Industry: Education

Duration: Started in 1997 – on-going

Location: Granby, Quebec

Case study type: Species rehabilitation

In situ conservation of endangered species: recovery of the Spiny Softshell Turtle in Quebec

The Granby Zoo is a zoological park as well as a water and amusement park founded in 1953. It covers 100 acres in the City of Granby, Quebec. This organization, governed by the Zoological Society of Granby employs over one hundred permanent employees and up to 425 young seasonal workers. The collection of Granby Zoo consists of over 1,000 animals from some 200 species and it welcomes an average of 600,000 visitors each year.

Granby Zoo's perspective on biodiversity

Impacts on biodiversity

The Granby Zoo (the Zoo) is a large-scale tourist enterprise near Montreal. Its main contributions are focused on conservation of an animal collection and the preservation of the genetic diversity of the kept species, as well as education of the population.

The Zoo also provides entertainment activities to its clientele via recreational tourist installations and derivative products. Environmental impacts of the Zoo include water consumption and water effluents and waste management.

Granby Zoo Biodiversity Management Policy

Since 2004, the Granby Zoo management has been committed to adopt best practice standards in its core activities within the zoos and aquariums network and to contribute to local communities' development.

The Granby Zoo was accredited by the Association of Zoos and Aquariums (AZA[1]) in 2004, and successfully reaccredited in 2009. As the second institution to be accredited in Quebec and the fifth in Canada, the Zoo must comply with a set of professional criteria including specific procedures for animal care and conservation policies. This accreditation automatically gives accreditation to the Canadian Association of Zoos and Aquariums (CAZA) and allows the Granby Zoo privileged access to the 26 other accredited members' animal population to acquire or place animals. Since early 2005, the Zoo is also the only member in Quebec, and the third in Canada to be a member of the World Association of Zoos and Aquariums.

Lastly, the Zoo has been distinguished in 2004 as one of the 25 best zoological institutions worldwide for the quality of its records of animal populations and its continuous contribution to the International Species Inventory System (ISIS) since 1979. ISIS is a global database created in 1973 that gathers information on animals from wild species kept in captivity, such as identification number, age, sex, parents, birth place and circumstance of death. It contains information on 2 million animals from about 10,000 species, housed in 825 institutions, in 76 countries worldwide.

The Zoo has implemented a green policy with 5 objectives. During the last three years environmental measures led to significant reductions in water and energy consumption, greenhouse gases, as well as improvements in waste management and recovery. Its green and sustainable practices are documented in a Green Program, issued in 2007 and updated in 2010, a leading practice within the zoological domain, acknowledged in the recent sustainable tourism prize from Eastern Townships Tourism Association received by the Zoo.

Quarantine procedures to prevent the introduction of infectious diseases, potentially carried by newly acquired animals are established, as well as preventive medicine programs designed for the health and well-being of Granby Zoo animals.

Animal waste is spread on agricultural farm lands of a cultivator in the district after being analysed by an engineering firm to ensure that all parameter requirements follow MAPAQ's (Ministère de l'Agriculture, des Pêches et de l'Alimentation du Québec) standards on the regulation of animal waste control.

In situ conservation of endangered species: recovery of the Spiny Softshell Turtle in Quebec

Rationale

Over the years, the Granby Zoo has acquired strong expertise and know-how in species reproduction programs and research, as well as in education of communities and public on biodiversity conservation.

As an accredited zoo, the Granby zoo is committed to contribute to the conservation both of exotic and of national species, and to participate in research projects taking place in Canada and in other places around the world. It develops programs and activities for biodiversity conservation both *in situ* (into the wild) at local and at international level and *ex situ* (in captivity at the Zoo).

The *ex situ* research programs includes participation in:

- Species Survival Plan (SSP) dedicated to manage the reproduction of 25 endangered species present in the Zoo, in cooperation with other AZA and CAZA accredited zoos in North America. This program is crucial to manage the genetic diversity, to ensure a sustainable reproduction of animals in captivity and to avoid genetic anomalies due to improper reproduction plans. Such a plan is all the more important for endangered species such as the Siberian Tiger (*Panthera tigris altaica*) which population in captivity around the world is higher than in the wild.
- Population Management Plan (PMP) designed for non endangered species to manage the reproduction of captive individuals of the 29 species of the site taking into account the genealogy of individuals, based on ISIS database.
- International *ex situ* reproduction projects with a view to reintroduce the species into the wild, as for the Puerto Rican Crested Toads (*Peltophryne lemur*) for which it has been part of a reintroduction program since 1998.

The Zoo also contributes to four *in situ* conservation programs:

- The inventory of avian fauna in Granby. The Zoo has developed a partnership with the local ornithology club of the Haute-Yamaska to carry out with an association, *Regroupement Québec Oiseaux*, a comparative inventory of the avian fauna in the City of Granby and within the Zoo area, which represents a microhabitat.
- A multi-year project conducted jointly with students from Université du Québec à Trois-Rivières (UQTR) to carry out a flora and fauna inventory on the tourist area of the Isle St-Quentin located in Trois-Rivières.
- A conservation project on the Geoffroy's Pied Colobus Monkey – *Colobus vellerosus* – in the Boabeng-Fiema Monkey Sanctuary protected area in Ghana, West Africa since 2008, in cooperation with the Nature Conservation Research Center, the Ghana Government and the Swift Family Foundation.

The contribution of the Granby Zoo to the recovery programs on the Spiny Softshell Turtle presented in this case study started in 1997, with the creation of the recovery team for this species by the Ministère des Ressources naturelles et de la Faune (MNRF). The Zoo was approached by the MNRF to join the Spiny Softshell Turtle recovery team due to its known expertise on reptilians' biology and was willing to contribute by developing protocols for the observation and the conservation of the turtles. The recovery team gathers representatives from Environment Canada, *Service canadien de la Faune*, Conservation Baie Missisquoi, Nature Conservancy Canada, Granby Zoo, Ecomuseum and Amphibia-Nature.

Description

The Spiny Softshell Turtle (*Apalone spinifera spinifera*) is a freshwater turtle also known as the pig-nosed rubber-backed turtle. Its olive or tan coloured shell is quite flat, round and marked with dark blotches. Male specimen measure between 12 and 24 cm and females, measuring 18 to 42 cm can weigh as much as 12 kg.

The Spiny Softshell Turtle is designated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Listed as a threatened species in Schedule 1 of the Species at Risk Act, the species, its residence (e.g., *hibernacula*) and its critical habitat are partially protected. It is also one of the 7 species designated as threatened by the Quebec Government under the *Loi sur les espèces menacées ou vulnérables*.

Spiny Softshell Turtles occur around large bodies of water in south-western Quebec and in the Ottawa River region. Although it is abundant in the United States, it is vulnerable in Canada. In Ontario, the population that was estimated to be 1,000 to 2,000 in 1985 dropped to a current estimate between 800 and 1,000. It is also particularly threatened in Quebec where the only remaining population, estimated at 100 individuals[3], is located in the Missisquoi Bay in Lake Champlain and in the Pike River (*Rivière aux brochets*) in the south of the province.

Spiny Softshell Turtles are particularly threatened by human activities: their nesting areas are often beaches, where recreational activities can cause high egg mortality. Adults are often killed or injured by collisions with boats, while water pollution and urban and agricultural development along shorelines threaten their habitat. Sarcophagi flies are known to feed on the eggs, as well as predators such as raccoons, skunks and foxes.

The Zoo has been a founding member of the Recovery Team since the beginning both as a financing and a participating partner. It has contributed to the two intervention plans (1997-2004 and 2005-2009) to help increase the population in Quebec by:

- improving the knowledge and understanding of the species biology. The Zoo collaborated in radio-telemetry protocols to identify nest sites, *hibernaculum* sites and movements as well as necropsy protocols for researchers and teams, to help understand causes of mortality.
- finding nesting sites, monitoring and protecting nests until egg-hatching. Since 2008, the Zoo has started a program through *ex situ* incubation of eggs and release of young individuals. In June 2009, 4 females were observed on a nesting site and 4 nests were discovered. A program to monitor hatching and to maximize the survival rate was implemented in 2009, including the protection of nests from predators and incubation of eggs in captivity at the Zoo for release of young individuals in the future.

After the first phase of the program, the project did not give the expected results and the protocol for *ex situ* incubation has been reviewed to increase the chances of success of hatching eggs. The program will be extended in 2010 and 2011 thanks to the support of the Canadian Wildlife Federation, the Canadian Association of Zoos and Aquariums, and the Ministère des Ressources naturelles et de la Faune.

Stakeholders and roles

In the framework of its research projects, the Granby Zoo is building partnerships with universities in Canada and abroad (York University, Laval University, Concordia University, UQTR), particularly to study species behaviour.

The Granby Zoo is one of the major partners of the Spiny Softshell Turtle Recovery Plan led by the Ministère des Ressources naturelles et de la Faune, in partnership with local communities and associations, SOS Tortues and Nature Conservancy Canada among others. The in situ and ex situ conservation projects are managed by 2 full-time employees at the Zoo.

Communication

Since 2002, with the Spiny Softshell Turtle Recovery Project, the Zoo participates in an educational program that contributes to raising awareness of 50,000 people around the Lake Champlain, through exhibitions and discussions in schools.

In particular, the Zoo educators facilitated one-hour workshops in schools in the Lake Champlain area and provided interpretation on the Spiny Softshell Turtle during local events (e.g., rural fairs) as well as in local parks. For this purpose, the Zoo created an educational program comprising the display of individuals, interactive modules and the presentation of biological material. The Zoo also developed another 20 educational programs for schools that include a part on biodiversity conservation. Each year, approximately 27,000 children aged from 5 to 13 have access to these programs at school with the Zoomobile or at the Zoo.

Local residents have been encouraged to develop behavior which contributes to the conservation of the species (e.g., correct management of waste to limit the presence of predators, keeping natural banks along the river and the lake and protecting nesting areas). Along the Pike River, basking areas have been installed and brochures and awareness campaigns are provided to the residents throughout the summer to inform them on the status of this species and to keep them aware of basking areas.

Since 2007, the Zoo has established a Conservation Day during the first week of July. Emphasis is put on the protection of turtles in Quebec, and in particular on the Spiny Softshell Turtle.

The Zoo is currently working on two exhibition projects:

- one of them, focusing on endangered species in Canada, including the Spiny Softshell Turtle, called "To the Rescue of Endangered Species" will be posted in spring 2010 on the Virtual Museum of Canada web site[2];
- the other one called "Illegal Killer Trade" will be ready in the summer of 2010 and displayed in different provinces across Canada over the next three years.

Outcomes

Benefits

Biodiversity

The positive outcomes of the *in situ* and *ex situ* conservation programs carried out by the Granby Zoo lie in:

- the conservation of a healthy genetic profile of animals in captivity;
- the contribution to the recovery of endangered species populations in their own habitat, especially the Spiny Softshell Turtle;
- an increased awareness of the value of biodiversity conservation from local communities where the project takes place and from more than 600,000 visitors per year.

In particular for the Spiny Softshell Turtle, the program has contributed to enhance knowledge of the biology of this species. Education on this emblematic species may also create positive impacts for the conservation of other species living in the same ecosystems.

Economic

The strong involvement of the Zoo in international conservation programs of endangered species has contributed to enhance the Zoo's image and credibility in the professional area, hence facilitating its access to new species to renew and complete the collection presented to the public. Since 2004, because of its significant impact on regional economy, and also the quality of its development, educational and conservation activities and programs, the Zoo has benefitted from governmental grants.

This engagement of the Zoo with exotic species, together with a strong commitment at the local level to protect and preserve biodiversity, has also led to increased visits and revenues which in turn provide additional resources to invest in conservation research programs and projects.

Lessons learned

The first results of the Spiny Softshell Turtle recovery program have provided some lessons learned and contributed to improving incubation protocols.

Changes in company's practices

In the past few years, the Granby Zoo has become an important partner in the conservation of wildlife in Quebec and abroad, either through financial support or research projects in cooperation with academia.

These projects have had an impact on the employees' involvement and sense of belonging and have contributed to reinforce a more proactive conservation role for the Granby Zoo.

Far from being only a place where animals are kept in captivity for visitors to see, the Granby zoo is establishing itself as an important educator on biodiversity conservation and as a valued contributor to conservation research programs.

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[1] There are 221 AZA-accredited zoos and aquariums.

[2] www.museevirtuel-virtualmuseum.ca/index-eng.jsp

[3] http://dsp-psd.tpsgc.gc.ca/Collection/CW69-14-293-2003F.pdf