Information Retrieval Methods for Aquatic Research Data In Zoos and Aquariums

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ABSTRACT

Some zoos and aquariums have formal research programs. Other institutions without formal research programs do participate in a research process. Both structures of research yield valuable information on aquatic animal behavior and husbandry. Awareness and documentation of this research is limited. We will discuss methods of information retrieval of zoo and aquarium research.

People have put wild animals on display since ancient times. Until very recently, animals were displayed as symbols of status. The London Zoo in 1835 was a fashionable place to stroll, to see and be seen, and only incidentally to look at the animals. Many zoos and aquariums amounted to nothing more than exhibits called menageries. Animals were displayed in gloomy pits or cages, or in dark, empty tanks.

Shedd Aquarium was designed and built during this period of thinking about animals in captivity. Opening in 1930, Shedd Aquarium was hailed as an architectural wonder. Classical Greek elements harmonized with an aquatic motif to feature the building’s purpose, housing aquatic animals in captivity. However, attention given to that purpose was minimal. Tanks housed isolated species. Thinking about habitats or care and needs of the animal was limited and underdeveloped. During the late 1970s, the American Association of Zoological Parks and Aquariums (AAZPA), the professional organization for zoos and aquariums, redirected the mission of zoos and aquariums from the display of animals for the curious public to education, conservation, and research. The display conditions make all the difference. Where space for animals was stark and dark, exhibits are now designed to recreate the animals’ natural habitats. Visually appealing to visitors, the display space now includes a play area for the animals and provides space for recreation and exercise. The rockwork of Shedd Aquarium’s river otter habitat, built in 1986, was molded from rocks along midwest rivers. A large exercise area with a waterfall is included, allowing the otters space to exhibit natural behaviors. Also renovated during this time was a 90,000 gallon coral reef exhibit. The exhibit was redesigned to give the animals maximum hiding and resting space, and to encourage community or habitat behavior.

As a further commitment to education and research, Shedd Aquarium is currently building an oceanarium to house belugas, white-sided dolphins, false killer whales, penguins, and sea otters. Years of planning and research on the needs of the animals have been considered, resulting in pools that will give the animals maximum space, and provide them with areas that will give them time away from other animals and people. They will also be allowed in pools with other species. Behavior studies and other noninvasive research will be documented. The goal is to incorporate the best choices for care of the animals, as we understand what that means at this point in time. As humans begin to recognize the need for integrated care of aquatic animals, the need for understanding more about what that means increases. This means more research.

Aquatic research in zoos and aquariums fits into three broad areas. The first area is purely self interest and preservation; we want to keep the animals alive. Surgeries are performed, diseases are treated, necropsies are documented, and behaviors are studied.
The second area of research in zoos and aquariums is research tied to commercial or governmental interests. Controlled environments are easily manipulated, yet retain much of the complexity of the real system, and controlled environments are more easily studied than natural environments. Aquaculture endeavors work with aquariums to study water quality and animal husbandry. University researchers under government contract study fish populations. Diseases are diagnosed; predator-prey behavior is monitored.

The third area of aquatic research in zoos and aquariums is structured research, usually in association with an outside organization. The focus of this research is on conservation of the animal — either by a better understanding of the biology of the animal or by determining habitat needs. The IUCN, formerly the International Union for the Conservation of Nature and Natural Resources and now the World Conservation Union, is a network of governments, non-governmental organizations, scientists and other conservation specialists joined together to promote the protection and sustainable use of living resources. IUCN is currently sponsoring research on partula, threatened Tahitian land snails. Tracked by the London Zoo, other zoos and aquariums are attempting to breed this snail in captivity. The hope is to prevent extinction. CITES, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, was drafted in 1973 and attempts to regulate trade in declining species. Tridacna clams are dwindling because of their commercial value. Through CITES, several aquariums are participating in a pilot study to seed tridacna clams.

Under AAZPA, the American Association of Zoological Parks and Aquariums, a Species Survival Plan was established to insure viable gene pools of selected endangered species. Zoos and aquariums are cooperating to coordinate efforts to create long-term breeding strategies for many aquatic animals, including sea turtles and penguins.

Retrieval methods for information about aquatic research in zoos and aquariums depend on the particular area of research. Data on structured research in association with cooperative organizations is easy to retrieve. IUCN has established a World Conservation Monitoring Center. Partners include the World Wildlife Fund and the United Nations Environmental Programme. WCMC, located in Cambridge, England, will build comprehensive files on five hundred best sites for the maintenance of biological ecosystems, keep records on thousands of threatened species of plants and animals and create a global network of protected areas and national parks. WCMC’s database will eventually link into other conservation databases, including the World Bank, FAO, and Nature Conservancy, making it one of the largest conservation databases available.

A lot of commercial and governmental research information tagged to zoos and aquariums will be found in common databases. But it is difficult to access. Research results are often published by the home institution, and the connection with zoos and aquariums is lost. For example, a lot of data gathered at Shedd Aquarium is to improve management of Great Lakes resources. Consequently, the information is retrievable not under the names of the animals studied or Shedd Aquarium, but rather under the agency publishing the results or under Great Lakes.

Data on behavior, feeding, nutrition, and general caretaking of aquatic animals in zoos and aquariums - data that is increasingly important in conservation biology - exists but is not easily accessible. It is filed away in notebooks, feed schedules, water quality test results, and institutional archives, and is usually stashed wherever storage space exists. No hard copy indices exist. Both organization and funds are lacking.

Currently, the best way to retrieve information about aquatic research in zoos and aquariums at this level is to use AAZPA publications, both the directory and the newsletters, and find out which animals are in which institutions. Then hook into the small network of zoo and aquarium libraries. This network does have access to a lot of primary data. We do not have an efficient method of organization or dissemination of the information.

Zoos and aquariums are still struggling financially for dollars to support animal caretaking and research. Funds to make that data available don’t yet exist. Until funds do exist to organize and disseminate that information, we can only work within the existing framework.

The study of controlled environments in zoos and aquariums advances our understanding of the waters of the world. Even though results of these studies are not published, organized, or formally disseminated, it is valid data and should not be dismissed because it isn’t digitized.
BIBLIOGRAPHY


APPENDIX

Selected List of Journals and Serials Focusing on Zoos and Aquariums

AAZPA Newsletter (Monthly) 1959-
AAZPA National Conference (Annual proceedings)
Zoological Park and Aquariums in the Americas (Biennial directory)
Zoological Park and Aquarium Fundamentals

For further information concerning these publications contact

American Association of Zoological Parks and Aquariums (AAZPA)
Rte. 88
Oglebay Park
Wheeling, WV 26003

IUCN Bulletin (Quarterly) 1952-
Primate Conservation Monographs (Series)
Species - Newsletter of the IUCN/Species Survival Commission 1983-

For information concerning these publications contact

The World Conservation Union
Ave. du Mont-Blanc
CH-1194
Gland, Switzerland
(Formerly the International Union for Conservation of Nature and Natural Resources [ICUN])

Endangered Species Technical Bulletin (Monthly) 1976-

For information concerning this publication contact

U. S. Department of the Interior
U. S. Fish & Wildlife Service
Washington, D. C. 20240