

Captive Orcas

‘Dying to Entertain You’

The Full Story

A report for
Whale and Dolphin Conservation Society (WDCS)
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Introduction.

Killer whales, more properly known as orcas, have been kept in captivity since 1961, helpless victims of a blatantly commercial experiment which has seen dozens of wild orcas plucked from their families and forced to live in artificial social groupings which bear scant resemblance to their natural order. Unaware of their plight, millions of people flock each year to watch the orca show, seduced by the extravagant promises of the display industry. Glossy brochures herald a spectacle - billed "The Wettest Show on Earth!" which will simultaneously entertain and educate the whole family.

Visitors are invited to enter a fantasy land, where orcas weighing several tonnes circle, leap and tail-slap seemingly out of sheer high spirits. Highly-choreographed show routines, performed to a background of tired old rock songs, are presented as "natural behaviour". Entranced, many of the spectators fail to register the bare concrete walls of the tank. At show's end, as they file out, few people notice the endless circling of the captives in the holding pools or the drooping dorsal fins of the males.

Clever marketing and showmanship have, however, failed to completely conceal the reality behind the razzmatazz. Visitors may experience feelings of disappointment, distaste and disillusionment after watching the orcas perform, finding it hard to articulate these feelings precisely, but aware that the docile, playful orca portrayed is far removed from the real animal. Similar emotions have been reported after seeing captive tigers or elephants - an awareness that the animal's dignity is demeaned and that, in 'taming the spirit of the great beasts', we, too, are somehow reduced in stature.

This growing uneasiness with the concept of keeping orcas in captivity has only been increased by a spate of newspaper articles and video footage documenting the reality of the captives' existence. Despite the best attempts of the display industry to blow a smokescreen over such negative publicity, the wider world is now increasingly aware that all is not well in fantasy-land. In recent years, first a trickle, then a steady torrent, of incidents have been reported. A growing catalogue of "accidents", illnesses, failed pregnancies and premature deaths has forced a dramatic reappraisal of the suitability of orcas for confinement.

In 1989, at Sea World's San Diego park, a young female named Kandu rammed into a second female, Corky, with sufficient force that Kandu died almost instantly, in front of a horrified crowd of onlookers. In 1991, at Sealand of the Pacific in Canada, a young female trainer called Keltie Byrne was drowned by Sealand's three resident orcas after she accidentally fell into their tank. In July 1999, a 29 year-old man, Daniel Dukes, was found dead, draped over the back of male orca, Tillikum, at Sea World's Florida facility. We will probably never know the full story behind his death. Whilst undeniably the most tragic, these incidents were by no means isolated. Aggression between captive orcas and, equally disturbingly, aggression towards trainers, has increased in recent years. Disenchanted trainers and orca advocates alike have alleged that the mental and physical health of the orcas is highly compromised by the captive situation.

For years, the display industry has employed a variety of arguments in its attempt to justify keeping orcas captive. We have been led to believe that captivity benefits both onlookers and animals alike: entertaining and educating audiences whilst, at the same time, providing a comfortable life for the captives. But, as long-term research into wild orca populations increases our knowledge of the species, so the glaring disparities between the lives of the captives and the lives of wild orcas becomes all too apparent.

The reality of existence for the captives has become painfully obvious: cramped, chlorinated tanks, often inhabited by frustrated and unhealthy whales, performing circus tricks which bear little resemblance to their natural behaviour. Many people now feel that witnessing such impoverishment is unlikely to offer any real educational benefit.

In 1992, WDCS commissioned a report entitled "The Performing Orca". Researched and written by Erich Hoyt, the report provided an in-depth summary of the issues surrounding the captive orca industry. In the years following its publication, no fewer than eleven adult orcas have died, eleven calves have died aged four years or under, and there have been at least six known stillbirths/miscarriages - giving the lie to the display

industry's contention that captives are surviving longer. In fact, the most respected scientific research to date suggests that captivity is highly correlated with a dramatically reduced lifespan in the case of orcas.

This latest report aims both to summarise the relevant issues and to up-date readers on events occurring since the publication of "The Performing Orca". It seeks to provide a "behind the scenes" tour of the display industry, highlighting the reality of captivity and employing scientific, ethical and welfare arguments to debunk some of the myths surrounding the confinement and display of orcas. Above all, it seeks to provide information to the widest possible audience - only then can members of the public make an informed choice.

Finally, there is some cause for optimism. Greater public awareness of the issues has led in turn to a willingness to question previously taken-for-granted assumptions about captivity. Attendance at several marine parks has declined in recent years and others have stopped displaying orcas altogether. An ambitious rehabilitation and release project came a step closer to its goal in January 1996, when a young male orca named Keiko was moved to a specially-designed rehabilitation pool or "halfway house" at the Oregon State Coast Aquarium. In September 1998, Keiko was airlifted to a purpose-built seapen located in Klettsvik Bay, Vestmann Islands in Iceland. If all goes according to plan, the programme will culminate in Keiko's full release into the freedom of his native Icelandic waters, hopefully during 2000. (Please refer to Section 7: Release Programmes).

Change will be gradual, but the very fact that change is taking place is important. For the sake of the captives, we must ensure that this momentum is not lost.

Section 1

The Showbiz Orca

First the facts:

- At least 134 orcas have been taken into captivity from the wild since 1961. One hundred and six (79%) are now dead. (An additional male escaped after 2.25 years in captivity. His fate is unknown.)
- Of the 107 which died, average length of survival in captivity was under six years (range: 1 day - 27.2 years).
- Most captives die before they reach their early 20s, yet in the wild, females may live as long as 80 years or more.
- As of August 2000, a total of 49 orcas (26 wild-caught and 23 captive-born calves) are held in 13 marine parks in five countries.¹ There is also a male orca, Keiko, now in a seapen in his native Icelandic waters, as the second stage of a rehabilitation and release programme.
- Of 59 known pregnancies in captivity since 1968, only 23 calves (38%) have survived.
- Sea World owns 22 orcas, 44% of the world-wide captive total. Around 10 million people visit Sea World parks annually. Sea World has itself estimated that as much as 70% of its income derives from visitors attracted by the orca shows.²

Now the facade. Enjoy the show...

To the orcas circling endlessly in the holding pool, it is merely the start of the third, or the fourth, or the fifth show of the day. This performance is likely to be identical to the last and the one before that. Today will eventually join a long line of yesterdays as the orcas clock up yet another day in captivity. A day that will join the weeks, which turn into months, which blend seamlessly into years.

To the spectators filing into the stadium, clutching cameras and popcorn, the show which is about to start is eagerly anticipated as the highlight of their visit to Sea World. Yet, these surroundings are not unique to Sea World's marine parks. The tiers of benches ranged around the concrete stadium, allowing spectators an uninterrupted view of the show pool with its unnaturally 'superclear' water and Plexiglas sides, are echoed in other orca parks elsewhere in the US, or in Canada, France, Argentina or Japan. But Sea World is clear victor in the battle for superlatives: it owns the most orcas, has the largest pools, its shows are the most highly-choreographed, and it derives the most profit from its showbiz cetaceans.

As the audience takes their seats, their attention is drawn to a giant video screen which dominates the small stage at the rear of the pool. As hidden cameras pan around the stadium, visitors point and wave delightedly as they recognise themselves on the big screen. The performance warms up with 'Shamu's Quiz'. Question after question is flashed onto the screen and the audience is asked to raise a hand or nod their head in response to such brainteasers as 'Are killer whales fish or mammals?'

As the quiz screen fades, four trainers run on-stage, dressed in sleek, red and black wetsuits. The piped music, previously just 'acoustic wallpaper', now swells to a triumphant crescendo and the crowd, entering into the spirit of the show, eagerly claps and cheers the trainers' arrival. The audience becomes aware of the orcas circling in the holding area, but before the whales are allowed to enter the show pool, the huge screen flickers once more into life. An avuncular narrator explains some of the myths and legends associated with killer whales. These 'great black fish, rulers of the sea' are 'relentless predators, with enormous strength and a ferocious nature' and a 'tremendous capacity for killing and eating'. Brief footage is shown of a wild orca pod off Vancouver Island. But by now, the audience is losing concentration.

Two orcas have been let into the main show pool and are circling. The larger of the two, its dorsal fin flopped rather pathetically over to one side, makes several rapid circuits of the pool, leaping in a rather perfunctory way at precisely the same spot each time, accompanied by 'oohs and ahs' from the crowd. The voice of the on-screen narrator continues its description of orcas, '..four tons of streamlined muscle and bone'.

At precisely the moment that his disembodied voice is describing the orca's 'interlocking teeth designed for ripping and tearing', one of 'these monstrous juggernauts of the deep' docilely approaches the stage, to be rewarded by a trainer who doles out a handful of dead fish from a steel bucket. The intense irony of this moment is lost on the audience.

The screen changes once more and, to the accompaniment of rock music blaring from the huge speakers, the show proper begins. This time, the giant screen simultaneously relays the action taking place in the pool, both above and below the water. A quick circuit, then, as the music reaches a crescendo, an orca heads straight for the audience. On cue, it lunges forward, propelling its entire body out of the water and hauling itself onto a shallow shelf which runs along the front of the tank. Flipping its tail up, the orca 'bows' to the delighted crowd.

Sliding back into the unnaturally clear water, it joins the other orca for a medley of highly-choreographed twirls, spyhops, flipper waves and tail slaps. An orca responds again to the trainer's cue, moving obediently to the poolside and allowing its back to be stroked. A female trainer now explains to the crowd that its skin 'feels like hard rubber.' On cue, the orca splashes. Standing on its tail, it waves both pectoral fins at the crowd and spits water 'playfully'. The crowd shrieks with laughter. The front benches are always packed, in gleeful expectation of a soaking from 'Shamu'.

But even these endearing antics serve merely as a warm-up in preparation for the real spectacle to come: 'Playtime with the whales'. A wetsuited male trainer now moves from the poolside and onto the back of the larger orca. As gentle music plays, the orca carries him slowly across the pool. Sliding from the whale's glistening back, both trainer and orca roll over in the water, floating together, to a chorus of sentimental 'ahs' from the spectators.

In an instant, the music swells once more and, in a flurry of spray, the trainer reappears, this time crouching on the orca's head before moving nimbly to stand upright, clasping the whale's chin, both feet balancing on the orca's front flippers. Slipping back into the water, he emerges again, this time kneeling astride the orca's back.

Standing up, he balances upon its back, 'logrolling', as they move to the poolside where he leaps deftly back on stage, amid a roar of applause. A reward of dead fish and the trainer remounts the orca, swimming the pool's width underwater and emerging as the orca once more 'beaches' itself upon the shallow shelf, this time with his trainer still aboard. A child is chosen from the audience and is briefly lifted onto 'Shamu's' back by a smiling female trainer. Cameras flash and then the action continues.

A second trainer now dives into the water to join the smaller orca. Floating on his back in the water, he is pushed around the pool by the whale, to the accompaniment of fast-tempo music, the crowd clapping in time with the beat. Right on cue, both disappear beneath the surface. For a brief moment as the crowd holds its breath in anticipation, neither are visible. Then, in a turmoil of cheers and spray, the trainer re-emerges. Propelled upwards out of the water by the three-ton orca, he balances triumphantly for an instant upon the whale's nose.

More gravity-defying stunts follow, as the trainers, propelled dramatically into the air by their proteges, dive gracefully back into the water as the crowd roars approval. The music swells into the finale, punctuated by the dramatic breaches of the two orcas. The show climaxes with a final spectacular backflip, and the audience begins to file out.

The stadium is now silent and the orcas are returned once more to the narrow confines of the holding pool. Their only certainty being that tomorrow will bring another such show... and another .. and another.

In order to understand just how alien this existence is for the orcas, we need first to develop an understanding of the day to day routines and complex social relationships enjoyed by orcas in the wild. The following section paints a picture of daily life in a wild orca pod.

Section 2

Life in the wild

'A lesson in harmony.'

'Dawn in Blackney Pass, an August morning. The first tendrils of light creep across the sky, chasing away the last remnants of the night. It is one of those summery days when the ocean is flat calm and shimmers silver in the early morning light. Outlined in mist, the pine-covered mounds of Parson Island are barely visible; to the left, the majestic sweep of waterway known as Blackfish Sound. Far to the right, Mount Derby stands sentinel. A bald eagle hovers, motionless, on gentle air currents and Dall's porpoises arc lazily through the limpid water.'

Suddenly, a single black fin rounds the corner into the Pass, moving slowly northwards, hugging the shoreline. The distinctively-curved dorsal fin and glistening ebony back of Tsitika (A30) breaks the surface, quickly followed by a succession of explosive exhalations as each of her five children effortlessly rise, enveloped in the mists of their blows.

Tsitika is an old friend, elegant and serene as she leads her family through the Pass. On her left is Strider (A6) eldest son and easily recognised by the distinctive mark on the trailing edge of his dorsal fin. The other sons, Blackney (A38) and Pointer (A39) are there too, breathing almost as one on Tsitika's right; Blackney close enough to be almost touching his mother. Tsitika's daughters, Clio (A50) and three year old Minstrel (A54) complete the family group, arcing and rolling lazily through the water in the bright morning light. The whole picture is one of effortless synchrony in motion. Suddenly, Strider picks up speed as he hurtles after one of the big spring salmon known locally as 'smileys'.

The whales regroup, diving and surfacing to breathe almost in unison. They make three shallow surface dives and then sound for a longer dive, their fins rotating like cog wheels at the surface as they descend into the emerald green ocean. The only reminder of their presence is the smooth glassy footprint that lingers briefly at the surface. These waters hold meanings and associations far beyond human understanding; generation after generation of orcas has swum through these waters and this morning's group is supremely confident of this: their birthright.

[Journal entry. British Columbia, August 1992.]

Introduction.

It is impossible to watch orcas in the wild and not be changed by the experience. Since Roman times, the orca has captured the imagination of man. Their dramatic appearance, sheer size and speed and complete mastery of their three-dimensional ocean environment ensures that even the briefest sighting will linger long in the memory of the watcher.

Orcas, or killer whales, live in every ocean of the world, but partly because they spend most of their time underwater and partly because of their reputation as a blood-thirsty and voracious predator, very little has been known until recent years of their biology and social behaviour. Man's fascination with the predator - whether tiger, shark or orca - is tempered only by his fear. Since ancient times, the orca has featured in the myths and legends of many cultures, sometimes as sacred beast or icon - as among the Tlinglit of south-east Alaska and also the Kwakiutl and Haida peoples of British Columbia, who both identify with and revere the orca - but more often as demon.

The killer whale's legendary ferocity and appetite ensured that its very name struck fear into the heart of sailors and fishermen. In 1874, the whaler Charles Scammon wrote that '...they seem always intent upon seeking something to destroy or devour' and as recently as 1973, a US Navy manual warned that '[orcas] will attack human beings at every opportunity'. Orcas have been commonly shot at in almost every ocean of the world, often by frustrated fishermen but also by locals taking pot shots at an animal they had been taught to loathe on sight.

Then in the early 1960's, the situation changed abruptly. Ironically, the catalyst for a radical change in the public perception of orcas was the taking of the first orcas from

the wild for the captivity industry. Early captures centred around British Columbia and Washington State. The Canadian Government, responding to public controversy surrounding the captures, hastily commissioned scientists from the Canadian Pacific Biological Station to conduct a population census to determine whether the population could withstand further takes.

FINgerprinting Techniques...

Beginning in 1971, researchers such as Michael Bigg, Graeme Ellis and John Ford spent several seasons following the whales. Their original brief gradually expanded as researchers began to realise that here was an opportunity to learn far more about the orca than merely to estimate population size.³

Bigg and his colleagues devised a method of identifying those orcas they encountered. They would photograph the dorsal fin and the grey-coloured saddle patch located just behind this fin on the orca's back. Comparing these photographs back in the lab, they realised that no two were the same - the dorsals were distinctively different, either in size and shape, or by the patterns of nicks and scratches acquired during the rigours of their life. These nicks could be compared to birthmarks, battle scars or fingerprints in humans. Each individual was assigned an identification letter and number: the first orca recognised was dubbed A1.

Gradually, social relationships between individuals became apparent. Photographs revealed that the same groupings of individuals travelled together year in, year out. These were not random associations, but enduring and cohesive groups. Suddenly, orcas were no longer simply individuals, but group members.

Community Living....

Researchers in British Columbia and Washington State have identified three distinct forms of orcas which fundamentally differ in many aspects of their social organisation, behaviour, appearance, diet and even dialect. The first group, by far the most studied, are known as residents. The resident orcas are further divided into two communities whose territorial waters do not overlap.

The first community of orcas, totalling around 200 individuals in 1999, spends most of its time in the waters off northern Vancouver Island and thus has been named the northern resident community. A second community of 84 whales (summer 1999 census), whose home range lies off south-eastern Vancouver Island, is known as the southern resident community. These two groups have never been observed to interact.
(STOP PRESS: see update on status of these populations at the end of this section)

Residents live in stable social groups, known as pods, which typically contain between 10 - 20 members. They feed predominantly upon salmon for most of the year: frequent sightings off Vancouver Island between June and October coincide with the salmon migrations. Winter movements are less understood and it is likely that the residents become more wide-ranging. In 1995, there were confirmed sightings of resident orcas in Alaska, possibly as a result of hunting more widely-dispersed prey.

A second distinct form of orcas, totalling around 170 individuals to date, is believed to be both socially and genetically isolated from the residents. These whales, known as 'transients', appear to occupy a much wider home range, travel in much smaller groups of one to five individuals and generally seem to possess a more fluid social structure than the residents. They vocalise much less frequently than the residents and dive for longer periods, spending much more time underwater.

Although the territorial waters of transients and residents frequently overlap, the two groups apparently do not interbreed or even interact socially. Indeed, they often seem uncomfortable in each others' presence and appear either to ignore or directly avoid the other, or (as has recently been observed), residents may 'chase off' the transients.

In recent years, a third form has been identified. Dubbed 'offshores', this little-studied population has been observed in the Pacific Ocean, around 24 - 40km (15-25 miles) off

Vancouver Island. These orcas tend to travel in larger groups of 30 - 60 individuals. To date, around 200 offshores have been identified (1993 figs). Population estimates for both transient and offshore groups are likely to evolve as studies progress.

Genetic analysis work carried out to date using samples taken from stranded (or captive) resident and transient orcas has revealed that these two forms of orcas are genetically quite distinct, suggesting that they are separate sub-species or races. In time, genetic studies may confirm current speculation that all three forms of orcas identified in this region are indeed separate races.

Since the resident communities of orcas have been far more widely studied than transient or offshore groups, the description of orca life which follows is based upon long-term observations of the residents.

'Family ties'

Slowly and painstakingly, researchers began to build up a picture of the day-to-day existence of wild orcas. It soon became obvious that previous highly-dramatised accounts of orcas told only part of the story. Orcas, it seemed, possessed a social life that was far richer and more complex than anyone could have imagined. This research marked a turning point in our knowledge and understanding of this, the largest member of the dolphin family.

Orcas society is incredibly complex and very highly evolved. As knowledge of the social structure of the resident orcas off Vancouver Island has been accumulated, these orcas have come to be described as amongst the most closely-bonded animals on earth. Social structure - at least, among the resident orcas studied - runs entirely along maternal lines, hence the basic unit of orca society is known as a matrilineal group. Typically, such a group consists of a mature female and all her offspring, including adult sons who remain with their mothers for life. Adult daughters and their offspring also travel in this extended family group, which may span three or even four generations and may contain as many as nine whales. One or more matrilineal groups which are always observed travelling together are known as a subpod.

The females in each subpod are likely to be closely related: mothers, sisters, daughters and cousins. The bonds formed are long-term and only death or capture can sever these family ties. Researchers have never known any individual to move permanently from one subpod to another. Subpods are generally named after the senior female in the group, for example Tsitika's (A30) subpod are known as the 'A30s', although there are exceptions to this rule.

A 'pod' is a larger social unit, an extended family group composed of several subpods and most number between 10 - 20 individuals. A typical pod might consist of a few closely-related females (probably sisters or cousins) and all their offspring. Thus a pod will include grandmothers, mothers, aunts, sisters, brothers and cousins - but fathers are conspicuously absent. Some researchers now believe that calves are the products of matings between pods, rather than incestuous matings between a son and his mother, sister or aunt. This avoids inbreeding, creating and maintaining a healthier gene pool.

This hypothesis also suggests that orca mothers are effectively 'single parents'. Since mating almost certainly takes place outside the pod, the father has no further contact with any resulting offspring and thus does not have to expend energy contributing paternal care. Instead, he devotes time as a 'dutiful son' towards helping to rear youngsters within his own maternal subpod - either his siblings or his sisters' offspring. It is hoped that on-going genetic studies will cast more light on the mystery behind orca paternity and mating behaviour.

Females typically give birth to their first calf at around 14-15 years and will have an average of five calves over roughly a 25 year period, although the gap between calves can range between two and 12 years. Calf mortality is fairly high; nevertheless, around 60% of calves survive the crucial first year. Like humans, but unlike most other mammals, orcas stop bearing calves around the age of 40-55 and probably stop ovulating. Females may live a further 20 or more years after bearing their last calf and,

since some individuals may reach 80 or more years, most mothers will be alive throughout their son's entire lives. Male lifespan is shorter, generally a maximum of 50-60 years, hence the senior members of any pod are likely to be female. Older, post-reproductive females in the pod usually assume a 'granny' role, devoting much of their time to assisting younger females to rear their calves.

'The family that plays together, stays together.'

Daily life in an orca pod tends to follow a comfortable routine composed of foraging for food, travelling, resting and socialising or play behaviour. Throughout the day, the emphasis is firmly upon the social.

Pod members may spend as much as two-thirds of their time foraging for food, depending upon the time of year and the relative abundance or scarcity of prey species. Individuals tend to spread out, often over areas of several kilometres. By vocalising to keep in touch and working co-operatively together, a pod can systematically sweep an area of fish.

If the pod decides to move on to a new feeding site, no time is lost and pod members will often travel in tight formation, moving at speeds of around 13-16kmph (8-10mph). A pod can comfortably cover 80km (50m) in a day and distances of 120-160 km (75-100 miles) are not uncommon.

After feeding, the pod may decide to rest awhile. Orcas, in common with all other species of whale and dolphin, are voluntary breathers. In humans and most mammals, breathing is an unconscious activity, but whales must consciously surface to take regular breaths. This requirement dictates that orcas cannot sleep as such; instead, pod members group tightly together forming a line of animals that dives and surfaces as a unit. Young calves tend to stay close to their mother, often physically touching and appearing to breathe in unison. Sometimes one or two orcas will 'keep watch' over the resting pod as it moves, slowly and peacefully at the surface.

Orcas, like many other highly successful predators, place great emphasis upon socialising and playing. Play seems to assume an important role in orca society, probably helping individuals to bond and allowing juveniles to learn social and sexual behaviours from older pod members. The action tends to be fast and furious and can take the form of breaching and spy-hopping above the water and rolling and tail thrashing at the surface. Calves appear to delight in playing 'chase me Charlie' or rolling playfully over their mother's or sibling's bodies. Objects such as floating kelp may be employed: an orca may drape a long strand over its body whilst diving and swimming energetically. An unusual form of social behaviour has been observed at Robson Bight, in Johnstone Strait, British Columbia. Orcas from the Northern resident community frequently visit particular beaches in the Bight, where they enter the shallows and rub their bodies vigorously over the small, smooth pebbles at the shoreline.

In late summer or early autumn, the ultimate in orca social behaviour occurs, when several pods get together, to form a 'superpod' of maybe 100-200 whales. Such occasions are marked by much excitement and vocalising and researchers believe that these highly sociable gatherings also provide the ideal forum for mating to take place.

Intelligence

Are orcas intelligent? Defining another species' intelligence is at best an inexact science, since commonly-applied indicators of human intelligence may be highly inappropriate when applied to another species. However, researchers attempting to define and quantify 'intelligence' agree that there are several criteria which may be measured objectively, and which may be considered alongside other, more subjective factors, such as social behaviour. Two physiological indicators are brain volume and brain convolutions and orcas score highly on both counts. The brain of an adult orca can weigh up to 6kgs (13lbs) and, whilst brain size is not in itself an indicator of intelligence, the fact that it is structurally complex is significant.

The cerebral hemispheres - the area of the brain believed to deal with advanced mental processes in humans - are exceptionally well developed in orcas, and the cerebral cortex is highly convoluted. A further indicator is the brain weight to spinal cord ratio. In humans, this ratio is around 50:1, in apes 8:1 and in horses about 3:1. Bottlenose dolphins (close cousins to orcas) compare favourably to homo sapiens, with a ratio of 40:1.

Echolocation, communication and dialect

In the realm of the orca, sound rather than sight is the dominant sense. Studies have revealed that orcas possess excellent vision, both above and below water. However, underwater, shifting patterns of light and shadow, combined with wave action and turbid waters, may render sight unreliable and sound becomes the primary tool, both for hunting and for social interaction. Orcas use a highly sophisticated system known as sonar or echolocation when hunting their prey. The orca unleashes a rapid series of high-pitched clicks which are directed through the fatty tissue in the forehead known as the melon. By listening to the echoes which reflect off the body of prey species in its path, the orca is able to form an 'acoustic image', or sound picture, which precisely locates and identifies its prey, even in the darkest waters.

Orcas communicate via a series of pure-tone, bird-like whistles, grunts, squeaks and harsh, shrieking calls, which vary depending on the context. If individuals are routinely foraging or travelling, calls are basically stereotyped, with only slight variations in duration and pitch. However, some situations create a great deal of excitement, such as when two pods meet after a separation period. At such times, vocal activity is often intense and the calls produced are shorter in duration, higher in pitch and rapidly repeated. When playing, both adults and calves emit an array of squeaks, squeals and whistles.

Sound carries much further in water than in air, and calls may travel as far as 10 km (6.2 miles) underwater, enabling individuals to keep in vocal contact with other pod members whilst foraging, even when out of visual range.

Researchers use underwater microphones (hydrophones) to eavesdrop on the rich acoustic world of the orca. In the late 1970's John Ford discovered that each orca pod has its own distinctive call repertoire, known as a dialect. Dialects are extremely rare in the animal kingdom, only orcas and humans share dialects among individuals living in the same area.

Young orcas apparently learn pod dialect by mimicking their mothers and other pod members. It seems likely that dialect serves as an 'acoustic membership card', readily identifying pod members and helping to preserve the social cohesion of the group. It is also possible that dialect plays a role in mating behaviour. Perhaps orcas consciously choose a mate who communicates in a different dialect, (therefore a member of a different pod), thus helping to avoid inbreeding.⁴

Orca studies in other parts of the world

Orcas are widely-distributed in every ocean of the world and thrive in a wide variety of habitats. However, they are more concentrated in cooler waters, particularly toward the polar regions and may even enter areas of ice floe in search of prey. The largest concentrations are found in the waters off Iceland, Norway, Alaska, British Columbia, northern Japan and Antarctica. Elsewhere, sightings are more sporadic.

Different populations may vary subtly in appearance, for example orcas in the Antarctic are smaller and have a yellowish hue. Off Australia and New Zealand, orcas tend towards dark purplish-brown, whilst off Mexico, the greyish saddle patch behind the dorsal fin is much plainer and more featureless than in resident populations off British Columbia.

Most of what we know about the habits and social behaviour of orcas in the wild is derived from more than a quarter of a century of study in British Columbia and Washington State. In recent years, scientists and researchers in other parts of the world have also begun to study local orca populations, inspired by the groundbreaking work of Michael Bigg and his colleagues. In the mid-80's, researchers in Alaska began photo-identification studies and found social composition and behaviour to be very similar to the BC communities.

In Argentina, researchers have witnessed male orcas intentionally stranding themselves in order to seize sealion prey; and off the Crozet Islands in the Indian Ocean, researchers have documented that females routinely teach their calves deliberate stranding techniques as part of hunting behaviour.⁵

Fact file on orcas

Order: Cetacea (Whales, dolphins and porpoises).

Family: Delphinidae

Species: *Orcinus orca*

Common name: Killer whale, orca

Distribution: All oceans of the world, particularly cooler temperate and polar regions. The orca is one of the most wide-ranging mammals on earth.

Appearance: Robust body; bluntly tapered head; large, paddle-shaped flippers.

Colouration: Predominantly jet-black, with brilliant white chest and chin and distinctive white patch behind each eye. Grey saddle patch behind the dorsal fin.

Dorsal Fin: The most distinguishing feature. Up to 1.8m (6ft) in males, 0.9m (3 ft) in females. Varies widely in shape and may have distinctive nicks and scars on the trailing edge.

Length: Males average 7 - 8 metres (23 - 26.2 ft), females around 6 metres (19.7 ft).

Average Weight: Males: 3,600 - 5,500 kg (3.5 - 5.4 tons); females 1,350 - 3,650 kg (1.3 - 3.6 tons).

Lifespan in the wild: Males average 29.2 years, maximum 50-60 years. Females average 50.2 years, maximum 80-90 years.

Sexual maturity: Between the age of 10-15 years for both sexes. Average length of males at sexual maturity ranges between 5.2 - 6.2m; females, 4.6 - 5.4m.

Reproduction: Calves are typically born at five-year intervals, following a 17-month gestation period. New-born calves measure 2.0 - 2.5 m (6.5 - 8.2ft) and weigh around 200 kg (441 lbs).

Latest news, November 1999

Northern residents:

Whilst the northern resident population of British Columbia appears to be relatively stable in terms of numbers (around 200 members since at least as far back as 1993), this population still faces many threats. Commercial fish farms have proliferated in the area in recent years, and Hanson Island is currently threatened by logging. In addition, there have been substantial increases in boat traffic (WW boats, sports fishing, kayak tours, cruise ships, freighters, tugs) over the past decade and these have collectively encroached upon the orcas' core habitat and the ability of the whales to lead normal lives.

ORCALAB, on Hanson Island, carries out long-term acoustic and visual monitoring of the northern residents. Their research has revealed that boat noise disturbs communication amongst orcas and is also likely to influence traditional patterns of habitat use. For example, during August 1999, the orcas disappeared from their core area in Johnstone Strait and instead, spent time off Port Hardy and elsewhere, only returning to their core area during October/November. It is too early to tell whether this behaviour was in response to heavy boat traffic during the summer months, but this must be considered a possible contributory factor. (Source: ORCALAB website www.orcalab.org).

WDCS also funds the work of Alexandra Morton, who reported that some northern residents were seen 50 miles off the west coast of Vancouver Island, far off their normal summer range. There were also reports of misplaced runs of salmon, and salmon arriving up to two months late in their passage through Johnstone Strait. Whilst mammal-eating transients still come through the Broughton archipelago where Alexandra lives, the fish-eating residents seem to have abandoned this area, despite a relatively plentiful supply of chinook salmon, their favourite food. Commercial salmon farms in the area may be one reason – some of the salmon farmers are still using acoustic devices to deter marine mammals from raiding their salmon pens. These devices broadcast a sound at levels which are probably painful to the orcas.

Southern residents

In April 1999, the Canadian Government listed the orcas of the southern resident community (J, K and L pods) as threatened. The Committee made this decision on the Status of Endangered Wildlife (CSEW) in Canada, who based their decision on the findings of whale researcher, Robin Baird. Further, the CSEW listed ALL orcas in Canadian waters as vulnerable. Although Canada's definition of threatened does not carry the same regulatory weight as does the U.S. Endangered Species Act (ESA), it does ensure that the whales get special consideration when regional assessments are made and also makes their protection a priority for federal funding.

This move has prompted Pacific Northwest cetacean researchers (who believe that these orcas would probably also qualify as threatened under the U.S. ESA) to consider a formal petition for ESA listing. The Progressive Animal Welfare Society (PAWS) announced in November 1999 that it was seeking State protection for orcas in Washington State waters. If state officials agree that the idea has merit, further scientific study and soliciting of public input would begin, a process likely to take at least a year. A Washington State listing of orcas as threatened or endangered would further add weight to reviews of their status and habitat requirements.

Amongst the primary reasons for listing the southern residents as threatened is the fact that this population has failed to show sustained growth over the last quarter century. In fact, numbers are falling drastically. In November 1999, there were 83 orcas in J, K and L pods, compared to 98 in 1995. Eight orcas died during 1999, including a female in her mid-20s (L51 Nootka), and her new calf (L97, Tweak), who died shortly after losing his mother. So far, in 1999, there have only been 2 successful births.

Further, members of J pod are known to be contaminated with extremely high levels of toxins. Ken Balcomb, founder of the Center for Whale Research, and toxins expert, Dr. Peter Ross, have both expressed their concern. Peter Ross commented that “results suggest that contaminant levels may be high enough in some of the marine mammals... to affect reproduction, immune function and endocrine function and that the killer whale population may be at particular risk.”

Orcas and seals increase their contaminant burdens by consuming contaminated prey. Males tend to accumulate higher burdens as they age. Adult males in J pod, for example, carry enormous levels of PCBs. Females tend to “off-load” some of their toxins to their calves, via both the placenta, and via their milk. Some researchers believe this to be a factor in calf mortality. Although resident orcas prefer salmon, shortages of salmon species have forced them to shift to rockfish and bottomfish, which carry even higher PCB levels than salmon. Some salmon stocks have just been listed as threatened in the U.S. Finally, the southern resident’s home waters are amongst the highest levels of boat-based whale watching in the world. Balcomb is calling for the both U.S. and Canadian governments to address the issues of pollution and habitat degradation as a priority.

(Source: Cethus, newsletter of the Whale Museum, WA Fall/Winter 1999. Website www.whale-museum.org)

Section 3 Captivity: a one-way ticket

Orca captures have largely taken place in the following areas of the world:

1. Washington State (WA), USA/ British Columbia (BA), Canada
2. Iceland
3. Japan
4. Other regions, including California and Argentina.⁶

Capture sites and methods: 'The capture years'

Early captures were characterised by a heady combination of opportunism, recklessness and ineptitude. They were entirely unregulated and some orcas were captured after becoming accidentally entangled in fishing nets. Experimental capture methods included the use of harpoons, hoop nets, gill and purse seine nets.

In 1961, the very first orca to be captured was taken in Californian waters. A small female, she was easily corralled with boats and nets and was taken to Marineland of the Pacific, Los Angeles. She survived only one day. She died after repeatedly swimming around her pool at high speed, ramming into the sides of the tank. In 1962, an orca was hoop-netted in Puget Sound, WA, but the line caught in the propeller. At least 11 orcas have died during bungled capture attempts.

1. 1964 -1976 Washington State / British Columbia: Between 275-307 orcas were captured, of which 56 were taken into captivity (53 died in captivity, 1 escaped after 2.3 years, only 2 - Corky and Lolita - are still alive.)

The captive orca industry was still very much in its infancy and undergoing a steep learning curve, but collectors with some experience of marine mammals were beginning to replace inexperienced collectors and fishermen.

After several false starts, collectors such as Don Goldsberry (Sea World) and Ted Griffin (Seattle Public Aquarium) discovered an almost foolproof method of capturing orcas. The key was to ambush the whales as they swam into harbours or narrow, shallow water inlets. By stringing a net across the mouth of the inlet, the entire pod could effectively be entrapped.

The main advantage of taking so many orcas at a time, was that a selection of the best individuals could be made, with younger and male animals being preferred. If the whales were reluctant to enter the inlet, Goldsberry was not adverse to using seal bombs as a gentle persuader.

Collectors discovered two further, unexpected factors in their favour: firstly, orcas' strong family instinct meant that the pod would remain tightly bunched together for support. Secondly, most orcas respect nets and despite their size and strength, rarely attempt to barge through or jump over them. Occasionally, an individual, often an adult male, would escape the nets, but rarely could he persuade his family to leave other members and follow him to safety.⁷

This method of capture was to decimate a pod known as the A5s from the northern resident community. This pod was believed originally to have had about 19 members, before it was captured twice, in April 1968 and again in December 1969, both times in Pender Harbour, north-west of Vancouver and, ironically, about 200km (125 miles) from their normal home range. Altogether, 12 pod members were taken into captivity. but only one whale is still alive today - Corky at Sea World, San Diego. Her pod mate, Yaka, died at Marine World Africa, Redwood City, CA in late October 1997. As captures increased and more orcas were taken into captivity, the capture industry became driven by a new imperative: to provide a mate or companions for whales already in captivity.

Some pods, particularly those in the southern resident community, suffered capture on two or three occasions. K pod, for example was captured on three occasions. In February 1967, the entire pod was captured at Yukon Harbour, WA: five were taken into

captivity, three died during the capture and the rest were released. K pod was captured again in August 1970, when a group of around 85 whales, comprising the entire southern resident community (J, K and L pods), was driven into Penn Cove, WA. Goldsberry and Griffin, under contract to Sea World, were responsible for the captures. Eight orcas were taken into captivity on this occasion and at least four orcas (including three calves) were accidentally drowned in the nets.

The bodies of the four orcas later washed to shore. Their bodies had been slit open and weighed down with steel chains. After months of denial, Goldsberry and Griffin admitted that they had been behind the capture and had gone out, at dead of night, towed the corpses into the Sound and weighed them down with chains, hoping that they would sink without trace.

Nootka II, an adult female member of K pod, managed to avoid capture during these first two attempts. However, she was finally caught in August 1973 and taken to Sealand of the Pacific, Victoria, earmarked as a potential mate for Haida, a male captured in October 1968. Nootka II died nine months later of a ruptured aorta.

Holding areas:

Once captured, orcas tended to be held at the capture site in outdoor pens, usually roughly netted into a bay or harbour until they could be transported to the purchasing facility. Researchers have recorded the intense vocalisations made by entrapped orcas, describing 'loud, strident screams'. Sometimes other pod members would linger helplessly just beyond the netted zones, unable to assist their pod members to escape.

In 1965, Namu, one of the first orcas to be captured, was towed over 400 miles in a floating pen to Seattle. A cow and two calves, believed to be his mother and siblings, vocalised to the captive and followed the flotilla for four days, covering around 240 km (150 miles).

Some orcas died in the holding pens. In March 1970, a transient pod of five orcas were captured in Pedder Bay, off southern Vancouver Island. Two females, Nootka and an albino, Chimo, were immediately transported to Sealand, but the other three whales staged a hunger-strike which lasted over 75 days. After a female died of malnutrition, the other two began eating and were released without Sealand's permission before they could be transported to a marine park buyer in Texas.⁸

Effects of capture upon remaining animals:

No pods have been completely eliminated by capture, but a number of subpods have been wiped out. Transient pods, being much smaller, were particularly susceptible to decimation by capture. The captors rarely considered the effects of capture upon those animals left in the pod. However, in recent years, researchers such as Peter Olesiuk have studied the likely impact of capture upon remaining pod members and commented that 'the population is more sensitive to removal of juveniles than mature animals. This is due to the high reproductive value of juveniles compared to mature females... moreover the removal of one animal may adversely affect the survival of other animals. For example the death (or capture) of females might also increase the likelihood of the death of their dependent offspring.'⁹

The population growth rate for orcas is low, estimated at only around three percent per year. Researchers, such as Kenneth Balcomb of the Centre for Whale Research, have discovered that the southern resident community suffered far greater losses than the northern residents, losing at least 34 of its members during capture attempts.

A census in November 1999 showed that the southern residents number 83 members. This population is in decline as, for the past few years, the mortality rate has exceeded the birth rate. Whilst up from the 68 animals counted in 1976, the 1999 figure marks a decline from the 1995 census of 98 animals. In 1997, 19 members of L pod were "trapped" in narrow Dyes Inlet for a month. This sort of incident can only have a negative effect upon such a vulnerable population.

It is also important to note that current deaths are involving orcas of all ages, not just older animals. Even young adult females - usually considered virtually "immortal" - are dying (see end of Section 2). Further research needs to be carried out to examine the reasons for this unusual pattern, although it is possible that the community's decimation during capture operations is partly responsible for abnormal population growth.¹⁰

Legislation:

Captures had been largely unregulated, but the August 1970 capture of the entire Washington-southern Vancouver resident orca population galvanised both public and legislative action. In 1970, laws were passed in Canada which controlled the harassment, capture and killing of orcas in its waters and stipulated that capture permits would be restricted to Canadian captors. The following year (1971), Washington State also passed laws regulating captures, requiring permits and state officials to oversee humane handling of orcas after capture.

In 1972, the Marine Mammal Protection Act (MMPA) was passed in the USA and extended federal protection to orcas. The taking (defined as 'to hunt, capture, kill or harass') of any marine mammal in US waters or by US citizens elsewhere in the world was prohibited, except by special permit issued by the National Marine Fisheries Service (NMFS). None of the three surviving orcas taken from BC/WA waters (i.e. Corky, Yaka and Lolita) are covered by the auspices of the MMPA since all were captured pre-1972, but other captives held in North American facilities come under its jurisdiction.

The last capture in BC waters took place in 1975, and captures in WA ceased abruptly in 1976. Growing public outrage at the level of captures, capture methods and deaths during capture was further stoked by what was regarded as arrogance and a flagrant disregard for public opinion on the part of the collectors. In February 1976, right under the noses of delegates attending a symposium on killer whales, Goldsberry and Griffin (subsequently revealed to be under contract to Sea World) captured six orcas in Budd Inlet, Puget Sound. Don Goldsberry was observed using seal bombs and aircraft to 'buzz' the whales, herding them into his nets. Two orcas were taken on this occasion.

The resulting uproar led to Washington State imposing a ban on all future captures in its waters. Ralph Munro - now Secretary of State, but at the time Natural Resources Aide to State Governor Dan Evans played a large part in securing this ban. He described the Budd Inlet capture as 'like a war .. [the seal bombs were being let off with] explosion after explosion.' It was 'one of the most gruesome things I have ever seen.' Washington State filed a law suit protesting at the captures, since the use of seal bombs and aircraft to 'buzz' the whales violated the capture permit. Sea World's involvement with the captures was only revealed at this stage. The permit violations - along with the threat that other dubious capture practices might be exposed - prompted Sea World to press for an out-of-court settlement.

This was granted only after Sea World reluctantly agreed to release the two orcas taken at Budd Inlet and to end all orca captures in Washington State waters. Marine parks requesting capture permits since then have met with such a barrage of public disapproval that it seems highly unlikely that any more captures will be permitted.

Collectors were forced to turn their attention to other waters for future captures. A permit application addressed to NMFS dated 1973 indicates that Sea World considered 'as its first choice, the location of Canadian offshore waters in and around Vancouver Island north, on through coastal Alaskan waters. Second choice would be coastal waters off the north-western United states. Third choice would be offshore Alaskan or Mexican waters.' Permit number 22 was duly issued. But, by August 1976 and mindful of the fact that North American waters were now effectively closed to further captures, Sea World requested a modification to permit number 22, to allow it to capture or purchase orcas from additional collecting areas -including Iceland, Norway, Greenland, Japan, England and South American and African Countries. The net was spreading wider.

2. Iceland: 1976 -1989 A total of 64 orcas were captured, of which 55 were taken into captivity (34 are now dead, 21 survive.)

The Icelandic government initially welcomed overtures from Sea World and other marine parks eager to exploit orca populations off Iceland for captivity purposes. For several decades, orcas had been regarded as a nuisance, supposedly competing with fishermen for herring stocks. Between 1955 and 1972, Norwegian whalers had taken around 300 orcas. Orcas did not enjoy a positive public profile and the opportunity to make some money out of the captures and, at the same time, appease the powerful fishing lobby, seemed heaven-sent. From 1975, capture operations and the issue of permits was regulated by the Icelandic Ministry of Fisheries.

A consortium of collectors dominated capture activities off Iceland. An advance team would obtain capture permits from the Icelandic government. Reportedly, sums of up to \$1 million would change hands in order to secure capture permits. Once these had been obtained, collectors would move in. After the Puget Sound fiasco of 1976, Sea World wanted to keep a much lower profile, but Sea World's Don Goldsberry agreed to help two less experienced collectors, Jon Gunnarsson of Saedyrasafnid Aquarium in Iceland and W.H. Dudok van Heel from Dolfinarium Harderwijk in Holland. The trio adapted capture techniques using purse seine nets, a technique which had met with some success in Washington State and was ideally suited to their purpose in the deep Icelandic offshore waters.

Precise timing was involved but, once encircled by the nets, the orcas became docile and made little attempt to escape. Fifty-five orcas were caught in this manner from the mid-1970s. The team deliberately concentrated on capturing juveniles, since they were easier to handle and, it was thought, might adapt better to captivity. Orcas as young as two years of age were routinely taken.

Holding Areas:

In the early years, captured orcas were kept in floating pens located in Grindavik harbour and were shipped abroad after a few days or weeks. Sea World's 1978 permit application describes the procedure 'after capture, the whales are transported to a safe harbour and placed in specially constructed bay pens.. from this point, transportation is routine to final destination.' Other captives had to endure a journey of between four and 18 hours to a purpose-built holding facility at Hafnarfjord Marine Zoo, Saedyrasafnid. It is rumoured that the Saedyrasafnid police department was 'paid off' in order to protect Sea World's interests.

The holding pool at Saedyrasafnid was concrete, measuring 20m by 15m (66 x 49ft) and only 6m (20ft) deep. Originally, the pool had no roof, but after an incident in 1979, when five orcas being held pending shipment to Japan developed severe frostbite, (two orcas died of secondary pneumonia as a direct result, the other three were released), a roof was hastily added. Sometimes orcas could be kept at Saedyrasafnid for as long as two years, pending sales to marine parks world-wide. A third holding option involved the whales being flown directly to Dudok van Heel's facility, Dolfinarium Harderwijk, in Holland.¹¹

By 1982, Goldsberry, van Heel and Gunnarsson had officially retired from capturing, leaving Helgi Jonasson of the FAUNA company to mastermind captures between 1983 - 1989. It has been alleged that the FAUNA Co. was nothing more than a 'cover', enabling Sea World to covertly continue capture operations.

The last Icelandic captures were in October 1989. Since then, a groundswell of public sympathy and efforts by conservation groups have currently halted further captures. In 1990 and 1991, Jonasson of FAUNA applied for capture permits but was refused on both occasions by the Minister of Fisheries. Further permit applications made as recently as 1994 have also been refused.

3. Japan: 1972 - to date. 28 orcas captured, of which 19 were taken into captivity (14 are now dead, 5 survive) Please see footnote⁽¹⁾

To date, no marine park outside Japan has purchased orcas taken from Japanese waters. Captures for dolphinariums have been largely unregulated, being carried out by inexperienced local fishermen using two main methods - harpooning, and herding the animals into a net. Capture methods can be very crude - attempts to wrestle the whales into submission by riding them 'rodeo-style' have been reported. Several orcas have died shortly after capture: for example, three orcas captured off Japan in 1979 had all died within three months of capture. The better Japanese marine parks, perhaps wary of being tainted by association with 'iruka no oikomi ryo', the annual drive fishery responsible for the slaughter of thousands of small whales and dolphins, have increasingly turned to Iceland and North America for their orcas.

However, on February 7th, 1997, a group of ten orcas - believed to be transients - were taken at Hatajiri Bay, near Taiji, Wakayama prefecture. Fishermen from the Isana Fishing Co-operative first spotted the group of orcas, including two calves, about 50km off the Japanese coast. They sent eight fast boats out to encircle the pod and, by using water bombs and banging on iron rods to create a barrage of noise, succeeded in driving the group into the bay.

Holding areas:

The ten whales were imprisoned in the bay via a series of strong nets. On February 9th, five orcas were sold by tender. Representatives of several Japanese marine parks visited the area and marine park personnel examined and sexed the whales. Three parks - Izu-Mito Sea Paradise, Shirahama Adventure World and the Taiji Whale Museum - successfully bid for five of the orcas. It is rumoured that they were sold for 30 million Japanese yen apiece. The pod had been captured under so-called 'academic permit' issued by the National Fisheries Agency in Japan and, since this permit allowed the taking of only five orcas, the remaining animals - three males and two females - were released on February 10th.

That same day, the purchased animals were roughly netted and dispatched to their new owners. Video footage taken at the scene documents the rough handling that the whales were subjected to as they were prepared for transportation, and records also the anguished vocalisations of the whales as they became separated from other pod members. One female (approx. 4.5m long) was sent to the nearby Taiji Whale Museum; a second female, (approx. 5.4m) also went initially to the Taiji Whale Museum, but was later transported to her final destination: Izu-Mito Sea Paradise. The three remaining animals - an adult male (4.7m and 1350 kg in weight), an adult female (6.3m and 5500kg) and a young male calf (approx. 4-5 years old, 3.75m long and 700kg) - were all sent to Shirahama Adventure World.

Three of the whales (including the females sent to the Taiji Whale Museum) were hoisted by crane onto trailer trucks and taken by road, whilst the remaining two were placed between two boats and by this means transported to Shirahama Adventure World. Observers noted the poor condition of the male calf which, even whilst still in the Bay, appeared very sickly.

Adapting to Captivity

Orca experts - including Dr Paul Spong - joined Japanese animal welfare groups (such as IKAN, JAVA and the Elsa Nature Conservancy) in their attempt to monitor the post-capture condition of the five orcas. In March 1998, they visited some of the captives to assess their condition and express their concern to the relevant authorities. The female held at Izu-Mito Sea Paradise prompted especial concern, since she was not eating properly and risked becoming dehydrated/malnourished. She exhibited depressions behind the blowhole which can be characteristic of malnutrition. A second visit in late May 1998, revealed her to have gained at least some weight; she was now reported to be eating around 50 kg of fish per day.

However, the female held at Taiji Whale Museum, although reported in May 1997 to be eating around 46kg of mackerel per day (about 2.5% of body weight, almost enough to maintain it) was making what Paul Spong described as a "bizarre twisting movement with her body every minute or two". He went on to report that "her appearance worried me too, as there were a series of parallel ridges running across her back behind the blowhole. Possibly they may have resulted from the skin filling out after she began eating." She was still being kept in the same small 10m square pen inside the lagoon at the Museum which had been her home since capture.

The female held at Shirahama had consistently refused to eat by herself and was being force-fed small amounts of fish (around 10kg, barely enough to sustain life). An official of the Fisheries Agency told Spong that he was "emotionally concerned" about the condition of this female. She had reportedly been pregnant when captured and had (again, reportedly) suffered a miscarriage in April 1997. Spong was unable to ascertain the condition of the two males held at Shirahama, but believed that they were both eating.

Then, on June 14th, 1997, the male calf at Shirahama died, after only 130 days in captivity. Three days later, the adult female at Shirahama died. Weakened by malnutrition and unable even to float by herself, she had spent her final days supported by a canvas sling in a half empty tank (staff at Shirahama had decreased the water in the pool by half in a bid to prevent her from "drowning".) Shirahama has announced that internal organs from the two dead orcas will be sent for analysis at the Prefectural Medical College at Wakayama. Bacterial infection is one possibility to be investigated. Logically, the trauma of capture, combined with the failure of the orcas to eat properly, must have played a significant role in their premature deaths.

Update - March 1999:

Orca expert Paul Spong spent a fortnight in Japan during February 1999. During his visit, he saw all three survivors from the capture of orcas at Taiji two years ago. Here is Paul's account: "All 3 orcas looked to be in fairly good condition now, especially the female being held at the Taiji Whale Museum. She looked great... energetic & alert, breath & body full, dorsal fin still straight. She is in the largest part of the lagoon at TWM... it's about 130m across, flushed by sea water (there are fish, plants, sand & rocks, the depth varies but is sufficient for her to dive on one side, disappear from view & surface on the other). She had two dolphins for company & was breathing synchronously with one of them. I'm not sure why, but she has not been put together with the other orca, Nami chan, though she spends time facing Nami chan's enclosure. She was hungry, even after feeding, & appears hooked on fish now (you'll recall that she is a transient orca, i.e. was previously accustomed to eating marine mammals). She is not performing (is being used for "research").

The other two survivors are not performing yet either, though the female at Izu Mito Sea Paradise is clearly on display, as she is in the same pool as Tanouk (now called Yamato). They looked to be in about the same condition to me, i.e. both maybe ok but not as good as the TWM female. The dorsal fins of both are bending. The IMSP female seemed active, was definitely hungry even after feeding (picking up scraps of fish off the bottom). Her body looks ok but isn't quite as full as the TWM female. She seemed alert, was interested in the spectators, though not as intently so as the TWM female.

The male at SAW was confined in a tank about 8m square, behind the show tank. There's another connected space about 8m x 15m beside it. Those two spaces hold 4 orcas, including the male Goro, whose dorsal fin is now completely bent over. The Taiji survivor at SAW isn't performing yet (may soon be) though he is receiving "husbandry" training (e.g. to provide urine samples). When I saw him, he was mostly swimming in circles with fairly typical respiration patterns (long dive followed by several shorter ones). When he stopped swimming he arched his body rhythmically several times in a manner that was reminiscent of the TWM female two years ago, 6 weeks after capture. In any event, he looked ok (maybe about as ok as an orca is in a tiny concrete tank) & his breathing sounded ok. He was hungry after feeding

too. My overall impression was that all three Taiji survivors are likely to live for some time... meaning there's still a chance of returning them to the ocean & their family.“

Implications

This capture - and its aftermath - has important implications for several reasons: firstly, this was the first pod of orcas to be sighted off the Taiji coast for several years (some sources say for as long as a decade). Secondly, no accurate scientific information exists on Japan's orca population, but it is likely that the population has never fully recovered from large-scale decimation during Japanese whaling, with orca deaths peaking during the mid-1960s. Even less is known of population parameters for transient orcas (the so-called 'Taiji Five' are believed to be transients) and so this capture has alarmed orca researchers, who fear that possibly one of the last remaining transient pods in Japanese waters has been decimated by the captivity industry.

The Japanese National Fisheries Agency maintains that the International Whaling Commission's moratorium on whaling does not apply to orcas and that, in any case, it has the authority to allow the capture of the orcas under international quotas set to catch whales for 'scientific study'. However, many nations feel that Japan exploits the 'research' loophole to continue whaling - and the capture of whales for commercial purposes - with impunity. Where individuals apply for permission to capture orcas for 'scientific research', the Fisheries Agency can allow capture after consultation. The permit under which the 'Taiji Five' were captured was issued to Taiji fishermen by the JFA as far back as 1992, following a 1991 application by five Japanese marine parks (including the three which purchased orcas) to capture orcas for 'research purposes'.

However, this permit lay gathering dust until February 1997, since no orca pods had been sighted in the intervening years. International condemnation of the captures has been rapid, with conservation and animal-welfare groups joining forces to demonstrate their anger and concern to the Japanese authorities. Video footage of the orcas, taken at Hatajiri Bay, has been widely distributed and the capture received international media coverage. Well-orchestrated campaigns have been mounted, using letter-writing, fax and internet technology and orca experts have visited the captives to assess their condition and express their concern to the relevant authorities.

Potential Future Capture Sites for Orcas

The recent capture at Taiji may set a dangerous precedent, sparking fears that other countries may be encouraged to attempt orca captures in the future. For example, Argentina has only taken a handful of orcas to date, but during 1996, an Argentine marine park lobbied its government very hard to issue capture permits allowing four more wild orcas to be taken for display purposes. Conservation groups, headed by the Cethus Foundation, (which is funded by WDCCS), have so far successfully campaigned against the issue of new capture permits.

On March 14th 1999, officials from the Nagoya Port Aquarium, Japan, visited Norway to negotiate the capture of six orcas for their facility. Perhaps the Japanese had believed that captures in a remote part of Norway (a fellow whaling nation) would pass unnoticed by the international community. However, once news of their intentions leaked out, national and international outrage persuaded the Japanese to abandon their plans. The Norwegian Trade Council described opposition to the captures as "overwhelming". It seems that both the Japanese and the Norwegians completely underestimated the strength of public feeling against orca captures. However, Nagoya Port Aquarium's recently announced expansion project reportedly requires the capture or purchase of up to 6 orcas by 2001.

Russia is another potential capture site for orcas. In the mid 1990s, the Russian TINRO Institute, based in Vladivostok, tried repeatedly spent around US \$1 million in their bid to capture orcas in the Sea of Okhotsk, with the intention of selling them to Japan. However, due to technical details, they were unable to capture a single orca and the Taiji captures in February 1997 temporarily stalled any capture attempts in Russian waters.

However, during the summer of 1999, belugas were live captured off Russia. At least 16 animals were exported to marine parks in Canada and Japan. Marineland, Canada now

has 12 belugas (3 adult males, 9 juvenile females). They have never previously kept this species captive. Since a captive orca could be worth up to \$600,000 to the Russians, the possibility of orcas being captured off Kamchatka, eastern Russia, should not be dismissed. Indeed, rumours have circulated during 1999, that TINRO is once again planning such captures for the international display industry. A further rumoured potential capture site is off Iceland.

A new facility in Valencia, Spain, was rumoured during 1999 to be seeking to acquire up to six orcas.

Transport from the wild: 'Clocking up the miles'

Moving orcas from A to B has exercised the minds of collectors and marine parks since the early days of capture. With the exception of Sealand of the Pacific, Victoria, BC and Seattle Aquarium, WA, both of which were geographically very close to capture sites, the translocation of orcas was an unavoidable occurrence. Orcas captured in North American or Icelandic waters had to be transported - usually by air, but sometimes by road or by sea - often several thousand kilometres to purchasing marine parks in North America, Canada, Europe and Japan.

The logistics of transporting a several-ton aquatic mammal over such long distances, presented a major challenge. Collectors such as Dudok van Heel favoured capturing younger animals, since it was believed that they would be easier to handle during transport and might also fare better in captivity. Accordingly, calves as young as two years old were taken, especially off Iceland. He commented that 'such an animal does not weigh more than 300kg and is, in fact, just a large dolphin to handle'¹²

The whole experience of transportation, especially if it came soon after a traumatic capture, could not help but be an intensely stressful experience for the orca. Before the mid- 1970s, orcas were secured in a sling during long haul flights. Van Heel admitted that '[the sling] has been used successfully but also with sad losses on long distance transport.' In August 1968, a young male named Tula, captured in BC waters, was transported by air using the sling method to Harderwijk, Holland. The journey lasted 68 hours: 33 hours longer than anticipated. Tula survived the journey but died only three months later.

From around 1975, airlines began to charge on the basis of volume rather than weight and the sling method was abandoned in favour of transporting orcas in specially constructed steel boxes filled with water. The fact that two-thirds of the animal's weight could be supported by water eased some of the stress of the journey. Crushed ice was also used to prevent the orca overheating. In recent years, marine parks have been obliged to comply with guidelines set by the International Air Transport Association (IATA) when transporting orcas by air.

Van Heel claims that the after-effects of such transportation are minimal: 'after a journey of 15 - 20 hours, the animals swim away as if they had only had a medical check'. However, even the most meticulously planned journey can fall victim to unforeseen delays or bad weather.

Transport from tank to tank:

As public and federal opposition to captures mounted during the 1970s and 80s, permits for wild capture became increasingly difficult to obtain. Many marine parks were forced to consider importing orcas from other facilities in order to satisfy their need for new animals.

Orcas are routinely moved from park to park, often clocking up distances of several thousand kilometres entirely to suit the expediency of the marine parks. Of the 134 orcas taken from the wild, most have flown at least once: 73 (over half) were forced to undergo at least one 3,200 km (2,000 mile) journey and around 20 have taken two or more such journeys.

- An orca called Nootka, captured in 1970 in BC, lived in five different marine parks during her 20 years in captivity. She was flown from a facility in Canada to California, then to Texas, back to Canada, before finally being exported to Sea World, San Diego, logging up a total of more than 8,000 air miles.
- But Nootka's travels were as nothing compared to the experience of King, an Icelandic orca captured in 1979. He travelled 19,300 km (12,000 miles) between Iceland, northern Europe, Canada and finally died in 1983 at Kamogawa Sea World in Japan, less than four years after capture.
- In February 1994, a non-stop flight transporting a male named Ulysses from Barcelona to Sea World, San Diego met with unexpected delays in unloading, resulting in a 17 hour long ordeal.

- On 19th November, 1995, a young male named Tanouk was airlifted from Marineland, France to Izu-Mito Sea Paradise, Japan. Observers reported that his body was 'terribly damaged' by transportation, with several wounds on his abdomen and dorsal fin clearly visible.
- However, not all journeys, even in recent years, were by air. In 1979, an Icelandic female orca named Katina was moved by truck under cover of darkness from Marineland, Ontario, across the Canadian border to her new home at Sea World, Cleveland, Ohio.¹³

Sea World has also been criticised for its policy of constantly shifting orcas between its four parks (in California, Florida, Texas and Ohio) to suit its breeding requirements and also to stock its Ohio facility, which is only open during the summer months. Journeys between parks are between 1,600 - 4,000 km (1,000 - 2,500 miles) and orcas can be moved as often as twice a year.

'Orca laundering' - the big whitewash?

Larger marine parks, such as Sea World, with an eye to public relations, became increasingly reluctant to be associated directly with wild captures, given their negative connotations and capture-related mortalities. Obtaining US import permits for wild-caught orcas had also become much more difficult. Since it, therefore, proved easier to import orcas to the US from other marine parks than directly from the wild, an 'arrangement' was developed, whereby orcas would be captured - directly or indirectly - by the final receiving facility. For example, until the late 1980s, Sea World made available its experienced collectors and equipment for use during Icelandic capture operations. However, rather than transporting the orca directly to the final facility, the animal would instead be maintained abroad for several years at a co-operating marine park.

A permit application would then be lodged with NMFS for the eventual import of the animal. In this way, the original collector could take orcas from the wild, 'launder' them via a second facility and import them innocently as 'already captured' animals, a few years down the line. Although import permits issued by NMFS were required for every orca brought into the US, this has historically proved to be just a formality, since no permit application to import orcas from other countries has yet been denied.

This method of obtaining orcas was practised extensively by Sea World in particular, often making use of facilities such as Marineland (Canada), Windsor (UK) and Harderwijk (Holland). Marineland (Canada) also played temporary host to several Icelandic orcas caught in November 1979 and kept at Marineland for only a matter of months before export to Kamogawa Sea World, Japan (one female dying en route) and Reino Aventura, Mexico City.

Breeding loan.

'Breeding loan' is industry jargon for the judicious transportation of breeding age male or female orcas from one facility to another, with or without money changing hands. Sea World has received orcas from Holland, Canada and Britain under these convenient auspices. The usual terms of breeding loan state that the first calf belongs to the receiving facility. Technically, the breeding animal remains the property of the supplying facility, (along with any second calf). However, to date, none of the orcas 'loaned' have ever been returned.

- In October 1976, two females named Gudrun and Kenau were taken off Iceland by the consortium of Goldsberry, Gunnarsson and Dudok van Heel. Both were sent to Harderwijk for 'holding'. Kenau was imported to Sea World in June 1977. Harderwijk kept Gudrun, but over a decade later, in November 1987, she was imported by permit to Sea World, Florida, ostensibly on 'breeding loan'. Gudrun died in February 1996, just four days after her third calf was stillborn.
- In October 1977, the same team captured six Icelandic orcas, all were sent to Harderwijk, for 'holding'. One male, Magnus, died two months later, in December 1977. That same month, Sea World purchased and subsequently imported three

- other orcas from Harderwijk - Kona II, Kanuck II and Kandu V. Two females, Winnie and Hoi Wai, went to Windsor. Winnie was later imported by permit to Sea World, Florida in October 1991, again on 'breeding loan'. Winnie's Marine Mammal Inventory Report lists her collector as Sea World.
- Ulysses, captured in 1980, resided at marine parks in Spain until February 1994, when Sea World imported him as a breeding male, citing the move was 'on behalf of the Barcelona Zoo for a period of at least two to six years'. Significantly, Sea World's permit application was lodged even before Ulysses had been 'officially' made available for import.

Note: The routine movement of pregnant females, and very young calves, is dealt with in the section on Captive Breeding.

Special deals: 'Strings attached?'

'Special deals' may be struck between the receiving and the supplying facilities. For example, Sea World sent three false killer whales to Harderwijk in partial exchange for Gudrun. A second 'deal' involved Winston, a male orca captured by Goldsberry off Washington State in 1970, who was originally sent to Windsor. It has been alleged that Sea World promised Windsor a smaller orca for his future exchange. In 1976, Sea World sent three dolphins to Windsor as partial trade for Winston, followed a year later by Winnie, the 'smaller orca' mentioned in the deal. (In 1991, as mentioned above, Winnie travelled to Sea World Florida on 'breeding loan'.)¹⁴

These highly convenient 'reciprocal arrangements' probably go some way towards explaining why Sea World and other larger parks have historically been loathe to criticise bad practice in smaller or second-rate marine parks.

The Future:

The 1994 amendments to the MMPA effectively allows any North American facility which complies with USDA/APHIS Animal Welfare Act standards to import and export marine mammals at will, without the need to apply for further permits. The full impact of this deregulation remains to be seen, but it appears likely that the global traffic in orcas will only increase.

New information (unconfirmed at time of publication) suggests that as many as 63 orcas may have been captured in Japanese waters to date. Source: Mr Nishizaki, Coastal Whaling Section of the Japanese Fisheries Agency, who obtained the data from the Far Seas Fisheries Institute. (Source: Dr Paul Spong, pers comm.)

Section 4 Conditions in captivity: "Life in the tank."

'I know of no marine mammals kept in captivity in natural conditions. As a matter of fact, there is an inherent contradiction in using the term natural to refer to captive circumstances.' (Professor Hal Markowitz)

In the Wild...

- Orcas live in large, closely-knit, highly complex social groups typically numbering 5 - 25 members.
- Members are related by blood and remain together for life.
- The pod may travel as many as 160 km (100 miles) in a day, in a home range of maybe 800 - 1,500 km (500-900 miles).
- They forage for live prey and socialise, rest and play as a cohesive group.
- Free will and freedom of movement characterise their existence.
- They are supremely adapted over centuries to cope with the rigours of life in the wild.

In Captivity:

- From the moment an orca is taken into captivity, this free will and freedom of movement is virtually obliterated. From this moment onwards, humans will mastermind the captive orca's life.
- Home is a bare and largely featureless concrete tank, minuscule compared to their natural ocean habitat.
- Artificially salinated and chlorinated water usually replace natural seawater.
- Captives must learn to accept dead fish.
- Blood-bonds are replaced by forced associations, with orcas from different pods and different oceans being routinely mixed and matched.
- Calves are routinely moved from their mother at a very tender age.
- In 1999, at least four facilities keep a solitary orca, and Keiko is solitary in Iceland
- Natural daily routines and social interactions are replaced by forced and highly artificial show routines.
- Above all, the orca's quality of life is severely compromised.

The adaptations a wild-caught orca is forced to make in order to adjust to captivity are almost unimaginable. A rich and varied social existence, the natural birthright of the orca, with all its subtleties and shades of meaning, is replaced a bare and largely featureless tank. Instead of the freedom to dive 30-60 metres (100-200 ft) deep into the ocean, the average show pool is a mere 8.4 metres (27.6 feet) deep. Far from being a microcosm of the orca's natural existence, a 'window into the wild', the tank represents a sad pastiche of the ocean environment and the life of the orca held captive becomes a grotesque parody of its wild counterpart.

If we take as a starting point the premise that captive animals should ideally be kept in conditions that approximate as closely as possible those found in their natural habitat, then it quickly becomes apparent that this is an impossible aim when applied to orcas. Orcas are the largest animals to be kept in captivity anywhere in the world. Their sheer physical size, large home range and complex social behaviour make them inherently unsuited to a life in captivity.

Given that the captive situation can never hope to replicate their natural habitat, then the barest minimum requirements of orcas in captivity may be deemed as being: the provision of adequate food, a reasonable area in which to swim, and suitable companionship. But what about more complex, yet still vitally important needs, such as space for resting, play and socialising behaviour? What about the need for privacy, for room to escape from companions and other distractions if required? Can both basic and higher needs conceivably be met in the captive situation?

This section attempts to present a general overview of conditions, highlighting the vast difference in facilities provided by marine parks for their captive orcas.

Standards and regulations for captive display:

The regulations governing the keeping of orcas in captivity vary widely from country to country and even from state to state.

USA: 22 orcas are currently held, representing 43% of the total held in captivity worldwide. Location: Four Sea World parks (20 orcas), Marine World Africa in San Francisco (1), Miami Seaquarium (1).

The Marine Mammal Protection Act (MMPA) is the major piece of legislation protecting marine mammals in the US. Prior to substantial amendments in 1994, the terms of the MMPA stipulated that no marine mammal could be taken in US waters or by US citizens elsewhere in the world, without a special permit issued by the National Marine Fisheries Service (NMFS). Once in captivity, the Animal Welfare Act came into play, authorising the Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) to set standards governing transport, handling, minimum pool size, water quality etc. in marine parks. Government-appointed veterinarians conducted regular inspections of the parks.

The MMPA has been amended on five occasions since it was first enacted in 1972, largely in response to determined lobbying, both by environmental groups (who felt that the MMPA had not been properly enforced on occasions) but also by the marine parks, who complained that the Act was overly protectionist! In 1989, fearing that stronger regulations proposed by NMFS might become law, the captivity industry began a concerted lobbying campaign to 'restructure' and 'streamline' MMPA regulations, culminating in the 1994 amendments to the MMPA, which handed over jurisdiction of captive marine mammals from NMFS to what was regarded as the understaffed, underfunded (and at the time, many believed, inadequate) United States Department of Agriculture (USDA)/APHIS responsible for enforcing the Animal Welfare Act. **Crucially, whereas previously, captive orcas and other captive cetaceans were the property of the American people, they are now the property of the marine parks.**

USDA/APHIS is widely regarded as being a more permissive, less effective agency, with a reputation for being more 'industry friendly'. The move can only be regarded as a retrograde step, effectively removing 22 years of protection under NFMS, limiting opportunity for public comment and essentially achieving something approaching self-regulation by the captivity industry.¹⁶

Professional bodies: The larger US marine parks are members of the American Zoo and Aquarium Association (AZA). Ostensibly setting certain minimum standards among its members, in reality it serves mainly as a cosy 'within the industry' forum for exchanging surplus animals and gives a veneer of professional affiliation when a facility is submitting permit applications to collect, import or export animals

Canada: Eight orcas are currently held in two parks: Vancouver Aquarium (1) and Marineland, Niagara Falls (7).

There are no national standards or federal regulations governing the display of orcas in Canadian marine parks and Canada does not currently possess legislation equivalent to the MMPA or AWA in the US. Canadian marine parks are, therefore, subject only to provincial or municipal regulations. In practice, this glaring absence of national standards means that regulations are localised and piecemeal. The Canadian Association of Zoological Parks and Aquariums (CAZPA), a professional association modelled upon the AZA in the US, made some attempt to establish national standards for marine parks, but dropped this in favour of judging facilities on a case-by-case basis. Whilst some marine mammals, such as bottlenose dolphins, caught in US waters may

receive a measure of protection under the US MMPA, there exists no national regulations specifically addressing the needs of captive orcas.

The Province of Ontario's Ontario Society for the Prevention of Cruelty to Animals Act (OSPCA) cannot be regarded as comparable to the US Animal Welfare Act (AWA) since the former is non-punitive, and there are no standards or regulations for the care and housing of animals under the Act. Marineland of Canada, at Niagara Falls, Ontario is monitored by the Niagara Falls Humane Society (NFHS) which is affiliated to the OSPCA. NFHS inspectors have a poor history of enforcing the Act at Marineland, and additionally, have no training in marine mammal facility design or captive husbandry. Marineland, Niagara Falls is not accredited by CAZPA.^{16a}

Britain: no orcas kept in captivity since 1991.

In 1985, the Department of the Environment (DOE) commissioned biologists Dr Margaret Klinowska and Dr Susan Brown to thoroughly review existing standards and conditions within the marine park industry and to suggest standards for improving facilities. Their report was critical of the marine parks, but also failed to please environmental groups, who felt that the recommendations did not go far enough. The DOE set up a steering group to review these draft recommendations and to consider comments from both the display industry and environmental groups. The result was a revised report containing a list of guidelines, which were published by the Secretary of State in 1990.¹⁷

These guidelines - covering such provisions as minimum pool size, water quality, handling, and banning the keeping of solitary animals - represent the strictest standards anywhere in the world, yet it is important to remember that they are somewhat less rigorous than those recommended in the original draft report. Arguably the most important standard relates to pool size. A primary enclosure for up to 5 orcas must be a minimum 12,000 cu metres/3.2 million gallons and pool depth an average of 15 metres (49 ft), with an absolute minimum depth of 12 metres (39 ft) to allow for the 'three-dimensional requirements of Cetacea'. Even Sea World, with the largest orca pools in the world, would be unable to comply with minimum UK requirements on the basis of pool depth.

Facilities were given until 1993 to comply with the new standards. It seems hopeful that the strictness of the standards will also deter British marine parks from exhibiting orcas in the future. Certainly, Windsor was unable to meet the new requirements; their orca pool was just too small and they had kept a solitary orca for several years, a practice banned under the new regulations. Lacking the finance to make the necessary improvements, they gave up the unequal struggle, and Winnie, Britain's last remaining captive orca, left Windsor in October 1991, bound for Sea World, Florida.

Japan: Twelve orcas are held at four marine zoos.

Location: Kamogawa Sea World (4), Taiji Whale Museum (2), Shirahama Adventure World (also known as World Safari) (4), Izu-Mito Sea Paradise (2).

Orcas have been captured in Japanese waters under 'academic' or 'scientific research' permits issued by the Fisheries Agency of Japan. There are no regulations or industry-wide standards for keeping orcas in Japanese marine parks. (See section 3 Japan captures for information on the Taiji captures in February 1997 and how they have fared in captivity). The new Nagoya Port Aquarium has announced its intention to import orcas, belugas and dolphins for public display. A Nagoya staff member was quoted in July 1999 as commenting that the facility hopes to have at least a male and a female by 2001, but since sensitivity is high over wild capture, it is likely that, initially at least, they will import captive bred animals from another Japanese facility, maybe Taiji Whale Museum or Nanki Shirahama Adventure World.

Elsewhere: A further seven orcas are held: at Marineland, Antibes in France (6) and at Acurio Mundo Marino in Argentina (2).

CONDITIONS IN CAPTIVITY

Pool size. Pool design and water quality. Feeding. Acoustics and ambient noise. Social composition and companionship. Solitary confinement.

Pool size:

'Not enough consideration has been given for the moral implications of confining a huge animal like the killer whale in a relatively tiny space like an aquarium tank. There'd be quite an outcry if a dog were kept in a cage of the same relative size.' (Ian MacAskie, Pacific Biological Station, Canada).¹⁸

Pool sizes vary tremendously from facility to facility, but almost all orca pools meet or exceed minimum standards set for their particular state or country. Cynics might argue that this is primarily because the 'cart is put before the horse', that is, that standards are set with reference to already existing facilities. Thus, it might be claimed that the display industry dictates the standard rather than the reverse. Minimum pool sizes were frequently calculated in a rather arbitrary manner, being based upon the average length of a mature mammal, this figure was then randomly multiplied in order to determine minimum vertical and horizontal pool dimensions.

In the US, for example, Section 3.104 (1) (I) of the Animal Welfare Act (AWA) states that an imaginary circle drawn in the centre of an orca enclosure must measure at least 14.6m (48ft) in diameter; roughly twice the length of the average animal. Minimum depth requirement is a mere 3.7m (12ft). These statutory minimum size requirements increase with every additional animal occupying the pool. Sea World has the largest orca pools anywhere in the world - its parks at San Diego, California and Orlando, Florida boast interconnecting pools totalling 4.6 and 4.3 million gallons respectively. These figures may appear very generous, but it is worthwhile taking a closer look at the individual pools making up the total volume cited.

For example, 'Shamu Stadium' at San Diego at 50m x 24m x 10.6m deep (165ft x 80 ft x 35ft) is the show pool, containing 2.5 million gallons of water. However, two holding pools each measure only 36m x 23m (120 ft x 75 ft) and are a mere 4.6m (15 ft) deep. Orcas may spend a considerable amount of time in these much smaller enclosures. In Spring 1995, work was begun on a fourth pool of approx. 1.7 million gallons. Furthermore, whilst Sea World's pools are the largest anywhere, they are arguably also the most over-crowded. Sea World keeps more orcas per pool than other marine parks.

Pool size is, of course, meaningless unless related to the situation in the wild. To put it into some sort of context, Erich Hoyt in his 1992 report 'The Performing Orca' calculated that (based upon the daily travels of a wild orca pod and taking into account even the minimum distance travelled, minimum depth of dives and so forth), the minimum volume of water traversed in an average 24 hours would total 6,006,000,000 cubic feet, containing over 45,302,778,000 gallons.

This is over 9,000 times larger than the sum of the interconnecting orca pools at either Sea World, San Diego or Orlando. Of course, no pool could ever reach 'optimal' size based on conditions in the wild, but the comparison aptly serves to highlight the enormous adjustments orcas must make to life in captivity.

Most other pools are considerably smaller:

- Shamu Stadium at Sea World's seasonal facility at Aurora, Ohio is much smaller than sister pools at San Diego and Orlando, at only 7.9m (26 ft) deep, with a volume of just over half a million gallons.
- Shirahama Adventure World in Japan has a main pool whose volume is less than 1 million gallons. The pool is a mere 7m (23 ft) deep.
- Marineland of Canada's main pool 'King Waldorf Theater' measures 23m x 7.6m (75 x 25ft), is up to 6.7m (22 ft) deep, with total water volume 1 million gallons (3,712 cu m). Two connecting holding pools are 7.6m (25ft) in diameter and only 3.7m (12 ft) deep. Marineland's indoor "warehouse" pool (where Junior reportedly died in 1994, see section on solitary confinement) at the time of

writing (August '97) houses four young orcas: two males (aged 4 years, 9 months; and 2 years, 11 months); a female (aged 1 year, 4 months) and a ten month old calf (sex unknown).

November 1999 Update: Sea World Ohio is currently updating its orca tanks. Winnie and Kayla have been moved to SW California whilst this work is in progress. There are currently no details on what form the renovations will take and when this work is scheduled for completion. Marineland, Cote D'Azur in France is also renovating its orca tank during 1999/2000.

Lolita: Too tight a squeeze?

Miami Seaquarium's 'Whale Bowl' has been home to Lolita since 1970, the year she was captured from J pod in Penn Cove WA. Her mate, Hugo, died in 1980 and since that time, she has lived alone in a single tank (80ft x 73 ft), shaped rather like a perfume bottle, which doubles as holding area and performance pool. In December 1995, the (then) twenty-five-year-old tank was the subject of an USDA investigation as animal welfarists claimed that it failed to meet minimum size regulations. As long ago as 1993, a USDA inspector herself cast doubts on the pool's compliance with standards.

At issue is the method of measuring the pool: the difficulty has been to determine whether a concrete island in the middle of the irregularly-shaped pool should be included in diameter measurements, as Miami Seaquarium claim. If so, then the pool's diameter is 18.3m (60ft), well exceeding legal requirements. However, if the concreted area is excluded, then the horizontal dimension from the front wall to the wall that forms the barrier is only 35 feet wide, far less than the legal minimum dimension which should be at least (14.6m) 48 feet in both directions.

If USDA decide that the second method of gauging diameter paints a more accurate picture of Lolita's limited range of movement within the tank, then Miami may be forced either to modify Lolita's tank or to relocate the orca. The Humane Society of the United States (HSUS) has objected to the Federal Government's failure to enforce the Animal Welfare Act in relation to the size of Lolita's pool.

A deciding factor may be the dilapidated tank itself, in recent years it has deteriorated badly and in places is held together with industrial jacks. In addition, the stadium surrounding the pool is badly corroded with salt water from Lolita's show routine breaches and may pose a safety hazard to visitors.

November 1999 update: In mid-May of this year, Arthur Hertz, owner of the Seaquarium, appeared on Miami television to proclaim that the Seaquarium would begin construction of Lolita's new tank 'in six months.' That time has nearly gone by, and there is no sign of any new tank, which would not solve Lolita's problem anyway. (Source: Free Lolita campaign, Tokitae Foundation). See Section 7 on release potential of individual orcas.

Pool design and water quality:

Cost is probably the primary factor governing the design of show pools, but other important factors include cleaning and husbandry requirements, and also the needs of the spectators. After all, if the onlookers ranged on benches surrounding the pool don't have a clear view of the whales, they simply won't return. So maximum visibility is a prime requirement, hence many pools are clear sided, allowing a clear and uninterrupted view of the action, both above and below the water. Walls tend to be smooth sided, partly for visibility, partly for ease of cleaning. Unfortunately, pool design tends to be dictated rather more by the housekeeping and profit-making needs of the establishment rather than by the true needs of the whales.

Very few facilities use natural seawater. Taiji Whale Museum in Japan has pools situated in a cove reinforced with concrete walls, but at least they allow seawater to flow in and out. Miami Seaquarium uses untreated seawater drawn from Biscayne Bay and kept at around 55°C; whilst both Vancouver Aquarium, Canada and France's Marineland

Cote D'Azur use treated natural sea water. All other marine parks use a manufactured seawater mix. The pool environment is highly controlled, with complex filtration and purification systems in place to remove animal wastes, prevent the growth of harmful bacteria and other organisms and maintain reasonable levels of clarity. Orcas have very small bladders and urinate almost continuously, producing several litres of urine, as well as several kilograms of semi-liquid faeces daily. Several orcas sharing one pool will thus exert an extremely heavy load upon the filtration system.

Chlorine is widely used to supplement filtration, it provides a residual disinfectant 'cover' and also helps to maintain water clarity. Great care must be taken to ensure that the amount of chlorine added is precisely right. Chlorine reacts with organic matter (animal waste) within the water. If too little chlorine is added, dichloramines are formed. These are effective disinfectants, but are irritating and have an unpleasant smell. If the balance is tipped the other way and too much chlorine is added, then trichloramines form, which are severely irritating and smell extremely unpleasant.

The optimal level is midway between the two. Hyperchlorous acid or 'free residual chlorine' represents this optimal level and is achieved at not more than 0.5 parts per million. Free residual chlorine is non-toxic, non-irritant, a very effective disinfectant and leaves the water extremely clear. In smaller pools, organic waste is comparatively concentrated and so unpleasant 'chemical soups' may be more likely to occur.²⁰

Feeding:

In the wild, orcas eat a very varied diet, catching a wide variety of prey ranging from fish, to squid and even other marine mammals, (including cetaceans), according to location, season and availability. The variety of their diet is only part of the equation: equally important is the fact that they are able to fulfil their natural imperative - to hunt and kill their own prey at will. All orcas in captivity are fed dead fish, usually herring. Wild-caught orcas often have considerable difficulties adjusting to this new and highly artificial feeding regime.

Fish is usually purchased frozen and in large quantities. Vancouver Aquarium for example, purchases around 110 tons of top quality herring from local fishermen each year. Finna, their male orca who died in October 1997, was reported to receive 80 kg (175lbs) daily, whilst the female, Bjossa receives 54 kg (120lbs) per day. However, a male named Orky was recorded as eating as much as 100 kg (235 lbs) per day at Marineland, California in the late 1980s. Frozen fish are routinely supplemented with vitamins and minerals since they have a lower nutritional value than freshly caught fish, having lost all their water-soluble vitamins during freezing, thawing and subsequent preparation. Several parks supplement with 'Sea World Marine Vitamins' which contain hefty doses of vitamin B1 in particular.

Marine parks defend the practice of providing dead fish on the grounds that manual feeding by park staff allows a measured quantity of fish to be fed to each animal and any individual failing to eat properly would be quickly noticed. Further, they claim that there are possible health problems associated with live fish, as well as the problems of purchase and storage. However, it is more likely that cost is a crucial factor. Frozen fish are considerably cheaper and easier to handle than live.

In reality, probably the main obstacle to providing live prey is the fact that chlorine kills fish very quickly. The sterile, chlorinated waters of the pool are a far cry from their natural environment. Orcas in captivity are noticeably less active than their wild counterparts, one reason being that since they are provided with regular meals, they have no need or opportunity to hone their natural hunting skills.

Acoustics and ambient noise:

Professor Hal Whitehead's 1990 paper on captive cetaceans compared the experience of a 'highly acoustic cetacean...[such as an orca] ..living in a tank with acoustically reflective walls, to that of a visually oriented animal, like a human, living captive in a room covered with mirrors on all walls and the floor. The experience is likely to be profoundly disturbing, especially over the long term.'²¹ In the wild, the world of the orca is primarily a world of sound. Whilst foraging, travelling or playing, orcas keep in constant communication, their calls capable of travelling distances of 10 km (6.2 miles). Streams of echolocation clicks are used for locating food and for navigating in dark or murky waters.

Whilst scientists are unable to agree upon whether confinement affects cetacean hearing and vocalising behaviour, it is only logical to suppose that the smooth concrete walls of the tank inhibit the orca's natural acoustic abilities, designed for open ocean living.

In the tank, many of the reasons for communicating are rendered unnecessary. Paul Spong, a researcher specialising in studying the communications of wild orca in BC commented 'Certainly orca vocalise in tanks but .. it can't possibly be for the same reasons orca vocalise in real life.' Food is provided, rendering hunting redundant. In the confined space, tank members are close at hand, making 'keeping in contact' calls unnecessary. Finally, the super-clear chlorinated waters of the pool render echolocation superfluous, although orcas will occasionally inspect new objects placed in the pool using a stream of echolocation clicks.

This is not to say that captive orcas don't vocalise, they certainly do, but the frequency of vocalisations and the reasons for such communication are very much reduced. Marine parks and researchers are also unable to agree as to whether high levels of background noise adversely affect captive orcas. John Ford of Vancouver Aquarium claims that ambient noise in marine parks is not a problem, since orcas living in Johnstone Strait off Vancouver Island, BC, often experience high levels of background noise from fishing boats, tug boats and so forth, seemingly without any problems. But Paul Spong disagrees - in his experience, boat noise in Johnstone Strait 'reduces and often eliminates calling altogether.'²²

Acoustic specialist Christopher Clark believes that our knowledge of cetacean acoustics and response to ambient noise is still far too sketchy. He believes that until very recently, whale pools have not been designed with acoustics in mind - an obvious example of a more enlightened approach being the newly renovated Vancouver Aquarium. Clark suggests that ideally, pools should have no parallel surfaces, but should be irregular in shape, in order to deflect, absorb and disperse sound in a more natural manner. Ambient noise levels should ideally be no greater than average natural levels in the ocean.²³

John Ford agreed that 'steps should be taken by aquaria to minimize noise levels, if only to err on the side of conservatism in the absence of data and to satisfy our human perception of what must be acoustically comfortable for the animals'. Vancouver Aquarium has made efforts to reduce background noise levels by mounting pumps on rubber mats. Additionally, its new orca pool 'features a varied contour and is divided into three separate pools of different shapes and sizes.'

Social composition and companionship:

Orcas are, above all, social animals. In the wild, orcas live in peaceful communities, with families feeding, playing and resting in close physical proximity to each other. Their social horizons revolve around their immediate subpod or pod, occasionally joining with other related pods to form a 'superpod' of maybe 100 individuals. In practice, an individual's daily companions would be blood relatives. In captivity, orcas from different pods, indeed different oceans, and communicating in different dialects are routinely exhibited together.

There have never been complete pods exhibited in captivity. Several members from the A5 pod, captured in the late 1960s were exhibited together for some years, but Corky, the only surviving member, now shares a tank at Sea World, San Diego with Icelandic orcas. Her vocalisations are now a rather poignant mixture of her natal pod calls and Icelandic dialect.

Sea World's penchant for moving orcas around from park to park on a regular basis, can only cause additional problems. No sooner have individuals made some sort of adaptation to their pool companions, than the balance is upset with the removal of one whale and replacement with a totally new and strange animal. The adaptation and socialisation process must begin anew.

Before the MMPA was amended in 1994, regulations were being considered which would have required that 'whenever known to occur in social units in the wild, marine mammals ..must be held.. in a manner and composition that in number, sexual ratio and age structure provides the closest practicable approximation [to] the wild.'²⁴

Small wonder that the marine park industry fought so hard to prevent these and other regulations being enacted, since the number, sex and age composition of captives far from resembles those found in wild populations. Researcher Peter Olesiuk and his colleagues estimate that stable wild populations comprise 56.4% females and 43.6% males, with an overall breakdown of around 50% juveniles, 19% mature males and 31% mature females.²⁵

Marine parks often fail to come close. For example, Acuario Mundo Marino in Argentina and Izu-Mito Sea Paradise in Japan, both display just one mature female and one mature male; whilst Taiji Whale Museum, Japan displays just two adult females.²⁶

Solitary confinement.

Worse, in 1999, several orcas are still being kept solitary from members of their own species, an inexcusable situation, given the extent of our knowledge about this supremely social animal.

- Lolita languishes in her dilapidated pool at Miami Seaquarium, solitary since the death of her mate, Hugo, in 1980.
- Vigga is now alone at Marine World Africa, USA after the recent death of her poolmate, Yaka.
- Bjossa is solitary at Vancouver Aquarium, following the death of her mate, Finna in October 1997.
- Tillikum is kept alone in his tank at SW Florida
- In September 1999, orca expert Dr Naomi Rose, visited Sea World, San Diego. In a letter of concern to USDA/APHIS, she noted that a juvenile male, Sumar, was displaying behaviour which she described as "certainly unusual and frankly disturbing". The 16 month-old orca was isolated in a medical pool, relatively motionless, with his head towards the corner of the pool. As he rose to breathe, he lightly bumped his head against the pool walls. Upon questioning staff, Dr. Rose learnt that the whale was not physically ill. Given this, she commented that, for Sumar "to remain socially isolated for extended periods cannot be good for his social and behavioural development." Little Sumar was removed from Taima, his mother, when only 11 months of age, since she was exhibiting aggression towards him.^{26a}

See also the section on stress.

Junior's story:

Orcas which fail to adapt to captive conditions or cannot get along with pool mates are sometimes kept in a 'back pen' until the marine park can find a suitable buyer. Junior, a young male, spent years languishing in a back pen at Marineland, Ontario. Despite being listed in a 1992 inventory of orcas held (part of a report to the Canadian Committee on Marine Mammals), and being filmed in the indoor warehouse pool on at least two occasions (in January 1990 and again in April 1994), Marineland was incredibly reluctant to admit to his existence. Junior spent the final four years of his life

in this indoor pool, deprived of natural light and the company of other orcas, and forced to endure the noise of overhead fans and the barking of sealions. He finally died there, lethargic and reportedly psychotic, in the summer of 1994, aged only around 13 years.

^{26b}

HEALTH OF CAPTIVE ORCAS

Survival rates and longevity. Causes of death. Stress. Aggressive behaviour towards other orcas. Aggression towards trainers.

'Husbandry problems of marine mammals in captivity often come directly from exhibiting animals in enclosed environments.' (Sea World veterinarian Jay Sweeney 1990)²⁷

Introduction:

Orcas are, quite literally, a multi-million dollar investment to the marine parks. When Hong-Kong Ocean Park lost Hoi Wai, its solitary female, in April 1997, the South China Morning Post (27/4/97) reported that a replacement orca might cost up to HK\$7 million. When the first orcas were brought into captivity over thirty years ago, virtually nothing was known about their biology and husbandry requirements. Since then, marine parks have been forced to undergo a steep learning curve.

Marine parks generally rely on a three-pronged approach to maintaining - or attempting to maintain - the health of their captives. Firstly, they rely on the observations of trainers to alert them to behavioural changes in any animal as these may serve as an early sign of a health problem, for example lethargy or refusal to eat. Secondly, the better parks employ veterinary staff. Sea World, in particular, has invested highly in medical facilities and specialist care. Frequent blood checks are carried out: weekly, in the case of pregnant females. Thirdly, captive orcas and dolphins are reportedly routinely fed a wide variety of antibiotics and other medicines, under a policy of so-called 'preventive medicine'.²⁸

Ironically, it could be asserted that, since captive orcas are kept in such a carefully controlled environment, with regular food, expensive medical care and none of the rigours of life in the wild, they should be living at least as long, if not longer than their wild counterparts. Indeed, the marine parks are eager to foster this belief that the captive situation is more favourable than the wild.

Sea World's Daniel Odell claimed in 1995: 'Our killer whales live in habitats where the water quality and temperature are carefully monitored and controlled. Unlike killer whales in the ocean, those at Sea World are not forced to contend with dangers such as shortages of food, parasites and threats from humans.. [they] receive a balanced, nutritious diet and we make sure their day includes plenty of exercise.'²⁹

Jim Bonde of Marine World Africa declared in 1994 that 'the average lifespan of whales and dolphins in most oceanariums is now comparable to or even longer than the lifespan of their counterparts in the wild.'³⁰

But even the most cursory glance at available statistics gives the lie to this boast, at least with respect to orcas. So why can't the marine parks keep their whales alive? Why is the mortality rate so unacceptably high? A useful starting point might be a comparison of survival rates in the wild with those in captivity.

Survival rates and longevity:

The issue of what constitutes natural lifespan has long been the subject of contention between the marine park industry and researchers studying orcas in the wild. Marine parks maintain that there is very little difference between lifespan in the wild and in captivity.

The central issue is clouded for two reasons: firstly, marine parks tend to adopt lower estimates of lifespan, whilst some researchers and conservationists cite maximum lifespan as well as average; secondly, accurate comparison is difficult, since valid comparative data is limited. Solid research exists on longevity in the wild, but reliable data is often lacking in the captive situation. Although the marine parks can obviously record the precise time of death of captive orcas, such deaths are usually veiled in secrecy and the display industry is notoriously reluctant to release details to outsiders.

In a special report for the 1990 meeting of the International Whaling Commission, scientists Peter Olesiuk, Michael Bigg, and Graeme Ellis presented their best estimates of natural lifespan for orcas in the wild. Their report stated that:

- Female have an average life expectancy of 50.2 years and maximum longevity of 80 to 90 years.
- Males have an average life expectancy of 29.2 years, and maximum life expectancy of about 50 to 60 years.
- Annual mortality rate (mean percentage of population dying each year, excluding calves) was estimated at only 2.3%.³¹

The findings of Olesiuk et al are echoed in a 1994 publication on orcas, edited by John Ford, Graeme Ellis and Kenneth Balcomb.³²

These estimates of lifespan are based upon more than a quarter of a century's study of wild orcas off Vancouver Island, British Columbia. They are based upon intensive observations of known individuals and pods, on a year in, year out basis. The strength of the study lies in the fact that calculations are based upon actual events - real births and deaths. This work is widely respected by the scientific community and is often cited.

Supporting these findings, the Center for Whale Research which carries out an annual census of orcas in Puget Sound, Washington reported in 1994 that 'almost 65% of the 94 plus whales... are over 45 years of age. There is clear evidence of several free-ranging males who are well into their 40s and 50s.'³³

Despite these respected studies, marine parks vary widely in their official position on longevity:

- Sea World persists in maintaining that 'the most recent and reliable scientific studies indicate the maximum length of time a killer whale could expect to live in the wild is between 25 and 35 years. Perhaps as important, killer whales cared for in properly and professionally run oceanariums mirror and will someday likely exceed that potential life expectancy.'³⁴ (Sea World Education Department, 1994.)
- However, in recent years, Marine World Africa has directly contradicted Sea World's position, stating in its 1995 booklet 'A Closer Look at the Animals': 'Life Expectancy: 50 to 75 years.'

Valid comparisons between average and maximum longevity in the wild and in captivity are made more difficult, since orcas have only been kept in captivity for the past 30 years. It may take another 20 years for captives - especially females - to attain the average life expectancy. To date, only one captive orca, a male named Orky, has survived to even the average age at time of death of males in the wild. Orky was captured from the A5 pod in 1968, at around the age of ten. He died at Sea World in 1988, aged about 30 years.

The oldest captive females are Corky, at Sea World, San Diego, (taken from the A5 pod in 1969) and Lolita, at Miami Seaquarium, (taken from Washington State waters in 1970). Both are around 34 years old. These females will need to survive at least a further two decades in captivity before they will have achieved at least the mean life expectancy for a female orca -i.e. 50.2 years. Given the track record of marine parks for keeping orcas alive in captivity, this seems highly improbable.

Although Sea World continues to assert that survival has improved in recent years, the fact remains that most captives die before their early twenties. Equally damning, more orcas have died at Sea World parks in the last decade than in the preceding **two** decades:

1965-1985: 11 deaths.

1986-1996: 14 deaths.

(NB figures exclude known stillbirths and infant mortalities not reported to NMFS).

Since 1989, the year that Anheuser-Busch purchased Sea World, eight out of 12 (67%) of Sea World's adult females has died. Average age at time of death was a mere 16 years.

A 1988 study by DeMaster and Drevenak estimated the annual mortality rate for captives at 7.0%, and two further studies, by Woodley, Hannah and Lavigne (1994) and by Small and DeMaster (1995) both estimated (captive) annual mortality rate at 6.2% (excluding calves), considerably higher than the 2.3% annual mortality rate figure for wild populations.³⁵

Causes of death: 'What a shame about Shamu!'

Determining true causes of death can be very difficult. Part of the problem lies in incomplete or inconsistent record keeping by the marine parks and in gaining access to these records. Post-mortem records are only available for those orcas listed in Marine Mammal Inventory Reports and, most significantly, since necropsies - animal autopsies - are usually conducted 'in-house' by the staff veterinarian, they are unlikely to cast blame for the animal's death upon their marine park employer or other veterinarians.

In recent years, some attempts have been made to lift some of the secrecy surrounding deaths. In 1991, following a spate of five orca deaths at Sea World in a two year period, America's National Marine Fishery Service (NMFS) - in response to complaints from environmental groups - requested that Sea World immediately reports all orca deaths and allow a NMFS observer to be present at the necropsy.

The same year, Sea World tied itself up in knots whilst attempting to defend the health of its captive orcas. On the one hand, Sea World veterinarian Michael Walsh claimed in a written statement to NMFS that captive orcas 'have died of a variety of diseases that can afflict any animal, anywhere. [They] die of diseases that occur in any population.' In the same report, fellow veterinarian Jim McBain directly contradicted this statement, stating instead that 'marine mammals in controlled environments are spared many of the problems affecting their counterparts in the wild, including such things as parasites, predators, natural toxins [and] natural disasters such as freezing, pollution, [and] variations in the availability of food.'³⁶

In fact, necropsy reports reveal that captives are not spared from parasites or natural toxins and commonly report infestation by such parasites as nematode, trematode and tapeworm.

Furthermore, the captive situation appears to increase the incidence of some infections rarely encountered in wild populations. In 1985, a paper by marine mammal veterinarians, Andrew Greenwood and David Taylor, drew attention to the high incidence of death due to bacterial infections. They studied causes of death for 32 orcas from marine parks in North America and Europe and listed the following common causes: pneumonia (bacterial infection of the lung) 25%; systemic mycosis (fungal disease affecting the whole body) 22%; other bacterial infections 15.6%; mediastinal abscess (bacterial infection of the chest cavity) 9.4.% and other/unknown (28%).

Hence, 50% of the orcas died of bacterial infections, particularly upper respiratory infections. Greenwood and Taylor noted that 'the high incidence of systemic mycosis ... is unusual and alarming [and is] uncommon in open air, natural sea water systems, [if] killer whales [were] kept under these conditions [they] may be considered less at risk.' Whilst such infections are not exclusive to captives, it may be inferred that they are aggravated, if not caused by, the highly artificial conditions of confinement.³⁷

A few examples from Marine Mammal Inventory Reports/Necropsy Reports:

- Kilroy died in 1978 at Sea World San Diego, of gangrenous pneumonia
- Nepo died in 1980 at Marine World Africa, USA, of acute broncho-pneumonia
- Benkei II died in 1983 at Shirahama Adventure World, Japan, of malignant lymphoma
- Nemo died in 1986 at Windsor Safari Park in Britain, of thrombocytosis (a serious blood disorder)
- Orky died in 1988 at Sea World San Diego, of acute broncho-pneumonia

- Prince died in 1991 at Hong Kong's Ocean Park, of pseudomonas (severe bacterial infection associated with multiple abscesses and septicaemia)
- Hyak died in 1991 at Vancouver Aquarium. The necropsy revealed a perforated lung, severe damage and inflammation affecting both lungs. It also revealed damage to the brain which in humans would be consistent with pre-Alzheimer's lesions.
- Hoi Wai died in 1997 at Hong Kong's Ocean Park of acute haemorrhagic enteritis (severe blood loss).

One thing is fairly certain, with the possible exception of Orky (who died aged 30 years), no captive orcas have died of illnesses or conditions which might remotely be attributed to 'old age'. Yet, in 1991, Sea World's Brad Andrews, in the written statement to NMFS cited above, claimed that 'more than two-thirds of the deaths we've experienced were due to old age, and illnesses or injuries the animals sustained before coming to Sea World.' In fact, only one orca listed on Sea World's Marine Mammal Inventory Report indicates 'old age' as a cause of death, and Andrew's rather sweeping statement blaming deaths upon illnesses or injuries sustained prior to arrival at Sea World, rather casts doubts upon Sea World's much-vaunted policy of preventive medicine and also upon the wisdom of importing less than healthy animals!

In many cases, information about cause of death is either too sketchy or in some cases non-existent, making it difficult for significant conclusions to be drawn. Further, the illness or disease which finally kills the animal may tell only part of the story. An orca may therefore die of pneumonia, but stress leading to a damaged immune system may have been a contributory factor. Orky, for example, exhibited classic signs of stress and maladaptation in the 18 months following his move with Corky, from Marineland to Sea World, San Diego. He lost approximately one third of his body weight before finally succumbing to the acute broncho-pneumonia which killed him.

A major cause of premature death amongst captive females is complications during pregnancy. Since 1987, five females have died at Sea World during pregnancy or shortly following births (see Captive Breeding). Pregnancy-related complications are rare amongst wild populations.⁴⁰

The reluctance of many marine parks - especially Sea World - to release accurate information relating to orca deaths also extends to its employees. Many marine park employees are unaware of what constitutes natural health and lifespan amongst wild orcas and are led to believe that many of the captives which have died in their teens and twenties were in any case nearing the end of their natural lifespan. Significantly, 'Soundings' the professional journal for trainers is extremely reluctant to publish news of orca deaths in its regional news pages, possibly to avoid damaging the morale of trainers and employees involved in caring for captive orcas.

Stress:

'To deny liberty to a wild animal involves the diminishing of that animal's life. It is an inherent characteristic of wild things to be free.. in almost all cases, the denial of this inherent characteristic involves stress, frustration, anxiety and even aggression.' (Professor Andrew Linzey, Animal Theologian, 1987)⁴¹

- It is estimated that stress may be a contributing factor in as many as 50% of captive deaths. In his 1992 report, 'The Performing Orca', Erich Hoyt writes that 'examining the known causes of death in captive orcas, stress was a possible predisposing factor in 38 of 74 deaths.'
- Marine parks commonly use 'Mylanta' and other anti-ulcer drugs.

Stress is, of course, part of daily life. It is not exclusive to the captive situation. In the wild, orcas face different challenges and hazards, but it could be argued that they are biologically adapted over many years to dealing with such challenges. But an orca's innate biological conditioning cannot prepare it for the unnatural traumas of capture, transport and confinement, imposed by humans.

Reactions to perceived stress will vary from animal to animal in the same way as they vary from person to person. Some animals appear to adapt quite quickly to new situations, whilst many others seem less able to adapt. It is very difficult therefore, to judge the boundary between an acceptable level of stress and an unacceptable level. The captive situation, nonetheless, presents a whole host of potential stressors.

Psychologist Bob Mullan and anthropologist Garry Marvin writing in 1987, summarised it thus: 'separation from natural habitat; enforced idleness; direct control by humans; loss of life in normal social groups; drugs, medication and fertility control; and caging - a total alien environment with artificial diet, unusual noise, strange odours and the unnatural proximity of both alien species and the human visitor.'⁴²

Stress is not merely a psychological condition, it produces specific changes within the body's biochemistry which can be measured. It is possible to measure stress levels by the analysis of respiratory rate, pulse rate and blood and serum chemistry. Stress can also produce changes in behaviour - for example lethargy or refusal to eat - or can lead to repetitive behaviour or pronounced or unusual aggression. Stress in manageable amounts is part of life - but when stress levels escalate, especially over a long period of time, then collapse of immune functioning, illness and even death can result.

- In the early 1980s, researchers studied stress levels in a group of four captive bottlenose dolphins at the National Aquarium in Baltimore. The dolphins had been rushed into taking part in performances without adequate time for adaptation. Severe stress reactions to the noise and the close proximity of human visitors resulted in one dolphin, Gretal, dying from bleeding ulcers and internal abscesses. The other three dolphins also suffered ulcers. After recuperating in a quiet environment, they relapsed once returned to the noise and bustle of the show pool. Researchers observed that increased levels of stress resulted in physical conditions (the ulcers), behavioural abnormalities (repetitive behaviour, such as standing on their tails) and these observations correlated with abnormal blood and serum chemistry.⁴³
- Yamato, the adult male held at Izu-Mito Sea Paradise, was previously known as Tanouk when he lived at Marineland, France. Whilst at Marineland, he had been separated for some time from other orcas because of mental (as well as physical) health problems.
- When Lolita's trainer since 1988, Marcia Henton, was replaced in 1995, Lolita's behaviour was distinctly depressed. Her performances were lacklustre, she hardly had the energy to breach and in between shows, she remained motionless at the bottom of her tank, or hovered at the surface as if awaiting Marcia's return.

Aggression:

Aggressive behaviour amongst orcas belonging to the same pod is rarely witnessed in the wild, yet aggression between orcas or towards trainers is a disturbing trend in marine parks. Several factors are believed to influence this explosion in aggressive behaviour.

Firstly, pool size. Restricted space seems to heighten aggression between animals which have little opportunity to escape or to seek privacy. In contrast, long-term observations of wild orca communities off Vancouver Island suggest that aggression between the members of a pod, or between different pods within the resident clan or community, is seldom, if ever, witnessed. The daily routine of the residents is characterised by peaceful co-existence.

However, in recent years, researchers have witnessed signs of less than sociable interactions between resident and transient groups. Such behaviour has usually taken the form of appearing to ignore the other group, or specific avoiding action being taken. Last year, resident orcas were also observed apparently 'chasing off' transients who had entered the residents' home waters. None of these options are possible in the narrow confines of a tank.

These observations obviously have implications when considering the second major factor: namely the social mix of individuals in the captive setting. This all-important social balance of animals within the pool is frequently grossly distorted. Wild orcas spend all their time with blood relatives and other members of their pod, but in the captive situation, orcas from different pods and different oceans are routinely kept together. The whales communicate in different dialects and the constant movement of individuals between parks further compounds the situation.

Thirdly, orcas establish their own social hierarchy or pecking order. In captivity, as in the wild, the oldest or largest female is usually the dominant animal, but exceptions have occurred, especially in smaller facilities. The US Animal Welfare Act states that 'marine mammals that are not compatible shall not be housed next to animals that would cause them stress or discomfort, or interfere with their good health'. However, it is believed that to date, no marine park has ever been charged with non-compliance with this regulation.

A 1985 report by marine mammal veterinarians, Andrew Greenwood and David Taylor states unequivocally that 'clearly, trainers should be aware of the potential risk of serious fighting between incompatible specimens, and facilities should allow for the separation of animals.'⁴⁴

Tragically, all too often, marine parks have not been sensitive to the subtleties of dominant/subdominant roles and have kept incompatible animals in the same pool, sometimes with disastrous results.

- In 1987 Sea World acquired Corky and Orky, an adult breeding pair, and transferred them to the San Diego park. Orky, the male had been the dominant animal and Corky was very much the subdominant when she arrived at Sea World. She was harassed unrelentingly by Kanduk, the residing dominant female, who herself mated with Orky. In 1989, Kanduk rammed Corky in front of a stadium full of horrified spectators. Kanduk fractured her jaw and ruptured an artery, she died 45 minutes later. Kanduk and Orky had produced a calf and it is possible that the attack was motivated by jealousy of Corky's attempts to help to care for the calf. Sea World tried to pass the incident off as a 'normal' display of dominance, but must take its share of the blame for not paying heed to social dynamics.⁴⁵
- At Sea World's Orlando park, two entirely incompatible males were kept together. Kotar, a small Icelandic orca was forced to share a pool with Kanduk, a transient orca captured from BC. These two orcas would never have been found together in nature. Aggression between these two males was pronounced and the confines of the pool meant that neither animal could escape from the other. Kotar was often observed deliberately beaching himself and making crying sounds. Kanduk occasionally beat his head against the pool's gate until it bled and also made frequent distress calls. In 1987, Kotar reportedly bit Kanduk's penis, turning the pool water red with blood and forcing shows to be cancelled for two days. Both orcas are now dead. Kanduk died in 1990 at around 20 years of age; his necropsy report listed 'a penile scar 10 cm long.' Kotar died in August 1995, aged only 19. Were their deaths hastened by the immune-depleting effect of these constant 'fight or flight' scenarios?⁴⁶

In early 1994, Ulysses, a mature male, arrived at San Diego on 'breeding loan' from Barcelona. His intended mate, Kasatka, was still caring for her three year-old calf when he arrived and trainer Mike Scarpuzzi is quoted as saying 'it is crucial that Ulysses understand Kasatka, the dominant orca. If he doesn't, the results could be violent. Maybe even deadly.'⁴⁷

The terse wording of necropsy or Marine Mammal Inventory Reports gives only a suspicion of the true number of deaths resulting from traumatic injuries and possible incompatibility: 'haemorrhage', 'ruptured kidney', 'related to jaw fracture' and so forth.

Marine parks are always loathe to announce any orca death, but are particularly reluctant to broadcast deaths due to aggression between orcas, since the notion of aggression directly contradicts the image of the 'cuddly sea panda' which they are so keen to promote. However, with the rise in popularity of home video cameras, very public displays of aggression such as Kandu's attack upon Corky, will be increasingly difficult to hush up.

Aggression is not always directed towards other orcas in the pool. There are several instances of individuals deliberately ramming observation windows, or colliding with the walls of the pool. Given that orcas possess highly sophisticated navigational systems and are presumably familiar with their surroundings, it seems highly unlikely that such 'accidents' are not deliberate. One can only speculate whether they represent the release of pent-up aggression or are a deliberate attempt at self-injury.

- In the 1970s, a male named Hugo broke an observation window at Miami Seaquarium, causing significant water loss and slicing off the end of his nose.
- In 1985, researcher Jerre Mooney witnessed Corky - then at Marineland in California - break an observation window. The incident resulted in the loss of over a third of the water in the pool.
- In 1991, Kahana died at Sea World, Texas after colliding with a pool wall. She suffered multiple skull fractures, cerebral contusions and severe haemorrhaging.
- In 1992, a young female named Samoa died at Sea World at the age of only 13. For months prior to her death, horrified onlookers had watched her performing bizarre, repetitive movements, hurling her body into the air and crashing down again and again upon the hard surface of a wide shelf at the side of her pool. Sea World staff claimed never to have witnessed such behaviour. Was this a deliberate attempt at self-injury? Samoa was pregnant and her near-term foetus died with her.⁴⁸
- Keet, the original 'Grandbaby Shamu' born in February 1993, has been observed by visitors allegedly slamming his head and body repeatedly into the walls of his tank at Sea World, Texas. He was taken from his mother, Kalina, at the age of just one year, 8 months.⁴⁹ (See section on Captive Breeding).
- During the autumn of 1995, Splash, then six years old, was involved in an incident at Sea World's San Diego park. It appears that he was interacting with another male when he collided with the side of the pool, cutting his chin badly and requiring stitches.⁵⁰
- During 1997, there were even reports that Keiko - the male Icelandic orca transferred from a sub-standard pool on Mexico to much improved conditions at Oregon Coast Aquarium, as the first stage in a rehabilitation and potential release programme - was repeatedly banging his head against the viewing window of his pool and displaying signs of aggression. The aquarium was forced to temporarily close the viewing area to visitors, who were charged \$8.50 a head to see the famous 'Free Willy' orca.^{50a}
- A female caught at Taiji in February 1997 and sent to the Taiji Whale Museum was observed in May 1997 by orca expert Dr Paul Spong to be making a "strange twisting movement with her body every minute or two."

Aggression towards trainers.

- In March 1987, at Sea World, San Diego, 21 year-old trainer Jonathan Smith was suddenly grabbed by a six-ton orca and carried to the bottom of the tank. He was carried, bleeding to the surface, but no sooner was he released, than a second whale slammed into him. Both whales repeatedly dragged him to the bottom of the pool, as if trying to drown him. He finally escaped from the pool, but had suffered a ruptured kidney, lacerations to his liver and severe cuts.

- In June 1987, 28-year-old trainer Joanne Weber had a three-ton orca, Kandu, land on her during rehearsals at Sea World. Joanne fractured a bone in her neck which has resulted in permanent loss of head movement.
- In November 1987, Orky, the five-ton male came crashing down upon 26-year-old trainer John Sillick during a show at Sea World, San Diego. At the time, Sillick was riding on the back of a female orca. Sillick suffered severe fractures to both hips, pelvis, ribs and legs. He nearly died of his injuries.
- In February 1991, the first death occurred. Part-time trainer Keltie Byrne, 20, slipped and fell into the orca pool at Sealand of the Pacific, Canada. Sealand trainers had stopped doing in-the-water-work, so she wasn't wearing a wetsuit. Three orcas were in the pool: Tillikum, Haida and Nootka. One of the orcas seized her in its mouth and began dragging her around the pool, mostly underwater. Although a champion swimmer, Byrne proved no match for three orcas determined to keep her in the pool and she finally drowned. It was several hours before her body could be recovered.

Smith, Sillick and Weber all filed lawsuits. Despite being encouraged to go to court, all three accepted out-of-court settlements, with confidentiality clauses ('gag orders') attached - effectively ensuring that many pertinent details remain hidden. Keltie Byrne's parents have so far decided not to sue.⁵¹

- On 12th June, 1999, at the 2.30pm show, Sea World trainer, Ken Peters, was shaken up but otherwise unharmed after an incident at the San Diego facility in which 23 year-old female orca, Kasatka, grabbed him by the leg. Previously, Kasatka had been circling and had started to thrash around in the water near Mr Peters. Then, without warning, she grabbed him by the shin with her teeth and tried to push him out of the pool. The incident forced the cancellation of the show. Sea World later issued a statement that the orca would be given "additional training to discourage aggressive behaviour". Spokesperson Darla Davis said that "we're keeping her in the show but not allowing any trainers in the water with her and she will be doing additional behaviour modification." She added that "while it is unusual for a whale to bite a trainer, Kasatka is the dominant whale in her pod (sic) and will definitely be more aggressive than the others." This incident was the second of its kind involving Kasatka: in 1993, she had previously tried to bite a trainer.^{51a}
- On the morning of July 6th, 1999, a member of the public was found dead in an orca enclosure. The body of Daniel Dukes, 27, was discovered naked and draped over the back of male orca, Tillikum, at Sea World's Florida site. Daniel, whose address was listed as a Hare Krishna temple in Miami, is believed to have hidden in the marine park at closing time on July 5th. Authorities say he either jumped, fell or was pulled into Tillikum's tank. At almost 5 tonnes, the 14 year-old male is the largest in captivity and was also involved in the death at Sealand in 1991. Tillikum may have played with Duke's 81kg body as if it was a toy. Whilst initial reports suggested that the body had no obvious injuries, the autopsy report indicated that Dukes had been bitten in the groin after drowning in cold water.

Duke's parents initially filed a several million dollar law suit against Sea World for pain and suffering caused at the death of their only son. Attorney Patricia Sigman said that Sea World was legally liable as it had portrayed the orca as human loving, and as a "huggable stuffed toy". She went on to say that an inaccurate image had been given of this whale, when in fact, "he is extremely dangerous." Sea World said at the time that they would be vigorously contesting the suit. General manager, Vic Abbey, stated that "a fellow trespasses on our property, evades our security, scales two very clear barriers and takes off his clothes and jumps into 50 degree water with an 11,000 pound (4,990kg) killer whale. This is an incredibly unwise thing to do. He is responsible for his actions."

However, marine mammal scientist and captivity expert, Dr Naomi Rose, said that the fact that a Sea World patron was able to gain access to the whale pools after the park was closed demonstrates that Sea World does not provide enough security for whales and visitors alike, and that Sea World's programmes are not properly educating spectators about the wild nature of these five-tonne animals. In early October 1999, Duke's parents dropped their suit. Vic Abbey said he did not know why the suit was dropped, but stressed it had not been settled.^{51b}

The 1991 tragedy at Sealand has no precedent, and the full details surrounding the 1999 death of Daniel Dukes may never be known, so it is impossible to assess whether Tillikum played any active role in his death or whether Dukes was unable to swim and simply drowned. However, other incidents involving sometimes serious injury to trainers are by no means as isolated as the marine parks would have the public believe.

Marine mammal veterinarian Jay Sweeney writes that 'aggression expressed by killer whales towards their trainers is a matter of grave concern [and has] included butting, biting, grabbing, dunking and holding trainers on the bottom of pools and preventing their escape. Several situations have resulted in potentially life-threatening situations.'⁵²

So what exactly was going on in these and other incidents? Whilst some, such as the incident involving Joanne Weber, may be passed off by the marine parks as regrettable 'accidents' - a simple miscalculation on the part of the orca whilst performing a stunt - other situations cannot be explained away so easily. Indeed, in many cases, such as this latest incident involving Kasatka, the actions of the orcas involved appear to have a decidedly calculated air, a look of deliberate intention.

Why are the whales displaying such open aggression towards their trainers? Part of the reason may lie in the training philosophy espoused by each marine park. Graeme Ellis, a former trainer and now researching orca in the wild, maintains that a good training programme is one which keeps orcas mentally healthy and interested, whilst promoting trainer safety. 'It's not how many tricks you can train them to do in two months; it's how long you can maintain a whale's sanity... We seem to have a limited imagination when it comes to keeping these animals from becoming bored or neurotic.'⁵³

In the mid-1980s, Sea World, famous for its showy, splashy routines and extensive 'in-the-water' work, adopted a new training method, soon dubbed the 'Sea World Method'. Designed to keep both trainers and orcas interested and stimulated, it placed great emphasis upon variety and randomness in the content of training sessions. Unfortunately, this inconsistency and unpredictability appeared to unnerve both orcas and trainers. Following a spate of 'accidents', some outlined above, the scheme was hurriedly dropped, but not before a great deal of controversy had been caused, and several older and more experienced trainers had resigned in protest.

Bud Krames, a senior trainer, resigned because he didn't agree with the new training system. He estimated that around 35 trainers also departed within the space of one year. Some commentators feel that part of the problem has been an over-dependence upon young or inexperienced trainers, unfamiliar both with training signals and with the particular personality of each orca. Orky, for example, had a history of unpredictable behaviour.

For a while, trainers were ordered to stop doing in-the-water work, but within six months, were back in the water. Conveniently, the return coincided with the launch of a new orca show to mark Sea World's 25 anniversary! This time, however, the orcas were trained to focus only upon the main trainer on stage, ignoring other trainers in the water.

Over the years, most 'accidents' have occurred at facilities which routinely feature trainers performing in-the-water stunts such as riding the whales around the pool or balancing upon the orca's head. Some facilities, such as Vancouver Aquarium in Canada; Miami Seaquarium in the US and Taiji Whale Museum in Japan, no longer allow trainers to enter the water.

Graeme Ellis believes that orcas generally do not enjoy being ridden and that 'they may tolerate it when they are young or new to captivity, but later it can lead to problems.' Ironically, as in the Keltie Byrne case, adopting a policy which keeps trainers out of the water is no guarantee of safety, since any object - including a person - entering the pool is immediately a great novelty. Did the Sealand orcas think Byrne was a seal, or a plaything? Or were they bored and neurotic - perhaps even driven psychotic by the conditions of captivity?

Ex-Sealand trainer Eric Walters, who left because he believed that working conditions were inherently unsafe, has raised the highly contentious issue of food and sensory deprivation. He maintained that some marine mammals at Sealand, including orcas, were frequently deprived of their full food ration if they failed to perform well.

In addition, the orcas were cooped up each night in a small dark holding pool, only 8m (26 ft) in diameter and 6 m (20 ft) deep. Sealand's three orcas, two females, Nootka and Haida, and a male, Tillikum, barely had room to turn around and sometimes fought

each other, incurring quite severe injuries. Researcher Paul Spong believes that this sensory deprivation, combined with possible food deprivation, was sufficient to affect the orcas' mental state. Keltie Byrne's death was only the last in a long line of aggressive incidents involving injury to Sealand trainers.

The official line taken by marine parks is that food deprivation is unnecessary and, according to Sonny Allen of Marine World Africa, 'can work adversely down the road. What happens, we've found, is that it leads to aggression.' Despite this assertion, former trainers at Sealand and elsewhere have alleged that orcas which refused to perform might be deprived of some of their daily food ration as an incentive to better performance.⁵⁴

There is no one definitive answer to explain why orcas might quite literally 'bite the hand that feeds them'. It seems most likely that aggression stems from a combination of factors: the stress of unnatural confinement, sometimes with incompatible pool mates; the pressures of being asked to perform routines by young and often inexperienced trainers in a highly artificial and noisy environment and above all, the sheer frustration and boredom inherent in the captive situation.

Section 5

Marine Park Myths.

'Are sources of entertainment so scarce, we may ask, that they can be justified even at the cost of animal misery?' (Professor Andrew Linzey 1987)⁵⁵

Introduction:

Marine parks evolved from the same tradition as circuses, zoos and fun-fairs: in other words, to entertain the paying public and make a tidy profit for the operators. Even today, most marine parks feature a great variety of mechanical rides as well as animals performing circus-type routines. In fact, many parks - including all four Sea World parks; Miami Seaquarium; Marineland Cote D'Azur (France); Ocean Park (Hong Kong) and Adventure World (Japan) reflect their true colours by their membership of the International Association of Amusement Parks and Attractions (IAAPA). Only a handful of American facilities - Sea World, Vancouver Aquarium and Marine World, Africa UDA - are members of the American Zoo and Aquarium Association (AZA).

Whilst entertainment is still very much the name of the game, in recent years, attempts have been made by marine parks to redefine their purpose. Increasingly, marine parks began to feel the need to justify their existence to the wider world beyond the turnstiles. Despite the industry's attempts to present an unvaryingly rosy image, news of unacceptably high mortalities, accidents and injuries had gradually leaked out. Details of these incidents were supported in recent years by amateur videos, which undeniably showed cramped and featureless conditions, mindless circus tricks and, most disturbing of all, occasionally captured aggressive incidents or bizarre, repetitive behaviour.

Suddenly, public entertainment was no longer adequate justification for keeping orcas in captivity. Growing public interest in environmental and animal welfare issues made the marine parks increasingly nervous. As the arguments against captivity became more and more persuasive, the marine park industry realised that it must adapt in order to survive.

The parks responded quite cynically and moved swiftly to improve their credibility. Suddenly marine parks were being marketed not merely as places of family entertainment, but as centres of excellence in the fields of education, research and conservation.

Sea World's 'Pledge and a Promise' is typical of the new 'respectable' facade. The 1995 visitor guide to Sea World's Ohio park promises that 'although entertainment is Sea World of Ohio's most visible facet, education, conservation and research are still our primary commitments and embody Anheuser-Busch's *A Pledge and A Promise* to a quality environment. This ... establishes breeding and research programs and underscores the need for environmental sensitivity through our local education programs.'

This section will look at the four great 'myths' namely: education, conservation, captive breeding and research, put forward by many marine parks in an attempt to justify their existence.

Education:

'Education is a very vital part of any attempt to help people understand an animal. But I think the best way to do that is to help them learn about the animal in its own environment. Displaying captive marine mammals teaches a negative rather than a positive [attitude], because people never get to witness the mammals' natural behavior.' (Jim Phillips, Educational Specialist, 1990)⁵⁶

Not everyone in the marine park industry was an immediate convert to the new crusade. George Millay, father of Sea World, angrily exclaimed in 1989 that 'Sea World was created strictly as entertainment. We didn't try to wear this false facade of educational significance.' But this new focus upon education was not merely a public relations exercise. It was driven in part by the 1988 amendments to the Marine Mammal Protection Act, which required that all American parks displaying marine mammals must provide an educational component as part of their public programme.

However, the 1994 re-authorisation of the MMPA essentially overturned the previous requirement to meet certain standards and effectively gave the marine park industry the green light to self-determine what constituted a suitable programme of 'education.' Under this new self-regulation, the AZA and the Alliance of Marine Mammal Parks and Aquaria (the Alliance) have stipulated minimum requirements governing educational presentations. Guidelines set out by the Alliance include the stipulation that 'education programmes about marine mammals must present information about these animals, their ecosystem, or marine wildlife conservation that is based upon the best current scientific knowledge.' The extent to which 'best practice' translates into reality will be examined in this section.

Larger marine parks, such as Sea World, have spent many millions of dollars in their enthusiasm to raise their educational credibility. In 1990, Sea World claimed to have spent \$3 million during the year on its educational programmes.⁵⁷

On the surface, this might appear a wonderful opportunity to inform the paying public as well as visiting schoolchildren about the marine environment, using the biology and social behaviour of orcas as the focal point. By lighting the touch-paper of their enthusiasm, marine parks have the opportunity to inspire a new and profound respect for marine mammals and their ocean habitat. But how well have they responded to this challenge and what calibre of information is being disseminated through these educational programmes? Equally important, how much of the information is accurate, appropriate and in context - and how much is retained once the visitor leaves the park?

Arguably, the overwhelming obstacle to any attempt at educating visitors lies in the very fact that the captive situation bears absolutely no relation to the life of free-ranging orcas in the wild. Captive orcas are a sad caricature, a weary and spiritless version of their wild counterparts. Visitors cannot help but leave with a distorted perception of orcas and their environment. Most disturbingly, they may leave with the notion that it is acceptable to confine orcas and other animals, solely to meet human demands for entertainment and 'education'.

Attempts to inject an educational component into show routines have met with very mixed results. Marine parks steadfastly maintain that the public learns best if education is combined with entertainment. Sea World's Brad Andrews commented in 1991 that 'zoological displays are the most effective means of acquainting and educating the greatest numbers of people about wildlife. Live animals hold a person's interest in a way not possible with static exhibits.'⁵⁸

A fair point, if the educational component was not so blatantly at odds with the entertainment value. All too often, splashy, showy routines take centre stage and an often feeble attempt at education is tagged on, almost as an afterthought.

Psychologists contend that we learn most from what we see, hence our lasting impressions are mainly visual. If this is so, then 'the images that persist are those of the trainers riding, kissing, hugging, patting and flying off the heads of orcas, as trained animals are put through their paces of 'the wettest show on earth'. (Hoyt, 1992). The accompanying commentary, along with video clips and captioned photo display boards, is very much secondary to the main event: the splashy, glitzy, edge-of-your-seat razzmatazz that is the orca show.

'There is little to be learned by watching three-ton mammals in an oversized swimming pool... there's a fine line between teaching people to value wildlife, and parading these animals for witless amusement. There is a danger we will see more, not less, exploitation of wildlife - an exploitation that is all the while touted as 'educational'!' (Alton Chase, US columnist, 1989).⁵⁹

The parks try to defend themselves and, at the same time, patronise their visitors by claiming that most people have a very short attention span. Randy Brill of the Chicago Zoological Society commented that 'Dad, mom and the kids are not looking for a technical lecture on cetaceans. They are spending their money and want to be entertained.'⁶⁰

Although show scripts have improved somewhat in recent years, and are not nearly so corny, cliché-ridden and self-congratulatory as they were until the mid-1980s, the blaring rock music and stunts with the trainers nevertheless remain centre-stage at most parks. Moreover, the commentary is still full of careful euphemisms to avoid sensitive or negative connotations.

Hence, captive orcas are not captured but 'collected' or 'acquired from the natural environment'; they don't live in tanks but in 'enclosures' or 'controlled environments'; they perform 'behaviours' rather than tricks. These buzzwords paint a gloss over the true nature of captivity and serve to reduce the captives to the level of performing robots. Staff and trainers are also carefully coached in answering 'tricky' questions from visitors, especially in deflecting arguments relating to captivity.

In the blurb promoting Sea World Orlando's 1995 'brand new' killer whale show 'Shamu: World Vision', visitors are presented with a rather confusing juxtaposition of wild and captive behaviour. Visitors are informed that actress Jane Seymour will narrate 'thrilling footage of killer whales in the wild, presented on the huge 'Shamuvision' screen. You'll witness these magnificent creatures as they travel in pods, dive and pursue prey. Then you'll experience the real thing as the true stars of 'Shamu: World Focus', the Sea World killer whales, demonstrate these natural behaviors up close - leaping, splashing, sliding out and bowing.' The audience is deliberately lead to believe that the choreographed antics they witness during the orca show represent natural behaviour.

The facts in black and white?

The larger parks also claim to educate through the medium of a wide variety of glossy brochures, educational packs for schoolchildren, 'Killer Whale Fact Sheets' and other pamphlets. In these, as in the show commentaries, a highly selective view of orcas is presented, carefully orchestrated to present the captive situation in the best possible light and deflect any potential opposition.

But these so-called 'educational materials' are often bland and dull in format and when compared to the lively and colourful souvenir booklets, they seem stodgy and pedestrian. A missed opportunity or merely a token effort? Furthermore, whilst non-controversial information may be presented in a straightforward way, more controversial topics (such as longevity) may be dealt with in an oblique manner, or worse, the facts presented may be out-dated or downright incorrect.

The most current scientific findings are ignored when they don't happen to coincide with the marine park agenda. Examples include the issue of longevity and the oft-repeated question of drooping dorsal fins.

Longevity:

A 1996 study,⁶¹ co-authored by Erich Hoyt, has revealed the gross discrepancies between the most recent scientific findings and the information disseminated by the marine parks on the issue of natural lifespan. Sea World's research biologist, Daniel Odell states in a 1995 children's educational book 'Getting to Know the Whales': 'The most recent scientific studies suggest that a killer whale's lifespan is between 25 and 35 years, regardless of where it lives. It's pure speculation when [field researchers] conclude these animals live to a maximum of 50 to 60 years.'⁶²

Miami Seaquarium echoes Sea World's longevity figures, whilst Marineland of Canada's 1995 'Marineland Educational Manual' states that 'it is believed that the killer whale may live for up to 35 years.' Significantly, an almost identical manual distributed around 1991 stated 'killer whales may live for up to 50 years.'⁶³ This dramatic revision downwards - flying in the face of long-term and highly-respected field research - can only be regarded as a less-than-sophisticated attempt to deceive the public; disseminating inaccurate information in order to justify a spate of premature deaths amongst captives.

The droopy dorsal debate:

Visitors to marine parks frequently ask why the tall dorsal fin of captive male orcas has completely flopped over to one side. The 'explanation' given in Sea World's 1995 pre-performance Killer Whale Quiz that 'height, weight and genetics all play a part in the straightness or droopiness of a killer whale's dorsal fin' conveniently makes no mention of the fact that this phenomenon is almost unique to captive orcas, occurring in only a tiny handful of individuals observed in the wild and giving the lie to a comment by a Sea World hostess in 1995 that bent fins are 'inherited from their mothers and fathers, like eye colour'. Less dramatic, but equally telling, captive females also often display drooping dorsals.

In fact, the consensus amongst scientists seems to be that drooping fin syndrome has rather less to do with genetics or to 'overheated collagen' (another marine park 'explanation') than to the fact that orcas have inadequate space in which to swim, cannot travel in a straight line and so are reduced to swimming in small circles, mainly counter-clockwise. Indeed, marine mammal vet Sam Ridgeway commented that of 10 orcas he observed at Sea World, eight had a left tilted fin and swam counter-clockwise. The other two had right tilted fins and swam clockwise.⁶⁴

'Shamu' never dies:

Perhaps the most misleading information of all is propounded by Sea World in its insistence on maintaining what orca researcher Erich Hoyt refers to as the 'Shamu lie'. Back in the 1960s, Sea World dreamt up the idea of using the same few names for all its performing orcas, ostensibly in the interests of maintaining continuity and providing a recognisable image.

The idea has benefited Sea World considerably, with endless marketing spin-offs. Sea World literature makes great mileage from the 'Sea World Family' of Shamu, Baby Shamu and Kandu, all trademark names. But the hype artfully conceals the reality of individual orcas living cramped and restricted lives, far from their family pods.

Even worse, the 'Shamu myth' conceals deaths from the paying public. Since the name is passed from orca to orca, 'Shamu' never dies. In 1991, following the death of one of the orcas at Sea World's Texas park, a spokesman said 'Shamu has not died today. One of the whales who plays that role we lost this morning, yes. But Shamu lives on.'

A few other marine parks, including Kamogawa Sea World in Japan; Marineland, Canada and Marineland, Cote D'Azur in France, also use the same few names for their orcas; but Sea World dominates the market when it comes to whitewash.

Thankfully, there are exceptions. There do exist marine parks - notably the Vancouver Aquarium - which have made a determined attempt to offer an intelligent and well-presented educational programme. According to Hoyt et al's 1996 study of North American marine parks displaying orcas,⁶⁵ only Vancouver Aquarium, along with Marine World Africa, USA, provided information on orca lifespan which was consistent with the most up-to-date scientific research.

In 1986, Vancouver introduced a new programme entitled 'A Day in the Life', which attempted to give visitors an insight into the daily happenings of a wild orca pod. Since then, the educational component has continued to expand. 1991 saw the opening of an expanded 'killer whale habitat' and that same year, scheduled performances were discontinued, partly to reflect the new education-oriented philosophy, but partly also because their female, Bjossa, had begun to behave in an increasingly unpredictable manner. Whether Vancouver Aquarium's more enlightened approach towards the display of orcas and their more sophisticated approach towards educating their visitors will be adopted by other marine parks remains to be seen.

Lasting impressions?

A further consideration is just how much information the visitor retains. When school parties visit Sea World and watch a modified version of the Shamu show, what thoughts

go through their minds? Are they able to see beyond the showbiz routines and equate the animal performing for their amusement with orcas in the wild? Or do they leave with the overwhelming impression that humans have a right to dominate other species: that 'anything goes' as long as it entertains the public? And how much do they recall after leaving the park?

Recent studies have come up with some interesting results. It appears that the marine parks themselves are uncomfortably aware that their efforts at education have not made a lasting impression on visitors. William Donaldson, president of the Zoological Society in Philadelphia went so far as to admit that 'the studies we have conducted .. show that the overwhelming majority of our visitors leave us without increasing either their knowledge of the natural world or their empathy for it. There are even times when I wonder if we don't make things worse by reinforcing the idea that man is only an observer in nature and not a part of it.'⁶⁶ He was referring to zoos, but the circus atmosphere prevalent at marine parks is hardly a more sympathetic environment.

More alarmingly for the marine parks, it appears that where visitors, especially children, **do** retain information after the visit, the lasting impression may be a deeply negative view of the plight of captive animals.

More independent studies are needed, but informal studies carried out in 1991 suggested that teachers frequently expressed disquiet as to the supposed educational value of a visit. A Californian teacher quoted in a 1991 study, felt that students regarded visits to marine parks as entertainment rather than education and such visits may even have a negative impact upon more informed youngsters. 'For students who have .. developed admiration and compassion for whales, seeing them confined in a tank and performing tricks to entertain a crowd often leaves [them] with feelings of deep sorrow. An aquarium show cannot be transformed into a sound educational experience simply by interspersing natural history trivia among the back flips, synchronised leaps and other 'entertaining' feats commonly performed by the animals.'⁶⁷

A teacher from Pennsylvania, quoted in a separate study, questioned the value of captive display when 'feelings of anxiety for the animals are the result of observing them in captivity, rather than feelings of respect and wonder for the animals.' She further commented that 'they [the children] are not developing a responsible attitude which will lead them to act in ways to preserve the natural habitats of the animals .. [they] are merely spectators and helpless ones at that.'⁶⁸

However, some children were able to see through the veneer of the show commentary, reaching their own shrewd conclusions as to the value, or otherwise, of the shows. One fifth grade student in California, when asked to write an assignment for a cross-curriculum study on marine mammals, chose to write about orcas from the vantage point of a Sea World trainer. She wrote 'we're supposed to tell people that orcas live to be 25 years. However, in the wild they can live to be 80. In the wild, the dorsal fins are not bent, but at Sea World they are bent because they have to swim in the same direction all the time and close to the surface. Just goes to show you. Don't believe everything you hear.'⁶⁹

In conclusion, it may be argued that, with the exception of Vancouver Aquarium, educational information is all too often badly presented, inaccurate and sometimes wilfully misleading. Crucially, Vancouver Aquarium is run as a non-profit society, whilst most marine parks, such as Sea World, are blatantly run as highly profitable ventures. It seems unlikely, therefore, that education will ever seriously compete with entertainment.

CONSERVATION

'Conservation' is arguably one of the buzzwords of the 1990s, but never has the need to inform and educate people about the perilous state of our planet been so urgent. Many people feel that marine parks are in a strong position to use the massive appeal of whales and dolphins as a vehicle for introducing conservation messages to the public.

In an ideal world, education and conservation would go hand in hand: marine parks would follow the lead of the World Conservation Union (IUCN) and raise awareness of the need to conserve species and ecosystems.⁷⁰ Unless and until people are made aware of the myriad threats facing marine mammals and their habitats, they cannot possibly act to lessen or remove such threats. Only through raised awareness can action be taken to halt or reverse the damage we have already done.

Whilst Nadia Hecker of the National Aquarium in Baltimore claimed in 1991 that 'conservation is a major reason for our industry's existence' it is difficult to square this boast in the case of orcas. Sea World, in particular, is very vociferous in support of its 'conservation programmes' for endangered species such as the manatee. In tandem with Miami Seaquarium, it operates a highly publicised rescue, rehabilitation and release programme for Florida manatees.

Orcas have never popularly been regarded as an endangered species, yet, in recent years, it has become apparent that certain orca populations are much smaller than previously estimated. Many orca researchers now suspect that whaling and large-scale capture operations in the past may have had more of an effect upon orca numbers than previously recognized, and that certain populations - previously believed to number in the thousands - may actually contain only several hundred (or fewer) individuals. For example, during the 1960s and 70s, the orca population of the Pacific Northwest was decimated by live captures, with at least 56 orcas taken into captivity and a minimum of 11 orcas killed during capture attempts.

The Southern Resident community (see section 2) was particularly affected and, some thirty years on, far from recovering, now has 15 **fewer** members than it did in 1995. The population is now a mere 83 animals. The transient orca pod captured off Taiji, Japan, in February 1997, was the first pod to be sighted in the area for many years, fuelling speculation that orca numbers in the Eastern Pacific may also be much lower than previously believed. Until much more is known of population parameters for orcas, the 'precautionary principle' approach demands that no further orcas should be taken from the wild.

No orca (whether wild-caught or captive bred) has yet been released back into the wild, although a pioneering rehabilitation and potential release project is currently underway. Masterminded by a coalition of conservation and welfare groups, the project centres upon a young male named Keiko. (Please refer to Section 7, Release Programmes).

Furthermore, although orca habitats in every ocean of the world are subject to a whole host of serious threats, no attempt has yet been made by any marine park to carry out 'practical orca conservation', in the sense of protecting and enhancing the species in the wild, conserving the orcas' natural habitat and so forth. Many environmentalists believe that orcas could serve as a 'flagship species' for getting across the message that the world's oceans are in a perilous state. Not content with wreaking havoc upon the land, recent research has demonstrated that man-made toxic chemicals are widely dispersed throughout every ocean and, shockingly, no body of water, however remote from land, now remains without some form of pollution.

In March 1989, the Exxon Valdez oil spill wreaked havoc upon the wildlife of Alaska's Prince William Sound. Orcas were affected - along with a host of other marine creatures - since their prey was contaminated by oil and the orcas themselves were directly exposed to toxic pollutants in the oily water. It is believed that at least 14 orcas died as a direct result of the Exxon Valdez disaster. Other threats to orcas (and other marine life) include climate change; fisheries interactions, including competition with humans for scarce fish stocks and prey depletion due to over-fishing by commercial vessels; noise

pollution (from shipping, seismic testing and oil and gas exploration); coastal development; logging and other industrial concerns, and so forth. In addition, many species of whales and dolphins (such as the river dolphins, porpoises and blue and right whales) are under threat of extinction. Even relatively numerous species such as bottlenose and common dolphins have suffered horrendous losses during commercial fishing.

How have the marine parks responded to this challenge? Sadly, for the most part, marine parks have conspicuously failed to take up the challenge. Conservation messages - when they are incorporated at all - are largely tagged onto the end of a show or are buried beneath the razzmatazz.

The main problem from the marine park perspective is that conservation messages just aren't any fun, they sit uncomfortably next to the relentlessly jolly and upbeat tone of the orca show. In a 1990 study, Interpretation Directors at Vancouver Aquarium, which is generally acknowledged to be one of the better educators, admitted that 'despite an overwhelming commitment .. towards conservation education, little is actually happening, at least that people can quantify in a scientific manner.'⁷¹

In some cases, conservation messages are cynically manipulated by marine parks in a blatant attempt to present captivity in a favourable light by comparison; thus justifying the parks' continued existence. The ocean is frequently presented in a negative light, as a dangerous place full of hazards, both natural and man-made.

Opposition to captivity is presented as illogical and misdirected, given the dangers of the natural environment. 'In an age of severe ocean pollution, oil spills, tuna net deaths and death from entanglement in discarded fishing gear, certain groups have unfortunately chosen to focus their time and energy on questioning the validity of displaying marine mammals at public aquariums.' (National Aquarium, Baltimore, 1989)⁷²

Marine World Africa USA declared in 1991 that 'in one day of tuna fishing in the eastern tropical Pacific, commercial fishing fleets have killed more dolphins than have ever been collected for oceanariums.'⁷³ This claim is both exaggerated and irrelevant, since it is a bit like historically justifying slavery on the basis of famine and disease in Africa! One form of injustice does not vindicate another.

Significantly, the majority of marine parks have conspicuously failed to use their high public profile and financial clout to lead the way in cleaning up the ocean environment. It has been left to environmental groups to lobby for stricter curbs on marine pollution and to raise public awareness about the millions of needless dolphin deaths during commercial tuna catches.

A rare exception is Hong Kong's Ocean Park Corporation. It funds the Ocean Park Conservation Foundation which, in 1993, launched a five-year Conservation Action Plan. Spearheaded by the late Steve Leatherwood, the Action Plan sought to address conservation, research and educational concerns relating to river dolphins and other cetaceans in Asiatic waters.⁷⁴

The majority of marine parks, however, stand guilty of blatant hypocrisy: of paying lipservice to conservation whilst being unable to demonstrate many practical initiatives, or worse still, operating in flagrant contradiction to their own 'conservation messages'. Sea World, for example, exhorts spectators at its orca shows to respect the marine environment and not throw litter into the ocean. It also organises occasional beach clean-ups and litter patrols. Yet, in the late 1980s, Sea World was fined for dumping waste water in San Diego's Mission Bay. The discharge exceeded permitted toxicity levels by as much as 700%.⁷⁵

Whilst outwardly happy to promote themselves as conservation bodies, most marine parks will only adopt the mantle of conservation as long as it equates with their overall agenda. Put simply, the parks don't often practice what they preach, (section 6 deals more fully with examples of hypocritical disregard for conservation agenda).

CAPTIVE BREEDING:

'Biologists consider reproduction to be the primary indication of whether an animal is healthy and well-adapted to its surroundings. We consider breeding to be successful only if the offspring survive and thrive.' (Jim McBain, Sea World 1991)⁷⁶

- Of 55 known orca pregnancies in captivity world-wide since 1968, only 21 calves (38%) have survived.
- Sea World has lost five adult females during or shortly following births. Four out of five males who fathered calves are now dead. Whilst calf mortality in the wild is believed to be around 40% during the first year of life, the deaths of adults in their teens and twenties is extremely rare.

The vast majority of marine parks have a miserable record when it comes to captive breeding. Only four facilities (Sea World – 4 parks; Marineland, Canada; Marineland, France, and Kamogawa Sea World, Japan) have been able to keep a captive-born infant alive for more than a matter of days. Until January 1998 (and the birth of Lovey, a female calf born to Stella, both of whom are alive as of November 1999), Kamogawa Sea World in Japan had not succeeded in keeping a calf alive for more than a day. For example, Maggie/Magy, an Icelandic female held at Kamogawa, gave birth to a male calf in March 1995. The calf died after a mere 30 minutes. Her second calf was stillborn in early autumn 1997 and Maggie herself died on October 7th, 1997.

Marineland, Niagara Falls, Canada has produced five surviving calves, one of which ('Splash') has been exported to Sea World, whilst Marineland, Antibes in France has three surviving calves. In comparison, Sea World's total of 13 calves (eleven born at Sea World, two acquired from other parks) seems a creditable achievement. But is it? How successful has Sea World's captive programme really been and what are the main reasons for encouraging orcas to breed in captivity?

Sea World is tremendously proud of its captive breeding programme. Its 1993 souvenir brochure proudly declares that 'nothing better symbolises the pride of our Sea World family than our remarkable new crop of baby animals. From big squirts like our baby killer whales and walruses to little dippers like otter pups and fuzzy chicks. While they are all cute and loveable, there's more going on here than meets the eye...'.⁷⁷ All too true, although not in the sense that Sea World intended!

Behind the scenes and far from the gaze of even the most inquisitive of visitors, a catalogue of miscarriages, stillbirths, calves surviving only a matter of hours or days and females dying of pregnancy-related conditions has unfolded over the years. These incidents give the lie to the 'happy family' myth propagated by the marine parks.

Why breed? The obvious, yet most cynical, answer is simply that nothing pulls the crowds like a baby animal. Sea World has more captive-born orcas than any other marine park and each new birth is heralded in a blaze of media publicity, with crowds flocking to see 'Baby Shamu'. (Contrast Sea World's blaze of publicity - even meriting a full page on its Internet web site - at the successful birth of Unna, a female calf, to Katina, on 27th December, 1996 at its Orlando park; with the conspicuous absence of any information following a reported birth, again at Orlando, in February 1997. To date, Sea World has remained tight-lipped and has refused, so far, to confirm or deny that the February birth took place, fuelling intense speculation that the calf did not survive.)

A less palatable answer, but certainly one which carries equal weight, is that breeding must take place in order to replenish captive numbers; in other words, to replace dead orcas. Since 1985, the year of the first successful captive birth at Sea World, a total of 13 adults (nine females, four males) have died at Sea World parks alone. Ironically, Sea World has lost five adult females during pregnancy or shortly following births.

What about the much-vaunted conservation benefits of captive breeding? Captive breeding is often promoted as the great hope for conserving endangered and vulnerable species. Marine parks have certainly done their share of basking in the reflected glory of a small handful of successes in this field for example: manatees and Malaysian otters. From a conservation angle, the whole purpose of a captive breeding programme should

be the eventual release of captive-bred individuals in order to replenish threatened or depleted wild populations.

This goal echoes World Conservation Union (IUCN) policy on captive breeding, which recommends that wild populations of vulnerable species should be assisted by means of a viable captive breeding programme before populations are allowed to decline too drastically. The policy specifically states that 'reintroduction to the wild should be the ultimate objective of all captive breeding programmes.'⁷⁸

Captive breeding as a conservation tool is clearly not applicable in the case of orcas or bottlenose dolphins, the two cetacean species most commonly held captive. Neither species is regarded as endangered in the wild, no captive-bred orcas have been liberated and, to date, marine parks have not shown any interest in a release project.

The history of captive breeding:

Orcas are the largest animals that can be bred in captivity. The history of orcas breeding in captivity is relatively recent, dating back only to the late 1970s. Prior to that time, (with the exception of two stillbirths in 1968, by females who had conceived in the wild), there were no pregnancies, since captives were either immature, kept alone or kept only with others of the same sex.

The first live captive birth took place in 1977. Corky and Orky, a breeding pair held at Marineland of the Pacific, California, produced a male calf. He survived only 16 days. Over the next decade, the pair produced four more calves: one was stillborn and none of the others survived longer than 46 days. Corky seemed to have difficulty in adjusting to the maternal role. Brad Andrews, who worked with Corky both at Marineland, California and later at Sea World, commented that she 'didn't seem committed to keeping the youngster alive.'

After two miscarriages (in July 1986, and August 1987 after she was moved to Sea World), Corky stopped ovulating, aged only in her early 20s. In the wild, a female's calving years may extend from around the age of 15 to over 40. Corky's total of seven pregnancies produced not a single surviving calf. In stark contrast, Stripe (A23), the wild orca believed by researchers to be Corky's mother, gave birth in 1992 to her sixth calf at the ripe old age of 45! All of Stripe's calves survived the first few years of life and four survive today.⁷⁹

Corky's experiences are, sadly, far from unique. Marine parks understandably have been reluctant to divulge the precise number of stillbirths, miscarriages and premature deaths at their facilities. It was only with the passing of the 1994 amendments to the Marine Mammal Protection Act that American parks have been obliged to report stillbirths or infant mortalities. However, in 1995, researcher Jerje Mooney trawled through newspaper clippings and necropsy reports to compile a list which makes for grim reading.

Calf mortality (excluding Corky's pregnancies and calves conceived in the wild):

1/86, SW, CA: live birth by Kenau, female calf died at 11 days.

1/86, SW, CA: stillbirth by Kandou.

11/88, V.A: live birth by Bjossa, female calf died at 22 days.

11/90, SW, TX: miscarriage by Kahana during 7th month of pregnancy.

3/91, ML, France: stillbirth by Freya.

9/91, VA: live birth by Bjossa, female calf died 96 days later.

2/92, SL: live birth by Nootka, male calf died at 33 days.

8/92, ML, Can: live birth by Kiska, male calf died at 62 days.

?/93, ML, France: reported stillbirth by Freya.

8/94, SW, FL: stillbirth by Nootka.

11/94, SW, TX: live birth by Haida, female calf died at 38 days.

3/95, VA: live birth by Bjossa, female calf survived 10 minutes.

3/95, KSW, Japan: live birth to Maggie, male calf died same day.

2/96, SW, FL: stillbirth by Gudrun.

[2/97, SW, FL: **reported** birth on 25/2/97, but SW refused to confirm and calf not listed]

4/97, SAW, Japan: (reported) miscarriage by female captured at Taiji 2/97.

10/97, KSW, Japan: stillbirth by Maggie
5/98, ML, Can: calf born to Nootka V, died 7/6/98 aged 11 days.

[Key: Sea World (parks in Florida (FL), California (CA), Texas (TX) and Ohio (OH), Vancouver Aquarium (VA), Marineland (ML), Canada/France, Kamogawa Sea World, Japan (KSW).]

World-wide, between 1968 and November 1999, a total of 32 calves have been miscarried, stillborn or have died within days of birth. This figure represents only known mortalities (and therefore does not include the reported birth at SW in February 97 since SW refuse to confirm or deny the birth and apparent subsequent death). The true total could be considerably higher.

- Average survival time of those calves which died shortly after birth: a mere 37 days.
- When Bjossa gave birth to her second calf, K'yosha, at Vancouver Aquarium in 1991, it was described as a 'perfect birth'. Yet K'yosha died only 96 days later, in such agony from an abscess near her brain that she spent her last hours repeatedly beating her head against the concrete of her tank, once with sufficient force to shatter her jaw.

Sea World, in particular, has invested heavily in its captive breeding programme: a 1991 estimate suggested that \$120-130 million dollars had been spent since 1984, in start-up, facilities, research and running costs.⁸⁰ Sea World's Brad Andrews claimed in 1995 that 'our breeding efforts are unrivalled in the zoological community.'⁸¹ Certainly, in comparison with Vancouver Aquarium's three births with no survivors, Sea World's current total of eleven surviving 'home-bred' calves appears more creditable.

However, these 11 were the only successful live births out of a total of 22 pregnancies. Two further calves were born alive but died within days of birth. Sea World has also had its share of miscarriages and stillbirths and, most worryingly of all, lost five females during or shortly after pregnancy.

Whales dying at Sea World during, or shortly after, pregnancy

10/87, SW, FL: Kona dies during pregnancy. Foetus discovered during the necropsy.
8/91, SW, FL: Kenau dies in 12th month of pregnancy, male foetus.
3/92, SW, TX: Samoa dies during labour of near full-term foetus.
9/94, SW, FL: Nootka dies 26 days after a stillbirth.
2/96, SW, FL: Gudrun dies four days after the stillbirth of a near full-term foetus.

Sea World has claimed that some of the deaths were unrelated to complications during pregnancy, but in the wild, mortality of females during pregnancy or shortly following a birth is extremely uncommon.

Given its huge investment in captive breeding, it could be argued that Sea World should have been able to avoid at least some of its fatalities, both mother and calf. Sea World has, after all, by far the largest facilities, with the space to separate pregnant females from other animals, thus ensuring privacy. Sea World's veterinary programme is second to none: frequent blood and other tests are taken so that pregnancies can be detected very speedily and female orcas are specially trained in 'nursing behaviour', e.g. presenting their mammarys to their young.

Despite its financial commitment to captive breeding, Sea World has conspicuously chosen to ignore the natural rules governing pregnancy, the mother-calf relationship and the involvement of other pod members which researchers have observed in wild populations. In the wild, mother-calf pairs remain in close proximity throughout their lives. John Ford of the Vancouver Aquarium has researched kinship among resident communities of wild orcas and commented that 'within this unique social structure, calves never leave their mothers.'⁸²

Indeed, the whole experience of pregnancy, birth and calf rearing in captivity is far removed from the situation in the wild. In the wild, young orcas spend several years

observing the births of older females and learning the rudiments of maternal behaviour in preparation for their own parenthood. Females are assisted during the birth and after by other pod members who function as 'aunties'.⁸³

These complex social relationships are rendered meaningless in the highly artificial social groupings and close confinement of the captive situation. Whilst some orcas - notably Orky - made an effort to assist at the birth, other orcas have acted aggressively towards the birthing female and marine parks are forced to routinely separate pregnant females, a situation totally at odds with the co-operative relationship observed among wild orcas.

Sea World has frequently been criticised for its policy of transporting females from park to park whilst up to nine months pregnant and for taking calves from their mothers at under five years of age. At least six juveniles have been separated from their mothers at a tender age:

- Kalina separated from her mother at 4 years, 5 months
- Keto at 3 years, 9 months
- Splash at 2 years, 8 months
- Nyar (now dead) at less than 2 years, 5 months
- Keet at 1 year, 8 months
- Sumar at only 6 months

The first successful captive birth in 1985 is a case in point. Kalina, a female, was born at Sea World's Florida park. Promptly dubbed 'Baby Shamu' she was taken from Katina, her mother, at 4 years 5 months and conducted on a whirlwind trip around all four Sea World parks. At the age of six, she was impregnated, giving birth in February 1993 to the first second-generation orca born in captivity. Predictably, the calf was christened 'Grandbaby Shamu' by a delighted Sea World.

Kalina was impregnated again in January 1994, transferred to Florida during the ninth month of pregnancy, leaving behind her first calf, Keet, a male aged just 1 year, 8 months. The separation directly contradicted advice given in 1990 by marine mammal vet Jay Sweeney that 'attempts at removing a juvenile cetacean under two years of age from its mother frequently results in significant stress ...[since it] remains emotionally dependent on its mother. The juvenile, especially a male, has difficulty coping with alternative environments.'⁸⁴ (See Section 4 on Stress).

Kalina gave birth to Keto, her second calf, in June 1995, whilst still under ten years of age. In the wild, orcas would not normally have their first calf until their early to mid teens. The youngest wild female observed with a calf was 11 years of age.⁸⁵ Yet, Sea World's 1993 'educational' booklet on Killer Whales states confidently that 'studies of killer whales in marine parks suggest that females become sexually mature when they reach about 4.6-4.9m (15-16ft) at about 6-10 years.' Ironically, in previous editions, and prior to Kalina's births, they stated that 'females become sexually mature .. at about 8-10 years.' A case of the facts changing to fit the park's agenda.⁸⁶

On May 14th, 1998, Taima gave birth to Sumar, a male calf, at Sea World's Orlando park. Taima was just 8 years old. Beginning around August 1998, what is described as a "high level of aggression" was observed from Taima towards her calf and in November 1998, the two were separated. Taima's sire was Kanduke, a transient orca, now dead.

On March 8th 1999, Sumar endured a 5-hour flight and truck journey from Orlando to SW's San Diego park. He was accompanied by 4 year-old Kito, a young male orca companion, with whom the 10 month-old calf has formed a bond following the forced separation from Taima, his mother. The two will join Corky, an adult female at San Diego, who has previously acted as a surrogate mother.

Latest news:

See section on stress, detailing Dr Naomi Rose's observations of Sumar at SW San Diego in September 99.

Also, Keet was transferred from SW TX to SW CA on 11.11.99 to create more space at Texas for SW Ohio females, Winnie and Kayla, who are temporarily being housed there whilst their Ohio tank is being renovated.

Marineland, Canada also has also a history of removing calves from their mother at an early age. Splash, a male calf born in August 1989 to Nootka at Marineland Canada, was transferred to Sea World in April 1992, aged only 2 years, 8 months.

In June 1995, a Zoocheck Canada official visited Marineland and noted that two male calves, Neocia (also known as Baby October, born October 92) and Kanuck (born August 94) were not housed in the King Waldorf tank with their mothers. Marineland staff stated that the two calves were then being kept in the indoor warehouse pool. If correct, this means that Marineland had removed a calf (Kanuck) from his mother when only ten months old.

A July 1997 email from Brian McHattie of Zoocheck, Canada, stated that Marineland then kept four orcas under 5 years of age in this indoor pool, namely:

- Neocia/Baby October (m) at the time (i.e. July 1997) aged 4 years, 9 months
- Kanuck (m) then aged 2 years, 11 months. Separated from his mother at 10 months.
- Malik (f) then aged 1 year, 4 months. Estimated separation from Nootka V at 13 months.
- Nova (m) then aged ten months. Estimated first separation from his mother, Kiska, at 7 months.

Latest news:

Kanuck has not been seen since Spring 1998 and is, therefore, presumed dead. According to Dept. of Fisheries and Oceans (DFO) records, September 10th 1998, no export permit has been issued for Marineland, and the facility has not exported orcas to any other Canadian facility. Marineland has consistently refused to respond to Zoocheck Canada's requests for information on Kanuck's status. If Kanuck DID indeed die around Spring 1998, he would have been under four years old.

Nova was reunited with her mother, Kiska, in July 1998. Malik was reunited with Nootka V in July 1999.

It should also be noted that discrepancies have occurred in MMIRs (Marine Mammal Inventory Reports) filed by Marineland. Whilst not formally required to submit these reports, Marineland has filed several in recent years, but has provided no information on transfers or mortalities and some information provided has been misleading. For example, although newsclippings indicated that Neocia was born in October 1992, Marineland's MMIR stated his birth as January 1992^{86a}

The incredible shrinking gene pool.

Observers have speculated that some unsuccessful pregnancies may be the result of in-breeding. In the wild, a healthy gene pool is maintained by the practice of matings taking place outside the immediate pod. Yet in captivity, orcas which are probably related have been allowed to interbreed.

- Corky and Orky were both captured from the A5 pod and were possibly related. Corky and Orky mated, but all seven pregnancies ended in miscarriage, stillbirth or premature death.
- Vancouver Aquarium's Bjossa mated twice with Finna. Their first calf died after 96 days, the second died within ten minutes of birth. Bjossa and Finna were captured together in 1980, from the same Icelandic waters. In order to prevent further failed births, Bjossa was administered a contraceptive called Regu-Mate although the use of contraceptives is still experimental. At one stage, Vancouver planned to exchange their male, Finna, for a non-breeding female, but he died in October 1997, before any exchange could be agreed.

- Thor, Stella, Oscar and Maggie, the four orcas held at Kamogawa Sea World in Japan, have only just succeeded in producing a successful calf. Lovey, a female, was born to Stella in January 1998. Thor (aka Bingo) was captured in 1984, the others in 1987. All came from the same waters off the east coast of Iceland. Maggie's first calf - a male - was born alive in March 1995, but died after 30 minutes. Her second calf was stillborn in autumn 1997 and Maggie herself died on October 7th, 1997.
- Freya, the female held at Marineland, Antibes, produced a successful calf (Valentin, born 14.2.96), but prior to that, she suffered two stillbirths, in 1991 and 1993. All Marineland calves were sired by Kim II. (NB Yamato, a male now held at Izu Mito, Japan, was held at Marineland until 1995, where he was known as Tanouk. He did not, however, sire any calves during his time there). Freya and Kim II were both taken from Icelandic waters in October 1982, but from capture zones at different ends of the island, so it is difficult to tell whether they might have been related.

Equally unnatural has been the principle of mating Pacific orcas with Atlantic orcas - a situation which would never occur in nature. The resulting offspring, of mixed Atlantic and Pacific genetic stock, belong neither to one population or the other. Most captive-born orcas have this questionable genetic background. It appears that the marine parks have to accept that their captive breeding programme must either suffer the problems associated with inbreeding, or the equally unnatural creation of 'hybrid' orca calves from geographically and genetically distant populations.

The main problem has been a pronounced shortage of breeding males. Sea World's response to the problem has been the routine shifting of its breeding males from park to park. In its quest to further broaden its gene pool, and to replace males which died prematurely, Sea World has been eager to import orcas - especially breeding age males - from other marine parks. Winston was imported in 1986 and, following the death in 1991 of Sealand trainer Keltie Byrne, Sea World was only too willing to import Sealand's three orcas, Haida, Nootka and Tillikum, despite their implication in her death. A further male, Ulysses, was imported on 'breeding loan' from Barcelona in February 1994.

All the calves born at Sea World (whether surviving or dead) have been sired by just five fathers: Orky, Kotar, Winston, Kanduke and Tillikum. Only Tillikum is alive today. Ulysses has, as of November 99, failed to sire a single calf, leaving Tillikum as the sole 'breeding bull'. Sea World's eldest male calf, Splash, is now ten years old and it is possible that SW will attempt to breed from him in the near future.

Other marine parks have even less flexibility when it comes to breeding. Even if all the orcas currently in captivity world-wide were brought together, the gene pool would still be far too small to ensure future genetic viability.

Despite Sea World's pride in its captive breeding record, it is time for the marine parks to acknowledge that, overall, the programme has been a failure. Captive births, far from swelling the captive population, at best have merely served to keep pace with deaths. Calves born merely replace dead adults. Furthermore, failed pregnancies and infant mortalities have been unacceptably high, as have maternal deaths.

- On February 14th 1996, Freya successfully gave birth at Marineland Cote D'Azur, France. However, only a week later, at Sea World, Florida, Gudrun went into labour during the 14th month of pregnancy. After a difficult labour, the calf was stillborn. Gudrun herself died a mere four days later.
- Gudrun's previous calf, Nyar, a female, died on 1st April 1996, aged only two years, three months. She had been sickly since birth and had never performed in shows.

Marine parks have never had the intention of returning captive born orcas to the wild. Yet, if the gene pool amongst captive orcas continues to shrink, the unthinkable might happen. In an obscene juxtaposition of the ideals of captive breeding (i.e. repopulating the wild) marine parks may move to resume further captures from the wild, in order to support a shrinking and unviable gene pool in captivity. The 1997 captures off Taiji (see

Section 3) which resulted in five orcas being taken to marine parks in Japan may set a dangerous precedent.

A spokesperson for Izu-mito Sea Paradise, which acquired one of the Taiji females said that 'keeping the female in a pool together with a male orca [Tanouk/Yamato, imported from Marineland in France in 11/95], we will study **breeding physiology**, behavioural ecology, etc.'(emphasis added). If captive breeding programmes do not result in a self-sustaining captive population, then surely it is time for the parks to consider whether orcas should be kept in captivity at all.

RESEARCH

'Most of us engage in little pure science - we function to bridge the gap between science and lay people in one very specific area.' (Sea World's Otto Fad, 1994)⁸⁷

'No aquarium, no tank or marineland, however spacious it may be, can begin to duplicate the conditions of the sea. And no dolphin who inhabits one of those aquariums .. can be described as a 'normal' dolphin. Therefore the conclusions drawn by observing the behaviour of such dolphins are often misleading when applied to dolphins as a whole.' (Jacques Cousteau, 1975)⁸⁸

Marine parks have been conducting 'research' upon captive orcas and other cetaceans since the mid-1960s, when scientists working with Moby Doll, at Vancouver Aquarium, attempted to analyse orca sounds and visual capabilities. In the 30 intervening years, the larger marine parks have spent many millions of dollars in their quest to learn more about the biology and social behaviour of their orcas.

In 1991, Marine World Africa attempted to defend the confinement of orcas by asserting that 'it is vital that a handful of these animals be in captivity so that we can learn about them, physiologically and behaviourally.'⁸⁹

Can this really be adequate justification for keeping fifty-one orcas captive world-wide and what has really been learnt? Has research using captive orcas furthered our knowledge of the species as a whole, or merely served a useful dual role: firstly providing information applicable only to the husbandry of captives and secondly, giving a veneer of academic importance to the marine parks, elevating the status of the larger facilities from merely entertainment park to the level of a research institute?

Research in the wild:

In fact, by far the greatest proportion of research on orcas has been carried out in the wild. The most widely-cited and long-term studies have taken place in the Pacific Northwest, off the coast of British Columbia and Washington State. Researchers here have spent the past quarter of a century conducting photo-identification studies of orca pods known as the northern and southern resident communities.

Several hundred individuals have been photographed and observed in a year-on-year benign study which has yielded many fascinating insights into orca society. Births and deaths, as well as visible injuries or illnesses, have been meticulously logged, and foraging, rest and play behaviour closely observed. The long-term nature of the study has increased both the status and the accuracy of its findings, since new or unusual behaviour can be verified by observation in subsequent years.⁹⁰

Similar studies have been conducted along the west coast of North America, stretching between Mexico and Alaska. Elsewhere, researcher Miguel Iniguez is currently studying three little-known orca populations off the coast of Argentina, and work is ongoing off Iceland, Norway, and the Crozet and Prince Edward Islands, both located in the Indian Ocean, off the coast of South Africa.

The most obvious advantage of studying orcas in their natural habitat is that 'naturalness' can be guaranteed. The research is benign (i.e. non-invasive): the orcas are simply observed going about their daily life. Researchers make use of photo-

identification techniques and underwater recordings using a hydrophone, analysing the results once back in the lab. In-the-wild studies have yielded much valuable information on such diverse areas as population structure, diet, acoustics and social behaviour.

Research in captivity:

In the highly artificial captive environment, this 'naturalness' factor disappears. Captivity, by its very nature, frequently distorts the behaviour and vitality of the orca to an unacceptable degree. Life in a wild orca pod, with the freedom to range at will, dive to great depths and associate freely within the pod is replaced by a world whose horizons are bounded by the shallow concrete pool, characterised by forced associations and by the virtual absence of freewill. Since the captive situation bears no relation whatsoever to the natural environment, much of the so-called 'research' conducted by the marine parks is only applicable at best to a tiny minority of orcas - those held captive.

Marine parks vary enormously in the amount of importance they attach to research. The smaller facilities conduct little if any research, whilst the better parks such as Vancouver Aquarium forefront their research and educational programmes. Tellingly, very few facilities - Vancouver Aquarium and Kamogawa Sea World being exceptions - have administrators with a scientific background. Despite its academic image, the research budget at Vancouver Aquarium is relatively small, with only 1% (\$50,000) of its 1990 budget devoted to its research programme; although if education and research are considered together, the figure rose to 13%.⁹¹

Sea World, predictably, spends the most money on its research programme and regards itself as being at the forefront of marine mammal research. The Hubbs - Sea World Research Institute was established back in 1963 and is located in one corner of Sea World's San Diego park. Whilst the Institute claims to be a separate, non-profit foundation, and derives some of its income from grants, corporate sponsorship and private contribution, it nevertheless relies heavily upon Sea World for around 20% of its income (1992 figure). Sea World also provides office space, pays basic bills and taxes, and makes available the use of its captive animals and equipment for use in research experiments.

Hubbs scientists largely work on their own projects and research proposals are funded for research in the wild as well as in captivity, but there have been occasions when research has been driven by Sea World's agenda, rather than being conducted in the interests of expanding knowledge. Hubbs scientist Frank Awbrey (1991) claimed that 'much of our effort has been directed towards basic questions of distribution and abundance of cetaceans around the world. With support from NMFS, Sea World and other sources, we have evaluated population status and assessed stocks of killer whales and other cetaceans in places from the Arctic to the Antarctic.'⁹² What he fails to make clear, however, is that much of the research was not entirely driven by scientific curiosity about the status of wild orca populations, but rather, was largely dictated by Sea World's collecting needs at a particular time.

Sea World funded Hubbs scientists in 1984 and again in 1987 to carry out population estimates and background research on wild orca populations off Alaska and Iceland respectively. Sea World had a federal permit to capture 100 orcas in Alaskan waters, 10 to be transferred to its parks, the remaining 90 to be temporarily studied and then released. It hoped that, by painting a research veneer over what was a blatant capture operation, public reaction would be muted. Sea World was wrong and the governor of Alaska forbade any capture operation.

Turning its attention to Iceland as a potential capture zone and with an eye to NMFS regulations which required population estimates before issue of capture permits, Sea World again funded Hubbs, along with Johann Sigurjonsson of Iceland's Marine Research Institute, to conduct background research and a population census. This research produced a weighty 316 page volume of specially-commissioned scientific papers. Both incidents were clearly a question of commercial motives driving the scientific research agenda.⁹³

Research or husbandry?

Whilst the larger marine parks are eager to promote themselves as research institutions, the fact is that much of the research conducted is motivated less by the desire to increase scientific knowledge of orcas than by the necessity of keeping their captives alive. Hence, the need to improve husbandry and veterinary knowledge fuels the research agenda.

Sea World biologist Daniel Odell (1991) commented 'the first type of research we do is basic research. This research emphasises life history and husbandry parameters [and] is important for animal husbandry purposes.'⁹⁴

Admittedly, some findings deriving from research conducted in captivity have yielded some useful knowledge, particularly in the area of reproduction. Research deriving from captive breeding of orcas has proved invaluable in contributing to knowledge about gestation periods, nursing patterns and weaning behaviour.

- Rough estimates of orca gestation had been made at Marineland during Corky's pregnancies in the late 1970s, but later research at Sea World confirmed that orca gestation periods averaged 17 months. Calculations were based upon monitoring hormone levels in urine samples - clearly a procedure that could not be replicated in the wild. The resulting information about the reproductive cycle and breeding behaviour has aided wild researchers in their observations of wild orca populations.⁹⁵
- Another area which may potentially benefit wild populations as well as captive, is that of genetics. Techniques developed by scientists at Cambridge University were used in 1988 at Vancouver Aquarium to determine the paternity of a newborn calf. It is possible that similar DNA studies could prove very useful in developing our understanding of social structure and the relationship between pods in the wild. Much remains to be learned about mating behaviour, particularly paternity, amongst wild orca communities.⁹⁶
- Research in the area of acoustics has also provided some potentially useful information. Whilst marine parks often claim to lead the way in both hearing studies and in the analysis of orca sounds, work involving captives was in fact pioneered by the US Navy, Air Force and other institutions. Since then, further studies into the hearing capabilities of orcas have been conducted at the Vancouver Aquarium, and at Marine World Africa, USA. It is hoped that studies which demonstrate an orca's hearing range may have useful application in determining acceptable levels of ambient noise, both in captive situations (crowd noise, music, pool pumps) and in the wild (boat noise).⁹⁷

Other research appears rather less useful. For example, Sea World has conducted much research into studying the stereotyped call repertoire or 'dialect' of killer whale calves born at its parks. It claims to be able to offer a unique setting for these studies, stating 'this is not information that has been available from the wild, despite the 20 years of study invested in the Puget Sound/British Columbia area. We still have not answered many of the most interesting questions about the system of dialects .. the answers to these questions will tell us whether there really are 'lineages' of killer whales determined by acoustic relatedness.'⁹⁸

Sea World's assertion is factually incorrect. John Ford's detailed study of orca dialects in the wild [since the late 1970s] has established the very points which Sea World claims are still in doubt: that is, that free-ranging orca pods communicate in dialects, some aspects of which will be unique to that pod, thus allowing common ancestry to be inferred.⁹⁹

In contrast, Sea World's research seems fundamentally flawed. In the wild, calves learn pod dialect by imitating their mothers and other pod members. Sea World's Killer Whale education pack (1993 edition) admits that 'calves are most likely to develop calls like those of their closest associates.' Since most of its calves are of mixed parentage and many are separated from their mother at a young age, the calves are likely to be exposed to a bizarre mixture of dialect, rendering any useful attempt at study totally meaningless. It is possible that Sea World is conducting these experiments with the aim

of discrediting the accepted link between dialect, and lineage or kinship ties amongst orca families, in an attempt to justify their own blatant disregard for such family bonds. Surely the primary objective of research should be to expand knowledge in ways which will benefit both captive and wild populations? Research findings should be both applicable and replicable outside the research venue. Sadly, with a few honourable exceptions, much of the research undertaken at marine parks can only be described as bad science, conducted in a haphazard fashion, with much duplication of effort and often rendered meaningless because of flawed hypotheses and methodology. The overwhelming impression is that research is undertaken purely to suit the needs of the marine park and to justify the continuing confinement of orcas.

Section 6

The display industry makes a killing.

Marketing the image. The goal is dominance. Lobbying. Smear campaign against animal welfarists. Dubious bedfellows. Japanese drive fisheries. The trade in pseudorcas. Drive fisheries in the 1990s. Over-capturing.

'The killer whale has become, over the years, synonymous with the name Sea World' (1978 Sea World permit application]

Marketing the image

' Potential justifications for keeping wild animals captive are threefold: entertainment, education and conservation. The first is surely the weakest. The harm done to animals cannot be justified, even in utilitarian terms, by whatever entertainment value such parks may possess. But, of course, it is seldom the seemingly altruistic desire to entertain and amuse that is at stake - it is the desire for profit.' (Professor Andrew Linzey, *Animal Theologian* 1987).¹⁰⁰

The previous section examined attempts by marine parks to justify their existence on the basis of education, conservation, captive breeding and research. However, the primary reason that marine parks exist is to make a profit. Marine parks may attempt to cloak their activities with a veneer of academic or research activity, but the dollar is always the bottom line.

It is deeply ironic, given the catalogue of injuries, accidents, stillbirths, miscarriages and deaths relating to captive orcas, that the species is regarded as the lifeblood of those marine parks, which persist in displaying cetaceans. Orcas are extremely important to the economic well being of Sea World. According to its own estimate, killer whales account for around 70% of annual revenue at the four Sea World parks.¹⁰¹

Approximately 9-10 million visitors walk through the turnstiles at Sea World parks each year. Each visitor spends an average of \$50 on entrance, snacks, drinks, gifts and souvenirs, bringing Sea World an annual income from visitor revenues of between \$400-500 million.¹⁰² A lucrative business indeed.

Yet the 'product' which Sea World and other marine parks are so eager to sell to visitors bears little resemblance to the true nature of either wild or captive orcas. Even captive orcas don't live up to the hype. Despite attempts to market them as loveable performing clowns, captives - most inconveniently - tend to suffer illnesses and accidents, pregnancies end in stillbirths and premature deaths are all too common.

Instead, the parks peddle a clever caricature of orcas; a potent combination of myth and clever marketing. No park is more adept at promoting this myth than Sea World. The killer whale motif, which forms part of the Sea World corporate logo, is echoed time and again around its parks. Visitors to the San Diego park, for example, can purchase Shamu beer mugs, coasters, keyrings and cuddly toys at the 'Gifts from Shamu' souvenir shop; Shamu tee-shirts, sweatshirts and baseball caps from 'Dolly Dolphin's Emporium'; have their photo taken at 'Shamu Photo' or with one of the Sea World employees dressed in oversize orca costumes; purchase jewellery at 'Shamu's Vault', or ride on the Shamu bus. There's also 'Shamu's Happy Harbor', a 'colorful 3-acre Caribbean-themed adventure land for kids and parents.' Everywhere, the highly fabricated Shamu image occupies centre-stage and the orcas themselves disappear beneath the sheer weight of the fairytale.

Sea World was purchased in 1989 by the brewing giant, Anheuser-Busch and it is easy to see how Anheuser-Busch's flair for self-publicity lends itself so well to the ingenious marketing of the four Sea World marine parks. 'The King of Beers' markets its products so aggressively that it is estimated that the average American sees the Budweiser logo ten times a day¹⁰³. Under the banner of the Busch Entertainment Corporation, Sea World has hosted a range of televised events, ranging from the Miss California beauty pageant, to Fourth of July celebrations and even environmental awards presentations.

In their quest to promote their product to the widest possible audience, Anheuser-Busch and Sea World have cynically made use of the latest in modern technology. A press release put out by Busch Entertainment Corporation (BEC) and William Morris (a prestigious advertising agency) declared that 'Busch Entertainment Corp. will work with William Morris to build franchise programs around the parks' characters, for instance, Shamu; build awareness through publishing, home video, television specials and possibly film, and expand BEC's existing in-school educational programming.'¹⁰⁴

Sea World thus attempts to influence the education agenda by broadcasting Shamu TV into schools through cable television.¹⁰⁵ By 1995, Sea World was broadcasting its own television soap, 'Out of the Blue'. Billed as a 'live-action sit-com' it is filmed at Sea World's Florida park and features orcas 'Shamu' and 'Kandu', as well as half a dozen personable teenage employees. Whilst the entertainment value is undoubtedly high, the show's value in terms of promoting conservation messages is virtually nil.

Teachers may purchase interactive educational materials for use on schools' computers. The reach of Sea World's Education Department now extends to the Internet. Schoolchildren can now access a range of information and, by clicking the 'Ask Shamu' icon, can call up answers to the most commonly asked questions on Sea World's marine mammals. Pupils are further invited to e-mail their questions which may be used in future Shamu TV broadcasts.

The ubiquitous image of Shamu lulls visitors into a false sense of security. Shamu never gets sick, never shows aggression, and above all, never dies. (see Section 5: Education). Real, living and breathing orcas with all their complexities are left far behind in this never-never land of false illusions. The myth is further perpetuated in the tone of the visitors guides and souvenir brochures.

Far from instilling respect for the animals and maintaining their dignity, Sea World seems to deliberately foster a distinctly flippant tone. It's 1993 souvenir brochure 'Dive into Sea World' is typical, relegating captive orcas to the level of a circus spectacle: 'Funny stuff is ongoing at Sea World ...all of [our] animal stars are good for a laugh or two. You can clown with sea lions, blow kisses to our walrus, or you might even get a thundering shower from the ever-playful Shamu.' A 1991 Sea World magazine advertisement features a child sitting on an orca's back. The title proclaims that 'Every great American theme park has an unforgettable ride!' and the text continues 'when it comes to memorable experiences, perhaps nothing compares with sitting on the back of a killer whale. At any number of his Sea World shows, Shamu graces some lucky child with a thrill that is shared by the entire audience.' As author and biologist Richard Ellis aptly commented in 1983, 'it is not for us to demonstrate respectful dominance over these creatures, but only respect. Sea World makes clowns of the orcas, depriving them of their dignity.'¹⁰⁶

'The Goal is dominance.'

August Busch III is head of the Anheuser-Busch dynasty. The prevailing image at Sea World - that of the animal as performer first and representative of a wild species second - is, by all accounts, very much in line with its president and chief executive's own feelings towards the natural world. Unlike his father, August Busch II (the previous head of Anheuser Busch, who died in 1989), the son is less the animal-lover, and rather more the highly astute businessman.

A 1995 cover story in Forbes magazine profiles August Busch III thus: '[he] hunts competitors the way he stalked the deer and moose whose heads stare mutely from the walls of his rural Missouri ranch house. 'The goal is dominance', he said and his ice-blue eyes tell you he means it. This is as fiercely competitive a chief executive as you will find in US industry.'¹⁰⁷

Lobbying:

Behind the scenes, far from the crowds, the noise and the razzmatazz, marine parks work tirelessly in pursuit of their own agendas, often becoming embroiled in lobbying and political manoeuvring at the highest level. Nicholas Brown, executive director of the National Aquarium, summed it up when he commented 'entertainment was the key to the aquarium boom in the early 70s, but the focus is now changing to include facilitating research, promoting advocacy and influencing legislation.'¹⁰⁸

Since the 1970s, and particularly following the heated debate surrounding live captures from North American waters, marine parks realised that they faced an uphill battle to persuade the public of the legitimacy of keeping whales in captivity. A 1983 conference, 'Whales Alive', merely added extra fuel to a debate which had begun some years previously. Staged in Boston, the conference brought together 167 delegates to discuss the 'non-consumptive utilisation of cetacean resources.' Delegates recommended that 'efforts should be made to bring to an end, in due course, the keeping of cetaceans in captivity, with a view to the ultimate replacement of dolphinariums by facilities for observation, educational studies and enjoyment of wild cetaceans..' (Barstow 1983)¹⁰⁹

Marine parks realised that they must act fast in order to defuse criticism of their activities. In 1991, 'Resolution 13' was submitted to the annual meeting of the American Veterinary Medical Association. Signed by 163 of its members, the Resolution opposed further capture of whales and dolphins from the wild. It was speedily quashed by a well-briefed veterinarian from Sea World.¹¹⁰

The part played by marine parks in dismantling the Marine Mammal Protection Act, leading to its reauthorisation and substantial dilution in 1994 has already been discussed (see Section 4). In a 1993 speech, Nina Young, marine mammalogist for the Center for Marine Conservation noted that 'the public display industry has been beset by the animal rights community, the press, the government and the courts. They are no longer without controversy and are highly visible and easy targets. While the attacks, for the most part, are unwarranted, the reputation of zoos and aquariums is not flawless. Like any industry it is plagued with bad actors or facilities...it is unlikely that both sides (the industry and animal welfare groups) could ever resolve their differences .. any hope of breaking this gridlock lies with the public display community's ability to undertake a proactive, self-regulatory approach to disarm the vocal animal rights community and disarm NMFS's inertia.'¹¹¹

Robert Jenkins, representing the 'Alliance' (between the American Zoo and Aquarium Association and the Alliance of Marine Mammal Parks and Aquariums) boasted in 1994 that success in weakening the MMPA had been achieved '..through a consistent, co-ordinated and unrelenting approach to Capitol Hill and the Congressional staff responsible for the MMPA reauthorisation; the public display community was able to achieve virtually all of [its] agenda.'¹¹²

He might also have mentioned the fact that heavy lobbying was accompanied by equally heavy-weight cash contributions. The Alliance received cash donations of up to \$35,000 from Anheuser-Busch and the Busch family to help to fund its campaign. Predictably, the 'King of Beers' is also King of the Lobbyists: Anheuser-Busch was heavily involved in US President Bill Clinton's inaugural parade, and former Anheuser-Busch lobbyist Ron Brown was later appointed by Clinton to head the prestigious Department of Commerce, which happens to house the National Marine Fisheries Service (NMFS). Friends in high places indeed.

Smear campaign against animal welfarists

Not content with shamelessly lobbying at the highest levels in order to achieve their goals, marine parks have conducted a concerted smear campaign against animal welfare campaigners. Critics of the captivity industry are often casually dismissed as 'vocal minorities', who are 'misinformed' or 'misguided', but in situations where the marine parks hope to win press or public sympathy, they are not averse to referring to opponents as "extremists' or even 'terrorists'.

Despite the industry's fabrication of 'bomb threats' and the heavy handed treatment of protesters by security staff and police escorts, opposition to the captivity industry has, in

reality, taken the form of peaceful demonstration outside parks, leafleting and petitioning. Even peaceful rallies, such as one organised in 1988 outside Sea World's Texas park, have been hastily broken up, in this case because San Antonio's mayor Henry Cisneros did not want a visiting Soviet general to witness democracy and free speech in action.¹¹³

Sealand of the Pacific in Victoria attempted to blame the 1982 death of their female orca, Miracle, on a bungled attempt by activists at liberating her from her open sea pen. After the facility closed, a commercial diver put the rumour firmly to rest by establishing that Miracle had died of drowning after she had accidentally entangled herself in an old cargo net.¹¹⁴

Such rather crude attempts to smear their opponents serve merely to highlight the fact that marine parks are aware that they have failed to persuade the public (of which animal welfare campaigners form part) of their legitimacy. This awareness is reflected in the titles of papers presented at within-the-industry conferences, such as those organised by AZA and IMATA (the International Marine Animals Trainers Association). Such conferences have, in recent years, dealt with topics such as 'The zoo image, how it is perceived and how it can be promoted' (1985 AZA conference); 'An analysis of marine mammal display problems in the media' (1990 IMATA conference); 'Crisis management .. taking control of the animal rights challenge' (1991 AZA conference); 'Dealing with animal activists' (1991 IMATA conference).

In mid-1995, IMATA announced the Alliance's new media strategy which will involve 'developing a comprehensive and pro-active public relations plan for 1996 in an attempt to communicate and reinforce a positive image to the public at large.'¹¹⁵

Marine parks appear hell-bent on shedding their 'only for profit' image and adopting the mantle of a caring, responsible and conservation-friendly organisation. But the taint of several suspect past affiliations will prove difficult to erase.

Dubious bedfellows:

Whilst outwardly keen to espouse the cause of conservation, marine parks have, over the past quarter century, developed a dubious relationship with the tuna industry: an industry which globally has been responsible for the deaths of millions of dolphins. During the hearings leading up to the enactment of the MMPA in 1972, Sea World employed the services of lobbyist George Steele, who was also hired to represent the American Tuna boat Association.¹¹⁶

Sea World's dolphin shows were at one stage sponsored by the tuna company, Starkist, in the days before restrictions were placed on tuna which had been 'caught on dolphin'. More recently, the Marine Mammal Coalition, (representing the major marine parks) has employed the services of attorney John Hodges. In 1992, Hodges also represented the American Tunaboat Association in their efforts to modify or limit the embargo placed on existing tuna shipments.¹¹⁷ Do such politically sensitive affiliations represent naivety on the part of the marine park industry, or merely a cynical disregard which borders upon extreme arrogance?

Certainly, Sea World has shown a blatant disregard for protocol on several occasions. In its quest to maintain orca stocks, it has employed a range of techniques which, whilst not illegal, do not reflect well upon the integrity of the organisation. Orcas have frequently been captured from the wild, maintained for a short time at co-operating facilities in Europe and Japan, before being imported as 'already-captured' animals after a period of months or years, (**see section 3**).¹¹⁸

This 'orca laundering' procedure effectively ensures that Sea World has neatly avoided the negative publicity associated with wild capture. Similarly, public horror at the 1991 death of Sealand trainer Keltie Byrne was not sufficient to deter Sea World from purchasing the orcas involved in her death. Sea World's eagerness to acquire three breeding-age adults clearly overrode any doubts as to the wisdom of allowing its own trainers to perform with animals of such unpredictable mental state. (**see section 4, on aggression towards trainers**)

Other, less than healthy, animals have been knowingly purchased by Sea World, one example being the 1987 purchase of the male Kanduke from Marineland, Canada. Sea World was fully aware at the time of purchase that Kanduke had swallowed a float whilst at Marineland. After his death in 1990, a '55 x 20 x 13cm deflated fishing buoy' was confirmed in the necropsy report.¹¹⁹ More recently, Sea World was reportedly keen at one stage to acquire Keiko, the male orca held until recently at Reino Aventura, Mexico City (and currently in a seapen off Iceland as the second stage of a pioneering rehabilitation and release programme). Keiko's starring role in the 1994 hit movie 'Free Willy' and the resulting publicity made him an attractive proposition, despite the fact that at the time, he was underweight and suffered an unsightly viral skin condition. Orcas, in any condition, at any price, would seem to be the prevailing rationale.

Japanese drive fisheries

But, arguably the worst example of putting profit before propriety involves the willingness of larger marine parks to do business with Japanese fishermen, despite full knowledge of the methods used by these fishermen to acquire whales and dolphins. For years, Japanese fishermen on Taiji and Iki Islands have practised 'iruka no oikomi-ryo', the traditional drive fisheries which have resulted in the deaths of thousands of small whales and dolphins. The drives originally took place between October and April as a form of 'predator control' since the fishermen believed that the dolphins competed with them for fish stocks. The species most affected were pilot whales, and also striped, Risso's, bottlenose and white-sided dolphins.

By the late 1970s, the drive fishery was beginning to decline, largely due to adverse publicity in the world press which prompted international outrage. This coincided with the increasing difficulties experienced by the marine parks in locating suitable areas for wild capture of orcas and other cetaceans. With the decline in sites where live captures were still permitted, plus more restrictions on capture under the MMPA, the parks turned their attention to Japan as a potential capture site. It has been alleged that Lanny Cornell, then Corporate Director of Sea World, sent Don Goldsberry to the Iki peninsula. Goldsberry, along with Dr. Tobyama, director of Kamagawa Sea World, and later joined by dolphin collector Jay Sweeney, swiftly developed a business relationship with the Japanese fishermen. This cash arrangement benefited both parties, since the marine parks paid several thousand dollars more per animal than the fishermen could have earned from the sale of the meat.

The trade in pseudorcas

By the early 1980s, the involvement of the marine park industry had breathed new life into the drive fisheries. In short, they began to be conducted much more regularly, with the primary aim of fulfilling orders placed by marine parks. The parks were particularly interested in acquiring pseudorcas (false killer whales, known in Japan as Oki Gando) a species previously little affected by the drive fisheries. Since 1963, 28 pseudorcas have been captured for US marine parks alone.

Representatives of the marine parks - including Sea World and Marine World, Africa USA - were given the first choice of animals herded into the bay at Iki. Selected individuals would be held in a side bay for a period of months before export to purchasing facilities. Animals not selected by the marine parks would be driven onto the beach and slaughtered.¹²⁰ Marine World, Africa USA even went so far as to insist that it was actually 'saving the lives' of dolphins which would otherwise have been slaughtered for their meat had they not been purchased for the display industry - appearing to have conveniently forgotten the reason for the drives being reinstated!

The US conservation community challenged Marine World, Africa USA's import permits for pseudorcas, citing the requirement under the MMPA that documentation be provided demonstrating that captures had been 'humane'. In 1993, NMFS denied all dolphin imports from Japan which didn't comply with humane capture requirements.

The market rate for live bottlenose dolphins was in the region of 300,000 Japanese Yen, whilst pseudorcas fetched 450,000 Japanese yen. The fishermen themselves did not

make a great deal from these transactions - the bulk of the profits were siphoned off by the Tokyo-based 'Dolfino' corporation, which brokered the animals, and also by Jay Sweeney, who collected the animals. In a 1992 interview, Sweeney vehemently denied working with the drive fishermen, claiming he was merely overseeing the removal; however, he was filmed three years earlier (by Howard Jones) at Taiji, actively supervising the dolphin captures.

Ironically, many of the pseudorcas taken during the drive fishery and exported to parks and aquariums became ill with hepatitis or similar diseases, probably contracted from the polluted coastal waters off Iki Island. In spring 1985, Sea World imported four pseudorcas from Iki to its San Diego facility. By January 1986, two had died of hepatitis and more than 20 Sea World employees had been exposed to the disease after handling the animals or being involved with necropsies; all had to be vaccinated with gamma globulin as a precaution. Hong Kong Aquarium took 12 pseudorcas from Iki and all 12 died within a year of hepatitis-like diseases.

Ocean Park, Hong Kong imported 11 pseudorcas in 1987. Five were swapped or given to other facilities, the rest are now dead. The latest casualty, nicknamed Barney, died on October 10th 1999, of a bacterial lung disease called melioidosis. The 16 year-old pseudorca fell ill in September 1999, a few days after Typhoon York and had been receiving veterinary treatment. However, Ocean Park didn't release details of his death, which was only revealed when the South China Morning Post began investigating in November. The park denied any cover up. Director of zoological operations and education, Suzanne Gendron, stated that "Barney is the only marine mammal we have lost to melioidosis since 1993." However, the disease is not new to Ocean Park. In 1976, even before the park officially opened, an outbreak of melioidosis killed at least 33 marine mammals there. Since 1977, the year the park opened, over 100 marine mammals have died, mainly from this disease.

Melioidosis can cause bacterial infections in the blood and brain, and is characterised by a form of pneumonia which can dissolve the lungs. These bacteria flourish in soil and water, and scientists suspect that the 1976 outbreak was caused by heavy rains stirring up mud and sand, and washing bacteria into the bay near the park. Unfortunately, the park's practice of burying the carcasses of affected dolphins near the coast, thus allowing bacteria to be washed into the sea, may have perpetuated the outbreak. Contaminated seawater may have been drawn up to replenish the tanks of surviving animals, thus infecting them. When there are very severe typhoons, the bacteria can also be windborne; this may account for Barney's infection. Antibiotics are only partially successful in dealing with this bacteria. Humans are also affected by this disease, which can remain latent in the body for up to 26 years. Hoi Wai, the park's female orca, died of an undisclosed illness in 1997.^{121a}

Drive fisheries in the 1990s

In 1995, the drive fishery at Taiji claimed the lives of 1,650 dolphins.^{121b} The following year, on October 18th, 1996, fishermen belonging to the Futo Fishery Co-operative Association conducted their annual drive in the coastal waters off the Izu peninsula, south of Tokyo. Approximately 200 bottlenose dolphins, 50 pilot whales and 50 pseudorcas were corralled in Futo Bay. The number of animals taken (as well as the different species involved) far exceeded their permitted quota of 75 bottlenose, 75 striped, and 450 spotted dolphins. The 'best capture specimens' - 75 bottlenose dolphins and around a dozen pseudorcas - were placed in a separate area where they could be viewed by buyers representing Japanese marine parks.

After selling several juveniles, the fishermen slaughtered around half a dozen adult dolphins deemed 'unsellable'. Bottlenose dolphins destined for the captivity industry were sold for roughly \$US3,000. The price for pseudorcas varied between \$US5,000 and \$US6,000. As carcasses, these same animals would fetch roughly \$US300 apiece. A total of 37 bottlenose dolphins and 6 pseudorcas were sold to marine parks. The 100 or so unsold animals were taken to a separate area, where several were slaughtered. The wholesale slaughter of all the unsold animals was only prevented thanks to a barrage of faxes, sent by at least twenty-one Japanese conservation groups to the Ministry of Fisheries, which challenged the legality of the drive (on the basis of blatant

overcatching; the capture of pilot and false killer whales not listed in the permit, and the unauthorized sale of marine mammals to the marine parks). Ministry officials, confronted with multiple permit violations, ordered the release of the 150 remaining animals - which included those destined for captivity.^{121c}

In 1997, over 1,000 dolphins and small whales were killed in Japanese drive fisheries and 73 were live captured.

On 13th October, 1999, a drive fishery conducted at Futo resulted in around 200 bottlenose dolphins being driven into Futo harbour, Izu Peninsula, Japan. Since the fishery was blamed for taking more than their quota of bottlenose dolphins, and had taken prohibited pseudorcas in the 1996 drive, the dolphins were landed this time in the presence of supervisors from the prefectural government. However, a tv crew witnessed the fishermen secretly processing the dolphins at dead of night.

The following account is based upon a report from the DWAN, the Japanese NGO Dolphin and Whale Action Network.

“On October 14th, some of the dolphins were selected for aquaria. Two of them died of shock when they were landed. Dolphins not selected for live display – ie those deemed suitable only for their meat – were pulled with a hooked pole and a rope was secured around their tail fluke, slinging them up whilst still alive. After they were transported to the processing area, the dolphins were killed by cutting the carotid artery, but many did not die immediately.

In the end, a total of 69 dolphins died and 6 were sold to aquariums (Izu-Mito Sea Paradise, and the Keikyu Aburatsubo Marine Park). The remaining dolphins were released (since the permitted quota was for 75 dolphins) but some fishermen used hand hooks to force the dolphins out of the nets and injured dolphins were observed.

Local people told us that about half the dolphin meat was sold in the market of Ito city, but the rest of it was not put on the market. Dolphin meat has been traditionally consumed in this area but does not seem to be popular amongst younger people these days. Recent research has also revealed that dolphin meat is highly contaminated. After this hunt, high levels of methyl mercury have been detected even from the lean meat selling in the nearby market.”^{121d}

Over-capturing:

In spring 1987, Sea World took a total of 12 pseudorcas from Iki, despite having NMFS permits for only six. The six 'permitted' animals were flown to San Diego, one dying en route. The remaining half dozen were sent on a bumpy 12 hour journey to Kamogawa Sea World aboard a flatbed truck. Three of these animals, caught without permits, were, according to Dr John Hall (former marine mammal scientist at Sea World between 1986-1990), to be 'used as trade goods to barter for the killer whale Gudrun' held at the Dolfinarium at Harderwijk, Holland. An MMIR report, dated 23/3/94 lists their collector as 'Kamogawa Sea World, Japan.'

The pseudorcas could not be transported direct to Holland, since they lacked the necessary permit documentation. Instead, in November 1987, they underwent a nightmare journey, being trucked from Kamogawa Sea World to Tokyo and then flown to Amsterdam via Hong Kong, Singapore and Dubai, total flying time: 26 hours. The pseudorcas were officially sent on 'breeding loan' to Harderwijk, whilst inevitably, Gudrun's export, one week later to Sea World, Florida was also described as 'breeding loan'. Gudrun died in February 1996, only four days after her calf was stillborn.¹²²

A further example of overcatching (i.e. taking animals surplus to permit quotas) cited by Dr Hall concerns an incident in October 1978, when Sea World captured six Icelandic orcas, despite having permits for only four. Four animals were, therefore, imported directly, whilst the other two were sent to facilities in Canada and France. The following June, one of the two, a young female named Katina, was imported from Marineland, Canada. Sea World had a valid import permit, but since she had originally been taken

without a valid capture permit, Sea World chose to transport her over the border by truck at dead of night.

Section 7 The times they are a-changing.

The future of marine parks. Changing climate of public opinion. Ethics. Alternatives to captive display. Whalewatching. Cetacean-free facilities. Future of current captives. Release programmes (Keiko, Lolita, Corky). Release debate.

The Future of Marine Parks: Where Now?

'It's my feeling a lot of people have a good feeling about the rest of the aquarium and have a real problem with the killer whales. I am with them. It's something whose time has come. Nothing stays the same.'¹²³ (Stefani Hewlett Paine, former staff biologist, Vancouver Aquarium.)

- 1980: 33 orcas in 17 marine parks world-wide
- 1983: 34 orcas in 20 parks
- 1990: 47 orcas in 17 parks
- 1996: 48 orcas in 16 parks
- 1999: 51 orcas in 14 parks

In the last decade, there has been an overall reduction in the number of marine parks world-wide which display orcas. Some facilities have ended orca shows, with new ones taking their place, but overall, there are six fewer parks displaying in 1999 than in 1983. A small figure maybe, but it constitutes 30% of the 1983 total and represents firm proof that the era of the captive orca may at last be drawing to a close. The total number of orcas in captivity has risen only slightly since 1990 and the fact remains that, whilst there have been a total of 21 successful captive births since the first, in 1985, there have also, in that period, been 30 reported deaths among adult orcas and at least ten reported deaths of calves shortly after birth. Thus, for each successful birth, there have been two deaths.

There are signs, too, that the public is becoming increasingly disenchanted with the captivity industry. Greater publicity surrounding accidents and deaths combined with a wider awareness of the issues involved in keeping whales and dolphins in captivity have led to a remarkable change in the public's attitude towards the marine parks.

The decade spanning the early 1980s to the early 1990s probably marked the peak of popularity for marine parks as entertainment venues. Visitor numbers were undoubtedly boosted by an upsurge in cheap flights to the USA, particularly to Florida and this coincided with a general upswing in the British economy. The 'boom time' of the mid-1980s promoted a 'feel-good factor' and a climate of greater affluence, which was reflected in the proportion of disposable family income spent on holidays, entertainment and luxury goods. This heady period lasted only until the end of the decade, when interest rates began to rise again and the British economy entered a period of recession.

Significantly, since the early 1990s, attendance levels at many parks have largely stabilised or begun to decline. This section will examine some of the reasons for this decline, with particular attention paid to changing public attitudes towards marine parks. It will also examine some viable alternatives to the confinement and display of orcas; concluding with some suggestions for managing current captives.

'Our economy is entering a period of recession during which expenditures for leisure may be much smaller. Marine mammal facilities are expensive to build and operate. The care of marine mammals is labor intensive... some institutes may decide that maintenance of the species is simply too costly.'¹²⁴ (Brian Joseph, Minnesota Zoological Gardens, 1990)

- Attendance at Vancouver Aquarium has dropped by 20% since 1990. 802,000 visitors in 1994 marked a decline of 5% on 1993 levels.
- At Sea World, San Diego, 1994 attendance was 3.6 million: 200,000 fewer visitors than their reported 1992 attendance level of 3.8 million.
- Marine World Africa USA reported low attendance levels for 1994 at 1.7 million visitors. These figures were down a further 10% by the end of the first half of 1995.

Attendance at Sea World's Ohio park has remained static at 1.5 million in 1994. Their Florida and Texas parks have fared somewhat better, with reported attendance figures for 1994 at 4.6 million visitors (up 2% on 1993) and 1.5 million visitors (up 7% on 1993) respectively.

Since marine parks are notoriously reluctant to publish details of annual attendance, figures quoted represent the best available information. Generally, the most reliable source for such data has been the International Association of Amusement Parks and Attractions publication 'Amusement Business'. Occasionally, more concrete information comes into the public arena, when a park applies to expand its facilities. In 1995, Sea World, San Diego was obliged to provide the Californian Coastal Commission with accurate turnstile figures as a condition of its application to the Commission for a permit to construct a fourth orca pool.¹²⁵

The enormous venture capital outlay and high day-to-day running costs mean that marine parks (especially those displaying orcas) must maintain a steady stream of visitors through their turnstiles in order to survive. Any decline in attendance figures represents a serious headache to the parks. In 1992, for example, an incredible \$1.2 **billion** was spent on building, expanding and improving zoos and aquariums in the USA alone.

A glance at Sea World's annual budget provides extra proof that entertainment is a serious business. Total budget for the four Sea World parks in 1994: \$164 million. Total outlay in 1994 for capital improvements: \$105 million. Other parks, whether smaller or less commercially-oriented, have a much smaller annual budget: Vancouver Aquarium, for example had a 1994 budget of \$4.2 million, with \$134,000 allocated to capital improvements.

* Marine World Africa USA was forced to admit in August 1995 that they were experiencing severe financial difficulties and were barely able to repay debts which had accumulated to an astonishing \$54 million.¹²⁶

The need to attract more and more visitors in order to keep pace with financial outlay has forced marine parks to devise a range of projects and high-profile attractions designed to have high visitor appeal and thus increase revenue.

Many of the parks offer after-hours rental of their facilities for private functions, parties and weddings; whilst after dark, visitors to Sea World parks can enjoy 'Summer nights'. Billed an 'Evening Extravaganza', it features laser shows, firework displays, gondola skyrides and strolling musicians and, of course, the animals. The visitors' guide tempts 'after all, it's a whole new park after dark. At night, the Shamu show featuring those fabulous killer whales really shines bright.' (1993 souvenir brochure). Florida's 1995 new killer whale show 'Shamu: World Focus' features a confusing and bare-faced attempt to equate the spontaneous natural behaviour of wild orcas with the highly unnatural conditioned acrobatics of the captives.

As increasingly showy live animal performances proliferate, so adventurous mechanical rides and other attractions have also mushroomed. Sea World, Florida offers 'Wild Arctic', in which visitors can experience a 'jet helicopter ride through a blizzard, explore a polar research station and encounter live polar bears, beluga whales, walruses and harbor seals.' 'Mission: Bermuda Triangle' is billed as a ride which will take visitors on 'an unforgettable new journey to the bottom of the sea!'

In spring of 1998, Sea World of Florida opened 'Journey to Atlantis' which SW described as its 'most sophisticated and costly attraction ever.... part water-ride, part roller coaster, 'Journey to Atlantis' will be a heart-pounding, white-knuckle experience plunging eight riders at a time into the middle of a fierce battle between good and evil for the lost city of Atlantis.' These blatantly commercial high-entertainment attractions hardly support Sea World's claims to lead the way in promoting serious research, education and conservation goals.¹²⁷

Significantly, Sea World is all too aware that it faces major challenges from 1998, as Walt Disney World and Universal Studios Florida announce multibillion dollar expansions via new theme parks: Disney's 'Animal Kingdom' is scheduled to open next

spring, and Universal Studio's 'Islands of Adventure' is due to open in 1999. Sea World's public relations machine has been working overtime. Many attractions will be changed and updated during 1997-8. Vic Abbey, executive vice president and general manager of the Orlando park boasted that 'You've heard of state-of-the-art. That's too old-fashioned for us. What we're building for our visitors right now is state-of-the-future.' Admitting that, in recent years Sea World has spent 'hundreds of millions of dollars on expansions and renovations' Abbey declared that 'We're fired up. We're aggressive .. and we're transforming this park for the next century.'

Part of Sea World's response during 1999 has been to renovate its orca tank at Ohio, but arguably its most high-profile new venture was the announcement of a new "Discovery Cove" theme park adjacent to its Orlando park. Billed as "an exclusive, reservations-only tropical paradise amid Central Florida's mega-attractions, 'Discovery Cove by Sea World' offers guests a once-in-a-lifetime, dream-come-true opportunity to live the ultimate marine life experience and swim and play with dolphins, stingrays and thousands of fascinating animals." The blurb goes on to say " imagine feeling the playful nudge of a dolphin as you swim together in a deep-water lagoon surrounded by sandy beaches and lush tropical landscaping... Guests learn about the dolphins' behaviors and then swim into deeper water, where they get to know the animals and discover how Sea World trainers use hand signals to communicate with the dolphins. Taking the relationship one step further, guests swim and play with the dolphins, one-on-one and feel the power and grace of these magnificent animals." Discovery World will open during 2000 and prices were not available at the time of going to press. (Source: Sea World website release.)

The changing climate of public opinion:

Of course, an examination of attendance figures alone does not shed much light upon visitors' attitude towards keeping orcas and other cetaceans in captivity. Visiting a marine park does not, in itself, indicate that an individual condones orca captivity. Further, whilst millions have visited marine parks and watched orca displays, many more millions have stayed away, many because they find the displays offensive or demeaning. The true number of 'quiet objectors' may never be known.

In an attempt to defuse criticism and rally support in favour of captivity, marine parks frequently cite results of a 1992 public opinion poll entitled 'Public attitudes towards aquariums, animal theme parks and zoos', which was commissioned by the AZA and conducted by the Roper Organisation.

In the poll, 89% of people interviewed agreed with the statement 'it's best to see animals in their own environment, but most people won't get to, so parks are important.' However, since the statement consists of an attractive statement 'it's best to see animals in their own environment'; the qualifier 'but most people won't get to' forces the response 'so parks are important'. A blatant example of a non-objective statement, heavily loaded to elicit the desired positive response!

Ironically, whilst 91% believed in 'the importance of educating people about environmental conservation' and 'educating people about the animals displayed', only 64% believed in 'the importance of entertaining people while they learn about the animals.' Further, 37% 'agreed mostly that animals in animal parks generally don't live as long as they do in the wild' and that 'places that keep animals in captivity do them harm by removing them from their natural habitat.'¹²⁸

Equally telling, is the finding of a 1994 public survey conducted by IAAPA that three million people who had visited zoos and aquariums did not anticipate visiting such facilities in the next twelve months. More research needs to be carried out into the number of second or multiple visits to marine parks, since repeat visits denote a greater degree of satisfaction with conditions than a single visit.¹²⁹

Some informal studies have been conducted soliciting the feelings of schoolchildren following a visit to a marine park. A 1991 study by Stalker¹³⁰, involved children from a Pennsylvania school who reported their emotions after a recent visit to a Sea World

park. One student observed that keeping animals in captivity was horrible 'it's like being grounded for the rest of your life.' Another commented after seeing the orca show, 'those whales didn't do anything to people. It's not fair.'

Sixth-grade pupils from Henderson Elementary School in Vancouver wrote feelingly after a visit to the Vancouver Aquarium in March 1995, where they had helplessly witnessed the third failed birth of Vancouver's female orca, Bjossa. The calf died within minutes of birth. One boy wrote 'Who do we think we are? I'm mad that the government won't listen, especially to kids. There's one thing that I don't understand, if us land mammals can have our freedom, why can't water mammals?' Another pupil at the same school wrote 'keeping whales in tanks is wrong for many reasons, but I'll name only one. They didn't do anything to deserve being caught, taken from their families and put in a tank that takes away their right to freedom.'¹³¹

Maybe unwittingly, these young adults have cut right to the heart of the matter, touching upon a debate which has been raging between pro- and anti-captivity campaigners for years. Namely, the question of ethics: do we have a right to deprive animals of their freedom, distorting their natural behaviours and life patterns for our entertainment? Does this action become more justified if a 'conservation', 'education' or 'research' label is applied?

Ethics:

'At the core of humaneness, is the idea of kind-ness, or the idea that we and other animals are basically of one kind. I myself believe what people are saying today is 'let them be'. A useful marine mammal, they say, is one out there somewhere in the wild - free, alive, hidden .. perpetuating its ancient bloodlines.' (Dr. Victor Scheffer, research biologist and author, 1978).¹³²

'Animals have the right to be animals - to live free of human control wherever possible and in accordance with their own natural conditions of life. We need to free animals of our desire to control them and from our attempts to humanise them. .. To deprive them of their liberty is to deprive them of their God-given nature.' (Rev Professor Andrew Linzey, Animal Theologian, 1996)¹³⁴

The Concise Oxford Dictionary defines ethics as 'relating to morals, treatment of moral questions and principles, rules of conduct.' Do we morally have the right to remove animals from their natural environment and confine them - regardless of any educational or entertainment benefits? Many would argue that we do not. When this question is applied to an animal as large and as socially complex as an orca, the answer can only be a more resounding 'no!' Previous sections of this report have dealt with conditions in captivity and also the physical and psychological effects of confinement upon orcas, highlighting the myriad adjustments which captives must make in order to survive in captivity. Even if conditions for captive orcas were uniformly superb and illnesses, stillbirths and premature deaths were unheard of; the question would nevertheless remain: do we have the right to deprive fellow creatures of their liberty?

The debate over the morality of capture and confinement gathered momentum from the mid-1980s. In 1983, a conference in Boston entitled 'Whales Alive' (Global Conference on the Non-consumptive Utilisation of Cetacean Resources) debated the issue of morality, but failed to reach a consensus, although a resolution was passed stating clearly that 'efforts should be made to bring to an end, in due course, the keeping of cetaceans in captivity.'¹³⁴ The following year, at a workshop on animals and display, the AZA's Ethics and Law Working Group admitted that the display industry had a 'moral obligation' to show 'compassion and humane treatment to animals in captivity.'¹³⁵

However, this is not the same as saying that captivity is morally wrong. Delegates further stated that 'if bringing animals into captivity .. causes adverse effects, these effects, on balance, are outweighed by such benefits as enhancement of human appreciation of all animals, conservation of species and advancement of knowledge.' Such a statement

owes much to a framework of moral reasoning known as 'utilitarianism'. According to this viewpoint, an action is justified as long as the apparent good outweighs the harm. But as Rev. Professor Andrew Linzey, Animal Theologian at Oxford University points out, those who adopt this theory 'are never compelled to recognise their ethical obligation to each **individual** animal, as well as to the species itself.' ¹³⁶

Philosophers Dale Jamieson and Tom Regan also speak for many when they argued that, even if the study of captives **was** to yield information which may conceivably advance conservation of wild populations, the question of whether such benefits are morally acceptable depends to a great extent 'on the means used to secure them .. no benefits are morally to be allowed if they are obtained at the price of violating individual rights'.¹³⁷ In other words, the end does not automatically justify the means.

The AZA Working Group went on to comment that 'some people contend that it is morally wrong to remove animals from the wild and hold them in captivity, either because they believe that some animals have evolved sufficiently to acquire rights equivalent to those recognised for human beings, or because they believe animals are severely harmed by life in captivity .. these beliefs are not currently supported by sufficient scientific evidence. Consequently, they do not provide a factual basis for an overriding moral objection to displaying animals in captivity.'

In response, those opposing captivity would argue, firstly, that animals do have rights and that many captives **are indeed** severely harmed by confinement and secondly, as Erich Hoyt makes clear in his 1992 report 'The Performing Orca', this sort of statement, when related to ethics, merely side-steps the central issue. An individual's moral or ethical stance on a subject is not based upon scientific facts but rather, upon a deeply-held belief or conviction as to what is right or wrong in any given circumstances.

In a 1985 report entitled 'Dolphins and Whales in Captivity', Australia's Senate Select Committee on Animal Welfare was, however, prepared to consider ethical issues as well as more straightforward welfare concerns. The report concluded that 'many people ..now question whether humans are entitled to exploit animals and to act in a manner which will cause animals to suffer. Critics argue that oceanaria exploit cetacea primarily for profit and that this is morally indefensible because it causes suffering to cetacea who, as intelligent and complex beings, are entitled to greater consideration by humans...even if oceanaria could show that profit and recreation were not the primary motives .. the use of captive cetacea for education and research is not only of dubious benefit but is also morally questionable.' The same year, the state of Victoria banned all future captures of whales and dolphins.¹³⁸

The debate further intensified in 1990, with the staging in Geneva of the 'Bellerive Symposium on Whales and Dolphins in Captivity'. This conference was largely attended by those opposed to captivity and delegates overwhelmingly concluded that 'whales and dolphins are self-aware beings that routinely make decisions and choices about the details of their lives. They are entitled to freedom of choice. Thus, they are entitled to freedom. Imprisoning them in captivity is, quite simply, wrong.'¹³⁹

In 1995, the Humane Society of the United States (HSUS) released a report entitled 'The Case Against Marine Mammals in Captivity'. The report concludes 'to the marine mammal, the experience of captivity is not a set of aspects that can be perceived separately; it is a whole, inescapable life in a tiny enclosure, deprived of virtually any semblance of naturalness .. the reality of the entire captive experience for wild-caught marine mammals is so sterile and contrary to even the most basic elements of compassion and humaneness that it should be rejected.'¹⁴⁰

The last word goes to Paul Spong, who has studied wild orcas for over two decades, 'the whales will only be truly saved when we humans no longer regard them as resources to be exploited and 'managed', but rather as fellow creatures with clear rights that we acknowledge, grant and protect.'¹⁴¹

Alternatives to orca display:

Many people now believe that marine parks, along with zoos, aquariums and other facilities displaying live animals, are at a cross-roads in their existence. As we move towards the next century, the feeling is that marine parks must make a choice. The parks can either continue to promote increasingly elaborate shows and fairground attractions in an attempt to boost visitor numbers, or they could concentrate their efforts upon educating visitors about conservation and environmental issues, without the artifice and gimmicky show routines. The choice is literally research or razzmatazz; conservation or circus tricks.

Thirty years ago, most people in the developed world could not hope to see exotic animals in the wild. Nowadays, we live in an era characterised by greater mobility and high technology: foreign travel is easy, cheap and accessible to almost everybody and every home has its colour television and video. Most schoolchildren are computer-literate before they leave primary school and recent innovations such as CD-ROM, e-mail and the tremendous potential of 'virtual reality', make learning both exciting and fun.

The display industry argues that people learn best when they are able to view a live animal, rather than one captured on celluloid and often take credit for raising the public's awareness of natural history and conservation issues. John Kirtland of IMATA, the marine mammal trainer's professional body, commented in 1991: 'why are people concerned today? Why are they more aware? Because they have had the opportunity to see these animals and learn about them in zoos and aquariums...We have provided the general public, whom would never otherwise have the opportunity, with a chance to discover the beauty and wonder of these animals - an opportunity that is more immediate and has a more profound effect than all the two-dimensional images in a book or video ever could.'¹⁴²

There would be few problems with his statement if it referred to watching animals behaving spontaneously in their natural habitat. However, as this report has consistently reiterated, captive orcas are not even remotely representative of their species. The concrete and Plexiglas environment in which they are viewed in captivity, coupled with mindless routines and blaring muzak, renders the experience almost useless in terms of instilling knowledge and respect for orcas and their ocean habitat. The orcas performing for the crowds are mere caricatures of their real selves: the entire 'essence' of wild orcas is totally absent.

Further, half-hearted efforts on the part of the marine parks have conspicuously failed even remotely to recreate the natural habitats of their captive animals. The very nature of captivity renders such attempts, at best, highly artificial simulations. However, this has not prevented the marine parks from attempting to do exactly this with their smaller marine mammal exhibits. The 1995 visitor's brochure for Sea World's Ohio park proudly announces the opening of 'Dolphin Cove' billed as an 'all new 375,000 gallon naturalistic environment'; it further boasts similar simulations of the natural world for its otters, penguins and manatees. Of course, such attempts to provide a more 'photogenic' environment are largely for the visitors' benefit. Whilst a larger enclosure is obviously a step in the right direction, the reality of life for the captives remains largely unchanged.

Significantly, with the exception of Vancouver Aquarium, no attempts have been made in most marine parks to recreate orca habitat. Sea World's Shamu Stadium does not claim to be anything other than it is - a highly functional concrete enclosure for captive orcas!

By contrast and giving the lie to Kirtland's statement, there has, in recent years, been a massive upsurge in the quantity and quality of natural history films and documentaries available on video and on television. As whale scientist Sidney Holt aptly commented in 1985, 'we are now in an era when film and video..handled by dedicated naturalists, can at last reveal to us and show the public what wild animals really look like and how they behave and live..if intentions are educational then it would be far better to invest in widely distributing such material than in constructing yet more oceanaria.'¹⁴³

Film-making technology has advanced tremendously in the past decade. New techniques have evolved which allow the minutest details of the natural world to be observed in close up or in slow motion. These advancements, coupled with

improvements in underwater filming techniques, have brought the natural world, almost literally, into our living rooms. The huge public and critical acclaim for the BBC's natural history documentaries including 'Life on Earth' and 'The Trials of Life' has demonstrated the public's appetite and enthusiasm for learning more about wildlife.

The advantages of such documentaries are of course, two-fold: viewers gain a 'window into the wild', observing the spontaneous and unforced behaviour of wild species, without the need to remove any animals from their natural environment. Education and conservation messages can be combined with the sheer enjoyment of observing animals behaving naturally and without artifice. Further, the massive popularity of the 1993 film 'Free Willy' and its sequel demonstrates that the attention and emotional involvement of the viewer can indeed be engaged through the medium of a feature film. Public response to the film's anti-captivity message has been phenomenal.

A New York high school science teacher quoted in a 1991 study by Pregnell¹⁴⁴, described the reactions of her students after viewing a film showing the release of three pilot whales rehabilitated at the New England Aquarium after stranding: 'The emotional involvement was obvious on the students' faces'. One sixteen year old female student commented 'we have finally used our intelligence to let them use theirs.'

Whalewatching

An increasingly attractive alternative to viewing captive whales and dolphins is to watch the animals in their natural habitat. Over the past decade, there has been a dramatic increase in the numbers of people going whalewatching. In 1994 (the last year for which figures are available), a total of 5.4 million people in 65 countries, experienced the thrill of watching whales and dolphins in the wild. Of that total, around 100,000 people went orca-watching, from Puget Sound to Alaska. Numbers of whalewatchers have increased year on year and this trend looks likely to continue.¹⁴⁵

Orcas are widely distributed, but one of the best, most accessible and consistently reliable locations for sightings are the waters off British Columbia and Washington State: ironically also the site of most of the early captures for the display industry. In 'The Whalewatcher's Handbook', author Erich Hoyt suggests that orca enthusiasts should either head for north-eastern Vancouver Island, where they may join a guided cruise which will incorporate the Robson Bight Ecological Reserve and offer opportunities to view members of the northern resident community of orcas; alternatively, watchers may choose to visit the San Juan Islands, Washington State. The waters around the San Juans represent the core area for the southern resident community. The area is an official whale-watching park and orcas pass so close to the rocks that good sightings are possible from land as well as from the water.

Closer to home, hundreds of orcas arrive every autumn, following enormous shoals of herring into Tysfjord, northern Norway. Excellent sightings are virtually guaranteed between October and January and whale-watching weekends, in the company of a whale expert, are now available.

Whale watching off Iceland - the site of many orca captures between the mid-70s to late 80s - has also grown tremendously in popularity. The first whale-watching trip was in 1991, off Iceland's Southeast coast. In 1996, 9,500 people went whale watching, producing total revenues of £2 million/US \$3.1 million. (Compare this to 1994, when only 200 people went out, producing revenues of around £90,000.)^{145a}

Preliminary figures for 1999 (May to September) show that the total number of whale watchers has risen to around 34,000 (up from 30,300 in 1998). Husavik is still the whale watch capital and Asbjorn Bjornvinsson's Whale Centre there doubled its visitor numbers in 1999 to 12,000, compared to 6,000 in 1998. Blue whale watching from Olafsvik, on the Snaefellsnes Peninsula, West Iceland, is also becoming more popular, since the chance of seeing blue whales is often close to 100%. 3,000 passengers went blue whale watching in 1999 compared to 1,500 in 1998.^{145b}

The way forward: cetacean-free facilities

How should the marine parks respond to the upsurge in public interest in viewing orcas and other cetaceans in the wild? One solution might be to follow the example of Vancouver Aquarium in abandoning scheduled displays, constructing a more naturalistic environment in which to present the orcas and making education rather than entertainment the primary focus. But, in the light of what has been learned about keeping orcas in captivity, a growing number of people now believe that any form of cetacean display - even without the showy routines - is unacceptable.

In the conclusion to his 1992 report 'The Performing Orca' and after weighing up all the available evidence, Erich Hoyt was forced to conclude that orcas 'are inappropriate and unsuitable animals for captive display.' Many share his belief. Indeed, since his report went to press in early 1992, the situation for the captives has hardly improved: in the intervening period, no fewer than 11 adults have died, eleven calves have died aged 4 years or less and there have been at least six stillbirths/miscarriages in marine parks world-wide.

Given the huge financial commitment of maintaining orcas and the ever-lengthening list of factors against their confinement, a more widely-acceptable solution may be for marine parks to consider the gradual phasing out altogether of orca display, in favour of new and imaginative educational exhibits which do **not** feature live animals. Who knows, if they were to take this bold step, they may win back significant numbers of people who currently refuse to visit such facilities because they feel profoundly uncomfortable with the notion of captivity?

Today's advanced technology may hold the key to providing a workable alternative to confinement. Already, some of the more far-sighted marine parks are taking advantage of technological wizardry and new advances are limited only by our imagination. 'The trend has been more and more away from keeping cetaceans in captivity' (Dave Powell, Monterey Bay Aquarium.)¹⁴⁶

Arguably the most imaginative example to date of a successful cetacean-free facility is the Monterey Bay Aquarium, near San Francisco, California, which has won respect and recognition from members of the public and the display industry alike. The Aquarium was built at a cost of \$55 million and currently attracts over 1.7 million visitors annually. In 1996, it was America's most-visited aquarium. A conscious decision was taken not to include live whales and dolphins, instead, displays incorporate beautiful life-size models which combine innovative technology with a strong educational component. A 43-foot model of a female grey whale - complete with barnacles - is exhibited next to her 22-foot calf. Other lifelike replicas include orcas, dolphins and porpoises.

A further departure is the Aquarium's decision to focus on local rather than 'exotic' wildlife and it has won international acclaim for its expertly-designed 'undersea tour' of the marine life in Monterey Bay. The Aquarium boasts a three-storey 8.5 m (28 ft) high 'Kelp Forest' exhibit, giving a divers-eye view of a living kelp forest community and featuring fish and invertebrates commonly found in the natural kelp forests in the waters of Monterey Bay. Sea otters may be viewed both above and below water as they dive and swim in a naturalistic 'Rocky Coast' habitat. The Outer Bay galleries, opened in March 1996, represent the first time any aquarium has created 'open ocean' exhibits on a grand scale. Its centrepiece is a million-gallon 'indoor ocean' exhibit, viewed through the largest windows on Earth, which contains open ocean species, such as sharks, barracuda, giant ocean sunfish, schooling tuna and bonito and sea turtles.

Hands-on learning is encouraged via a host of microscopes, telescopes and interactive exhibits throughout the Aquarium. The latest imaginative development has been the use of LIVELINK video technology, in which an underwater video camera provides live footage from Monterey Bay via a remote operated vehicle (ROV) capable of operating to depths of 1,800 metres (6,000 ft). Orca researcher Paul Spong has long suggested that similar technology could be utilised to provide live action satellite link-ups direct

from the 'rubbing beaches' at the Robson Bight Ecological Reserve, British Columbia, home to the northern resident community of orcas.

The Aquarium's close links with the local ocean environment are further emphasised through organised grey whale, seal and sealion watching trips, and visitors can also join organised kayaking expeditions in order to enjoy an even closer view of the sea otters. Other new marine parks and aquariums have followed the growing trend for facilities which don't feel the need to feature live whales and dolphins. Currently, there are around 70 established or proposed public display facilities in the United States alone which refuse to display cetaceans.

The Pacific Science Center in Seattle has produced a touring exhibition entitled 'Whales - Giants of the Deep', the first of its kind in the world. Exhibits include life-like robot whales, programmed to move, spout and vocalise and presented in simulated ocean environments. Visitors are treated to spouting humpback whales and spy-hopping grey whales in a highly authentic display which also incorporates many interactive educational activities.¹⁴⁷

Some far-sighted aquariums in Britain (for example, Sea Life Centres nationally, and Deep Sea World, Scotland) have made the decision not to exhibit cetaceans but instead provide displays and exhibitions on the theme of whales and dolphins, with CD-ROM and other interactive displays, demonstrating the massive entertainment potential of cetacean-free facilities. The British public's love and respect for whales and dolphins is ably demonstrated by the fact that, thanks to public opposition, cetaceans are no longer held captive in this country. This respect is further evidenced in the popularity of documentaries and films on orcas and other whales, and in the swelling membership of the 'Whale and Dolphin Conservation Society' (WDCS), which currently has 70,000 supporters.

The future of current captives:

Those opposing captivity acknowledge that change will not occur overnight but rather, there should be a gradual transition towards phasing out the confinement of orcas and other dolphins. 'Throughout history, unethical institutions have usually been reformed by a slow evolutionary process.. they can be constructively changed and eventually abolished through the efforts of a well-informed public.'¹⁴⁸ Or, in the words of the philosopher John Stuart Mills: 'every great movement goes through three stages: ridicule, discussion and adoption.'

Those marine parks which persist in displaying orcas are already aware of the growing public antipathy towards the confinement of these mammals. Conservation and animal welfare groups hope that, as the public becomes more informed about the issues relating to captivity and as enthusiasm for such displays falters, reflected in falling revenue at the turnstiles; marine parks will be forced to re-evaluate their stance on captive display. Such a movement is far from being a pipe-dream, since this is exactly what has happened in Great Britain and much of Australia.

In the short term, the two main priorities should be as follows:

1 Firstly, to ensure that no further orcas are brought from the wild in order to service the needs of the display industry.

No orcas have been wild-caught in North American waters since 1976, and from Icelandic waters since 1989. The trade has undoubtedly dwindled considerably since its heyday in the 1970s and 1980s but from time to time, rumours surface that Sea World or another of the larger marine parks may be considering future captures, either in past capture locations, or in previously unexploited sites.

In December 1994, permit applications to capture up to half a dozen orcas from Icelandic waters were lodged with the Icelandic Government. On that occasion, the application was refused, but there are few grounds for complacency. Indeed, the display industry, represented by the Alliance of Marine Mammal Parks and Aquariums (AMMPA), actively lobbied the International Whaling Commission (IWC) in 1992, seeking to prevent the IWC from regulating directed hunts and fisheries affecting the smaller whales and dolphins. These species currently receive no international protection and are consequently extremely vulnerable to exploitation. However, were the IWC to adopt measures affording them some degree of protection, the AMMPA fears that such regulations could effectively curtail their ability to capture further cetaceans for marine park collections.¹⁴⁹

Then, in February 1997, five orcas were taken at Taiji off the Japanese coast and transported to 3 Japanese aquariums. After the Taiji capture, Sea World was forced to issue a statement denying involvement in the captures, in order to scotch rumours circulating in Japan that, after a year or so, one or more of the Taiji orcas will be exported to a Sea World park on 'breeding loan'. At the time of last update (November 99) this has not happened and the 3 surviving orcas remain in Japan.

In Argentina, Miguel Iniguez and his colleagues at the Cethus Foundation waged a strong campaign to thwart that country's marine parks, who have been lobbying the Argentine Government very hard to issue capture permits for orcas. In November 1998, the Cethus Foundation's campaign proved successful, with the passing of legislation which forbids the capture of orcas in Argentine waters.

In March 1999, a bid by the newly-expanded Nagoya Aquarium in Japan to acquire capture permits to take orcas off Norway was thwarted only because of a tremendous international outcry by conservation and anti-captivity groups and individuals. [see Section 3 for more detail on this.]

2 The second major priority is, naturally, to ensure that existing captives have the very best possible facilities.

The welfare of the orcas must always be paramount. In particular, every effort should be made to ensure that orcas are not kept solitary. Given the amount of knowledge which has been amassed about this supremely social animal, it is inexcusable to keep any orca separate from its own kind, yet at the time of writing, at least several orcas remain in solitary confinement.

The routine transfer of orcas between parks in different parts of the world should immediately cease, **unless** such transfer is in the interest of the individual orca: for example, movement of a lone orca to a larger facility with other orcas, or movement to a more suitable facility. The needs of the animal must always take precedence over the profit motive. No orcas should be held in dilapidated or inadequate pools. (Please refer to Section 8 for a full list of suggestions and recommendations.)

Release programmes:

'Any suggestion that an animal in our long-term care be released should be approached with a great deal of scepticism. Killer whales that have been living in man's protective care for an extended period would face great difficulties surviving in the wild' ('The Facts About Sea World's Killer Whales' 1993)¹⁵⁰

'There is no doubt that whales and dolphins can be successfully re-released to the wild.' (Marine mammal veterinarian Dr Lanny Cornell 1993).¹⁵¹

No other area of contention more aptly summarises the polarity between pro- and anti-captivity factions than the release debate. There are several individual orcas, captured from known pods, (or, in the case of Keiko, from a known location off south-east Iceland), which could be viable candidates for a carefully-planned, gradual release programme, which, if successful, would hopefully encourage further release efforts. In recent years, release campaigns have largely centred around the following individuals:

Keiko: The success of both the 1993 Warner Brothers movie 'Free Willy' and its sequel have heightened public awareness of the plight of captive orcas. The plot centres around the relationship which develops between a 12 year-old boy and Willy, a captive orca and climaxes with the boy's attempts to win Willy his freedom by releasing him back into the ocean. The story is fictitious, but the part of 'Willy' was played by Keiko, a 6.5m (21 ft), three-ton Icelandic male aged about 18, who, until January 1996, was held in a cramped and inadequate tank measuring only 26m x 13m (85 x 43ft) at Reino Aventura, Mexico City.

Ironically, whilst Keiko starred in the first movie (predominantly shot in a tank), Warner Brothers were obliged to replace their star performer with a remote-controlled model for the sequel, which was filmed in the open ocean.

A coalition of conservation and welfare groups on both sides of the Atlantic, the 'Free Willy Keiko Foundation' (FWKF), have campaigned strongly for the opportunity to release Keiko back into his home waters off Iceland. In early January 1996, the first stage of an ambitious \$5 million rehabilitation plan became reality and Keiko was flown to a 'halfway house' in Newport, Oregon. His brand-new, purpose-built pool was five times larger than his tiny tank in Mexico and he was able to enjoy swimming in cold salt water for the first time in many years. Keiko's official veterinarian is none other than Dr Lanny Cornell who, until the late 1980s, was Vice President and Zoological Director at Sea World. In 1993, Dr Cornell examined Keiko at Reino Aventura for a report commissioned by the Fund for the Animals in the USA.¹⁵²

Keiko rapidly gained weight: when he first arrived, he weighed just 3505 kgs (7,720 lbs) - 908 kgs (2,000 lbs) less than the average male orca in the wild. By February 1997, he had put on 454 kgs (1,000 lbs) and grown 10cm (4 in) in length, on a daily diet of herring, squid, capelin and sardines. His veterinarians were delighted that an unsightly skin disease significantly improved in the salt water and, whilst large lesions remained

under his flippers, his 'papilloma' lesions have 95% disappeared. When he first arrived at Oregon, Keiko's stamina was very low and he was only able to dive for 3 minutes. His dive time increased to 13 minutes - being able to dive for longer periods is absolutely essential in the wild, as Keiko will have to chase live fish. Live fish were introduced to his tank in summer 1997.

During the autumn of 1997, Keiko's health was the subject of furious debate. The Oregon Coast Aquarium announced that Keiko had health problems - tapeworms and a respiratory condition - which would threaten his release to the wild. This claim was disputed by Dr Lanny Cornell, representing FWKF, the Trust in charge of Keiko. Cornell stated that Keiko was in good physical condition and restated the Foundation's goal of returning Keiko to the North Atlantic "in a year or two." The Aquarium's reluctance to lose Keiko may have been related to the fact that the "celebrity orca's" presence benefited the local economy to the tune of \$75 million (£50 million). In early 1998, following a lengthy arbitration process, the two sides agreed to work more cooperatively together for the overall good of Keiko.

By late spring, 1998, Keiko - now extremely fit and able to catch live fish - moved another step closer to freedom, when the FWKF unveiled plans for a sea pen, the next stage in the rehabilitation process. After considering potential sites off Iceland, Scotland or Ireland, the FWKF selected a site in a sheltered cove at Vestmannaeyjar (Westmann Islands), a volcanic archipelago six miles off Iceland's south coast.

Iceland is the obvious site for a release, as Keiko was originally captured there and may even have distant memories of those waters. Iceland was initially somewhat wary of the release project - in the past, Iceland was a major supplier of wild-caught orcas for marine parks and has only recently given up whaling. However, David Oddsson, Icelandic Prime Minister was in favour of a release project and, whilst ex-whalers were predictably negative, a majority of Icelandic people (54% in a 1998 poll) supported Keiko's return to his native waters. Keiko is a huge attraction and could bring substantial revenues to Iceland and boost its rapidly growing whale watch industry.

A seapen was constructed: essential to enable Keiko to become used to the movements of the ocean and to fine-tune his hunting abilities. On September 11th, 1998, Keiko was flown from Oregon to Iceland and was transferred to his new home. A team of 4 veterinarians along with FWKF staff were on hand to supervise the transition. Keiko has appeared to adapt exceptionally well to the new conditions and is currently thriving in his new home. He has been diving for ever-increasing periods, thoroughly exploring his seapen and vocalizing to pilot whales and other cetaceans in the vicinity. In recent months, he has begun to forage for salmon and other fish, rather than being totally dependent upon being fed by his carers; this is crucial to his long-term survival, should he be fully released.

November 1999 update: FWKF has merged with the Jean Michel Cousteau Institute to form the Ocean Futures Society. Ocean Futures reports that Keiko is in good physical condition and spending more time underwater. A release date of summer 2000 has been pencilled in. Ocean Futures are still feeding Keiko fish, although they hope that his hunting instincts will return once fully back in the wild. They say that contact with humans is being reduced as part of this strategy. WDCS and others welcome this news, since orca experts had expressed concern, both at the continuing practice of feeding Keiko rather than encouraging him to fend for himself, and also the continuing degree of human contact, both of which now seem to be being reduced. The first steps to freedom will be to let Keiko out of his seapen and allow him to swim around the islands, accompanied by keepers in a boat.

Ocean Futures has received some criticism in recent months, as some orca experts feel that Keiko is ready now to be returned to the open ocean and that his release is being stalled because OF lacks the scientific expertise to correctly determine Keiko's health and physical stamina. OF however, maintains that delays are due to problems in sourcing equipment to attach to Keiko's body to monitor his progress post-release.

Keiko's progress is being monitored daily and there are hopes for an eventual full release back into the freedom of the open ocean. It would be naive to believe that there

won't be any more obstacles placed in front of further progress towards a release, but WDCS believes this to be a crucially important project. Its success will set a precedent for further well-planned orca release programmes.^{152a}

Lolita: Captured in August 1970 at around 6 years of age, from Washington State waters, Lolita (also known as Tokitae, which means “shimmering water”) is the last surviving captive orca taken from the southern resident community. She comes from L25 sub-pod, whose members have been closely studied since 1976 by scientists at the Center for Whale Research. Aged around 34 years, Lolita has spent nearly three decades as a captive, held in a now decrepit tank at Miami Seaquarium. She has never had a calf and, since her mate Hugo died in 1980, she has been solitary.

Lolita is now 22 feet in length and weighs about 8,000 lbs. She is in astonishingly good mental and physical health, given that she has been held alone since 1980. She obviously has an exceptionally robust temperament. She is described as having a very gentle nature and an excellent memory. Marcia Henton, Lolita’s trainer until 1995, said that she once found an old hand signal book which hadn’t been used for some 8 years. Yet when she made a certain hand signal, Lolita remembered it and made the appropriate action. Henton was replaced in 1995 and for a time afterwards, Lolita’s behaviour was very lacklustre, as if depressed.

The Tokitae Foundation, headed by Howard Garrett, continues to campaign ceaselessly for her release. In 1994 and 1995, WA Governor Mike Lowry teamed up with WA Secretary of State, Ralph Munro, to petition Art Hertz, owner of Miami Seaquarium, for Lolita’s release back to her native waters “a citizen of the state of Washington”, as Lowry declared her.

Garrett is certain that if Lolita was released, her pod would recognise her. Despite so many decades of captivity, she still makes calls unique to the L25 subpod. There are four females among the L25s who are the right age to possibly be Lolita’s mother. In 1996, a recording of her family pod vocalising was played to Lolita.

Hertz has so far refused to consider her release, claiming that she would continue to respond to humans and would not be able to catch live fish or be accepted by any social group. He also claims that she might catch or spread diseases. Garrett and other experts, including Ken Balcomb refute all of these counts. They say that Lolita’s courage and her gentleness may have significantly contributed to her longevity and good health and provide some indication of her ability to readapt to her home waters. She has received good care at Miami and been kept in chilled natural seawater (55°C), which is optimum for a captive orca. The southern residents have been extremely well-studied over the past decades, which provides a sound basis for monitoring her progress, post-reintroduction.

The Tokitae Foundation is calling for a gradual release programme, which would involve linking Lolita’s pool with her pod in the wild, so that she could vocalise to her family and redevelop social bonds. The next step would be for an organisation such as Ocean Futures, or HSUS to form a partnership with the Miami Seaquarium, and other orca experts, to arrange for Lolita’s transportation to a specially-prepared seapen in Puget Sound, where she would be able to swim greater distances and be provided with live fish. Her progress would be carefully monitored and a decision taken on whether she could be fully released (as would be expected), or provided with sustenance, medical care and human companionship in the longer term in this semi-wild environment.^{152b} (See also Section 4 on the size of Lolita’s tank, stress and solitary confinement)

Corky: Currently held at Sea World’s San Diego park, Corky was captured at Pender Harbour, north-west of Vancouver, in December 1969, aged around five years. December 1999 marks her 30th year of confinement, but orca campaigners, headed by Paul Spong, have long called for her release. Representations to Anheuser Busch, the company which owns Sea World, have so far fallen on deaf ears and Sea World have consistently trotted out the same old anti-release arguments (see below).

Corky’s family, members of the A5 pod, are well-known to researchers. The orca believed to be Corky’s mother is still alive, as are several of Corky’s siblings. Paul Spong is calling for a similar release programme to that outlined above for Lolita, with Corky being returned to a specially constructed sea pen not far from Orcalab, and in the core area where her family pod spend much of their time.

In 1993, recordings made of the A5 pod were played to Corky in her tank. Corky's reaction was dramatic; her whole body started shuddering in response to the distinctive vocalisations of her family pod. It was obvious to observers that she recognised her family's calls. A quarter of a century of confinement had not blunted her response to her kin.¹⁵³

November 1999 update: Between May and July 1999, Paul, Helena and Anna Spong of Orcalab, organised for the Free Corky bus and "freedom banner" to tour the US and Canada, spreading the word about Corky's plight and collecting many messages of support. The banner – currently 2.5 km long and consisting of 14,000 handmade patches – is already the longest banner made by children in the world and is proof of the strength of feeling amongst children for Corky's release. More events are planned to coincide with Corky's 30th anniversary in captivity.^{153a}

Release debate:

Significantly, both Corky and Lolita are regarded as 'older' animals by the industry, since they are nearing the maximum lifespan amongst captives. Yet in the wild, they would merely be young adults, with possibly three or more decades of life ahead of them. The fact that they have survived thus far in captivity suggests that all possess extremely strong constitutions, a factor which can only enhance their attractiveness for release.

Predictably, the enthusiasm of orca scientists and researchers to see carefully selected individuals released back to their home waters to join their family pods is not shared by the majority of marine parks, who are understandably reluctant to part with an extremely lucrative asset. Several arguments are put forward to justify the industry's opposition to release proposals. Foremost among these arguments is the contention that captives would not be survive in the wild, after many years of total dependency in captivity.

In 1993, Sea World declared that 'Corky's ability to fend for herself in a competitive and uncontrolled world with pollution, parasites, disease and the need to hunt for food is questionable.'¹⁵⁴ Further arguments against release revolve around the potential of disease transmission to wild populations. In 1995, Brad Andrews, Sea World's Director of Zoological Operations stated that 'to release Corky would jeopardise not only her life but also the lives of the wild killer whale population, an experiment Sea World cannot support.'¹⁵⁵

The display industry presents the release process as an ill-conceived experiment, doomed to failure; yet they conveniently overlook the fact that the **real** experiment began when orcas and other cetaceans were first brought into captivity. The parks have been happy for wild-caught orcas to undergo the ordeal of capture followed by acclimatisation to captivity. They have routinely introduced newly-caught individuals to existing captive groups without much agonising over disease transmission, relying upon veterinary expertise to screen new arrivals for potential health problems. Release programmes merely reverse this process: returning captives to the ocean, this time combining long-term knowledge of specific wild populations with careful preparation for release, including the most up-to-date medical screening.

Although no orca has yet been fully returned to the wild, there have been several release programmes involving bottlenose dolphins. These have met with varying degrees of success, as is to be expected given that such programmes are still in their infancy. However, a great deal has been learned as to the correct protocol governing reintroductions and researchers involved in release proposals involving orcas can only benefit from past lessons.

'Reintroduction attempts are most likely to succeed when there is suitable habitat for return; effective techniques to prepare animals for release, including acclimatization to live prey and temperature; the presence of the same species at the release site; post-release monitoring; government and professional co-operation and public education.' (D. G. Kleiman 1989).¹⁵⁶ All the above conditions could realistically be met when returning specific orcas to their home waters.

In Keiko's case, orca scientists have spent several years meticulously planning a release programme. Supplementing Keiko's own rehabilitation programme, scientists have been working hard to pinpoint the orca's home pod off Iceland. 'Genetic fingerprinting' specialists may be employed to locate Keiko's family pod by comparing skin samples. The task is far from easy; but once Keiko's pod has been identified, researchers such as Kenneth Balcomb of the Center for Whale Research are confident, on the basis of over 25 years detailed observation of wild orca populations, that Keiko would be accepted by his pod. Orcas maintain extremely strong family bonds and have demonstrated a capacity for very long memories, making recognition and acceptance of a 'long-lost' pod member quite feasible. Predictably, the Keiko release project has met with extremely stiff opposition from the Alliance of marine mammal parks and dolphinarium.

Of course, the real reason behind the marine parks' opposition is their fear that a successful reintroduction could set a precedent, leading to calls from the public for further captives to be returned to the wild and setting in motion a train of events which would ultimately call into question the very premises upon which the captivity industry is built: namely that the wild is a dangerous and threatening place, that captives fare better under human care and that the entertainment and educational value deriving from watching orcas perform more than justifies their long-term confinement.

Curiously, however, Marine World Africa USA commented in 1995 that 'experimental [release] programs with non-endangered species of cetaceans and pinnipeds' should be tried first, and that 'public display facilities such as Marine World Africa and Sea World are the only organisations with the means and the expertise to undertake these ambitious programs.'¹⁵⁷ In 1992, even Sea World was forced to acknowledge the possibility of returning a captive to the wild, as part of the conditions attached by NMFS to 'Co-operative Agreement number 1Q' relating to Sea World's planned importation of the male Tillikum, from Sealand of the Pacific, Canada.

Sadly, so far, the marine parks' generally defensive attitude towards the question of releasing captive orcas has prevented the industry from realising the potential benefits which would accrue should they decide to join the dialogue and participate actively in the release debate. It remains to be seen whether other parks will follow the example of Reino Aventura and allow a captive to enter a release programme. Reino Aventura had several compelling reasons for agreeing to part with Keiko: his starring role in 'Free Willy' had cast a spotlight upon his real-life situation. The spectacle of the under-weight orca with an unsightly skin condition, swimming in a tiny pool, had aroused much public sympathy. His solitary status merely served to heighten his plight. However, having taken the bold decision to allow him to enter the release programme, his previous owners will undoubtedly reap considerable benefits in terms of goodwill and publicity.

Most likely, other marine parks will adopt a 'wait and see' attitude, refusing to commit themselves until they have been able to judge the relative success of the first attempt at a reintroduction. Campaigners are under no illusions that the marine parks will be queuing up to enter their captives into similar programmes. Undoubtedly, there will be many in the display industry who are fervently hoping that the first attempted orca release will fail. In the case of Keiko, whilst the Icelandic people themselves have expressed support for the project, some individuals within the Icelandic government are rather less enthusiastic. Those individuals who are still interested in a future resumption of whaling could find their hopes severely dented by a successful release effort and the attendant upsurge in local goodwill towards whales.

Inevitably, politics, as well as conservation and welfare concerns, will play a major role in this and future release efforts. Nonetheless, conservationists believe that an orca release programme, meticulously planned and managed, could provide a wonderful opportunity to educate and inform the public on such issues as animal welfare, conservation and habitat preservation. Live satellite link-ups from a release site could enable both researchers and the public to follow the progress of the released orca, gaining further insights into orca pod cohesion, social structure and communication.

In this respect, the marine parks are in a unique position. Any marine park which takes the enlightened decision to agree to the release of an orca could document the entire

release process, from decision, through the rehabilitation stage to final release, showing live action footage on the large video screens commonly used during the orca shows. The educational and conservation messages implicit in such a programme are self-evident. Here would be a chance to demonstrate a measurable commitment to a species whose interests have, for so many years, been subservient to the needs of the display industry and, in so doing, restore some much-needed credibility to that industry.

Anti-captivity campaigners acknowledge that release attempts featuring certain individual captives - namely, those orcas born in captivity (usually of mixed ancestry, being the product of matings between orcas from different oceans) and those wild-caught orcas about whose original pods we have only sketchy or no information - will present much greater challenges, but this should not preclude sensible discussion of these animals' suitability for release.

No one can predict the outcome of a release, but many feel that the potential benefits - not least to the orca - far outweigh any possible problems. The Keiko project has advanced the debate considerably and many believe that the lessons learned during his rehabilitation process will increase confidence, paving the way for further such projects. Time is running out for the captives: we owe it to them to give it our best shot.

Section 8 Conclusions and recommendations

The first orca was taken from the wild in 1961. In the years which have elapsed since that first capture, much has been learned about the species. Many people have undoubtedly gained from the experiment, not least the owners of the marine parks who have derived enormous profits from this most lucrative of assets. Yet, the image of the killer whale peddled by the marine parks - the cuddly sea panda, who lets children sit upon its back and playfully splashes crowds with water - is every bit as misleading as the orca's previous public incarnation as a ferocious and blood-thirsty killer. Rather like an incomplete jigsaw puzzle, the true nature of the animal is hinted at, but never fully revealed. The truest portrayal of what constitutes orca society has been provided by researchers studying the species in the wild, supplemented in recent years by sensitive yet realistic coverage in natural history films and documentaries.

The species as a whole may have benefited from wider public knowledge and appreciation, but few outside the industry would argue that the captives themselves have gained from years, even decades, of incarceration. Separated from their families, kept in cramped and featureless tanks, forced to endure an unvarying routine and deprived of the opportunity to use their natural strength, speed and stamina to hunt for their own food: the captive orca is a mere shadow of its wild counterpart.

All too often, behind the facade of conservation, education and 'family entertainment', the grim reality of captivity consists of blaring piped 'muzak', demeaning tricks performed by increasingly traumatised and sickly whales, along with a growing litany of 'accidents', illnesses, stillbirths and premature deaths.

All the information presented in this report points to a single, inescapable conclusion which echoes that reached in previous reports, most notably Erich Hoyt's 1992 report, 'The Performing Orca': namely, that orcas are inherently unsuited to captivity.

Change cannot occur overnight but must rather be a gradual process. The following recommendations are made to further the debate:

- 1 No more orcas should be taken from the wild in order to shore up the needs of the display industry.
- 2 Transportation of orcas from park to park, or from country to country must end, unless such transfer benefits an individual orca: for example, relocating a solitary orca to a new pool with companions.
- 3 Where possible, captives taken from known pods/capture locations should be rehabilitated and returned to the wild. It is essential that release programmes are seen to be meticulously planned and responsibly managed, in order to promote the best chance of success and also to improve the likelihood of further such releases.
- 4 It is possible that certain captive orcas may prove unsuitable candidates for release programmes. The welfare of those orcas remaining in captivity must receive the utmost priority.
- 5 Dilapidated or cramped pools should be phased out as quickly as possible. If new pools are then required in order to house those captives unsuitable for release, then these should be designed with acoustics in mind, ideally being irregularly shaped with no parallel surfaces. Background noise - from pumps, filters, music and crowds - should also be minimised.
- 6 Those pools which use natural sea water might consider training their captive orcas to catch live fish. This is a more expensive option, but one which could improve the quality of life and therefore the health of the whales.
- 7 Where possible, orcas should be kept in social groups which closely resemble social composition in the wild. Incompatible animals should not be housed together. No orca should be kept solitary.

8 There needs to be a serious reappraisal of captive breeding programmes relating to orcas. Captive breeding has been an overall failure, as evidenced by the growing catalogue of failed births and pregnancy-related adult deaths. This failure, combined with a shortage of adult males and the consequent depletion of the gene pool, suggests that it is now time to call a halt. This report, therefore, recommends that no more orcas should be bred in captivity, making the current generation of captives the last.

9 There should be a re-appraisal of show routines, with circus-type tricks being phased out. In-the-water work should be discontinued at all facilities as it presents a highly misleading image of orcas and represents most risk to trainers. Trainer safety must occupy top priority.

10 The educational content of both shows and related printed materials should be re-evaluated by educators unaffiliated with the industry. Information provided must be consistent with the latest scientific findings. Education and conservation messages should be presented in a clear and accessible manner, rather than being tagged onto a show routine as an afterthought.

11 Further studies are needed into alternatives to keeping orcas in captivity. A new generation of cetacean-free facilities is paving the way and this area merits greater investment. Other advances, such as live satellite linkups, videos and virtual reality will also advance education and entertainment, rendering the confinement of live animals obsolete.

APPENDIX

Table 1 **Current distribution of captives**

As of April 2001, a total of 49 orcas are held in captivity (26 wild-captured plus 23 captive-born calves) in 11 marine parks in 5 different countries. This figure includes Keiko, currently in a seapen off Iceland as the second stage of his structured rehabilitation and potential release project.

<i>Country</i>	<i>Facility</i>	<i>Total orcas held</i>	<i>Wild-caught</i>	<i>Captive-born</i>
USA	Sea World Inc (3 marine parks)	22	8	14
	Miami Seaquarium	1	1	
Canada	Marineland, Niagara Falls	7	3	4
France	Marineland, Antibes	6	3	3
Japan	Kamogawa Sea World	5	3	2
	Shirahama Adventure World	3	3	
	Taiji Whale Museum	2	2	
	Izu-Mito Sea Paradise	1	1	
Argentina	Acurio Mundo Marino	1	1	
Iceland	Keiko release programme	1	1	
Total		49	26	23

Table 2 **The fate of the 134 orcas taken from the wild**

Country	Total captured	Died during capture	Released	Taken into captivity	Died in captivity	Escaped /unknown	Still alive
WA	223-255	10	182-214	31	29	1	1
BC	52	1	26	25	24		1
ICELAND	64		9	55	37		18
JAPAN	28 ¹		9	19	14		5
ARGENTINA	3			3	2		1
CALIFORNIA	1			1	1		0
TOTALS	371-403	11	226-258	134	107	1	26

¹ New information, still to be confirmed, suggests that as many as 63 orcas were captured. The precise breakdown of this figure has yet to be confirmed, but it seems likely that the figure includes orcas captured and released and orcas which died during capture attempts. Source: Far Seas Fisheries Institute/Coastal Whaling Section of the Japanese Fisheries Agency, pers comm to Dr Paul Spong, April 97.

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