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NEWSLETTER EXCERPTS
AUGUST 2007

In order to allow us to showcase the many interesting research and conservation programs being conducted within our member institutions we will be posting excerpts from each bi-monthly publication of the CAZA newsletter. The full newsletter is available by subscription and as a service to all CAZA members. Comments or suggestions should be sent to the editor Greg Tarry g.tarry@rogers.com

MISSION STATEMENT

To be a Canadian leader in the conservation of biodiversity by coordinating and supporting its members in the areas of education, animal management, scientific study and field conservation.

RESEARCH AND CONSERVATION PROGRAMS AT THE VANCOUVER AQUARIUM

Cetacean Research



The Vancouver Aquarium has a long tradition of research on cetaceans (dolphins, porpoises and whales). Our busy Cetacean Research Lab is situated in the Levy Marine Mammal Research Centre on the Vancouver Aquarium Grounds. Field studies occur throughout British Columbia's waters and the North Pacific. Some of the Cetacean Research Laboratory's projects are described below.

Long-term monitoring of Killer Whale Populations in British Columbia

The world's longest continuous study of killer whales--and one of the longest on any animal species--has been underway in British Columbia for over 30 years. The project is a unique cooperative effort of marine biologists from the Canadian Department of Fisheries and Oceans, the Vancouver Aquarium Marine Science Centre, the University of British Columbia, the Centre for Whale Research, OrcaLab, and a host of other institutions. At least 18 graduate students have earned Masters or PhD degrees based on their involvement. Photo-identification is at the core of the project and makes it possible to track the lives of all of the more than 500 killer whales living along the British Columbian coast. Other important techniques used include acoustic analysis of calls, and analysis of DNA from minute skin samples. The Vancouver Aquarium has been a central player in the research since the early 1970's. Its participation in the project is funded by the BC Wild Killer Whale Adoption Program .

North Pacific Killer Whale Project

In the mid-1980's, killer whale scientists in British Columbia used the knowledge they had acquired to help Alaskan biologist Craig Matkin start a long-term research project in the northern Gulf of Alaska. Matkin and his colleagues formed the North Gulf Oceanic Society, which until recently has focused on killer whale populations in and around Prince William Sound, near Anchorage. Recently, Matkin and the Vancouver Aquarium's cetacean scientist Dr. Lance Barrett-Lennard expanded the scope of the project to include killer whales along the Alaskan Peninsula as far as the Aleutian Islands. As part of this exciting new initiative, research teams working from Kodiak Island and Dutch Harbour are spending the summers studying western Alaskan killer whale populations. As in British Columbia, the primary research methods are photo-identification, analysis of calls, and DNA analysis.

Killer Whale Mating Patterns, Social Systems and Population Structure based on DNA Analysis

Since the early 1990's, the Vancouver Aquarium has been involved in an exciting study of killer whale societies based on DNA analysis. The project is focused on tracing relationships, and asks questions such as: Are fish-eating residents and transients genetically isolated? How do resident killer whales--which spend their entire lives in their birth pods, avoid inbreeding? Do killer whales mate for life? Did killer whale pods with similar calls learn them from common ancestors?

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Do members of the southern BC, northern BC, and southern Alaskan resident communities interbreed?

BC Cetacean Sightings Network

In 2002, a new project began at the Aquarium to help acquire important conservation information about BC's whales: their abundance and distribution throughout the year, the habitats they use and the threats they face. The project is run by the Vancouver Aquarium jointly with Fisheries and Oceans Canada using funding provided by Environment Canada's Habitat Stewardship Program.

Vocal Learning in Belugas

The Beluga Whales that live at the Vancouver Aquarium offer researchers a unique opportunity to study vocal development and learning in this highly intelligent species.

Steller Sea Lion Research at the Vancouver Aquarium

In addition to our ground-breaking cetacean research, the Aquarium supports an ambitious and dynamic program of research on Steller sea lions. This project is conducted at our facilities by the North Pacific Universities Marine Mammal Research Consortium. The Consortium is conducting studies on sea lion metabolism, food requirements, relationships between diet and health, and testing ways of studying Steller sea lions in the wild—all with a view to understanding the causes behind the decline of killer whales in the north Pacific.

Since 1980, the world population of Steller sea lions (*Eumetopias jubatus*), has dropped from more than 300,000 animals to fewer than 100,000. The portion of the population breeding from Prince William Sound west through the Aleutian Islands has suffered the most dramatic decline, losing 75 per cent of its numbers. In 1997, the western population was declared endangered under the United States Endangered Species Act, while the eastern Alaska population was considered threatened.

Alaskan harbour seal populations have also declined, northern fur seals are depleted and similar declines have been reported in some seabird breeding colonies. In British Columbia, Steller sea lion numbers appear stable, but harbour seal populations have increased rapidly. Further south, striking increases are being observed in the range and abundance of elephant seals and California sea lions.

Possible reasons for these changes include parasites and disease, killer whale predation, nutritional stress through competition with man or other species for food, or nutritional stress caused by natural and/or human-induced changes in the abundance, quality and distribution of prey. Climate change, pollution, entanglement in marine debris, and incidental and intentional take



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by man may also be involved. Whether the decline is caused by a single factor or a combination of all of the above is a matter of scientific debate. However, the nutritional stress hypothesis is receiving increasing amounts of attention and funding in recent years.

Only a concerted effort and a commitment to long-term research will determine the causes of changes in the North Pacific. Field, captive, and laboratory studies are integrated and draw on the expertise and talents of university-based physiologists, ecologists, marine mammalogists, fisheries specialists, animal trainers and oceanographers. Since 1993, the Consortium has been engaged in a captive research program at the Aquarium to better understand the nutritional needs of Steller sea lions, and to develop better techniques for studying them in the wild.

Steller sea lions have been participating in a comprehensive research study designed to explore the “nutritional stress” hypothesis, the leading contender to explain the decline in Steller sea lions in the wild. This hypothesis proposes that Steller sea lions are declining due to a change in the type, quantity, or distribution of their prey. The studies are providing information that is otherwise unobtainable from wild animals.

With the help of the Aquarium’s captive sea lions, important advances have been made in several areas, including:

1. energy requirements of Steller sea lions
2. the relationship of diet to sea lion health
3. nutritional requirements and the value of different diets such as pollock and herring
4. validating methods of studying sea lions in the wild

All components are helping to test the nutritional stress hypothesis, by applying the results to wild populations.

Direct Action Conservation Programs

Ocean Wise

Ocean Wise is a Vancouver Aquarium conservation program created to educate and empower consumers about the issues surrounding sustainable seafood. Ocean Wise works directly with restaurants and markets, ensuring that they have the most current scientific information regarding seafood and helping them make ocean-friendly buying decisions. The options are highlighted on their menus and display cases with the Ocean Wise logo, making it easier for consumers to make environmentally friendly seafood choices.

River Works

River Works is a Vancouver Aquarium Conservation Program that inspires the stewardship of aquatic habitats through public involvement, monitoring activities, habitat restoration, educational experiences and community connections. The program develops environmentally active citizens in the Fraser River estuary through workshops and field activities designed to promote direct action and natural environment enhancement. Each year, hundreds of volunteer hours are contributed towards the inventory, monitoring, and restoration of vital wetland habitats.



Ocean Wise

A Vancouver Aquarium Conservation Program





RESEARCH AND CONSERVATION PROGRAMS AT THE VANCOUVER AQUARIUM

TD Great Canadian Shoreline Cleanup

What do a stolen car, over 200,000 cigarette butts, a rickshaw and 57 shopping carts have in common? They were all items removed from Canada's shorelines during the TD Great Canadian Shoreline Cleanup in 2006.

Last year more than 40,000 Canadians joined forces to rid 722,887 items of shoreline litter from vital waterways and park land. The total weight in garbage removed was 84,708 kg.

The TD Great Canadian Shoreline Cleanup, run by the Vancouver Aquarium, is now the second largest contributor to the International Coastal Cleanup (ICC). The ICC boasts more than 80 participating countries and recently announced the results of their report on litter effects. According to the ICC, one million seabirds and more than 100,000 marine mammals fall victim to the litter we leave on our shorelines.

This year, the TD Great Canadian Shoreline Cleanup, one of the Vancouver Aquarium's largest national conservation initiatives, is expected to involve even more participants than ever before. With over 630 shoreline sites already registered, it seems Canadians everywhere want to make a difference.



CAZA IS NOW A CONSERVATION PARTNER IN THE TD GREAT CANADIAN SHORELINE CLEANUP

This year we are hoping for 100% of CAZA member organizations to take part in this important event. This annual national conservation program engages Canadians in direct action and gets them started making a difference. We expect 60,000 Canadians to participate this year by spending a few hours cleaning up a local shoreline and CAZA organizations should be out in force.

Past participants have found that the cleanup is a great way to engage your local community and generate positive media attention. This is also an excellent opportunity for your institution to strengthen its commitment to local environmental stewardship and outreach. The program is a hands on, direct action, event that engages visitors, employees, and the community in environmental conservation. The program is run by the Vancouver Aquarium who will provide you with all the necessary supplies and support to host a cleanup, and educational activities that can be incorporated into your existing programs. In addition, your media team is invited to work with the program's media team to ensure local coverage which highlights your participation.

Among the many benefits enjoyed by participating organizations, is that the TD Great Canadian Shoreline Cleanup generates instant media attention, providing positive coverage and great photo opportunities that truly showcase how CAZA members can mobilize people to take action, to make a difference, today. Since the organizers provide all the materials required—including marketing and media relations support— your staff and volunteers need only to show up, have fun, and protect local wildlife from harmful trash.

The cleanup takes place September 15-23. If you haven't already, visit www.vanaqua.org/cleanup to register your institution.



THE GREENING OF THE FOOD CONCESSION AT THE ASSINIBOINE PARK ZOO

Gordon Glover

Food services at the Assiniboine Park Zoo, under the management of the Zoological Society of Manitoba, has taken a big step toward 'going green' with the introduction of environmentally friendly, compostable containers. An interview on CBC radio with a representative of the Waste Reduction Store regarding a product line of food vendor containers made of biodegradable material initiated the program that has resulted in the replacement of all disposable food vending containers (except soft-drink containers) with biodegradable products that look, feel and perform as well as the plastic and styrofoam products they replace.

Bagasse is made from the waste of sugar production. The sugar cane is pulped into containers that have a natural look and feel.

The **Ecotainer Cup** is made from paper that contains no elemental chlorine; it is made from a forest managed in a sustainable way; and lined with a wax derived from corn. Did you know most coffee cups are lined with a petroleum based wax and are bleached with chlorine? This corn resin is also used to make a line of plastic looking containers and cups that we may consider carrying in the future.

Forks, Knives and Spoons are all made from potatoes! Even though they look and feel great you can't eat them! But you can take them home, wash them, re-use them, break them in pieces and stick in your compost! They will bio-degrade.

For everyday concession use:

- o Round containers appropriate for soups and salads made from Bagasse instead of polystyrene
- o Ecotainer coffee cup- the most green alternative available
- o Clamshell containers made from Bagasse

For special events:

- o Potato forks, knives and spoons instead of plastic
- o Three compartment plates made from Bagasse instead of polystyrene
- o Ecotainer coffee cup- the most green alternative available
- o Clear corn cups

Cost: well the 'green' containers do come at a 20% +/- premium over conventional containers but accurate sizing of the containers has improved portion control substantially reducing the impact of the increased container cost.

The final objective of this effort is to completely end the landfill disposal of material from within the Zoo. It shouldn't be all that difficult. There are composters used in agriculture that will reduce organic material to usable compost within 10-14 days (winter and summer). If all the food vending containers and other disposables (straws, napkins etc) can be compostable, then all the concession waste, animal waste and animal food waste can be mixed, possibly shredded and composted. The end product; a high quality compost that can be used or sold.

For more information about these products please visit the distributor's website at <http://www.happyplanetproductions.com>

RESEARCH AND BREEDING AT MOUNTAIN VIEW CONSERVATION CENTRE

Mountain View Conservation and Breeding Center conducts non-invasive research including hormonal analysis utilizing fecal hormones, DNA analysis, behavioural and developmental research, as well as predator recognition studies.

Mountain View Conservation Centre has conducted research with the Universities of Lethbridge, British Columbia, UCLA Berkley, Fraser Valley College and many others. The research has addressed areas such as; predator recognition, mate selection, herd dynamics, and fecal hormonal studies to analyze reproductive cycles. Studies have been carried out on the Vancouver Island Marmot, Cheetah, Fishing Cat, Aardwolf, Malayan Tapir, African Wild Dogs, and Pallas' Cats.

We continue to have a very strong desire to support non-invasive research at Mountain View.

Spotted Frog Recovery Program



The Oregon spotted frog is one of the most endangered amphibians in Canada. It can grow to an adult body length of between 5 and 10 cm and its main prey are insects and their larva and eggs. Three sub populations exist in the Fraser Valley, British Columbia at isolated locations where immigration and emigration among populations does not occur. Population sizes have been estimated on an annual or semi-annual basis by counting egg masses in each sub population site since 1997. The Oregon spotted frog, whose scientific name, *Ranapretiosa*, means precious frog, historically occurred throughout south-western B.C. and has the dubious honour of being the only organism in Canada to have received an emergency listing as Endangered in 1999; its conservation status was formalized in 2000. The species also occurred throughout the northwest US, where it has also suffered a dramatic decline.

The reasons for its extreme rarity include draining of wetland habitat for development, and the introduction of the American bullfrog, a much larger species whose prey also includes smaller frogs like the Oregon spotted frog. The bullfrog is also a more adaptable species and is capable of eradicating smaller frog species from individual ponds. The entire wild population of Oregon spotted frogs is currently confined to 3 ponds in BC: Seabird Island, Aldergrove Military base and on a private farm in Chilliwack.

The recovery plan for spotted frogs began in 1999. It was rapidly apparent that there would need to be an ex-situ component to the plan to increase wild numbers as quickly as possible. The strategy was to collect recently laid egg masses in early Spring and transport them to captive facilities that would maintain the eggs until they had developed into froglets and then release them in late summer; basically a "head start " program. Mountain View Conservation Center was first involved with the captive element of the recovery program in 2003 when we received 853 frog embryos that were split between 6 large containers in a purpose built area of the Center. By the time of the summer release, we had reared a total of 541, of which 513 were released in August 2003. A small number were retained at Mountain View that were to be hibernated in the outdoor rearing containers and in a tank in our visitor center. Of these, the majority of the ones hibernated outside survived the winter and were released in March 2004. All 12 of the froglets in the visitor center survived hibernation and 8 were released in March 2004. 4 were retained for both educational purposes and to enable us to take their captive management through a full cycle and develop



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techniques for breeding the species in captivity, should such a measure be required in the future.

As a result of our success in 2003, in 2004 we were requested to expand the level of our commitment to the program and we received 1273 eggs/embryos from the Aldergrove site (the same location as for the 2003 collection), and 1360 from a second wild site on Sea Bird Island. We established a second, completely separate facility for these so as to minimize disease or other risks. Ultimately, 758 Froglets were successfully released back to Sea bird Island. Our second batch of frogs from the Aldergrove site were released in September 2004.

In recent discussions with wildlife officials, we are again being asked to dramatically increase our level of involvement in this species recovery program, including maintaining frogs until they are adult size, 2-3 years old, which would further enhance the level of post release survival rates. Discussions are currently underway regarding the creation of a new wetlands area for the frog-breeding program.

This year at Mountain View we had an overall success rate of 78% from hatch through morphing. Conservation of these populations is dependent on community involvement and interest in the species. In 2006, the Seabird Island First Nations band initiated several community liaison projects about wetlands and the Spotted Frog that involved their local school children and training of conservation technicians.

African Painted Hunting Dogs Conservation Program

The Painted Hunting Dog is the second most endangered carnivore in Africa. Mountain View has two family packs of Painted Hunting Dogs, 28 animals in total, in our breeding and re-introduction program. We are working with Greg Rasmussen of Zimbabwe, a world recognized Painted Hunting Dog conservationist, in planning a return of this species to Africa. Greg was recently featured on Global TV with reporter Linda Aylesworth. Visit his website here. We hope to be able to work with Greg in our first Painted Hunting Dog release in Zimbabwe, Africa, in the near future.

Vancouver Island Marmot Recovery Program

Hidden away in a secluded area of the Conservation Center is the Vancouver Island Marmot breeding facility. It is home to seventeen rare rodents now considered to be one of the most endangered species of mammal in North America. These creatures live in spacious, naturalistic pens designed to promote natural behaviours such as burrowing, hibernating and basking on boulder.



This year, for the first time in the history of the captive breeding program, the Calgary Zoo, Toronto Zoo, the marmot facility on Mount Washington, as well as Mountain View all were successful with pups being born. For us, this was a notable milestone as it was the first year that we have had animals of breeding age. Two litters were born on approximately May 23, 2002 for a total of five pups.

There are approximately 200 Marmots in captivity, of which 39 are scheduled to be released, and approximately 50 left in the wild. 'Tough Gal', born in 1992 and the last surviving member of her colony had never produced a single pup. She was transferred from the Toronto Zoo on July 2001. After spending a summer at the 'Marmot Hilton' as we



RESEARCH AND BREEDING AT MOUNTAIN VIEW CONSERVATION CENTRE

are known in the zoo world, and hibernating through the last winter, Tough Gal was observed breeding with her mate, Hobo. To everyone's surprise and pleasure, she did produce a single offspring.

This year, three research studies were conducted at the Mountain View Conservation and Breeding Center involving the Vancouver Island Marmots.

The first was a hormone study to determine how the marmots cycle during the breeding season. The marmots at Calgary Zoo and Toronto Zoo were also involved in this study.

The second project was a study to determine if captive marmots are still able to recognize predators. This has been a topic of concern since the goal of breeding marmots is to return them safely back to the wild, and knowing what is and isn't a predator may be critical to their survival.

The third study was one of behavioural observation. The marmots at Mountain View have access to very spacious and naturalistic pens with large rocks, tree stumps and deep soil, allowing for very normal marmot behaviour. The pups that were born here this year provided new information about their development and family group behaviour that was previously suspected, but not really known. For instance, the male plays an important part in protection as well as social development of the pups. The infinite patience and gentleness the 'father' showed while boxing and wrestling with the 'kids' and the tolerance while being ambushed from behind rocks by the pups provided new insight, as well as many hours of fun for the observer, into this remarkable little rodent.

Senegal Reintroduction Project

On December 14th, 2006, six Addax (*Addax nasomaculatus*) made the journey from Mountain View Conservation Society to the Guembeul Faunal Reserve near St. Louis, Senegal. This is the most recent step in a long-term reintroduction project for not only Senegal, but several neighboring countries, Mali, Chad and Niger in North- West Africa. The project will include not only Addax, but also Mhorr Gazelle (*Gazella dama mhorr*) Scimitar-horned Oryx (*Oryx dammah*), Slender-horned Gazelle and West African Ostrich (*Struthio camelus*). The project has received Mhorr Gazelle from Almeria, Spain and Scimitar horned Oryx from France and from Hai Bar Reserve in Israel. Mountain View plans on shipping Mhorr Gazelle and Scimitar-horned Oryx in early 2008 to provide new genetics to the already transported animals. Slender-horned Gazelle and West African Ostrich will be shipped in 2009 from Mountain View. This project is supported by the Senegalese National Parks, the Israel Nature and National Parks Authority, Mountain View Conservation Society, San Diego Zoo, Disney Wildlife Conservation Fund, International Fund for Animal Welfare, Friends of Animals and the Rotterdam Zoo.

Northern Spotted Owl

Mountain View is currently constructing its breeding facilities and prerelease flyways for this highly endangered British Columbian Owl. The quarantine facilities of Mountain View have just recently been completed and Owls should arrive in the summer or fall of 2007.