CAPTURE AND MAINTENANCE OF CETACEANS IN CANADA

A Report Prepared by

The Advisory Committee on Marine Mammals

for the

Minister of Fisheries and Oceans

November 30, 1992

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EXECUTIVE SUMMARY

On February 6,1992 the Honourable John Crosbie, Minister of Fisheries and Oceans asked the Advisory Committee on Marine Mammals to undertake a review of the matters surrounding live capture of cetaceans and their maintenance in captivity.

In fulfilling this task the Committee has consulted widely among organizations and individuals, including representatives of the northern communities, animal welfare organizations, conservation and nature-oriented associations and the general public of Canada. It has brought together the details of the experience with live capturing of cetaceans and the history of their maintenance in Canadian aquaria. It has drawn upon experience gained by aquaria here and in the United States. It has also studied the relevant publications on the topic from the United States of America and the United Kingdom as well as references in the biological literature on cetaceans.

Careful consideration of the information and advice gained from these sources has led the Committee to the following conclusions and recommendations.

CONCLUSIONS

1. Existing legislation under the Fisheries Act gives protection to whales in Canadian Waters. The same Act provides the basis for controlling the live capture of whales. Import and export are presently controlled under the Export and Import Permits Act. This situation is likely to change in the near future with the introduction of the Wild Animal and Plant Protection Act. That legislation will allow greater control over export and import of cetaceans.

2. The care and maintenance of marine mammals in aquaria is a matter of Provincial jurisdiction but the Provinces have no regulations specifically dealing with standards of facilities and care of marine mammals.

3. The Canadian Association of Zoological Parks and Aquaria has an accreditation process that could provide a suitable way of achieving appropriate standards of facilities and care for marine mammals in captivity.

4. There are five facilities in Canada holding cetacea for live display. One is in the process of closing and another, Montreal Biodome, has expressed its intention to include beluga in its displays in the near future.

5. As of 1993 there will be two aquaria in Canada with orca, one with beluga, three with bottle-nosed dolphins and one with a white-sided dolphin.

6. Stranded animals generally are not a suitable source of cetaceans for aquaria.

7. Given the present state of knowledge, the release to the wild of cetaceans that have been in captivity for extended periods is inappropriate.

8. Certain attributes of cetaceans and their habitat places them in a special position in the affections and concerns of some people beyond those for most other mammals frequently held in zoos or aquaria.

9. This special status requires that those associated with the capture and keeping of cetacea exercise special concern for their accommodation and care.

10. Several organizations and individuals expressed their opposition to the keeping of cetaceans in captivity. Although their objections were often in terms that could not be examined factually they are none the less important.

11. Many of the concerns expressed about the physical and mental wellbeing of cetacea now in Canadian aquaria arose from misinformation, from anthropomorphism or were very difficult to substantiate.

12. The beluga is the only cetacean now subject to a directed capture program in Canada.

13. Though there may have been isolated incidents during the live capture of beluga at Churchill that involved unnecessary disturbance to the animals, it is the view of the Committee that the capture process is now quick, efficient and humane. There is no evidence to support the allegation that the capture of beluga at Churchill disrupts nursing females and their young.

14. The beluga captured in the Churchill River are part of a large population. The live capture program has not affected the status of the population.

15. No orca have been live captured in Canadian waters since 1975.

16. Facilities in Canada holding orca and or beluga for public display provide a public educational benefit, but there is still opportunity for improvement in the standards of the educational presentation.

17. The annual survival rate of both beluga and orca in Canadian aquaria is similar to that estimated for wild stocks..

18. The Committee is of the opinion that there are a sufficient number of beluga in aquaria to support captive breeding programs.

19. Public opinion supports the live capture program for beluga and the presentation of cetaceans in aquaria for educational and research purposes.

20. The public shows little support for performance type presentations involving cetacea. It does not consider that such acts justify keeping these animals in captivity.

21. Representations from the Inuit generally indicate strong support for the continuation of the beluga live capture program, however Inuvialuit of the western Arctic expressed divided views as to the keeping of beluga in captivity.

22. Future decisions concerning live capture of beluga will be influenced by the Native Land Claims Agreements.

23. It is the opinion of the Committee that the standards of care and maintenance of cetacea in Canadian aquaria, are, for the most part, of the same level as specified for U.S. aquaria, but that the present facilities in which orca are held are not adequate.

24. Although the husbandry of orca has made great advances, there are still problems to be solved. Noteably the flaccid fin condition, infrequent in the wild, is seen in many aquarium animals and suggests a deficiency in some aspect of the housing, management or nutrition of the whales.

25. The Committee believes that none of the Canadian aquaria have facilities that meet the optimal conditions for the captive breeding of orca. While much has been learned about the facilities and special care required where successful breeding programs are sought, it is probable that there is much still to be learned. The loss of young animals is disturbing to many, thus there should be every effort to provide state of the art facilities and care before breeding is attempted. It is also important that each program be approached with a learning plan.

26. There are several ways for people to experience whales and to learn details of their adaptations and their environmental needs: swimming with free living cetaceans; viewing from the surface glimpses of their anatomy and behaviour by means of whale watching trips; seeing and hearing whales via photography, video and electronic media; studying them in aquaria. In the view of the Committee, these are not mutually exclusive alternatives. At this time the aquarium, though lacking in environmental context, remains an acceptable and useful way of introducing large numbers of people to the form and function of living cetacea.

27. The Committee has not found any substantiable reasons why cetaceans should not be maintained in aquaria that can provide adequate facilities and standards of care.

RECOMMENDATIONS

1. The Committee recommends that the Department of Fisheries and Oceans ensure standards are implemented for the accommodation, care and maintenance of cetaceans in captivity in Canada.

2. The Committee further recommends that the Department of Fisheries and Oceans work with the aquarium industry to develop these standards, and that the Minister encourage the Canadian Association of Zoological Parks and Aquaria (CAZPA) to adopt such standards and to incorporate them into the accreditation process. It is the view of the Committee that such a process should have built into it the requirement for independent periodic review of facilities and operations.

3. The Committee recommends that if satisfactory standards and compliance mechanisms are not adopted by the aquarium industry the Department of Fisheries and Oceans examine the options to regulate the imposition of such standards.

4. The Committee recommends that the Department of Fisheries and Oceans work with the Department of Environment to implement regulations under the Import and Export Permits Act and/or the proposed Wild Animal and Plant Protection Act such that permits for importation of cetaceans into Canada be issued only to institutions that comply with the standards referred to in Recommendation 1.

5. The Committee recommends that, given the present state of knowledge, the release to the wild of cetaceans that have been in captivity for extended periods is inappropriate. This recommendation implies that the aquarium industry has a perpetual committment to the welfare of those cetaceans brought into their facilities. In this context, the Committee recommends that the orca currently held in Sealand Victoria be transferred to other suitable facilities.

6. The Committee recommends that the education programs in Canadian aquaria that are directed toward increasing the public appreciation for and understanding of cetacea and their environment continue to be updated and expanded.

7. The Committee recommends that The Department of Fisheries and Oceans should consider that there are other sources of beluga whales, including captive born animals, when considering applications for live captures.

8. The Committee recommends that Canadian aquaria, possibly through CAZPA, participate in all relevant stud-book projects for captive cetaceans. It is important that, with a small founding stock available for breeding programs, careful records be maintained of the lineages of every individual.

9. The Committee recommends that the live capture of orca in Canada terminated in 1975 should not be reopened.

10. The Committee recommends that until Canadian aquaria upgrade their facilities for orca, further imports of this species should be discouraged.

11. The Committee recommends that aquaria should not attempt the breeding of orca until their facilities are state of the art.

12. The Committee recommends that the Department of Fisheries and Oceans encourage research on various aspects of releasing cetaceans into the wild and is of the opinion that:

    1) the priority topic of research should be the problem of possible disease transmission from captive to wild stocks.
    2) following resolution of problems of disease transmission, behavioural training and experimental release should be done with species such as bottle-nosed dolphins before being tried with beluga or orca currently held in Canadian aquaria.

I. INTRODUCTION

It is about thirty years since it was discovered, almost by accident, that the orca or killer whale was not the terrifying creature that it had been pictured and that it would quite quickly adapt to aquarium facilities that could reasonably be provided. In captivity they proved to be remarkably tractable and trainable and were, above all, magnificent animals to present to the public as representative of the order cetacea, the whales, dolphins and porpoises.

The advent of the aquarium orca was almost coincident with the public realization that several species of large whales had been seriously depleted in numbers by commercial whaling and at least two species were in danger of extermination.

The public accepted the orca exhibits with enthusiasm and attendance at the aquaria that had cetacean exhibits rose rapidly. Many of these aquaria tried hard and successfully to present the orca as living examples of the large group of whales, specialized in many structural and functional ways for life in the oceans completely divorced from the necessity of returning to land.

There is no doubt that public appreciation of the lives of whales in general increased many fold through their contact with living whales in an aquarium setting. Then too the research opportunities the aquarium cetaceans presented to animal scientists were quickly seized upon. The resulting research yielded greatly expanded understanding of the biology of the smaller whales and, by extrapolation, the cetacea generally. These early captives played a major role in the growing cult of the whale that led directly to important changes in the commercial killing of whales world wide and, in 1982, resulted in the adoption of a ten year moratorium on the commercial killing of the "great" whales.

The Vancouver Public Aquarium was among the first in the world to present cetaceans of the size of the orca to the public and has been an active contributor to the many aspects of whale husbandry, the design of facilities, developing of standards of care, devising techniques of training and presenting the creatures to the public, delivering imaginative educational programs based on their animals and contributing to the international body of research findings. Other Canadian Institutions, later in the field, profited greatly from the experience gained by the pioneer institution. However the cost of building the facilities and providing the care required by cetaceans of this size limited the number of institutions in Canada presenting orca to three.

Bottle-nosed dolphins preceded orca as aquarium animals and success with these two species led marine oriented facilities in Canada and other parts of the world to experiment with several kinds of small whales and dolphins as aquarium species. The beluga proved to be one of the most adaptable of these.

To many animal keepers the ultimate test of their success as custodians is to have the species breeding successfully in captivity. As aquaria increased the size of their facilities and learned how to meet the special needs of their whales and dolphins it became recognized that these were social animals and were best exhibited in groups including both sexes. Inevitably births occurred and it was soon realized that a successful breeding colony required facilities and care

practices specially oriented to the nursing females and their young. Most of the early births failed to survive, but this changed after the special needs were recognized and met.

As these events were unfolding in the aquarium industry western Europe and North America experienced the burgeoning of environmental activism including several groups that directed their attention to what they considered to be the plight of animals in zoos and aquaria. The criticisms of the aquaria were couched in such terms as abuse, animals rights and ethics.

The aquarium industry was not blameless, and there were instances of what appeared to the public as inappropriate care. But the question remains whether the taking from the wild of these large mammals to be maintained in captivity for use in education and research remains an acceptable and useful way of achieving these ends.

It was in this context that the Minister of Fisheries and Oceans of the Government of Canada asked the Advisory Committee on Marine Mammals to review the live capture of cetaceans in Canada and the issues arising from their maintenance in aquaria.

The Advisory Committee is an independent committee appointed by the Minister. Current members are Dr. Ian McTaggart Cowan (Chairman), Mr. Ken Brynaert, Ms. Stefani Paine, and Dr. Norman Snow. The terms of reference for this review were included in the Minister's letter to the Chairman of the Committee dated February 6 1992: "The review should include consideration of the views expressed by organizations who support and those who are opposed to the maintenance of cetaceans in captivity. I am also concerned with the apparent lack of standards or regulations related to the maintenance of cetaceans in captivity and request that the Committee examine relevant legislation and consider the advisability of developing such standards."

In conducting this review the Committee examined information on Canadian facilities maintaining cetaceans, relevant legislation, standards for the care and maintenance of cetaceans in the U.S. and the U.K. and the history of the live capture program for cetaceans in Canada. The Committee also sought the views of a large number of organizations and individuals. The Committee is grateful to those who provided information and assistance as well as their views on the issues examined.

<u>Issues</u>

The Committee identified and examined the following major issues as part of its review:

- Should cetaceans be maintained in aquaria?
- Should standards be established for the maintenance and care of cetaceans in Canadian aquaria. If so how should they be developed, implemented and enforced?
- Should the beluga live capture program be continued?
- Should the import and export of cetaceans be permitted to continue? If so, under what circumstances?
- What are the Canadian public attitudes towards the capture and maintenance of cetaceans in captivity?
- What is the state of knowledge on the problems and potential for releasing captive cetaceans into the wild?

II. HISTORICAL PERSPECTIVE

1. Live Captures of Cetaceans from Canadian Waters

Of at least 28 species of odontocetes recorded from Canadian waters only two species have been regularly captured in Canada for long term holding in aquaria, the killer whale (Orcinus orca) and beluga whale (Delphinapterus leucas).

The narwhal (Monodon monoceros), harbour porpoise (Phocoena phocoena), and white-beaked dolphin (Lagenorhynchus albirostris) have been captured on an occasional basis, and stranded Pacific white-sided dolphins (Lagenorhynchus obliquidens) and Dall's porpoise (Phocoenoides dalli) have also been held for short periods in aquaria. (Reeves and Leatherwood 1984; Lewis and Berry 1988; G. Hewlett, VPA, pers. comm.).

Bottlenose dolphins (Tursiops truncatus) kept in Canadian aquaria have been imported from the United States.

a) Killer Whales

The first killer whale kept in captivity in Canada was a young male accidentally captured by the Vancouver Public Aquarium 28 years ago (Newman and McGeer 1966). The original intent was to kill a specimen from which a life-size model would be made. This was consistent with the belief at the time that killer whales were vicious and dangerous and therefore could not be exhibited alive. The animal was harpooned from shore off East Point, Saturna Island, British Columbia. When it was determined that the animal was only superficially wounded it was taken to Vancouver and held in a dry dock in North Vancouver. Eight days later it was transferred to a net enclosure approximately 14m x 23m x 6m deep in Vancouver Harbour. This whale survived in captivity for 86 days.

During this time both the public and the scientific community could view and consider the killer whale from a new perspective. A decade of live captures of killer whales followed.

According to Hoyt, 1992, thirteen live capture operations took place in British Columbia collecting 25 killer whales during the period 1965 - 1975. A number of whales were exhibited in aquaria in Canada, others were transported to the United States and overseas. No killer whales have been captured in Canadian waters since 1975 (Bigg and Wolman 1975) and no killer whales were ever collected from the Canadian Arctic or the east coast of Canada.

b) Beluga Whales

The first beluga whales collected in Canada for public exhibit (though not exhibited in Canada) were captured in the St. Lawrence River. Although accurate records are not available Reeves and Leatherwood (1984) indicate that about 18 beluga were caught during the mid to late 1800's and a further dozen or so in the early 1960's. No belugas have been captured from this area since 1965, a period of 27 years.

The first well-documented beluga whales in captivity in Canada were not from Canadian waters but were the result of an accidental capture by fishermen in the Nak Nek River in Alaska in 1967. The adult female and juvenile male were subsequently purchased by the Vancouver Public Aquarium where they lived for 9 and 13 years respectively.

The live-capture of beluga whales from the tidal waters of the Churchill River estuary in northern Manitoba began in 1967. Of the 68 animals collected during the past 25 years, 7 have remained in Canada, the balance were exported. A review of the beluga live capture program from 1967 to August 1992 is covered in Section III, 3. It is important to note that beluga have seldom been used for entertainment type show presentations in aquaria as have killer whales and dolphins.

III. CURRENT STATUS

1 Legal Status in Canada for Live Holding and Live Capture of Cetaceans

The main legislative base for the Department of Fisheries and Oceans is the Department of Fisheries and Oceans Act, which established the Department in April 1979; and the Fisheries Act, which was enacted in 1867 in accordance with the responsibility for "sea-coast and inland fisheries" placed on the Federal Government by Section 91(12) of the Constitution Act, 1867.

While the responsibility for "sea-coast and inland fisheries" clearly provides the authority to regulate the live capture of cetaceans, generally, once fish (including marine mammals) are, with proper authority, taken from their natural environment and under an individual's control, there is no longer a "fishery". Instead, the fish are now an individual's property. The regulation of such "property" is a provincial matter and therefore there is no jurisdiction under the Fisheries Act to pass regulations on the maintenance of cetaceans in captivity.

While there is no federal law directly related to the maintenance of cetaceans in captivity, a number of provisions of the Health of Animals Act, 1991, administered by the Department of Agriculture, may be applicable. For example, Section 64 (i) of this Act provides for the making of regulations for the humane treatment of animals and governing the care, handling and disposition of animals. In addition the Criminal Code of Canada addresses the matter of cruelty to animals.

Importation into Canada and exportation from Canada of cetaceans is subject to the Export and Import Permits Act. Regulations under the Act adopt the procedures and species described in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Under these regulations, a CITES permit issued by the Canadian Management Authority, is required for the exportation of cetaceans from Canada. For those species on Appendix II of CITES (this includes all cetaceans for which trade is not prohibited), importation into Canada requires only an export permit from the country of origin. The importation into Canada of cetaceans for public display is therefore not controlled by the Department of Fisheries and Oceans. The importation and exportation of cetaceans is also subject to conditions related to health, protection and transportation in the Health of Animals Act.

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The Committee has examined the Cetacean Protection Regulations, the Beluga Protection Regulations and the Narwhal Protection Regulations under the Fisheries Act and has concluded that these regulations provide adequate protection for cetaceans.

Existing legislation under the Fisheries Act gives protection to whales in Canadian Waters. The same Act provides the basis for controlling the live capture of whales. Import and export are presently controlled under the Export and Import Permits Act. This situation is likely to change in the near future with the introduction of the Wild Animal

and Plant Protection Act. That legislation will allow greater control over export and import of cetaceans.

The care and maintenance of marine mammals in aquaria is a matter of Provincial jurisdiction but the Provinces have no regulations specifically dealing with standards of facilities and care of marine mammals.

2. Organizations in Canada Currently Holding Live Cetaceans

There are only five facilities in Canada holding captive cetaceans and one of these, Sealand in Victoria, will permanently close within the year. Two of the remaining four have dolphin shows only and one of these is a temporary, summer only, facility. In the latter case three dolphins are brought into Canada from the U.S. for the period April to October each year.

Only two facilities, the Vancouver Public Aquarium in Vancouver, B.C. and Marineland of Canada in Niagara Falls, Ontario, exhibit killer whales and dolphins. The Vancouver Aquarium also holds beluga whales, and is the only Canadian facility at present which does so.

3. Directed Live Captures of Cetaceans in Canada

Since 1975, the only directed live capture of cetaceans in Canada has been for the taking of beluga (white whales) from the Churchill River area of Hudson Bay for public display and research.

While at this time the western Hudson Bay population has not been officially classified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Campbell 1991), population surveys undertaken by Richard et al (1990) produced an estimate of at least 23,000 individuals for this population, and it appears to be the largest population in Canadian waters. Approximately 300 individuals from this stock are harvested annually by native people for subsistence purposes.

Beluga whales are particularly well-suited for public, educational display as there is little "performance expectation", on the part of the public. Because of their small size, it is economically feasible for exhibiting organizations to provide space to house larger groups rather than pairs. This provides for the social needs, so far as they are understood, for the species and has contributed to the successful captive reproduction now taking place.

Permits to capture beluga whales for public education and display, are granted by the Minister of Fisheries under Section 4 of the Fisheries Act. Applications are reviewed by officials of the Department of Fisheries and Oceans and both the Minister's Advisory Committee. Guidelines for this review ensure that only appropriately accredited facilities with a demonstrated professionalism in the care and keeping of cetaceans will be given consideration. There is also a requirement for educational programs, research contribution and the ongoing reporting of the health status of the animals collected.

The licence limits the capture to gray subadult (immature) beluga as follows:

Females	minimum length of	245 cm
	maximum	290 cm
Males	minimum	245 cm
	maximum	395 cm

These length limits restrict the capture to weaned but reproductively immature (especially female) belugas. These animals are easier to handle and acclimate more readily than older animals. Single or small pods of gray subadult beluga are selected for capture. Thus pregnant animals, cows with calves and mature males are avoided. The animals taken are three to six years of age.

The guidelines developed by the Advisory Committee and approved by the Minister are contained in Appendix 1.

Beluga whales are captured in the water in the estuary by separating a suitable specimen from the group using small open boats powered by outboard motors. More than one boat may be used to herd the whale into shallow water whereupon two or more persons jump into the water beside the whale and very quickly restrain it using manpower and a rope around its head. The staff of Nanook Enterprises undertake the capture. The animal is measured and, if it falls within the acceptable length and is of the desired gender, a pole supported sling is lowered into the water and under the whale. Sling and whale are then lifted into a boat and the whale is transported to shore, and then into a shore-based holding facility.

The actual live-capture is supervised throughout by on-site officials from the Department of Fisheries and Oceans, a biologist, Fisheries Officer and a contract veterinarian/scientist. The permit holding Director, curator, or trainer and the veterinarian for the receiving institution are also in attendance. Every effort is made to ensure the well-being of the animals.

The Committee is aware that concerns have been expressed that animals are sometimes treated inhumanely in the course of the live capture. The Committee reviewed the capture technique employed and determined that certain elements, such as loud shouting were unnecessary but that the capture method was quick, efficient and humane. Work done by St. Aubin and Geraci tested and timed blood parameters indicative of stress and found that most returned to non-stress levels within a few days and that no long lasting effects were found. The Committee also found that charges of animals being "chased to exhaustion" were exaggerations and that strict onsite supervision by Fisheries and Oceans Departmental staff prevented such activity. The Committee found no evidence to support the claims that the capture site was a nursery area and that activities there were disturbing the nursing females. The Committee was interested in ongoing work on refining live capture procedures and methods, work that may in future be important in tagging and field studies of wild populations of beluga whales.

There have been a total of 68 beluga whales live-captured in the Churchill River estuary (Manitoba-Western Hudson Bay Coast) during the period 1967-92. This live-capture program involves the beluga stock from western Hudson Bay, a healthy population that is not adversely

affected by live-capture. The beluga have gone to various aquaria in Canada (Vancouver Public Aquarium), U.S.A., Japan and West Germany.

Appendix 4 summarizes details of the live capture program between 1967-1992.

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The beluga is the only cetacean now subject to a directed capture program in Canada.

Though there may have been isolated incidents during the live capture of beluga at Churchill that involved unnecessary disturbance to the animals, it is the view of the Committee that the capture process is now quick, efficient and humane. There is no evidence to support the allegation that the capture of beluga at Churchill disrupts nursing females and their young.

The beluga captured in the Churchill River are part of a large population. The live capture program has not affected the status of the population.

No orca have been live captured in Canadian waters since 1975.

IV. SURVIVAL OF CETACEANS IN CAPTIVITY

Good information is available on the survival of beluga whales taken in the live-capture program. Appendix 4 provides a listing of all beluga live-captured and the status of their survival in aquaria. Some information is also available for bottlenose dolphins and killer whales.

a) Beluga whales

Sub-adult beluga are about 3-6 years old when live captured for aquaria. About 60% (38 beluga) of all those live-captured (68 to date) in the Churchill area are alive today. This survival is for the time span of 25 years of the program (1967-92). Of 35 beluga live-captured since 1984, 85% (28 beluga) are alive today. This is indicative of improved husbandry and increased knowledge.

In the wild, maximum longevity may be 30 years or more (Seargent, 1973); however, using data from a recent study of an Alaskan stock, an average (mean) life-span of 12 years was estimated (Richards, Department of Fisheries and Oceans, pers. comm.). Losses are attributed to both natural (diseases, parasites, predation, ice, etc.) and harvest mortality. In the Canadian Arctic, all beluga stocks are harvested by Inuit as part of their subsistence food fishery.

In aquaria the mean age of surviving beluga or the mean age at death can be calculated but these statistics are of no real meaning unless the entire cohort of animals that are used in estimating survival is dead. For example, if four animals were captured at the same time and two died at 2 years while the other two are still alive 15 years later, the mean age of surviving beluga is 15 while the mean age at death is 2. There is an insufficient data base to calculate life-span for beluga in captivity. It is therefore, more meaningful to use annual survival rates (ASR) which indicates the number of animals alive after one year, divided by the initial number at the beginning of that year. For example, an ASR of 0.95 would indicate that 95% or 95 out of 100 animals have survived in that year.

A recent scientific study (DeMasters and Drevenak 1988) has shown that the annual survival rate of beluga in captivity (N = 48) was 0.94 ± 0.03). They also indicate that there was no statistically significant difference in survival rates between the various aquaria. ASR for beluga, bottlenose dolphin and killer whales, in aquaria, was in the 0.92 - 0.94 range which indicates that survival in captivity may be equal to or better than survival in the wild.

In June 1992, the Department of Fisheries and Oceans, Central and Arctic Region, Winnipeg, calculated ASR for 64 beluga sent to various aquaria in Canada, U.S.A., Japan and Germany during the period 1967-92. The results were as follows: (R. Moshenko, unpublished data):

i) that overall ASR was 0.94;
ii) that ASR for the period 1967-79 and 1980-92 were 0.93 and 0.96 respectively; and
iii) that ASR for females and males were 0.95 and 0.94 respectively.

Estimates of annual survival rates show no significant difference when compared with the findings of DeMaster and Drevenak (1988). Taking into account the recent work by Wells and Scott (1990), but presuming that the increase in survivorship over time noted by Richter (1988) may still be occurring, it appears that wild and captive survival is very similar.

It should be noted that since the beluga live capture program began in Churchill, Manitoba, there have been no beluga deaths as a result of handling and transport. In 1973 two newly captured animals were killed by polar bears which attacked the whales during the night. Subsequent to this incident all captured whales have been under continuos observation to ensure their safety.

b) Killer whales

The survival rate of captive orca has been estimated several times using slightly different data. Richter (1988) using data to 1985 gives an annual survival rate of 0.93 and finds no significant improvement over time. Bain (1988) using data up to 1987 reports improved survival over time. A still more recent study by Baird (unpublished) based upon an analysis of experience with orca in Canadian aquaria over the five year period 1987-1991 produces an annual survival rate of 0.98. This compares favourably with rates calculated for wild population on the coast of British Columbia by Olesiuk et al (1990). He found that juveniles of both sexes had an annual survival rate of 0.98, mature males, 0.96 and mature females 0.99.

Thus it appears that the increasing trend in killer whale survival noted by Bain (1988) has continued, and survival of killer whales in Canadian aquaria in recent years has been similar to that in the wild.

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The annual survival rate of both beluga and orca in Canadian aquaria is similar to that estimated for wild stocks..

V. BREEDING CETACEANS IN CAPTIVITY

All the orca introduced to aquaria have been captured as young animals and required several years of growth and development before they reached sexual maturity. It is not surprising therefore that only recently have there been calves born to the aquarium animals. Furthermore, few aquaria had more than one or two animals.

In recent years experience in several aquaria has added significantly to knowledge of the facilities and care that appear to be required for establishing a successful breeding colony of orca. The Sea World Aquaria in the United States have been leaders in the field and have published their findings (Asper et al 1992). Their results are important as we look at Canadian facilities.

They emphasize that successful breeding programs are built around: 1) facility design; 2) establishment of breeding colonies of behaviourally compatible males and females; 3) husbandry practises which allow early detection of pregnancy; and 4) the pre- and postnatal association of inexperienced females with experienced females.

Facility requirements include multiple pool systems that provide pools that can be allocated as nursery areas where near term females are placed with others at similar stage and with mothers and their young calves. Here the neonates and their mothers remain, away from the breeding colony, until the calves are one to three years old.

For orca the shape and size of the nursery pool is important as the mothers appear to require a long glide path to permit the newborn young to nurse effectively.

The breeding of orca in Canadain aquaria has had limited success with only three of seven young born surviving. This is below the wild survival rate for neonate killer whales in British Columbia, estimated to be 50% (Olesiuk et al. 1990). It must be recognized however that the data from the wild do not include stillbirths or very early death, both of which are included in the captive figure.

On the basis of these findings it is the view of the Committee that none of the Canadian aquarium facilities are suitable for the establishment of breeding colonies of orca and it is testimony to the adaptability of some females that, in less than ideal circumstances, two of the six young born have survived to weaning.

To date there have been nine beluga whales born in aquaria. Two calves born at the New York Aquarium (August 1991) and one born at Sea World, Texas (August 1992) are alive as of November 1992. For the other, earlier births survival range from a few minutes to sixteen weeks.

Currently, aquaria with a complete breeding stock have developed breeding and associated research programs. Table 1 summarizes beluga births in North American aquaria. On the basis of successful breeding programs for other species of cetacea, the committee is optimistic that breeding programs for beluga can be established.

TABLE 1
Beluga Births in North American Aquaria

Date of Birth	Aquarium	Beluga Mother	Survival Success of Calf	Comments
22/07/72	New York	Francis (1967)	Several hours	Mother deceased in 1974
13/07/77	Vancouver	Kavna (1976)	16 weeks (see below)	Conceived in the wild
17/06/81	New York	Amy Lou (1976)	Several minutes	Mother deceased in 1982
25/08/81	New York	Kathy II (1973)	8 weeks	Mother would not nurse
07/05/84	Sea World San Diego	#D1-7302 (1973)	4 days	Mother deceased in 1985
07/08/91	New York	Natasha (1984)	Alive	Male calf doing well
14/08/91	New York	Kathy II (1973)	Alive (as of 03 August 1992)	Male calf doing well
02/08/92	Point Defiance	Manyak	Several minutes	
08/08/92	Sea World Texas	SWC-D1 8730	Alive	Male calf doing well
Others:				
25/05/74	New York	Francis (1967)	-	Mother died with calf near full term
10/07/87	Sea World San Diego	#7903 (1979)	-	Mother died due to complications from stillborn calf

- Compiled 03 February 1992

In general, successful captive breeding of cetaceans is progressing well and is more successful in some species than in others. Smaller cetaceans with a faster growth and maturation rate show the greatest success. Sea World, USA for example has had 77 bottlenose dolphin births since 1978, 7 killer whale births since 1983, and 8 Commerson's dolphin births since 1983. These births represent 52%, 44%, and 38%, respectively, of the live animals currently in their inventory

for these three species. Of the 77 bottlenose dolphin calves born, 80.5% survived beyond three months, and 7 second generation calves have been born as of 1991.

Taking the entire North American population of cetaceans in captivity as of March 1990 (431 cetaceans representing 10 species) the trend is moving in the direction of successful captive breeding. In 1979 captive born represented 8% of the total captive population at that time. In 1983, captive born represented 21% of the captive population and in 1990, captive born were 26% of the population.

The experienced gained in current cetacean captive breeding programs may have value in augmenting the understanding of the breeding biology of cetaceans and improving the management of endangered species of small cetaceans (Ames 1991).

The Committee is of the opinion that there are a sufficient number of beluga in aquaria to support captive breeding programs.

The Committee believes that none of the Canadian aquaria have facilities that meet the optimal conditions for the captive breeding of orca. While much has been learned about the facilities and special care required where successful breeding programs are sought, it is probable that there is much still to be learned. The loss of young animals is disturbing to many, thus there should be every effort to provide state of the art facilities and care before breeding is attempted. It is also important that each program be approached with a learning plan.

VI. STRANDED CETACEANS

The smaller toothed-whales, including all those of a size to be potentially accommodated in aquaria, appear to strand under several different circumstances. Most single animals that strand do so because of overwhelming pathological conditions. Some, however are young that appear to have lost or been abandoned by their mothers.

The reasons behind mass strandings have been the subject of many studies. Shoreline and sea bottom contours seem to predispose certain areas to periodic strandings of groups of animals of the same species. It is believed that these animals have become disoriented rather than pathologically distressed. In some instances it is suspected that a "group leader" either through illness or accident has gone aground taking the group along. Among such a group of animals there are likely to be some that would be suitable for rehabilitation in aquaria.

While most aquaria are prepared to offer assistance to a stranded cetacean, where practical and possible to do so, ie. where the animal is neither too large nor too distant to be rescued, they do so at their own time and expense. Providing space, staffing, and veterinary care for an injured or seriously ill cetacean can be expensive and taxing for a facility.

Among a number of attempts by Canadian aquaria to assist single stranded animals, a few abandoned young have been successfully rescued. The most widely publicized was the newborn orca "Miracle" rescued by Sealand, Victoria. However, the suggestion that stranded cetaceans be a source of exhibit animals for aquaria, while attractive in principle, is usually impractical or inadvisable. Apart from the threat of introducing disease to the aquarium, such animals may be incompatible as to species, sex or behaviour relative to the existing colony.

The public, on the other hand, has an expectation that aquaria have an obligation to offer this service as a kind of aquatic animal shelter, and if the animal is returned to health, that it should be released.

On the positive side, caring for stranded animals does provide a valuable opportunity to learn more about cetacean pathology and may offer clues to health problems encountered by cetaceans in the wild.

The Committee noted that operation and responsibility for stranding networks were not included in the terms of reference for the current review.

Stranded animals generally are not a suitable source of cetaceans for aquaria.

VII. MAINTENANCE STANDARDS FOR CAPTIVE CETACEANS

The Committee has reviewed comprehensive standards developed in the United Kingdom and the United States for keeping cetaceans in captivity. These standards address the issues of water quality, food and food handling, veterinary care, qualifications and training of personnel, personnel safety and pool characteristics.

The Advisory Committee on Marine Mammals is of the view that there should be standards relating to facilities and maintenance of captive cetaceans in Canada. The Committee concluded that the standards developed and applied to the keeping of cetaceans in the U.S.A. and the U.K. provide a useful basis for developing standards for aquaria in Canada that maintain cetacea.

In addition to the above categories related to facilities and care the Committee is of the view that acoustic considerations and issues relating to single animals of a species should be addressed in such standards. The standards should also address the issue of personnel safety as recommended in the verdict of the coroners inquest (May 5, 1991) of the death of a trainer at a Canadian aquarium.

A number of nongovernmental organizations and individuals have suggested to us that Canada should have a Marine Mammal Protection Act similar to that of the United States.

It seems to the Committee that a simpler and equally effective means of assuring that captive cetacea in Canadian aquaria receive the best possible care is to ask the Canadian Association of Zoological Parks and Aquaria (CAZPA) to specify appropriate standards of facilities and care as part of the accreditation process. In support of such an arrangement it will be essential that accreditation by CAZPA be a requirement for the issuance of permits by the Government of Canada for live capture, import and export of cetaceans.

The application of such standards to institutions importing cetaceans into Canada should be possible under the Wild Animal and Plant Protection Act bill C42 if this Act receives Parliamentary approval.

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The Canadian Association of Zoological Parks and Aquaria has an accreditation process that could provide a suitable way of achieving appropriate standards of facilities and care for marine mammals in captivity.

Future decisions concerning live capture of beluga will be influenced by the Native Land Claims Agreements.

It is the opinion of the Committee that the standards of care and maintenance of cetacea in Canadian aquaria, are, for the most part, of the same level as specified for U.S. aquaria, but that the present facilities in which orca are held are not adequate.

Although the husbandry of orca has made great advances, there are still problems to be solved. Noteably the flaccid fin condition, infrequent in the wild, is seen in many aquarium animals and suggests a deficiency in some aspect of the housing, management or nutrition of the whales.

The Committee has not found any substantiable reasons why cetaceans should not be maintained in aquaria that can provide adequate facilities and standards of care.

VIII. THE ROLE OF AQUARIA IN EDUCATION

Aquaria do play a role in public education as evidenced by the results of two opinion polls (Angus Reid, 1989 and Decima Research, 1992) where two thirds of Canadians had visited marine parks and of those, 83% described their visit as educational. This can be interpreted as the individuals themselves acknowledging that they learned something.

Four of the five exhibiting facilities in Canada offer education programs for school children. Based on the numbers provided, participation in these, as a percentage of annual attendance is as follows: Marineland, 7%; Sealand, 20%; the Dolphin Centre, 11%; and the Vancouver Public Aquarium, 1.5%.

Since a facility's education programs are an important part of the Committee's review when considering recommendation or rejection of a live capture permit request, facilities in the U.S. exhibiting beluga whales captured and exported from Canada were also contacted for information on their education programs. Detailed responses and samples of educational materials were received from Sea World, Mystic Marinelife Aquarium, the National Aquarium in Baltimore, and the Point Defiance Zoo and Aquarium. The education program at the Shedd Aquarium has incorporated material and information provided to them from the Department of Fisheries and Oceans.

The Committee was encouraged by the quality and scope of education programs dealing specifically with cetaceans at the responding facilities. In particular the Committee noted the Braille program at Sea World, the video presentation developed by the National Aquarium in Baltimore and materials provided in large print format for seniors at the Mystic Marinelife Aquarium, all indicating a sincere effort to extend the educational reach of the exhibiting facility.

Facilities in Canada holding orca and or beluga for public display provide a public educational benefit, but there is still opportunity for improvement in the standards of the educational presentation.

There are several ways for people to experience whales and to learn details of their adaptations and their environmental needs: swimming with free living cetaceans; viewing from the surface glimpses of their anatomy and behaviour by means of whale watching trips; seeing and hearing whales via photography, video and electronic media; studying them in aquaria. In the view of the Committee, these are not mutually exclusive alternatives. At this time the aquarium, though lacking in environmental context, remains an acceptable and useful way of introducing large numbers of people to the form and function of living cetacea.

IX. RESEARCH IN AQUARIA

Observations and studies on captive cetaceans have contributed significantly to an understanding of cetacean biology and physiology. This contribution to science made by the aquaria must be acknowledged. Some findings have been opportunistic, others have been directed, and the majority are the result of an accumulation of data over time.

For beluga whales alone, over 50 reports and journal papers have been published on studies or data generated from captive animals. This has added significantly to the known biology of the species as well as contributing to improved living conditions and life expectancy of aquarium animals. The kind of data gained ranges from specifics such as blood chemistry, tooth layering for age verification, growth rates, diving capabilities, and echolocation, to general health, survival, reproduction and husbandry.

A selection of scientific publications and published abstracts of papers delivered at scientific conferences on cetacean research in Canadian aquaria is provided in Appendix 2.

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According to the information available the Committee has concluded that research on captive cetaceans in Canadian aquaria has been entirely benign.

X. THE RELEASE OF CAPTIVE CETACEANS INTO THE WILD

The thought expressed in this proposal, to return captive cetaceans to the wild, is an aesthetically attractive one. It is possible to imagine taking an animal into an aquarium for a year or two to serve as a source of education or research and then returning it to the area of its origin taking with it a host of experiences.

Cetaceans have indeed been taken from the wild and kept in confinement for weeks or months as research subjects or for rehabilitation after stranding, and then released. But these were generally short periods during which the animal was maintained close to its point of origin and out of contact with other species.

As the concept goes, it should be possible to retrain an animal, that has been held in an aquarium for years, to make a living in the wild and then release it to return to its "Family" and to live out a normal life span. Unfortunately putting the idea into practice involves many unknowns.

The task of training any of the present aquarium species to kill their prey would be relatively easy but though this is an essential prerequisite for wild living it is not a sufficient capability.

All the toothed whales are predators and in all predators to survive requires a series of complex skills plus physical and physiological competence. There have been successful reintroductions in some terrestrial carnivores and it should be possible with some species of cetaceans.

In contemplating a release back into the wild there are three concerns:

1. Concern for the well being of the individual animal being released.
2. Concern for the wild individuals of the species and other species in the same habitat; and
3. Concern for humans using the same environment.

Concern for the individual includes making sure that the animal can kill its own prey. But much more difficult is to teach the individual to find its prey today, tomorrow, six months from now and so on when this may require moving long distances to secure seasonally available food resources.

Then too there is the matter of physical and physiological competence to cope with the ocean in all its vagaries.

It is well known to comparative anatomists that the skeleton of animals that have grown to maturity in zoos is altered in many ways from that of an animal that has matured in the wild. Many of the skeletal changes reflect changed muscle mass the consequence of different levels of use. Little is known about changes in physiological competence accompanying the two very different lifestyles. Is a cetacean after months or years in an enclosed and protected environment

still sufficiently able as a breath-hold diver to seek its prey in long deep dives or to survive the fury of an ocean gale?

From what we know some groups of dolphins live in relatively small home ranges within protected waters that produce an adequate year round supply of food species. This makes the task of meeting their energy needs appear to be relatively simple. Individuals from these stocks would be the most likely candidates for successful release.

The orca however probably has a much more difficult task. For example, an orca in the North Atlantic must learn how to knit the seasonally fluctuating resources of large ocean areas into a year round livelihood. This is an ability usually gained by years of learning at its mother's side or as a member of a skilled and experienced pod.

The individual, after years of sheltered aquarium life, may have lost its skill at detecting and avoiding predators, if it had learned them before its capture. For orca there are probably few predators but for dolphins and beluga they are a fact of life.

The toothed whales are known to play host to a large assortment of parasites some of which can induce life threatening diseases or lead to a debilitation that renders the individual more vulnerable to other natural causes of death (St. Aubin pers. comm.). Have years of feeding on a diet free of parasites and of living with a relatively small number of cetacean contacts left the animal with little natural resistance to disease organisms?

The death of large numbers of European harbour seals in 1986, resulting from a virus similar that of the canine distemper virus, is a dramatic example of the kind of impact that could result from the release to the wild of captive animals carrying an undetected virus.

Concern for other cetacean species arises largely from the possibility that the captive animal may be a carrier of disease organisms that the wild stock has not been exposed to. Relatively little is known about many of the viruses of marine mammals and it is impossible to screen a potential releasee for many of the viruses it may carry. The Committee notes particularly the major conclusion of the Workshop on Releasing Marine Mammals into the Wild (U.S. Marine Mammal Commission 1991) that, with the possible exception of highly endangered species, risks to wild populations from transmission of viral diseases from the release of rehabilitated captive animals, make such endeavours inadvisable.

The threat to humans posed by a released animal may seem slight. However, during its period in an aquarium a cetacean has learned to associate with man in many novel ways. When it is released from the aquarium back into the wild it takes these learned behaviours with it. An orca so conditioned may prove to be an apparent or actual danger to swimmers or others using the sea. The insurance liability involved would be an interesting matter.

This brief catalogue of some of the complications associated with returning once captive animals to the wild does not make the possibility less interesting only more in need of carefully planned research. It is possible to imagine circumstances in which the ability to release aquarium animals might present an attractive management option in the future.

Given the potential for serious problems as well as the possible advantage, serious well planned research should be undertaken to examine the problems and see if solutions to them can be found. This should concentrate first on the species, such as the bottle-nosed dolphin, that seem to present the least complicated problems to be solved.

Experience with Release

There have been a few exploratory projects carefully designed to learn something of the problems and potential of the concept.

The Naval Ocean Systems Center in the United States has for several years experimented with the training of bottle-nosed dolphins and pilot whales to leave a facility (S. Ridgeway, pers. comm.). These studies have yielded information that could be useful in programs designed to prepare cetacea for future release to the wild.

Three pilot whales rescued from a mass stranding on the northeast coast of the United States were rehabilitated at the New England Aquarium and released bearing radiotelemetry devices (Mate et al 1987; J. Goodyear, video film).

In 1989, two bottle-nosed dolphins from Florida were returned into the parent population after two years as research animals at the University of California, Santa Cruz. These animals were given the best possible professional rehabilitation training and medical treatment prior to release. They too were equipped with radio telemetry devices (St. Aubin, pers. comm.).

In both the pilot whales and the bottle-nosed dolphins, despite some radio malfunction, it was possible to track one animal for several weeks. Though the results were encouraging maintaining contact for several months may be required before it is possible to be reasonably certain that the "return" program has been successful.

It is apparent that even with the best of design, equipment and execution the complicated process of preparing cetaceans for release, and monitoring them for the periods required to make certain that they have survived on their own is in its early stages.

The release of three dolphins from commercial facilities in the United Kingdom in 1991 (Project Into the Blue), is in a different category. It appears that the animals may have been of three different local strains or subspecies (St. Aubin, Ontario Veterinary College, pers. comm.). One was Tursiops truncatus, one a the North Pacific form Tursiops t. gilli and the third from the Indopacific. To release singletons of a subspecies into a marine region (Turks and Caicos islands) where it does not occur naturally is contrary to biological propriety.

All animals had been in captivity for a number of years and one of them is reported to have been ailing and under antibiotic treatment (Kirtland 1992). According to the same source "the entire operation was ill-conceived and poorly executed. It was little more than a publicity stunt... with no concern for the welfare of the dolphins in anything other than an anthropomorphic sense."

On the other hand some of those involved reported (viva voce) to a conference in Vancouver, B.C. on October 31, 1992 that one of the animals had that day been identified at sea in company of a group of dolphins. We may never know what steps were taken to prepare these animals for release and whether or not they were successful. This is unfortunate as the issues are important and every such attempt at a release to the wild should be given the best scientific design, meticulous documentation and monitoring conducted so as to be beyond criticism.

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Given the present state of knowledge, the release to the wild of cetaceans that have been in captivity for extended periods is inappropriate.

X1. THE ETHICS QUESTION

Klinowska and Brown (1986) in their searching examination of dolphinaria in the United Kingdom introduce the discussion of ethics with the following statement:

> "Among the points made about keeping cetacea in captivity only some are amenable to assessment through evidence; the ethical beliefs cannot be quantified. Beliefs are not without importance in this issue, but aside from pointing out these beliefs, there are considerable difficulties in evaluating personal opinions, whether these are from members of the public, interest groups or from cetacean experts."

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The Committee acknowledges that a number of organizations and individuals are opposed to the live capture and maintenance of cetaceans in captivity for ethical reasons. In support of this opposition many have cited needless pain and suffering, and the adverse effects of separation of family groups and maintaining animals in an unnatural environment. The Committee considers that most of these concern cannot be substantiated scientifically. Further, the Committee notes that for the majority of Canadians (see discussion of public opinion polls) the live capture and maintenance of cetaceans in captivity is ethically acceptable.

Certain attributes of cetaceans and their habitat places them in a special position in the affections and concerns of some people beyond those for most other mammals frequently held in zoos or aquaria.

This special status requires that those associated with the capture and keeping of cetacea exercise special concern for their accommodation and care.

Several organizations and individuals expressed their opposition to the keeping of cetaceans in captivity. Although their objections were often in terms that could not be examined factually they are none the less important.

Many of the concerns expressed about the physical and mental wellbeing of cetacea now in Canadian aquaria arose from misinformation, from anthropomorphism or were very difficult to substantiate.

XII. COMMITTEE CONSULTATION AND PUBLIC OPINION

The stated objectives of keeping dolphins and related species of cetaceans in aquaria is to provide the public with opportunities to appreciate at first hand the elegance of these creatures, the extent of the adaptations they have evolved to permit life in the sea, and to permit study of the animals under controlled conditions.

It is expected that those experiencing this close contact with the animals, guided by well thought out programs designed to interpret the physical and behavioral features of the animals and the impacts of man upon them and their habitats, will lead to a more informed and understanding public better able to respond intelligently to the needs of conservation and habitat preservation.

In Canada there are six facilities designed to keep cetaceans: Sealand of the Pacific in Victoria, the Vancouver Public Aquarium in Vancouver, Marineland of Canada in Niagara Falls, Montreal Biodome, the Dolphin Centre in West Edmonton Mall and Canada's Wonderland at Maple, Ontario. In the latter facility they are in Canada only during the summer months. Each of these is dependent upon its visitors for the financial support to keep it alive. They obviously have a direct interest in the public's views as to whether the programs being delivered are found to be of sufficient interest to invite return visits. At the same time both the Government of Canada and the Provincial governments share responsibility for the cetaceans as wild creatures and aquarium displays respectively and have a concern that the public understands and supports how they are discharging their responsibilities.

1. Public Opinion Poll

In 1989 the Ministry of Fisheries and Oceans commissioned a sampling of public opinion on the live capturing of white whales (beluga) in Canada. The study was undertaken by Angus Reid Associates, a firm with long experience in conducting and interpreting public opinion polls.

The Committee is well aware of the problems of designing and conducting such surveys and of the difficulty of framing questions that do not bias the results. Even so it was decided to undertake a repeat of the study in 1992. By using the same questions as in the 1989 poll and supplementing them with some others designed to gain more detailed information, it was believed that any changes in public attitude during the intervening period would be revealed. The 1992 poll was done by Decima Research, another very experienced firm.

In 1989 it was found that two thirds of Canadians had visited marine parks (= Aquaria). In British Columbia it was 94%. Eight out of ten who had visited described their experience as educational. Among these visitors 18% said they felt sorry for the animals in captivity. Three in ten Canadians knew that Canada was one of the world's main sources of beluga for aquaria; 71% of those polled supported the continuation of the program to live capture whales and to maintain them in aquaria for public viewing and education; 23% were opposed. Seventy five percent supported capture programs to provide living animals for research in marine parks.

Support for continuation of the programs was highest in British Columbia where it was 78% and opposition was lowest there, 17%.

Support was lowest in Quebec at 66%; 70% in Ontario, 73% in the Prairie provinces and 77% in the Atlantic provinces.

The new questions in the 1992 poll were designed to reveal differences in attitude toward the two major species exhibited by the three aquaria; the orca or killer whale and the beluga or white whale.

The answers to the same questions as were put in 1989 revealed an increase of 5% in the number of Canadians that had visited an aquarium that featured cetaceans. Of these 83% described their experience as educational, essentially unchanged since 1989. The national average of those supporting the continued capture of cetaceans for public display and educational purposes was also unchanged (72% in 1992, 71% in 1989). The same was true for support for capturing and maintaining cetaceans in aquaria for study (75% in 1989, 78% in 1992). However the regional breakdown revealed some significant changes. The question was directed at the capture and keeping of beluga, the only cetacean now available for live capture in Canada.

In British Columbia the level of support had declined from 78% to 61%. Overall the support for capture and keeping beluga for study was 78% in 1989, 75% in 1992, an insignificant change. Support has risen substantially in the Atlantic provinces from 77% to 83% and Ontario from 70% to 75%. It also appeared from the 1992 poll that the public made little distinction between beluga and orca.

Other questions added to the 1992 poll were introduced to test the response of the public to three rather than two aspects of the purpose of keeping cetaceans in aquaria: research, public display for education, and a performance (= entertainment type) of presentation. This revealed a remarkable discrimination by the public as to what was an acceptable purpose for keeping a creature in captivity. Support for entertainment presentation was very low, about 39%, support for the other two aspects has been detailed above.

It is quite clear from these polls of public attitude that the Canadian public finds their contacts with cetaceans in aquaria educational and enjoyable and that they support the continuation of the opportunity for this experience. It is equally clear that the majority of Canadians do not regard the presentation of performance shows as a valid reason for keeping cetacea in captivity, but education and research are approved by the majority.

Public opinion supports the live capture program for beluga and the presentation of cetaceans in aquaria for educational and research purposes.

The public shows little support for performance type presentations involving cetacea. It does not consider that such acts justify keeping these animals in captivity.

2. Letters, Briefs and Personal Interviews

The office of the Minister of Fisheries and Oceans has, over the past year, received letters from a number of individuals expressing their views on keeping cetaceans in aquaria for public viewing. The majority of them appear to have been members of organizations in the United States of America that have a dedication to animal welfare or animal 'rights'. Others were from similar organizations in Canada. Still others were from Inuit people of the Canadian Arctic, and a few from apparently unaligned individuals with thoughts on the subject.

The Committee wrote to many of these individuals and invited them either to meet with us or to submit a statement of their concerns and preferences in writing.

Letters were sent also to each of the Canadian aquaria and to the Canadian Association of Zoological Parks and Aquaria seeking their input.

As the responsibility for the maintenance of animals in captivity rests with the provinces, the Committee wrote also to the appropriate Minister in each of the ten Provinces as well as Yukon and Northwest Territories. Each was asked to provide information on the laws and regulations of their province or territory under which cetaceans in captivity were assured care and facilities appropriate to their needs. Each was asked also for an informal statement of the attitude of their jurisdiction on the topic of cetaceans in captivity.

In addition to the helpful responses from each of the Provinces and Territories, the Committee received 10 briefs, 18 letters, one petition and nine requests to meet the Committee. The Committee is most grateful to all that participated for the time and effort they devoted to explaining to us their points of view. See Appendix 5.

A Brief Summary of Comments Received

Because there is considerable overlap in the nature of the issues raised by those who wrote to us or presented briefs the general focus of these will be summarized without attribution. The following seem to the Committee to encompass all the points made.

Four organizations representing animal welfare and animal 'rights' and some individual correspondents proposed the following:

1. End the capture of cetaceans for aquaria in Canada or elsewhere.
2. Improve standards and enforcement of standards for those cetaceans now in captivity.
3. Investigate opportunities to return cetaceans currently in captivity to the wild.
4. Obtain a Canadian Marine Mammal Protection Act.
5. Obtain more public input into the decision-making process affecting cetaceans.
6. Transfer responsibility for cetaceans from the Department of Fisheries and Oceans to the Department of Environment.
7. No more permits to be issued for the export of cetaceans now in Canadian aquaria.
8. Provide funding from government sources to increase and improve the rescue of stranded marine mammals.
9. Research permits be restricted to those wishing to undertake "humane" types of research.
10. One presentation to The Committee expressed the view that facilities and care at one of the Canadian aquaria were grossly inadequate.

In addition to receiving briefs and letters from individuals and organizations, the Committee reviewed literature on the topic.

In recent years there have been several conferences that included on their agendas contributions with a bearing upon some of the issues that arise in the debate as to whether or not the continuing presence of cetaceans in aquaria/oceanaria is justified. The Committee has reviewed the proceedings of:

- Whales Alive Conference, Boston, Mass. 1985. Sponsored by International Whaling Commission and a number of NGO's;
- International Whaling Commission Conference on Cetacean Behaviour and Intelligence and on the Ethics of Killing Whales, held at the Smithsonian Institution, Washington, D.C., May 1980;
- Canadian Federation of Humane Societies Symposium - Whales in Captivity: Right or Wrong, held in Ottawa, Ontario, April 1990.

3. Contact with the Canadian Facilities

The five Canadian facilities exhibiting cetacea were contacted; (See appendix 3 for detail of the collections and facilities).

In addition The Committee invited Montreal Biodome to present its plans, which include the exhibition of beluga and the operation of a unit to attempt rehabilitation of stranded marine mammals.

The Committee notes that Sealand of the Pacific in Victoria has made the decision to cease operating as an aquarium in 1992 or early 1993. It plans to close and remove its facilities and to dispose of its collections.

Vancouver Public Aquarium informed us that it has discontinued any element of "performance entertainment" from its presentation of cetaceans and is concentrating on further improving its already strong educational program in which cetaceans are presented.

The Committee was made aware that Montreal Biodome hopes to be able to open its cetacean facility in 1994.

Each of the aquaria was most cooperative and helpful in making available details of its facilities, its cetaceans, programs of animal care, the presentation of the animals to the public, its educational efforts and research. It was especially helpful to share the information on the housing, care and presentation of cetaceans that they have derived from their pioneering experiences in live capturing and keeping these creatures.

Each of the aquaria continues to support the view that the exhibition of living, healthy cetaceans serves an important role in expanding the public's appreciation of and concern for cetaceans. The Committee had available current information from aquaria in the United States related to the facility requirements for breeding and rearing orca and beluga.

4. Consultation with the Indigenous People of Arctic Canada

Cetaceans have always featured prominently in the survival of the indigenous peoples of Canada. They provided food, fuel and structural materials to most of the peoples of the Arctic coast. To many of the peoples there today the beluga and narwhal retain this integral role with respect to subsistence and culture.

The Committee was in touch with the indigenous people and others of the Churchill community as well as with the Inuvialuit Game Council, the Inuit Tapirisat of Canada (ITC) and Keewatin Regional Council. Their concerns and attitudes toward beluga as a resource that they use, and toward the capture of the animals for use by aquaria, are important to any Canadian decisions regarding these species.

The Committee has not been able to make as many contacts with the people of northern communities as it would have liked but spokespersons from the local government of Churchill, from the Inuvialuit, and from ITC expressed their concerns in terms distinctly different from those previously listed.

In each instance their views were predicated on three points:

1. That the population of beluga from which the animals were to be taken was at a level of abundance that the small number of captures would not adversely affect it;

2. That the animals transferred to aquaria would receive the best possible care and accommodation;
3. That the beluga should be used to educate southern Canadians about the wildlife of the north and its need for a healthy environment and sensitive conservation.

These groups and individuals had the following concerns:

1. The use of beluga for food and other products is an ancient tradition with continuing importance to northern people, especially the Inuit. Live capture is a form of supportable resource use. The techniques were developed in Churchill.
2. The live capture creates local pride and affirms northern skills and values.
3. They would like to see more research undertaken on the sub-population that enters the Churchill area.
4. The local people of Churchill strongly support continually improved standards for aquaria for the safe keeping of the beluga and for the promotion of the conservation, scientific and educational values of aquaria.
5. The whale-using communities of the western Arctic reported support for live capturing but admitted mixed feelings. Some of the hunters were not happy with conditions in which "their whales" were kept in aquaria. They regarded the pools as too small. The general opinion was that the best place to see a beluga is in the Arctic sea.

Representations from the Inuit generally indicate strong support for the continuation of the beluga live capture program, however Inuvialuit of the western Arctic expressed divided views as to the keeping of beluga in captivity.

Future decisions concerning live capture of beluga will be influenced by the Native Land Claims Agreements.

The Committee has considered all these expressions of concern and preferred results with the greatest care during the preparation of this report and the recommendations for action.

RECOMMENDATIONS

1. The Committee recommends that the Department of Fisheries and Oceans ensure standards are implemented for the accommodation, care and maintenance of cetaceans in captivity in Canada.

2. The Committee further recommends that the Department of Fisheries and Oceans work with the aquarium industry to develop these standards, and that the Minister encourage the Canadian Association of Zoological Parks and Aquaria (CAZPA) to adopt such standards and to incorporate them into the accreditation process. It is the view of the Committee that such a process should have built into it the requirement for independent periodic review of facilities and operations.

3. The Committee recommends that if satisfactory standards and compliance mechanisms are not adopted by the aquarium industry the Department of Fisheries and Oceans examine the options to regulate the imposition of such standards.

4. The Committee recommends that the Department of Fisheries and Oceans work with the Department of Environment to implement regulations under the Import and Export Permits Act and/or the proposed Wild Animal and Plant Protection Act such that permits for importation of cetaceans into Canada be issued only to institutions that comply with the standards referred to in Recommendation 1.

5. The Committee recommends that, given the present state of knowledge, the release to the wild of cetaceans that have been in captivity for extended periods is inappropriate. This recommendation implies that the aquarium industry has a perpetual committment to the welfare of those cetaceans brought into their facilities. In this context, the Committee recommends that the orca currently held in Sealand Victoria be transferred to other suitable facilities.

6. The Committee recommends that the education programs in Canadian aquaria that are directed toward increasing the public appreciation for and understanding of cetacea and their environment continue to be updated and expanded.

7. The Committee recommends that The Department of Fisheries and Oceans should consider that there are other sources of beluga whales, including captive born animals, when considering applications for live captures.

8. The Committee recommends that Canadian aquaria, possibly through CAZPA, participate in all relevant stud-book projects for captive cetaceans. It is important that, with a small founding stock available for breeding programs, careful records be maintained of the lineages of every individual.

9. The Committee recommends that the live capture of orca in Canada terminated in 1975 should not be reopened.

10. The Committee recommends that until Canadian aquaria upgrade their facilities for orca, further imports of this species should be discouraged.

11. The Committee recommends that aquaria should not attempt the breeding of orca until their facilities are state of the art.

12. The Committee recommends that the Department of Fisheries and Oceans encourage research on various aspects of releasing cetaceans into the wild and is of the opinion that:

    1) the priority topic of research should be the problem of possible disease transmission from captive to wild stocks.
    2) following resolution of problems of disease transmission, behavioural training and experimental release should be done with species such as bottle-nosed dolphins before being tried with beluga or orca currently held in Canadian aquaria.

APPENDIX 1

BELUGA LIVE CAPTURE PROGRAM

The objective of the Beluga Live Capture Program is to promote education, public awareness and conservation. The humane treatment of animals shall be of paramount concern.

Principles

Applications for the live capture of cetaceans in Canadian waters will be considered in accordance with the following principles:

1. Live capture will only be considered where such capture is unlikely to have a significant adverse effect on a species or stock or on its use for subsistence purposes.

2. Live capture may be recommended only after a qualified inspection under the supervision of the Department of Fisheries and Oceans is made of the receiving facilities and only after a review indicates a high likelihood of success in captivity.

3. All costs incidental to the approval of the application and capture shall be born by the applicant.

4. Live capture for educational and public display purposes may be considered only for aquariums having a public school program incorporating material provided by the Department of Fisheries and Oceans on the natural history and status of the cetacean species concerned.

5. Live capture for educational and public display purposes will only be considered for aquariums accredited by the CAZPA or equivalent.

6. In order to minimize the impact of live captures on the stock from which the cetaceans are to be removed, the program will be limited and priority shall be given to Canadian facilities.

7. Live capture of cetaceans may be considered in order to increase the genetic diversity for those species for which there are successful captive breeding programs.

PART 1: DOCUMENTATION FOR APPLICATION

Subject to the priority given to applications from Canadian institutions, consideration will be given to applications filed with complete documentation in the order that they are received.

1. Applicants shall provide a letter of intent no later than May 1 in the year previous to proposed live-capture.

2. Applications shall be submitted no later than September 1 in the year previous to proposed live capture. This application shall contain all the necessary documents listed herein.

3. An application for a live capture license shall be accompanied by:

   a) documents providing detailed description of the final holding facility.
   b) a copy of the institutions accreditation certificate, e.g., CAZPA or equivalent, as approved by the Minister.
   c) copies of permits issued for the live capture, holding and use, and import (if applicable).
   d) a description of the husbandry program including qualifications and experience of staff with the species under consideration.
   e) a list of previous holdings and experiences (up to ten years) for the species under consideration and a summary history of other cetacean species.
   f) a description of training programs for the resident veterinarian and other staff.
   g) any other information necessary to evaluate the application.

4. Applicants must provide details of the plans for live capture, temporary holdings, and arrangements for transport to final destination.

5. Applicants must provide documentation on their educational programs. This shall include schedule and outline of children's school program, educational materials and information on participation.

6. Applicants must provide documentation on research and monitoring program design. This shall include the monitoring for health status, feeding, growth, reproduction, behavior and any medical corrective treatments. Specific program outlines of the research program should include: objective, materials and methods, and expected results.

7. Applicants to provide a rationale and justification as to how their overall programs in education and/or research would be applicable to, and would enhance, the conservation and education objectives of the Department of Fisheries and Oceans.

8. The applicant's facility shall be inspected and approved, on behalf of the Department of Fisheries and Oceans, by an independent, qualified and experienced marine mammal veterinarian, for high standards of animal holdings, care, use and husbandry practices. For

proposed facilities, design plans are to be provided for review by the Department of Fisheries and Oceans.

9. For proposed new or expanded facilities a letter of intent and application must be submitted prior to finalizing the building (design) plans for the pools. Approval in principal may be considered subject to review of construction plans, husbandry plans, staff recruitment and training programs to be instituted as well as documentation listed above.

10. To provide adequate time for arrangements to be made concerning the capture and transportation that will maximize the safety and well being of the cetaceans, decisions respecting applications will be conveyed by the Minister of Fisheries and Oceans by April, during the year of the proposed live capture.

PART 2: OPERATIONS

1. The live capture can only proceed under a license issued by the Minister of Fisheries and Oceans. The licensees are to be the Aquarium Project Director (on site) and the approved Field Collector.

2. The live capture operation shall not proceed or be initiated without the presence of a Biologist and a Fishery Officer of the Department of Fisheries and Oceans to ensure compliance with conditions of the license.

3. A qualified and experienced marine mammal veterinarian shall be provided by the applicant and be present at all times to oversee all aspects of the operation.

4. The cetaceans shall be live captured by approved field collectors who shall also provide for continuous observation of the cetacean from the time of capture to the time of departure from the field station.

5. Method of capture shall be a condition of the license. It is to be humane, and not involve the use of equipment potentially injurious to the cetaceans.

6. The retention of animals for evaluation of medical, behavioural and other characteristics shall be minimized and specified as a condition of license.

7. Captured cetaceans shall be held for a minimum time prior to transport to the aquarium's permanent facility. This time shall be specified as a condition of a license.

8. Prior to export of cetaceans from Canada, a CITES Export Permit must be obtained by the Licensee (Field Collector).

PART 3: FOLLOW-UP

1. The Licensee (Aquarium) shall provide the following reports:

   a) within one month: a detailed report of the live capture.
   b) within six months: a report including:
      i) statement of general health of cetaceans certified by staff veterinarian;
      ii) progress report on the scientific aspects of the monitoring and research program. This information is to be designated as proprietary prior to publishing by the Aquarium or researcher.
   c) within 12 months and annually thereafter: annual reports including information specified in b) i and ii above.
   d) when a cetacean dies, a comprehensive report on the circumstances leading up to the demise of the cetacean, plus a copy of the certified necropsy report, shall be provided within one month of the cetacean's death. Further specifications concerning these reports may be elaborated as conditions of a license.

2. Upon death of the cetacean, the aquarium is to make available biological samples (eg: teeth) as requested by the Department of Fisheries and Oceans.

PART 4: SPECIES FOR WHICH THERE IS NO HISTORY OF LONG TERM CARE AND HANDLING IN CANADA

In keeping with the overall objectives of the live capture program, for species for which there is no history of long-term care and handling in Canada, the following provisions are suggested:

1. To provide data for the evaluation of the potential success of future maintenance in captivity, experimental live capture and short term on site holding and release of a limited number of cetaceans per year may be considered.

2. Observations and study shall include acclimation to: shallow pools, warmer water, feeding, general behavioral and physiological changes resulting from captivity which will further the understanding of maintaining cetaceans in captivity.

3. If (1 and 2) above are successful, and scientific data indicates good chances of survival in captivity then additional live capture may be considered for further evaluation in a permanent facility.

4. If the Department of Fisheries and Oceans is satisfied with the success of the experimental holding as above, further live capture under the general guidelines may be considered.

APPENDIX 2

RESEARCH CONDUCTED ON CETACEANS IN CANADIAN AQUARIA.

1990's

Hoelzel, A.R., and G.A. Dover. 1991. Genetic differentiation between sympatric killer whale populations. Heredity 66: 191-195.

Hoelzel, A.R., J.K.B. Ford, and G.A. Dover. 1991. A paternity test case for the killer whale (Orcinus orca) by DNA fingerprinting. Marine Mammal Science 7(1):35-43.

Graham, M.S., and P.R. Dow. 1990. Dental care for a captive killer whale, Orcinus orca. Zoo Biology 9:325-330.

1980's

Hewlett, K.G., J. Chamberlin-Lea, P.L. Goldie, D.A. Duffield, and T.A. Stevens. 1989. Determination of paternity in killer whales (Orcinus orca) by chromosomes and DNA fingerprinting. Page 28 in Abstracts of the Eighth Biennial Conference on the Biology of Marine Mammals, Pacific Grove, CA.

Kastings, N.W., S.A.L. Adderly, T. Safford, and K.G. Hewlett. 1989. Thermoregulation in beluga (Delphinapterus leucas) and killer whales (Orcinus orca). Physiological Zoology 62:687-701.

Stevens, T.A., D.A. Duffield, E.D. Asper, K.G. Hewlett, A. Bolz, L.J. Gage, and G.D. Bossart. 1989. Preliminary findings of restriction fragment differences in mitochondrial DNA among killer whales (Orcinus orca). Canadian Journal of Zoology 67:2592-2595.

Lewis, R.J., and K. Berry. 1988. Brain lesions in a Pacific white-sided dolphin (Lagenorhynchus obliquidens). Journal of Wildlife Diseases 24 (3):577-581.

Brodie, P.F. 1982. The Beluga (Delphinapterus leucas); growth at age based on a captive specimen and a discussion of factors affecting natural mortality estimates. Reports of the International Whaling Commission 32:445-447.

Dalheim, M.E., and F. Awbrey. 1982. A classification and comparison of vocalizations of captive killer whales (Orcinus orca). Journal of the Acoustical Society of America 72(3):661-670.

Drinnan, R.L., and R.M.F.S. Sadlier. 1981. The suckling behavior of a captive beluga, Delphinapterus leucas calf. Applied Ethology 7:179-185.

1970's

Matthews, A. 1979. Profile of the rescue and subsequent recovery of a juvenile killer whale (Orcinus orca). Page 40 in Abstract of the Third Biennial Conference on the Biology of Marine Mammals, Seattle, WA.

Matthews, A. 1978. Air transport by helicopter of juvenile Orcinus orca. Aquatic Mammals 6:97-98.

MacNeil, A.C., J.L. Neufeld, and W.A. Webster. 1975. Pulmonary nematodiasis in the narwhal. Canadian Veterinary Journal 16:53-55.

MacNeil, A.C., T.A. Gornal, W.E. Giddens, and J. Boyce. 1974. Evidence of Nocardia sp. in a captive-born Beluga whale. Aquatic Mammals 6:50-53.

Hoey, A., and K.R. Thornton. 1971. Techniques of management of killer whales in capture in a cold water environment. Pages 13-22 in Proceedings of the Eighth Annual Conference on Biological Sonar and Diving Mammals, Stanford Research Institute, Menlo Park, CA.

Spong, P., and D. White. 1971. Visual acuity and discrimination learning in the dolphin (Lagenorhynchus obliquidens). Experimental Neurology 31:431-436.

Thornton, K.R., and A. Hoey. 1971. Management of inflammatory skin granuloma in an albino Orcinus orca. Pages 25-33 in Proceedings of the Eighth Annual Conference on Biological Sonar and Diving Mammals, Stanford Research Institute, Menlo Park, CA.

White, D., N. Cameron, P. Spong, and J. Bradford. 1971. Visual acuity in the killer whale (Orcinus orca). Experimental Neurology 32:230-236.

White, D., P. Spong, N. Cameron, and J. Bradford. 1971. Visual discrimination learning in the killer whale (Orcinus orca). Behaviour Research Methods and Instrumentation 3:187-188.

Spong, P., and D. White. 1970. Sensory guidance of behavior in the killer whale (Orcinus orca). Proceedings of the Seventh Annual Conference on Biological Sonar and Diving Mammals, Stanford Research Institute, Menlo Park, CA. 1960's.

Newman, M.A., and P.L. McGeer. 1966. The capture and care of a killer whale, Orcinus orca, in British Columbia. Zoologica 51:59-70.

Schevill, W.E., and W.A. Watkins. 1966. Sound structure and direction.

APPENDIX 3

CANADIAN FACILITIES HOLDING LIVE CETACEA AS OF NOVEMBER 1992

1. **Name:** * **Sealand of the Pacific**

Location:	Victoria, British Columbia
Exhibiting Cetaceans since:	1968
Inventory of Cetaceans held as of July 1992:	2 adult female killer whales imported from Iceland 10/82. 1 juvenile male killer whale captive born, 24/12/92.
Ownership:	Private
Accreditation Status:	None
Formal Education Programs:	Yes
Annual Participation:	40,000
Presentation Format:	Natural history/animal show, scheduled performance.
Annual Attendance:	200,000
Research:	Growth rates, medical observations andveterinary results.

Facilities for live holding:

main pool - floating net pen

shape - rectangular with gated holding pool
surface area - 603.9 m^2
volume - 6,442 m^3 (volume varies with tide height)
maximum length - 30.5 m x 19.8 m
maximum depth - 10.7 m (depth varies with tide height)
water system - open to the sea, untreated natural sea water

holding pool: 8 m x 7 m x 3.65 m deep

holding pool has a platform to raise whales, with scale system attached

* Facility to be closed, killer whales have been sold to a U.S. organization.

2. Name: **Marineland of Canada Inc.**

Location:	Niagara Falls, Ontario
Exhibiting Cetaceans since:	1972
Inventory of Cetaceans held as of November 1992:	4 killer whales imported from Iceland; 1 female 10/79 1 female 10/81 2 males 11/84 1 orca calf born 21 October 1992 6 bottlenose dolphins
Origins:	Mexico, Cuba and one from Niagara Falls Aquarium, N.Y.
Ownership:	Private
Accreditation Status:	None
Formal Education Programs:	Yes
Annual Participation:	50,000
Presentation Format:	Animal show
Annual Attendance:	700,000
Research:	No information

Facilities for live holding:

main pool (outdoor)

shape - crescent-shaped oval [with circular (7.6 m diameter x approx. 2m deep) holding pools at each end]
surface area - 263.2 m^2
volume - 2,467,596 litres
maximum length - 22.9 m x 7.6 m (75' x 25')
maximum depth - 6.7 m (22')

side pool

shape -circular
surface area 94.6 m^2
volume - 190.2 m^3
diameter - 7.6 m
depth - 2.4 m

side pool

shape - circular
surface area - 94.6 m^2
volume - 331.5 m^3
diameter - 7.6 m
depth - 4.1 m
water system - ozone and ion-generated chlorine treated, manufactured sea-water

training pool (indoor)

shape - oval
surface area - 179 m^2
volume - 162,219 litres
maximum length - maximum depth -
water system - ozone and ion-generate chlorine treated, manufactured sea-water

Bottlenose dolphins

Indoor pool (September through late June)

shape - circular, with 2 gates (usually left open)
surface area - 147.7 m^2
volume - 439,003 litres
diameter - approx. 13.4 m
maximum depth - approx. 4.9 m
water system - ozone and ion-generated chlorine treated, manufactured sea-water

holding pools - approx. 4.8 m long x 3 m wide x 2 m deep

3. **Name:** **Vancouver Public Aquarium**

Location:	Vancouver, British Columbia
Exhibiting Cetaceans since:	1967
Inventory of Cetaceans held as of November 1992:	2 killer whales imported from Iceland; 1 female 11/80 1 male 11/80 1 White Sided dolphin imported from California; female /71 5 Beluga whales; 1 female, 8/76, Churchill 1 female, 7/85, Churchill 2 males, 8/90, Churchill 1 female, 8/90, Churchill
Ownership:	Society, Vancouver Public Aquarium Association
Accreditation Status:	Canadian Association of Zoological Parks & Aquariums American Association of Zoological Parks & Aquariums
Formal Education Programs:	Yes
Annual Participation:	12,500
Presentation Format:	No shows, biological information given by guides and graphics
Annual Attendance:	810,155 (1991)
Research:	Yes, blood chemistry, growth rates, veterinary results

Facilities for live holding:

killer whales/Pacific white-sided dolphin pool

shape - irregular shaped, three separate pools, separable by gates
total surface area - 715 m^2
total volume - 3,785,400 litres
maximum length -
maximum depth - 6.7 m
water system - ozone and chlorine treated sea water, pH 8.0-8.3

Beluga pool

shape - irregular shaped (medical pool separated by gate with raiseable floor)
surface area -
volume - 1,900,000 litres
maximum length - 37 m x 17.4 m
maximum depth - 6.5 m
water system - ozone and chlorine treated sea water, cooled to 11° C

4. Name: **Dolphin Centre, West Edmonton Mall**

Location:	Edmonton, Alberta
Exhibiting Cetaceans since:	1986
Inventory of Cetaceans held as of November 1992:	4 bottlenose dolphins imported from U.S.; 2 males /86 2 females /86
Ownership:	Private
Accreditation Status:	None
Formal Education Programs:	School presentations
Annual Participation:	35,000
Presentation Format:	Entertainment/education animal show
Annual Attendance:	5 million viewers, 800/day in show amphitheatre
Research:	Yes; disease, psychology, growth rates

Facilities for live holding:

Main Tank: 915,750 l; 17 m x 11m x 4.5m
Back Tank: 287,750 l; 6.8m x 4.5m x 4.5m
Medical Tank: 45,000 l;. 6.0m x 5.0m x 3.3m

Total capacity: 1,318,500l

Water is treated with chlorine and filtered through activated carbon filters.

5. Name: **Canada's Wonderland**

Location:	Maple, Ontario
Exhibiting Cetaceans since:	1984
Inventory of Cetaceans held as of November 1992:	do not own animals, brings in 3 bottlenose dolphins in spring for summer season. Animals owned by Marine Productions, Gulfport, Miss.
Ownership:	Private
Accreditation Status:	None
Formal Education Programs:	No information
Annual Participation:	No information
Presentation Format:	Animal show
Annual Attendance:	No information
Research:	No information

Facilities for live holding: Salt water with diatomaceous earth filtration system

Display Pool
- shape - oval
- surface area - 166.65 m^2
- volume - 616,600 litres
- length - 20.73 m
- depth - 3.7 m

Holding Pool
- shape - circular
- surface area - 35.77 m^2
- volume - 109,000 litres
- length - 6.75 m
- depth - 1.5 - 2 m

APPENDIX 4

BELUGA LIVE CAPTURE PROGRAM 1967-91
CHURCHILL RIVER ESTUARY (MANITOBA) AND
COASTAL W. HUDSON BAY AEA

Capture Year	Aquarium	Sex	Size at Capture (cm)	(kg)	Current Status
1967	New York Aquarium	F1	-	284	Deceased 1975
	New York, NY, USA	F2		272	Deceased 1974
1969	Zoo Duisburg	F1	294	-	Deceased 1984
	Duisburg, W.Germany	F2	289	-	Good-on display
1973	Sea World	F1	-	-	Good-on display at New York Aquarium (Kathy II)
	San Diego, CA, USA	F2	-	-	Deceased 1985 (7302)
		F3	348	454	Deceased 1979
		M	277	318	Deceased 1973
1975	Mystic Marine Life	F	259	268	Deceased 1983
	Mystic, Conn., USA	M	279	-	Deceased 1975
	Zoo Duisburg	M	330	-	Good -on display
	Duisburg, W.Germany				
	New York Aquarium	M1	267	-	Good-on display
	New York, NY, USA	M2	289	-	Deceased 1986 (at Sea World)
1976	Mystic Marine Life	F	275	413	Deceased 1982 (at New York)
	Mystic, Conn., USA				
	Vancouver Public	F1	248	645	Deceased 1985
	Aquarium, Vancouver,	F2	305	580	Good-on display
	BC, Canada				
	Kamogawa Sea World	M	250	200	Deceased 1983
	Japan	F1	304	315	Deceased 1989
		F2	252	190	Deceased 1988

Capture Year	Aquarium	Size at Capture Sex	(cm)	(kg)	Current Status
1977	Minnesota Zoological Garden, Minneapolis, Minn., USA	M	350	500	Deceased 1990
		F	275	363	Deceased 1989 (at Sea World)
1977	U.S. Naval Ocean Systems, San Diego,	M1	319	393	Deceased 1985
		M2	257	300	Good-Research Program
		F	310	490	Good-Research Program
1979	Sea World San Diego, CA, USA	F1	279	-	Good-on display (7904)
		F2	287	327	Deceased 1981 (7906)
		F3	262	281	Deceased 1986 (7905)
		F4	262	296	Deceased 1987 (7903)
		M1	256	272	Good-display (7902)
		M2	264	341	Deceased 1981 (7901)
1980	U.S. Naval Ocean Systems, San Diego, CA, USA	F1	270	205	Deceased 1984 (DL639)
		F2	261	261	Deceased 1982 (DL638)
		F3	271	261	Good-research (DL637)
1984	Point Defiance Aquarium Tacoma, Wash., USA	M	279	319	Good-on display
		F1	276	255	Good-on display
		F2	257	220	Good-on display
	New York Aquarium New York, NY, USA	M	240	223	Good-on display
		F1	255	285	Good-on display
		F2	272	-	Deceased 1985
	Mystic Marine Life Mystic, Conn., USA	F	246	228	Good-on display
		M	296	370	Deceased 1984

Capture Year	Aquarium	Sex	Size at Capture (cm)	(kg)	Current Status
1985	Mystic Marine Life Mystic, Conn., USA	F1	264	-	Good-on display (XDL04)
		F2	277	-	Good-on display (XDL05)
	Baltimore National Aquarium, Baltimore, Maryland, USA	F1	267	313	Deceased 1991
		F2	272	330	Deceased 1989
	Vancouver Public Aquarium, Vancouver, BC, Canada	F	289	-	Good-on display
		M	284	-	Deceased 1990
1987	Sea World San Diego, CA, USA	M1	262	252	Good-on display (8728)
		M2	287	308	Good-on display (8731)
		F1	254	247	Good-on display (8730)
		F2	262	265	Good-on display (8729)
	New York Aquarium New York, NY, USA	F	277	335	Good-on display
	Baltimore National Aquarium, Baltimore, USA	F1	252	261	Good-on display
		F2	262	227	Good-on display
1988	Sea World	F1	279	318	Good-on display (8878)
	San Antonio, TX, USA	F2	285	308	Good-on display (8877)
		F3	272	286	Good-on display (8879)
		F4	244	213	Good-on display (8876)
	Kamogawa Sea World, Japan	M	249	270	Good-on display

Capture Year	Aquarium	Sex	Size at Capture (cm)	(kg)	Current Status
1989	John G. Shedd Aquarium Chicago, Ill., USA	F1	265	-	Good-on display
		F2	250	-	Good-on display
1990	Vancouver Public Aquarium, Vancouver, BC, Canada	F	259	-	Good-on display (103006)
		M1	279	-	Good-on display (103007)
		M2	354	-	Good-on display (103005)
1992	John G. Shedd	F1	258	262	*deceased 22 Sept/92
		F2	264	269	held in veterinary pool
		M1	257	284	*deceased 22 Sept/92
		M2	319	375	held in veterinary pool
	GRAND TOTAL	68			

* The Committee has received autopsy reports: the finding is that these individuals died of shock reaction to medication that had been administered to combat a lung worm infection.

Note: Numbers in parenthesis provide beluga identification as designated by some aquaria.

APPENDIX 5

REFERENCES

Ames, M.H. 1991. Saving some cetaceans may require breeding in captivity. Bioscience 41(11):746-749.

Anonymous. 1983. Whales Alive - Report of global conference on the non-consumptive utilisation of cetacean resources, New England Aquarium, Boston, 7-11 June 1983. IWC Document IWC/35/19.

Anonymous. 1988. Dolphinaria - Report of the Steering Group. Department of the Environment (UK). 117pp.

Asper, E.D., B.F. Andrews, J.E. Antrim, and W.G. Young. 1992. Establishing and maintaining successful breeding programs for whales and dolphins in a zoological environment. International Marine Biological Research Institute, Kamogawa, Japan, IBI Report 3:71-84.

Bain, D. 1988. A journey through the NMFS marine mammal inventory. Proceedings of the International Marine Animal Trainers Association Annual Conference, Hawaii 1987:103-130.

Bigg, M.A., and A.A. Wolman. 1975. Live-capture killer whale (Orcinus orca) fishery, British Columbia and Washington, 1962-73. Journal of the Fisheries Research Board of Canada 32:1213-1221.

Campbell, R.R. Editor. 1991. Rare and endangered fishes and marine mammals of Canada: COSEWIC Fish and Marine Mammal Subcommittee status reports: Canadian Field-Naturalist 105(2):151-156.

DeMaster, D.P., and J.K. Drevenak. 1988. Survivorship patterns in three species of captive cetaceans. Marine Mammal Science 4(4): 297-311.

Hoyt, E. 1992. The performing orca - why the show must stop. Whale and Dolphin Conservation Society, Bath, UK. 104pp.

Kirtland, J. 1992. Fate of released dolphins remains unclear. IMATA Soundings, Summer 1992:21-22.

Klinowska, M., and S. Brown. 1986. A review of dolphinaria. Prepared for Department of the Environment, UK. 247 pp.

Lewis, R.J., and K. Berry. 1988. Brain lesions in a Pacific white-sided dolphin (Lagenorhynchus obliquidens). Journal of Wildlife Diseases 24(3):577-581.

Mate, B.R., J. Prescott, and J. Geraci. 1987. Free-ranging movements of a pilot whale from a satellite-monitored radio. Page 45 in Abstracts of the Seventh Biennial Conference on the Biology of Marine Mammals, Miami, FL, December 1987.

Newman, M.A. 1970. Narwhals captured. Vancouver Public Aquarium Newsletter 14(5): 3 unnumbered pages.

Newman, M.A. 1971. Capturing narwhals for the Vancouver Public Aquarium, 1970. Polar Record 15(99): 922-923.

Newman, M.A., and P.L. McGeer. 1966. The capture and care of a killer whale, Orcinus orca, in British Columbia. Zoologica 51(2):59-70.

Olesiuk, P.F., M.A. Bigg, and G.M. Ellis. 1990. Life history and population dynamics on resident killer whales (Orcinus orca) in the coastal waters of British Columbia and Washington State. Reports of the International Whaling Commission 34:497-507.

Reeves, R.R., and S. Leatherwood. 1984. Live-capture fisheries for cetaceans in USA and Canadian waters, 1973-1982. Reports of the International Whaling Commission 34:497-507.

Richard, P.R., J.R. Orr, and D.G. Barber. 1990. The distribution and abundance of Belugas, Delphinapterus leucas, in eastern Canadian subarctic waters; a review and update. Canadian Bulletin of Fisheries and Aquatic Sciences 224:23-38.

Richter, T.J. 1988. A temporal comparison of survivorship patterns in three species of captive cetaceans. Southwest Fisheries Center Administrative Report LJ-88-14.

Sergeant, D.E. 1973. Biology of white whales (Delphinapterus leucas) in western Hudson Bay. Journal of the Fisheries Research Board of Canada 30:1065-1090.

St. Aubin, D.J. and J.R. Geraci. 1989. Adaptive changes in hematologic and plasma chemical constituents in captive beluga whales (Delphinapterus leucas). Can. Fish. Aquat. Sci. 46:796-803.

United States Marine Mammal Commission. 1991. Workshop on releasing marine mammals into the wild. Chicago, Dec. 3-5, unpublished. (Sponsored by U.S. Mar. Mamm. Commis. and U.S. Nat. Mar. Fish. Service).

Wells, R.S., and M.D. Scott. 1990. Estimating bottlenose dolphin population parameters from individual identification and capture-release techniques. Reports of the International Whaling Commission Special Issue 12:407-415.

APPENDIX 6.

LIST OF PERSONS THAT SUBMITTED WRITTEN COMMENTS TO THE COMMITTEE OR APPEARED IN PERSON

Andrews, Brad F. - Sea World Inc., Orlando, Florida
Beland, Dr., Pierre - St. Lawrence National Inst. of Ecotoxicology, Rimouski, P.Que
Best, Stephen - Canadian Fed. of Humane Societies, Toronto, Ont.
Berman, M. - Earth Island Inst., San Francisco, Calif.
Boyer, P. - M.P., Ottawa, Ont.
Brandon, Lorraine - Eskimo Museum, Churchill, Man.
Brown, Stephanie - Canadian Fed. of Humane Societies, Nepean, Ont.
Carpenter, Andy - Inuvialuit Game Council, Inuvik, NWT
Doncaster, Anne - International Wildlife Coalition, Mississauga, Ont.
Ford, John - Vancouver Public Aquarium, Vancouver, B.C.
Freeman, Milton - Dept. of Anthropology, Univ. of Alberta, Edmonton.
Hamilton, Peter - Lifeforce, Vancouver, B.C.
Holer, J. - Marineland of Canada, Niagara Falls, Ont.
Hummel, Monte - World Wildlife Fund of Canada, Toronto, Ont.
Jewell, Paula - Humane Soc. of U.S.A., Washington D.C.
Johnson, Andy. Vancouver Public Aquarium, Vancouver, B.C.
Kelsey, Elin - Vancouver Public Aquarium, Vancouver, B.C.
Lauthier, Clement - Canadian Association of Zoological Parks and Aquaria, Granby, P.Que.
Marjian, Nazan - Manitoba Animal Alliance, Winnipeg, Man.
Maxwell, Colin - Canadian Wildlife Federation, Ottawa, Ont.
McKenzie, R. - Local Government, District of Churchill, Churchill, Manitoba
Mence, Tony - International Union for the Conservation of Nature and Natural Resources, Morges, Switzerland.
Moran, John - Parc Safari, Hemmingford, P.Que.
Murray, Sandra - Winnipeg
Newman, Dr. Murray - Director, Vancouver Public Aquarium, Vancouver, B.C.
Opl, Sylvia - Burlington, Ont.
O'Sullivan, Michael - World Soc. for the Protection of Animals, Toronto, Ont.
Parent, Serge - Biodome, Montreal, P.Que.
Pippard, Leone - Canadian Ecology Advocates, St. Jean, P.Que.
Sands, Cara - Friends of the Dolphins, Thornhill, Ont.
Scullion, Erin - Canadian Wildlife Federation, Ottawa, Ont.
Spong, Paul - Orcalab, Alert Bay, B.C.
Stace-Smith, Richard - B.C. Federation of Naturalists. Vancouver, B.C.
Twiss, John R. Jr. - Executive Director, Marine Mammal Commission, Washington, D.C.
Wall, Debbie - Manitoba Animal Rights Coalition. Winnipeg, Man.
Webber, Doug - Mayor, Churchill, Man.
Webster, Hon. Art - Minister of Renewable Resources, Whitehorse, Yukon.

The Committee is aware that a number of other individuals wrote to the Minister of Fisheries and Oceans commenting on various matters dealt with in this report.

The Committee also acknowledges the assistance given by officials of each of the Provinces and Territories in response to its request for information on Provincial regulations and policies applicable to the maintenance of cetaceans in captivity.

The Committee is most grateful to all those who gave us their advice, and especially so to those who met the Committee for discussion of their views and concerns.