

2020 Environmental Initiatives Report

Date: September 20, 2021

To: Board of Management of the Toronto Zoo

From: Director, Facilities & Infrastructure

Wards: All

SUMMARY

The purpose of this report is to update the Board of Management on environmental priorities and initiatives achieved for the Toronto Zoo in 2020. 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.

RECOMMENDATIONS

The Director, Facilities & Infrastructure recommends that:

1. The Toronto Zoo Board of Management receive this report for information.

FINANCIAL IMPACT

There is no financial impact resulting from the adoption of the recommendations in this report.

DECISION HISTORY

In 2006, the Toronto Zoo introduced a Greenprint that provided resources and suggestions for the creation of the 2007 Green Plan. The Green Plan addresses the Toronto Zoo's major environmental impacts and provides action steps towards a greener solution by outlining goals, targets, timeframes, and areas of responsibility.

COMMENTS

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 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. Kyla Greenham, Manager of Conservation Programs & Environment, chairs GEZT.

In 2020, GEZT concentrated on waste management, energy consumption reductions, and surface water quality improvements.

Although COVID-19 restricted the public education and engagement activities planned at the Zoo in 2020, infrastructure improvements and staff engagement continued.

Environmental Management System

GEZT manages the Zoo's ISO14001:2015 compatible Environmental Management System (EMS). It continues to work through the action plans set out in the EMS to ultimately achieve the 2007 Green Plan objectives. In late 2020, GEZT began work to update the Zoo's sustainability plan including new objectives, resetting targets for greenhouse gas emissions, energy and water consumptions, waste diversion, and renewable energy generation to align with the Zoo's new Strategic Direction, TransformTO, City of Toronto Biodiversity Strategy and the Paris Agreement. The new sustainability plan will be completed and presented in 2021.

In 2020, GEZT continued with the 2018 Action Plan priorities for energy, water, waste, and the palm oil conservation message. GEZT and Project Management continued with the multi-year project installing three more water bottle filling stations for visitors. A Detailed Concept Report has been received from Ecosystems Energy Inc. for the Energy Retrofit Project. The Project proposes to achieve GHG emissions savings, savings for energy and water consumption, and the replacement of the Americas heat distribution system. The Zoo will sign the second phase of the agreement in early 2021. Environmental Conservation Measures are to be complete by end of 2022. A second floating wetland was installed in the Americas pond and the Zoo's Zero-waste employee program was rolled out to the rest of the Zoo facilities. Details on each of these projects have been provided in later sections of this report.

As part of the Environmental Management System, incidences that have had or may have a negative impact on the environment are to be reported to the Conservation & Environment Office. There were four environmental incidences on site in 2020.

A significant erosion event occurred in the Canadian Domain by high water levels in the Rouge River during a storm event in January. The erosion impacted at least 4 separate

locations on Zoo property along the river. One location was significant to wash away approximately 100ft of the Zoo access road, including removing a portion of the perimeter fencing, the asphalt road, a water main and has eroded soil leading up to the perimeter fence of the Moose Exhibit. TRCA has established additional erosion monitoring sites along the riverbank and increased monitoring frequency. A plan has been prepared to relocate the Zoo access road and the perimeter exhibit fence a fair distance from the river's edge to deter any future impact to Zoo assets because of flooding.

In August, approximately 300L of sewage was spilled at the Indo-Malaya Paddocks during construction of the Outdoor Orangutan Habitat. The area was immediately cleaned up by Zoo and construction staff.

During the reopening inspection of the restaurants, a large amount of black mould was identified. A larger mould remediation inspection identified black mould in multiple locations: Restaurant Associates Administration Office, Caribou Café, and Twiga Restaurant. Remediation efforts were contracted, and all mould has been removed.

Finally, asbestos remediation action was taken in several locations at the Zoo to remove construction material containing asbestos.

The Toronto Zoo continues with an ongoing LED lighting replacement project. Utilizing operating budget, the electricians replaced lighting in the Learning & Engagement and Retail offices, Administrative & Support Centre, Africa, and Indo-Malayan pavilions. Specific LED retrofit projects included the Kids Zoo Courtyard bollard lights, the Special Events Centre, Horticulture & Material Collection exterior lighting, and graphic lightboxes for exhibits. To date, approximately 30% of the Zoo lighting has been replaced with LED. A special project was undertaken in 2020 for the fish aquaria on site. Lighting is critical for fish welfare by providing specific light spectrums for the different species. Historically, LED lighting for aquaria has not been reliable for providing the appropriate light spectrum, however, recently there has been progressive development of LED lights that meet the needs of aquaria for light spectrums. In 2019, the Fishes team trialed a new LED product with promising results. The 2020 pilot project replaced 6 halogen lights and 1 fluorescent light at three different aquaria to evaluate the reliability of this product across different light spectrum bulbs. The success of this program has significant potential to reduce energy consumption for the Zoo based on the number of high energy demand halogen lights at the different aquaria across the Zoo. Anywhere from three to seven 750W halogen lightbulbs are used for fish aquaria. Each of the new Kessel lights are 25W.

The Toronto Zoo is pleased to report a total of nine water bottle filling stations now exist at the Zoo. The Toronto Zoo installed its first water bottle filling station in 2018, five in 2019, and an additional three units were purchased and installed in public locations in 2020. Water bottle filling stations are now located at the Administrative & Support Complex, Canadian Domain Zoomobile Station, African Rainforest Pavilion, Americas Pavilion, Learning & Engagement Centre, the Front Entrance Bridge, Indian Rhino and Malayan Woods Courtyard, Africa Savanna, and the Horticulture/Materials Collection building. Seven are accessible to the public and two are accessible for staff. The Zoo plans to install five more stations in 2021. Records at the end of 2020 showed that more

than 26,624 water bottles were not used in 2020 and now more than 93,000 single-use plastic water bottles have not been used at the Zoo because of this initiative.

Facilities & Infrastructure has been investigating the transition of the Toronto Zoo fleet to a low carbon fleet to meet the TransformTO requirement that 75% of the City's fleet uses low carbon energy sources by the year 2030. To date, 36 of the 78 vehicles (46%) are categorized as green vehicles. The majority of these green vehicles fall under the heavy-duty and off-road categories.

New Infrastructure

In a continued effort to improve water quality and aesthetics of the series of ponds running through the Zoo; a second floating wetland was added. This floating wetland was installed in a highly visible location at the Americas wetland/Eurasia Wilds courtyard. Additional signage installations highlight the value of utilizing nature to maintain the health of ecosystems. Efforts continue to expand these platforms through the series of ponds at the Zoo creating layout designs that are both functional and pleasing to the visitors.



With the success of Plumbing Services' glass media pilot project in 2019, the Zoo has continued to exchange sand media in water filtration systems. In 2020, Plumbing Services exchanged sand media for glass media in the Gavial, Billabong, and Electric eel exhibit life support systems during their annual maintenance. This is expected to save 156,800 Litres of water per year.

Environmental Awareness/Public Outreach

Environmental awareness and public outreach moved to a virtual platform for 2020. Through Facebook Live, Scenic and Holiday Drive-Thru commentaries, virtual education programs, and social media the Zoo continued to reach several audiences.

Back by popular demand, the Toronto Zoo continued with polar bear conservation by celebrating International Polar Bear Day with another Polar Dip event on Saturday, February 1, 2020. Sixty-four people had the opportunity to "dip" into icy-cold waters to raise awareness for polar bear conservation. More than \$16,750 was raised by dippers and virtual dippers for polar bear conservation and 280 pledges identifying ways that they could help polar bears and combat climate change.



The Toronto Zoo is a champion for Canada's majestic polar bears listed as vulnerable by the International Union for Conservation of Nature (IUCN) as they are at risk of becoming endangered due to climate change. Proceeds from the Toronto Zoo Polar Dip challenge went to support the Toronto Zoo's

role in scientific research, education, and saving and protecting the polar bear for future generations.



The Zoo participated in the 2020 AZA's Gorillas on the Line...Answer the Call Campaign; an awareness and fundraising to help Gorilla Conservation in Africa. The Toronto Zoo collected 2,431 cellphones during this campaign, the highest number of cellphones collected. This initiative collected 6,194 cellphones and over \$2,000 for Gorilla Conservation in the Dominican Republic of Congo. Unfortunately, the planned e-waste events were canceled for health & safety accommodations as a result of COVID-19. The Gorillas on the Line Campaign has raised their 2021 target to 15,000 phones. The Toronto Zoo will continue to participate.

All branches of the Toronto Zoo are assessing their internal processes and adopting new initiatives to promote environmental sustainability. These initiatives range in focus but are all meant to improve employee efficiency, offering more sustainable options to the visitors, and reaching the zoo's sustainability targets. Initiatives include things like adopting an online ticketing and verification process, using online financial resources to reduce travel to the bank, use of whiteboard for note-taking, repurposing decorating materials for multiple functions, showcasing local businesses that have excelled with organic products and/or exemplary environmental practices, Eco cups made of plant-based materials to minimize environmental impact during Brew at the Zoo, and using solar lights for temporary exhibits like the Holiday Market and group events. Staff used only repurposed items while decorating the hay bales for Hay-lloween Town and purchased sturdy reusable decorative storage sheds for special events vendor booths not only adding to the aesthetic appearance for our guests but improving the longevity and applicable uses.

Renaturalization/Biodiversity Improvement Projects

Opportunities to engage community members in renaturalization and biodiversity improvement projects at the Zoo is usually a key criterion for these projects. As volunteer opportunities were canceled due to COVID-19, Toronto Zoo staff stepped up to assist Horticulture and Nutrition with gathering browse for the animals and preparing the new browse farm. The browse farm now has an official Ontario Environmental Farm Plan (EFP). It was seeded with white clover to provide green ground cover to reduce erosion and weed growth and to improve the structure and fertility of the soil. Vernal areas and a potential snake hibernaculum have been isolated within the site plan and monitoring activities by the Zoo's Conservation Science team have been initiated. Planting of the farm is scheduled for spring 2021.

Working collaboratively, Horticulture and the Conservation Programs & Environment offices hired an Invasive Species Management Assistant to begin a site-wide inventory of invasive plant species as the initial phase to developing an invasive species management plan. Phragmites, garlic mustard, dog strangling vine (DSV), Japanese knotweed, burdock, loosestrife, grapevine, Russian olive, buckthorn, burning bush, Canada thistle, honeysuckle, Norway maple, Himalayan balsam, and poison ivy have all

been identified on the Zoo site. Sixty-seven percent of the species have been mapped to date. Mechanical removal of some of these plants will be the most effective removal process, and uniquely some of the species may also be used for the Zoo's Browse program. Nine hundred and twenty (920) kg of Phragmites was harvested for browse. Some were delivered fresh to the animals, while the remaining was preserved for silage. Nutrition and keeper staff reported that the Phragmites was well received by the animals. Nutrition will continue to research the use of invasive species as part of the browse program.

A partnership with the University of Toronto has outlined an invasive species biocontrol research project at the Zoo. Psyllids were released in the fall of 2020 at the Zoo to research their effect on Japanese knotweed. Additional biocontrol options are being considered for DSV as part of the research project for a release in spring 2021. GEZT is reaching out to the City of Toronto and Rouge National Urban Park to collaborate efforts as part of the Invasive Species Management Plan as the properties operated by all three organizations will act as seed banks for the others. Tackling invasive species together will be key to eliminating them or at least mitigating their spread.

Improvements to computer software programs used at the zoo and modifications by staff to develop an online work culture to accommodate work from home practices have resulted in a significant reduction in paper consumption at the Zoo. The Finance Unit reports a 50% reduction in paper use and storage requirements.

Partnerships/Collaboration

To achieve the goals of the 2007 Green Plan, 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.

Kyla Greenham represents the Toronto Zoo as a member of the Ontario Biodiversity Council (OBC), Biodiversity Education & Awareness Network, AZA Green Scientific Advisory Group, and Partners in Project Green.

Toronto Zoo believes every action counts towards saving and protecting wildlife and wild spaces. Modifications to facilities and mechanical systems to improve energy efficiencies may be one step the Zoo is taking to reduce its energy consumption and greenhouse gas emissions; it is also purchasing carbon offsets from Bullfrog Power. The Zoo increased the amount of renewable energy by 11% which offsets the zoo's GHG emissions by 9.3 tonnes and continues to power the exhibits, Conservation Breeding Programs, and guest experience with renewable energy. The additional carbon offset purchases also helped to reduce the impact of the Scenic Safari and Holiday Drive-Thru. The Zoo expanded its environmental partnership compliment with Memorandum of Understandings with Pollution Probe and Second Harvest.





Pollution Probe is one of the first environmental non-governmental organizations in Canada. As a non-profit group, Pollution Probe seeks to improve Canadian's health through research, education, promotion, and advocacy of actions to reduce pollution. Toronto Zoo has committed to partner with Pollution Probe to reduce plastic pollution in our local waters. As part of the Great Lakes Plastic Cleanup Program, the Toronto Zoo installed one Seabin and three LitterTraps on-site as an

educational awareness initiative. These functioning traps will collect wayward plastic and waste that has made it to the Zoo's waterway and stormwater collection bins before it can reach the Rouge River. The Zoo was also the proud host for the launch of the Great Lakes Plastic Cleanup program with Pollution Probe, the Ontario Minister of the Environment, Council of the Great Lakes Region, and Boating Ontario. The next collaborative plan with Pollution Probe will develop a plastic tour that incorporates new products such as construction materials, asphalt, park benches, waste receptacles, and signage that contain post-consumer recycled plastics recovered using newer technologies and processes. The new technologies and processes expand the types of plastics that can be recycled and extends the lifecycle of recycled plastics. For example, the lifetime from bottling until a single-use plastic bottle is recycled is approximately 6 months. The new recycling processes allow this type of plastic to be used in products that will last up to 20 or 30 years.



Second Harvest is the largest food rescue organization in Canada and a global thought leader on food recovery. They work across the supply chain from farm to retail to capture surplus goods before it ends up in landfill which negatively impacts the environment. The Zoo's Nutrition unit has worked with Second Harvest to be a recipient of surplus foods. Events & Partnerships hosted a food drive during the Holiday Market and Holiday Drive-Thru collecting food donations for local food banks. Events & Partnerships repurposed large food bins from Nutrition to collect the food items and Second Harvest made weekly collection and delivery trips to local communities to reduce transportation mileages. A total of 33,000 lbs of food was donated via the Holiday Drive-Thru/Holiday Market.

Toronto Zoo partnered with Purolator Tackle Hunger Red Bag Campaign and Scarborough Health Network to collect more than 7,700 lbs of non-perishable food items for local food banks.

Supporting the Toronto Fire Services Toy Drive, the Toronto Zoo collected 43 cribs full of toys during the Holiday Drive-Thru/Holiday Market.



Toronto Zoo also became an Ocean Wise Partner in 2020. Ocean Wise conducted an audit of all freshwater and seafood products purchased by both the Nutrition unit for animal diets and Restaurant Associates for the restaurants and catering services. More than 50% of the items previously purchased are Ocean Wise approved products. Ocean Wise has provided recommended Ocean Wise approved alternatives for the remaining items. Nutrition and Restaurant Associates will transition to the new Ocean Wise approved alternatives in 2021. As an Ocean Wise Partner, Ocean Wise is an ongoing resource that can be contacted at any time to provide guidance when sourcing new aquatic

products. To support the launch of the Ocean Wise Partnership, 86 Toronto Zoo and Restaurant Associates staff and volunteers completed the Ocean Wise Ambassador Certificate program and attended one of two Toronto Zoo personalized Ocean Wise training webinars hosted by Ocean Wise Science Experts in November. The Zoo has also highlighted 10 exhibits as Ocean Wise Approved, where the animals eat Ocean Wise approved items as part of their diet.

Partnerships & Events have partnered with Facedrive, a sustainable rideshare platform, to develop an MOU and offer discounted ridesharing services to Members, Staff, and prospective Guests of the Toronto Zoo. This was first launched as an add-on option for Scenic Safari and then was extended into applicable events/experiences such as Brew at the Zoo, Marketplace, and the Holiday Drive-Thru.

Leadership

Toronto Zoo was awarded the Eleanore Oakes Award at the 2020 CAZA Annual General Meeting for excellence in Education Program for its 2019 #Every Action Counts Program supporting the Washed Ashore Exhibit and commitment to reducing plastic at the Zoo.

Toronto Zoo maintains its active member status with AZA's Green Scientific Advisory Group, providing mentorship to members of the sustainability staff at other Canadian Zoos and Aquariums. In 2020, the AZA Green Summit went virtual with a six-webinar series featuring the three stages of sustainability: compliance, integration, and transformation, and the committee updated the existing guiding Green Guide documents.

Employee Engagement

In August, the Toronto Zoo took on the Plastic Free Challenge. A series of games, resources, pledges, and actions were offered through a virtual platform to engage staff both working on-site and from home in the Challenge. Due to COVID inter-zoo challenges were not occurring and the focus was directed to internal activities.

Toronto Zoo participated in the Waste Reduction Week from October 19 – 27th. Daily emails along with additional resources were provided to staff discussing each of the seven themes of Waste Reduction Week; circular economy, textiles, champions & innovators, plastic & packaging, food waste, swap, share & repair, and e-waste. To accommodate COVID-19 health and safety restrictions, the Zoo hosted a documentary series and games for staff to participate in each day of the week. This allowed staff to reengage with each other in a safe and fun way. In response to COVID-19 Waste Reduction Week activities such as e-waste collections, textile collections, and hands-on workshops were canceled.



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. The Zoo continued to offer Air freshener packaging, inkjet cartridges, Brita water filters, latex/nitrile gloves, personal safety equipment, coffee pods, Snack Wrappers, and filter cartridges and added the Swiffer Sweeper program. To date, the Zoo has recycled more than 90,000 items at a weight of 2,040 kg of waste diverted from landfill through TerraCycle.

Sustainability Plan Objectives

Waste Management

The Toronto Zoo Material Collections branch working with the City of Toronto Waste Management Division in 2008 set a target of diverting 70% of all Zoo waste from landfill. Since 2009 the Zoo has been successful in achieving 70% waste diversion for most years. A 2018 internal audit and a 2019 comprehensive report from Green For Life, the Zoo's contract waste hauler, suggested the Zoo's actual waste diversion program was not as successful as previously reported. The Material Collections branch and Conservation office working with other Facility and Infrastructure units evaluated sourced additional opportunities for waste diversion and put into place procedures to divert waste towards these additional programs. The Conservation Office also increased efforts for staff awareness and education about blue bin recycling procedures, the zero-waste employee program, and to introduce new recycling programs. The Conservation Office produced articles in the Connections staff newsletter and created new waste posters for the site. Additionally, Waste Reduction Week activities, October 19 to 27 included virtual games, digital resources and emails, and a documentary series on different topics of the global waste issue. GEZT immediately increased accessibility to

TerraCycle disposal bins to accommodate the increased use of disposable items such as face masks and disposable gloves in response to COVID-19 to ensure this would not increase landfill waste generated. The Zoo has been working to reduce waste generated at the Zoo, which can be seen in the graph with an additional 102 tonnes decrease in waste produced. The Zoo continues to have an issue with the non-recyclable Tim Horton's cups being disposed of in the recycling containers, contaminating that which is sent for recycling above the 10% threshold despite efforts to educate both staff and guests about recyclables, compostable, and landfill waste practices in 2019 and 2020. Toronto Zoo is happy to report that the single-stream recycling program has again diverted waste from landfill meaning the waste stream educational program is improving. Toronto Zoo has been able to increase its waste diversion rate to 78.5% by promoting the new and existing recycling programs it has for items such as metal, wood, skids, bones, organic material and using materials exchange programs such as the City of Toronto Asset disposition program and auctions. More than 421.5 tonnes of waste were diverted from landfill by using these alternative methods, not including eleven vehicles and nine large pieces of equipment. The impact of reduced visitor and staff attendance at the Zoo in 2020 on waste numbers should be taken into consideration when comparing to previous and subsequent years.

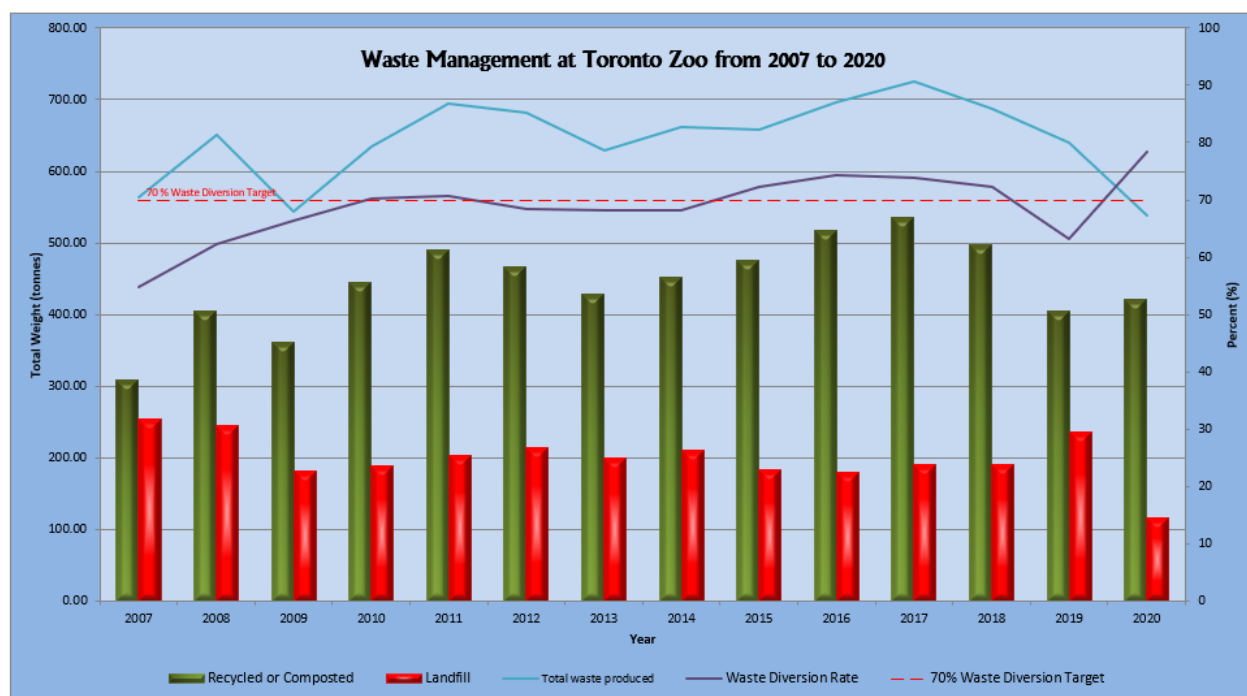


Figure 1. Actual waste disposal from the Toronto Zoo in the years 2007 to 2020. This graph shows the total annual volume of waste generated at the Toronto Zoo, the annual volume of waste diverted from landfill using alternative methods such as recycling and composting, the volume of waste sent to landfill, and the annual calculated waste diversion rate.

Greenhouse Gas Emissions and Energy Management

A deep dive audit of the greenhouse gas emissions data showed some errors in the consistency of the data over the years. Reanalysis of the data using actual consumption from invoices (as can be verified from 2014 to 2020) has readjusted the graph for the Zoo's greenhouse gas emissions since 2007. As seen in the graph (Fig. 2), CO₂ emissions were declining up until 2016 but started increasing again. Two explanations for the most recent trend are the increased consumption of energy for the Wildlife Health Centre which opened in 2017 as well as the transition from electrical services to natural gas services beginning in 2016. The Zoo began to transition to natural gas from electrical because of the significantly lower cost per unit of energy for natural gas. The increase in consumption of natural gas since 2016 (Fig. 4) corresponds with the increase in CO₂ emissions. Natural gas has a significantly higher emissions rate than electricity. Electricity and natural gas make up 99% of the Zoo's annual energy consumption, with the remaining 1% comprised of diesel fuel and gasoline for the Zoo's transit fleet.

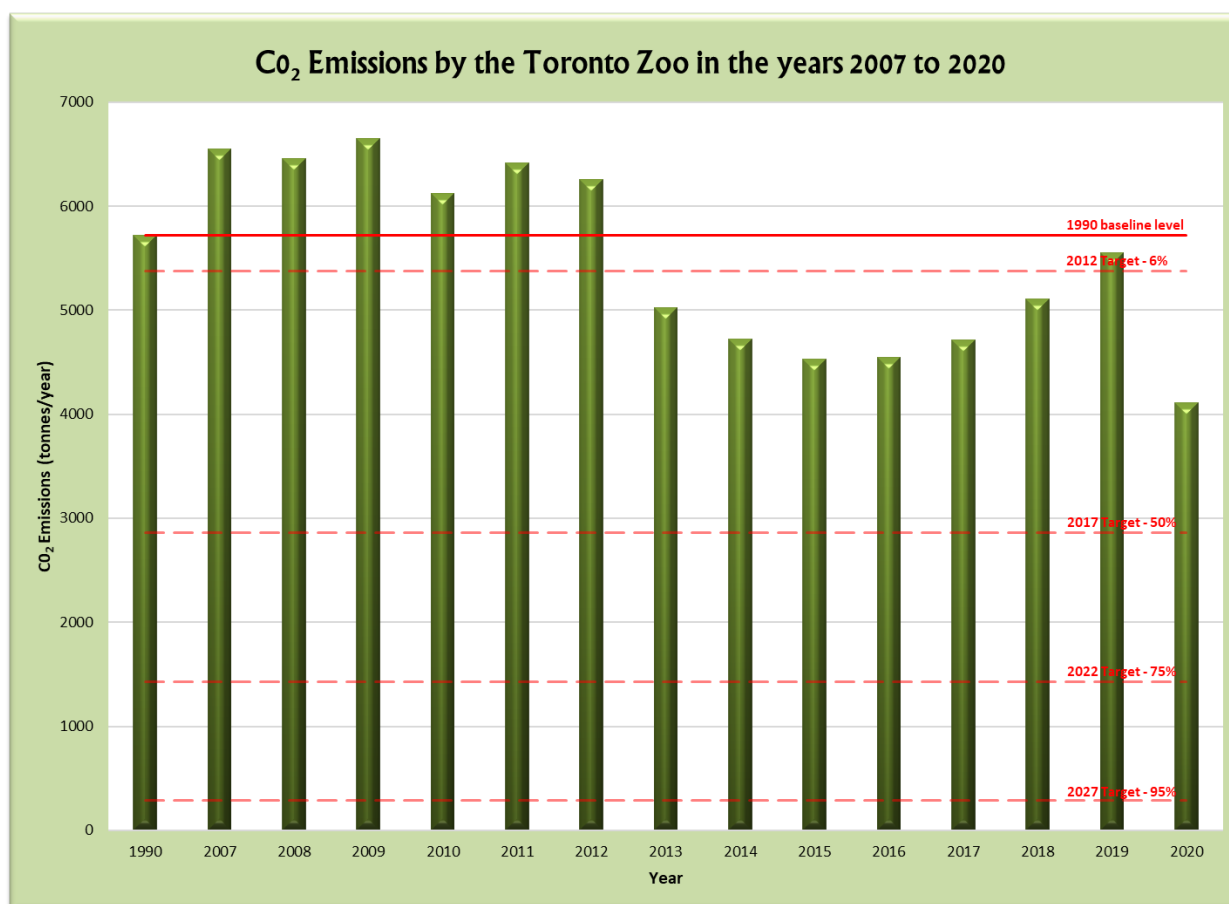


Figure 2. Annual greenhouse gas emissions, as represented by equivalent carbon dioxide emissions, from the Toronto Zoo in the years 2007 to 2020. All greenhouse gas emissions are based on the Zoo's annual energy consumption. Greenhouse gas emissions fluctuate based on the volume of energy consumed and the type of energy source (electricity, natural gas, propane, diesel fuel, gasoline, and heating oil). Annual greenhouse gas emissions are adjusted for carbon offsetting practices of the Toronto Zoo through the purchase of renewable energy from Bullfrog Power.

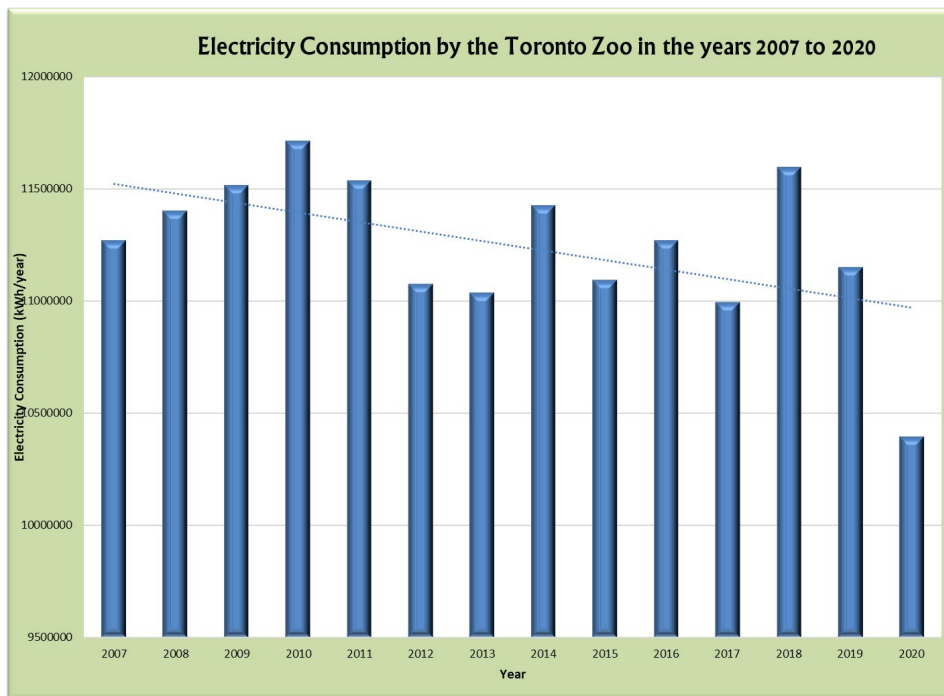


Figure 3. Actual consumption of electricity by the Toronto Zoo in the years 2007 to 2020.

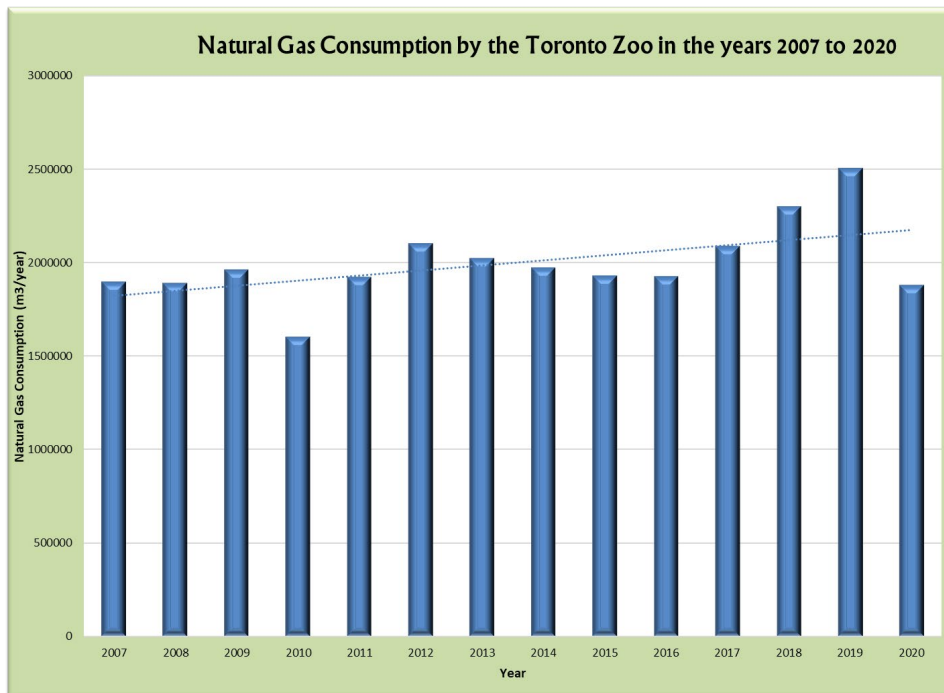


Figure 4. Actual natural gas consumption by the Toronto Zoo in the years 2007 to 2020.

Water Management

Water consumption (Fig 5) reductions continue to be a strong area of conservation for the Toronto Zoo. Consumption of potable water in 2020 was consistent with previous years. A deep dive audit of the potable water consumption records also showed discrepancies in the data and values were adjusted using the verified data from monthly invoices in the years 2013 to 2020.

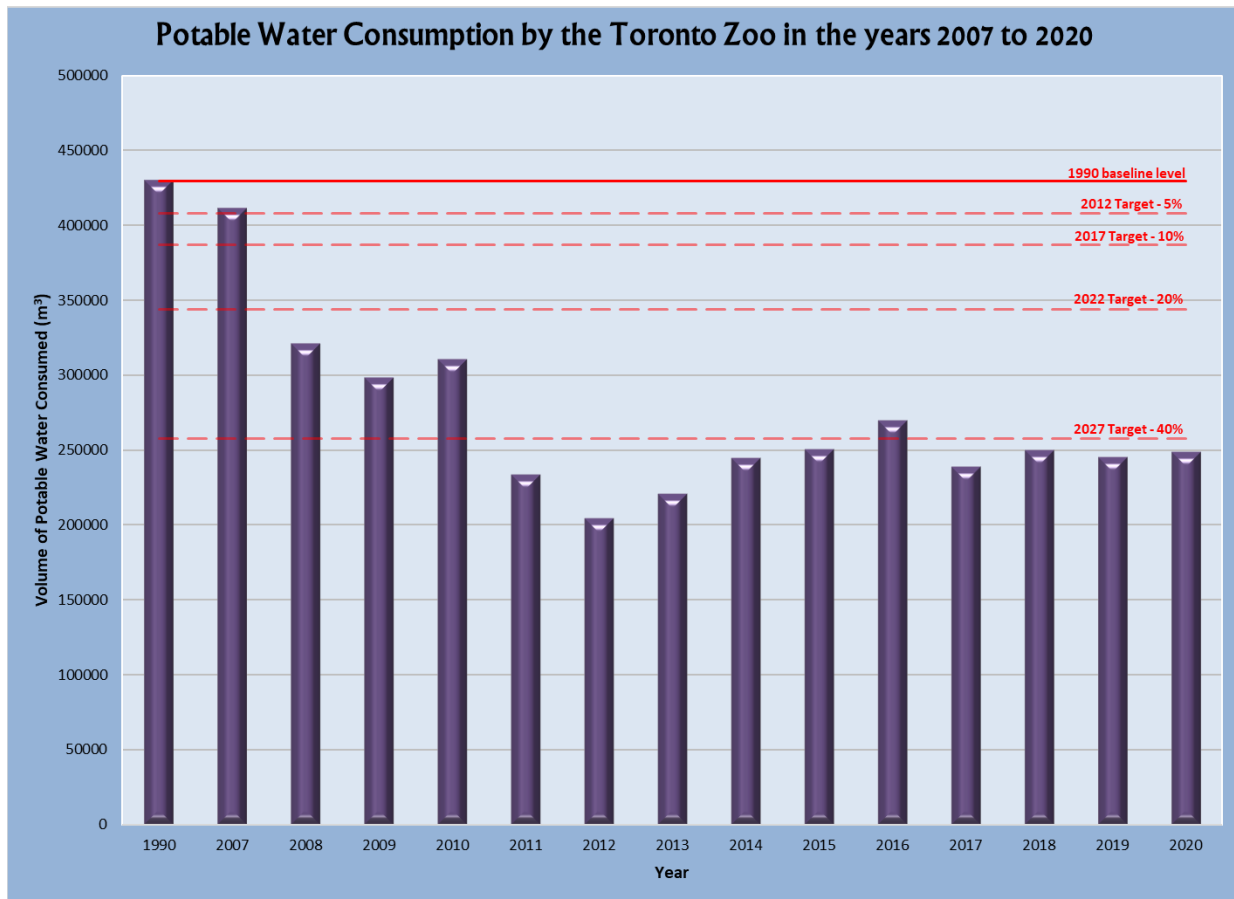


Figure 5. Actual potable water consumption at the Toronto Zoo in the years 2007 to 2020.

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ATTACHMENTS

Attachment 1 - 2020 Environmental Initiatives Report