AN INVESTIGATION INTO THE WELFARE OF CAPTIVE POLAR BEARS IN JAPAN

by the
ANIMAL CONCERNS RESEARCH AND EDUCATION SOCIETY (ACRES).

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The Animal Concerns Research and Education Society (Acres) is a Singaporean-based charity, founded in 2001 by Singaporeans. Acres aims to:

- Foster respect and compassion for all animals.
- Improve the living conditions and welfare of animals in captivity.
- Educate people on lifestyle choices which do not involve the abuse of animals and which are environment-friendly.

Our approach is **Scientific, Creative, Practical** and **Positive**.

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EXECUTIVE SUMMARY

1. Polar bears are poor candidates for captivity, even in the best of circumstances. They are extremely wide-ranging, highly intelligent, cold weather carnivores, so they are extremely problematic to house and care for in captivity. In fact, many experts believe they are one of the species most ill-suited to captivity.

2. Studies by researchers at Oxford University have indicated that the fact that polar bears have large home ranges in the wild may be the reason why they suffer problems in captivity such as stereotypical behaviour and high infant mortality. As stated in the report: "our findings indicate that the keeping of naturally wide-ranging carnivores should either be fundamentally improved or phased out".[1]

3. Zoos in other countries e.g. the United Kingdom, Switzerland and Germany have stopped keeping polar bears on welfare grounds.[2] The polar bear specialist group of the World Conservation Union (IUCN) does not advocate captive breeding of polar bears.[3]

4. In 2006, following a detailed behavioural study and the publication of a scientific report about the welfare concerns for the polar bears at the Singapore Zoo by Acres, the Singapore Zoo publicly announced that they would no longer import and house Arctic animals, including polar bears.[4]

Findings of the investigation:

5. Serious concerns were raised about the living conditions for the polar bears at Japanese captive facilities during the course of this investigation. The majority of the polar bear enclosures were undersized, barren, poorly designed, contained no areas of soft substrates, and did little to satisfy the biological and behavioural needs of the bears. Many of the enclosures appeared to be very old and in a state of disrepair.

6. Serious concerns about husbandry practices in place for the polar bears at Japanese captive facilities were also revealed.

7. None of the Japanese facilities met all of the minimum requirements stated in the Province of Manitoba (Canada)

Polar Bear Protection Act 2003 in terms of polar bear enclosure design and husbandry practices in place for polar bears. The Act includes a set of specific requirements regarding the keeping of polar bears in captivity.[8] These guidelines outline the minimum standards of care and husbandry that must be satisfied by those institutions seeking orphaned polar bears from Manitoba. This means that if any of the Japanese facilities applied to acquire polar bears from Manitoba, none of them would be eligible.

8. Overall, the enclosure design and husbandry for polar bears at Japanese captive facilities were wholly inadequate and fell drastically short of the internationally recognized bear husbandry standards, aimed at maintaining physically and mentally healthy individuals, that have been written by zoological associations and animal welfare organisations.[2,9,10,11,12,13,14]

9. In Japanese legislation, under the Law Concerning the Protection and Control of Animals and under the Standards Relating to the Keeping and Custody of Animals for Exhibition, there are specific requirements for captive facilities and those that work there to ensure the welfare of the animals in their care, including the requirement that they should "establish and equip facilities which match the habits and physiology of the animals for exhibition."[5] By failing to provide adequate care for the polar bears in many respects, many of the Japanese captive facilities may be contravening these laws.

10. All but one of the facilities investigated was a member of the Japanese Association of Zoological Gardens and Aquariums (JAZA). 3 of the facilities were also members of the World Association of Zoos and Aquariums (WAZA). JAZA and WAZA both have a Code of Ethics that members should adhere to, which includes standards of animal welfare that members should follow. [6,7] Many of the Japanese captive facilities appeared to not be complying with the JAZA or WAZA Code of Ethics in terms of ensuring the welfare of the polar bears.

11. At every captive facility, polar bears were seen to exhibit abnormal behaviours including abnormal stereotypic behaviours, high levels of inactivity and copraphagia.

12. The high levels of inactivity and abnormal stereotypic behaviours clearly indicated an abnormal animal-environment

interaction[15], almost certainly caused by a sub-optimal environment that did not satisfy the natural, species-specific behavioural needs of polar bears.

13. Stereotypies in captive animals have been associated with poor welfare for 5 decades.[16] The expression of stereotypic behaviour is "the most common visible sign of psychological disorder in all species of zoo bears".[17]

14. In many cases, obvious physical signs of distress in the polar bears were evident. Many exhibited poor body condition (underweight or overweight) and many appeared to have lost a lot of lean muscle mass.[18] Many bears also displayed some degree of fur loss.

15. Polar bears are adapted to the Arctic cold and cannot physiologically adapt to significantly warmer climates. The majority of the polar bears were housed in open-air enclosures and many showed clear signs that they were suffering from heat stress in the summer months when the investigation was conducted.

Recommendations:

16. As an interim measure, to mitigate at least some of the adverse effects of current conditions, Acres recommends that the captive facilities makes improvements to the existing enclosures, such as providing soft substrates, providing more shade and relief from the heat, providing more furniture and providing private areas.

17. At all facilities, husbandry methods need to be modified and more effective enrichment programmes should be implemented to improve the well-being of the polar bears.

18. Acres does not support the construction of new enclosures for the polar bears at any of the facilities. It is not possible to construct an enclosure that can accommodate polar bears in a way that satisfies their biological and behavioural needs and that can completely mitigate against the deleterious effects of unsuitable climates. However, in some cases where the enclosures are extremely small and poorly designed, Acres recommends that the bears be removed from these enclosures and moved to other existing, larger enclosures or to other facilities with more suitable accommodation for polar bears.

19. In the long-term, Acres recommends that all captive facilities in Japan phase out the keeping of polar bears on welfare grounds.

20. The potential educational value of keeping polar bears at Japanese captive facilities was found to be negligible. Overall, most visitors to these facilities spent a very short time at the polar bear exhibits and the vast majority of visitors did not read the informational signs about polar bears provided. In most cases, the informational signs contained little information and were of extremely limited educational value.

21. Without a polar bear exhibit, the Japanese captive facilities will surely not experience any reduction in visitor numbers, as it is doubtful that visitors come to any of the captive facilities in question only to see the polar bears. In fact, progressive steps taken by the captive facilities will garner more public support for them.

CHAPTER 1
INTRODUCTION

1.1 Project objectives.

Short term:

- To improve the welfare of all polar bears in Japanese captive establishments by engaging in dialogue with and making recommendations to these captive establishments and working with the Japanese Association of Zoological Gardens and Aquariums (JAZA).

Long term:

- To end the further import and keeping of polar bears in captivity in Japan.
- To curtail the breeding of existing captive polar bears in Japan.
- Ultimately, to phase out the keeping of polar bears in captivity throughout Asia.

This project was designed to be a starting point for a long-term study into the welfare of polar bears in captivity throughout Asia. Japan was chosen as a suitable country for initial investigations as it has a high number of captive facilities holding polar bears. The findings of the investigation can, in the future, be used to create awareness on the welfare of captive polar bears and campaign towards the phasing out of polar bears in captivity in Asia.

1.2 Introduction to Japan and its captive polar bears.

Japan has one of the largest populations of captive polar bears in Asia. As of July 2006, there were 24 captive facilities in Japan holding a total of 46 polar bears.

The majority of the facilities housed more than one polar bear: 4 facilities had 3 polar bears, 14 facilities had 2 polar bears and 6 facilities had 1 polar bear.

For the facilities with more than one bear, it appeared that in most cases there was at least one male or one female being housed together (this was either stated on informational signs or it appeared from the

size differences in the bears that there was probably a male and a female in the same enclosure). There therefore appeared to be possible potential for breeding polar bears at several of the zoos. One of the facilities, Sapporo Muruyama Zoo, had a cub on display and some facilities displayed signs highlighting their breeding success, indicating that the breeding of polar bears was highly valued.
All but one of the facilities holding polar bears in Japan were members of the Japanese Association of Zoological Gardens and Aquariums (JAZA). The only facility that was not a member of JAZA was Oga Aquarium.

3 of the facilities (Ueno Zoo, Higashiyama Zoo and Tennoji Zoo) were members of the World Association of Zoos and Aquariums (WAZA).

1.3 Project methods.

During the months of July and August 2006, researchers from Acres visited and surveyed all 24 captive facilities in Japan holding polar bears.

Investigation into the welfare of the bears

At each facility, data on the living conditions of the bears were collected and every polar bear enclosure was evaluated. Data on the physical condition and behaviour of the bears were also recorded. A zoocheck questionnaire (Appendix I) was used to record these data. In total, 29 polar bear enclosures were surveyed and evaluated.

As well as the general survey, enclosures and husbandry standards were evaluated to see if they met the guidelines of the Province of Manitoba (Canada) Polar Bear Protection Act 2003.[8] The Polar Bear Protection Act is a set of specific guidelines in relation to the keeping of polar bears in captivity outlining the minimum standards of care/husbandry that should be followed by those institutions housing polar bears. The Act was compiled in 2002 and made law by the Government of Manitoba, Canada. This act serves as a set of basic standards to refer to in order to ensure a minimum professional standard since it has actually been passed as a law and is specific to the species. It should be noted, however, that the minimum size requirements required by the Polar Bear Protection Act are considered by some to be inadequate and should therefore only be regarded as the absolute minimum that should be considered for polar bears.

The investigators assessed the breeding potential of each zoo by recording the age and the sex of each bear, where possible, using the informational signs at the enclosure to obtain this data.

Photographic and video evidence of enclosure design, living conditions of the bears, physical condition of the bears and behaviour of the bears was collected.

Investigation into the educational value of the polar bear exhibit.

The polar bear exhibits were evaluated with respect to their educational value. The following data were collected in order to make an assessment:

1. Whether or not informational sign/s were present at the enclosure/s (a sign was considered an informational sign only if the information described the species beyond the common name, scientific name and distribution.)
2. The position in which the informational sign/s were placed.
3. The content of the sign/s and quality of the information that was presented in the sign/s.
   This was achieved by taking photographs of every sign and subsequently having them translated into English.
4. The time spent by visitors observing the polar bear/s at the enclosures.
5. The number of visitors who read the informational sign/s where present.

The time spent by the visitors at the enclosure was recorded as follows:

1. Timing began when a visitor started to observe the polar bear/s in the enclosure.
2. The timing ended when the visitor stopped observing the polar bear/s in the enclosure.
3. When that visitor departed from the enclosure, the next visitor who began to observe the polar bear/s in the enclosure was taken as the next study individual.

For facilities that had more than 1 polar bear enclosure, the total time spent looking at all polar bears in all enclosures was recorded.

For the survey on time spent observing the polar bears, the target sample size was 400 individuals. However, in some circumstances when this sample size could not be obtained, data was instead collected from the largest sample size possible in the time available. For the survey on

the number of visitors reading the informational signs, every individual who stopped to read the signs was counted, from the facility's opening time to the closing time.

This method presents a very basic evaluation. The time spent by visitors at the enclosure is not by itself an effective tool in determining the effectiveness of the education being carried out at the exhibit. However, it is certain that if visitors spend only a few minutes at the enclosure, very little education can take place in that short amount of time. On the other hand, if a visitor does spend a longer period of time at the enclosure, this evaluation system would not be able to tell if any education had taken place. The evaluation of the number of visitors who read the informational signs also presents the same scenario. Therefore this evaluation system does not determine if education had taken place at the enclosure, but rather whether education *could* not have taken place.

1.4 Introduction to polar bears (*Ursus maritimus*).

Polar bears are the largest non-aquatic carnivore alive in the world today. Adult males may weigh from about 350 to over 650 kilograms whilst females normally weigh 150-250 kilograms.[19]

Polar bears are found throughout the ice-covered waters of the circumpolar Arctic.[19] Scientists have identified 12 subpopulations among an estimated 40,000 polar bears that range the frozen waters of the United States, Canada, Denmark, Norway and Russia.[20]

In the wild, the changing seasons strongly influence the behaviour of polar bears, with the seasonal influences on wild bears closely related to climatic conditions and availability of food.[21] With the changing seasons come changes in distribution, activity levels, hunting activity, mating behaviour and reproductive behaviour.

Polar bears are primarily carnivorous, feeding mainly on seals. Their diet is supplemented with seaweed, clams, crabs and fish collected while the animal is diving. They also eat carrion, such as dead whales washed ashore on Arctic coastlines.[22]

Although polar bears are not migratory animals, their seasonal movements in some areas may be considerable. Polar bears on the pelagic drift ice in the Barents Sea undertake extensive annual migrations following the seasonal changes in sea ice, yielding annual range sizes of 250,000 square kilometres.[23] One marked polar bear was

found to have crossed the Arctic, covering 3,200 kilometres in one year.[22] In one day, polar bears can travel 80 kilometres or more.[24] In an average lifetime, a polar bear may traverse 260,000 square kilometres.[22]

Polar bears are good swimmers and are able to swim 100 to 120 kilometres, and maybe even farther, without landing.[25]Their webbed paws propel them through the water at speeds of up to 6.5 kilometres per hour. While diving, polar bears can remain underwater for up to 2 minutes.[25] Scientists logged one non-stop swim by a polar bear of 200 miles.[20]

Polar bears are generally solitary in the wild, although large congregations do occur in certain areas, usually at significant sources of food, at certain times of the year. [25]

1.5 Welfare of wild animals in captivity.

Bears in captivity are highly susceptible to the development of abnormal behaviours, in particular stereotypies[30,31,32] and excessive inactivity.[33] Typical stereotypic behaviours displayed by bears include pacing, repetitive swimming, weaving, head-swaying and oral forms such as tongue-flicking and teeth grating.[30]

The captive environment presents a vastly different environment to what animals have adapted to. Compared to the dynamic and complex nature of the natural environment, the captive one is more static. Physical factors such as temperature, humidity, structural features, and the type, quantity, and availability of food are typically more predictable in a captive environment.[26] As a result of this predictability, captive environments frequently offer less stimulation and opportunity for choice than natural environments.[26]

Like their counterparts in the wild, captive animals need to engage in a variety of instinctive behaviours such as seeking shelter, nest sites, mates and food resources, avoiding predators and parasites, defending territories, and exploring new spaces.[27] However, most captives are, to a large degree, restricted or prevented from engaging in these behaviours.[27]
The behaviour of wild animals in captivity may also be under human control,[28] in contrast to the wild, where decisions are made based on the individual's own choices. This ability of the animal to have some control over its environment appears to be crucial in stress reduction and therefore reduce the risk of associated health problems.[29]

Suboptimal and restrictive captive conditions often result in the development of stereotypies,[34] which typically arise when an animal's environment lacks appropriate stimulation.[35] Stereotypies are behaviour patterns that are invariant in style, performed repetitively, and appear to have no function. They are of concern because they may indicate poor welfare, and are sometimes detrimental to health.[30]

Suboptimal conditions can also result in frustration and increased levels of stress, leading to development of aberrant behaviours such as hyperaggression, hypersexuality, lethargy and other problematic conditions.[27] Captive conditions also decrease the level of the animals' general reactivity and markedly change their behaviour.[10]

Some progressive zoos now recognize that confining animals in boring, behaviourally impoverished enclosures that fail to satisfy their species-specific needs is no longer acceptable.[27]

Each animal species has evolved adaptations to survive in their own particular natural environment. It is thus extremely important that zoo designers, zoo management and animal care staff allow for a free expression and utilization of these adaptations in captivity.[27] Progressive enrichment strategies should be implemented to encourage animals to take control of their own lives by providing an environment that allows them choice and control.

1.6 Welfare concerns for polar bears in captivity: International scientific studies.

Polar bears are poor candidates for captivity, even in the best of circumstances. Captive polar bears are notorious for their tendency to exhibit stereotypic behaviours. These behaviours include head-swinging, pacing, tongue-flicking, and circular or to-and-fro patterns of swimming.[36] Other abnormal behaviours that have been described include head twisting and head weaving. Polar bears are particularly well known for pacing[10] and probably the most universal movement observed in almost any zoo in the world by polar bears is the expression of "head-body turns". According to WSPA, this movement is often seen as part of pacing stereotypies, but may also be expressed as part of swimming stereotypies.[2]

1.6.1 British zoos studies.

Studies undertaken at British Zoos in the 1980s and 1990s documented and examined in detail the abnormal and stereotypic behaviours displayed by the polar bears there.[36,37,38]

In one survey carried out in British zoos between 1989 and 1991, all polar bears in these zoos showed stereotyped behaviours, with the most common being that of pacing to-and-fro.[36] In this survey, zoo polar bears were recorded spending an average of 33% of their day engaged in stereotyped behaviours. One polar bear spent 60% of his time engaged in stereotyped behaviour.[36] In a separate study, abnormal behaviour was seen to be displayed by all polar bears in 5 British zoos.[38]

With captive polar bears, stereotypic behaviour is particularly resistant to change.[36] It is not only wild caught polar bears that are susceptible to developing these abnormal behaviours in captivity. Captive born individuals appear just as prone to development of abnormal behaviours, including stereotypic behaviours.[38]

Captive polar bears are also prone to other forms of abnormal behaviour. Polar bears have been recorded displaying pronounced inactivity or apathy, for example sitting "trance-like" in one squatting position for hours at a time, staring at a wall.[38] It has been suggested that the original cause of this pointless squatting behaviour was boredom, this boredom then led to a form of ennui, then the bear became mentally moribund.[38] It has long been recognised that cerebral degeneration is a common feature amongst opportunist species kept in captivity.[38] Apathy in captive animals has been recorded by numerous scientists including Hediger (1950, 1955), [39,40] Meyer-Holzapfel (1968)[41] and Morris (1964)[42].

Following his investigations into the welfare of captive polar bears, Stefan Omrod (1992) concluded "It is self-evident that polar bears have extreme difficulty in adjusting to the conditions of captivity. This is especially clear when one examines the widespread incidence of aberrant behaviour." "The welfare of polar bears is not good. I believe that many suffered and may still be suffering, to some degree, in the process of adapting to their captive environment". [38]

1.6.2 Oxford University report.

A 2003 report by researchers Dr. Georgia Mason and Dr. Ros Clubb at Oxford University strongly indicated that a particular lifestyle in the wild confers vulnerability to welfare problems in captivity.[1] It appeared that home-range size and the daily distance travelled was the predicting factor in how well a species adapts to captivity. The researchers suggested that problems including poor health and a tendency to pace are directly related to the size of the animal's home range in the wild. These problems were suggested to stem from constraints imposed on their natural behaviour.[1]

One of their key findings was that among the carnivores, naturally wide-ranging species show the most evidence of stress and/or psychological dysfunction in captivity.[1] The direct relationship of home range size to abnormal behaviour and high infant mortality in captivity existed independent of factors like the size and design of the enclosure and feeding schedules.[1]

It is unclear why natural home-range size is so important. "It could be that some carnivores roam because they are very sensitive to changing prey densities, or some species find roaming pleasurable, so they roam," Dr. Mason said. "They might be designed in such a way that roaming makes their central nervous system develop properly".[43]

The typical zoo enclosure for a polar bear is one-millionth the size of its home range in the wild, which can reach 31,000 square miles, the authors said.[1] They also remarked that some captive polar bears spend 25% of their day in what scientists call stereotypic pacing, and infant mortality for captive animals is around 65%.[1]

The researchers based their findings on an analysis of some 1,200 journal articles covering 4 decades of observations of animals in the wild and at 500 zoos worldwide.[43]

The study revealed those species that are inherently likely to fare badly in zoos and other establishments. One of the conclusions of the report was that polar bears and other wide-ranging carnivores do so poorly in captivity that zoos should either drastically improve their conditions or stop keeping them altogether. As stated in the report: “our findings indicate that the keeping of naturally wide-ranging carnivores should either be fundamentally improved or phased out”.[1]

1.6.3 Singapore Zoo study.

A behavioural study into the welfare of polar bears at the Singapore Zoo conducted by Acres in 2005 revealed serious welfare concerns for the 2 bears.[4]
Key findings of the 3 month study were as follows:

1. Both bears engaged in high levels of abnormal stereotypic behaviour (Inuka: 64.5% of the active periods; Sheba: 56.8% of the active periods). The bears were at times observed to be constantly pacing or swimming stereotypically. Stereotypic behaviour is widely recognised as a clear indication of an abnormal animal-environment interaction and a sign of psychological disorder in animals.

2. Both bears displayed high levels of inactivity (Inuka: 42.5% of the time; Sheba: 64.6% of the time). This is recognised as a clear indication of an abnormal animal-environment interaction, almost certainly caused by a sub-optimal environment that does not satisfy the natural, species-specific behavioural needs of the bears.

3. Both bears exhibited signs of severe heat stress. The bears were both seen to be panting for long periods of time (Inuka: 36.0% of the time; Sheba: 38.7% of the time), indicating that they were far too hot. The bears were also seen to be exhibiting other behaviours indicating heat stress.

Overall, the study provided convincing evidence that the polar bears at the Singapore Zoo were suffering from the effects of captivity and heat stress from living in an unsuitable climate. The findings of the study provided overwhelming support for the opinion that the keeping of polar bears by the zoo should be phased out on welfare grounds.

1.7 The phasing out of keeping polar bears in captivity.

Because of the innate difficulties of providing the spacious and stimulating environment required by captive bears, many zoos no longer hold bears in their collections or have decided not to replace current stock after the bears die.[65] This situation is perhaps most apparent in the case of polar bears.

Polar bears are one of the species for which the effects of captivity have been studied in detail.[36,37,38] The results of such studies have highlighted the ubiquitous incidence of abnormal behaviour for polar bears in captivity and highlighted the immense difficulties in meeting the needs of this species in a captive environment.

Even at progressive, professionally-managed zoos, there remain severe problems with polar bears displaying abnormal behaviours. Regardless of whether or not enclosures fulfil the various recommendations for polar bears, stereotypic and abnormal behaviours still prevail.[38] In a study of polar bear behaviour in British zoos, it was found that the design or size of enclosures did not have any significant influence on incidences of stereotypic behaviour.[38] Even for the bears living in the largest enclosure in this study, 4 different stereotypic behaviours and apathetic behaviour were recorded. In another large enclosure which followed the layout suggested as being the most suitable for polar bears (level, with raised areas and containing few rocks), the stereotypic behaviours observed were as extreme as anywhere else.[38] These observations strongly indicate that, for polar bears, simply changing the layout/design and increasing the size of enclosure is still not enough to eradicate or even limit the occurrence of abnormal behaviours.

The question therefore remains; will there ever be an enclosure adequate enough to prevent or eliminate stereotypic behaviour in polar bears? An evaluation of all of the evidence leads to a resounding no. Certainly, at this point in time, no one has come close to designing an enclosure that meets the needs of polar bears and, because of the nature of this species, it is doubtful that anyone ever will.

Zoos in the United Kingdom have been phasing out the keeping of polar bears in recent years. Since the 1990s, 6 zoos in the United Kingdom have stopped keeping polar bears. Today, there is just one polar bear still being held in captivity in the United Kingdom at Edinburgh Zoo, and the public pressure on the zoo not to acquire any more polar bears once she dies is immense.

With regard to the trend towards phasing out the keeping of bears in zoos, the Chief Curator at Chester Zoo, the United Kingdom's largest zoological garden, has stated, "…if we cannot provide for the environmental requirements of any animal properly we should not keep them. Historically, a number of bear species were kept here but since the last aged female polar bear died here in the early 1990s we have not felt it appropriate to replace her…In summary, historically bears have had a 'poor deal', somewhat masked by their [physical] resilience."[44] Similarly, the following response was given by Chester Zoo when questioned on the absence of polar bears at the zoo: "Our last two polar bears were Amos who died in 1989 leaving Sabrina who unfortunately died of a tumour in 1992. A decision was taken at that time, not to keep Polar Bears in the collection any more as it is very difficult to provide the right kind of conditions for the type

of environment they require and, they are no longer a highly endangered species." (Email correspondence, 27 January, 2006).

The situation is much the same for zoos in Switzerland. Until a few years ago, Basel Zoo and Zurich zoo were the only two zoos in Switzerland still keeping polar bears. Both zoos have now come to the conclusion that, in principle, polar bears should not be kept under the conditions the zoos can offer at present.[2] As the zoos cannot at present build large new exhibits that meet the requirements of the species, the keeping of polar bears has been phased out.[2]

Similar enlightenment is also found in Germany, where zoos are phasing out the keeping of not only polar bears, but also other bear species.[2]

The latest zoo to follow this trend is the Singapore Zoo which, after reviewing a report published by Acres about the welfare concerns for the 2 polar bears at the zoo, publicly announced in September 2006 that they would no longer import and house polar bears.[45]

In 1993, the Universities Federation for Animal Welfare (UFAW) published a report based on behavioural studies of polar bears in the United Kingdom entitled "The behaviour of captive polar bears".[36] Subsequently, UFAW made the following statements and recommendations about the keeping of polar bears in captivity:

- Zoos have the responsibility to improve the environments in which the polar bears are kept according to UFAW recommendations.
- Where conditions are so poor that improvements are impracticable the animals should be found new homes or as a last resort humanely put down.
- In the absence of suitable environments polar bears should not be bred.
- The keeping of polar bears should be phased out as the present captive population declines.
- Until a suitable environment can be built that meets all the bears' behavioural needs UFAW cannot recommend that polar bears should be kept in zoos.

It is not just animal welfare bodies and the zoos themselves that are expressing reservations about the keeping of bears in zoos. The bear Taxon Advisory Group (TAG) of the European Endangered Species Program (EEP) holds the opinion that " Zoos should not consider designing enclosures for bears unless they can meet all their behavioural needs…[If a large and natural enclosure is not feasible]

then serious questions have to be asked as to whether a smaller enclosure is suitable and precisely what the grounds may be for the reduction in welfare inevitable in a restricted place…the fewer the natural elements (trees, ground vegetation, hills, rocks, creeks or lakes), which provide the special activity areas, in an enclosure, the more difficult it becomes to and the more carefully it must be planned and designed to allow for a range of normal behaviours…the more options, with regards to substrates, vegetation and structures, that we can offer the animals, the greater the likelihood that we shall be able to meet their demands." [14]

Clearly then, as knowledge about the detrimental effects of captivity on the well-being of polar bears increases along with awareness of the immense difficulties in fulfilling their needs, progressive zoos are choosing to stop keeping this species on welfare grounds. Public enlightenment and concern have no doubt also played a key role in bringing about these changes.

CHAPTER 2
LEGISLATION: INTERNATIONAL AND LOCAL

2.1 Japanese legislation.[44]

There are certain pieces of legislation in Japan which refer to the treatment of animals and also specifically to the keeping on animals in a captive environment.

Article 2 of the Law Concerning the Protection and Control of Animals (Law No. 105, October 1, 1973) states:

> "All people must not only refrain from killing, injuring and inflicting cruelty upon animals, but they must also treat animals properly, taking their natural habits into account"

Under the Standards Relating to the Keeping and Custody of Animals for Exhibition (Notification No. 7, February 10 1976, of the Prime Minister's office), the general principles state:

> "Persons in charge of or keepers of animals for exhibition should understand the habits, physiology and ecology, etc of the animals in their charge and treat them with affection; should exhibit the animals in their natural form and seek to deepen the knowledge of animals and an interest in the protection of animals among spectators."

Under the same standards, it is stated:

> "The person in charge should establish and equip facilities which match the habits and physiology of the animals for exhibition (and) ensure that animals for exhibition have necessary exercise, rest and sleep, and should foster healthy growth and the development of the natural habits of animals for exhibition, bearing in mind (that) food and water should be given in a proper manner in keeping with the kind of animal and its stage of development."

Under Standards Concerning the Structure of holding Facilities and Measures for Keeping and Controlling Animals etc. relating to animal dealers/traders (2000). Based on Law for the Humane Treatment and Management of Animals (established in 1973 and revised in 2002) it is stated that:

"Places for excreting, perches and bathing pools should be made available."

"Enclosures should be designed to maintain proper temperature, ventilation and light so that animals will not be subject to excessive environmental stress. Or there should be equipment provided to maintain such conditions."

"Outside enclosures or enclosures facing the outside should provide shelter from sun, wind and rain."

2.2 Canadian legislation.

The Wild Life Act of the Province of Newfoundland and Labrador includes specific requirements for the keeping of polar bears, including minimum permissible enclosure size, den requirements, exercising equipment requirements and pool requirements.[46]

The Province of Manitoba has a robust legislative and policy framework in place for the protection of polar bears. Recognising polar bears as a species with special requirements, a set of specific requirements in relation to the keeping of polar bears in captivity was included in The Polar Bear Protection Act, which was made law by the Government of Manitoba, Canada, in 2003.[8]

These guidelines outline the minimum standards of care and husbandry that must be followed by those institutions housing polar bears. These strict guidelines must also be met by any zoos wishing to acquire a polar bear from Manitoba, which is the province that is the primary source of orphan polar bears.

2.3 Japanese Association of Zoological Gardens and Aquariums (JAZA) Code of Ethics [6]

All members of JAZA should adhere to the association's Code of Ethics. The JAZA Code of Ethics can be read in full in Appendix II.

The Code of Ethics of JAZA states:

- The facilities shall give full consideration to species preservation and animal welfare in their care and study of animals
- Care facilities, equipment and tools appropriate to each animal's habits and physiology shall be furnished.

- Information essential to animal care, display and research shall be acquired and maintained.
- Animal care personnel shall be fully competent in the knowledge and skills required for adequate treatment of the animal species under their supervision.
- The requirements for appropriate animal care and health shall be met.
- Animal care shall be provided in compliance with standards established by the JAZA for each species.

2.4 World Association of Zoos and Aquariums (WAZA) Code of Ethics [7]

All members of WAZA should adhere to the association's Code of Ethics. The WAZA Code of Ethics can be read in full in Appendix III.

The Code of Ethics of WAZA states:

- Animal welfare: Members of WAZA will ensure that all animals in their care are treated with the utmost care and their welfare should be paramount all times. At all times, any legislated codes for animal welfare should be regarded as minimum standards. Appropriate animal husbandry practices must be in place and sound veterinary care available.
- Exhibit Standards: All exhibits must be of such size and volume as to allow the animal to express its natural behaviours. Enclosures must contain sufficient material to allow behavioural enrichment and allow the animal to express natural behaviours. The animals should have areas to which they may retreat and separate facilities should be available to allow separation of animals where necessary, e.g., cubbing dens. At all times animals should be protected from conditions detrimental to their well-being and the appropriate husbandry standards adhered to.
- Basic principles for the guidance of all members of the World Association of Zoos and Aquariums: (iv) Co-operate with governments and other appropriate bodies to improve standards of animal welfare and ensure the welfare of all animals in our care.
- WAZA and its members should make all efforts in their power to encourage substandard zoos and aquariums to improve and reach appropriate standards. If it is clear that the funding or the will to improve is not there, WAZA would support the closure of such zoos and aquariums.

CHAPTER 3
PROBLEMS WITH POLAR BEAR ENCLOSURE DESIGN AND HUSBANDRY AT JAPANESE CAPTIVE FACILITIES

3.1 Problems with enclosure design and husbandry.

The urgent need to apply biological knowledge of the species' natural lifestyle to the captive environment is habitually emphasised throughout the contemporary bear husbandry literature.[16]

There were a number of significant problems with both enclosure design and husbandry practices for the polar bears at all Japanese facilities surveyed which had severe implications for the welfare of the bears.

The following sections provide an overview of the problems and compare the standards of polar bear enclosures and husbandry practices at Japanese facilities at the time of the investigation to those described in standards contained in national legislation, zoo guidelines and recommendations made by animal welfare organisations (see Appendices).

A number of guidelines and pieces of legislation have been written and published by zoo associations, zookeeper associations, individual zoos, governments and animal welfare groups regarding the minimum standards acceptable regarding the keeping of wild animals in captivity. Many of the guidelines and pieces of legislation recognise bears as animals with special needs and make specific recommendations accordingly, either for bears in general or for specific species. Some include specific guidelines for polar bears.

A number of such guidelines and pieces of legislation, specifically written for bears, will be used throughout this report for comparative purposes. Further details regarding these guidelines and legislation can be found in the WSPA report "Keeping bears in captivity".[2] A summary of the main recommendations with regard to the keeping of polar bears in captivity from all these various sources is included in the Appendices.

Guidelines and Legislation.

Guidelines for keeping bears in captivity .[2,9,10,11,12,13,14]

TAG guidelines
In 1998 the Taxon Advisory Group (TAG) of the European Endangered Species Program (EEP) published guidelines for keeping bears in captivity. The EEP is a subdivision of EAZA (European Association of Zoological Parks and Aquaria).

ABWAK guidelines
In 1992 the Association of British Wild Animal Keepers (ABWAK) published a compilation of articles with management recommendations for bears written by various authors: "Management guidelines for bears and raccoons."

IBF guidelines
In 1996 the International Bear Foundation (IBF), Rhenen, Europe published the proceedings of an international workshop on captive bear management: "Large bear enclosures". The group made recommendations relating to bear management.

UFAW recommendations
In 1993 UFAW (Universities Federation for Animal Welfare) published a report based on behavioural studies of polar bears in zoos in the United Kingdom: "The behaviour of captive polar bears". Subsequently, UFAW made a number of recommendations about the keeping of polar bears in captivity.

WSPA recommendations
WSPA has recently compiled a set of Recommended Minimum Needs for captive bears in the report "Keeping bears in captivity". Although not yet published, these guidelines will be referred to. The WSPA report reviews current guidelines for keeping bears in captivity and compiles a set of best standards, termed Recommended Minimum Needs. These are based on current knowledge on how bear species should be kept but will be continually updated as knowledge increases.

Legislation specific to polar bears. [8,46,47]

The various pieces of legislation in place in different countries regarding specific recommendations for polar bears will be referred to for comparison where applicable, such as when considering size of enclosures.

Throughout the report, the standards contained in the Polar Bear Protection Act of Manitoba will also be used as a benchmark set of standards against which the standards at the Japanese captive facilities can be measured. The Manitoba standards are comprehensive, cover a wide range of husbandry areas and the Act has actually been passed as a law.

Recommendations of the Scientific CITES Authorities of Liechtenstein and Switzerland and the Province of Newfoundland and Labrador- Wild Life Act will also be discussed.

3.2 Problems with polar bear enclosure design at Japanese captive facilities.

In general, with a few exceptions, the polar bear enclosures at Japanese captive facilities were undersized, barren, poorly designed, did not accommodate any soft substrates and did little to satisfy the biological and behavioural needs of polar bears. These suboptimal conditions have most probably contributed to the high level of abnormal stereotypic behaviours and inactivity discussed in Chapter 4.

Legislation regarding enclosure size.

The Polar Bear Protection Act, Manitoba.[8]

- An exhibit area in a facility containing one or two polar bears must be at least 500 m^2. The size of the exhibit area must increase by an additional 150m^2 for each additional polar bear in the facility.
- An off-exhibit area in a facility containing one or more polar bears must be at least 75m^2. The size of the off-exhibit area must increase by an additional 25m^2 for each additional polar bear in the facility.
- A facility must have a holding area for each polar bear that is a least 4m x 3m x 2.5m.

Scientific CITES Authorities of Liechtenstein and Switzerland.[47]

- Although not legally binding, the Scientific CITES Authorities of Liechtenstein and Switzerland, 1989 recommended a minimum enclosure size for two polar bears of 400m^2 land surface area (100m^2 per additional adult) and a minimum pool surface area of 100m^2 (50 m^2 per additional adult).

Province of Newfoundland and Labrador- Wild Life Act.[46]

- For polar bears, the minimum surface area per pair is 4,500m^2 with a minimum additional 2,000m^2 per animal.

3.2.1 Size of polar bear enclosures.

Polar bears are renowned for their nomadic lifestyle and have exceptionally vast home ranges in the wild. The home range of a polar bear in the wild can reach 31,000 square miles.[1]

Enclosures containing captive wild animals should provide sufficient space to allow the expression of a full range of species-typical behaviour and movements. Lack of space is a major factor contributing to poor welfare for captive animals. Enclosure size has been identified as a factor influencing the development and form of stereotypic behaviour.[48] Smaller, less complex enclosures are known to result in stereotypic, self-destructive and other abnormal behaviour in a variety of mammals and birds.[49,50] In addition, it has been found that

for carnivores, frequency and prevalence of pacing is positively correlated with home range size in the wild.[51]

The amount of space provided for captive animals is so critical to their well-being, especially for wide-ranging animals such as polar bears, that minimum enclosure size requirements for certain species are actually stated by law in some countries or provinces within countries.

Enclosure size at Japanese captive facilities.

One of the most obvious problems with the vast majority of the polar bear enclosures at Japanese captive facilities was the extremely small amount of space provided for the bears.

At all but 3 facilities, enclosure size fell far short of the minimum size requirements of the Polar Bear Protection Act. Generally, the enclosures were too small to allow for the expression of a full range of species-typical behaviours and movements.

Some enclosures, like this one at Sapporo Muruyama Zoo, were extremely small.

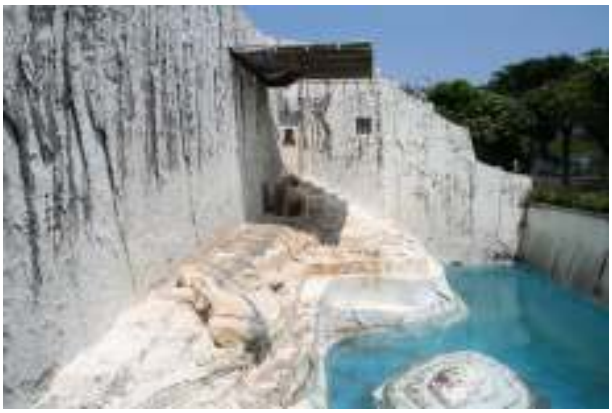
This enclosure at Tokuyama Zoo was exceptionally small with a very limited dry land area, especially for 2 bears.

- 4 enclosures were estimated to be less than $50m^2$ in area, i.e. less than a tenth of minimum size requirements stated in the Polar Bear Protection Act.

- 12 enclosures (41.4%) were estimated to be less than $100m^2$ in area, i.e. less than a tenth of minimum size requirements stated in the Polar Bear Protection Act.

- The smallest enclosures were found at the following facilities: Sapporo Muruyama Zoo, Kushiro Zoo, Tobe Zoo, Yagiyama Zoo and Cuddly Dominion.

Not only were most of the enclosures extremely small in total area, but additionally the actual dry land area provided in many of the enclosures was wholly inadequate and unacceptable. In some cases, the land area provided for 2 bears was barely a few metres long and wide. In 2 enclosures, each housing 2 bears (at Hirakawa Zoo and Tokushima Zoo), the bears could barely pass each other in places because the land area was so narrow.



Enclosures like this one at Hirakawa Zoo, with very little usable land area, were common.

- The smallest dry land area sizes in the enclosures were found at the following facilities: Tokuyama Zoo, Hirakawa Zoo, Cuddly Dominion, Yagiyama Zoo, Yokohama Sea Paradise and Kumamoto Zoo.

In terms of outdoor enclosure size, only 3 of the enclosures, at Yokohama Zoo and, Kobe Oji Zoo and Higashiyama Zoo, appeared to meet the minimum standards stated by the Polar Bear Protection Act. All of the other enclosures fell far short of meeting the minimum size requirements stated in the Act.

All of the polar bear enclosures at Japanese facilities fell far short of the size requirements stated in the Province of Newfoundland and Labrador- Wild Life Act and those recommended by WSPA (Appendix IV). None of the enclosures fulfilled the recommended minimum size of outdoor land surface area recommended by the Scientific CITES Authorities of Liechtenstein and Switzerland or that stated in the Wild Life Act of the Province of Newfoundland and Labrador, Canada.[44]

3.2.2 Style of enclosure.

Certain styles of animal enclosure, such as pit-style enclosures, cages and grottos (dry land area surrounded by at least 3 solid walls presenting a cave-like appearance) are no longer considered appropriate and have been phased out in the more progressive zoos. The TAG guidelines clearly state that the traditional bear pit surrounded by a high wall or enclosures of concrete are not acceptable bear enclosures.[2]
Keeping animals in such enclosures is known to be detrimental to their welfare, and animals suffer from severe constraints in such conditions such as a lack of view.

Cages are no longer considered appropriate environments for captive wild animals.

These types of enclosures, which do not take the welfare of the animals into consideration and are designed simply for human visitors to get an unrestricted view, also give the wrong impression that animals are ours to be used for entertainment.

The keeping of large mammals in indoor, fully enclosed, glass fronted enclosures is totally unacceptable from a welfare point of view.

Style of enclosures at Japanese captive facilities.

Many of the polar bear enclosures were of an inappropriate style.

- 9 out of the 29 polar bear enclosures (31%) were of a style considered inappropriate for mammals.
- 5 of the polar bear enclosures at Japanese facilities were cages from which the bears had a very restricted view out.
- 2 of the enclosures were pits from which the bears had no view out.
- 2 of the enclosures were indoor, fully enclosed, glass-fronted enclosures.

At 2 facilities, Adventureworld and Yokohama Sea Paradise, the polar bears (2 at each facility) were kept in indoor, fully enclosed, glass fronted enclosures, their only view out being onto an indoor visitor viewing area. These bears lived in completely artificial surroundings, never breathing fresh air or seeing daylight. It is hard to think of a more unnatural situation for this large, wide ranging, Arctic bear.

Some bears, like these 2 at Yokohama Sea Paradise, were kept in indoor glass-fronted enclosures.

3.2.3 Design of interior.

In the past, bear enclosures have typically been made of concrete, rock and water, with few, if any, moveable objects. The vast majority of the polar bear enclosures at Japanese facilities embodied this outdated concept. It is now recognised that there is little in such areas that relates to the natural habitat of the animals. Consequently, when polar bears are kept in enclosures of such design, there is little to stimulate their natural behaviour and well-being.[36]

A traditional-style, concrete polar bear enclosure. Such enclosures are now known to be detrimental to the bears' well-being.

Traditionally, polar bear enclosures have been built of hard materials such as concrete and gunite because of the erroneous belief that they simulate sea ice habitat. In a very superficial way, concrete and gunite can be made to visually resemble some features of pack ice, but of course texturally they are very different. Ice has a wide variety of consistencies and textures and is nothing like the hard surfaces found in zoo exhibits. It must also be remembered that a polar bear's natural habitat features vegetation, which is never represented in these traditional concrete and gunite enclosures.

Current opinions on appropriateness of bear enclosures are generally in agreement that bare, concrete enclosures are not suitable environments for bears (Appendix V).

Interior enclosure design at Japanese captive facilities.

At the vast majority of Japanese captive facilities, the overall designs of the polar bear enclosures were outdated, lacking in complexity and failed to meet the bears' needs on some very basic levels.

The majority of the polar bear enclosures seemed to be of the style of traditional 1960's-1970's concrete exhibits. Such enclosures are known to damage an animal's mental and physical well-being.[18] The problem with these old designs is that they do not meet the bear's needs on some very basic levels.

A typical polar bear enclosure, with bare concrete levels supposedly representing a sea-ice environment.

- The majority of the enclosures lacked any real complexity. For 14 of the 29 enclosures (48.3%), the land area was barren with no usable fixtures.

In general, the enclosures could in no way accommodate for a full behavioural repertoire when there were clearly no possibilities for foraging, climbing, digging and resting in natural substrates provided in most of them.

- Many of the bears only had very restricted views out of their enclosures.

For most of the bears, their limited view out of the enclosure was restricted to the areas where visitors stand. Some bears had no opportunity to view out of their enclosures at all. The provision of observation points to view out of the enclosure and for climbing structures to enable them to view horizons is considered a minimum need for bears.[2]

Many of the guidelines recommend a minimum of 2 separate outdoor enclosures to house 2 polar bears for segregation purposes. However, at

every Japanese captive facility which housed more than 1 polar bear, there was only one enclosure provided for groups of 2 or more bears in every case.

Clearly, the vast majority of polar bear enclosures at the Japanese captive facilities did not fulfill many of the requirements or follow recommendations stated by the various zoo associations and animal welfare organisations (Appendix V) in terms of providing the essential components of a polar bear enclosure.

Many of the polar bear enclosures could not be considered to meet the minimum standards regarding enclosure design stated in the Polar Bear Protection Act.

Legislation regarding enclosure design.

Polar Bear Protection Act, Manitoba.[8]

- The exhibit should be of sufficient size and design to discourage the development of unnatural behaviours, enable the animal(s) to exercise a range of physical activities to maintain good physical condition and facilitate public interpretation.
- The indoor areas of a facility must have skylights to provide natural lighting. Any artificial lighting in a facility must be of an intensity that does not threaten the well-being and comfort of the polar bear.

Land: water ratio.

Polar bears are bears first and marine mammals second,[18] so polar bear enclosure design should reflect this. Both the TAG and WSPA guidelines recommend that the ratio of water to land in polar bear enclosures should not exceed 1:3 (Appendix V).

- In 5 of the 29 enclosures (Yokohama Sea Paradise, Adventureworld, Tokuyama Zoo, Hirakawa Zoo and Kumamoto Zoo), the surface area of the pool was larger than the area of dry land in the enclosure.

All of these enclosures were of a very small size to begin with, so the fact that over half of the enclosure is taken up by the pool in each case meant that the dry land area available to the bears was minimal.

Off-exhibit areas.

It is common practice at many captive establishments for animals to spend the vast majority of their time locked in off-exhibit areas or night dens during closing hours. Therefore, the standard of the off-exhibit areas is critical for the overall well-being of the animals. Off-

exhibit areas/night dens are often indoors and usually have a roof to provide shelter.

- For 5 enclosures, at Kobe Oji Zoo, Himeji City Zoo, Tobe Zoo, Kyoto Zoo and Cuddly Dominion, it was possible to view the off-exhibit areas. In every case, these areas were completely barren with concrete floors. There were no soft substrates or bedding materials provided.

- At Cuddly Dominion, the night dens did not have a roof to provide shelter from adverse weather conditions. There was simply a small covered cement 'box' in each, which barely appeared big enough to accommodate the bears.

The off-exhibit areas for polar bears at Japanese captive facilities (those which could be seen) clearly did not fulfill many of the requirements or follow the recommendations stated by the various zoo associations and animal welfare organisations (see Appendices). WSPA guidelines state that dens that are bare, damp and with a concrete floor are not acceptable. They recommend that indoor facilities should be as interesting and hospitable as outdoor quarters with elevated resting platforms and they should allow for entry of natural light. ABWAK guidelines state for indoor accommodation, bears should be able to view beyond their enclosure boundary (Appendix V).

3.2.4 Substrate.

The provision of natural substrates should be considered a fundamental need for polar bears when trying to accommodate for their natural behaviour.

Legislation regarding substrates.

Polar Bear Protection Act, Manitoba.[8]

- The exhibit area must include an area at least 125m^2 that is covered by soil, straw, wood chips or other suitably soft substrate.

Polar bears are well known for their habit of constructing day beds to rest in. A polar bear day bed is a hole about half to one and a half metres deep and from one to two metres wide usually dug in the snow.[25] Wild polar bears have been shown to manipulate a wide range of soft substrates other than snow to build day beds, including lichen and moss, sand, tall grass and kelp.[36] Soft substrate to dig into of significant depth so they can adjust their own body temperature is a basic polar bear need.[18]

All bears, including polar bears, also build nests, sometimes padded with vegetation, before settling down to sleep at night.[14]

Captive bears appreciate the comfort of nesting material.[10] It has been suggested by some that nest building constitutes a behavioural *need* for bears.[16] The term 'need' has been defined by Fraser and Broom (1990) as a deficiency in an animal which can be remedied only by obtaining a particular resource or responding to a particular environmental or bodily stimulus.[52] If the animal is unable to satisfy a need, the consequence, either shortly or eventually, will be poor welfare.[16] Because bears construct nests both in the wild and in captivity, the inability to do so may lead to behavioural frustration as well as physical discomfort.[16]

Concrete.

As a substrate, concrete fails to provide for any species-specific behaviours such as digging or foraging. Lack of suitable substrate for these behaviours is a serious welfare issue as it limits the opportunities available to the bears to be actively involved in activities such as digging. It has been suggested that animals kept in an environment with little or nothing to occupy their time often show abnormal behaviour.[44]

Concrete is also particularly unsuitable substrate for polar bears, a species notorious for pacing, as contact with this hard substrate may lead to abrasions and sores on the polar bears' feet, or footpad ulcerations commonly observed in animals exhibiting stereotypic pacing on concrete surfaces.[5] Another problem with using concrete as a substrate, especially in a tropical climate, is that it radiates heat in hot weather,[16] thus subjecting the bears to extremes of temperature.

The widespread use of concrete flooring is therefore a serious welfare issue for the polar bears housed at Japanese captive facilities.

The provision of natural substrates, either natural ground vegetation or areas of loose natural materials or both, is a common recommendation in the guidelines of zoo associations and animal welfare organisations (Appendix VII).

Past studies have provided evidence of a preference for soft substrates exhibited by polar bears. For example, in one documented case at Dublin Zoo, a polar bear was seen to spend 80% of his time in the sand and bark litter following modification of his enclosure to include areas of these substrates. [10]

The provision of natural substrates such as earth, sand or wood chips can lower the thermal load on animals.[16,53] Natural substrates such as

earth and wood chips are also desirable as substrates in terms of their manipulability and, unlike concrete, do not carry the risk of bears splitting their claws.[16]

In the absence of snow to roll in, captive polar bears also require soft substrates to effectively dry their fur after coming out of the water.[18]

The importance of the provision of natural substrates for polar bears is so crucial that the Polar Bear Protection Act requires that polar bear enclosures contain an area of soft substrate measuring at least 125m^2.[8]

Substrate in polar bear enclosures at Japanese captive facilities.

At the vast majority of Japanese captive facilities, the polar bear enclosures did not accommodate any soft substrate and, in most cases, the flooring was full concrete. Concrete flooring is an inappropriate substrate for any captive wild animal, including bears, and fails to provide for species-specific behaviours (such as foraging or digging) and the construction of day beds.

Nearly all of the facilities did not appear to implement any of the recommendations made by various zoo associations and animal welfare organisations in terms of providing natural and soft substrates for the polar bears (Appendix VII).

The vast majority of bears had only hard concrete flooring to rest on.

- For every polar bear enclosure, concrete was the principal substrate. For the vast majority of polar bear enclosures (25 out of 29 or 86.2%), concrete was the only substrate.

- The vast majority of enclosures (26 out of 29 or 89.7%) did not accommodate any areas of soft substrate.

- Only 1 enclosure, the enclosure at Yokohama Zoo, had any form of natural ground vegetation.

- Only 2 enclosures, found at Oga Aquarium and Yokohama Zoo, appeared to provide soft substrates in which the bears could dig.

- Only at one facility, Oga Aquarium, did the area of soft substrate (in this case woodchip) appear to meet the minimum guidelines set out in the Polar Bear Protection Act, which states that the exhibit area must include an area at least 125m^2 that is covered by soil, straw, wood chips or other suitably soft substrate. The other 28 enclosures did not meet the minimum requirements of the Polar Bear Protection Act in terms of provision of soft substrate.

- At no facility were the polar bears seen to be provided with any soft substrate or materials suitable for nest building.

At many facilities, viewing the polar bears swimming underwater was considered a major attraction for visitors. However, this may in fact be having a detrimental impact on the welfare of the bears as the use of natural substrates may be being avoided for fear that they will be tracked into the pools and obscure underwater viewing and clog filtration systems. This is an example of where the bears' welfare may be being compromised for visitor enjoyment.

The popularity of underwater polar bear viewing may have serious welfare implications.

3.2.5 Shelter/shade.

The provision of shelter is one of the most fundamental requirements of any captive animal enclosure.

All captive animals should have conditions of temperature, humidity, light and ventilation compatible with their biology and behaviour. Conditions of high temperature and humidity can be problematic for all animals. Studies have identified that thermal stress can have a profound impact on health, well-being and longevity of captive animals, particularly large and small species.[16] Many animals, particularly birds and mammals, have the ability to elevate internal heat production when they get cold. However, they have greater difficulty cooling themselves down when they get hot because they can only reduce heat production to a level compatible with continuation of their basic metabolic processes. This may not be sufficient to deal with conditions of high temperature, so captive animals must be given the opportunity to 'thermoregulate' by moving to cooler, more shady areas

such as forest cover, burrows, rock cavities or pools. Shelter from adverse weather conditions such as heavy rain should also be provided.

Shelter provided in polar bear enclosures at Japanese captive facilities.

The vast majority of polar bear enclosures at Japanese captive facilities did not provide sufficient shade from the sun or shelter from adverse weather conditions.

Many of polar bear enclosures at Japanese facilities did not provide the bears with any form of shelter or shade during the day.

- Of the 27 open-air enclosures, 16 did not provide any shade or shelter at all for the bears. A further 4 enclosures did provide some shelter or shade, but this was insufficient for the number of bears in the enclosure.
- Therefore, overall 20 enclosures (74% of enclosures) did not contain sufficient shelter for the polar bears.

In the majority of enclosures there was no shelter or shade provided to offer respite from the sun or rain.

This is an unacceptable situation, especially when the species in question is an Arctic species being housed in a country where temperatures at certain times of the year can reach over 30°C and the average daily temperatures during the summer months are usually over 20°C.

In the vast majority of cases, there was no access to covered off-exhibit areas during opening hours, so the bears could not freely move into such areas to escape the direct heat.

3.2.6 Furniture.

Furniture refers to physical structures within an enclosure that serve to enrich the animals environment, such as climbing frames, giant rocks, mature trees, streams and pools.

As stated by the Secretary of State Standards of Modern Zoo Practice, United Kingdom: "Animals should be provided with space and furniture to allow such exercise or foraging behaviour as is needed for their welfare. Animal enclosures should be equipped, in accordance with the needs of the species, to minimise any abnormal behaviour and to aid and encourage normal behaviour patterns."[54]

Legislation regarding enclosure furniture.

The Polar Bear Protection Act, Manitoba.[8]

- Exhibit area design: The exhibit area must contain structural features such as resting platforms, waterfalls and nesting sites. It must also contain stabilised rocks, tree trunks or similar materials that are redesigned periodically to provide a change in the environment for the polar bear.

The provision of a variety of structural enclosure features for polar bears to utilise is widely recognised to be of great importance for their well-being by zoo associations and animal welfare organisations. Their guidelines recommend a variety of structural features and furniture that should be provided in outdoor bear enclosures for all species (Appendix VIII). Although, unlike other bears, wild polar bears do not climb trees, this does not mean that in a captive situation they would not benefit from the opportunity to climb and explore structures. Polar bears in the wild encounter a wide variety of natural structures to climb such as ice ridges, rocky cliffs and mountainsides.[55,19]

For indoor/off-exhibit accommodation, some of the guidelines recommend the provision of platforms raised from the ground to provide a more complex environment and resting sites.

Furniture in polar bear enclosures in Japanese captive facilities.

None of the polar bear enclosures at Japanese captive facilities provided sufficient furniture for the bears, with many not providing any furniture other than pools. In 4 enclosures, no swimming pool was provided whilst in 1 enclosure the polar bear did not appear to have any access to water at all.

Furniture on dry land.
The vast majority of the polar bear enclosures were barren and lacked complexity.

Most enclosures contained little or no furniture for the bears to utilize.

- 14 of the 29 enclosures (48.3 %) were completely barren with no usable fixtures on land.

- In many of the enclosures, there were no structures for the bears to climb or elevated resting platforms. Many of the enclosures did not contain fixed rocks.

- In the vast majority of the enclosures, there were no natural features such as tree trunks that the bears could exploit or utilise. Tree trunks or logs were provided in only 6 enclosures. (Ueno Zoo, Sapporo Muruyama Zoo, Oga Aquarium, Obihiro Zoo, Yokohama Zoo and Tobe Zoo)

- Only 2 of the 29 enclosures, at Asahiyama Zoo and Yagiyama Zoo, contained trees.

- None of the enclosures contained nesting sites.

- All 5 of the off-exhibit area/ night dens that could be viewed contained no furniture at all.

The majority of enclosures did not follow the recommendations made by various zoo associations and animal welfare organisations in relation to provision of furniture (Appendix VIII).

It was clear that the vast majority of the polar bear enclosures at Japanese facilities did not meet the minimum requirements for structural features provided in enclosures for polar bears stated in the Polar Bear Protection Act.

Swimming/bathing pools.

As polar bears are semi-aquatic mammals a pool large enough for swimming and diving must be considered a basic need.

- In 3 of the enclosures, at Sapporo Muruyama Zoo, Asahiyama Zoo and Tobe Zoo, only a bathing pool was provided which was not large enough for the bear to swim in. A bathing pool (as opposed to a swimming pool) is defined as a small pool or body of water that allows animals to drink, wade or partially submerge.

- At one facility, Kushiro Zoo, one of its polar bear enclosures did not have any pool at all.

Therefore in 4 of the enclosures at Japanese facilities, the polar bears were deprived of the opportunity to swim, even though swimming is a fundamental natural behaviour for this species in the wild.

Many of the swimming pools, where provided, were not large or deep enough to allow for normal swimming movements and/or diving behaviours.

3.2.7 Private areas.

Private areas are extremely important for an animal's welfare and should take precedence over the ability of visitors to constantly view the animals.

Exhibiting animals in a way that does not allow them privacy can result in detrimental physiological and behavioural consequences. The presence of visitors has been shown to have measurable effects on certain aspects of an animal's physical state. For example, a correlated increase in the cortisol levels in captive animals as the number of visitors increases has been documented.[56] Cortisol is a hormone known to be released during times of stress. Being surrounded by a 'faceless'

Legislation regarding private areas.

Polar Bear Protection Act, Manitoba.[8]

- Any window that allows public viewing must be located in a position that allows the polar bear to avoid public viewing if desired.

crowd of unfamiliar and often noisy visitors most likely constitutes a source of stress for the animals.[16]

Animals should also be able to retreat from the view of other animals in the same enclosure. Less dominant animals should not only be able to avoid physical contact with dominant animals, but should be able to remove themselves visually as well. Visual barriers should be provided for polar bears, as bears are not naturally sociable animals.[10]

The provision of private areas for bears to retreat from the public and cage mates is considered an essential enclosure feature for bears by several of the zoo association and animal welfare guidelines (Appendix IX). The Polar Bear Protection Act states that polar bears must be allowed to avoid public viewing if desired.[8]

Facilities that impose inevitably stressful conditions in which animals cannot escape from public view or from each other must be considered inappropriate. As polar bears are by nature solitary animals, the ability for them to escape from cage mates should be considered essential.

Provision of private areas in polar bear enclosures in Japanese captive facilities.

The vast majority of the polar bear enclosures at Japanese captive facilities did not provide sufficient private areas where the bears could adequately retreat from public view or from each other.

- In 27 out of 29 enclosures (93.1%) the polar bears either had no private areas at all, or there were insufficient private areas for all bears.

Therefore most of the polar bears, when they were in the outdoor enclosure and pool, were unable to completely avoid visual, auditory and olfactory exposure to visitors, whose numbers were often great. Only 2 enclosures (at Yokohama Zoo and Tennoji Zoo) provided sufficient private areas.

At many enclosures visitors could view the bears from multiple points around the enclosure, offering little privacy for the bears.

Viewing windows.

In many cases, several visitor viewing areas were situated at many different places around the enclosures, meaning that the bears were subject to viewing from visitors at multiple points around the enclosure.

Underwater viewing windows often meant that the bears could not escape from public view at all.

For enclosures with viewing windows, these windows very often placed in multiple positions, meaning that the bears could be viewed in nearly every area of the enclosure, both on land and in the pool.
At every enclosure with viewing windows, at least one of the windows was situated where visitors could look underwater into the pool, meaning that the bears could not escape from view even when under the water.

- At nearly every enclosure with viewing windows (the only exception being Yokohama Zoo), the windows were not placed in such a way that the bears could escape the view of the public.

That windows should be placed in such a way that bears can escape from public view is a requirement of the Polar Bear Protection Act, therefore all of the facilities with viewing windows at the polar bear enclosures, with the exception of Yokohama Zoo, failed to meet this requirement of the Act.

One enclosure where the bears were subject to particularly intense viewing pressure from visitors was found at Adventureworld, where the bears could be viewed through windows placed all the way around the enclosure at a second floor indoor viewing area and about three quarters of the way around at ground level.

At Asahiyama Zoo, this bear, whose enclosure featured 3 viewing domes, was subject to intense visitor viewing pressure.

Perhaps the most intrusive situation of all was that seen at

Asahiyama Zoo, where in one of the enclosures there were 3 Perspex 'viewing domes' spread throughout the ground where visitors could stand and look into the enclosure, as well as being able to view the bear from nearly the entire perimeter of the enclosure. Such a situation resulted in a complete lack of privacy and no escape from the visitors for the bear.

Ability to escape from other bears in the same enclosure.

- For enclosures where bears were housed in groups of 2 or 3 (either permanently or at certain times of the year), which was the case in 16 enclosures altogether, the bears were completely unable to retreat from each other in all but one enclosure (at Yokohama Zoo).

In several cases when 2 bears were housed together, 1 bear appeared dominant over the other and the subordinate bear was often observed to be trying to avoid the dominant bear but (in all but one case) had nowhere to retreat to. Similarly, in the enclosure with 3 bears (Toyohashi Zoo), the 2 smaller bears appeared to be dominant over the larger bear, who had no effective means of retreat.

3.2.8 Safety.

There were concerns regarding the safety of the bears in some enclosures.

- 12 out of the 29 enclosures (41.4%) contained rusty fixtures or objects which posed a potential health and safety hazard.

- 2 of the enclosures, at Kushiro Zoo and Nihondaira Zoo, had extensively cracked floors which the bears could potentially injure themselves on. One bear at Kushiro Zoo was seen to be taking broken chunks of concrete into his mouth which is a potential heath hazard.

In 1 enclosure, at Yagiyama Zoo, the bear was seen to be tearing off pieces of the rubber window seal with his claws and teeth and ingesting them.
2 of the enclosures, at Sapporo Muruyama Zoo and Asahiyama Zoo, had very steep drops into moats surrounding the enclosures. At Sapporo Muruyama Zoo, the moat was a dry moat whilst the moat at the Asahiyama Zoo enclosure contained water. The cub in the enclosure at Sapporo Muruyama Zoo was seen running around the narrow rim of the

pool right beside the steep drop into the moat. A fall for this cub would in all likelihood prove fatal.

- At 16 enclosures, it was possible for visitors to throw objects into the enclosure, posing a possible safety or health hazard to the bears in the event that dangerous objects or unsuitable foodstuffs were thrown in.
- At 6 enclosures, visitors could potentially climb over barriers and touch bears through the bars of cages.

3.2.9 Noise levels.

In most cases visitors were able to get very close to the bears.

At the vast majority of enclosures, high noise levels were observed. Noise was generated from a variety of sources including visitor voices, visitors banging on windows, music played over loudspeakers and nearby attractions such as amusement park rides. At all facilities, visitors were able to get very close to the bears. High noise levels can result in stress for the bears and certain guidelines recognize that polar bear enclosures in particular should be located in quiet areas.[2]

Overall, polar bear enclosures at Japanese facilities generally failed to reach minimum acceptable standards and provide even the most basic requirements in terms of enclosure design.

3.3 Problems with polar bear husbandry at Japanese captive facilities.

3.3.1 Condition of the polar bear enclosures at Japanese captive facilities.

Many of the enclosures appeared very old and a large number were seen to be in a state of disrepair with stained floors and walls, peeling and worn paintwork and cracked floors.

- Overall, 7 out of the 29 enclosures were categorized as being in a state of disrepair and in need of urgent maintenance work.

- A further 5 enclosures looked very old with apparently no upkeep work having been carried out for a considerable amount of time.

3.3.2 Access to off-exhibit areas.

Providing captive animals with free access to both indoor and outdoor areas may give them more choice and control over their environment.

WSPA recommends that bears shall be allowed free movement indoors and outdoors at all times and that polar bears shall have free access to dens at all times.[2]

Legislation regarding access to off-exhibit areas.

Polar Bear Protection Act, Manitoba.[8]

- The Polar Bear Protection Act, Manitoba, requires that polar bears must be allowed to move freely between the exhibit area and the off-exhibit area at all times.[8]

Access to indoor areas for polar bears at Japanese captive facilities.

At most of the Japanese captive facilities, the polar bears were denied access to the indoor areas/ night dens throughout the day.

- In 23 enclosures the doors to the night dens were closed throughout the day, meaning the polar bears had no access to off-exhibit areas.

Therefore, the facilities with these enclosures failed to meet the requirements of the Polar Bear Protection Act, which states that polar bears must be allowed to move freely between the exhibit area and the off-exhibit area at all times.[8]

One polar bear, at Hirakawa Zoo, was seen to be locked into the off-exhibit area at 1400 and was not let out again for the rest of the day. If this occurs on a daily basis it would constitute a serious welfare concern for the bear as being locked into an off-exhibit area for the majority of the day is likely to be detrimental to the bear's well-being.

3.3.3 Provision of clean drinking water.

The provision of a clean, safe source of drinking water should be considered an essential and basic requirement for any captive animal.

- However, in 28 out of 29 polar bear enclosures at Japanese facilities, no source of drinking water other than the water in the pools appeared to be provided.

Only one facility, Oga Aquarium, appeared to provide a separate source of drinking water in a trough.

The water in swimming or bathing pools cannot be considered as a suitable and hygienic source of drinking water as it is not clean due to the fact that the bears bathe in it. In addition, on many occasions, the bears were seen to urinate and defaecate in the pools. Several times, the polar bears were seen drinking water from pools that they had urinated and defaecated in.

Lack of a suitable and hygienic supply of drinking water was therefore a concern for the polar bears at the vast majority of Japanese facilities.

3.3.4 Feeding routines and methods.

In the wild, polar bears are active hunters and forage feeders. They are continually searching for opportunities to hunt seals, walruses and to find supplementary food sources such as carrion. Some populations are also known to eat berries, eggs and kelp during the times they inhabit terrestrial environments.

In a captive situation, it is not practical to provide polar bears with seals or walruses to hunt. However, there are certain feeding methods that are generally recognised to be the most beneficial to their welfare.

International bear husbandry standards (e.g., EEP, AZA) emphasize the importance of feeding bears at least 3 times during the day.[16] In captive situations it seems that bears benefit if their food expectations are met promptly, as early in the morning as possible, to alleviate the stress associated with the anticipation of food.[36] Random scatter feeding and modification of feeding techniques may prove beneficial for polar bears.[38] However, it must be noted that scatter feeding on bare concrete surfaces only has a limited value as an enrichment technique. For scatter feeding to really keep the bears occupied, the food should be scattered throughout areas of natural substrates.

Legislation regarding feeding methods.

Polar Bear Protection Act, Manitoba.[8]

- The Polar Bear Protection Act, Manitoba, requires that those keeping polar bears must ensure that the regular feeding schedule is supplemented by irregularly timed and located feedings involving foods not normally served.[8]

The recommendations by the various zoo associations and animal welfare groups are in general agreement about the importance of using a variety of methods of food delivery (Appendix XI). Feeding methods that allow for extensive foraging, natural manipulation, and processing including scatter feeding, hiding food and burying food in soft substrates are widely recommended. Some of the guidelines suggest giving the bears some of their food at irregular times of the day. The UFAW and WSPA guidelines both recommend feeding the main meal early in the morning. Some guidelines suggest that polar bears benefit from food that floats.

Feeding methods for polar bears at Japanese captive facilities.

The feeding methods apparently employed by some Japanese captive animal facilities may not be in the best interests of the polar bears.

At many of the facilities it was evident (through observations and informational signs) that the bears were fed the bulk of their daily food in one main meal in the evening inside their indoor cages. At some facilities there were signs stating that the bear/s were fed at the same time each day (usually in the evening), sometimes accompanied by descriptions of the food they were given or photographs. Only at 3 facilities, Ueno Zoo, Obihiro Zoo and Oga Aquarium, were the bear/s

given a substantial amount of varied food (constituting a 'meal') during opening hours.

The method of feeding one main meal a day in the evening may lead to stress, as the bears are anticipating their food all day. This also constitutes a predictable, dull feeding routine. As a result, the amount of time spent feeding is likely to be short, offers few challenges and requires little, if any, foraging effort.

At the vast majority of facilities, there was little evidence of any scatter feeding or any other type of feeding enrichment methods being employed in the outdoor enclosures. In most cases, there did not appear to be anywhere in the outdoor enclosures where food could be hidden or buried to make feeding times more interesting. Only at 2 facilities, Obihiro Zoo and Oga Aquarium, was scatter feeding and the hiding of food around the enclosure seen to be employed as a feeding technique. At all other facilities, at no time were the bears seen to be foraging for food and the floors of the enclosures were always free of food suggesting the absence of any scatter feeding. In no enclosure was there any sign that food was available adlib.

Therefore, many of the Japanese captive facilities did not appear to follow the guidelines set out by various zoo associations and animal welfare organisations relating to methods of food delivery (Appendix XI).

Many of the Japanese facilities did not appear to meet the requirements of the Polar Bear Protection Act in relation to food delivery.

3.3.5 Enrichment programme.

In the wild, polar bears display a compelling curiosity about anything that enters their environment[20,57] and will manipulate objects and substrates in their environment.[58,59] This type of behaviour occurs during hunting and foraging routines and also during the construction of dens and daybeds.[36] Therefore, bears which are denied such behavioural opportunities could be considered disadvantaged.[36] It seems likely that polar bears have an intrinsic ability and motivation to manipulate objects and support for this theory comes from studies which have shown that captive polar bears do manipulate objects regardless of season, sex and age.[36]

It is therefore clear that polar bears are intelligent, inquisitive animals who need constant stimulation. It has been suggested that the investigative and exploratory foraging styles of opportunistic feeders,

such as bears, renders them particularly prone to frustration in environmentally-impoverished captive environments.[42] The potential of a species for manipulation and object-related activity appears to be an indicator of behavioural and psychological needs in captivity.[60,61]

Providing novel items for stimulation is vital to the well-being of any animal.

Environmental enrichment is a technique for improving the environment and/or enclosures of captive animals by increasing their behavioural opportunities.[62] The aim of environmental enrichment is to provide an environment in which captive animals behave as closely as possible to their wild counterpart.[63]

However, it must be remembered that while enrichment is a positive and required addition to any polar bear management programme, it also shows that there are inherent deficiencies in the bear's captive environment. After all, natural environments don't need to be enriched because they are already complex and interesting.

Enrichment may include furniture, but can also comprise non-fixed items such as logs, branches and scratching posts. Many animals can also benefit from auditory and olfactory stimuli (the introduction of new scents and odours has been a successful method of stimulation for several bear species.[44]) Ice snacks consisting of fruits, meats etc. frozen in a bucket of water have been seen to keep polar bears occupied.[38]

Environmental enrichment influences the physical, mental and social well-being of captive animals, frequently resulting in beneficial effects on overall animal health.[26] Appropriately planned and implemented environmental enrichment programmes can contribute to improved animal health through creating opportunities for the animal to exert some form of control over its environment.[26]

Environmental enrichment should be viewed as an integral part of an active, preventative, veterinary medicine programme[26] and should not be considered as an optional feature of wild animal husbandry; it should be regarded as a necessity.

Legislation regarding behavioural enrichment.

Polar Bear Protection Act, Manitoba.[8]

- The Polar Bear Protection Act, Manitoba, requires that those establishments holding polar bears must establish a written behavioural enrichment programme designed to stimulate and encourage natural behaviour in the polar bear. [8]

At a workshop on the Behavioural Needs of Bears in Captivity, held as part of the First European Conference on the Status, Conservation and Welfare of Bears in Captivity in 1991, it was stressed that, because of the animals' high level of intelligence, novel objects and situations that keep the bears alert and their behaviour flexible should be provided.[64] Sensory stimuli, including olfactory stimulation and a soft environment, were considered a priority.[64]

The guidelines written by zoo associations and animal welfare organisations all stress the importance of behavioural enrichment programmes and give detailed information about various enrichment techniques that should be used for bears (Appendix X). It is frequently emphasized that behavioural enrichment is only effective if stimuli/objects are frequently changed. All the guidelines stress the importance of using a variety of objects and stimuli and strongly recommend using feeding enrichment techniques. The ABWAK and WSPA guidelines recommend that at least 10 objects should be available to polar bears at all times.

The provision of enclosure furniture, natural substrates and varied feeding techniques as forms of enrichment have been discussed previously. This section will deal with the concept of an environmental enrichment programme employing other behavioural enrichment techniques involving non-fixed items and other stimuli.

Enrichment for the polar bears at Japanese captive facilities.

In general, although some enrichment activities and devices were provided for some polar bears at some Japanese captive facilities, in the majority of cases the enrichment programme in place was wholly inadequate and of limited benefit to the bears. At many of the facilities there was no meaningful enrichment programme in place for the polar bears whatsoever.

2 facilities, Oga Aquarium and Yokohama Sea Paradise, did appear to recognise the importance of environmental enrichment as evidenced by signs describing the enrichment measures in place.

Enrichment objects for play and manipulation.

Enrichment objects were defined as inedible, movable objects for play and manipulation that the bears could manipulate and which could be moved around by the keepers.

Number.

- 12 of the 29 enclosures did not contain any enrichment objects.

- Of the 17 enclosures with some objects provided, 10 contained only 1 or 2 items, a completely inadequate quantity that would provide little, if any stimulation to the animals. Overall, only 4 out of the 29 enclosures contained more than 6 enrichment items.

The vast majority of the captive establishments therefore failed to meet the recommendations of the ABWAK and WSPA guidelines which both recommend that at least 10 objects should be available to polar bears at all times. Only 2 enclosures, at Obihiro Zoo and Oga Aquarium, contained more than 10 objects for play and manipulation. However, at Obihiro Zoo only logs were provided, therefore there was no variety. Therefore, only 1 establishment, Oga Aquarium, provided over 10 varied enrichment objects for its polar bear.

Many of the enrichment objects present in enclosures appeared well- chewed and worn, indicating they had been in the enclosures for some time without being replaced.

Many bears showed no interest in the few enrichment items they were provided with, indicating that they were already bored with them and they had ceased to be enriching.

At many facilities, the only play objects available to the bears were plastic buoys.

Variety.

Of the 17 enclosures that did have some objects for play and manipulation, 7 enclosures only had plastic buoys. In some cases where there was more than one buoy, the buoys were the same size and shape. Therefore there was little or no variety in the objects provided in many cases.

In the vast majority of cases, enrichment items were limited to buoys and logs. Other items occasionally used included tires and plastic containers.

Overall, where enrichment objects were provided there was usually very little variety in type of object, size or shape.

Day to day enrichment activities.

At many of the captive facilities, there was no evidence of a day-to-day enrichment programme in the form of provision of feedings or the introduction of novel objects.

Enrichment feedings.

Enrichment feedings were defined as when food which was additional to the bears' main meal/s was thrown into the enclosure by a keeper. This included the provision of ice blocks, with or without food frozen inside.

Enrichment feedings can be employed as a form of behavioural enrichment, occupying the bears at certain times throughout the day. To truly be considered a form of enrichment, the feedings should occur at irregular times every day so that they simply do not become routine.

- At 13 of the 29 enclosures, the bears were not given any food at all during the course of the day.

- Of the 16 enclosures where enrichment feedings did occur, the bears in 6 of the enclosures received only one feeding.

- The bears in a further 6 enclosures received only 2 feedings.

- Only at 4 enclosures were there seen to be 3 or more enrichment feedings throughout the day.

In some cases the food provided for the bears during the enrichment feedings was wholly inadequate. In some instances only one piece of food such a single apple or egg was thrown into the enclosure which usually contained 2 bears. This was seen at Hirakawa Zoo, Higashiyama Zoo, Tennoji Zoo, Himeji City Zoo and Tokuyama Zoo. In such cases, the dominant individual took all the food.

In many cases the food lacked variety. For instance, in cases where the feedings occurred along with a keeper commentary, at Asahiyama Zoo,

Yokohama Sea Paradise and Toyuhashi Zoo, the bears were fed small pieces of dead fish or small pieces of meat at every feeding. At these 3 facilities, the feedings were advertised as occurring at the same time each day. Therefore, their value as an enrichment tool is severely limited as the feedings simply become yet another routine for the bears.

Feedings appeared to encourage begging behaviour from some of the bears.

In some cases, the feedings appeared to encourage 'begging' behaviour by the bears. Bears were seen begging for food at Tokuyama Zoo and Yokohama Sea Paradise. Such begging displays serve only to reinforce the wrong attitude that bears are subservient animals who are dependent on humans.

At 8 enclosures the bears were given ice blocks as a form of enrichment and in 4 cases the ice blocks had food frozen inside. The plain ice blocks did not always receive much attention but the ice blocks with the food frozen inside were very popular with the bears and kept them occupied for some time.

At Ueno Zoo, the bears received frozen meat on the bone which was seen to keep them occupied for a considerable amount of time.

In nearly all cases, except in the case of food frozen in ice blocks and the frozen meat on the bone, the food items given during feedings were eaten within a very short time by the bears, therefore did not occupy the bears for significant periods of time which is what an enrichment activity should aim to do.

At one facility, Kobe Oji Zoo, there was a sign advertising a date and time when ice blocks would be given to the polar bears. This indicated that ice block feeding occurred on an infrequent basis and was considered a 'special occasion' rather than being part of a frequent enrichment routine.

- In all enclosures (except at Ueno Zoo), no feeding enrichment devices were apparent.

At Ueno Zoo, there was a metal bucket with the bottom removed suspended over the pool. An ice block containing apples was placed in

the bucket. When the ice melted, the apples fell into the pool. This offered an unpredictable method of delivering food and the bears were seen to anticipate the food falling in which kept them somewhat occupied.

Overall, the best enrichment programme was seen at Ueno Zoo. As well as the device mentioned previously, various foods were given 3 times throughout the day. At one feeding, food was frozen in ice blocks and another time frozen meat on the bone was given. Apart from Ueno Zoo, no other establishment appeared to have a meaningful enrichment programme.
Oga aquarium also appeared to make an effort with its feeding enrichment techniques for the polar bear there. Peanut butter was smeared onto holes in the wall and on logs and used to stick biscuits on the wall. Whilst this did keep the bear occupied for a time, it only occurred once in the day.

The vast majority of facilities did not appear to follow many of the recommendations for provision of enrichment programmes for polar bears as stated in the guidelines of various zoo associations and animal welfare organisations (Appendix X)

The majority of Japanese facilities appeared not to meet the requirement of the Polar Bear Protection Act regarding provision of enrichment which states that those establishments holding polar bears must establish a behavioural enrichment programme designed to stimulate and encourage natural behaviour in the polar bear.

3.3.6 Hygiene.

Enclosure floors.

Overall, the floors of most of the polar bear enclosures at Japanese captive facilities were fairly clean and free of significant amounts of faeces and old food. Only 1 enclosure (at Nihondaira Zoo) had significant amounts of faeces/urine on the enclosure floor.

However, there were some areas of concern regarding hygiene standards in the polar bear enclosures at Japanese captive facilities.

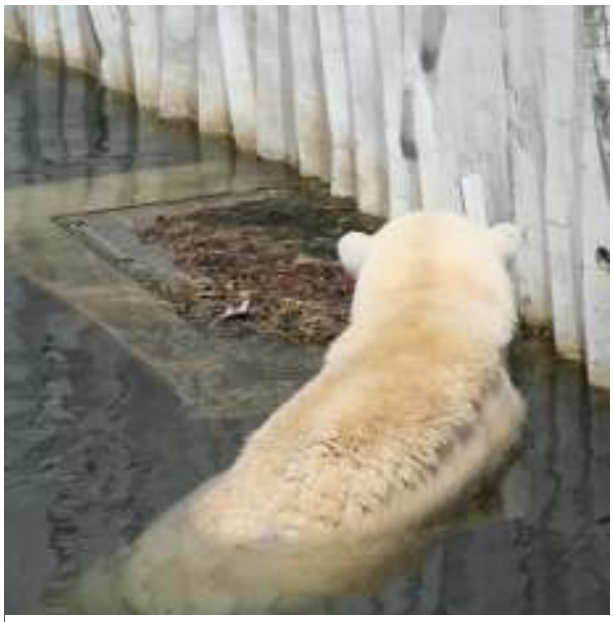
- 4 enclosures (at Kushiro Zoo, Yokohama Sea Paradise, Himeji City Zoo and Tokushima Zoo) had uneven floors resulting in pools of stagnant water on the enclosure floor.

- In 4 enclosures (at Himeji City Zoo, Tokushima Zoo, Tobe Zoo, Cuddly Dominion) a significant amount of algal growth on the enclosure floor was observed.

Another great hygiene concern was that in the majority of enclosures there appeared to be no drainage system in place for removal of water being used to clean the dry land area of the enclosure. In 18 enclosures altogether, it seemed likely that any waste water from spraying the enclosure would make its way into the swimming pool, which was usually situated at the base of or side of enclosures. The situation was particularly severe for the enclosures at Cuddly Dominion, Hirakawa Zoo and Nihondaira Zoo where, in all cases, the dry areas were extremely small and sloping into the pool making it inevitable that waste water sprayed in those areas would run into the pools. Similarly, at Tokuyama Zoo where the polar bear enclosure contained only an extremely small piece of dry land overhanging a pool, it was hard to see how the enclosure could be cleaned without the contaminated water running into the pool.

Pool water.

- In 11 enclosures, the water in the swimming/bathing pools was considered dirty; either green or brown from algal growth or containing debris.



Some pools and moats contained unhygienic water, such as this one at Higashiyama Zoo.

The condition of the water was of particular concern at enclosures at Nihondaira Zoo, Higashiyama Zoo, Kyoto Zoo, Himeji City Zoo and Cuddly Dominion. In addition, the bears at Higashiyama Zoo also had access to a moat at the front of the enclosure which contained filthy, stagnant water. The bears were seen to swim in this water and drink it. There were also drains at the sides of this moat which were filled with rotting leaves and pieces of food. The bears were seen to eat this waste.

Therefore, access to unhygienic drinking and bathing water was a major concern at several facilities.

3.3.7 Social groupings.

At many of the facilities the polar bears were kept in male/female pairs, a social grouping not generally found in the wild except during their brief period of courtship. In several cases, one bear appeared to exert dominance over the other and monopolise resources such as food, pools or shaded areas. In many instances where 2 bears were housed together, little interaction between the bears was observed, sometimes none at all.

In one case, at Toyohashi Zoo, there were 3 polar bears housed in a single enclosure. 2 of the bears were observed to exert dominance together over the other bear.

3.3.8 Overcrowding.

Many of the enclosures simply were not large enough to house the number of polar bears they contained.

- At Hirakawa Zoo, Tokuyama Zoo, Yokohama Sea Paradise, Himeji City Zoo and Cuddly Dominion the polar bear enclosures all housed 2 polar bears, despite the fact that they were extremely small.

The enclosure at Toyohashi Zoo was not big enough to accommodate 3 bears.

- In the case of Tokuyama Zoo and Hirakawa Zoo, the dry land areas were so small the bears could barely walk past each other in places.

- At Toyohashi Zoo there were 3 adult polar bears kept in an enclosure with very limited dry land area, resulting in severe overcrowding.

It was also sometimes the case that a facility had more polar bears than it could adequately house. For instance, at Sapporo Muruyama Zoo the adult male bear (Denari) was being kept in a small, totally unsuitable cage because he needed to be kept apart from the female and cub. Placing a bear in a small inadequate enclosure for this reason for any length of time is unacceptable and the zoo should instead have made

sure it could adequately house all its polar bears before engaging in any breeding programmes. At Kushiro Zoo, the young male bear (Tsuyoshi) was only in the main enclosure for 2 hours in the morning, them spent the rest of the day in a very small, unsuitable cage because the other enclosure was needed for 2 other polar bears. Kushiro Zoo only acquired Tsuyoshi in recent years (he was born in December 2003) and the zoo should have made sure they had adequate facilities to house him before acquiring him.

Overall, Japanese captive facilities generally failed to reach minimum acceptable standards and fulfill even the most basic requirements in terms of polar bear husbandry practices.

3.4 Physical signs of stress/ physical condition of the polar bears at Japanese captive facilities.

Many of the polar bears at Japanese captive facilities were seen to exhibit abnormalities in their body condition and physical appearance.

3.4.1 Body condition of bears at Japanese captive facilities.

- Several of the polar bears, 21 in total, appeared to be of abnormal weight. 15 of the bears were considered to be overweight whilst 6 bears were considered underweight.

The most overweight bears were individuals were seen at Kushiro Zoo (the two bears housed together), Kobe Oji Zoo (the smaller bear), Tokuyama Zoo (the smaller bear) and Cuddly Dominion (both bears).

Overweight bear at Cuddly Dominion.

The most severely underweight bears were both the bears at Adventureworld, Pinky the bear at Nihondaira and the larger of the two bears at Hamamatsu Zoo.

Underweight bear at Adventureworld.

3.4.2 Minimal lean body mass.[18]

Healthy polar bears carry hundreds of pounds of fat firmly attached to the muscle tissue. However, captive polar bears may exhibit minimal lean body mass i.e. are lacking muscle, which is a common problem in captivity for both males and females. In the wild, healthy adult male polar bears do not have visible necks due to a massive build up of muscle tissue from their shoulders to the base of their heads. In males, insufficient lean body mass can be diagnosed by the obvious appearance of the neck. When a female polar bear with insufficient lean body mass stands up, all of her fat falls down to her hips and she takes on the classic 'pear shape' and can be described as a "pear bear".

Captive female bear with a classic 'pear-shaped' body which is typical for captive bears who have lost a lot of lean muscle mass.

Healthy polar bears are extremely muscular.

Generally, the polar bears at Japanese captive facilities appeared to be lacking in muscle build, probably as a direct result of lack of

exercise and inappropriate diet. All of the male bears and larger bears who were thought to be males did have obvious necks, therefore exhibited signs of insufficient lean body mass. Many of the females and the smaller bears thought to be females fitted the description of the "pear bear", therefore could be diagnosed as having insufficient lean body mass.

3.4.3 Condition of fur.

This bear at Hirakawa Zoo exhibited severe fur loss.

Many of the polar bears exhibited some degree of fur loss.

- In total, 12 of the 46 bears had bald patches on their bodies. A further 4 bears exhibited thinning fur over their bodies.

Severe fur loss is most often stress-related and long-term stress may play a role in the fur loss.[18] The high temperatures and humidity that the bears were frequently exposed to during the summer months could also be a contributing factor to the bears shedding fur.

Many of the bears had bald patches on their heads only. This could indicate abnormal and excessive rubbing behaviours e.g. repeatedly rubbing their heads on metal bears.
One bear at Hirakawa Zoo (the smaller bear) exhibited severe fur loss with pink lesions on the shoulders and sides and severe scratching behaviour.

- 7 of the bears had dirty and/or matted fur, suggesting that they were unable to groom themselves properly.

In the wild polar bears roll in the snow to groom themselves, but this possibility is not available to polar bears in Japan during the summer months. Therefore dirty fur could be a result of the bears not being able to groom themselves properly. Dirty fur could also be indicative of hygiene problems in the enclosure (outdoor or indoor).

Overall, many polar bears at Japanese facilities exhibited abnormalities in body condition.

3.5 Summary.

1. There were substantial problems with and major inadequacies with regard to enclosure design and husbandry for the polar bears at every Japanese captive facility inspected which severely compromised the welfare of the polar bears. However, there were variations in the severity of the problems between the establishments.

2. Lack of space was a widespread problem for this wide-ranging species. Many enclosures provided extremely small and wholly inappropriate living conditions for polar bears.

3. Lack of soft substrate and lack of private areas were evident in nearly every enclosure.

4. Lack of shelter, insufficient furniture, no access to off-exhibit areas and few or no objects for play and manipulation were all common problems.

5. The facilities deemed to have the most serious problems with their polar bear enclosure sizes and designs were Adventureworld, Cuddly Dominion, Hirakawa Zoo, Kushiro Zoo (smallest enclosure), Sapporo Muruyama Zoo (smallest enclosure), Tokuyama Zoo and Yokohama Sea Paradise.

6. A lack of sufficient enrichment programming was encountered at every facility, except for Ueno Zoo.

7. Inappropriate social groupings for the polar bears was a common problem.

8. There were some hygiene problems, especially regarding cleanliness of pool water.

9. Another major problem was the apparent lack of clean drinking water supply in all but one enclosure.

In general, the Japanese facilities did not follow the recommendations made by various zoo associations and animal welfare groups in terms of enclosure design and husbandry practices for polar bears, and this ultimately meant that the welfare of the bears was being compromised.

- Overall, the majority of polar bear enclosures at Japanese captive facilities failed to satisfy the minimum standards for all the key criteria for enclosure design and husbandry identified in the Polar Bear Protection Act.

- Not one of the facilities met all of the minimum enclosure and husbandry requirements for polar bears stated in the Polar Bear Protection Act.

CHAPTER 4
BEHAVIOURAL EFFECTS OF CAPTIVITY FOR POLAR BEARS

At every Japanese facility, polar bears were observed displaying abnormal behaviours, predominantly stereotypic behaviours. These abnormal behaviours were a clear indication that the welfare of the polar bears had been compromised.

Very few of the bears were seen to engage in 'normal' or natural behaviours such as foraging or random swimming. In general, with very few exceptions, the bears were observed stereotyping or were inactive.

4.1 Stereotypic behaviour.

At the Japanese facilities, many of the polar bears were observed displaying various abnormal stereotypic behaviours. A description of each behaviour is shown in the following table (Table 1)

Table 1. Abnormal stereotypic behaviours displayed by polar bears at Japanese captive facilities.

Activities	Definition
Head weaving	The moving of the head from side to side in a repetitive motion.
Neck turning	When an animal throws its head back in a violent circular motion, sometimes during a change of direction during pacing/walking about the cage, but may occur from a stationary position as the animal resumes forward movement.
Pacing	The constant motion of an animal between 2 or more points in an enclosure in a repetitive manner.
Stereotypic swimming	A constant swimming pattern between 2 or more points within a pool in which movements are repetitive.

The most commonly seen behaviours were pacing and pacing incorporating neck turning.

Pacing and neck turning stereotypic behaviours were the most commonly observed forms of abnormal behaviour.

In total, 33 bears displayed some form of stereotypic behaviour.

- 20 bears displayed pacing behaviour.
- 7 bears exhibited pacing behaviour accompanied by neck turning.
- 4 bears engaged in stereotypic swimming behaviours whilst a further 2 bears displayed stereotypic swimming behaviour incorporating neck turning behaviour.
- 5 bears were seen to display neck turning behaviour from a stationary position, the behaviour occurring alone.
- 2 bears exhibited head weaving behaviour.

In all cases where stereotypic behaviour was observed, it was seen to occur for significant periods of time.

Indeed, during the observation period, some bears spent almost the entire time engaged in stereotypies:

- At Sapporo Muruyama Zoo, Denari (the adult male) spent most of the day pacing from the back to the front of his small cage.
- At Asahiyama Zoo, the largest bear spent nearly all day engaged in pacing and neck turning behaviour.
- Tsuyoshi, a male at Kushiro Zoo, repeatedly paced the length of his cage, performing a classic neck turning maneuver whenever he changed direction.
- Pinky, the bear at Nihondaira Zoo, was seen to spend nearly the whole day pacing the same route in her enclosure.
- At Obihiro Zoo, Satsuki the bear spent most of her day pacing the same route accompanied by neck turning behaviour.
- At Yagiyama Zoo, the bear in the smaller enclosure spent the whole day either pacing the dry area or swimming in a stereotypic fashion, accompanied by neck turns.

- At Kumamoto Zoo, Mickey the bear spent most of the day pacing or swimming stereotypically, also with neck turning behaviours.

Stereotypic swimming was a frequently observed abnormal behaviour.

Stereotypic behaviours were widely displayed by polar bears at Japanese facilities and, in most cases, were severe in intensity and bout duration.

Discussion.

Stereotypic behaviours are repeatedly performed, relatively invariant movement patterns with no apparent function or goal.[61] These behaviours are clearly an indication of an abnormal animal-environment interaction.[7] For most wild mammals in captivity, this probably means that the animal grew up in or is currently living in an environment suboptimal for meeting its natural, species-specific behavioural needs.[7] These stereotypic behaviours are almost unique to captive animals. [59]

Stereotypies in captive animals have been associated with poor welfare for 5 decades.[8] This is because they tend to develop in situations that have been identified as stressful and aversive.[7,62] On the basis of behavioural and physiological evidence such situations include lack of stimulation, unavoidable fear or frustration[63] and absence of a resource, or resources, required by the animal.[64] Such resource requirements can range from access to more space, a more complex, quieter or more interesting environment, food, social and sexual partners, or ability to perform certain behaviours.

Bears generally have large home ranges in the wild. These species that are wide-ranging and opportunistic might be expected to have a greater tendency to develop certain atypical behaviours such as stereotypic pacing. Bears and small carnivores are particularly sensitive to "motor restraint by lack of space" .[8]

The expression of stereotypic behaviour is "the most common visible sign of psychological disorder in all species of zoo bears". [9]

4.2 Excessive Inactivity.

Many of the bears spent a large proportion of their time inactive. This is likely due in part to the extremely hot ambient temperatures that they were exposed to during the course of this investigation. However, the uninteresting living conditions and lack of stimulation was likely to be an important contributing factor too and excessive inactivity in zoo animals is also one of the recognized signs of chronic stress.

Many bears exhibited long periods of inactivity.

- 10 polar bears were classed as chronically inactive, meaning they barely moved at all during the course of the day.

Some bears lay inactive on the land, whilst others lay motionless in pools for hours on end.

Chronic inactivity was exhibited by the 2 bears housed together at Asahiyama Zoo, the 2 smallest bears at Kushiro Zoo, the largest bear at Yokohama Sea Paradise, the smallest bear at Kobe Oji Zoo, the largest bear at Tokushima Zoo, the largest bear at Tokuyama Zoo and both bears at Cuddly Dominion.

Furthermore, many of the bears who exhibited stereotypic behaviours for some of the time were observed to be inactive for the rest of the time.

Abnormally long periods of inactivity were exhibited by the vast majority of polar bears at Japanese facilities. Furthermore, some bears were classed as 'chronically inactive.'

Discussion.

Excessive inactivity in zoo animals is one of the recognised signs of chronic stress.[7] Animals housed in a barren environment show an overall decrease in interaction with the environment.[55] This decrease in interaction results in a high level of inactivity. The lack of sufficient space, climbing structures, manipulable objects, enrichment and proper feeding husbandry all contribute to this lack of activity and the resulting boredom of the bears. Broom and Johnson (1993) emphasise that a "profound lack of stimulation is something to which no vertebrate is likely to adapt".[56]

Whether in the wild or in captivity, every living organism is affected by the environment in which it lives.[8] Individuals have to constantly adapt to the changing environment. However, some environmental stimuli are so intense, prolonged or frequent that adaptation is impossible[56] and this result in an increased level of stress in the animals. This can be manifested in a variety of ways, including changes in the animal's behaviour.

Following initial exposure to a stressful stimulus, the general emergency response is initiated, but once control over the situation is not achieved, two distinct coping mechanisms become activated in both humans and non-human animals.[57] They are referred to as active and passive chronic stress response.[8]

The active chronic stress response is characterized by active attempts to control a situation by fighting or fleeing. The passive chronic stress response is initiated after active strategies have failed to resolve the problem.[8] It is characterized by increased pituitary-adrenocortical activity, immobility and indications of depression.[8] It is also characterized by the behavioural response termed 'learned helplessness'.[58] This involves the shift of the behaviour of the animals from an active state into a more passive, inactive state.

4.3 Other abnormal behaviours.

One bear, the smallest bear at Kobe Oji Zoo, was seen to engage in copraphagia, i.e. the eating of excrement. This is widely recognized as an abnormal behaviour in captive animals.

4.4 Summary.

1. Based on the clear evidence that behavioural abnormalities were being displayed by every bear at every Japanese captive facility, the welfare of the polar bears at these facilities appears to have been severely compromised.

2. The high levels of inactivity displayed by the majority of the bears and the high incidences of abnormal stereotypic behaviours were a clear indication that the living conditions for polar bears at Japanese captive facilities, as documented during the course of this investigation, failed to meet the species-specific needs of the bears.

3. These behavioural problems were likely, in part, to be a result of the inadequacies in enclosure design and husbandry discussed in Chapter 3. They were also likely to be due to the nature of polar bears, i.e. that they are wide-ranging Arctic animals, notorious for faring poorly in captivity.

CHAPTER 5
ANALYSIS OF THE EDUCATIONAL BENEFIT

5.1 Educational value of captive polar bears at Japanese captive facilities.

At the majority of Japanese captive facilities, the amount of time spent by visitors at the polar bear enclosures was brief and only a small proportion of visitors looked at the informational signs.

5.1.1 Time spent at the polar bear exhibit by visitors.

Overall, the average time spent at polar bear enclosures, with a few exceptions, was very brief.

- The average time spent looking at the polar bears was 84.5 seconds.

The average time visitors spent looking at the polar bears ranged from 21.8 seconds (Hamamatsu Zoo) to 385.3 seconds (Asahiyama Zoo).

- At 19 facilities, the visitors spent, on average, less than 2 minutes observing the polar bears. At 8 of these facilities, the average time spent at the polar bear enclosure was less than 1 minute.

5.1.2 Number of visitors who looked at informational signs.

Overall, very few visitors looked at the informational signs provided at polar bear exhibits.

- The average number of visitors who looked at the informational signs about the polar bears was 6.9% (Asahiyama Zoo excluded).

The proportion of visitors who looked at the informational signs varied from 0% (Tobe Zoo and Hamamatsu Zoo) to 34.8% (Oga Aquarium).

- At 19 facilities, less than 10% visitors were observed to look at the informational signs. At 9 of these facilities, less than 5% of visitors looked at the signs.

- At 2 facilities, not a single visitor was seen to look at the signs.

[Note: Information on number of visitors who read the informational signs was collected at every facility except for Asahiyama Zoo, where technical difficulties did not allow us to accurately record whether or not visitors read any of the information signs. This was because there were many signs inside an indoor polar bear educational centre and it was not possible for the researchers to follow visitors into this area.]

In addition to the informational signs, at many zoos there were boxes containing speakers which provided a commentary about polar bears for a small fee. Not one visitor was seen to use one of these commentary boxes.

At Adventureworld, brochures with information about polar bears were provided for visitors. During the course of our survey, not one visitor was seen to take a brochure.

5.1.3 Informational sign content.

In the vast majority of cases, the information provided by informational signs was very basic, and therefore the potential educational value of such information was negligible. In some cases, the signs were obscurely placed making it unlikely that they would be read.
However, a few facilities, notably Asahiyma Zoo and Oga Aquarium, did appear to have made an effort with their educational signs and displays at the polar bear exhibits.

5.2 Summary.

1. In most cases, the educational value of the polar bear exhibits at Japanese facilities was negligible. For the most part, visitors ignored the information provided on the signboards and spent only a very short time at the polar bear exhibit/s.

2. It is doubtful that there is any legitimate educational benefit to having polar bears at Japanese captive facilities. The fact that the bears were, in all instances, displayed in an entirely artificial context, the short amount of time visitors spent at the enclosures and the visitors' apparent limited interest in the signs combined to make the polar bear exhibits appear educationally redundant overall.

3. It is also necessary to note that at one facility, Yokohama Sea Paradise, one of the bears was encouraged to 'wave' and catch food with their paws during a feeding session, for which he/she was rewarded with a piece of food. This type of display of unnatural

behaviours is undoubtedly counterproductive in terms of education and gives a very misleading impression of polar bear behaviour. The display of unnatural behaviours by any of the polar bears at any facility should be discouraged.

CHAPTER 6
HEAT STRESS FACED BY POLAR BEARS IN UNSUITABLE CLIMATES

Polar bears are highly adapted to life in the Arctic with their fur, tough hide and blubber layer providing excellent insulation against the cold.[19]For polar bears, the negative aspect of being so well insulated is that they overheat quickly, even in the Arctic.[19] Any temperature above freezing is warm to a polar bear; at 21.1°C polar bears can become severely heat-stressed.[20]

The majority of the polar bears at Japanese captive facilities were housed in open-air enclosures, many with little or no shelter from the intense sun. For a species that becomes severely heat stressed at 21.1°C,[20] there were obviously going to be welfare concerns in subjecting polar bears to much higher daily temperatures (sometimes over 30°C) which were experienced on most days during the course of this investigation in Japan.

The majority of the polar bears had to endure high temperatures, most with little or no shade provided in their enclosures.

There were very few ways to cool down provided for the bears in the open-air enclosures; the only limited relief from the heat was provided by the ice blocks given to some bears at a few facilities and the small pile of ice provided for the bear at Oga aquarium.

Findings of the investigation into the welfare of bears at Japanese captive facilities regarding heat stress.

- Many of the polar bears in the open-air enclosures showed clear behavioural indications that they were too hot.

Bears were observed panting for long periods of time and/or lying with their bodies spread-eagled and flat to the ground. Panting and lying flat to the ground are both recognized as ways that polar bears try to dissipate body heat.

Panting, a method by which bears cool down, was frequently observed.

Polar bears do not have any physiological or morphological means of staying cool (such as sweat glands) and therefore have to rely on behaviour to cool themselves through several unique methods, shared by dogs. [48]One way that polar bears may dissipate heat is through slobbering tongues, panting like a dog.[48] Polar bears will also adopt different postures when sleeping or lying depending on whether they want to get rid of heat or conserve it.[19] The hot spots of bears are the muscles, nose, ears, footpads and particularly the inside of the thighs and "armpits". Polar bears will lie spread-eagled in their efforts to dissipate heat; their groins and armpits are the only spots on the body that have little fur and no fat.[47] They will lie with their legs (thighs) spread wide to lose heat, often sprawled on snowfields or patches of snow.[48]

Some bears lay flat on the ground, with their armpits and thighs in contact with the floor, in an attempt to dissipate heat from their bodies.

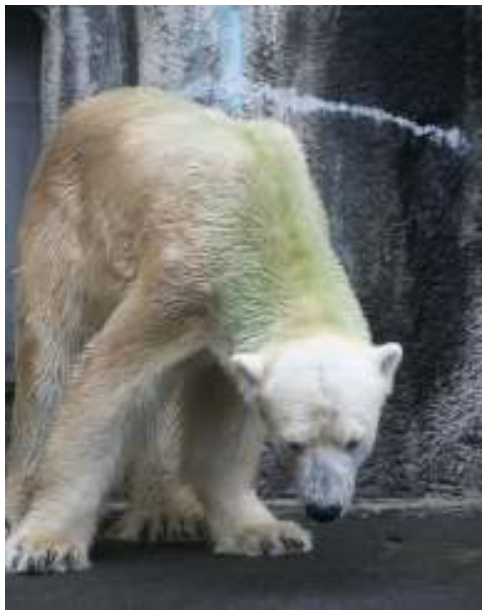
Discussion.

Exposing polar bears, a species which is highly adapted to life in the Arctic, to temperatures exceeding 20°C on a regular basis is undoubtedly going to cause them physical discomfort.
Many of the polar bears kept in open-air enclosures at Japanese captive facilities did show signs of heat stress. They were seen to be inactive for much of the day, and engaged in specific behaviours and adopted

certain postures in an effort to lose heat from their bodies. Where shade was available, the bears chose to rest in shaded areas. Many bears also rested in pools, perhaps in an effort to be slightly cooler than they would be on land.

Algal growth in fur.

- 15 of the polar bears showed signs of algal growth in the hair shaft of their guard hairs, causing their fur to turn green.



Many bears had green fur, caused by algal growth in the guard hairs. This signifies an inappropriate living environment.

The algae responsible are thought to be blue-green algae (Cyanophyta) which grow inside the hollow outer guard hairs.[54]Green fur is apparently a phenomenon only observed in captive polar bears and only in warm weather. There have been no comparable records of green bears in the wild, and no algal associations have been found with the pelts of wild bears.[54]
The algae itself does not harm the bear; it is what the algae signifies that is the problem. In captive polar bears in the summer months, the habitat of the hollow hairs suit the algal cells well as it is warm and moist.[54]The rampant algal infestation of the fur of the polar bears is therefore a clear indication that their fur is warm and moist which strongly suggests their bodies are hot and also indicates that their fur is damp for substantial periods of time. The appearance of algae in the hair shaft is therefore indicative of an unsuitable living environment and is also likely to be partly caused by the fact that the bears have no soft substrates that they can use to dry off when they come out of the pools.

Summary.

1. The polar bears housed in open-air enclosures at Japanese facilities are undoubtedly too hot and appear to suffer from heat stress during the summer months in Japan's climate. They are physiologically adapted to an Arctic climate and simply cannot adapt to significantly warmer climates.

2. For the short-term improvement of the welfare of the polar bears, substantially more effort should be made to provide the bears with means to obtain relief from the heat, especially during the summer months.

CHAPTER 7
INDIVIDUAL CAPTIVE FACILITY REPORTS

This chapter contains individual zoo reports for all 24 captive facilities investigated. The reports contain details about the living conditions of the polar bears and the husbandry measures in place for the bears at each facility. The reports are arranged in alphabetical order.

At the beginning of the individual report, it will be stated whether or not the enclosure and husbandry standards meet the minimum requirements set out by the Province of Manitoba (Canada) Polar Bear Protection Act, 2003.

7.1 Explanation of categories used in individual captive facility reports.

Most of the categories used in the reports refer to the facilities provided in the main body of the enclosure, which in most cases was an outdoor, open-air enclosure (except for 2 facilities where bears were housed indoors), or to husbandry measures in places. In each category, a description of the facilities /husbandry practices is provided.
The only exception to this is the category of "Night dens", which gives a brief description of the off-exhibit area in the few cases where this could be observed.

The following explains what information is covered by each category used in the individual captive facility reports.

General notes.
Any relevant information on the facility, for example whether it is a member of a zoo organisation. The date the facility was surveyed.

The bear/s.
The number, sex, date of birth and origin of the bears. (This was documented as far as possible but it was not always possible to obtain this information. Details of the sex, date of birth and origin of the bears were obtained from the informational signs placed at the enclosures.)
Any husbandry practices relating to individual bears.

The enclosure/s.
The enclosure style, condition, number and type of visitor viewing stations and noise levels. Any other important information relating to the enclosure.

Size of enclosure/s.
An approximate size of the enclosure (from visual estimation).

Animal sightlines.
The view the bear/s had from within the enclosure.

Noise levels.
The level of noise encountered in the vicinity of the enclosure and the source of the noise.

Ground type/substrate.
The ground composition and whether or not any soft substrates were provided.

Shelter/shade.
Any structures providing shade from the sun or shelter from rain.

Furniture.
Any physical structures within an enclosure that served to enrich the animals environment, such as climbing frames, giant rocks, mature trees, streams and pools.

Objects for play and manipulation.
Objects in the enclosure that only served the purpose of stimulating the bears' exploratory and play behaviours, e.g. plastic buoys, barrels, tires etc.

Private areas.
Provision of any private areas where the bear/s could retreat from public view or from each other (where applicable). If private areas were provided, whether these were sufficient for all the bears in the enclosure.

Access to off-exhibit areas.
Whether or not the bears had access to the off-exhibit areas during the day.

Night dens.
A brief description of the off-exhibit areas, where these could be viewed.

Hygiene.
The cleanliness of the enclosure floor, swimming pool and water.

Safety.
Potential safety hazards.

Provision of enrichment/feedings.
Whether any form of enrichment activities, such as enrichment feedings, were provided during the day. If so, the nature of the enrichment activity and, in the case of enrichment feedings, the quantity and composition of foodstuffs given.

Bear behaviour.
A general description of the activity levels of the bear/s. A description of any abnormal behaviours being displayed by the bear/s. Any incidences of interaction between bears. Any other behaviours of interest.
(We are aware that giving an accurate description of a bear's behaviour is not possible after only 1 day of observation. However, specific forms of bear behaviour, such as stereotypies, can lead to certain conclusions, even after just a short period of observation. Abnormal behaviours do not develop overnight and do not generally occur as one-off incidences.)

Physical condition of bears.
A basic description of the physical conditions of the bears (weight, fur condition etc.) and whether there were any apparent physical abnormalities.

Informational signs/ visitor behaviour.
Information on the number of visitors who looked at the signs. A description of the content of the informational signs. The average time spent at the polar bear exhibit by visitors.

Assessment.
At end of each report, the features of the enclosure and the husbandry practices that are lacking are listed.

7.2 Individual Captive Facility Reports

7.2.1 Adventureworld

Overall findings.
Adventureworld's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the facility did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Adventureworld is a member of JAZA.

Date of visit: 27 July 2006.

I The bears
Number: 2.

A stuffed polar bear cub was on display near the enclosure. An accompanying sign stated "Shiro Kuma Kun, born in Adventureworld, raised by care takers as mother was unable to take care of baby."

II The enclosure.

Indoor, fully enclosed, glass-fronted enclosure with air-conditioning and artificial lighting. The enclosure was circular and situated in the middle of a dome-shaped building. Less than half of the enclosure was dry land. Visitors could look into the enclosure at ground level through 3 large adjacent windows and 5 small separate round windows which allowed very close up views of the bears. Visitors could also view the bears from a second floor level, through windows extending all the way around the enclosure.

Size of enclosure.
Approximately 88m^2.
The dry land area comprised just over one third of the whole enclosure. The pool took up over half of the enclosure. Whilst some parts of the swimming pool were deep enough for the bears to dive and swim, a lot

of the pool area was taken up by an area of shallow water with artificial concrete replica 'ice block' structures at different levels under the water. This relatively unusable area took up just under half of the total area of the enclosure.

Animal sightlines.
The bears could look out through the glass-fronted side, onto the indoor visitor viewing area.

Noise levels.
High levels of noise were observed from large numbers of visitors getting very close to the enclosure. Visitors were seen to bang on the windows.

Ground type/ substrate.
Hard, artificial flooring throughout. No soft substrates.

Furniture.
No furniture provided on land. Swimming pool approximately 56m^2 in size, approximately 4m deep at its deepest point allowing the bears to dive. Other parts of the pool were too shallow for swimming or diving.

Objects for play and manipulation.
No movable objects were provided.

Private areas.
No private areas for the bears to escape from public view or each other. The bears could be viewed from 100% of the top level of the enclosure and 75% of the ground level.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

III Provision of enrichment/ feedings.
The bears were given feedings at 1045, 1315, 1500 and 1615. At each, they were given pieces of meat and bread. The food was thrown in by a keeper through a top window. Visitors were allowed to throw some of the food in. 5 small ice blocks containing small pieces of meat were thrown into the pool at 1410.

IV Bear behaviour.

Both bears engaged in stereotypic behaviour (pacing) for a significant amount of time. They paced along the edge of the pool, often simultaneously.

V Physical condition of the bears.

The larger bear was substantially underweight and protruding shoulder blades and hip bones were clearly visible.
The smaller bear was underweight with prominent hip bones. The smaller bear had bald patches on her head.
Both bears had very dirty fur and the smaller bear's fur was heavily matted on one side of her body.

Both bears at Adventureworld were underweight.

VI Informational signs/ visitor behaviour.

3 different signs provided fairly detailed information about polar bears. 1 small sign with basic facts about polar bears was positioned in 3 different places above the viewing windows. 2 large signs with details of polar bear physiology, including diagrams, were positioned at entrance to exhibit.

The small signs above the viewing windows were placed too high to be read easily. The large signs were positioned adjacent to automatic doors at the entrance of the dome where there was often a high level of human traffic, and few people stopped to read them.

4% of visitors looked at one or more of the signs.

The keeper provided a commentary as he gave the feedings.

A 4-page fact sheet with 1 page of information on polar bears was provided, but no one was seen to take this.

The average time spent at the enclosure by visitors was 150.5 seconds

VII Assessment.

Lack of:
- Sufficient space, especially dry land area.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.

- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Provision of varied enrichment activities/feedings throughout the day.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.
- Fresh air and anything resembling a natural environment.

7.2.2 Asahiyama Zoo

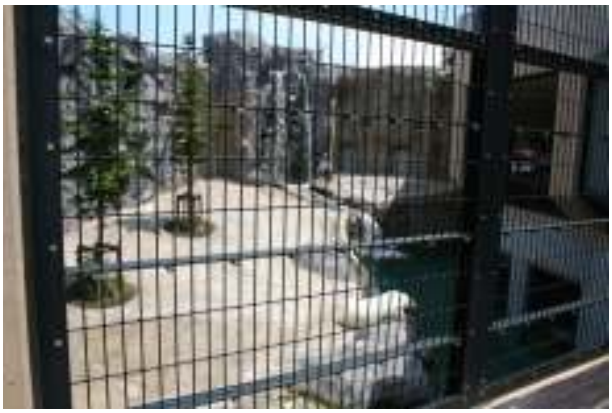
Overall findings.
Both polar bear enclosures at Asahiyama Zoo failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Asahiyama Zoo is a member of JAZA.

Date of visit: 5 July 2006.

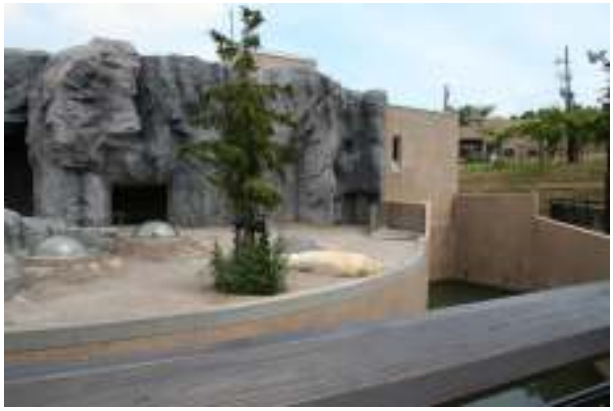
I The bears.
Number: 3.

Sex: 1 male, 1 female (housed together). The male was called Iwan and was born on 8.12.00. The female was called Lulu and was born on 20.11.94.
1 bear of unknown sex housed alone.



Enclosure 1.

II The enclosures.
Enclosure 1: Iwan and Lulu were in an open-air, rectangular, semi pit style, enclosure. There was a high wall at the back and on one side, whilst on the other sides were the visitor viewing areas. The bears could be viewed from above and through windows looking onto the pool.



Enclosure 2.

Enclosure 2: The single bear was in an open-air, semi-circular island style enclosure. The ground was at visitor level, with a deep moat containing water at the front. Visitors could stand at nearly every point around the enclosure. At a small viewing area at the

back of the enclosure, visitors could potentially climb over the barrier and reach through the bars and touch the bear. Here, signs warned visitors not to touch the bear.

Size of enclosures.
Enclosure 1: Approximately 180m^2.
Enclosure 2: Approximately 127.2m^2.

Animal sightlines.
Enclosure 1: The bears had a very limited view out of the enclosure; they could only see out through the windows of the pool onto the visitor viewing areas.
Enclosure 2: The bear could see out of the enclosure onto the visitor viewing area only.

Noise levels.
High noise levels were observed at both enclosures from visitors getting very close, loud school groups and a nearby rollercoaster. In Enclosure 1, a waterfall generated constant noise.

Ground type/ substrate.
Enclosure 1: Fully concrete flooring. No soft substrates.
Enclosure 2: Fully concrete flooring. No soft substrates.

Shelter/ shade.
Enclosure 1: No shelter from rain or shade from sun provided.
Enclosure 2: No shelter from rain or shade from sun provided.

Furniture.
Enclosure 1: 3 trees in enclosure; all were too small with too little foliage to provide shade. Swimming pool approximately 54m^2 in size and between approximately 2-3 m deep, allowing the bears to dive.
Enclosure 2: 2 small trees in enclosure; both were too small to provide shade. 1 small concrete 'hill.' Small pool approximately 9m^2 in size, which was too small and shallow for the bear to swim in.

Objects for play and manipulation.
Enclosure 1: 2 plastic buoys. The smaller bear played with the buoy.
Enclosure 2: No movable objects provided.

Private areas.
Enclosure 1: No private areas for the bears to escape from public view or each other. The bears could be viewed by visitors from 4 separate viewing areas. The bears could be viewed from above and through windows looking into the pool.

Enclosure 2: No private areas for the bear to escape from public view. Visitors could stand all the way around the front of the enclosure and also at a viewing area at the back. In addition, there was a viewing window at the back of the enclosure. There were also 3 Perspex "viewing domes" inside the enclosure where visitors could put their heads up from below and look into the enclosure. Visitors could do this continuously, resulting in a complete invasion of the bear's privacy.

This bear was subjected to intense visitor viewing pressure.

Access to off-exhibit areas.
Enclosure 1: No access to off-exhibit areas throughout the day.
Enclosure 2: No access to off-exhibit areas throughout the day.

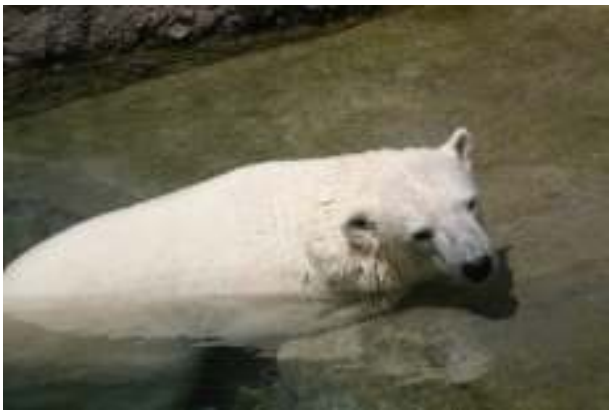
Hygiene.
Enclosure 1: Enclosure floor was clean. Pool water appeared clean.
Enclosure 2: Enclosure floor was clean. Pool water appeared clean. However, the water in the moat was very dirty.

Safety.
Enclosure 2: There was a steep drop to the moat which the bear could potentially fall down.
Visitors could throw objects into both enclosures.

III Provision of enrichment/ feedings.
Enclosure 1: Feeding of small dead fish (with keeper commentary) occurred at 11.00, 14.00 and 15.30.
Enclosure 2: No feedings or provision of enrichment activities were observed.

IV Bear behaviour.
Enclosure 1: The larger bear engaged in stereotypic behaviour (pacing and neck turning). He/she paced mainly in a circular or teardrop route around one of the trees and paced for a large proportion of the day. He/she was observed neck turning by the pool, usually in the same place.

Enclosure 1: The larger bear repeatedly paced a teardrop route around this tree.



Enclosure 1: The smaller bear spent much of the day lying in the same position in the pool.

The smaller bear was inactive for most of the day, spending the majority of the time resting and sleeping in the pool. If the smaller bear was the female, there was an indication that she had been noted to be inactive before as a sign explained "She (Lulu) has been active since the beginning of the year," suggesting that before this time she was more inactive.
The bears were not observed to interact.
Enclosure 2: The bear was inactive for most of the day, typically sleeping on the land or lying in the pool.

V Physical condition of the bears

Enclosure 1: The larger bear had bald patches on his head.

Enclosure 1: The larger bear had bald patches on his head and shoulder. A sign referring to the male bear Iwan (probably the larger bear) stated that "the black skin can be seen on the head because he has been active as usual."
There did not appear to be any obvious outwardly visible signs of physical abnormalities for the other, smaller bear (probably the female, Lulu). It seemed that Lulu has had problems with her weight in the past because a sign referring to Lulu explained that "Last year's weight control seems to be effective."
Enclosure 2: The bear appeared somewhat overweight.

VI Informational signs/ visitor behaviour.

1 sign provided fairly detailed information, with diagrams, about polar bears. This was positioned at all the outdoor viewing areas around the enclosures. There was an indoor educational display with extensive information on polar bears including over 15 detailed informational signs, informative wall murals and 2 stuffed polar bears. The signs and exhibits were positioned in such a way that they were easy to see and read.

There was a keeper commentary during each of the feedings.

The average time spent at the enclosure by visitors was 385.3 seconds.

VII Assessment.

Enclosure 1.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- View.
- Source of drinking water other than pool water.

Enclosure 2.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Effective barriers between visitors and the bear.
- Pool large enough for swimming.
- Source of drinking water other than pool water.

7.2.3 Cuddly Dominion

Overall findings.
Cuddly Dominion's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the facility did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Cuddly Dominion is a member of JAZA.

Date of visit: 10 August 2006.

Cuddly Dominion is a captive animal facility comprising a large bear park containing hundreds of bears, and an animal-based theme park with shows, petting and photography sessions among it's many 'attractions'.

The polar bears were housed inside the bear park area.

Inside the bear park, visitors were able to buy a variety of food items including bread, chicken, sausages and biscuits, to feed to the bears. Some visitors were observed throwing food into the polar bear enclosure.

I The bears.
Number: 2.

II The enclosure.

Open-air, extremely small, square, pit-style enclosure with high walls. The pool took up most of the enclosure, leaving very little dry land area. The enclosure looked very old and was in a state of disrepair. It appeared that the floor used to be painted blue and the walls and bars separating the night den area used to be painted green, but there were only very small patches of paint left. The bars separating the night den area were completely rusted.

Size of enclosure.
Approximately 49m^2.
The land area was only approximately 20m^2 in size.

Animal sightlines.
The bears could not see out of the enclosure.

Noise levels.
High noise levels were observed from water running constantly into the pool, visitors getting too close to the enclosure and bears in nearby enclosures fighting and banging on night den doors.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
No furniture provided on land. Swimming pool approximately 29m^2 in size. The pool was divided into 2 sections by a concrete bar.

Objects for play and manipulation.
No movable objects were provided.

Night dens.
The night dens were visible to visitors and comprised of 2 open-air enclosures, separated from the main enclosure by metal bars. There was a very small (1m x 1.8m) cement shelter with a roof in each night den providing the only protection from the elements for the bears.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. However, there were considerable hygiene concerns for the enclosure. There was no visible drainage system in the enclosure and any waste washed from the flat concrete floor would apparently run into the pool. The water in the pool looked very dirty and dark green, indicating substantial algal growth. The pool water was the only source of drinking water. There were empty plastic bags inside the enclosure and around the visitor viewing area. These bags looked like the bags in which food was sold to feed to the bears. The night den floors were covered in algal growth.

Safety.
There were plastic bags inside the enclosure which the bears could potentially ingest. Visitors were able to throw objects into the enclosure. There were 3 rows of sharp spikes along the length of a concrete divider in the pool. The bars separating the night den area from the main enclosure were completely rusted.

III Provision of enrichment/ feedings.
The bears were fed large chunks of fatty white meat in the morning.

IV Bear behaviour.
Both bears were almost completely inactive for the entire day. Neither bear walked more than about 20m in total or entered the pool in the 8 hours they were observed (from 0830 to 1730).

V Physical condition of the bears.
Both bears were extremely overweight, especially the larger bear. Both bears had patches of green fur indicating algal growth in their guard hairs, especially the smaller bear.
The smaller bear seemed stiff and perhaps arthritic in his/her movements as he/she walked. The smaller bear was also observed scratching his/her body a lot with the claws.

Both bears at Cuddly Dominion were extremely overweight.

VI Informational signs/ visitor behaviour.

2 informational signs provided basic information on polar bears. Both signs were old and faded. 1 sign was positioned on the back wall of the enclosure and fairly difficult to read.

3.2% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 38.9 seconds.

VII Assessment.

Lack of:

- Sufficient space, especially for 2 individuals.
- Sufficient land area.
- Shelter from sun and rain.
- Adequate shelter in night den.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- Pool large enough for significant swimming.
- View.
- Regulated diet.

7.2.4 Hamamatsu Zoo

Overall findings.
Hamamatsu Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Hamamatsu zoo is a member of JAZA.

Date of visit: 21 July 2006.

I The bears.
Number: 2.
Sex: 1 male, 1 female.

The male, Jason, was born on 12.8.92 at Melton Zoo in England. The female, Buffin, was born on 12.9.91 at Koimaden Zoo in Sweden.

II The enclosure.
Open-air, grotto style enclosure with high walls at the back and sides. In addition to the main body of the enclosure, the enclosure extended into the area behind the sea lion enclosure next door. The enclosure looked old with heavily stained walls and floor.

Size of enclosure.
Approximately 260 m^2.

Animal sightlines.
The bears could view out of the front of the enclosure onto the visitor viewing area.

Noise levels.
High noise levels were observed from the sea lions in the neighbouring enclosure, from visitors and animals at the nearby petting zoo and from visitors getting very close to the enclosure.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
There was a curved cement roof/shelter approximately 3.5m x 3.5m on a pole (approximately 4m high). However, it was seen that this did not provide effective shelter from the rain as when it rained the whole floor under the shelter became wet. It could not be determined if this provided any shade from the sun as on the day of our visit it was overcast or raining the whole day.

Furniture.
No furniture provided on land. Swimming pool approximately 82.5m^2 in size.

Objects for play and manipulation.
Two small identical round buoys. The smaller bear played with these briefly.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

Safety.
Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
The bears were given a few dead fish at 1500. The smaller bear ate most of the fish. Both appeared to be very hungry.

IV Bear behaviour.
The smaller bear engaged in stereotypic behaviour (pacing and neck turning). Sometimes the neck turning behaviour was part of the pacing routine, but sometimes it occurred alone. The larger bear was also seen to engage in stereotypic behaviour (neck turning).
Both bears were very inactive in the morning, both lying motionless in the rain for long periods of time.
The larger bear appeared to be pursuing the smaller bear for much of the day and there was a significant amount of interaction between the two; they were seen play-fighting and 'mouthing' at each other many times. The smaller bear often appeared to be trying to avoid the larger bear, but there were no private areas to escape to.

The smaller bear engaged in stereotypic pacing and neck turning behaviour for long periods of time.

V Physical condition of the bears.

The larger bear appeared to be underweight; the shoulder blades were prominent and there was very little fat around the abdomen. The larger bear had dirty fur.

There did not appear to be any obvious outwardly visible signs of physical abnormalities for the smaller bear.

Both bears had green fur, especially the larger bear, indicating algal growth in their guard hairs

Both bears had algal growth in their guard hairs. The dirty fur indicated a lack of grooming opportunities for the bears.

VI Informational signs/ visitor behaviour.

There was one sign with very basic information on polar bears. The sign could be viewed easily.

0% of visitors looked at the sign.

The average time spent at the enclosure by visitors was 28.1 seconds.

There was an audio box into which people could put money to hear a commentary. No one was seen to use this.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- Effective barriers between visitors and the bear.
- Provision of enrichment activities/feedings throughout the day.

7.2.5 Higashiyama Zoo

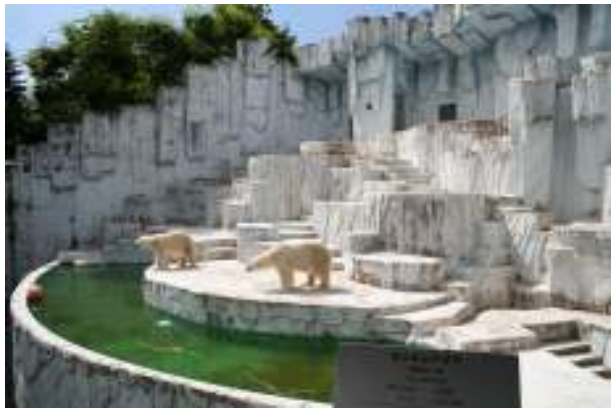
Overall findings.
Higashiyama Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Higashiyama Zoo is a member of JAZA and a member of WAZA.

Date of visit: 22 July 06.

I The bears.
Number: 2.

II The enclosure.
Open-air, grotto-style enclosure with high walls on 3 sides. The floor was divided into many different levels and sloped downwards from the back to the front of the enclosure. The enclosure appeared old and in a state of disrepair. The paintwork throughout the enclosure, especially the floor, was chipped and worn. The enclosure was a traditional-style polar bear enclosure painted to resemble a 'sea ice' environment.



Size of enclosure.
Approximately 500m^2.
As the floor was divided into many different levels, there was no significantly-sized usable flat land area, the largest being approximately 28m^2.

Animal sightlines.
The bears could view out of the enclosure onto the visitor viewing area from the higher levels. The bears could not view out of the enclosure from the lower levels or from the swimming pool.

Noise levels.
High noise levels were observed from the sea lions in the neighbouring enclosure and from visitors getting too close to the enclosure.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
An overhanging roof at the back of the enclosure provided a shaded area of approximately 60 m^2. It was unclear whether this sheltered area would provide sufficient shelter from heavy rain.

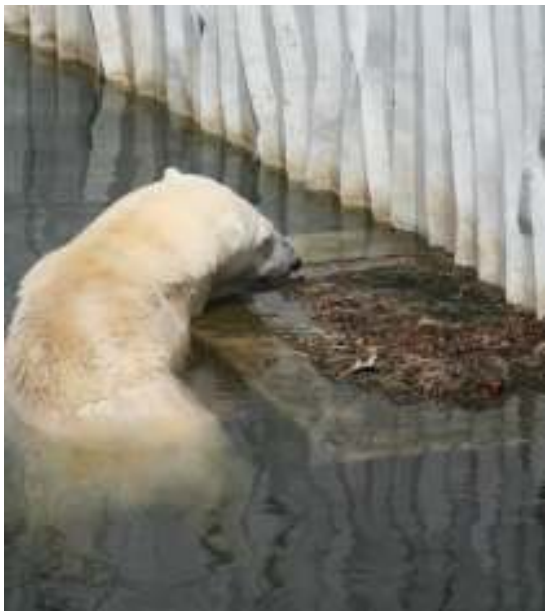
Furniture.
No furniture provided on land.
Swimming pool approximately 60m^2 in size. The bears also had access to a moat at the front of the enclosure which was filled with water and approximately 80m^2 in size.

Objects for play and manipulation.
2 identical small plastic buoys. 1 small log and 1 piece of rotten log. 1 well-chewed plastic container. The larger bear played with both logs and the container. The smaller bear manipulated the rotten log and the buoys.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to of-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. However, there were severe hygiene problems with the water in the pool and the moat. The water in the swimming pool was very green and murky, indicating a lot of algal growth. The water in the moat was extremely dirty and dark brown in colour with a lot of algal growth. It appeared to be stagnant and to have not been changed for several weeks. There were drains at the side of this



The bears were able to enter the stagnant water in the moat and eat the rotting debris from the drains.

moat which were filled with leaves and debris. The bears were observed consuming this material. They were also seen drinking water from both the swimming pool and the moat.

Safety.
Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
No significant feedings or provision of enrichment activities were observed. One apple divided into pieces was thrown in the enclosure in the morning.

IV Bear behaviour.
Both bears engaged in stereotypic behaviour. The smaller bear repeatedly paced a figure-of-eight pattern at the highest level at the back of the enclosure in the afternoon. The larger bear displayed head weaving behaviour, again at the highest level at the back of the enclosure and in the afternoon. This head weaving behaviour was accompanied by pacing backwards and forwards.
In the morning both bears were inactive, possibly due to the extremely high ambient temperatures and humidity.
The smaller bear often appeared to be chasing the larger bear and the larger bear seemed very wary of the smaller bear early. There was a significant level of interaction between the bears, especially when they were both in the swimming pool.

V Physical condition of the bears.
There did not appear to be any obvious outwardly visible signs of physical abnormalities for either bear. They did have some green fur, indicating algal growth in their guard hairs.

VI Informational signs/ visitor behaviour.
1 small informational sign provided basic information about polar bears. The information was also provided in English. The sign could be viewed easily.

1.2% of visitors looked at the sign.

The average time spent at the enclosure by visitors was 32.3 seconds.

There was an audio box into which people could put money (100 Yen) to hear a commentary about polar bears. No one was seen to use this.

VII Assessment.

Lack of:

- Sufficient space.
- Sufficient shelter from rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- Effective barriers between visitors and the bear.
- Provision of enrichment activities/feedings throughout the day.

7.2.6 Himeji City Zoo

Overall findings.
Himeji City Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Himeji City Zoo is a member of JAZA.

Date of visit: 30 July 2006.

I The bears.
Number: 2.
Sex: I male, 1 female.

The male, Hokuto, was born on 20.11.00. He came from Moscow Zoo, Russia and arrived at Himeji City Zoo on 31.5.02. The female, Yuki, was born on 26.11.99. She came from a zoo in the former Yugoslavia and arrived at Himeji City Zoo on 30.5.02.

II The enclosure.
Open-air, rectangular, traditional-style cage. The bears also had access to an outdoor holding cage and an indoor night den from 0935 onwards. The cages appeared very old and metal fixtures throughout the enclosure were heavily rusted. Visitors could stand all the way around the cage to view the bears.

Size of enclosure.
The main cage was approximately 54m^2 in size. The outdoor holding cage was about 6 m^2 in size and an indoor night den was around 6 m^2 in size. Therefore, the bears had approximately 66m^2 of space in total.

Animal sightlines.
There was fine wire mesh fixed over the bars, severely restricting the bears' view out of the enclosure.

Noise levels.
High noise levels were observed from visitors getting very close to the cage. Visitors could potentially climb over the barrier and put their fingers through the wire mesh.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
No furniture provided on land. Small swimming pool approximately $9m^2$ in size. The pool was not deep enough to swim or large enough to allow for extensive swimming.

Objects for play and manipulation.
No movable objects were provided.

Night dens.
The visible night den had a roof and could be viewed by visitors. It had a concrete floor and did not contain any soft substrates or furniture.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
One night den was accessible throughout the day. However, this night den was only big enough to comfortably accommodate 1 bear at a time and was also visible to the visitors.

Hygiene.
Enclosure floor was free of debris, although there was some algal growth on the rocks. The water in the pool was green, indicating substantial algal growth, and there was algal growth on the bottom of the pool and on the steps leading into the pool. Inside the night den, the floor was very uneven and poorly drained and there were several pools of water on the floor persisting throughout the day.

Safety.
The metalwork throughout the enclosure including the bars, mesh, doors to night dens and door frames was rusted.

III Provision of enrichment/ feedings.

1 piece of bread was thrown in at 0930. 1 ice block containing some apples, bread and other foods frozen inside was given at 1320. The larger bear (who appeared dominant) ate the vast majority of the food.

IV Bear behaviour.

Both bears engaged in stereotypic behaviour (pacing) for a significant amount of time. Both bears paced a couple of different routes along the perimeter of the enclosure and around the pool, often simultaneously. The smaller bear paced more than the larger bear and the smaller bear often held the head at a tilted angle with the neck twisted. When turning corners, the smaller bear usually bent the head and twisted the neck downwards (as opposed to throwing the head backwards with a neck turn which is a more commonly seen behaviour). The larger bear appeared dominant.

V Physical condition of the bears.

Both bears had experienced considerable hair loss and their fur was reduced to a fairly thin covering. Their black skin was clearly visible through their fur, especially when they were wet. Both bears had bald patches on their bodies and patches of green fur indicating algal growth in their guard hairs, especially around the neck of the larger bear.

VI Informational signs/ visitor behaviour.

No informational signs about polar bears. 3 signs displayed details about the individual bears. The signs could be viewed easily.

3.6% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 55.8 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas sufficient for both bears.
- Source of drinking water other than pool water.
- Pool large enough for significant swimming or diving.
- View.
- Effective barriers between visitors and the bear.

7.2.7 Hirakawa Zoo

Overall findings.
Hirakawa Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

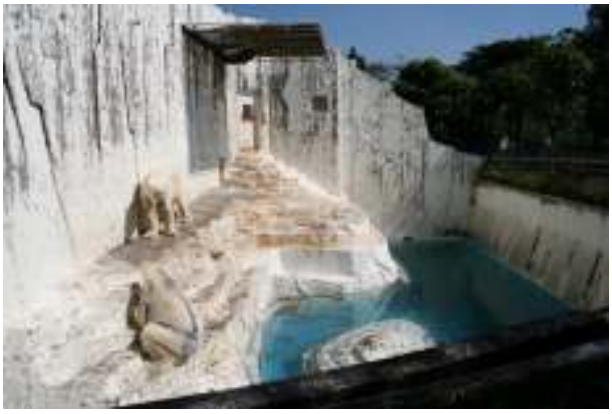
General notes.
Hirakawa Zoo is a member of JAZA.

Date of visit: 8 August 2006.

I The bears.
Number: 2.

The larger bear was locked into the night den at 1400.

II The enclosure.
Open-air, extremely small enclosure at visitor level with high walls on 2 sides. The pool took up just over half of the total area, leaving very little dry land. The enclosure appeared very old and in a state of disrepair. The paintwork was dirty and peeling and metal fixtures were rusted.



Size of enclosure.
Approximately 60m^2.
The dry land area was only approximately 25 m^2 and varied in width from just over 1m to 4m. Much of this land area was sloping so was not very usable.

Animal sightlines.
The bears could see out onto the visitor viewing area from the dry land area. The bears could not see out from the pool.

Noise levels.
High noise levels were observed from several sources: water running constantly into the pool, traffic on a nearby road and from a bear in the neighbouring enclosure who repeatedly banged on a night den door.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
A 2x3m metal frame with a shade cloth tied over it was positioned on the wall at the back of the enclosure. This did not cast any shade into the enclosure in the morning, but provided a small shaded area in the enclosure later in the day. This shaded area was only big enough to accommodate 1 bear.

Furniture.
No furniture provided on land.
Swimming pool approximately $35m^2$ in size. There was a small 'island' of about 1.5x1.5m in the pool.

Objects for play and manipulation.
1 large plastic buoy. Neither bear was seen to manipulate this.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

Safety.
The night den door and keeper door were heavily rusted. Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
2 plain ice blocks were thrown into the pool at 1100. 1 apple was thrown into the enclosure at 1120. The bears did not appear to be very interested in the ice blocks.

IV Bear behaviour.
The larger bear engaged in stereotypic behaviour (pacing and neck turns) for a significant amount of time. He/she started this behaviour as soon as the sky clouded over and the ambient temperature cooled.
The larger bear appeared dominant as the smaller bear often moved out of his/her way. The only shaded area available was monopolized by the larger bear.

V Physical condition of the bears.

The smaller bear appeared somewhat overweight. The smaller bear exhibited severe fur loss with lots of fur missing from her/his back, sides and shoulders. It appeared that she/he suffered from a skin condition as pink lesions were present on her/his shoulders and sides. The smaller bear was seen to scratch her/his body a lot, either with claws or by rubbing against the walls. Severe fur loss is most often stress-related and long-term stress may have played a role in the fur loss exhibited by the female bear. The presence of the larger dominant bear could be a major source of stress for this bear.
The larger bear had a black lump above one eye.

The smaller bear suffered from severe fur loss and had many lesions over her/his body. The bear exhibited excessive scratching behaviour.

VI Informational signs/ visitor behaviour.

2 informational signs provided basic information about polar bears. 1 sign displayed information in English too. Both signs could be viewed easily.

0.9% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 52.1 seconds.

VII Assessment.

Lack of:

- Sufficient space, especially for 2 individuals.
- Lack of dry land area.
- Sufficient shelter from sun.
- Shelter from rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of sufficient enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.

7.2.8 Kobe Oji Zoo

Overall findings.
Kobe Oji Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Kobe Oji Zoo is a member of JAZA.

Date of visit: 29 July 2006.

I The bears.
Number: 2.

II The enclosure.
Open-air, rectangular enclosure at visitor level with high walls all around. There were viewing windows in 2 of the walls through which visitors could view the bears from an indoor viewing area. Visitors could also view into the enclosure from above from a raised outdoor viewing area.

Size of enclosure.
Approximately 500m^2.

Animal sightlines.
The only limited view the bears had out of the enclosure was through the viewing windows in the walls, onto the indoor visitor viewing area.

Noise levels.
High noise levels were observed from loudspeaker announcements and a waterfall running constantly inside the enclosure. Noise also came from visitors knocking on the windows; in total there were 16 windows which visitors could potentially bang on.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
There was a sheltered area of about 24m^2 in size at the back of the enclosure provided by an overhanging roof.

Furniture.
2 large artificial boulders that the bears could climb and rest on.
Swimming pool approximately 96m^2 in size, approx 3m deep in some places allowing the bears to dive. The width of the pool varied between approx 2m to approx 10m. There was a waterfall running constantly in the enclosure forming a shallow river running into the pool.

Objects for play and manipulation.
No movable objects were provided.

Night dens.
1 indoor night den was visible through a viewing window. A thermometer indicated that the temperature inside the night den was 23°C.

Private areas/Access to night dens.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas (night dens) throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

III Provision of enrichment/ feedings.
No feedings or provision of enrichment activities were observed. A sign advertised that ice blocks would be given to the bears on the 30th of July at 11am.
The larger bear was locked into the night den at 1620 and given a large pile of food, suggesting that the bears were fed 1 large meal per day in the evenings.

IV Bear behaviour.
The smaller bear was seen to eat the faeces of the larger bear i.e. copraphagia.
Both bears were inactive for most of the day, possibly due in part to the extremely high ambient temperatures and humidity. The smaller bear barely moved at all throughout the day.
Both bears showed indications that they were suffering from heat stress. Both bears were seen to be panting for most of the day. The larger bear often lay with his/her body flat on the floor, probably in an

effort to dissipate heat from the body. The larger bear was seen to rest in the pool during the hottest part of the day.
The larger bear appeared dominant over the smaller bear, often blocking the movements of the smaller bear. The smaller bear seemed very wary when approached. Little interaction between the bears was observed.

V Physical condition of the bears.

The larger bear appeared somewhat underweight, with substantially thinned fur and a black lump on his lip.
The smaller bear appeared considerably overweight.

The smaller bear was overweight.

VI Informational signs/ visitor behaviour.

5 different signs provided information about polar bears, 2 of which gave fairly detailed information including diagrams and were positioned at both the top and bottom viewing areas. The other signs were at the bottom viewing area only. The signs could be viewed easily.

7.6% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 59.7 seconds.

VII Assessment.

Lack of**:**
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.

7.2.9. Kumamoto Zoo

Overall findings.
Kumamoto Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo not appear to satisfy the Act's basic husbandry requirements.

General notes.
Kumamoto Zoo is a member of JAZA.

Date of visit: 9 August 2006.

I The bear.
Number: 1.
Sex: Male.

The bear, Mickey, arrived at the zoo on 14.12.85.
A sign stated that a female, Minny, had passed away on April 21st.

II The enclosure.
Open-air, pit-style enclosure. The pool took up more than half of the enclosure, leaving very little dry land. The enclosure appeared to be fairly old with rusted metal fixtures. Visitors could view Mickey from above from a raised viewing area on one side of the enclosure. There was also a small (8m x 1.5m) window at ground level through which visitors could look into the pool.

Size of enclosure.
Approximately 88m^2.
The area of dry land was extremely small, only 3m wide and between 8m-15m long.

Animal sightlines.
The only view Mickey had out of the enclosure was through the window at ground level next to the pool, which was covered with metal bars.

Noise levels.
High noise levels were observed from piped music being played over loudspeakers, water running constantly into the pool and visitors getting close to the enclosure and knocking on the window.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
A small cement shelter which Mickey could lie beneath provided a sheltered area of about 2.7 m^2. 2 pieces of shade cloth were tied over the enclosure stretching from back to front and measuring 5m in width, providing some shade in the enclosure.

Furniture.
No furniture provided on land. Swimming pool approximately 55m^2 in size. The pool was 1.6m deep according to a sign.

Objects for play and manipulation.
No movable objects were provided.

Private areas.
No private areas for Mickey to escape from public view.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean. However, Mickey was seen to defecate into the pool, which was the only source of drinking water.

Safety.
The door to the night den was rusted. Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
At 1330 small pieces of ice were thrown into the pool.

IV Bear behaviour.
Mickey engaged in stereotypic behaviour (pacing, stereotypic swimming and neck turning) most of the time he was observed. He repeatedly paced along the edge of the pool for the length of the enclosure or, when in the water, swam in a repetitive circular swimming pattern, performing a neck turn at the same position each time.
A sign stated that Minny, the female who used to be in the same enclosure "used to swim turning in the water many times", indicating that she, too, exhibited stereotypic behaviour.

V Physical condition of the bear.

Mickey had patches of green fur, indicating algal growth in the guard hairs, and appeared to be fairly old. He arrived in 1985, so he must be at least 21 years old.

VI Informational signs/ visitor behaviour.

2 different signs provided basic information about polar bears. 1 was positioned at the top viewing area, 1 at the bottom viewing window. Signs could be viewed easily.

17.5% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 60.4 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.

7.2.10 Kushiro Zoo

Overall findings.
Both polar bear enclosures at Kushiro Zoo failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Kushiro Zoo is a member of JAZA.

Date of visit: 7 July 2006.

I The bears.
Number: 3.

Sex: 1 bear was a male called Tsuyoshi, born on 11.12.03 at Sapporo Muruyama Zoo, Japan.

Tsuyoshi was kept separate from the 2 other bears. There were 2 enclosures; a larger enclosure and a smaller cage. Tsuyoshi was in the larger enclosure from 0930 to 1130 whilst the 2 other bears were out of view (presumably in the night dens). At 1130 Tsuyoshi was locked into a smaller cage next to the larger enclosure and the 2 other bears entered the main enclosure from an off-exhibit area.

II The enclosures.

Enclosure 1.

Enclosure 1: The main enclosure was an open-air, grotto style enclosure, roughly rectangular in shape, with the ground level slightly below visitor level. The enclosure had high walls on 3 sides. It appeared very old and in a state of disrepair with a heavily cracked floor with chunks of concrete missing in several places. Several objects inside the enclosure were rusted.

Enclosure 2: The second enclosure was an extremely small, open-air cage with bars at visitor level, situated next to the main enclosure. Visitors could potentially climb over the barrier and put their hand through the bars.

Enclosure 2.

Size of enclosures.
Enclosure 1: Approximately 180m^2.
Enclosure 2: Approximately 32m^2.

Animal sightlines.
Enclosure 1: If the bears looked upwards they could see out of the front of the enclosure onto the visitor viewing area, but if they looked straight forward they could not see out of the enclosure.
Enclosure 2: The bear could see out of the enclosure on 2 sides onto the visitor viewing area. This view was restricted by the metal bars.

Noise levels.
High noise levels were observed at both enclosures originating from several sources. Noise came from music played on loudspeakers throughout the day, from loudspeaker announcements and from visitors getting very close to the enclosures. There was a large volume of noise from visitors at the nearby amusement park and also from a nearby rollercoaster. In Enclosure 1, there was constant noise from water running into the pool.

Ground type/ substrate.
Enclosure 1: The majority of the flooring was concrete. There was an area of sandy/gravelly substrate in a shallow pit approximately 18m^2 in size. No soft substrates.
Enclosure 2: Fully concrete flooring. No soft substrates.

Shelter/ shade.
Enclosure 1: No shelter from rain or shade from sun provided.
Enclosure 2: No shelter from rain or shade from sun provided.

Furniture.
Enclosure 1: No furniture provided on land. Swimming pool, approximately 45m^2 in size, with water deep enough for swimming and diving.
Enclosure 2: No furniture provided on land. No pool provided.

Objects for play and manipulation.
Enclosure 1: 1 large plastic buoy.
Enclosure 2: 1 small plastic buoy.
When Tsuyoshi was in Enclosure 1, he played with the buoy. The other 2 bears did not manipulate the buoy.

Private areas.
Enclosure 1: No private areas for the bears to escape from public view or each other.
Enclosure 2: No private areas for Tsuyoshi to escape from public view.

Access to off-exhibit areas.
Enclosure 1: No access to off-exhibit areas throughout the day.
Enclosure 2: Tsuyoshi had access to the night den for the duration of his time in this cage (between 1130 and 1630).

Hygiene.
Enclosure 1: Enclosure floor was free of debris, although the enclosure was not well drained; there was a trough running along the enclosure floor in which there appeared to be stagnant water. One bear was seen drinking this water. There appeared to be a lot of algal growth in the pool water.
Enclosure 2: Enclosure floor was clean.

Safety.
Enclosure 1: There was rust on the night den doors. The concrete floor was chipped and there were broken bits of concrete strewn around the enclosure. Tsuyoshi was seen picking up bits of concrete into his mouth, which was a potential health hazard.
Enclosure 2: The frame of the night den sliding door was heavily rusted.

III Provision of enrichment/ feedings.
Enclosure 1: No feedings or provision of enrichment activities were observed.
Enclosure 2: Tsuyoshi was seen to be fed 1 meal of meat on the bone, cabbage, apple, pumpkin and fish.

IV Bear behaviour.

When in Enclosure 1, Tsuyoshi was seen to engage in stereotypic neck turning behaviour. Tsuyoshi engaged in stereotypic behaviour (pacing and neck turning) for most of the time he was in Enclosure 2 (the cage). He always paced the same route and performed the neck turn in the same corner of the cage each time. Tsuyoshi appeared very agitated and frequently climbed up the bars to look into the other polar bear enclosure.

Tsuyoshi spent most of his time engaged in stereotypic pacing and neck turning behaviours when confined in the small cage.

The 2 bears housed together were almost completely inactive and spent most of the day sleeping. They both barely moved, only walking a few paces each. No interaction between the bears was observed.

V Physical condition of the bears.

There did not appear to be any obvious outwardly visible signs of physical abnormalities for Tsuyoshi.
The other 2 bears both had very dirty fur. Both appeared to have lost a lot of muscle mass and appeared to have a lot of loose skin.

VI Informational signs/ visitor behaviour.

1 informational sign with basic information about polar bears. The sign was positioned behind bars so slightly obscured and quite difficult to read. 2 signs displayed details about the individual bears. These could be viewed easily.

3.6 % of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 107.9 seconds.

VII Assessment.

Enclosure 1.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- View.
- Source of drinking water other than pool water.

Enclosure 2.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Pool for bathing or swimming.
- Any source of drinking water .
- Effective barriers between visitors and the bear.

7.2.11 Kyoto Zoo

Overall findings.
Kyoto Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Kyoto Zoo is a member of JAZA.

Date of visit: 25 July 2006.

I The bear.
Number: 1.
Sex: Male.

The bear, Paul, was born in 1974.

II The enclosure.

Open-air, semi-circular, traditional style cage with bars. Wire mesh was fixed over the bars to a height of 2 metres. The cage was at visitor level and visitors could stand all the way around the cage.
The pool took up between one third to a half of the enclosure space, leaving very little dry land. The land area was divided into different levels and there appeared to be only 1 level large enough for Paul to rest his whole body on. The enclosure looked very old; the walls and floor were heavily stained and many of the metal fixtures were rusted. Visitors could potentially climb over the barrier and put their fingers through the wire mesh.

Size of enclosure.
Approximately 88m^2.

Animal sightlines.
Paul could see out onto the visitor area, but his view was restricted by the wire mesh fixed over the bars.

Noise levels.
Noise from water running constantly into the pool from 1200 onwards.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
Shelter from sun and rain was provided by a covered roof about 1.8m wide extending along the length of the cage at the back. Further shade was provided by some shade cloth over the roof of the cage extending out from the covered roof for a further 1.8m.

Furniture.
No furniture provided on land. Swimming pool approximately $12m^2$ in size. The pool was not large enough for diving or extensive swimming.

Objects for play and manipulation.
1 ball, 1 tire suspended above the pool on a chain from the roof, 4 tires tied together and suspended from the roof. Paul manipulated the ball and the tire suspended above the pool. This tire was heavily chewed.

Night dens.
4 night dens behind the cage could be seen. Each night den was approximately $16m^2$ in size and had a roof. There was no furniture or no soft substrates in any of the night dens and all had concrete floors. All the night dens were in full view of the visitors.

The night dens contained no furniture or soft substrates.

Private areas.
No private areas for Paul to escape from public view.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. The water in the pool was very murky and green with algae. The sides of the pool were brown. There appeared to be no other source of drinking water.

Safety.
The chains on which the tires were suspended were rusted and the bars on the night den door were rusted.

III Provision of enrichment/ feedings.

No feedings or provision of enrichment activities were observed.

IV Bear behaviour.

Paul engaged in stereotypic behaviour (pacing) for a significant amount of time. The route paced was along the front of the cage and around the pool.

Paul spent many hours pacing along the length of the pool.

V Physical condition of the bear.

Paul had bald patches on his head. A sign explained that Paul's teeth were worn down so he was not able to chew well, therefore his meat was minced for him.

Paul had bald patches on his head.

VI Informational signs/ visitor behaviour.

No detailed informational signs about polar bears. A sign described Paul's diet whilst another outlined his daily life. The signs could be viewed easily.

10.1 % of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 40.1 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.
- Effective barriers between visitors and the bear.
- Pool large enough for extensive swimming.

7.2.12 Nihondaira Zoo

Overall findings.
Nihondaira Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Nihondaira Zoo is a member of JAZA.

Date of visit: 20 July 2006.

I The bear.
Number: 1.
Sex: Female.

A sign stated that the bear, Pinky, was the oldest polar bear in Japan, born in 1974, and had been in Japan for 32 years. The sign indicated that previously a male bear, Jack, had been housed with Pinky but had since passed away. The sign stated "She looks a little sad because Jack has gone."

II The enclosure.

Open-air, square enclosure with floor slightly below visitor level. The enclosure was semi-island style, with a pool on 2 sides and high walls at the other 2 sides. The enclosure looked very old and was in a state of disrepair with a chipped cement floor. There were many rusted fixtures and the paint on the floor and walls was missing in many places.
Spotlights were positioned around the enclosure as the zoo opened as a "night zoo" at certain times.

Size of enclosure.
Approximately 121m^2 .
The majority of the enclosure was taken up by the pool surrounding the land on 2 sides. Only approximately 56m^2 was dry land area.

Animal sightlines.
Pinky could view out of the enclosure on 2 sides (onto visitor areas) if she looked upwards. However, her view was restricted due to the fact the enclosure floor was below ground level.

Noise levels.
High noise levels were observed originating from several sources. There was noise from constant piped music on loudspeakers throughout the zoo, from traffic on a public road nearby, from a river running past the enclosure and from water constantly running into the pool.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
No furniture provided on land. Swimming pool approximately 65m^2 in size.

Objects for play and manipulation.
No movable objects provided.

Private areas.
No private areas for Pinky to escape from public view.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
There were many urine puddles and piles of faeces on the floor. Pinky urinated and defecated in many parts of the enclosure. The water in the pool was very murky and green and full of algae. There was a lot of debris (leaves etc.) in the pool.

Safety.
There were rusted parts on the keeper door and night den door. The cement on the floor was chipped in places. Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
No feedings or provision of enrichment activities were observed.

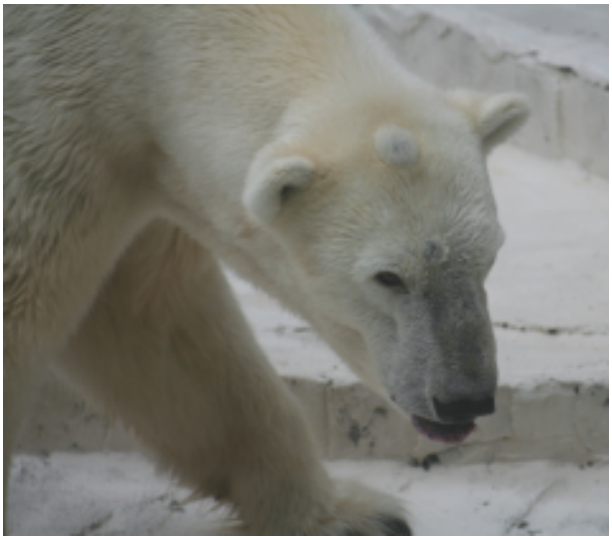
IV Bear behaviour.

Pinky engaged in stereotypic behaviour (pacing). Pinky paced more or less continuously for the whole day, always walking the same route back and forth. Each time she started at the same point at one of the walls, then walked 5 or 6 paces, turned and walked back to the same point on the wall. She only stopped once to go in the pool briefly.

Pinky spent nearly the whole day pacing back and forth.

V Physical condition of the bear.

Pinky appeared to be underweight and had a lot of loose skin. She had a lump of the top of her head which looked like a tumour or cyst. One side of her mouth looked bigger than the other, possibly indicating a swelling. Her fur was very dirty and matted, especially around her tail. She had patches of green fur indicating algal growth in the guard hairs. She was seen foaming at the mouth after pacing for a while.



Pinky had a large lump on her head.

VI Informational signs/ visitor behaviour.

1 sign provided very basic information about polar bears. 2 signs displayed details about Pinky. Signs could be viewed easily.

9.1% of visitors looked at one or more of the signs.

The average time spent at enclosure by visitors was 35.1 seconds.

There was an audio box into which people could put money (50 Yen) to hear a commentary. No one was seen to use this.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.

7.2.13 Obihiro Zoo

Overall findings.
Obihiro Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Obihiro Zoo is a member of JAZA.

Date of visit: 7 July 2006.

I The bear.
Number: 1.
Sex: Female.

The bear was called Satsuki and was born on 14.11.91 at Cleveland Metropark Zoo. She arrived at Obihoro Zoo on 31.10.92.

II The enclosure.
Open-air, rectangular, traditional-style cage with bars. The cage was semi-pit style, with part of floor area and the pool below ground level. The enclosure looked old with much of the paint on the floor and walls worn away and heavily rusted metal fixtures.

Size of enclosure.
Approximately 126m^2.

Animal sightlines.
Satsuki could view out top level on 3 sides, She could not view out and the pool.

Top: Outside view of cage.
Right: Interior views of both sides of cage.

Noise levels.
High noise levels were observed originating from several sources. Music was played constantly over the loudspeakers, interspersed with loudspeaker announcements, and visitors got very close to the enclosure. There was also noise from screams and a train whistle at the nearby amusement park.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
A large log was tied upright to a pole. A chain to hang meat on was hanging from top of cage. Swimming pool, approximately 27m^2 in size at the bottom of the cage which was deep enough for Satsuki to swim but not dive (Satsuki could stand up on 4 legs).

Objects for play and manipulation.
Several logs on floor of enclosure, 1 small plastic buoy, a loop of fireman hose hanging from roof of cage. Satsuki did not manipulate any of these objects.

Private areas.
No private areas for Satsuki to escape from public view.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Cage floor was clean. Pool water appeared clean.

Safety.
Rust on doors, poles, chain, metal discs on floor. There was a metal hook hanging on a chain from the roof (on which meat was hung) which could potentially be dangerous, and this too was rusted.
Visitors could potentially throw objects into the enclosure. Visitors were seen throwing food into the cage.

III Provision of enrichment/ feedings.
Satsuki was locked into night den at 1110. A keeper entered the cage and hid meat, apples and fish all around the enclosure and hung some meat on the hook. A large amount of food was given (3 chunks of meat, 10 fish, 5 apples approximately) which seemed to be a main meal.

IV Bear behaviour.

Satsuki engaged in stereotypic behaviour (pacing and neck turning) for much of the day. There were 2 distinct pacing routes, both occurring between the same 2 walls but following a slightly different route. The pacing behaviour was always accompanied by neck turning at the walls, either at one end of the route or at both ends. Where Satsuki repeatedly performed a neck twist against one of the walls, it could clearly be seen that the paint had been worn away on the wall where she repeatedly rubbed her head. The paint on the floor of the cage was especially worn away along the pacing route. Satsuki was also seen performing neck turns in the pool.

Satsuki displayed stereotypic pacing and neck turning behaviour for much of the day.

V Physical condition of the bear.

There did not appear to be any obvious outwardly visible signs of physical abnormalities for Satsuki.

VI Informational signs/ visitor behaviour.

1 sign provided basic information about polar bears. 1 sign displayed details about Satsuki. Signs could be viewed easily.

6.9% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 105.1 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Suitable enclosure design.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of sufficient enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.

7.2.16 Oga Aquarium

Overall findings.
Oga Aquarium's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the aquarium did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Date of visit: 14 July 2006.

I The bear.
Number: 1.
Sex: Male.

II The enclosure.
Open-air, rectangular, pit-style enclosure situated near to the sea. Visitors could look down into the enclosure from both indoor and outdoor viewing areas on 2 sides of the enclosure.

Size of enclosure.
Approximately 345m^2.

Animal sightlines.
The bear could not see out of the enclosure.

Ground type/ substrate.
The majority of the flooring was concrete. However, over one third of the ground was covered with woodchips, covering an area of approximately 149.5 m^2. The bear was seen to dig and roll in the woodchip and also sleep on the woodchip.
There was a constant patch of ice about 4m^2 in size and a few inches deep formed from the accumulation of small balls of ice which were continually spraying into the enclosure from a pipe in one top-hand corner.

Noise levels.
The enclosure was in a quiet location by the sea.

Shelter/ shade.
No shelter from rain or shade from sun provided in enclosure.

Furniture.
Some large boulders on which the bear could climb and rest. Some large logs lying on the ground. Swimming pool approximately 24m^2 in size.

Objects for play and manipulation.
5 plastic buoys and balls of differing sizes and shapes. 15 different pieces of log of different sizes, some branches, leaves and bones in the enclosure.
The bear played with the plastic toys, logs and bones both in the pool and on land. Pieces of bark were scattered around the enclosure and many of the logs had the bark peeled off, indicating that the bear had been peeling bark from the logs.
There was a small pile of snow/ice inside the enclosure. This was formed from small balls of ice that were continually sprayed into the enclosure from a pipe positioned high up in one corner. The bear was observed diving into the 'ice pile, grabbing mouthfuls of it in the process.

Private areas.
No private areas for the bear to escape from public view.

Access to off-exhibit areas.
Night den was accessible throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean. There was a small trough of drinking water in one corner.

Safety.
Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
Various food items (fish, carrots, leaves) were seen to be hidden under the logs. At 1125 the bear was locked into the night den and keepers entered the enclosure to scatter food. Pieces of watermelon, sweet potato, bread, fish, carrots and leafy vegetables were spread around the enclosure and hidden under logs. Biscuits (which appeared to be human biscuits) were stuck on the wall all around the enclosure with peanut butter. Peanut butter was smeared on the logs and into holes in the walls. A whole tub of peanut butter and a whole packet of biscuits were used.

IV Bear behaviour.

The bear engaged in stereotypic behaviour (pacing and neck turning) for a significant amount of time. The bear always paced along the same wall of the enclosure; the wall nearest the night den, below the outdoor visitor viewing area. The bear also engaged in neck turning behaviour, sometimes as part of the pacing routine or sometimes the neck turns were performed independently.

V Physical condition of the bear.

The bear appeared to be somewhat overweight and had bald patches on his head.

The bear had bald patches on the head.

VI Informational signs/ visitor behaviour.

10 informational signs with detailed information, including diagrams, about polar bears. 3 signs displayed details about this bear. Signs could be viewed easily.

34.8 % of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 358.4 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain in outdoor enclosure.
- Sufficient relief from heat and humidity.
- Visual barriers/private areas to avoid the public.
- Sufficient furniture/climbing structures.
- Sufficient movable enrichment devices for play and manipulation.
- View.
- Effective barriers between visitors and the bear.
- Provision of sufficient enrichment activities/feedings throughout the day.

7.2.15 Sapporo Muruyama Zoo

Overall findings.
Both polar bear enclosures at Sapporo Muruyama Zoo failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

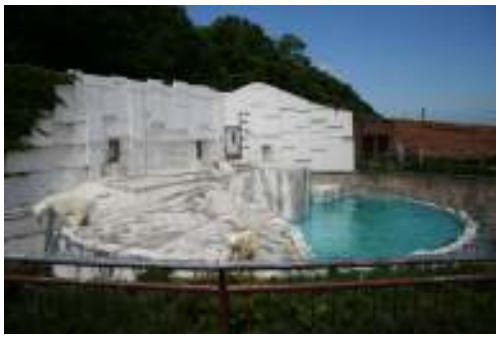
General notes.
Sapporo Muruyama Zoo is a member of JAZA.

Date of visit: 4 July 2006.

I The bears.
Number: 3.
Sex: 1 male, 1 female, 1 male cub.
The male was called Denari. The female was called Rara. The cub was called Pirica and was born on 15.12.05. A sign explained that Denari was kept separate as the keeper was worried he could hurt the female and cub.

II The enclosures.
Enclosure 1: Rara and Pirica were housed in an open-air, island-style enclosure with a deep moat around the front half. This was the main enclosure. There were steps down to the bottom of the moat.

Enclosure 2: Denari was housed in an extremely small, open-air rectangular cage at visitor level. Visitors could potentially climb over barrier and put their hand through the bars.



Enclosure 1.

Enclosure 2.

Size of enclosures.
Enclosure 1: Approximately 154m^2.
Enclosure 2: Approximately 24m^2.

Animal sightlines.
Enclosure 1: The bears could view beyond enclosure onto the visitor viewing area.
Enclosure 2: Denari could see out from 1 side of cage (the front) onto the visitor viewing area.

Noise levels.
High noise levels were observed from visitors getting very close to the enclosures and from many noisy school groups.

Ground type/ substrate.
Enclosure 1: Fully concrete flooring. No soft substrates.
Enclosure 2: Fully concrete flooring. No soft substrates.

Shelter/ shade.
Enclosure 1: No shelter from rain or shade from sun provided.
Enclosure 2: No shelter from rain or shade from sun provided.

Furniture.
Enclosure 1: No furniture provided on land. One swimming pool approximately 70m^2 in size.
Enclosure 2: No furniture provided on land. Small, shallow pool, approximately 4m^2 in size. This was not large enough for Denari to swim in or deep enough for him to submerge fully.

Objects for play and manipulation.
Enclosure 1: 2 plastic buoys, 1 long log, 1 very small log. Both logs were rotten. Pirica played with a buoy and a log in the pool.
Enclosure 2: 1 log hanging on a chain from the ceiling, 1 plastic buoy. Denari touched the buoy once.

Private areas.
Enclosure 1: No private areas for the bears to escape from public view or each other.
Enclosure 2: No private areas for Denari to escape from public view.

Access to off-exhibit areas.
Enclosure 1: No access to off-exhibit areas throughout the day.
Enclosure 2: Denari had access to the night den for much of the day and most of the interior of the night den was obscured from public view.

Hygiene.
Enclosure 1: Enclosure floor was clean. Pool water appeared clean.
Enclosure 2: Cage floor was clean. Pool water appeared clean.

Safety.
Enclosure 1: There was a large, potentially dangerous, vertical drop from the rim of pool down to the moat below. Pirica was seen walking along rim of pool and could easily have fallen in.
Enclosure 2: There was a rusted chain hanging from the roof of the cage (attached to a log).
Visitors could potentially throw objects into both enclosures.

III Provision of enrichment/ feedings.
Enclosure 1: The bears were given 2 feedings. In the morning they were given a few apples, in the early afternoon they were given some vegetables and apples.
Enclosure 2: Denari was given 2 feedings. In the morning he was given a few apples, in the early afternoon he was given vegetables and apples.

IV Bear behaviour.
Enclosure 1: Rara engaged in stereotypic behaviour (pacing) for a significant amount of time.
Rara often appeared to be trying to sleep/rest, but appeared uncomfortable, possibly due to the very high ambient temperature and humidity from which there was insufficient relief. Rara was seen to bang on the door to the night den on several occasions.

Rara engaged in stereotypic pacing behaviour for long periods of time.

Enclosure 2: Denari engaged in stereotypic behaviour (pacing) for most of the day (from back to front of the cage). A sign in front of his enclosure stated "I get irritated in here because it's so small but I have to put up with it."

V Physical condition of the bears.
Enclosure 1: There did not appear to be any obvious outwardly visible signs of physical abnormalities for Rara and Pirica.
Enclosure 2: Denari appeared somewhat underweight. His front teeth appeared to be rotten.

VI Informational signs/ visitor behaviour.

2 informational signs provided basic information about polar bears. 2 signs displayed details of the individual bears. Signs could be viewed easily.

19.1% of visitors looked at one or more of the signs.

The average time spent at the enclosures by visitors was 165.5 seconds.

VII Assessment.

Enclosure 1.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.

Enclosure 2.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Pool large enough for swimming.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- View.
- Effective barriers between the public and the bear.
- Source of drinking water other than pool water.

7.2.16 Tennoji Zoo

Overall findings.
Tennoji Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Tennoji is a member of JAZA and a member of WAZA.

Date of visit: 26 July 2006.

I The bear.
Number: 1.
Sex: Male.

The bear was called Gogo.

II The enclosure.

Open-air, grotto-style enclosure with high walls at the back and on 2 sides. The floor of the enclosure sloped downwards, with the land divided into small areas at many different levels. The enclosure appeared to be old; the paintwork on the walls and floor was chipped and stained and some fixtures were rusted.
There were moving jets of water spraying water over the whole of the enclosure continuously. Consequently, the floor of the entire enclosure was wet throughout the day, the only dry spot being the area under the cave.

Size of enclosure.
Approximately 286m^2.

Animal sightlines.
Gogo could look out of the front of the enclosure onto the visitor viewing area from the higher levels. Gogo could not see out from lower levels of the enclosure or from the pool positioned at the bottom of the enclosure.

Noise levels.
High noise levels were observed at times from trains running along an overhead track near the enclosure. There was also the noise of water running constantly into the pool.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
A small 'cave' provided a sheltered area of approximately 2.25m^2. Large trees on either side of the enclosure with branches extending over the enclosure offered some shade.

Furniture.
No furniture provided on land. Swimming pool approximately 108m^2 in size.

Objects for play and manipulation.
2 small plastic buoys of different shapes, 1 small block of wood. Gogo played with the block of wood.

Private areas.
There appeared to be a small area out of view of the public provided by a wall near the back of the enclosure, in front of the night den doors.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. There was some algal growth on the floor and sides of pools, but the water was fairly clear.

Safety.
A metal step leading to the pool was rusted. Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
1 apple cut into pieces was thrown into the pool at 1520 by a keeper. The keeper was apparently trying to encourage Gogo to go into the pool for the visitors.

IV Bear behaviour.
Gogo engaged in stereotypic behaviour (pacing) for a significant amount of time. In the morning he paced a route near the edge of the pool. In the afternoon he paced a route at the higher level at the back of the enclosure.

V Physical condition of the bear.

Gogo had some bald patches on the side of his face. He was observed rubbing his face on the bars of the door to his night den, which may explain the bald spots. He appeared slightly overweight.

VI Informational signs/ visitor behaviour.

1 sign provided basic information, with diagrams, about polar bears. 1 sign provided details about Gogo. Signs could be viewed easily.

8.3% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 70 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Sufficient visual barriers/private areas to avoid the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- Sufficient dry areas of floor.

7.2.17 Tobe Zoo

Overall findings.
Both polar bear enclosures at Tobe Zoo failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

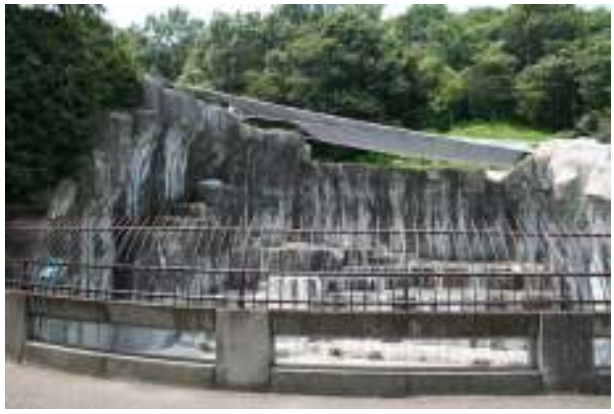
General notes.
Tobe Zoo is a member of JAZA.

Date of visit: 4 August 2006.

The keeper was seen to enter the cage with one of the bears (in Enclosure 2) and take photos of the bear.

I The bears.
Number: 2.

II The enclosures.
Enclosure 1: The main enclosure was an open-air, grotto-style enclosure, roughly rectangular in shape, with high walls on 3 sides. The floor was divided into many different levels and sloped downwards from the back to the front of the enclosure. In addition to the main body of the enclosure, the enclosure extended into the area behind the sea lion enclosure next door which provided a small amount of extra floor area. The enclosure looked old and in a state of disrepair. The white paintwork on the floor and walls was stained brown. The concrete floor was extensively cracked with large pieces of concrete missing in places.



Enclosure 1.

Enclosure 2.

Enclosure 2: The other enclosure was a small, dark,

open-air cage. Visitors could potentially climb over the barrier and put their hand through the bars.

There was a machine selling bear biscuits in front of the main polar bear enclosure together with a machine selling fish for the sea lions. Visitors could buy either of these and feed them, with no supervision, to the polar bears.

Size of enclosures.
Enclosure 1: Approximately 190m^2.
As the floor was on so many different levels, there was no significantly-sized usable flat land area.
Enclosure 2: Approximately 30m^2.
In addition to the main body of the cage, there was a night den area at the back which was accessible to the bear throughout the day.

Animal sightlines.
Enclosure 1: The bear could view out of the enclosure onto the visitor viewing area from the higher levels, but could not see out from the lower levels or from the swimming pool.
Enclosure 2: The bear could only view out forwards from the cage onto the visitor viewing area. The bear's view was further restricted by the bars of the cage.

Noise levels.
High noise levels were observed at both enclosures from loud announcements and music played over the tannoy every hour and from visitors getting too close to the enclosure. There was also a lot of noise from the sea lions in the neighbouring enclosure, especially when visitors came close. The visitors could buy fish to feed the sea lions, so the sea lions made a lot of noise in anticipation of being fed every time visitors approached.

Ground type/ substrate.
Enclosure 1: Fully concrete flooring. No soft substrates.
Enclosure 2: Fully concrete flooring. No soft substrates.

Shelter/ shade.
Enclosure 1: Shade was provided over the back half of the enclosure by a shade cloth tied above the enclosure.
Enclosure 2: The whole enclosure was shaded by shade cloth covering the entire roof of the cage and extending about 2m down the sides. Therefore the interior of the cage was very dark, with very little sunlight penetrating in.

Furniture.
Enclosure 1: No furniture provided on land. Swimming pool approximately 50m^2 in size.
Enclosure 2: No furniture provided on land. Very small pool approximately 2.5 m^2 which was not big enough for the bear to swim. The pool was empty until around 1310.

Objects for play and manipulation.
Enclosure 1: 1 large buoy. The bear played with the buoy.
Enclosure 2: 1 tire, 2 plastic buoys, 1 small metal bucket, 1 ball, 1 old log hanging on a chain from the roof. The bear did not manipulate any of these items.

Night dens.
Enclosure 2: A night den at the back of the enclosure could be seen. The night den appeared dark, with a concrete floor and contained no furniture or soft substrates.

Private areas.
Enclosure 1: The bear sometimes disappeared from view. There appeared to be a place at the side of the enclosure where the bear could not be seen.
Enclosure 2: There were no private areas for the bear to escape from public view.

Access to off-exhibit areas.
Enclosure 1: It was unclear whether the night den was accessible during the day as no night den door could be seen. It is possible that the night den was accessible during the day and this could have been where the bear escaped from view.
Enclosure 2: The night den at the back was accessible to the bear throughout the day. However, visitors could see into the night den.

Hygiene.
Enclosure 1: Enclosure floor was clean. Pool water appeared clean.
Enclosure 2: Cage floor was free of debris. However, the pool water was left running all day from the time it was switched on, as a result of which water continuously overflowed out of the pool. The floor of the cage was thus constantly wet and covered in algal growth.

Safety.
Enclosure 1: Visitors could potentially throw objects into the enclosure.
Enclosure 2: There was a rusted chain hanging from the ceiling (attached to the log.)

III Provision of enrichment/ feedings.

Enclosure 1: No feedings or provision of enrichment activities were observed.

Enclosure 2: The bear was given some food at 1345.

IV Bear behaviour.

Enclosure 1: The bear engaged in stereotypic behaviour (pacing) for a significant amount of time.

Enclosure 2: The bear was seen to display stereotypic behaviour (neck turning). The bear was also seen repeatedly bobbing up and down in the pool in a repetitive, stereotypic fashion.

The bear in the main enclosure had algal growth in the guard hairs.

V Physical condition of the bears.

Enclosure 1: There did not appear to be any obvious outwardly visible signs of physical abnormalities for the bear. The bear had some green patches of fur, indicating algal growth in the guard hairs.

Enclosure 2: The bear appeared to be overweight. A sign stated that the bear in Enclosure 2 suffered from a stress-related disease, and epilepsy was mentioned.

VI Informational signs/ visitor behaviour.

No detailed informational signs on polar bears. 2 signs displayed details about one of the bears named Peace. Signs could be viewed easily.

0% of visitors looked at the signs.

The average time spent at the enclosure by visitors was 36.3 seconds.

VII Assessment.

Enclosure 1.

Lack of:

- Sufficient space.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Source of drinking water other than pool water.
- Provision of enrichment activities/feedings throughout the day.

Enclosure 2.

Lack of:

- Sufficient space.
- Sunlight/light.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid the public.
- Furniture/climbing structures.
- Sufficient movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Source of drinking water other than pool water.
- Pool large enough for swimming.
- View.
- Effective barriers between visitors and the bear.
- Provision of enrichment activities/feedings throughout the day.

7.2.18 Tokushima Zoo

Overall findings.
Tokushima Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Tokushima Zoo is a member of JAZA.

Date of visit: 1 August 2006.

I The bears.
Number: 2.
Sex: 1 male, 1 female.

The male was called Chiro and was born on 3.12.1979. He came from Hokkaido, Japan. The female was called Barley and was born on 3.12.85. She came from Russia.

II The enclosure.
Open-air enclosure at visitor level with only a small area of dry land. There were walls on 3 sides and 2 of these walls contained viewing windows. In total, there were 6 large viewing windows and 6 small circular windows and the visitors could see the bears from nearly every point along the 2 walls.

Size of enclosure.
Approximately 75m^2.

Animal sightlines.
On the side of the enclosure opposite the viewing windows, the bears could see out through electric fencing onto an area of trees.

Noise levels.
Visitors could get very close to the bears and potentially bang on the windows.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided. Nearly all areas of the enclosure were in the full glaring sun.

Furniture.
No furniture provided on land. Swimming pool approximately 25 m^2 in size, approximately 1.5m deep.

Objects for play and manipulation.
1large buoy. The bears did not manipulate the buoy.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Some parts of the floor were not well drained due to its uneven surface, resulting in small pools of stagnant water containing brown algae. The water in the pool was green and the sides of the pool showed considerable algal growth.

III Provision of enrichment/ feedings.
No feedings or provision of enrichment activities were observed.

IV Bear behaviour.
Both bears were inactive for most of the day, possibly due in part to the extremely high ambient temperatures and humidity. The larger bear in particular hardly moved at all. The smaller bear engaged in stereotypic pacing and swimming, always a repetitive circular pattern around the pool, starting and finishing at the same point.
Both bears showed indications that they were suffering from heat stress, panting for most of the day and laying with their bodies flat on the floor in an effort to dissipate heat. The smaller bear was seen to submerge in the pool during the hottest part of the day and simply float around.

V Physical condition of the bears.

The smaller bear appeared overweight. A sign about Barley the female (probably the smaller bear) stated "I love to nap. Is that why I gain weight quickly?" The smaller bear also had bald patches on the head and shoulder.
There did not appear to be any obvious outwardly visible signs of physical abnormalities for the larger bear, although the bear had a significant amount of green fur, indicating algal growth in the guard hairs.

The larger bear had extensive algal growth in the guard hairs.

VI Informational signs/ visitor behaviour.

2 signs provided fairly detailed information, with diagrams, about polar bears. 2 signs displayed details about the individual bears. Signs could be viewed easily.

9.2% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 104.3 seconds.

VII Assessment.

Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Provision of enrichment activities/feedings throughout the day.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.

7.2.19 Tokuyama Zoo

Overall findings.
Tokuyama Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Tokuyama Zoo is a member of JAZA.

Date of visit: 6 August 2006.

I The bears.
Number: 2
Sex: 1 male and 1 female.

The male was called Hokuto and arrived at the zoo on April 9th (no year given). The female was called Yuki and she also arrived at the zoo on April 9th (no year given).

II The enclosure.
Open-air, extremely small, semi-circular, traditional pit-style enclosure. Over half of the total area of the enclosure (nearly two thirds) was taken up by a swimming pool, leaving an exceptionally small land area.
The enclosure appeared to be very old with heavily worn paintwork.

Size of enclosure.
Approximately 32m^2.
Enclosure was extremely small, especially for 2 individuals. The land area was approximately 14m^2 and only between 1m and 3m wide.

Animal sightlines.
The bears could not view out of the enclosure.

Noise levels.
High noise levels were observed from visitors getting very close to the enclosure.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
Some shelter was provided by a roof at the back of the enclosure. However, the sheltered area was only large enough for 1 bear.

Furniture.
No furniture provided on land. Swimming pool approximately 18m^2 in size.

Objects for play and manipulation.
No movable objects were provided.

Private areas
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean. However, one bear was seen to defaecate into the pool, which was the only source of drinking water.

Safety.
There was litter around the enclosure which could have been knocked in. Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.

1 boiled egg was given at 0945. 2 pieces of meat were given at 1005. 2 plain ice blocks were given at 1340. 2 ice blocks containing apples and meat were given at 1400.

The smaller bear exhibited 2 different stereotypic swimming behaviours, including performing repeated back-flips.

IV Bear behaviour.

The smaller bear engaged in stereotypic behaviour (stereotypic swimming) for a significant amount of time and followed 2 distinct, repetitive swimming patterns. One of

these patterns involved repetitive back flips.
The larger bear was inactive for most of the day.
Aggression was observed between the bears in the form of physical attack and vocalizations. Most aggression occurred when fighting over food and ice blocks. The smaller bear appeared dominant over the larger bear and stole food from the larger bear. The larger bear showed some aggression towards the smaller bear when the smaller bear disturbed the larger bear when he/she was sleeping.

V Physical condition of the bears.

The smaller bear appeared to be considerably overweight and had a bald patch on one leg.
There did not appear to be any obvious outwardly visible signs of physical abnormalities for the larger bear.

The smaller bear was considerably overweight.

VI Informational signs/ visitor behaviour.

1 sign provided basic information about polar bears. 2 signs displayed details about the individual bears. Signs could be viewed easily.

1.3% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 75.4 seconds.

The keeper provided a commentary when he gave the ice blocks.

VII Assessment.

Lack of:
- Sufficient space, especially for 2 individuals.
- Dry land area.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.

7.2.20 Toyohashi Zoo

Overall findings.
Kyoto Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Toyohashi Zoo is a member of JAZA.

Date of visit: 23 July 2006.

I The bears.
Number: 3.

II The enclosure.
Open-air enclosure, roughly rectangular in shape, with ground raised slightly above visitor viewing area. Visitors could see into the enclosure through 6 viewing windows along one side of the enclosure from a covered indoor viewing area. There were high walls at 2 ends of the enclosure.

Size of enclosure.
Approximately 250m^2.

Animal sightlines.
The bears could see out of the back of the enclosure, through an electric wire barrier.

Noise levels.
High levels of noise were observed from visitors getting too close to the bears and visitors knocking on the glass windows.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
No furniture provided on land. Swimming pool approximately 76m^2 in size, approximately 3m deep in some places allowing the bears to dive. The pool also contained some areas of shallow water.

Objects for play and manipulation.
No movable objects were provided.

Private areas.
There was an area at one edge of the enclosure where the bears could escape from public view. However, this appeared to only accommodate a maximum of 2 bears.

Access to off-exhibit areas.
One night den door was visible and this was closed the whole day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

III Provision of enrichment/ feedings.
The bears were given feedings at 1100 and 1430. Both times they were given small pieces of meat and dead fish, thrown into the pool or on land.

IV Bear behaviour.
All of the bears were inactive for most of the day. 2 of the bears engaged in stereotypic behaviour (pacing). This occurred at the edge of the enclosure, with both bears pacing the same route, often simultaneously.
The 2 smaller bears appeared dominant over the largest bear and were at times seen preventing the bear from coming out of the pool and stopping him/her from leaving the private area. The 2 smaller bears prevented the larger bear from accessing food thrown into the pool.
The 2 smaller bears were seen to rest together whilst the larger bear rested alone.

V Physical condition of the bears.

One of the smaller bears appeared to be overweight. This bear also had a black lump under the chin. There did not appear to be any obvious outwardly visible signs of physical abnormalities for the other smaller bear.
The larger bear had a black lump over one eye.
All 3 bears had patches of green fur, indicating algal growth in their guard hairs.

The 2 smaller bears were overweight. All 3 bears were highly inactive.

VI Informational signs/ visitor behaviour.

1 sign provided fairly detailed information, with diagrams, about polar bears. Details about the individual signs were displayed on the same sign. The sign could be viewed easily.

7.2% of visitors looked at the sign.

The average time spent at the enclosure by visitors was 68.8 seconds.

VII Assessment.

Lack of:
- Sufficient space, especially for 3 individuals.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Sufficient visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Source of drinking water other than pool water.

7.2.21 Ueno Zoo

Overall findings.
Ueno Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Ueno Zoo is a member of JAZA and a member of WAZA.

Date of visit: 2 July 2006.

I The bears.
Number: 2.

II The enclosure
Open-air, semi-circular, grotto-style enclosure with land at several different levels. The lower levels were below visitor level, the higher levels were at visitor level and above visitor level.

Size of enclosure.
Approximately 190.1m^2.

Animal sightlines.
The bears could see forwards out of enclosure at higher levels. The bears could not see out of pool which was situated at the bottom of the enclosure.

Noise levels.
High noise levels were observed as a result of a waterfall inside the enclosure (running intermittently), loudspeaker announcements, and visitors getting very close to the enclosure and guided tours.

Ground type/ substrate.
Fully concrete flooring. No soft substrates.

Shelter/ shade.
No shelter from rain or shade from sun provided.

Furniture.
2 fixed logs on the ground; both were a few metres long.
Swimming pool approximately 66m^2 in size.

Objects for play and manipulation.
No movable objects provided.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

Safety.
Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
The bears were given 3 feedings throughout the day: In the morning sweet potatoes, apples and boiled eggs were thrown into the enclosure. In the early afternoon they were given ice blocks containing sweet potatoes and apples. In the late afternoon frozen meat on the bone was provided.

There was 1 visible enrichment device, a metal bucket with the bottom cut out into which a block of ice containing apples was placed. When the ice melted, the apples fell into the pool.

IV Bear behaviour.
Both bears engaged in stereotypic behaviour (pacing) for a significant amount of time. The smaller bear also engaged in stereotypic swimming.
Both bears utilized only a limited area of the enclosure.
No interaction between the bears was observed.

The bears paced the same route simultaneously at the top level of the enclosure.

V Physical condition of the bears.

There did not appear to be any obvious outwardly visible signs of physical abnormalities for either bear.

The smaller bear engaged in stereotypic swimming behaviour, repeatedly pushing off from the same point of the wall and swimming exactly the same pattern.

VI Informational signs/ visitor behaviour.

1 sign provided information about polar bears. The sign was located some distance away from the polar bear enclosure and visitors standing at most points around the enclosure would not have been able to see the sign.

3.2% of visitors looked at the sign.

The average time spent at the enclosure by visitors was 106 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.

7.2.22 Yagiyama Zoo

Overall findings.
Both polar bear enclosures at Yagiyama Zoo failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Yagiyama Zoo is a member of JAZA.

Date of visit: 12 July 2006.

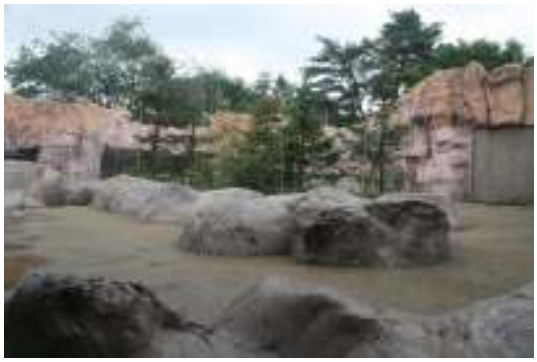
I The bears.
Number: 2.

II The enclosures.
There were 2 polar bear enclosures, one much larger than the other and each housing 1 polar bear.
Enclosure 1: The main enclosure was open-air, trapezium shaped and at visitor level with high walls all around. There were several large glass windows in 2 of the walls through which visitors could look into the enclosure from a covered viewing area.

Enclosure 1.

Enclosure 2: The smaller enclosure was open-air extremely small and roughly triangular in shape. It was at visitor level with high walls all around. There was 1 large glass window at the front of the enclosure through which visitors could look into the enclosure from a covered viewing area.

Underwater viewing window at Enclosure 1.



Enclosure 1.

Size of enclosure.
Enclosure 1: Approximately 400 m^2.
Enclosure 2: Approximately 30 m^2. The land area was extremely small, approximately 18 m^2 in size.

Enclosure 2.

Animal sightlines.
Enclosure 1: The bear's only view out of the enclosure was through the visitor viewing windows, onto the indoor visitor viewing area.
Enclosure 2: The bear's only view out of the enclosure was through the single large viewing window, onto the indoor visitor viewing area.

Ground type/ substrate.
Enclosure 1: Predominantly concrete flooring. There was an area of fixed pebbles, and some areas of gravel, but no soft substrates.
Enclosure 2: Fully concrete flooring. No soft substrates.

Noise levels.
Enclosure 1: Visitors could potentially knock on the windows on 2 sides of the enclosure, creating noise.
Enclosure 2: Visitors were seen knocking on the glass, creating considerable noise.

Shelter/ shade.
Enclosure 1: No shelter from rain or shade from sun provided.
Enclosure 2: No shelter from rain or shade from sun provided.

Furniture.
Enclosure 1: Some trees in the middle of the enclosure. They were not big enough to provide any shade. Many artificial boulders of different sizes throughout the enclosure. Swimming pool approximately 100m^2 in size, approximately 5m deep at the deepest point, allowing the bear to dive.
Enclosure 2: No furniture provided on land. Swimming pool approximately 12m^2 in size. This was empty at the beginning of the day and not filled for several hours. Once full, the pool was not large or deep enough to allow the bear to dive or for any significant swimming.

Objects for play and manipulation.
Enclosure 1: No movable objects provided.
Enclosure 2: No movable objects provided.

Private areas.
Enclosure 1: No private areas for the bear to escape fully from public view (the bear could partially be concealed from public view in some areas).
Enclosure 2: No private areas for the bear to escape from public view.

Access to off-exhibit areas.
Enclosure 1: No access to off-exhibit areas throughout the day.
Enclosure 2: No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure 1: Enclosure floor was clean. There was some debris in the pool water.
Enclosure 2: Enclosure floor was clean. The pool water was dirty, clouded and contained a lot of debris.

Safety.
Enclosure 1: The bear was seen to pull bits of the rubber seal surrounding the windows off with his mouth or claw and ingest them.

III Provision of enrichment/ feedings.
Enclosure 1: No feedings or provision of enrichment activities were observed.
Enclosure 2: No feedings or provision of enrichment activities were observed.

IV Bear behaviour.
Enclosure 1: The bear engaged in stereotypic behaviour (pacing and neck turning) for a significant amount of time. The bear paced along the back wall of the enclosure and performed the neck turn at the end of the pacing route, against the wall. The neck turning behaviour was especially pronounced in this bear. Neck turns were spontaneously performed from a stationary position, including a sequence of 3 neck turns in a row.
The bear utilized only

The bear in Enclosure 1 exhibited pacing and neck turning stereotypic behaviour for much of the day.

approximately 10% of the dry area of the enclosure. Most of the active periods were spent pacing the same route along the back wall, or resting in the same spot near one of the viewing windows.
The bear was frequently observed to be intently watching the bear in the smaller enclosure.
The bear showed indications of heat stress, panting for much of the day and foaming at the mouth at times.

Enclosure 2: The bear showed very pronounced stereotypic behaviour and was engaged in stereotypic behaviour (pacing, stereotypic swimming and neck turning) for most of the day.
In the morning when there was very little water in the pool, the bear repeatedly paced the same route around the edge of the dry land, performing neck turns when changing direction. As soon as the pool was filled, the bear spent nearly the whole of the rest of the day swimming in a repetitive circular pattern, always performing a neck turn when pushing off from the same spot on the window whilst standing up. The bear was seen to swim in a circle, go under the water, come up at the same point of the window, stand up and push off the window with a front paw, perform a neck turn, then repeat. This severe, unwavering stereotypic behaviour was observed for most of the day.


The bear in Enclosure 2 spent hours repeatedly swimming in circles, always pushing off from the window at the same position.

V Physical condition of the bears.
Enclosure 1: There did not appear to be any obvious outwardly visible signs of physical abnormalities for the bear. However, he/she was observed scratching at the ears a lot and shed a lot of fur when in the water.
Enclosure 2: There did not appear to be any obvious outwardly visible signs of physical abnormalities for bear, although he/she shed a lot of fur when in the water.

VI Informational signs/ visitor behaviour.

3 signs provided fairly detailed information about polar bears, including diagrams. Signs were easy to read, although all were placed in one area in the middle of the exhibit. Therefore, visitors who only viewed the polar bears from one of either end of the exhibit and did not walk the entire length of the exhibit would not see the signs.

7.2% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 200.5 seconds.

VII Assessment.

Enclosure 1.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Sufficient furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.
- Provision of enrichment activities/feedings throughout the day.

Enclosure 2.
Lack of:
- Sufficient space.
- Shelter from sun and rain.
- Relief from heat and humidity.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- Pool large enough for significant swimming.
- View.
- Provision of enrichment activities/feedings throughout the day.

7.2.23 Yokohama Sea Paradise

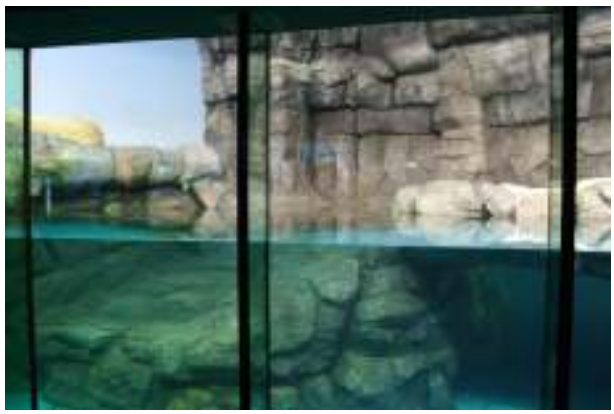
Overall findings.
Yokohama Sea Paradise's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the facility did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Yokohama Sea Paradise is a member of JAZA.

Date of visit: 17 July 2006.

I The bears.
Number: 2.
The bears were named Yukihime and Yukimaru. Both had been at Yokohama Sea Paradise since 1993. The bears came from different places.

II The enclosure.
Indoor, fully enclosed, glass-fronted enclosure with air-conditioning and artificial lighting. The enclosure was roughly rectangular. The pool took up most of the enclosure, leaving a very small land area making up less than half the enclosure. The dry land was divided into a lower level and a raised level. Visitors could view the bears through windows extending along the length of the tank on both the ground level and from a second floor level in the building.



Size of enclosure.
Approximately 72m^2.
There was very little available land area. Approximately half of the enclosure was taken up by the pool and a further area was taken up by an area of shallow water between the 2 land areas.

The swimming pool took up more than half of the enclosure.

The lower land level was the largest available piece of dry land, measuring approximately 18m^2.

Animal sightlines.
The bears could look out on one side, onto the indoor visitor viewing area.

Noise levels.
High levels of noise were observed from large numbers of people getting very close to the tank. Visitors were seen to bang on the glass.

Ground type/ substrate.
Hard, artificial flooring throughout. No soft substrates.

Furniture.
No furniture provided on land. Swimming pool approximately 36m^2 in size, approximately 2.5 m deep in some places allowing the bears to dive.

Objects for play and manipulation.
No movable objects provided.

Private areas.
No private areas for the bears to escape from public view or each other.

Access to off-exhibit areas.
No access to off-exhibit areas throughout the day.

Hygiene.
There was a pool of dirty water on the raised ground level. There was algal growth in the pool. Both bears urinated and defecated in the pool, which was the only source of drinking water.

III Provision of enrichment/ feedings.
The bears were given feedings at 1150 and 1450. At the first feeding they were given small pieces of dead fish, at the second feeding they were given small pieces of dead fish and pieces of meat. At both feedings the smaller bear was seen to sit on the hind legs and 'beg' and 'wave' before being rewarded with a piece of food, this behaviour seemingly encouraged by the keeper. The smaller bear also caught food with the front legs.
Ice blocks were thrown into the enclosure at a different time.

IV Bear behaviour.

The smaller bear was very inactive for most of the morning, sleeping on the lower land area. The smaller bear engaged in stereotypic behaviour (pacing) for most of the afternoon around the lower land area. The bear followed a very rigid route and pattern, always swinging the head to the left and making a full body turn in the same corner when turning around.

The larger bear was completely inactive almost continuously, lying and sleeping in exactly the same place nearly all day. A sign with a drawing of a sleeping polar bear stated "He likes to sleep." The larger bear did not appear very interested in food.

No interaction between the bears was observed and they rested far apart from each other.

The larger bear was chronically inactive, barely moving throughout the day.

V Physical condition of the bears.

Both bears appeared somewhat overweight.

Both bears had bald patches on their heads. Both had dirty, matted fur, especially the larger bear.

VI Informational signs/ visitor behaviour.

2 signs provided fairly detailed information, including diagrams, about polar bears. 1 sign displayed details about the individual bears. 1 sign described the importance of environmental enrichment and the measures in place for the bears.

9.1% of visitors read one or more of the signs.

The average time spent at the enclosure by visitors was 70.8 seconds.

VII Assessment.

Lack of:

- Sufficient space.
- Soft substrates / areas for digging.
- Visual barriers/private areas to avoid each other or the public.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Hiding places for feed.
- Access to off-exhibit areas.
- Source of drinking water other than pool water.
- View.

7.2.24 Yokohama Zoo

Overall findings.
Yokohama Zoo's polar bear enclosure failed to meet the minimum enclosure design requirements stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003 and the zoo did not appear to satisfy the Act's basic husbandry requirements.

General notes.
Yokohama Zoo (also known as Zoorasia) is a member of JAZA.

Date of visit: 16 July 2006.

I The bears.
Number: 2.
Sex: 1 male, 1 female.

The male was called Janbui and the female was called Chiro. At the time of our visit the bears were kept in separate enclosures adjacent to each other. A sign explained that the bears were kept together from February to mid-June, but were now separated because in the wild polar bears live separately except for during the mating season. The sign explained that the bears moved between the 2 enclosures on alternate days.
It was only possible to view the main enclosure properly. The other, smaller, enclosure was obscured from view, although we could see into it partially through wire mesh covered openings. Therefore, only the main enclosure i.e. the one that was on view to the public was assessed.
On the day of our visit, the smaller bear was in the main enclosure.
The bears could see and smell each other through wire mesh-covered openings in the walls between the 2 enclosures.

II The enclosure.
Open-air, elongated enclosure with high walls all the way around. Visitors could look down into the enclosure from a raised outdoor viewing area and onto the pool area at ground level through 3 indoor viewing windows.

Size of enclosure
Approximately 650m^2.

The main enclosure which was on view to the public.

Animal sightlines.
The bears' view out of the enclosure was restricted to looking out of these windows onto the indoor visitor viewing areas.

Noise levels.
A large waterfall running constantly into the pool was a continuous source of noise.

Ground type/ substrate.
The majority of the flooring was concrete. There were some areas of grass at the top of some of the hilly mounds, some small round patches of grass on the enclosure floor and some areas of soil.

Shelter/ shade.
A 25 m^2 shade cloth was tied above the enclosure on one side.

Furniture.
The enclosure was fairly complex. Some raised platforms and boulders were positioned throughout the enclosure. There were areas of vegetation at the top of some of the hilly mounds. There were also some logs. Large swimming pool approximately 250 m^2 in size. The pool extended along 2 sides of the enclosure and was approximately 4 m deep at the deepest point, allowing the bears to dive. The pool contained a shallow area where the bears could rest and a waterfall running into the pool at one end.

Objects for play and manipulation.
2 small plastic buoys, logs, leaves, bones. The bear manipulated the bones.

Private areas.
The bear could hide behind boulders and vegetation in some places. There were no private areas in the pool.

Access to off-exhibit areas dens.
No access to off-exhibit areas throughout the day.

Hygiene.
Enclosure floor was clean. Pool water appeared clean.

Safety.
Visitors could potentially throw objects into the enclosure.

III Provision of enrichment/ feedings.
No feedings or provision of enrichment activities were observed.

IV Bear behaviour.
The bear in the main enclosure engaged in stereotypic behaviour (stereotypic swimming)) for a significant amount of time. He/she swam from one side of the pool to the other in a straight line, always pushing off on his/her back from the same position on one side of the pool then, upon reaching the other wall, he/she turned and swam back to the starting position submerged just below the surface of the water. The bear was highly inactive throughout the morning, sleeping on the land and resting in the pool for long periods.

The smaller bear engaged in stereotypic swimming behaviour.

The bear in the smaller enclosure engaged in stereotypic behaviour (head weaving). He/she was often seen repeatedly swaying his head from side to side, sometimes stepping backwards and forwards simultaneously. This bear frequently appeared to be eager to make contact with and smell the bear in the main enclosure through the bars.

V Physical condition of the bears.
There did not appear to be any obvious outwardly visible signs of physical abnormalities for the smaller bear.
It was not possible to evaluate the physical condition of the other bear.

VI Informational signs/ visitor behaviour.
1 sign provided very basic information about polar bears. This sign was positioned at each of the 3 viewing areas. 1 other sign gave basic details about polar bear hunting behaviour. 1 sign displayed details about the individual bears and was placed at the raised visitor viewing area. The signs were easy to read.

8% of visitors looked at one or more of the signs.

The average time spent at the enclosure by visitors was 74.1 seconds.

VII Assessment.

Lack of:

- Sufficient shelter from sun and rain if both bears are in the enclosure.
- Relief from heat and humidity.
- Sufficient soft substrates / areas for digging.
- Sufficient visual barriers/private areas to avoid each other or the public if both bears are in the enclosure.
- Furniture/climbing structures.
- Movable enrichment devices for play and manipulation.
- Source of drinking water other than pool water.
- View.
- Effective barriers between visitors and the bear.
- Provision of enrichment activities/feedings throughout the day.
- Sufficient space.

CHAPTER 8
RECOMMENDATIONS

The Japanese captive facilities should, as a matter of urgency, make every effort possible to improve the living conditions of the polar bears and the husbandry practices in place, so the bears can, at the very least, express some of their natural behavioural repertoire.

The captive facilities should also implement measures to try to mitigate the physical effects of Japan's inappropriate climatic conditions on the polar bears.

Below are recommendations for short-term improvements to polar bear enclosure and husbandry techniques that can be implemented at all the Japanese facilities. These improvements serve to improve polar bear living conditions and will consequently have a positive impact on their well-being. These recommendations will hopefully serve to reduce the amount of abnormal behaviours and inactivity, but will probably not completely eliminate them. These recommendations are based largely on the EEP Ursid Husbandry Guidelines by the European Association of Zoos and Aquaria. One of the most important short-term improvements is providing a variety of enrichment.

8.1 Short-term recommendations.

The following recommendations are general, but in most cases can be applied to all the Japanese captive facilities inspected during the course of this study. As can be seen by the overall assessment at the end of each individual captive facility report (Chapter 7), every polar bear enclosure lacked acceptable standards in terms of several key features of enclosure design and husbandry. These shortcomings need to be addressed and living conditions and husbandry practices need to be improved for every polar bear at every facility.

However, there are some enclosures which are simply too small or do not have enough land area to implement most of these recommendations. In these cases, we recommend that the bears be moved to other enclosures or facilities. The enclosures at Hirakawa Zoo, Tokuyama Zoo and Cuddly Dominion are so small and have so little land area that it will be very difficult to make significant improvements. Similarly, the small dry land areas in enclosures at Kushiro Zoo (smallest enclosure), Sapporo Muruyama Zoo (smallest

enclosure), Himeji City Zoo, Yokohama Sea Paradise, Yagiyama Zoo, mean that very little that can be done to improve conditions.

However, that does not mean to say that in the meantime improvements should not be made to their living conditions. It is still possible to provide more shade and more enrichment objects and activities for the bears in these enclosures.

1. Provide soft substrates.

Natural ground vegetation is the best substrate for all bear species as it allows them to scratch, dig and construct pits and holes for resting. Food can also be scattered over the substrate or buried in it for the bears to find.

In addition, areas covered with materials of different composition, consistencies and textures, in both shady and sunny locations, will create diversity allowing the bears to construct day beds appropriate to different weather conditions.

An area bordered by wooden logs can also be filled with soil (10-20cm) in which a grass herb/mixture can be sown. This is possible even in extremely small enclosures of 200 square metres; the area may need to be regularly re-seeded.

Providing natural substrates in enclosures that feature a pool may be problematic as the bears may track a great deal of substrate material into the pool. However, a concrete lip can be constructed around the pool to prevent substrate materials from being tracked into it. An effective filter system can also help to negate this problem.

Any concerns about the hygiene of natural substrates in captive enclosures are unwarranted.[36] Substrates such as woodchips actually inhibit bacterial survival. It has been found that natural areas can provide behavioural and hygienic benefits for captive animals.[66]

2. Provide an area where the bears can construct day beds.

When resting, bears use day beds on the ground. These beds may be natural depressions or may be constructed by the bears, who scratch away vegetation and soil to create a shallow depression or pit.

3. Provide private areas.

Sufficient private areas should be provided to enable every bear in the enclosure to completely escape from public view and also avoid visual

contact with each other. These private areas can be created by boulders, caves, trees, bushes, logs etc.

4. Lower the temperature in the enclosure.

Sufficient shade should be provided to provide cool, shady areas to comfortably accommodate every bear in the enclosure.

The water in the pool should ideally be cooled, so the bears can obtain even greater relief from the heat. Ice blocks can be thrown into the pool and the enclosure on a regular basis to provide some relief.

Fans can be situated around the enclosures to provide some relief from the heat. It is important that these fans should operate silently.

Misters and sprinklers can be provided to spray cool water throughout the enclosure. These could be designed so that the bears can operate them themselves, e.g. through a touch pad or pedal or similar mechanism, thereby allowing the bears to have some control over their environment.

5. Make indoor areas accessible throughout the day.

Indoor areas should accessible throughout the day for the bears to escape from public view as they desire and also to allow them to retreat from the direct sun and heat during the summer months.

6. Provide more furniture.

Even though the majority of the polar bear enclosures were exceptionally small, additional furniture should be added to make them more complex and interesting to the bears. Root balls, logs and rocks properly placed over a deep natural substrate may allow the bears to dig beneath them to create resting or even denning places. However, the construction has to be worked out in such a way that despite digging, the system will not collapse and bury the bear.
In addition, the root balls and logs should have intact bark, so the bears can chew or rip it off. Ideally, there should also be rotten logs that they can rip apart.

7. Provide more enrichment.

Environmental enrichment aims to stimulate a wide range of species-specific behaviours, which are performed in normal sequences and frequencies.

There are 2 approaches to enriching an animal's environment. Both are necessary to achieve positive results.

- Including within enclosures, facilities which enable the animals to undertake a wide range of natural activities by providing a variety of appropriate natural materials, structures and substrates.
- Day-to-day enrichment by offering a daily range of stimuli, which stimulate different senses and elicit natural behaviours.

The first approach is static, changes will occur only occasionally. Complex topography, vegetation in the form of trees, bushes and ground flora together with artificial constructions and the provision of a variety of substrates will form integral parts of new enclosures from the very beginning. Even old enclosures can be modified so that they are more complex and interesting, by adding new substrates, vegetation and furniture which will facilitate the applications and enhance the effects of the second method of dynamic day-to-day enrichment.

Some novel enrichment should be included in daily husbandry. This will ensure that the environment is stimulating, provided the enrichment materials are frequently changed and offered at unpredictable times of the day.
Feeding enrichment is particularly valuable because it stimulates all the animals' senses and elicits exploration and manipulation. It can also increase the amount of time spent foraging.

Providing novel food as enrichment influences the level of activity immediately after its introduction, but there is no long-term effect over the day. Scattering food in piles of twigs or straw and hiding it inside objects, however, extends periods of foraging, increasing behavioural diversity. Feeding enrichment will require greater ingenuity in very small, poorly equipped enclosures, so techniques such as concealing food in ice or inside objects may help to solve the problem.

Feeding enrichment reduces walking and pacing in favour of manipulation, foraging and exploration, as stereotypic behaviour is commonly linked to feeding behaviour.

Prolonging foraging and feeding behaviour:

- Ice blocks with food in different sized buckets without handles.
- Ice blocks with food in large tubs.
- Fish or nuts in a plastic can with small openings.
- Whole cucumbers or melons.
- Branches.
- Honey, ketchup or mayonnaise smeared in or on traffic cones or buckets.
- Hides and bones of cattle or horses.

- Food which floats, such as nuts or apples, should be occasionally scattered in the water.

Encouraging exploratory and play behaviour:
Every new object, irrespective of the material of its construction, stimulates exploratory and play behaviour.

- Large plastic cans, tubs, pipes and traffic cones.
- Wooden logs, branches and twigs.
- Ropes.
- Large indestructible balls, such as "boomer balls".
- Large fishing floats.
- Empty rope reels.

Stimulating olfactory and rubbing behaviour:

- Different flavours (from drugstores or perfumeries) on the ground and on elevated structures to elicit sniffing behaviour.
- Hides for rolling and rubbing.
- Resin or spruce-needle oil on tree trunks and the ground elicits rubbing.
- Scent trails sometimes leading to concealed food items.

6. Start an enrichment programme.

The ideas and practical suggestions made above should be applied in such a manner as to provide the bears with options for a sufficient variety of activities to enable them to carry out a broader range of natural behaviours. While many of the activities will, by necessity, be quite different from those experienced by bears in the wild, the daily programme should aim to keep the animals occupied as much as possible.

Thus it should aim to provide the individual bear with:

- Security from disturbance or harassment, in the form of nesting sites and means of avoiding threats from conspecifics; a good relationship with familiar, friendly keepers (of the utmost importance if the animal is to feel relaxed and safe).
- An environment which provides the kind of complexity (environmental diversity) to which the animal is naturally adapted, including such features as soft ground nesting sites for polar bears.
- Opportunities for the animals to achieve simple goals with a reward, such as retrieving food from concealed pipes. This is often referred to as "control of the environment". Given appropriate facilities, bears may create their own goals in play, for example, polar bears have invented games involving stalking and pouncing on traffic cones, or bouncing a ball off a wall.

- Unpredictability in the form of variations in the diet, novel objects, training to new tasks, novel arrangements of existing materials.

It must be emphasized that environmental enrichment is more than placing a toy in a cage: it is a whole and varied programme designed to give animals variety and choice.

8.2 Specific recommendations for certain captive facilities.

The polar bears at Hirakawa Zoo, Tokuyama Zoo and Cuddly Dominion should be removed from these enclosures as soon as possible, and either moved into larger, more suitable enclosures or sent to other facilities with more appropriate living conditions.

Similarly, it would be advisable to move the polar bears at Kushiro Zoo (smallest enclosure), Sapporo Muruyama Zoo (smallest enclosure), Himeji City Zoo, Yokohama Sea Paradise, and Yagiyama Zoo out of the enclosures that they were housed in.

The enclosure at Toyohashi was severely overcrowded with 3 bears. This should be rectified by removing at least 1 of the bears.

At Yokohama Zoo, the bear should no longer be encouraged to 'wave' his/her paws and catch the food with his/her paws during the feedings as this kind of unnatural behaviour only serves to give the public a very misleading impression of polar bear behaviour and reinforces the wrong idea that it is acceptable to dominate animals and use them for human entertainment.

8.3 Long-term recommendations.

Acres recommends that all Japanese captive facilities cease breeding polar bears and that they refrain from obtaining any new polar bears from other facilities in the future.

The interests of those polar bears in the worst conditions would be best served by moving them to more suitable facilities in more suitable climates.

CHAPTER 9
CONCLUSION

Clearly, the results of this investigation have revealed some severe welfare problems for all of the polar bears housed at all 24 captive facilities in Japan.

At every captive facility, polar bears were seen to exhibit abnormal behaviours. Incidences of stereotypic behaviours were widespread and, in many cases, extremely severe. High levels of inactivity, a well-known symptom of stress, were also common.

These welfare problems can partly be attributed to the suboptimal conditions and inadequate enclosures the bears were housed in. Overall, the polar bear enclosures at Japanese captive facilities were undersized, barren, poorly designed and did little to satisfy the biological and behavioural needs of the bears. The inadequate husbandry practices in place for the bears also contributed to their poor living environments.

By not satisfying the fundamental needs of the polar bears in their care, most of the captive facilities undoubtedly failed to adhere to the Code of Ethics of both JAZA (of which all but 1 facility were a member) and WAZA (which 3 zoos were a member of). Additionally, by apparently failing to take the polar bears' habits, physiology and ecology into account, many of the facilities could also be considered to be failing to comply with Japanese laws.

Overall, the enclosure design and husbandry for polar bears at Japanese captive facilities were inadequate and fell drastically short of internationally recognized bear husbandry standards designed to maintain physically and mentally healthy individuals.

At every Japanese captive facility, the enclosures and the husbandry practices for the polar bears failed to meet all (indeed, often any) of the minimum standards for care and husbandry for polar bears (that must be met by those institutions housing polar bears) stated in the Province of Manitoba (Canada) Polar Bear Protection Act 2003. This means that if any of these facilities attempted to obtain a polar bear

from Manitoba (a major source of orphaned cubs) they would all be refused permission.

Although the conditions at every facility failed to meet the Polar Bear Protection Act standards, there was some considerable variation in the standard of the enclosures and the husbandry measures in place between facilities. It was clear that several enclosures were totally unacceptable for housing polar bears and the plight of the polar bears in these facilities needs to receive attention as a matter of urgency.

In the short-term, Acres urges every Japanese facility to implement the recommendations contained in this report as a matter of urgency to improve the living conditions of the polar bears. Acres would be glad to assist in this aspect.

For some enclosures, it is hard to see how significant improvements can be made because they are so small and poorly designed. In these cases, Acres recommends that the bears be moved to other existing enclosures (that have the potential to be modified to accommodate bears better), or that the bears be moved to other facilities with more appropriate accommodation, preferably in countries with a more suitable climate.

However, Acres does not support the construction of new enclosures for polar bears at any facility. It is not possible to construct an exhibit that can accommodate polar bears in a way that fully satisfies their biological and behavioural needs and that can completely mitigate against the deleterious effects of unsuitable climates. This report reaffirms the inherent difficulties in keeping polar bears without compromising their welfare. The bears in even the very largest and most complex enclosures all exhibited severe stereotypic and other abnormal behaviours.

The educational benefit, if any, of having polar bears at the Japanese facilities was shown to be negligible and can surely not be considered a justifiable reason for continuing to let so many polar bears continue to languish in wholly substandard conditions. There is no reason that facilities like Asahiyama Zoo, which has an informative educational centre about polar bears, cannot continue to educate visitors about the bears through this means, whilst at the same time acknowledging that polar bears do not belong in unsuitable enclosures in inappropriate climates.

Polar bears are poor candidates for captivity, even in the best of circumstances. They are extremely wide-ranging, highly intelligent, cold weather carnivores, so they are highly problematic to house and care for in captivity. In fact, many experts believe they are one of the

species most ill-suited to captivity. This belief has already resulted in a reduction in the number of captive polar bears in some regions (e.g. United Kingdom) and increased criticism of the keeping of polar bears worldwide.

In the longer term, Acres hopes that the Japanese facilities will follow the example set by other reputable zoos, most recently the Singapore Zoo, and gradually phase out the keeping of polar bears on welfare grounds. This would require a cessation of any breeding programmes for polar bears, as well as a stop to all future imports of polar bears into Japan.

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APPENDIX I: ZOOCHECK QUESTIONNAIRE

Zoo:_____Date/Time:_____

1) Does it appear that adequate provision is made at all times to meet the species-specific needs of the animals with regards to temperature, ventilation, lighting, humidity and noise?

   Temperature:
   _____

   Lighting:
   _____

   Humidity:
   _____

   Noise:
   _____

2) Is sufficient shelter provided in outdoor enclosures to give protection from inclement weather and excessive sunlight?
   - o No shelter is provided
   - o Shelter is provided but insufficient for all the animals in the enclosure
   - o Amount of shelter provided is just sufficient for all the animals in the enclosure
   - o More than sufficient shelter is provided for all the animals in the enclosure

Notes:
_____

3) Can the animals view beyond the enclosure?
   - o Animals are housed in a pit or in an indoor tank
   - o Animals are housed in a cage
   - o Animals are housed on an island where the animals are able to climb to a position where the animals can view beyond the enclosure
   - o Animals are housed on an island where the animals have complete and unobstructed view of the surrounding natural environment at ground level

Notes:
_____

4) Are substrates used for the floor surface suitable for the animals?
    - Concrete or wire meshed floor
    - Sandy, hard ground OR Grass/soft bedding available in less than 75 percent of the floor
    - Grass/soft bedding available in at least 75 percent of the enclosure
    - Grass/soft bedding available throughout the enclosure

Notes:

_____

5) Are enclosures and enclosure barriers in such a condition that there is no likelihood of harm to animals (Presence of rusty/sharp objects)?

Notes:

_____

6) Is the enclosure hygienic (Presence of rubbish, algae or enclosure is not well-drained)?

Notes:

_____

7) Do the animals appear to be in good physical health?

Notes:

_____

8) Are the animals provided with space sufficient to encourage natural movements and behaviours?

Size of enclosure:

_____

9) Is sufficient furniture present in the enclosure?

Notes:

_____

10) Are active efforts made to enrich the environment? Are activity/investigation devices changed periodically, and are the position altered?
    - No enrichment is provided
    - Enrichment is provided but insufficient for all the animals in the enclosure. Or enrichment is not changed periodically
    - Enrichment provided for all the animals and is changed periodically
    - A variety of enrichment is provided and changed periodically. Enrichment provided also stimulates natural behaviours (Natural behaviour program)

Notes:

_____

11) Is it evident that the enrichment devices provided are being used?
    - No enrichment is provided or animals are not observed using the enrichment
    - Animals are observed using the enrichment

Notes:

_____

12) Are the animals housed in an appropriate social group?

Notes:

_____

13) Are there signs of abnormal behaviours (observations must be more than one day if stereotypic behaviour is not recorded)?

Notes:

_____

14) Can the animals retreat from public view and from the view from each other?
    - No private areas are provided
    - Private areas are provided but insufficient for all the animals OR private areas provided are in an inappropriate position.
    - Number of private areas provided equals to number of animals in the enclosure AND are in appropriate positions.
    - Number of private areas provided is greater than number of animals in the enclosure AND are in appropriate positions.

15) Do the enclosure barriers effectively prevent contact between public and the animals?

Notes:

_____

APPENDIX II: JAPANESE ASSOCIATION OF ZOOS AND AQUARIUMS (JAZA) CODE OF ETHICS

(Taken from www.jazga.org.jp)

Conservation of wildlife becomes one of the major issues for mankind as destruction of the world environment intensified. Accordingly, the expected roles and social duties of zoos and aquariums have greatly changed. The duty to conserve wildlife and breed endangered species becomes increasingly important. Under such circumstance, the JAZA established its "Code of Ethics" to publicly announce its firm determination to meet such social demands.

Code of Ethics of JAZA

OBJECTIVES
Article?1. The purpose of this Code of Ethics is to establish principles for the
conduct of animal acquisition, care, study and display at zoo and aquarium
facilities (hereinafter "facilities"), thereby to contribute to the proper use and animal welfare and protection of nature.

DUTIES
Article?2. Members of JAZA shall be responsible for implementing and observing this Code of Ethics.

ACQUISITION OF ANIMALS
Article?3. Animal acquisition efforts must comply with all of the sectional below.
1. Acquisition of Animals and the means thereof shall not conflict with or break pertinent rules and regulations, domestic or foreign.
2. To the extent conditions permit, sought animals shall be bred in captivity. Other means of obtaining them shall be legal and be conducted only after adequate consideration for preservation of the species conserved.
3. Facilities shall clearly specify in their display and breeding programs the roles
to be fulfilled by animals prior to their collection.
4. Care shall be exercised to ensure that the sex, age, and pedigree meet their collection objectives and requirements.

ANIMAL CARE AND RESEARCH

Article 4. The facilities shall give full consideration to species preservation and animal welfare in their care and study of animals, and strive to comply with the sections below.

1. Care facilities, equipment and tools appropriate to each animal's habits and physiology shall be furnished.
2. Information essential to animal care, display, and research shall be acquired and maintained.
3. Animal care personnel shall be fully competent in the knowledge and skills required for adequate treatment of the animal species under their supervision.
4. The requirement for appropriate animal care and health shall be met.
5. Animal care shall be provided in compliance with standards established by the JAZA for each species.
6. Facility animals shall be utilized in efforts to preserve their species through exchanges, transactions, loans for breeding purposes and other such means.
7. Active efforts shall be made to promote domestic and international studbooks as well as to ensure genetic diversity.

DISPLAY

Article 5. Efforts shall be made to provide effective, suitable displays based on programs designed for educational effect.

1. Animal displays shall be designed, utilizing the latest pertinent information, to educate visitors on the habits, morphology and ecological niche of each species shown.
2. Educational activities shall be undertaken to enhance the value of each display as a learning experience.
3. Displays shall be utilized in cooperative efforts with educational and research institutions to contribute to academic advancement.

OBSERVATION OF PERTINENT LAWS AND REGULATIONS

Article 6. Domestic, foreign, and international laws and regulations on animal acquisition, care study and display shall be wholly understood and observed.

1. The latest information on those laws regulating animal acquisition, and on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, August 23, 1980; Treaty No. 25) in particular, as well as on related domestic legislation, shall be acquired and faithfully observed.
2. The Law Concerning the Protection and Control of Animal (October 1, 1973; Law No. 105), the Care and Feeding Standards for Display Animals (February 10, 1976; Circular No.7), and other legislation pertinent to animal care and display shall be fully understood and observed.

3. Facilities shall strive to accumulate valuable information on appeals by
international nature conservation groups as well as the activities and guidelines of animal-related organizations.

ETHIC COMMITTEE
Articles 7. To achieve the objective defined herein, JAZA shall establish its ethics committee, the details of which shall be provided for separately by JAZA regulations.

PROVISIONS
Articles 8. Amendments and other revisions to this Code of Ethics must be decided by the Board of Directors, subject to the approval by the General Conference of the JAZA.

SUPPLEMENTARY PROVISION
This Code of Ethics shall come into effect as of February 29, 1988.

APPENDIX III: WORLD ASSOCIATION OF ZOOS AND AQUARIUMS (WAZA) CODE OF ETHICS

WAZA Code of Ethics and Animal Welfare.

(Taken from www.waza.org).

Preamble

The continued existence of zoological parks and aquariums depends upon recognition that our profession is based on respect for the dignity of the animals in our care, the people we serve and other members of the international zoo profession. Acceptance of the WAZA World Zoo Conservation Strategy is implicit in involvement in the WAZA.
Whilst recognising that each region may have formulated its own code of ethics, and a code of animal welfare, the WAZA will strive to develop an ethical tradition which is strong and which will form the basis of a standard of conduct for our profession. Members will deal with each other to the highest standard of ethical conduct.

Basic principles for the guidance of all members of the World Association of Zoos and Aquariums:
(i) Assisting in achieving the conservation and survival of species must be the aim of all members of the profession. Any actions taken in relation to an individual animal, e.g. euthanasia or contraception, must be undertaken with this higher ideal of species survival in mind, but the welfare of the individual animal should not be compromised.
(ii) Promote the interests of wildlife conservation, biodiversity and animal welfare to colleagues and to society at large.
(iii) Co-operate with the wider conservation community including wildlife agencies, conservation organisations and research institutions to assist in maintaining global biodiversity.
(iv) Co-operate with governments and other appropriate bodies to improve standards of animal welfare and ensure the welfare of all animals in our care.
(v) Encourage research and dissemination of achievements and results in appropriate publications and forums.
(vi) Deal fairly with members in the dissemination of professional information and advice.
(vii) Promote public education programs and cultural recreational activities of zoos and aquariums.
(viii) Work progressively towards achieving all professional guidelines established by the WAZA.
At all times members will act in accordance with all local, national and

international law and will strive for the highest standards of operation in all
areas including the following:

1. Animal Welfare
Whilst recognising the variation in culture and customs within which the WAZA operates, it is incumbent upon all members to exercise the highest standards of animal welfare and to encourage these standards in others. Training staff to the highest level possible represents one method of ensuring this aim. Members of WAZA will ensure that all animals in their care are treated with the utmost care and their welfare should be paramount all times. At all times, any legislated codes for animal welfare should be regarded as minimum standards. Appropriate animal husbandry practices must be in place and sound veterinary care available. When an animal has no reasonable quality of life, it should be euthanased quickly and without suffering.

2. Use of Zoo and Aquarium Based Animals
Where "wild" animals are used in presentations, these presentations must:-
(a) deliver a sound conservation message, or be of other educational value,
(b) focus on natural behaviour,
(c) not demean or trivialise the animal in any way.
If there is any indication that the welfare of the animal is being compromised, the presentation should be brought to a conclusion.
When not being used for presentations, the "off-limit" areas must allow the animal sufficient space to express natural behaviour and should contain adequate items for behavioural enrichment.
While the code focuses on zoos and aquarium based "wild" animals, the welfare of domestic animals, e.g., sheep, goats, horses, etc., in, e.g, petting zoos should not be compromised.

3. Exhibit Standards
All exhibits must be of such size and volume as to allow the animal to express its natural behaviours. Enclosures must contain sufficient material to allow behavioural enrichment and allow the animal to express natural behaviours. The animals should have areas to which they may retreat and separate facilities should be available to allow separation of animals where necessary, e.g., cubbing dens. At all times animals should be protected from conditions detrimental to their well-being and the appropriate husbandry standards adhered to.

4. Acquisition of Animals
All members will endeavour to ensure that the source of animals is confined to those born in human care and this will be best achieved by

direct zoo to zoo conduct. The advice of the appropriate Species Co-ordinator should be sought before acquiring animals. This will not preclude the receipt of animals resulting from confiscation or rescues. It is recognised that, from time to time, there is a legitimate need for conservation breeding programs, education programs or basic biological studies, to obtain animals from the wild. Members must be confident that such acquisitions will not have a deleterious effect upon the wild population.

5. Transfer of Animals
Members will ensure institutions receiving animals have appropriate facilities to hold the animals and skilled staff who are capable of maintaining the same high standard of husbandry and welfare as required of WAZA members. All animals being transferred will be accompanied by appropriate records with details of health, diet, reproductive and genetic status and behavioural characteristics having been disclosed at the commencement of negotiations. These records will allow the receiving institution to make appropriate decisions regarding the future management
of the animal. All animal transfers should conform to the international standards and laws applying to the particular species. Where appropriate, animals should be accompanied by qualified staff.

6. Contraception
Contraception may be used wherever there is a need for reasons of population management. The possible side effects of both surgical and chemical contraception, as well as the negative impact on behaviour, should be considered before the final decision to implement contraception is made. (last sentence deleted)

7. Euthanasia
When all options have been investigated and the decision is taken that it is
necessary to euthanise an animal, care will be taken to ensure it is carried out in a manner that ensures a quick death without suffering. Euthanasia may be controlled by local customs and laws but should always be used in preference to keeping an animal alive under conditions which do not allow it to experience an appropriate quality of life. Whenever possible a post-mortem examination should be performed and biological material preserved for research and gene conservation.

8. Mutilation
Mutilation of any animal for cosmetic purpose, or to change the physical appearance of the animal, is not acceptable. Pinioning of birds for educational or management purposes should only be undertaken

when no other form of restraint is feasible and marking animals for identification should always be carried out under professional supervision, in a way that minimises suffering.

9. Research Using Zoo Based Animals

All zoos should be actively involved in appropriate research and other scientific activities regarding their animals and distribute the results to colleagues. Appropriate areas of research include exhibit design, observations, welfare, behaviour, management practices, nutrition, animal husbandry, veterinary procedures and technology, assisted breeding techniques, biological conservation and cryopresentation of eggs and sperm. Each zoo undertaking such research should have a properly constituted research committee and should have all procedures approved by a

properly constituted ethics committee. Invasive procedures designed to assist in medical research are not to be performed on zoo animals however the opportunistic collection of tissues during routine procedures and collection of material from cadavers will, in most cases, be appropriate.

The well-being of the individual animal and the preservation of the species and biological diversity should be paramount and uppermost in mind when deciding upon the appropriateness of research to be undertaken.

10. Release-to-the-Wild Programmes

All release-to-the wild programmes must be conducted in accordance with the IUCN/ SSC/Reintroduction Specialist Group guidelines for reintroduction.

No release-to-the-wild program shall be undertaken without the animals having undergone a thorough veterinary examination to assess their fitness for such release and that their welfare post-release is reasonably safeguarded. Following release, a thorough monitoring program should be established and maintained.

11. Deaths of Animals Whilst in Care

Unless there are sound reasons not to do so, each animal which dies in captivity, or during a release to the wild program, should undergo post-mortem examination and have a cause of death ascertained.

12. External Wild Animal Welfare Issues

While this code of practice is designed for animals held within Zoos, Aquariums, Wildlife Parks, Sanctuaries, etc., WAZA abhors and condemns ill-treatment and cruelty to any animals and should have an opinion on welfare issues for wild animals external to its membership.

WAZA requires that:

. The taking of animals and other natural resources from the wild must be
sustainable and in compliance with national and international law and conform with the appropriate IUCN policy.
. Any international trade in wild animals and animal products must be in compliance with CITES and the national legislation of the countries involved.
WAZA opposes:
. Illegal and unsustainable taking of animals and other natural resources from the wild, e.g. for bush meat, corals, fur or skin, traditional medicine, timber production.
. Illegal trade in wild animals and wild animal products.
. Cruel and non-selective methods of taking animals from the wild.
. Collecting for, or stocking of animal exhibits, in particular aquariums, with the expectation of high mortality.
. The use, or supply of animals for "canned hunting", i.e. shooting animals in
confined spaces, or when semi tranquilised or restrained.
. Keeping and transporting of animals under inadequate conditions, e.g., the keeping of bears in confinement for extraction of bile, dancing bears, roadside zoos or circuses / entertainment.

WAZA and its members should make all efforts in their power to encourage substandard zoos and aquariums to improve and reach appropriate standards. If it is clear that the funding or the will to improve is not there, WAZA would support the closure of such zoos and aquariums.

This document was prepared on the basis of the 1999 Code of Ethics and the 2002 Code of Animal Welfare. It was adopted at the Closed Administrative Session of the 58th Annual Meeting, held on 19th November 2003 at San José, Costa Rica.

APPENDIX IV: GUIDELINES FOR ENCLOSURE SIZE FOR BEARS

WSPA

Minimum size of enclosures for polar bears:

- Minimum surface area per pair outdoors = 4,500m^2
- Minimum surface area per additional animal = 2,000m^2
- Pool facilities = 100m^2 per two bears; 50m^2 per additional bear.
- Minimum requirement for dry, resting and social areas for polar bears= 37.16m^2 per 2 bears, 3.72m^2 per additional animal.
- Den should be 1.0-5.0 x 0.7-3.9 x 0.3-1.9 (length x width x depth m).

Enclosure size shall prevent persistent conflicts between individuals, prevent ware down of physical characteristics of the enclosure, and prevent unacceptable levels of parasites and pathogens.

TAG

Considerable space is required in order for animals to move freely amongst each other, structures, vegetation and substrates.

The recommended size of indoor cages and recommendations for the sizes of platforms/nest baskets are as follows:

- Floor space = 18.0 m^2 (2 x head-body-length)
- Smallest side = 3.0 m (head –body-length)
- Resting place = 4.8m^2 (head-body-length x shoulder height)
- Streams or pools should be around 100m^2 with shallow and deep water.

APPENDIX V: GUIDELINES FOR ENCLOSURE DESIGN FOR BEARS

WSPA

- Polar bears require two separate, large and overgrown outdoor enclosures for segregation purposes.
- For non-breeding animals the absolute minimum number of enclosures is two of equal size.
- The enclosure has to accommodate for a full behavioural repertoire, and it has to accommodate for species needs as well as specific individual needs. It shall provide the animals with a choice of environment and socialising, and it shall give the animal a sense of being in control. It shall be a large natural enclosure with concrete serving only as security and safety for animals and public. The permanent features of an outdoor enclosure shall provide key facilities for swimming, seclusion, nesting facilities as well as denning facilities. Indoor facilities shall be as well equipped as outdoor enclosures and shall be comfortable.
- Bears shall not be kept in traditional pits or concrete enclosures.
- Concrete shall be restricted to security fences, supporting steep slopes or as the base of steps or step slopes.
- All species must have a den or nest box appropriate for the species. Indoor facilities shall be as interesting and hospitable as outdoor quarters and they shall have skylights and windows to allow for entry of natural light.
- Temperature, ventilation and lighting shall at all times be suitable for the animal's comfort and well-being.
- Dens that are bare, damp and with a concrete floor are not acceptable.
- There shall be at least two entrances to indoor facilities, with free access from the outdoor enclosure.
- Indoor facilities shall provide resting platforms (not more than 1m above the ground for ground dwelling species, for older individuals not more than 10-20cm above ground, for individuals that are not able to climb nesting materials must be provided on the ground).
- For non-breeding bears there shall be a minimum of (n + 1) inter-linked indoor cages.
- Structures and furniture shall be well placed to allow animals to move freely.
- In polar bear enclosures the water to land ratio shall not exceed 1:3 and water must be cooled.

TAG

- Enclosures of concrete are not suitable bear enclosures.
- For polar bears the ratio of water to land must not exceed 1:3.
- There should be at least two entrances to indoor facilities from the outdoor enclosure.

Both WSPA and Tag guidelines state that essential enclosure features include:

- Provision of microclimate to provide sunny, dry and sheltered in cool weather; shady and open to the wind. This can be created by shrubs and trees, hills, horizontal wooden logs, large roots, sewer pipes, rocks, caves in rocks, old barrels, and large boxes. The provision of observation points to allow viewing beyond the enclosure provided by trees, hills, rocks, dead trees forming climbing frames with platforms is also considered essential.
- Provision of hiding places for food to stimulate foraging behaviour such as piles of logs, rocks and wooden logs which can be moved by the animals, pipes installed vertically in the ground, tree pipes.

ABWAK

- When constructing new enclosures design should maximise choice and control for the animals in captivity and provide means for the animals to express a full behavioural repertoire, e.g. foraging, digging, climbing and resting in natural substrates. Two separate outdoor areas are necessary in order to segregate animals for breeding purposes, illness or aggression and for easy cleaning of the exhibit.
- For indoor accommodation, topography should allow for bears to view beyond their enclosure boundary to avoid stereotypic behaviours.
- Polar bears must have pools with clear water. Underwater viewing is not recommended, as glass walls prevent keepers from supplying animals with enrichment items which the animals potentially could use to break the glass. And underwater viewing requires clear water conditions so natural substrates that may block drains and cloud water cannot be used.

UFAW

- Simulating sea-ice habitat by building concrete enclosures with blue pools can no longer be considered appropriate for polar bears.
- Polar bear exhibits should include two separate paddocks in order to separate individuals in times of sickness, reproduction and

aggression. These areas should contain large overgrown areas that will stimulate a wide behavioural repertoire.

IBF

- If breeding is not the purpose of the exhibit, the absolute minimum number of enclosures is two of equal size. Keeping bears in only one large enclosure should be avoided.

APPENDIX VI: GUIDELINES FOR PROVISION OF SUITABLE CLIMATE FOR BEARS

WSPA

- Facilities shall provide appropriate temperatures that meet the species natural needs. Facilities shall provide shelter from various weather conditions, e.g. dry areas and shade at all times for all individuals.
- Structures shall provide shelter in different weather conditions.
- Outdoor facilities shall protect against weather and sunlight.
- All bear species must have access to cool, shady places during hot summer days.
- In polar bear enclosures water must be cooled.

TAG

- All bear species must have access to cool, shady places during hot summer days and some species may choose shady places even at relatively low ambient temperatures. Structures within the enclosure should provide shelter in different weather conditions.

APPENDIX VII: GUIDELINES FOR SUBSTRATE FOR BEARS

WSPA

- All individuals shall have free access to substrates at all times and in different microclimates. Substrates shall not be harmful to the animal's skin or fur, and it shall be provided in such amounts as to accommodate for a full behavioural repertoire.
- For all bear species substrate shall consist of natural ground vegetation. It shall be available in both shady and sunny places in order to provide a choice of microclimate according to the weather conditions.
- Ground surfaces shall vary across enclosures, incorporating natural vegetation, earth, grass, bushes and trees.
- A sufficient quantity of areas/pits shall be available to accommodate all individuals in the enclosure.
- Nesting materials shall be available in both indoor and outdoor quarters. Areas shall contain materials such as dry leaves, hay, straw, wooden shavings or wood chips.

TAG

- Areas should contain materials such as dry leaves, hay, straw, wooden shavings or wood chips.
- Natural ground vegetation that is the best substrate for all bear species should be placed in both shady and sunny places in order to provide a choice of microclimate according to weather condition.
- When planning new enclosures, ground vegetation should, if possible, consist of natural flora, otherwise a grass/herb mixture along with trees and bushes should be used.

ABWAK

- When constructing new exhibits for polar bears, areas of natural vegetation should be available where animals can express their full behavioural repertoire.

UFAW

- For polar bears, existing enclosures should be modified and should incorporate natural substrates and natural areas. Pits of sand, bark litter, soil or pebbles stimulate digging, building daybeds, rubbing and foraging. And it provides the animal with a comfortable resting area. There should be sufficient mummers of

pits and natural areas so that one individual does not monopolise these substrates.

- Bears should have nesting materials (straw, wood wool, branches or leaves) in both indoor and outdoor quarters.

APPENDIX VIII: GUIDELINES FOR ENCLOSURE FURNITURE FOR BEARS

WSPA

- Enclosures shall contain suitable features to enable bears to climb, to view horizons, as obstacles to keep bears apart and for retreat to avoid visual contact between individuals.
- Shrubs and tree branches shall be included in the enclosure in order to hide food and encourage natural foraging behaviour.
- Structures and furniture shall be well placed to allow animals to move freely.
- Enclosures shall be equipped with claw logs (tree trunks, logs etc.) of sufficient size to allow fro proper claw or talon exercises.

ABWAK

- For polar bears, when improving existing enclosures introduce: large tree trunks, sand pits, bark litter pits to allow for foraging, digging, building daybeds, climbing and resting in substrates.
- For polar bears, indoor accommodation should contain wooden platforms raised above ground

APPENDIX IX: GUIDELINES FOR PRIVATE AREAS FOR BEARS

WSPA

- Animals shall have adequate retreating facilities away from people and other individuals.
- Individuals shall be able to seek seclusion at all times.

- Enclosures shall contain suitable features as obstacles to keep bears apart and for retreat to avoid visual contact between individuals.

TAG and WSPA both recommend the following:

- Hiding places for bears to avoid conspecifics and visitors are essential requirement for bear enclosures. These may be provided by shrubs and trees, hills, horizontal wooden logs, large roots, sewer pipes, rocks, caves in rocks, large boxes and barrels.
- Obstacles to deter bears from attacking each other are essential. These can be trees and shrubs, large horizontal logs or tree trunks.

UFAW

- Visual barriers can be introduced into existing enclosures to provide the animals with the opportunity to be without visual contact and to prevent aggressive interactions.

APPENDIX X: GUIDELINES FOR ENRICHMENT PROGRAMMES FOR BEARS

WSPA

- Polar bears shall have various enrichment objects available, these shall vary in shape, size, texture and colour. A minimum of 10 objects should be available in one enclosure and at least one per individual. All non-consumable and consumable enrichment items should be supplies in sufficient amounts to occupy all individuals in the exhibit.
- Environmental enrichment shall be a priority for daily husbandry, i.e. time, facilities and budget shall be appropriate or the welfare of the animals.
- Enrichment is a necessity in all bear enclosures, also large natural enclosures.

TAG

- Day-to-day enrichment is only effective if stimuli/objects are frequently changed.
- For polar bears, the following feeding enrichment techniques are recommended: ice blocks with food in different sized buckets without handles; ice blocks with food in large tubs; fish or nuts in a plastic can with small openings; whole cucumbers or melons; branches; honey, ketchup or mayonnaise smeared in or on traffic cones or buckets; bones of cattle or horses; hides.

ABWAK

- For polar bears enrichment items that induce play and more social interaction should be introduced, as well as greater use of the enclosure and a higher level of activity. The objects should be of varying shape, size, colour and texture and offered with a minimum of 10 objects in an enclosure. Always provide at least one object per individual.

UFAW

- Animals have more of a choice and a sense of control of their environment if they have a wide variety of objects to choose between. Moveable objects should on a regular basis be removed and introduced to the enclosure in order to stimulate exploratory and play behaviours.
- With large food items and inedible play objects enough should be provided to activate all individuals at the same time.

- Environmental enrichment should be a priority on a daily basis. There should be enough time, facilities and appropriate budgets for enrichment programmes.

IBF

- Enrichment is a necessity in large natural enclosures, and a programme should be set up for any given bear enclosure.
- Feeding enrichment shall be explored, such as changing the times of feeding, hiding food items, supplementary feeding (vegetables, fruits, browse, rawhide dog bones and live or fresh fish), finely chopped and scattered/hidden frozen blocks of ice or containers that offer manipulation.
- Introduce manipulative objects or objects for exploration, e.g. traffic cones, "boomer" balls, heavy rubber buckets. Rotate these items daily or periodically.

APPENDIX XI: GUIDELINES FOR FEEDING TECHNIQUES FOR BEARS

WSPA

- Food shall be provided at different times throughout the day, at least three meals per day, and on an adlib basis. Meal frequency shall increase gradually for species that naturally adapt a seasonal variation in feeding motivation.
- The animal's main meal of the day shall be fed in the morning at a fixed time and it shall not be fed indoors.
- Feeding methods shall allow for extensive foraging, natural manipulation, and processing. Most foods shall be scattered or hidden in the outdoor enclosure.
- Polar bears benefit from feed that floats in water.
- Clean fresh drinking water shall be available and accessible at all times for all individuals.

TAG

- Food should be presented so that manipulation, processing food items and extensive foraging will stimulate natural conditions. Meat should be provided as whole animals or large carcass portions. For polar bears, food that floats should occasionally be scattered in the water.
- Seasonal variations in feeding motivation should be taken into account in feeding management.
- Animals should be offered at least three meals in a day with most food scattered in the outdoor enclosure.
- Feeding enrichment should take into account that different species have different ways of foraging, i.e. utilise different food seeking skills.

UFAW

- Bears should receive their main meal early in the morning in order to reduce the animals' stress level in anticipation of food.
- In order to stimulate foraging behaviour, foods should be scatter fed or embedded in containers or blocks of ice two to three times a day at irregular intervals and with different contents.

IBF

- Scatter feeding at different times a day must be considered.