 40 (1983): 1522–1525; D. J. St. Aubin et al., "How do bottlenose dolphins, *Tursiops truncatus*, react to oil films under different light conditions?" *Canadian Journal of Fisheries and Aquatic Sciences* 42 (1985): 430–436).
- 135** Of 571 abstracts for (wholly or partially) cetacean-related studies submitted to the Seventeenth Biennial Conference on the Biology of Marine Mammals (Capetown, South Africa: Society for Marine Mammalogy, 2007), 11 reported on studies of cetaceans kept in naval or private research facilities (1.9 percent), with only 18 (3.2 percent) reporting on studies of cetaceans held at dolphinariums or aquaria. The majority of the cetacean research done with public display animals was conducted by facilities outside North America. For pinniped-related studies (248 abstracts), a greater percentage (7.3 percent) was conducted on captive animals, although more than a quarter of these studies used pinnipeds held in a U.S. government-subsidized research facility (the Alaska Sea Life Center). Only 3.2 percent of the pinniped-related studies were conducted in dolphinariums, aquaria, or zoos.
- 136** As an example, see Wells et al., "Experimental return to the wild of two bottlenose dolphins."
- 137** In 2005, a special edition of the journal *Aquatic Mammals* was published, featuring the results of a decade-long project by Laurence Couquiaud, a dolphin researcher with a degree in architectural design who has specialized in examining the design of dolphinariums and aquaria and the husbandry of captive dolphins. She conducted a survey of facilities around the world, in an effort to identify the best and the worst of dolphinarium design. She sought to provide guidance to the industry on best dolphin husbandry practices and on ideal construction of dolphin enclosures. Couquiaud is a proponent of public display, yet she recognized that many facilities fall short of ensuring dolphin welfare. She noted the priority in enclosure design: "The display of animals in a theatre setting allowed the oceanarium to accommodate large crowds and present shows. Until very recently, this remained the only type of display, with small additional features for husbandry and training purposes; it is still the dominant presentation type for shows around the world." Couquiaud, "A survey of the environments of cetaceans in human care: Introduction," 283.
- 138** "Artificial facilities tend to be downsized compared to natural ones for economic reasons." Couquiaud, "A survey of the environments of cetaceans in human care: Survey of international cetacean facilities," 317.
- 139** 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. A local newspaper reported that the facility was illegally blocking 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 apparent 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.
- 140** 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 and by late October, a fourth animal had died from a storm-induced condition. L. Diebel, "Trapped in an underwater hell, Mexico pressed to free dolphins," *Toronto Star*, 12 October 2003 (see www.cdn.informo/e031012/e031012.html for a reprint of this article); Y. Alaniz P. and L. Rojas O., *Delfinarios* (Mexico City: AGT Editor, S.A. and COMARINO, 2007), 204–205.
- 141** Hurricane Omar hit the island of St. Kitts in October 2008. A new captive facility there, Marine World, which held four sea lions and four fur seals, was seriously damaged and all eight pinnipeds escaped. One fur seal was immediately recaptured, but the rest were still at large more than a week later, sighted as far away as St. Thomas, U.S. Virgin Islands. These species are not native to the region and if not recaptured could die or introduce non-native pathogens to the local wildlife. M. Poiniski, "Sea lions spotted near Water Island," *The Virgin Islands Daily News*, 28 October 2008.
- 142** In 1996, Anthony's Key Resort, in Roatán, 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.

- 143** The Marine Life Oceanarium in Gulfport, Mississippi, held 17 dolphins in its various enclosures. Days before Katrina hit, the staff moved nine of these animals to inland hotel swimming pools. This is a common contingency plan for coastal facilities, particularly for sea pen enclosures, yet hotel pools are comparatively very small and must hold several dolphins for days or even weeks at a time. In some cases, regular table salt is added to the swimming pool water and the amount of chlorine used is typically very high, as swimming pool filtration systems cannot cope with dolphin waste. The Marine Life dolphins were held in these pools for several days before being moved to a dolphinarium in Florida.

Eight other dolphins were left in the largest tank in the complex, one with 30-foot high walls, which had weathered Hurricane Camille in 1969. While the inland hotel pools holding the evacuated dolphins were not damaged by the hurricane, Katrina completely destroyed Marine Life Oceanarium and the eight dolphins left behind were carried out to sea by a storm surge estimated to have been 40 feet high. In the next three weeks, all were recovered, although several were injured and ill from swimming in coastal waters heavily contaminated by hurricane debris and runoff. Subsequently all 17 dolphins were transferred to the Atlantis Hotel in Nassau, Bahamas, where they are now held in a SWTD facility. For the official U.S. government version of the rescue, see <http://www.noaa.gov/stories2005/s2510.htm>. A large number of federal and state government agencies were involved in this rescue, conducted almost entirely with taxpayer dollars. This news story also does not address the inadequacy of a hurricane contingency plan that put half of the facility's dolphins in heavily chlorinated, artificially salinized hotel swimming pools, left half in a tank on-site in the path of a Category 3 hurricane, and did not set aside funds for any rescues that might be required.

In addition to the dolphins, 19 sea lions and one seal were left behind at the facility, secured in a building that was thought to be safe. Afterwards, some of the sea lions were recovered from as far as 20 miles away. At least five died during the storm or from storm-related injuries, including at least one who was shot by a police officer. The seal was never found. SeaWorld Orlando provided temporary housing for the survivors until the animals were sent to a facility in the Bahamas (Dolphin Encounters in Blue Lagoon) in 2006. T. Gardner, "Rescued sea lions thrive at Dolphin Encounters in the Bahamas," *Los Angeles Times*, 9 September 2008, <http://travel.latimes.com/articles/la-tr-sealions14-2008sep14>.

- 144** Alaniz and Rojas, *Delfinarios*, 206–210. For at least two of the sea pen facilities in this area, Hurricane Wilma completely wiped out all the features above the water line.
- 145** Soon after the 2004 tsunami, the IUCN's chief scientist noted, "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://www.earthdive.com/site/news/newsdetail.asp?id=936>. To guard their coasts from further tsunami damage, many countries bordering the Indian Ocean have embarked on extensive mangrove restoration and replanting projects. <http://www.newsweek.com/id/48692>.

- 146** 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,%20Co.htm>.
- 147** 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 et al., 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/of99-353>.

- 148** There are many reports on the negative impact of aquaculture on the environment—see, for example, www.ejfoundation.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

- 149** A good general overview of pinniped natural history is provided in J. E. King, *Seals of the World* (Ithaca, New York: Cornell University Press, 1983); M. L. Riedman, *The Pinnipeds: Seals, Sea Lions, and Walrus* (Berkeley: University of California Press, 1989); J. E. Reynolds III and S. A. Rommel, eds., *The Biology of Marine Mammals* (Washington DC: Smithsonian Press, 1999). For more recent discussions of various conservation issues related to sea lion species specifically, see A. W. Trites et al., eds., *Sea Lions of the World* (Fairbanks, Alaska: Alaska Sea Grant College Program, 2006).
- 150** 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, Chapter 1, Part 3* (Washington, DC: U.S. Government Printing Office, 2005), 93–116, http://www.aphis.usda.gov/animal_welfare/awr.shtml. APHIS announced its intentions to revise its regulatory standards in 1993, an implicit acknowledgment that the standards were outdated. Several sections were revised and published in 2001, but key sections remain unchanged. The public display industry actively endorses APHIS as the regulatory agency in charge of captive standards, which was demonstrated during the reauthorization of the MMPA 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 factors rather than animal well-being are the industry's first priority.
- 151** 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.
- 152** King, *Seals of the World*; Riedman, *The Pinnipeds*.
- 153** 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).

- 154** 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.
- 155** R. Clubb and G. Mason, "Captivity effects on wide-ranging carnivores," *Nature* 425 (2003): 463–474; R. Clubb and G. J. Mason, "Natural behavioural biology as a risk factor in carnivore welfare: How analysing species differences could help zoos improve enclosures," *Applied Animal Behaviour Science* 102 (2007): 303–328.
- 156** 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 walrus (*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.
- 157** 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, 1997).
- 158** 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.
- 159** As an example, in May 2001, despite strong opposition by animal protection groups, the 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 MMPA 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.
- 160** 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.
- 161** Laidlaw, *Canada's Forgotten Polar Bears*. The Manitoba Wildlife Branch was also supposed to have a six-month "check-up" on traded bears, but this did not take place. Moreover, frequently bears were retraded and documentation was lost. As an example, three polar bears exported to the Ruhr zoo in Germany were retraded to the Suarez Brothers Circus in Mexico.
- 162** R. Laidlaw, "Zoocheck Canada's response to the polar bear facility standards advisory committee draft recommendations" (Toronto: Zoocheck Canada, 1998).
- 163** See <http://web2.gov.mb.ca/laws/statutes/ccsm/p094e.php>.
- 164** See <http://web2.gov.mb.ca/laws/regs/pdf/p094-210.02.pdf>.
- 165** The manatee exhibit at SeaWorld 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 (N. Rose, personal observation).
- 166** 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 as a result of being confined and handled in rehabilitation centers. H. Rebar et al., "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 (1996): 31–35.
- 167** 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. At least 18 sea otter pups have been born at SeaWorld San Diego—all have died before reaching sexual maturity. E. J. Brennan and J. Houck, "Sea otters in captivity: The need for coordinated management as a conservation strategy," *Endangered Species Update* 13 (1996): 61–67. By taking in orphaned California sea otters, facilities add those that are considered non-releasable to their captive collections, thus replenishing their numbers. Zoos and aquaria have apparently adopted an active strategy to retain orphaned sea otter pups or to select "rescued" animals that can sustain collections through captive breeding. 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. See endnote 169 for another rescue program that does seek to return orphaned pups to the wild and endnote 290 for other sea otter mortality statistics.

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.

168 On 16 July 1998, a request for the capture of 24 sea otters in Alaska was published in the *Federal Register* 63 (1998), 38418. The permit applications stated that six of the captured otters would then be chosen and transported to Japanese aquaria and dolphinariums. The justification for this capture was a lack of breeding success of sea otters in Japanese facilities. 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).

169 The southern sea otter population is listed as threatened under the U.S. Endangered Species Act. At the Monterey Bay Aquarium, the sea otter exhibit holds rescued animals from this population that are either non-releasable or are in the process of rehabilitation. Orphaned otter pups were once raised by human caretakers and returned to the wild, often to die soon after. These pups are now placed in a “surrogate” program, where adult female otters adopt the orphans and care for them, specifically to minimize the influence of human intervention on the pup’s behavioral development. This has resulted in higher survival rates following release back into the wild. T. E. Nicholson et al., “Effects of rearing methods on survival of released free-ranging juvenile southern sea otters,” *Biological Conservation* 138 (2007): 313–320.

Small Cetaceans

170 For a good general overview of cetacean natural history, see P. G. H. Evans, *The Natural History of Whales and Dolphins* (New York: Facts on File, 1987); Reynolds and Rommel, eds., *The Biology of Marine Mammals*; J. Mann et al., eds., *Cetacean Societies: Field Studies of Dolphins and Whales* (Chicago: The University of Chicago Press, 2000).

171 Most government standards for the maintenance of these animals, where standards exist, are minimal and, particularly regarding tank size, wholly inadequate. Further, they are not specific with regard to species (for instance, species that are from tropical and temperate climates may be housed together). For a typical example, see Animal and Plant Health Inspection Service, *Code of Federal Regulations*.

172 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.

173 Animal and Plant Health Inspection Service, *Code of Federal Regulations*.

174 Many animal welfare agencies consider that if an animal cannot perform or satisfy “behavioral needs” then “the individual’s welfare may be compromised,” 151. T. Friend, “Recognising behavioural needs,” *Applied Animal Behaviour Science* 22 (1989): 151–158. 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

175 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): 1–7; 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, Florida: Marineland Research Laboratory, 1968), 1–9.

176 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*.

177 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.

178 For an introduction to the natural history of the northeast Pacific populations of orcas, see Ford et al., *Killer Whales*.

179 In their 2007 study, Clubb and Mason concluded that stereotypies and high infant mortality in certain zoo carnivores was more a result of their ranging behavior than of their foraging behavior; that is, less a result of their carnivory and hunting activities than of their tendency in the wild to have large territories and cover large areas routinely. For example, cat species with small territories in nature do better in zoos than cat species with large territories—both species are from the same taxonomic family and both are predatory carnivores, but the wide-ranging species “needs” to roam, even though it is fed regularly in captivity, and suffers when it is not allowed to do so (see also earlier discussion of polar bears). Clubb and Mason, “Natural behavioural biology as a risk factor in carnivore welfare.”

180 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.

181 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.

182 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.

CHAPTER 3: HUSBANDRY AND HEALTH CARE

183 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; Couquiaud, "A survey of the environments of cetaceans in human care: Food and fish house," 364–370.

184 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.

185 For information on the use of temporary holding areas, 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. Another example involving sea lions occurred at the Aquarium of the Pacific in Long Beach, California in the summer of 2006. A female and her pup were held in a "behind-the-scenes" nursery enclosure, which did not have a permanent pool (typically required for pinnipeds). The animals were periodically given water baths and checked hourly. Between one check and the next, both animals died from heat exhaustion—some external event may have caused hyperactivity in the two, which without a permanent pool of water to help with temperature regulation led to their deaths. There is little evidence that this prolonged "temporary" maintenance in holding areas that do not otherwise meet primary enclosure standards has been curtailed in any country, despite the example set by the U.S. regulatory revisions.

186 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.

187 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—every successive transport causes the same spike in mortality risk, meaning dolphins never grow accustomed to the transport process. It takes a month before their mortality rates return to normal. See also endnote 127 and Desportes et al., "Decrease stress; train your animals," which presents direct evidence of the stress experienced by captive cetaceans every time they are removed from the water, even after years of handling.

188 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.

189 Melanie Adcock, D.V.M., conversation with N. Rose, 5 April 1995.

190 The "dolphin's smile" is merely an anatomical quirk—a fixed expression regardless of the animal's mood. A dolphin smiles even when dead.

191 Occasionally the cause of death is both obvious and unique to captivity. In January 2006, a 7-month-old dolphin calf at the Minnesota Zoo died after jumping out of a tank, apparently panicking during "gate training" (being trained to swim through a gate between two enclosures), and fracturing his skull on the concrete deck. J. McCartney, "Zoo dolphin dies in accident," *TwinCities.com*, 21 January 2006. Apparently the calf gave no indication (or at least none recognized by his caretakers) of his injury—he was returned to the tank and the severity of his condition was only realized when he ceased to surface to breathe and died.

192 Examples of this in the United States are Nootka, Quizt, and Kotar. Nootka, a 13-year-old female orca held by SeaWorld Orlando, died in September 1994. She was reported by SeaWorld 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). Quizt, 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 SeaWorld San Antonio in April 1995. He was 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. More recent deaths include Rio, a dolphin at the Minnesota Zoo, who stopped eating the morning of 6 March 2006 and was dead by 9:30 p.m. that evening (KARE 11 News, "Zoo dolphin matriarch dies," 8 March 2006). Outside the United States, a young dolphin named Will, conceived through artificial insemination using frozen sperm, died at Kamogawa Sea World in the early hours of a Tuesday in December 2005, after refusing to eat on the Saturday before. *Japan Economic Newswire*, 28 December 2005, <http://www.tmcnet.com/usubmit/2005/dec/1243969.htm>. An official at the park stated, "There was nothing particularly wrong with him right up to the moment [he died]. It is very regrettable."

CHAPTER 4: HUMAN-DOLPHIN INTERACTIONS

Dolphin-Assisted Therapy

193 For example, see papers published by Dolphin Human Therapy, <http://www.dolphinhumantherapy.com/Research/mainResearch.htm>.

194 See L. Marino and S. O. Lilienfeld, "Dolphin-assisted therapy: Flawed data, flawed conclusions," *Anthrozoös* 11 (1998): 194–200; T. L. Humphries, "Effectiveness of dolphin-assisted therapy as a behavioral intervention for young children with disabilities," *Bridges: Practice-Based Research Synthesis* 1 (2003): 1–9; B. Basil and M. Mathews "Methodological concerns about animal facilitated therapy with dolphins," *British Medical Journal* 331 (2005): 1407; L. Marino and S. O. Lilienfeld, "Dolphin-assisted therapy: More flawed data and more

flawed conclusions," *Anthrozoös* 20 (2007): 239–249; A. Baverstock and F. Finlay, "Does swimming with dolphins have any health benefits for children with cerebral palsy?" *Archives of Disease in Childhood* 93 (2008): 994–995; C. Williamson, "Dolphin-assisted therapy: Can swimming with dolphins be a suitable treatment?" *Developmental Medicine and Child Neurology* 50 (2008): 477.

- 195** There is no overall regulatory body policing dolphin-assisted therapy (DAT) facilities, so there is no oversight of the qualifications, certifications, or degrees of the staff at these facilities. P. Brakes and C. Williamson, *Dolphin Assisted Therapy: Can You Put Your Faith in DAT?* (Chippenhams, United Kingdom: WDCS, 2007).
- 196** 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), 239–246. Even David Nathanson, currently the strongest published proponent of DAT, may be moving away from using live dolphins. His latest publication reported on the use of animatronic dolphins for DAT. D. E. Nathanson, "Reinforcement effectiveness of animatronic and real dolphins," *Anthrozoös* 20 (2007): 181–194. He concluded that "Interaction with [an animatronic dolphin] provided the same or more therapeutic benefits as interaction with [live] dolphins, without environmental, administrative/legal and practical limitations, including high cost, associated with dolphins," 181.

Swim-with-the-Dolphins Attractions

- 197** See endnote 205 for a history of the U.S. SWTD regulations, ending in the suspension of their enforcement.
- 198** 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.
- 199** 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 and revision, in *Marine Mammal Science* 11 (1995): 520–544.
- 200** Another scientific examination of SWTD attractions concluded that SWTD interactions are dangerous to humans and dolphins and recommended against the expansion of such facilities 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 attractions, see T. G. Frohoff and J. M. Packard, "Human interactions with free-ranging and captive bottlenose dolphins," *Anthrozoös* 3 (1995): 44–53.
- 201** Control was defined as supervision by trainers who direct the type of interactions that occur between dolphins and swimmers.
- 202** A behavioral study on captive common dolphins (*Delphinus delphis*) in a SWTD attraction at Marineland Napier, in 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 interactions 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. Marineland Napier's last dolphin died in September 2008 and the facility was closed soon after. As of December 2008, the facility, which was New Zealand's only dolphinarium, re-opened on a limited basis (no formal shows) through April 2009. New attractions were to be evaluated during this period (see <http://www.marineland.co.nz/index.php>).

- 203** We are aware of only one study published in a peer-reviewed journal that systematically examined whether participation in SWTD sessions led to negative behavioral change in dolphins. Although the authors concluded that participation did not lead to such changes and was therefore not detrimental to the dolphins, they emphasized the caveats—the study, which took place at a dolphinarium in Mississippi, had a very small sample size (three dolphins) and the dolphins only participated in one session per day. The authors recommended that the results of this study should be "accepted with caution" and "should only be generalized to situations where dolphins partake in a single Dolphin Interaction Program each day," 364. M. Trone et al., "Does participation in dolphin-human interaction programs affect bottlenose dolphin behaviour?" *Applied Animal Behaviour Science* 93 (2005): 363–374. This latter situation is not typical of SWTD attractions in high-tourist traffic areas such as Florida or the Caribbean, where dolphins are more often used in three to five sessions a day. We are aware of only one study (presented at a veterinary conference and published in its proceedings) that examined whether dolphins experienced physiological impacts from participating in SWTD sessions. This study measured stress hormone levels and concluded that there was no difference in these levels between dolphins used in SWTD encounters and those in performance-only exhibits. However, the described methodology did not clarify the sampling regime—it was not clear when the animals were sampled (directly after a swim session or after some time had passed, for example), how often they were used in swim sessions, and so on. Additionally, the study was apparently never submitted for publication in a peer-reviewed journal. J. C. Sweeney et al., "Circulating levels of cortisol and aldosterone in *Tursiops truncatus*: A comparative look at display animals and animals in SWTD programs," paper presented at the 32nd Annual Conference of the International Association for Aquatic Medicine, Tampa, Florida, 2001.
- 204** Researchers surveyed people who had participated in SWTD interactions within the past 2 to 36 months and asked them how they felt about the education offered at the facilities they visited. The respondents replied that they could not remember many of the details of the interpretation, they did not consider it to be very factual, and some viewed the material to be "fill-in" (142) while the animals were being prepared for the interactive session. S. Curtin and K. Wilkes, "Swimming with captive dolphins: Current debates and post-experience dissonance," *International Journal of Tourism Research* 9 (2007): 131–146.
- 205** On 23 January 1995, APHIS published proposed specific regulations for SWTD interactions in the *Federal Register* 60 (1995), 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 sessions should apply also to sessions where participants remain essentially stationary and non-buoyant. *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 SWTD interactions, 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. The suspension continues, despite agency assurances over the years that the regulations are undergoing revision; at the time of this edition’s publication, SWTD attractions are still effectively unregulated in the United States.

206 The rash of SWTD facilities seems to have sprung up as ports and vendors compete for the excursion dollars of growing numbers of passengers from cruise ships. 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 activities, and visits to SWTD facilities are a popular choice. 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 or otherwise promote non-invasive, 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 promote non-invasive and sustainable whale and dolphin-related tourism activities to their passengers, it would reduce both the risk of passenger injury and the pressure on wild populations from the need to supply animals for these operations.

207 Manatí Park, a SWTD attraction in the Dominican Republic, conducted a capture of bottlenose dolphins that was illegal under both national and international law (see Appendix I for more details). As described in endnote 139, in November 2004, it was reported that Dolphin Discovery was expelled from Antigua after 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

208 A survey of visitors to a dolphinarium in Canada determined that “the motivation of visitors to marine parks is to see the display and performance/shows of marine mammals...rather than petting and feeding marine mammals. This finding disproves one of the claims of marine parks, which is that visitors come to marine parks because of the close personal interaction with marine mammals.” Jiang et al., “Public awareness and marine mammals in captivity,” 247.

209 In its report for the IWC’s Scientific Committee, the Whalewatching Sub-Committee noted that “in several locations where there are captive dolphin facilities with swim-with programs, petting pools or feeding stations, problems with human interactions with wild cetaceans have been exacerbated. Members of the public have stated that they are permitted and encouraged to engage in such actions in a captive setting, so assume it is acceptable with wild animals. This increases difficulties with awareness, acceptance and enforcement of regulations.” International Whaling Commission, “Report of the Sub-Committee on Whalewatching,” *Journal of Cetacean Research and Management* 9 (Supplement) (2007): 326–340.

210 In 1999, initial research findings were sent to the U.S. government, which forwarded this information to SeaWorld. Subsequently, some

improvements were noted at the petting pool facilities, but many problems still remained.

211 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 U.S. 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 SeaWorld 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 WDCC and The HSUS, *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.

212 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.

213 WDCC and The HSUS, *Biting the Hand that Feeds*.

214 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.

215 C. Boling, “To feed or not to feed: The results of a survey,” in *Proceedings of the 19th Annual Conference of the International Marine Animal Trainers Association* (Vallejo, California: IMATA, 1991), 80–88.

216 Disease transmission is obviously not the only risk posed to people at petting pools. Dolphins may also bite and strike at people with their snouts, causing bruising and skin breaks, risking infection. A petting pool dolphin grabbed a young boy’s arm with his mouth in Orlando, Florida, in 2006, bruising it but not breaking the skin. http://blogs.orlandosentinel.com/business_tourism_aviation/2006/08/dolphin_grabs_b.html.

CHAPTER 5: RISKS TO HUMAN HEALTH

Diseases

217 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 Trans-*

mission 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). This report was subsequently revised and published in a peer-reviewed journal (T. D. Hunt et al., “Health risks for marine mammal workers,” *Diseases of Aquatic Organisms* 81 (2008): 81–92), in which the authors noted that “During certain recreational activities, the public may also be at risk of transmitting diseases to and contracting diseases from marine mammals,” 82. They specifically referred to SWTD activities.

218 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*.

219 Eighteen percent of survey respondents reported respiratory illnesses contracted while working with marine mammals, although only 20 percent of these 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 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*.

220 Marine mammals can play host to a number of pathogens that pose risks to humans. A study of bottlenose dolphins off Florida, Texas, and North Carolina found 1,871 bacteria and yeast strains and 85 different species of microorganisms in fecal and blowhole samples, several of which were of potential pathogenic significance to humans. J. D. Buck et al., “Aerobic microorganisms associated with free-ranging bottlenose dolphins in coastal Gulf of Mexico and Atlantic ocean waters,” *Journal of Wildlife Diseases* 42 (2006): 536–544. Black Sea bottlenose dolphins carry antibodies (meaning they have been exposed to the associated pathogens) to morbillivirus, *Toxoplasma*, and *Brucella*. <http://www.russia-ic.com/news/show/6126>. There have been several incidences of humans being infected by marine mammal strains of *Brucella*, a bacterium that can cause symptoms ranging from fatigue and depression to joint pain, fever, spontaneous abortion in pregnant females, inflammation of the gonads in males, and even death. For cases of human infection with seal and dolphin strains of the *Brucella* bacterium, see S. D. Brew et al., “Human exposure to *Brucella* recovered from a sea mammal,” *Veterinary Record* 144 (1999): 483; A. Sohn et al., “Human neurobrucellosis with intracerebral granuloma caused by a marine mammal *Brucella* spp.,” *Emerging Infectious Diseases* 9 (2003): 485–488; W. L. MacDonald et al., “Characterization of a *Brucella* sp. strain as a marine-mammal type despite isolation from a patient with spinal osteomyelitis in New Zealand,” *Journal of Clinical Microbiology* 44 (2006): 4363–4370. The Center for Food Security and Public Health at Iowa State University warns that “Marine mammal *Brucella* can infect humans...groups at risk may include...people who work in marine mammal rehabilitation or display centers, as well as anyone who approaches a beached animal or carcass on a beach.” Center for Food Security and Public Health, “Brucellosis in Marine Mammals” (2007), http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_marine.pdf.

But *Brucella* is not the only transmissible pathogen; several more papers and case studies have been published documenting evidence of transmission of diseases from marine mammals to humans. See P. A. 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; A. W. Smith et al., “In vitro isolation and characterization of a calicivirus causing a vesicu-

lar disease of the hands and feet,” *Clinical Infectious Diseases* (1998): 434–439; C. Clark et al., “Human sealpox resulting from a seal bite: Confirmation that sealpox is zoonotic,” *British Journal of Dermatology* 152 (2005): 791–793; S. A. Norton, “Dolphin-to-human transmission of lobomycosis?” *Journal of the American Academy of Dermatology* 55 (2006): 723–724.

221 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.

222 Indo-Pacific bottlenose dolphins captured in Solomon Islands (see Appendix 1 for details) were found to have been exposed to both *Brucella* (M. Tachibana et al., “Antibodies to *Brucella* spp. in Pacific bottlenose dolphins from the Solomon Islands,” *Journal of Wildlife Diseases* 42 (2006): 412–414) and *Toxoplasma* (Y. Omata et al., “Antibodies against *Toxoplasma gondii* in the Pacific bottlenose dolphin (*Tursiops aduncus*) from the Solomon Islands,” *Journal of Parasitology* 91 (2005): 965–967), the causative agents of brucellosis and toxoplasmosis, respectively. *Brucella* is a pathogen transmissible to humans (see endnote 220). Toxoplasmosis is potentially fatal to marine mammals (G. Migaki et al., “Fatal disseminated toxoplasmosis in a spinner dolphin (*Stenella longirostris*),” *Veterinary Parasitology* 27 (1990): 463–464) and if contracted by pregnant women can result in abortion or congenital defects in the fetus. In children and adults, there are other symptoms and it is sometimes fatal. J. P. Dubey, “*Toxoplasma gondii*,” in *Waterborne Pathogens* (Denver: American Water Works Association, 2006): 239–241. Solomon Islands dolphins have been exported to Mexico, Dubai and the Philippines to SWTD facilities (see Appendix 1 for more details). This illustrates the potential for disease transmission to humans inherent in SWTD attractions, particularly since pathogens such as *Brucella* can be released into the water of pools and sea pens via an animal’s contaminated feces. Center for Food Security and Public Health, “Brucellosis in Marine Mammals.”

Injury and Death

223 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).

224 See www.local10.com/news/3791739/detail.html for a description of this incident.

225 On 1 January 2008, an 11-year-old captive bottlenose dolphin known as Annie, held by the Dolphin Academy Curaçao, breached above a group of tourists participating in a swim. She landed directly on three of them, a maneuver that was highly unlikely to be accidental. Two people received minor injuries, while one was hospitalized with what were described as “paralysis symptoms.” The dolphinarium employees allegedly confiscated cameras from facility visitors who viewed the incident and attempted to erase digital evidence of it, and forcefully told visitors not to describe the incident to anyone. One person, however, did retain a digital video clip from a personal camera. The Partij voor de Dieren (Party for the Animals) in the Netherlands (Curaçao is part of the Netherlands Antilles, a Dutch protectorate) asked questions about the incident in the Dutch Parliament, after expressing concern

- about the welfare of the dolphins and the safety of tourists (see video and details in Dutch about the incident at <http://www.partijvoordedieren.nl/news/view/1446> and also the English language version of the magazine Amigoe, 7 January 2008, <http://www.amigoe.com/english/>).
- 226** WDCCS and The HSUS, *Biting the Hand that Feeds*.
- 227** 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.
- 228** 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), www.hopkinsmedicine.org/dome/0410/newsreport2.cfm.
- 229** "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, North Carolina: Society for Marine Mammalogy, 2003), 161.
- 230** 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*.
- 231** 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.
- 232** 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.
- 233** 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.
- 234** M. C. de O. Santos, "Lone sociable bottlenose dolphin in Brazil: Human fatality and management," *Marine Mammal Science* 13 (1997): 355–356.
- 235** B. Liston, "Florida whale victim a drifter who likely drowned," *Reuters North America*, 7 July 1999.
- 236** See www.abc.net.au/news/newsitems/200407/s1163433.htm for a description of this incident.
- 237** The trainer received a broken foot as a result of this incident. See <http://www.msnbc.msn.com/id/15964896/> for a description.
- 238** See <http://www.smh.com.au/news/whale-watch/woman-survives-killer-whale-ordeal/2007/10/09/1191695867426.html> for a description of this incident. At least 19 other captive orca attacks or accidents in dolphinariums have been recorded (for a list, which spans the early 1970s to 1999, see <http://www.angelfire.com/gu/orcas/attack.html>).
- 239** The initial narrative summary on the November 2006 incident with Kasatka and Ken Peters, which included extensive background details on the history of keeping orcas in captivity and previous incidents involving trainer injuries, was written by an investigator with California's Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) after extensive interviews with Peters and other SeaWorld trainers (Cal/OSHA form 170A, narrative summary inspection number 307035774, no date). The content of this initial summary was based on those interviews. The information memorandum was intended to address "potential hazards" to employees and to offer recommended solutions (Cal/OSHA form-1, information memorandum, report number 307035774, 28 February 2007). These recommendations included: 1) improving control over the orcas by reducing environmental stressors (the narrative summary included a description of such possible stressors, including a performance schedule that was overly demanding); 2) increasing the number of orcas in the captive population, to reduce the need for the trainers to rely on one or two animals for the majority of performances (this suggests that distributing SeaWorld's 20 or so orcas over three locations is not in the best interests of the animals, although it maximizes the parent company's profits); and 3) reconsidering the possibility that lethal force against "out of control" orcas might be necessary to protect trainers. All of these recommendations belied SeaWorld's self-characterization of its management practices as always in the best interests of the animals and of the in-water interactions between trainers and orcas as absolutely safe.
- SeaWorld strongly objected to the information memorandum—which is only supposed to be issued when an actual violation of safety standards has been identified (whether or not an employee has been exposed to it)—and insisted that the majority of the narrative summary's contents were beyond the expertise of the investigator and should be deleted (this, despite the narrative summary being based on interviews with SeaWorld's own trainers). Three days after the memorandum was officially filed, a press release from Cal/OSHA (dated 2 March 2007) announced that the memorandum was being withdrawn, as SeaWorld was in full compliance with safety codes, and that the agency regretted "the difficulties it may have caused Sea World, its staff, and its patrons." The narrative summary of the incident was retained, but substantially redrafted to omit any language that suggested or otherwise contributed to an implication or impression that doing in-water work with orcas was high-risk. The final version was dated 4 April 2007.
- Subsequent communication between an HSUS representative (N. Rose) and a Cal/OSHA employee indicated that the withdrawal was the result of unprecedented pressure from SeaWorld executives on the agency. The executives strenuously objected to any suggestion that current practices at SeaWorld were insufficient

to protect the trainers from injury or ensure the well-being of the animals. The Cal/OSHA employee had never known the agency to redraft a narrative summary before (and deemed it an odd gesture, as the original summary would still exist as an official agency document, alongside the revised version).

HSUS requested and received copies of the original and redrafted summaries from Cal/OSHA. A side-by-side comparison of the two versions showed that the changes were primarily deletions, with very few additions or revisions. More than half of the original document was simply redacted. The missing text included any language suggesting that orcas are inherently dangerous and unpredictable; that they have individual differences in personality that make careful evaluation of their "mood" on a daily and even hourly basis essential for trainer safety (indeed, a full but simple description of the seven individual orcas at SeaWorld San Diego was omitted completely); that trainers believe stressors in the captive environment exist and contribute to an unavoidable risk of the animals going "off behavior"; and that, in the end, trainers "have no tools at their disposal to punish an orca that is misbehaving. There is little that they can do to punish an animal of this size anyway." Cal/OSHA original narrative summary, 7. All descriptions of previous "off behavior" incidents at SeaWorld and other facilities (both injurious and non-injurious), save for two previous incidents with Kasatka and one incident two weeks earlier involving another whale at SeaWorld San Diego that resulted in a minor injury, were deleted.

In essence, the original narrative summary made it clear that "the trainers [at SeaWorld] recognize this risk [of injury and death through in-water interactions] and train not for if an attack will happen but when." Cal/OSHA original narrative summary, 17. It concluded that in-water interactions were inherently risky and incidents such as the one between Kasatka and Peters could and should be anticipated and the routine safety precautions in place at SeaWorld were not only essential but could easily be augmented. The final version implied the opposite, leaving the reader with the impression that in-water interactions were inherently safe, that "off behavior accidents" and attacks were completely aberrant, and that the routine safety precautions taken by trainers were good practice but almost never needed.

240 A disturbing trend is the expansion of in-water interactions to other species, including larger cetaceans such as beluga whales (see <http://www.dolphinswim.net/eng/indexeng.html> and K. Walker, "SeaWorld says you can swim with the whales," NBC, 14 November 2006) and pinnipeds such as California sea lions (see <http://www.canada.com/topics/news/national/story.html?id=61c351ab-3536-4310-95a7-2d55b64d8e2e>). Sea lions are a particularly risky species for tourists to swim with, as their bites are dangerous (see endnote 217); a report on animal-inflicted injuries at the Denver Zoo indicated that its sea lions were more problematic than any other species, biting workers seven times in 2004 and 2005 (T. Hartman, "City's zookeepers hurt 45 times in past 5 years," *Rocky Mountain News*, 12 April 2007).

241 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.

CHAPTER 6: BEHAVIOR

242 This point is emphasized in Clubb and Mason, "Captivity effects on wide-ranging carnivores," and "Natural behavioural biology as a risk factor in carnivore welfare."

243 For examples and discussions of the behavioral problems experienced by animals in captivity, including marine mammals, see N. Carter, "Effects of psycho-physiological stress on captive dolphins," *International Journal for the Study of Animal Problems* 3 (1982): 193–198; H. Markowitz, *Behavioural Enrichment in the Zoo* (New York: Van Nostrand Reinhold, 1982); D. Ellis, "Pets, zoos, circuses, and farms: Personal impacts on animal behavior" in *Animal Behavior and Its Applications*, edited by D. Ellis (Chelsea, Michigan: 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.

244 "Life in a controlled environment may impede certain aspects of normal social dynamics," 296. Couquiaud, "A survey of the environments of cetaceans in human care: Whales, dolphins, and porpoises: Presentation of the cetaceans," 288–310.

245 The extreme example of this was the fatal 1989 interaction between Kandu V and Corky II at SeaWorld 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.

CHAPTER 7: STRESS

246 For examples and discussion of how stress can affect the health of marine mammals, see L. A. Dierauf, "Stress in marine mammals," in *CRC Handbook of Marine Mammal Medicine*, edited by Dierauf, 295–301; Fair and Becker, "Review of stress in marine mammals."

247 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, Maryland: 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; and Romero and Butler, "Endocrinology of stress."

248 L. Nielsen, *Chemical Immobilization of Wild and Exotic Animals* (Ames, Iowa: Iowa State University Press, 1999).

249 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.

250 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.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-260.PDF>. This review concludes that the chase and capture (handling) of dolphins can have significant negative impacts on individuals.

251 Small and DeMaster, "Acclimation to captivity."

of the Cambridge Philosophical Society, doi:10.1111/j.1469-185X.2008.00049.x.

252 A recent study describes one possible mechanism for the increased mortality risk faced by dolphins after a transport. Blood chemistry of animals transported between facilities indicated that dolphins find routine handling and transport stressful, even after living in captivity for several years. As a result, their various cell functions appear impaired, which would lead to a depression of their immune response. In such animals, "immunological uncertainty following transportation would enhance the potential risk of infectious disease in susceptible individuals," 382. K. Noda et al., "Relationship between transportation stress and polymorphonuclear cell functions of bottlenose dolphins, *Tursiops truncatus*," *Journal of Veterinary Medical Science* 69 (2007): 379–383. In short, because transport is stressful—to the dolphins, it is never routine—they face an increased risk of infection, illness, and death every time they are moved from one place to another, at least for a short time until they adjust to the new location. The four dolphins used in this study had been held in a dolphinarium for over five years and were transported 250 kilometers from one facility to another (a distance routinely traversed by many dolphins in the United States and elsewhere for husbandry and captive management purposes), using routine transportation methods.

253 R. J. Small and D. P. DeMaster, "Survival of five species of captive marine mammals," *Marine Mammal Science* 11 (1995): 209–226.

254 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. Benivschke (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.

255 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.

256 "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.

257 Guravich and Matthews, *Polar Bears*.

CHAPTER 8: CETACEAN INTELLIGENCE

258 P. Manger, "An examination of cetacean brain structure with a novel hypothesis correlating thermogenesis to the evolution of a big brain," *Biological Reviews of the Cambridge Philosophical Society* 81 (2006): 293–338.

259 L. Marino et al., "A claim in search of evidence: Reply to Manger's thermogenesis hypothesis of cetacean brain structure," *Biological Reviews*

260 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).

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

262 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!

263 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.

264 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; 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.

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

266 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.

267 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.

268 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.

269 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.

270 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.

271 The facility where this study was conducted, Kewalo Basin Marine Mammal Laboratory (KBMML) in Honolulu, Hawaii, had a controversial 30-year history, as the two dolphins (two more were added to the study later) were held in small, concrete tanks in a hurricane-prone area. One of the authors of this document (N. Rose) worked at KBMML for a semester in 1982. Eventually, the four dolphins died (one in 2000,

another in 2003, and the last two in 2004) and the laboratory was closed (it was entirely demolished in 2008).

- 272** 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, New Jersey: Lawrence Erlbaum Associates, 1986), 221–252.
- 273** L. M. Herman et al., "Bottlenose dolphins can generalize rules and develop abstract concepts," *Marine Mammal Science* 10 (1994): 70–80.
- 274** S. Yaman et al., "Preliminary results about numerical discrimination in the bottlenose dolphin (*Tursiops truncatus*)," *European Research on Cetaceans* 15 (2004): 118–122.
- 275** Jaakkola et al., "Understanding of the concept of numerically 'less' by bottlenose dolphins (*Tursiops truncatus*)."
- 276** For example, studies have indicated 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 apparent difficulty is due to the lack of complexity in their language. C. Holden, "Life without numbers in the Amazon," *Science* 305 (2004): 1093.
- 277** 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.
- 278** 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.
- 279** B. Amsterdam, "Mirror self-image reactions before age two," *Developmental Psychobiology* 5 (1972): 297–305.
- 280** 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.
- 281** D. B. Resnik, *The Ethics of Science: An Introduction* (London: Routledge, 1998).
- 282** 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.

- 283** C. Terrill, "Romancing the bomb: Marine animals in naval strategic defense," *Organization and Environment* 14 (2001): 105–113; W. Gasperini, "Uncle Sam's dolphins," *Smithsonian*, September 2003, http://www.smithsonianmag.com/science-nature/Uncle_Sams_Dolphins.html. 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.
- 284** At least nine U.S. Navy dolphins 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*. The most recent controversy related to the Navy's marine mammal program is the proposal to develop a "swimmer interdiction security system," naval jargon for using dolphins and sea lions to patrol harbors. In early 2007, the Navy published a notice of intent to prepare an environmental impact statement (EIS) on a proposal to move several of its dolphins and sea lions to Washington State, to patrol the Kitsap-Bangor submarine base there. *Federal Register* 72 (2007), 6536. As noted in the comments on this notice submitted by The HSUS:

Most of the dolphins in the DoN [Department of the Navy] marine mammal program were captured or are descended from dolphins captured in the Gulf of Mexico or Atlantic Florida—they are not physiologically adapted to tolerate cold water such as that found in Puget Sound for a prolonged period of time. Bottlenose dolphins are not naturally found in Washington's waters—the water temperature north of central California, in fact, is outside of their normal tolerance limits. The DoN itself recognizes this and plans to return the dolphins to heated enclosures on a regular rotation, after some number of hours on active duty during any particular day. This is a routine the DoN has developed on previous cold-water deployments. The very fact that this rotation is necessary demonstrates that the dolphins are being forced to perform in an environment outside their temperature tolerance limits.

At the time of this edition's publication, a draft EIS had been published and released for public comment.

CHAPTER 9: MORTALITY AND BIRTH RATES

- 285** Michael Hutchins of The Wildlife Society notes in an article that "zoos should deal with the increasing media and public interest in zoo animal deaths, including: 1) a greater commitment to studying the reasons for mortality in a wide variety of species; and 2) an increased investment in record keeping and analysis," 101. M. Hutchins, "Death at the zoo: The media, science, and reality," *Zoo Biology* 25 (2006): 101–115. The public display industry's claim that animal mortality is "natural" and "expected," and that the focus by those who oppose captivity on the natural phenomenon of death is overly emotional and unscientific, seems unwarranted given this article's implicit admission that the industry has in fact given insufficient attention to studying captive wildlife mortality patterns or even to keeping adequate veterinary records. Rigorous record-keeping should be routine and the industry's public relations rhetoric insists that it is, but this is apparently overstating the case.

Pinnipeds and Other Non-Cetaceans

- 286** 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 (California 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.
- 287** 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.
- 288** California sea lion pup mortality in captivity is 14.2 percent (on average), while mortality rates in the wild are much higher—the result of a high level of hookworm parasites in pups. See <http://www.afsc.noaa.gov/nmml/california/research/ccpresearch.php?url=nmmlccep0808>; Small and DeMaster, "Survival of five species of captive marine mammals."
- 289** 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."
- 290** The average annual sea otter mortality rate in captivity (for animals held from 1984 to 1999) was calculated to be 5.5 percent (varying from 11.8 percent to zero percent depending on the facility—endnote 167 notes that the mortality rate calculated for animals held from 1955 to 1996 was higher), 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.
- 291** Christopher Andrews, PhD, conversation with N. Rose, 21 July 1993.
- 292** The HSUS is working on several projects using a contraceptive method known as immunocontraception, which is a promising method of controlling reproduction in wildlife, both in the field and in captive situations. A small number of dolphinarium and aquaria have inquired about and experimented with this contraceptive method.

Bottlenose Dolphins

- 293** 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.
- 294** 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, 1997).

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

Orcas and Other Small Whales

- 296** See <http://www.orcahome.de/orcastat.htm> for the latest statistics known.
- 297** Two SeaWorld documents from the 1990s made the original claim of a 35-year life span for orcas. These were SeaWorld Corporate Zoological Department, *The Facts about SeaWorld's Killer Whales* (SeaWorld, 1993), and SeaWorld Corporate Zoological Department, *A Discussion of Killer Whale Longevity* (SeaWorld, 1994).
- 298** See <http://seaworld.org/animal-info/info-books/killer-whale/longevity.htm>. On the same web page, SeaWorld also acknowledges that "[scientists in the Pacific Northwest] believe that if a killer whale survives the first six months, a female's life expectancy is 50 years and a male's is 30 years" (emphasis added), although this life history information is accepted as factual by the international scientific community. 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, "Killer whale, *Orcinus orca*" are considered the definitive sources for life history information on this species. Two additional points: 1) SeaWorld's website neglects to clarify that the life expectancies of 50 years for females and 30 years for males are the mean, not the maximum, and 2) all whales captured from the wild have in fact survived the first six months of life (all orca captures are of weaned individuals; weaning occurs at about 2 years of age). That is, a good number of the orcas captured from the wild over the decades should have (and could have) achieved at least the mean life expectancies, yet very few have. Four or five males have surpassed 25 (assuming they were more than three years of age at capture), while only one, Ulises, has surpassed 30 (he is believed to have been born in approximately 1977); four or five females are believed to have survived beyond 30 years of age and only two, still alive, have lived past the age of 40 (see endnote 302). Ironically, the older these two females get, the more difficult it will be for SeaWorld and other facilities holding orcas to explain why most of their orcas die in their teens and twenties.
- 299** 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*.
- 300** These data on orca longevity and life expectancy are most recently cited in Ford, "Killer whale, *Orcinus orca*." SeaWorld does not mention these statistics in its killer whale information book (see endnote 298).
- 301** These analyses include K. C. Balcomb, *Analysis of age-specific mortality rates of Puget Sound killer whales versus SeaWorld 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.
- 302** These two are females—Lolita at the Miami Seaquarium and Corky II at SeaWorld San Diego.
- 303** 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 SeaWorld San Diego, has had at least seven unsuccessful pregnancies. Twelve of the viable calves are now dead (aged two to 15 years at death), leaving 28 living captive-born orcas at the time of this edition's publication, the eldest 23 years of age, but more than half of them less than 10 years old.

304 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*."

305 Clubb and Mason, "Captivity effects on wide-ranging carnivores."

306 Woodley et al., "A comparison of survival rates."

307 R. E. A. Stewart et al., "Bomb radiocarbon dating calibrates beluga (*Delphinapterus leucas*) age estimates," *Canadian Journal of Zoology* 84 (2006): 1840–1852; C. Lockyer et al., "Age determination in belugas (*Delphinapterus leucas*): A quest for validation of dentinal layering," *Aquatic Mammals* 33 (2007): 293–304.

308 See <http://www.seaworld.org/animal-info/info-books/beluga/longevity.htm> for the outdated information on this topic available from SeaWorld's website. This "educational" information may accurately reflect SeaWorld's experience with its captive belugas, but it does not accurately reflect the latest scientific research.

309 NMFS, *The Marine Mammal Inventory Report*.

Other Cetacean Species

310 NMFS, *The Marine Mammal Inventory Report*; Couquiaud, "A survey of the environments of cetaceans in human care," 299–305.

Conclusion

311 Reeves and Mead, "Marine mammals in captivity."

CHAPTER 10: CONCLUSION

312 Closures: Pittsburgh Zoo (dolphin exhibit only closed), Oklahoma City Zoo (dolphin exhibit only closed), Cedar Fair in Ohio (dolphin exhibit only closed), Steinhart Aquarium in California (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 Bery 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), Marine Life Aquarium in South Dakota (entire attraction closed), and Marine Life Oceanarium in Mississippi (entire attraction destroyed by Hurricane Katrina). Openings: Dolphin Connection in Florida (new attraction), Discovery Cove (separate SeaWorld Orlando attraction), the Texas State Aquarium (new exhibit), and the Georgia Aquarium (new attraction). Other dolphinaria, amusement parks, and aquaria have expanded or contracted already existing marine mammal exhibits and are not included in this list.

313 South Carolina is the only U.S. state to prohibit the public display of cetaceans.

314 J. C. Hillhouse, "ABITPC awaiting day in court," *The Daily Observer* (Antigua), 21 February 2004.

315 These include the city of Vodnjan, Croatia; the city of Virginia Beach, Virginia, USA; the city of Denver, Colorado, USA; and the city of Calgary, Alberta, Canada. The government of Panama, after two years of debate and controversy, decided not only against the building of a dolphinarium, but also against allowing the capture of dolphins from its waters.

316 C. Mvula, *Animal Attractions Handbook: Travelife—Sustainability in Tourism* (London: International Tourism Services, 2008), www.its4travel.com.

317 The only exceptions would be the rescue and rehabilitation of stranded marine mammals and the maintenance of animals who cannot be released.

APPENDIX I

La Paz, Mexico

318 Diebel, "Trapped in an underwater hell, Mexico pressed to free dolphins"; Alaniz and Rojas, *Delfinarios*, 204–205.

Bayahibe, Dominican Republic

319 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.

320 Captures had been prohibited since 2000, under Dominican Republic Environment Law 64–00, article 175. E.C.M. Parsons et al., "A note on illegal captures of bottlenose dolphins (*Tursiops truncatus*) in the Dominican Republic," *International Journal of Wildlife Law and Policy* (2009): (in press).

321 Under Article 11 of the Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the Cartagena Convention), 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. www.cep.unep.org/pubs/legislation/spaw.html. See also Parsons et al., "A note on illegal captures of bottlenose dolphins (*Tursiops truncatus*) in the Dominican Republic".

322 In 2004, Manatí Park opened a second facility, Parques Tropicales (Dolphin Island–Manatí Park) at Punta Cana. Five dolphins were housed in the new sea pens—there was speculation that these were the survivors of the eight animals captured in August 2002. The Dominican Republic, unlike its neighbor Haiti, is still heavily forested over much of its territory, and locals believed the dolphins had been

held for two years in a tank hidden by jungle, a period during which three dolphins may have died.

323 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." <http://www.manatipark.com/eng/naturaleza.htm>. This is yet another example of a dolphinarium or aquarium trying to camouflage its unethical activities with a conservation and education veneer.

Solomon Islands

324 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.

325 Parties to CITES may trade with non-Parties, but only if non-Parties meet the treaty's requirements.

326 Omata et al., "Antibodies against *Toxoplasma gondii* in the Pacific bottlenose dolphin (*Tursiops aduncus*) from the Solomon Islands," 965.

327 Ross et al., "Report of a fact-finding visit to the Solomon Islands," 7.

328 Besides being in violation of the CITES agreement, the Solomon Islands dolphins were being held in conditions in Cancún that violated 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 Cancún dolphinarium) separate from the park's existing dolphin population—this was not done. The dolphins were never properly quarantined and were kept in adjacent pens, allowing the possible transmission of non-endemic pathogens and diseases.

329 "Carcasses add to dolphin export controversy," *Associated Press*, 18 October 2007, <http://www.msnbc.msn.com/id/21344926/>.

330 Randall Reeves, the chair of the IUCN Cetacean Specialist Group (CSG), Frances Gulland, a member of the IUCN Veterinary Specialist Group, and Robert Brownell, a member of the IUCN CSG, wrote to Willem Wijnstekers, the Secretary-General of CITES, stating, "We are not aware that any credible, peer-reviewed studies of bottlenose dolphins have been undertaken in the Solomon Islands since 2003. Accordingly, we have not changed the conclusion we reached in 2003 that a non-detriment finding under CITES is not possible for these populations, and that exports should not take place," 2. R. Reeves et al., letter to W. Wijnstekers, 13 June 2007.

331 CITES Resolution Conf. 14.7.

332 Office of the Minister of Fisheries and Marine Resources, Solomon Islands Government, "Supplemental information in support of a non-detriment finding for Indo-Pacific bottlenose dolphins (*Tursiops aduncas*) [sic]," 10 October 2007.

333 <http://www.cites.org/eng/news/sundry/2007/dolphin.shtml>.

334 http://www.ssn.org/Documents/news_articles_SI_exports_EN.htm.

335 Out of 28 dolphins sent to Mexico in 2003, at least 12 had died by early 2008. This is an exceptionally high mortality rate in only five years for a species that can live 40 or more years. Senator J. Legorreta O., letter to Minister M. B. Tan, sent 7 May 2008.

336 The Review of Significant Trade is a process whereby trade in Appendix II species is examined to determine if exporting Parties are issuing appropriate NDFs. If the Animals Committee concludes there is reason for concern, it makes recommendations to the exporting Party, such as what scientific studies need to be done. These recommendations are passed on to the CITES Standing Committee. If approved by the Standing Committee, the recommendations are provided to the Parties; Parties must comply with the recommendations by established deadlines or the Standing Committee may recommend to other Parties that trade in CITES-listed species with that Party should be avoided. CITES Resolution Conf. 12.8 (Rev. CoP13).

337 Animals Committee 23, Doc. 8.5.1.

338 See endnote 59 for more on this issue.

339 See, for example, <http://www.mzi.com/pages/news.php?op=read&id=39390>.

340 M. Berman, email message to N. Rose, 30 June 2008.

341 R. R. Reeves and J. Horokou, "Non-detriment finding for *Tursiops aduncus* in the Solomon Islands," WG-5-Mammals, Case Study 2, November 2008. Horokou works in the Solomon Islands Ministry of the Environment and co-authored the following statement: "Much more and better-quality information than presently available will be needed on the distribution, population structure, removals (bycatch, hunted, live-captured) and numbers of Indo-Pacific bottlenose dolphins in the capture region before a credible NDF can be made and additional collections for export, or exports of animals already collected, are authorized," 11. Yet despite the admission by this government official that any NDF for Solomon Islands *T. aduncus* is currently not credible, within one month of this case study's presentation, seven more dolphins left Solomon Islands with a CITES export permit and were accepted by the Philippines.

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