

To: Board of Management

From: William A. Rapley
Executive Director
Conservation, Education and Wildlife

Subject: **2015 ENVIRONMENTAL INITIATIVES REPORT**

Date: 2016-02-29

Summary:

The purpose of this report is to update the Board of Management on environmental initiatives achieved and environmental priorities for the Toronto Zoo in 2015. The Toronto Zoo continues to complete projects to improve energy efficiency, water conservation, waste diversion and employee and public engagement to reduce its overall carbon footprint. The Toronto Zoo has also re-committed to environmental sustainability by establishing it as a core value of the Zoo in the new 2015 Strategic Plan. Significant movement towards the 2027 greenhouse gas emission targets of the Green Plan will require larger capital projects and are being considered during the Master Plan process.

Recommendations:

It is recommended that this report be received for information.

Financial Impact:

There is no financial impact from this report.

Background:

The Green Eco-Zoo Team (GEZT), a non-technical advisory committee, to the CEO addresses the environmental impacts of Zoo operations, policies and procedures, and makes recommendations that will lessen our ecological footprint in the Rouge Valley and on the earth. The organizational structure of the GEZT incorporates all divisions and units of the Zoo and meets quarterly.

GEZT provides an annual report to the CEO for presentation to the Board of Management on environmental projects, programs and initiatives in progress or completed over the past year. Mrs. Greenham chairs GEZT with Ms. Nia Gibson as co-chair.

Comments/Discussion:

In 2015 Toronto Zoo staff continued to complete operating and capital projects towards a more sustainable platform at the Zoo, as well as initiating a number of projects that captured the interest of staff and visitors, met the needs of reducing the Zoo's carbon footprint and optimized existing programs to financially benefit the Toronto Zoo.

Energy Efficiency Improvements

The 2007 Green Plan for the Toronto Zoo set a target goal to reduce the emission of greenhouse gas (ghg) during its annual operations to 95% below 1990 levels by 2027. The Zoo continues to make progress towards this target by implementing a variable portfolio of options to do so, and inclusion of sustainable initiatives in the new Master Plan will improve our ability to achieve the original targets from this point on. In the meantime, Toronto Zoo Facility & Services staff continue to replace and install aged infrastructure with more energy efficient models during renovations and as operating budgets permit.

The Utilities Branch initiated a site wide energy consumption reduction program by installing the first 3 on-demand hot water heaters in 2015, including the replacement of a 120 gallon hot water heater in the Africa Rainforest Cafe. The goal is to reduce overall energy consumption based on operation needs of the Zoo rather than operation requirements of the mechanics. Additional On-Demand Hot water heaters will be installed in 2016 and beyond. Now, with baseline data from these area meters, actual energy savings from this project can be calculated once we receive the 2016 Energy Audit from the City of Toronto.

In support of taking action on climate change the Toronto Zoo celebrated Earth Hour by turning off all non-essential lights from 8:30 p.m. to 9:30 p.m. To increase public awareness about Earth Hour and the impact of climate change, Toronto's Facebook pages hosted 4 spotlights on how climate change is impacting the habitat range of endangered species that can be viewed at the Toronto Zoo. Signage throughout the Zoo the week leading up to Earth Hour, also highlighted impacts to habitat and how people can reduce such impact.

During 2015, Facility & Services continued with and completed the installation of gas service to the Gate House and Valley Halla. The water heaters and boilers in both the Gate House and Valley Halla have been replaced with more efficient gas burning mechanics. Connection of the gas line to the wildlife service buildings on the east side of Meadowvale Road will be completed in the spring of 2016. Utilizing an incentive rebate program from Enbridge Inc., the conversion from Diesel fuel to natural gas will provide significant energy consumption reductions of up to 60 to 70% as well as reduce the overall cost of purchase.

Additionally, Facility & Services have replaces 3 near end of life furnaces with 97% energy efficient furnaces for the Wildlife Health Centre and replaced 3 inefficient exhaust fans with Heat Recovery Ventilators to reduce the differential heating requirement for fresh air coming into the building.

Facility & Services has been working with Area Supervisors to vary the air handling fans within buildings to optimize function, energy efficiency, animal safety and human safety. This project in 2015 is a precursor to the Variable Frequency Drive Installation capital project in 2016. A

\$20,000 incentive rebate program grant has been approved to assist with the cost of the capital project.

To date, the Toronto Zoo has been addressing energy efficiencies on a project to project basis. Energy efficiencies are incorporated with budgetary allowances into new construction, major renovations, and general maintenance or upgrades. With the assistance of Ecosystems Inc., an Energy Efficiency Business Case was developed that identified three potential Energy Performance projects ranging in cost from \$1.4M to \$2.2M that would see the Zoo addressing energy efficiency as the primary objective of the project and would have significant impact on the Zoo's ability to reach the Green Plan targets. 2016 will see the issuance of an RFP for an energy efficiency feasibility study and project descriptions for the Zoo to consider.

Toronto Zoo staff members continue to identify and investigate renewable energy sources and other green technologies that can be incorporated on-site, including solar panel installations that could remove or reduce the Zoo's reliance on the Ontario electrical grid.

Green Technology Implementation

Custodial piloted and purchased an Ozone Water Sanitizing system to reduce the amount of chemicals and water utilized for cleaning the Administrative and Operations Complex. Evaluation of the unit's success will determine the expansion of the system to additional units in other buildings.

The ZooShare biogas facility project continues to progress. ZooShare successfully completed their sales of community bonds for capital funding and has received their environmental and regulatory permits. Construction of the facility is on track for spring of 2016.

Environmental Awareness/Public Outreach

The Toronto Zoo reached a number of audiences in 2015 to promote Environmental and Sustainability Awareness through Public Outreach opportunities.

Once again the Toronto Zoo participated in the three day 2015 Green Living Show held at the Toronto Convention Centre. The show is North America's largest green consumer show dedicated to educating the public about easy and workable solutions for leading a sustainable lifestyle. More than 37,000 people attended the show over the weekend. Zoo staff and Volunteers made contact with 30,000 visitors. This show continues to be an excellent networking opportunity for the Zoo to connect with other conservation minded organizations and learn about new sustainability projects in Ontario.

Toronto Zoo held Earth Day Celebrations onsite with activities located throughout the Tundra Trek. Earth Day® Canada, a leading environmental education NGO, partnered with the Zoo to provide activities and games for kids and families. Nine environmental education organizations in Ontario were invited to provide visitors with fun resources showcasing the many ways we can be leaders in "green" living including; Adopt-A-Pond Wetland Conservation Programme, Great Lakes Outreach, Parks Canada, Rouge Park, Friends of the Rouge Watershed, Plug'N Drive, PhoneApes Cell Phone Recycling, Polar Bear International, ZooShare and the Toronto Zoo Wildlife Health Centre. Approximately 17,833 visitors attended the event. Bullfrog Power

sponsored the event by providing alternative energy for the Caribou Café and Tundra Trek facilities for the weekend, savings equivalent to carbon sequestered by 3.6 tree saplings grown for 10 years. This year's theme of 'Healthy Planet for Conservation' promoted the importance of healthy ecosystems on the health of all populations. Highlighting the construction of the new Wildlife Health Centre the veterinary staff were on hand with their ambulance to profile the very valuable work they do keeping the Zoo's wildlife so healthy. The annual rain barrel sale once again brought awareness to water resources and raised funds for the Zoo's Green Conservation program.

International Migratory Bird Day was held in the Rouge Valley and Zoo site. The theme for 2015 was Restore Habitat, Restore Birds.

As an Arctic Ambassador Centre, the Toronto Zoo actively engages target audiences in better understanding the impact of climate change on polar bears and their arctic habitat and the reliance of humans on a Carbon-based economy. Through our education programs we encourage students to become engaged in activities within their local community that result in stewardship or conservation actions that mitigate greenhouse gases. We work closely with Polar Bears International (PBI) and partner organizations to; support content development, share messaging tools, coordinate public information activities, engage the public in social media platforms to raise funds, and, create metric tools to measure program successes. Through these activities and collaborations the Zoo informs, inspires, and empowers others to take immediate steps to reduce CO₂ for the conservation of polar bear habitat and other species impacted by a warming world.

"Polar Bear Fest" and "Move Your Paws for the Polar Bear Cause" wrapped up the "Bundle Up for Polar Bears" initiative designed to encourage people to turn down their thermostat. Over 3000 people visited the Zoo over the course of the two-day event. Visitors enjoyed learning about polar bears through a variety of exciting polar bear-themed activities and made a 'polar pledge' to take action to reduce their impact on the environment. Many families spent over an hour taking part in all the activities. Two special presentations (Wildlife Care staff - Training and enrichment; Brandon Laforest, PhD candidate - nutritional studies on captive polar bears) were attended by over 100 people. Over \$3000 was raised for polar bear conservation through a silent auction and selling 'I ♥ polar bear' bracelets and polar bear key chains. Additionally, a 'plastic polar bear' sculpture was created from recycled plastic bags and a wire frame. This bear sculpture, along with a sign explaining the importance of recycling plastic or using alternatives, was on display during the event and for the entire month of March. Over 1550 people, including students at four elementary schools and Toronto Zoo staff and Volunteers, participated in this year's Bundle Up For Polar Bears Thermostat Challenge and turned down their thermostat by at least 2°C over the course of the week. An invitation to join the challenge was emailed to Toronto Zoo staff, Volunteers, and Members, as well the Zoo's educator and non-member marketing lists. The challenge, which celebrates International Polar Bear Day, resulted in a large reduction in CO₂ emissions that will help to slow the impact of climate change. To increase the reach and overall impact of this challenge, a resource package full of polar bear- and arctic-related activities and lesson ideas was developed and a new online registration page was launched, which included the option for individuals to make pledges to change other actions if they were unable to turn down their thermostat. The combined efforts resulted in savings of approximately 1,577 kg (3476 lbs) of CO₂/year (equivalent of 40.4 tree seedlings grown for 10 years to remove that amount of CO₂ from the air or CO₂ emissions from 65.7 propane cylinders used for home barbecues).

Recent expansions to the Toronto Zoo's PhoneApes Cellphone Recycling programs continue to promote awareness about Great Ape conservation. The Zoo hosted 2 e-waste collection days in 2015 (June and September), collecting over 6,000 tonnes of general e-waste for recycling. The Toronto Zoo added 2 additional permanent collection boxes to the partnership with the City of Toronto Waste Diversion office project with a total of 14 collection boxes in 13 of the main City of Toronto Operations Complexes for cellphone recycling. General marketing of these new boxes is ongoing to increase awareness about their existence and location. The Zoo is looking into support and commitment by other Zoos to spread the program nationally within Canada. A final expansion activity in 2015 was the translation of the boxes and marketing materials in the French language after interest by the French language schools in Ontario. The French language boxes will be distributed to interested schools in spring 2016. To date, the Toronto Zoo has recycled over 30,000 cellphones and donated more than \$27,000 to Great Ape conservation efforts in Africa.

Two members of CEW were educators and testers in the Peel Region District School Board Envirothon competition. The Ontario Envirothon is a unique competition for high school students to get outdoors and experience nature first hand and hands on. Local conservation organizations partner to provide students with interactive field trips and workshops to help them understand forests, soils, wildlife, aquatic ecosystems and the human impact on all of the things we value in nature. The national Envirothon competition will be held in Ontario in 2016, which CEW staff have a strong interest in participating in again.

Toronto Zoo participated in Earth Day® Canada's Earth Flag Campaign. Earth Day® Canada asked Canadians to sign the Earth Flag showing their support for Canada to improve efforts to mitigate climate change. The goal was to collect 1 million Canadian signatures on the flag to be hoisted in Paris, France at the COP21 Conference in December 2015. Toronto Zoo hosted a large 4' x 6' flag in the front courtyard for visitors to sign during their visit. The flag consisted of info graphics on Climate Change, the COP21 Conference and Toronto Zoo's initiatives to reduce its impact on Climate Change. The flag was a success for the Zoo. Over 9 panel, more than 40,000 visitors signed the flag in September and October 2015. In addition, the Toronto Zoo also hosted a digital widget on their webpage where visitors could digitally sign the flag. The Earth Flag was indeed taken to Paris and revealed internationally at the COP21 Conference. Since that conference, Canada has made significant commitments towards actions to reducing their contributions to climate change.

Kyla Greenham, Andrew Lentini, Julie Phillips and Dr. W.A. Rapley from the CEW Division attended the Ontario Biodiversity Summit. The summit addressed the state of Ontario's progress towards improving biodiversity at the mid-term period of the Decade of Biodiversity and workshops developed the directed of the Biodiversity Council of Ontario's vision for the next 5 years.

Toronto Zoo GEZT continued to extend its reach by participating in additional events such as Toronto's EcoWheels Festival and the Symcor EcoFair.

Renaturalization/Biodiversity Improvement Projects

The Toronto Zoo continues to commit to renaturalization of the Zoo site. Through Corporate Volunteerism and the commitment of Zoo staff to protect natural ecosystems, the Zoo hosted one

tree planting and one large meadow planting in partnership with Acres for the Atmosphere in 2015. An acre of Zoo land for planting was sponsored by TELUS, and over 175 TELUS staff and family members participated in the planting of approximately 300 trees. Symcor Inc. a strong supporter of Acres for the Atmosphere with over 150 staff and family completed the first official meadow planting on the Zoo site. The planting of meadow brush and flowers was directed by Horticulture and Curatorial staff to provide valuable habitat for insects and migrating butterflies like the Monarch.

Once again, Toronto Zoo staff participated in the Great Canadian Shoreline Cleanup at the Rouge Beaches. Toronto Zoo staff and community residences participated in this one day event and collected 21 bags of garbage (382lbs), 11 bags of recyclables and a few larger items including furniture.

Toronto Zoo continues to be a key member of the Ontario BioBlitz Steering Committee. Ontario BioBlitz – Don River Watershed 2015 was hosted by the Ontario Science Centre with over 700 registered experts and community participants. At least 1038 species of plants and animals were documented, and the number continues to grow daily as experts continue to identify samples obtained during the blitz. Toronto Zoo along with several key steering committee members such as the ROM, Ontario Nature, Parks Canada, and University of Guelph's Biodiversity Institute of Ontario (BIO) provided expert staff to conduct and lead taxon groups throughout the event. Dr. K. Kerr, M. Franke and Dr. W.A. Rapley assisted with the coordination of taxon groups while additional Zoo staff participated in the intensive blitz. Toronto Zoo has committed to remain an active member of the Steering Committee for the next 5 years and is working with the committee to prepare for the 2016 BioBlitz in the Credit River Watershed, hosted by Riverwood Conservancy. In celebration of Canada's sesquicentennial in 2017, the Ontario Flagship BioBlitz will return to the Toronto Zoo and the Rouge Urban National Park hosting the first Flagship BioBlitz under the BioBlitz Canada platform. The Ontario BioBlitz platform has expanded to act as an umbrella group to provide direction and assistance to other groups conducting bioblitzes across Ontario.

In 2015, a major project was completed to repair a leaky liner in the headwater pool of the Mayan Temple Waterfall. Not only did this project reduce water loss to the system and water damage to the structure of the waterfall, an extension plate added to the waterfall at the last minute further reduces water loss to the waterway system by redirecting the waterfall over the rocks of the waterfall, not the pedestrian safety barrier. Traditionally, water loss to the waterway was replaced by potable water at the cost of the Zoo. Reducing water loss to the waterway saves the Zoo money and reduces evaporation losses.

Partnerships/Collaboration

To achieve the goals of the Green Plan 2007, Toronto Zoo has reached out to create partnerships and collaborations with like-minded organizations. These partnerships and collaborations have been instrumental in achieving project goals, developing a resource base of knowledge and materials, and developing a network from which to learn and share.

The Toronto Zoo continues to support the PBI "Call to Action" Campaign to showcase Toronto Zoo as an Arctic Ambassador Centre. It outlines some of Toronto Zoo's key goals and ongoing initiatives, such as providing displays that showcase "green energy" for visitors such as Ice-Bear,

Geothermal Energy, and Green Roofs; as well as workshops on climate change for grades/youth groups and interpretation at the polar bear exhibit for visitors and educating the public through messaging in Keeper Talks. The Toronto Zoo's green initiative programs are profiled on the Arctic Ambassador Website.

Kyla Greenham has once again been appointed Vice President of the Conservation Council of Ontario (CCO) as an institutional representative. The CCO is a provincial NGO of conservation and sustainability organizations that provide expert knowledge and comments to government bodies regarding environmental protection, biodiversity conservation and sustainability.

Leadership

In March 2015, Kyla Greenham attended the Green Summit at the AZA Mid-year Meeting in Columbia, South Carolina. The opportunity was highly appreciated and rewarding. The Toronto Zoo continues to be seen amongst the top 5 institutions engaged in sustainable operations. Kyla Greenham was appointed as a non-voting member to AZA's Green Scientific Advisory Group (GSAG), to be upgraded to a voting member upon the Zoo re-accreditation by AZA. K. Greenham attends regular GSAG meetings providing leadership for sustainability within Canada.

The Toronto Zoo continues to maintain its Level Two ECO-business certification and Gold Level EcoCentres certification.

Employee Engagement

2015 was a remarkable year for employee engagement. Toronto Zoo participated in Partners in Project Green's (PPG) People Power Challenge (PPC) from April to September. PPC is an employee engagement challenge to improve active participation of staff in corporate sustainability activities/practices as well as personal sustainability practices, increases employee awareness of corporate sustainability policies and practices and identifies areas that need attention or improvement. PPG has been running the People Power Challenge since 2011, however this is the first year Toronto Zoo has participated. Working on a solid platform of sustainability and conservation action, the Toronto Zoo placed second, receiving \$2,500 towards green initiatives. The PPC consisted of pledges and suggestions made by staff and volunteers, interactions with the program's mobile app, initiation and completion of green/sustainable initiatives and participation of staff and volunteers in action of sustainability (habitat restoration, energy efficiency, resource use reductions etc.) and Zoo participation in the program is as follows:

- 89 people downloaded the Nudge Rewards App
- 9,530 interactions with the app
- 83 suggestions were submitted to GEZT
- 10 suggestions were already implemented by the end of the challenge
- 4 additional suggestions implemented by the end of 2015
- 358 pledges were made by staff/volunteers
- 28 Sustainability Educational Resources were generated and distributed
- 59 projects completed by September 2015 costing over \$1.192M
- 208 staff participating in 45 Events logging over 10,000 hours committed to sustainability.

Interactive awareness programs addressing palm oil were featured at the Orangutan exhibit in 2015. With the issue of the AZA Palm Oil Statement, GEZT is currently drafting a Toronto Zoo Palm Oil Statement. With a completed Palm Oil Statement the Zoo will be able to make commitments towards sustainable palm oil messaging on site.

The Toronto Zoo Materials and Collection branch continues to deliver waste bamboo to a permaculture facility in Holland Landing. It is estimated that based on the average consumption compared to the average bamboo being discarded over the past year, the Toronto Zoo has diverted approximately 8,680 kg of bamboo from landfill. 100% of the waste bamboo has been diverted from landfill through shipments to the farmer and onsite use by wildlife care, education and horticulture as recycled items for enrichment, educational crafts and alternative uses such as fence posts and tree plantings support posts. Waste diversion for the Toronto Zoo continues to improve as well, reaching once again a 70% waste diversion rate.

Toronto Zoo Horticulture Branch purchased 3 rainbarrels from the rainbarrel sale and installed them in a public facing location at the Caribou Café. The goal, to collect rainwater off the roof of the Caribou Café and utilizing to maintain the gardens in the general vicinity. Signage mounted by the system informs visitors of the water saving – stormwater management practice. Training completed by Horticulture staff on rain harvesting systems has resulted in a concept report to Project Management for a large rain harvesting system to be installed on the Horticulture Building and Greenhouses after the completion of the Wildlife Health Centre. A grant application is being submitted to the Federation of Canadian Municipalities to support the construction of this system in 2016. If installed, the system will hold a minimum of 34,000 L of water collected from the roof of the Horticulture Building and Greenhouses to be used in the Greenhouses and elsewhere on site, and can reduce the Zoo's potable water consumption to an average of 85,000 ML per year, or 17%.

To supplement activities of ZooCamp and ZooSchool, Horticulture staff built an organic vegetable garden and worked with the campers and students to maintain it for the growing season. Vegetables grown in the garden were used to build enrichment items for the wildlife in our care and taught a valuable lesson to students about the importance of eating local organic foods to reduce transportation and chemical impacts to the environment.

Transit staff initiated a pilot project looking into the recycling of vehicle oils. As a pilot project the branch is evaluating the impact on vehicle maintenance and warranty, cost, environmental protection and health & safety. The pilot project will continue into 2016 with hopes for future development. In addition, Transit staff have been investigating the use of bulk lubricants. Bulk purchase of lubricants has the potential to save money for the Zoo as well as reducing waste produced. Transit staff continue to prepare a business case for the use of bulk lubricants.

The Toronto Zoo continues to participate in the TerraCycle recycling program. TerraCycle is an international company with the innovation to divert currently non-recyclable (through local municipal recycling programs) products from landfill by innovative post-consumer waste product manufacturing. TerraCycle will upscale products by directly using the materials submitted into new items for sale such as purses/bags and pencil/pen holders, or recycle other products to create 100% post-consumer waste garbage receptacles, park benches, fence and cutting boards. Four TerraCycle recycling programs are being used for the Toronto Zoo's TerraCycle program: cookie and snack wrappers, inkjet cartridges, coffee bags and cereal plastic

packages. As a charity, the Zoo will be paid for each item collected. All funds generated will be diverted to green initiatives at the Zoo. To date, the Zoo has recycled more than 16,035 items at a weight of 158 kg of waste diverted from landfill, the equivalent to 106.8 tree seedlings grown for 10 years.

The TerraCycle program diverts inkjet and desk jet cartridges from landfill, however the issue of large toner cartridges at the Zoo remained. Toner is a hazardous material that causes significant environmental damage when improperly disposed of. Working with the City of Toronto Purchasing & Materials Management Division, GEZT has coordinated the return of used toner cartridges to the City of Toronto Stores Warehouse to be included in their disposal process. Due to the limited number of toner cartridges the Zoo uses per year, it was not cost effective to implement a waste diversion program of its own. The Zoo's toners are sent to the City's Warehouse on the next City of Toronto delivery truck's return, included in the asset sale process to return value to the City of Toronto budget and Toronto Zoo can account for diverting a toxic substance from landfill.

Two major water leaks were identified by staff and repaired in 2015. The Mayan Temple Waterfall required significant repairs to the underlining to reduce water leakage from the waterway system. At the time of the repairs, Projects Management took the opportunity to extend the lip of the waterfall an additional foot which further reduces water loss from the waterway system and improves visitor safety. The extension directs the water flow to the rocks reducing evaporation losses and away from the visitor path underneath reducing the amount of ice in the winter.

The Toronto Zoo continues to support the "Good Food Box" program offered by FoodShare. This program open to all Zoo staff and volunteers provides easy access to locally grown produce on a regular basis. The benefits of this program are significant. This provides easy access to locally grown food, delivered directly to the Zoo site reducing our overall carbon footprint, supporting local growers and the local economy. Organic produce is also available through the program thus further reducing our impact on the environment. In transportation costs alone, we save the equivalent of 1.5 million litres of gasoline or the amount of CO₂ sequestered by 90,667 tree seedlings grown for 10 years all in one single year.

The above noted activities are highlights from the 2015 operating year from the Toronto Zoo. We continue to complete our mission and vision to reduce the carbon footprint of Zoo operations, increase awareness of climate change and sustainability practices and report to the public our actions in achieving the targets of the 2007 Green Plan. Operating procedures, sustainability practices and green initiatives implemented in previous years continue to operate and the Zoo is showing progress towards meeting or exceeding the 2027 targets for green house gas emissions, waste diversion, and water consumption.

