



Environmental Initiatives Report 2023

Presented to the Board of Management of the Toronto Zoo

March 2024

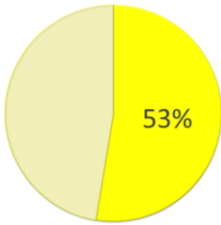
By K. Greenham

Manager, Conservation Programs & Environment

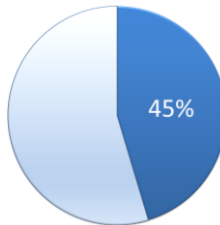
Sustainability at a glance

Progress Towards a Net Zero Toronto Zoo by 2030

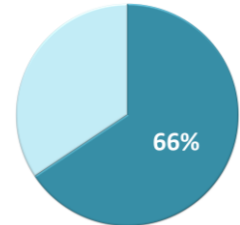
A Visual Overview of Toronto Zoo's Journey Since 2007



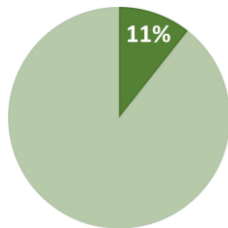
53% towards net zero
GHG emissions



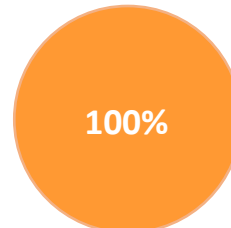
45% towards net
zero water



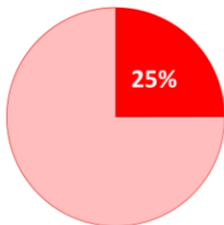
66% towards net
zero waste to landfill



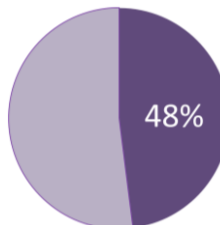
11% towards restoring
200 acres of land



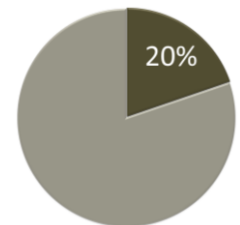
100% Sustainable Palm Oil Zoo
Achieved in 2022



25% of currently mapped
invasive species removed



48% LED lighting



20% towards fleet
electrification

Since embarking on its environmental sustainability journey in 2007, the Zoo has made significant strides. The 2022 TZNet0 Environmental Sustainability Plan sets ambitious targets for achieving net zero status in emissions, waste, and water by 2030, while also expanding environmental priorities to include biodiversity and climate resilience. The progress achieved to date reflects both ongoing efforts since 2007 and new initiatives introduced to meet the sustainability commitments outlined in the TZNet0 Plan.

Sustainability at a glance

Achievements in 2023

Corporate



Awarded one of Canada's Greenest Employer **third** consecutive year



143 MWh of renewable energy purchased



Joined The Green Will Initiative and completed strategic carbon management training

Natural Resource Management



Increasing recycled, sustainably sourced, or lower impact products purchases



Reduced potable water consumption by **8,000 m³** (**8,000,000 litres**)



7 heat pump conversion and upgrade projects completed

Transportation



Arrival of **first** SARIT Micromobility Vehicle



2 new EV charging stations installed

Biodiversity



13 acres of aquatic and terrestrial land restored



1,200 trees planted

Sustainability at a glance

Achievements in 2023

Waste Management



Diverted more than **66%** of waste from landfill



225 downloads of the Plastics Pathway App in **first** year of release



Recycled **210 kg** of face masks



Recycled **540 kg** of disposable gloves



3,207 cellphones recycled through PhoneApes



7,218 kg of electronics were recycled through PhoneApes



Water refill stations saved over **70,482** single-use plastic bottled from being used



20 alternative waste recycling programs earning **\$16,000** buy-back revenue



Paved **475 m²** of the Plastics Pathway with recycled-plastic asphalt, diverting **76,000** plastic bottles from landfills



78,000+ interactions with OSCAR increasing sorting accuracy by **11%**



1,494 Friendlier containers reused, **56 kg** of plastic waste saved, **7,848 L** of water saved, and **165 kg** of GHG emissions prevented



1,016 pieces of single-use plastic not used by staff in July during Plastic Free EcoChallenge

Community



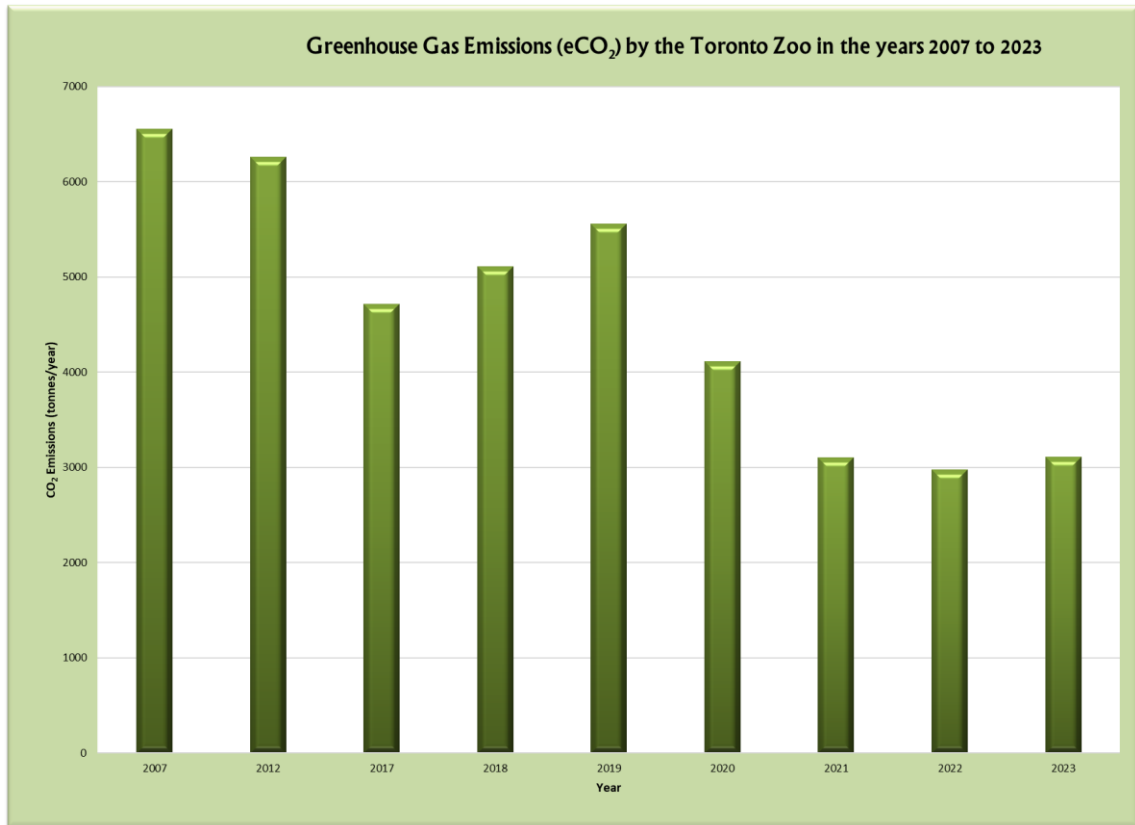
45 Climate Leaders trained through the CALL Program



1,016 volunteer hours committed to climate resiliency

Creating an environmentally sustainable zoo

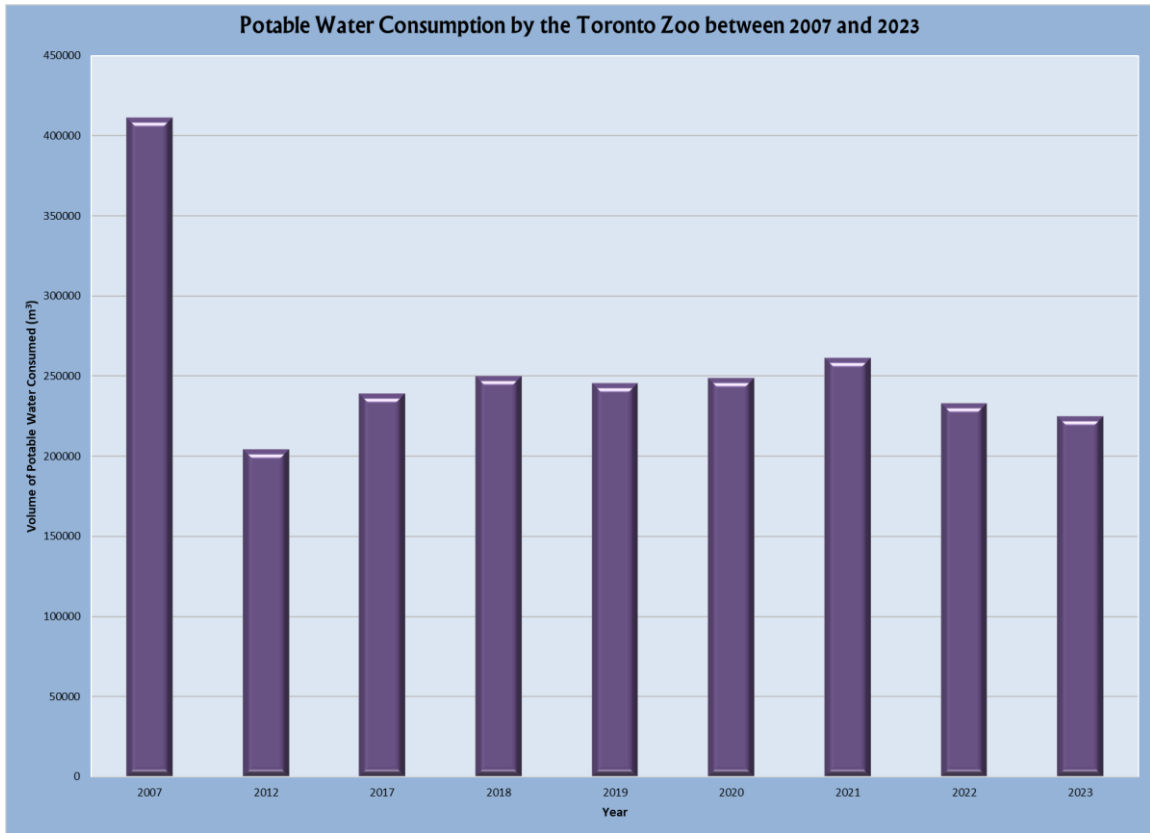
Our Journey to Net Zero Emissions



In 2023, greenhouse gas emissions saw a slight 2% increase due to higher electricity and natural gas consumption. The Americas Pavilion achieved an impressive 95% reduction in natural gas consumption after implementing the Steam to Hot Water and Heat Pump Energy Conservation Measure as part of the Energy Retrofit Project. This surpasses the initially proposed 50% reduction by Ecosystem Energy Service Inc., highlighting the necessity for ongoing efficiency enhancements to maintain steady year-over-year reductions in greenhouse gas emissions. Increased activities such as expanded services to accommodate higher attendance, extended hours, more after-hours events, increased onsite construction, and a natural gas leak contributed to this uptick in energy use. While this signifies a short-term variation year-over-year, it does not diminish the Zoo's long-term accomplishments in greenhouse gas reduction. With emissions remaining 46% below 1990 levels and achieving 53% progress toward our net-zero goal since 2007, it underscores the importance of incorporating the recommendations from the Net Zero Emissions Feasibility Study Report into the 10-year Capital Plan.

Creating an environmentally sustainable zoo

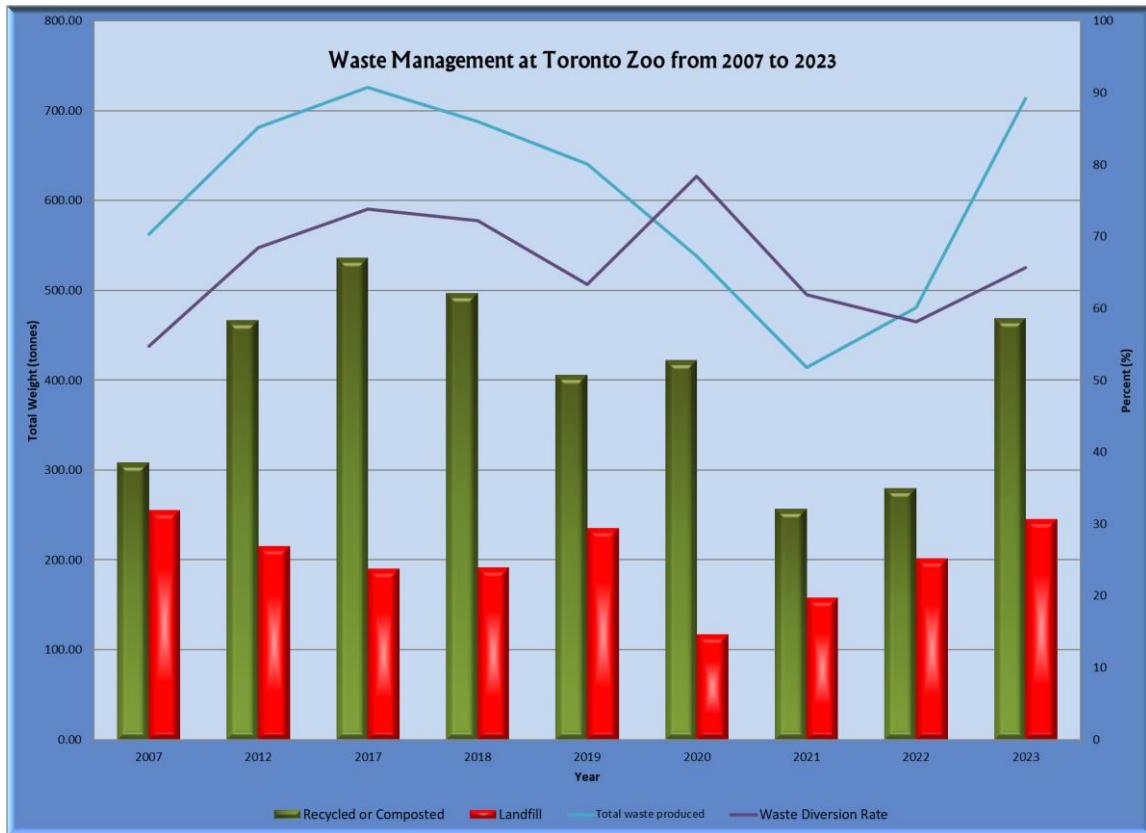
Our Journey to Net Zero Water



In 2023, our dedication to water conservation remained steadfast. Through the implementation of efficient water management practices and the adoption of innovative technologies, we achieved an impressive reduction in potable water consumption, lowering it to 48% below 1990 levels and advancing towards 45% of our net-zero goal. Despite potential increases in water usage due to higher attendance - public washrooms constitute 33% of our water usage - our success is largely credited to the completion of the penguin filtration replacement project in 2022. This project notably decreased the necessity for backwashes and full water changes in the pool year-round. Additionally, it aligns with the Water Conservation Measures of the Energy Retrofit Project, which aims to install filtration systems on the Pygmy and River hippo pools in 2024. Habitat pools account for 49% of the Zoo's water consumption. By prioritizing water conservation, we not only reduce our ecological footprint but also play a crucial role in safeguarding valuable freshwater resources.

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Our Journey to Net Zero Waste



In 2023, a notable increase in waste diversion from landfills resulted in a 10% rise in diversion rates compared to previous years. However, there was also an increase in waste sent to landfill, leading to an overall uptick in total waste generated. The increase in waste destined for landfills can be attributed to staff engaging in cleaning and decluttering activities as part of the preparation for AZA accreditation. While annual waste audits aim to provide deeper insights into resource consumption patterns and facilitate effective waste reduction strategies, the necessity of adopting a more strategic approach to waste management was acknowledged. As part of the comprehensive strategy, the Close the Loop program was launched, engaging a third-party review of existing processes to develop a comprehensive plan for achieving net zero waste to landfill by 2027. Results of the Close the Loop Program will be reported in 2024. Additionally, this strategic approach was complemented by the establishment of a sustainability education platform, known as The Climate Hub. The Climate Hub platform features educational training modules on the Zoo's Learning Management System, engaging Zoo staff in learning about sustainability efforts and their roles within them. The Waste Management module served as the pilot training series for the Climate Hub.

Creating an environmentally sustainable zoo

Transportation Electrification

The transition of the zoo's fleet to low carbon vehicles by 2030 is a pivotal endeavor in our commitment to sustainability and environmental stewardship. As part of this transition, we have taken the first step by installing two electric vehicle (EV) charging stations in the Administrative Parking lot, catering to both Zoo fleet and staff. These charging stations not only underscore our dedication to reducing our carbon footprint but also actively promote the adoption of electric vehicles within our workforce. Plans for additional EV charging station installations are in place to meet the Zoo's needs for a fully electrified fleet, with installation set to begin in summer 2024. The investment in EV infrastructure serves as a vital complement to our overarching fleet transition plan, which delineates our annual integration of electric vehicles across the entire fleet within the next seven years.

Centennial College's collaboration with the Zoo on a feasibility study demonstrates the viability of electrifying Zoomobiles using advanced trackless train technologies. The study highlights the potential for Solar PV arrays at the Zoo to charge Zoomobile batteries, aligning with net-zero targets and showcasing environmental stewardship. This initiative reduces reliance on fossil fuels, lowers the carbon footprint, and inspires others to adopt renewable energy, reinforcing the Zoo's commitment to sustainability and conservation.

SARIT Vehicle Research

The Zoo has forged a partnership with SARIT and York University to advance the deployment and refinement of the SARIT vehicle – an innovative electric vehicle. This collaborative pilot project underscores our steadfast commitment to integrating state-of-the-art technology into our daily operations, marking a significant stride towards sustainability and efficiency. Our collaboration will focus on:

- **Operational Versatility:** Evaluating the SARIT's adaptability in meeting diverse operational needs of our staff. This includes its performance in various zoo environments and its effectiveness in enhancing staff mobility.
- **Cost-Effective Electrification:** Assessing the SARIT as a cost-efficient solution in our journey towards electrifying and expanding the Zoo's vehicle fleet. This aligns with our goals for fiscal responsibility and environmental stewardship.
- **Innovative Development:** Working closely with SARIT and York University to conceptualize and test new features and accessories. Our goal is to enhance the SARIT's functionality, tailoring it to not only the unique needs of zoo operations, but for the benefit of other operators.
- **Exploring New Use Cases:** Beyond staff mobility and cargo delivery, we aim to explore how the SARIT can augment the zoo experience for our guests, particularly those with special needs, and assist in facility maintenance and guest services.



Creating an environmentally sustainable zoo

Achieving Net Zero by 2030

The completion of the Net Zero Emissions Feasibility study in 2023, with the assistance of the City of Toronto Energy & Environment Office, represents a pivotal step towards achieving the Zoo's ambitious goal of transitioning to net zero emissions, waste, and water by 2030, and provides a roadmap for the zoo to navigate the complexities of sustainability and environmental stewardship. Through meticulous examination of our current operations, pinpointing areas for enhancement, and delineating actionable strategies, the study equips us with the knowledge to make informed decisions driving substantial progress towards our sustainability goals. Central to its findings are recommendations for an annual reduction target of 5-6% in greenhouse gas (GHG) emissions from 2023 to 2028. These recommendations prioritize operational efficiency enhancements, energy consumption reductions, and deep retrofit projects. Additionally, the proposal suggests the deployment of a solar photovoltaic (PV) array in 2029 to offset the remaining 33% of emissions, ultimately leading to the realization of net zero emissions by 2030.

The preparation of the net zero feasibility study was a pivotal undertaking, guiding us in prioritizing retrofits and improvements essential for achieving net zero emissions by 2030. Amidst this endeavor, Facilities & Infrastructure remained engaged in ambitious initiatives aimed at enhancing operational efficiencies and embracing electrification through routine maintenance, state-of-good repair, and infrastructure improvement projects. These projects were undertaken with the clear intent of initiating the electrification of Zoo facilities.



Above: Heat pump at First Aid Station.

Left: New higher efficient boilers in Australasia.

Key Initiatives completed by Facilities & Infrastructure



New heat pumps installed at Australasia Pavilion, L&E, and Nutrition, rendering these systems carbon neutral.



Replaced boilers at the Administration Complex, IndoMalaya, and Australasia Pavilions with new 97% efficient systems, reducing each system's carbon footprint by 30%.



Decommissioned an inefficient heating/cooling system at O&D and an old gas furnace at the First Aid Station, reducing the carbon footprint by 95% and electricity consumption by 30%.



New recirculation lines for hot water installed in the Americas, Australasia, and IndoMalaya Pavilions, reducing the carbon footprint by 10-30% and water consumption by 5%.



Installed tankless boilers to replace hot water systems at the Administrative Complex and Polar Bear habitat, reducing their carbon footprint by an estimated 20%.



48% of the Zoo's lighting has been retrofitted to LED lighting

Creating an environmentally sustainable zoo

Operating Efficiencies

Efficient waste management, sustainable initiatives, and fostering behavioral change are integral components of any organization's commitment to environmental stewardship and operational excellence. As we navigate the complexities of the modern world, the imperative to minimize waste, maximize resource efficiency, and cultivate a culture of sustainability becomes increasingly paramount. Through rigorous evaluation and strategic interventions, we can identify opportunities for improvement, implement innovative solutions, and inspire meaningful behavioral shifts among community. By embracing this multifaceted approach, we not only enhance our environmental performance but also foster a culture of responsibility, innovation, and resilience that transcends organizational boundaries



The Toronto Zoo's participation in the City of Toronto's Green Will Initiative has been instrumental in shaping our approach to strategic carbon management and achieving our ambitious goal of net zero emissions by 2030. Through active engagement in this initiative, the zoo has gained invaluable insights into effective sustainability practices, innovative technologies, and collaborative partnerships. Leveraging the knowledge and strategies acquired through the Green Will Initiative, the Toronto Zoo has refined its approach to carbon management, implementing targeted measures to reduce emissions across its operations. In 2024, the Zoo will develop project scopes for the recommendations outlined in the Net Zero Emissions Feasibility Study Report, applying strategic carbon management principles, and ensure the integration of these recommendations into the 10-year Capital Plan. By integrating these learnings into its sustainability framework, the zoo is not only advancing towards its goal of net zero emissions but also serving as a beacon of environmental leadership within the community. Through collective action and shared commitment, we are paving the way towards a greener, more sustainable future for all.

AI Bin Sensor Pilot Project



To gain insights into waste quantities and variations within the zoo, we've implemented a network of 18 bin sensors, strategically positioned in high-traffic areas. These sensors help us monitor waste generated both from zoo food locations and items brought from home. Nine of these sensors have been deployed in landfill bins, while the remaining nine are placed in recycling bins. The program boasts an interactive dashboard accessible to all participants, enabling real-time tracking of recorded metrics and showcasing the positive impact these sensors have on our waste collection efforts. Additionally, our system sends notifications to designated individuals when bins are nearing capacity, facilitating efficient waste management throughout the day. The program has proven to be a resounding success thus far, and we are eager to expand its reach with the potential addition of more sensors in the future.



Creating an environmentally sustainable zoo

Operating Efficiencies

Service providers participating in the Zoo's sustainability targets play a crucial role in advancing environmental stewardship and promoting responsible practices. By aligning with the zoo's sustainability goals, our service providers not only demonstrate their commitment to environmental responsibility but also contribute to collective efforts in reducing our ecological footprint. Through sustainable sourcing, waste reduction, and energy-efficient practices, our service providers can help minimize environmental impacts associated with the goods and services provided to the zoo. Moreover, their involvement fosters a culture of collaboration and innovation, inspiring positive change within the supply chain and beyond. Ultimately, service providers' participation in the zoo's sustainability targets strengthens partnerships, enhances brand reputation, and contributes to the preservation of our planet for future generations.



Compass Group AI Waste Management

In 2023, Compass Group launched a pilot project in collaboration with Friendlier, a local business dedicated to eliminating single-use packaging in the food service industry, at the Africa Rainforest restaurant. This initiative introduced a convenient reusable food container for take-out service, encouraging eco-conscious patrons to participate through a refundable deposit system. Once returned, the containers undergo cleaning and sanitization at Friendlier's facility before being redistributed, effectively closing the loop on waste and extending the lifespan of valuable resources. The pilot project yielded remarkable results, with 1,494 eco-friendly containers utilized, resulting in the saving of 56 kg of plastic waste, 7,848 L of water, and the prevention of 165 kg of greenhouse gas emissions. Building on this success, Compass plans to extend the program to additional restaurants and catering events in 2024.

Food waste presents a pressing global challenge, carrying significant economic, environmental, and social consequences. Annually, billions of tons of food are discarded, contributing to greenhouse gas emissions, resource depletion, and exacerbation of hunger and poverty. In response to this critical issue, Compass Group has introduced a new AI monitoring program aimed at gaining deeper insights into food waste levels within its restaurants and actively working towards solutions. Through meticulous tracking, Compass Group can pinpoint inefficiencies, streamline processes, and minimize waste. While surplus food is predominantly donated to organizations like Second Harvest to aid those in need, this innovative program also focuses on managing portion control and optimizing inventory to further reduce food wastage, aligning with our commitment to sustainability and responsible stewardship.

Creating an environmentally sustainable zoo

Education and Awareness

Work on the plastics pathway at the Toronto Zoo continues to progress through a dynamic and collaborative partnership between Pollution Probe, Toronto Zoo, and GreenMantra. This innovative alliance brings together expertise from environmental advocacy, zoological conservation, and sustainable technology sectors to drive meaningful change in addressing plastic pollution. Through shared knowledge, resources, and a collective commitment to sustainability, the partners are actively exploring novel approaches to mitigate plastic waste within the zoo's operations and beyond. From educational initiatives and public engagement campaigns to the implementation of cutting-edge recycling technologies and the promotion of circular economy principles, this collaborative effort exemplifies the power of partnership in tackling complex environmental challenges. Together, Pollution Probe, Toronto Zoo, and GreenMantra are paving the way towards a future where plastic pollution is minimized, and the health of our ecosystems is preserved for generations to come.

Second OSCAR unit in Caribou Café

The addition of a second OSCAR unit at the Caribou Café, following the successful deployment of the first unit at the Peacock Café, marks a significant enhancement in our efforts to educate and engage guests in responsible waste sorting. OSCAR units are interactive and visitor-friendly devices that guests thoroughly enjoy interacting with, providing valuable insights into the environmental impact of proper waste sorting. Placing an OSCAR unit on the Plastics Pathway seamlessly integrates this program with our broader initiatives to address waste consumption, fostering guest engagement and connections with various aspects of the plastics pathway. In 2023, OSCAR engaged over 78,000 guests, achieving an impressive 57.9% average disposal accuracy. Over time, we observed an 11% increase in sorting accuracy for many items, such as napkins, with our current napkin sorting accuracy reaching up to 65%.



Paving the Way to Sustainability

The Toronto Zoo implemented a pioneering initiative as part of the Plastics Pathway, paving a 475 square meter section of the Tundra Trek public path. This innovative project utilized asphalt embedded with recycled plastic, derived from 132,000 plastic bags (or 76,000 single-use bottles), showcasing the innovative potential of sustainable materials. The innovative recycled plastic polymer produced by GreenMantra showcased the potential of sustainable materials and their circular economy. By incorporating this advanced material into the pathway, the zoo not only reduced its carbon footprint but also demonstrated a strong commitment to environmental stewardship. The Zoo extends its heartfelt gratitude to GIP Inc. for their commitment to work with this new innovative product, making this new element to the Plastics Pathway possible.



Creating an environmentally sustainable zoo

Education and Awareness

Public education and awareness play a pivotal role in promoting environmental sustainability by empowering individuals to make informed choices and take meaningful action to protect the planet. Through education, people gain a deeper understanding of the interconnectedness between human activities and the health of the environment. They become aware of the environmental challenges facing our world, such as climate change, habitat loss, and pollution, and are equipped with the knowledge and skills needed to address these issues. Moreover, raising awareness fosters a sense of responsibility and stewardship, motivating individuals to adopt more sustainable lifestyles and advocate for positive change within their communities. By engaging the public in environmental education and awareness initiatives, we not only cultivate a culture of environmental consciousness but also inspire collective action towards a more sustainable and resilient future for all.

Plastic Free EcoChallenge

Throughout the month of July, our dedicated zoo staff participated once again in the transformative initiative The Plastic Free EcoChallenge. This challenge educates individuals about the pervasive use of plastic in their daily lives while encouraging the cultivation of habits favoring plastic-free alternatives. The impact of our staff's collective efforts during this year's Plastic Free EcoChallenge was nothing short of remarkable. Together, they diverted a staggering 402 pieces of plastic cutlery, 48 disposable cups, 170 plastic bottles, and 396 plastic containers away from landfills. Furthermore, they exhibited their commitment to environmental stewardship by picking up 352 pieces of litter. Beyond these tangible achievements, our staff actively engaged in raising awareness about the perils of plastic pollution, engaging in 248 conversations with people on various topics stemming from their experiences during the EcoChallenge. These actions exemplify our unwavering dedication to promoting sustainability and reducing our ecological footprint.



The Zoo's Phone Apes program actively promotes responsible e-waste disposal and cell phone recycling. In collaboration with Upper Canada College, we organized an event that brought in 825 pounds of e-waste, with 32 cellphones collected. Another event, held independently, yielded 400 phones. The dedication of younger generations was evident when two local children organized their own cellphone collection drive, contributing eight phones. Additionally, the Zoo participated in the annual AZA Gorilla on the Line campaign, collecting 3,207 cellphones. These efforts highlight our commitment to environmental responsibility and wildlife conservation, emphasizing the importance of

collective action in supporting our Phone Apes program. We remain dedicated to furthering our conservation efforts through continued collaboration with the public.

Improving biodiversity for a sustainable planet

Floating Wetlands

Floating wetlands represent the zoo's innovative, nature-inspired approach to purifying the water within our stormwater ponds. Each summer, the dedicated Conservation & Environment team installs new floating wetlands to enhance our ecological efforts. In the current year, we proudly introduced three additional floating wetlands, which were carefully planted and launched into the ponds. With these new additions, our collective floating wetland area now spans 189 square feet. These floating wetlands contribute to the overall health and vitality of our ecosystem.



Network of Nature: Mini Forest Tree Planting

The Royal Canadian Geographic Society's Network of Nature Mini Forest Tree Planting event held on Saturday, June 24th, exemplified the remarkable value of collaborative conservation efforts. Despite a rainy start in the morning, the dedication of 250 volunteers from Symcor and their families, alongside the guidance of our zoo staff, allowed us to successfully plant trees at two locations near the Watusi and Penguin habitats. In just a matter of hours, we accomplished the planting of approximately 1,200 trees, adding to the mini forest at the front entrance. This event not only showcased the power of community engagement but also underscored the vital role that partnerships like the Royal Canadian Geographic Society play in preserving our natural environment and promoting biodiversity within our zoo.

Invasive Species Management

In 2023, the Horticulture branch took proactive steps in combating invasive species by establishing an Invasive Species Team. Tasked with implementing and maintaining the invasive species management plan, this dedicated team spearheaded a concerted effort to remove invasive species from zoo grounds. Throughout the year, their diligent efforts resulted in the clearance of invasive species from over 13 acres of land, targeting five of the thirteen invasive species identified at the zoo. Throughout the summer, Zoo staff from various departments volunteered their time to diligently focus on Dog-strangling Vine removal efforts, primarily in the area surrounding the Americas Pavilion. The Invasive Species Team has progressed to mapping invasive species in the Zoo's naturalized areas and will continue this effort into 2024.



Community, partners, and the Zoo working together

Sustainability Tours

During the summer, Kyla Greenham led informative tours aimed at educating the public, local business community, and on-site staff about the latest sustainability and conservation initiatives implemented by the Conservation & Environment team and the Toronto Zoo as a whole. These tours primarily centered around the newly established Plastics Pathway but also explored lesser-known areas to provide a comprehensive understanding of the zoo's sustainability efforts. The enthusiastic turnout reflects a genuine interest in learning about our sustainability measures.

E-waste event with Upper Canada College

The event, in partnership with Upper Canada College, saw remarkable success, bringing together 825 pounds of e-waste for proper disposal and repurposing of parts for other projects. Notably, to launch UCC's 2-week campaign, Gorilla Keepers facilitated a live interactive session between the Upper Canada College student body and the Zoo's gorilla troop. In addition to the diverse array of e-waste items collected, 32 cellphones were contributed to the Gorilla on the Line cell phone disposal program. This event exemplified the value of collaboration between institutions and the community in fostering environmental stewardship. Moving forward, we will be scheduling more e-waste events with local schools and public organizations, furthering our commitment to responsible, collaborative waste management and environmental conservation.



Waste Free Wednesdays

Throughout the vibrant months of July and August, we hosted Waste Free Wednesdays, offering our cherished guests a unique opportunity to delve into the intricate world of plastics. These engaging sessions centered on the discovery of microplastics and the pressing concerns associated with their presence in our environment. In addition, guests were introduced to our latest conservation endeavor, the Zoo's innovative Plastics Pathway, which they could explore further at our dedicated Guest booth in collaboration with Pollution Probe. To make the experience even more exciting, visitors had the chance to immerse themselves in the Plastics Pathway Scavenger Hunt, adding an element of fun and discovery to their journey through this critical topic. These enriching experiences align with our commitment to fostering environmental awareness and empowering our guests to take meaningful actions in the fight against plastic pollution.

Environmental Management System

Environmental Incidences Update

As part of the Environmental Management System, incidences on site that have had or may have a negative impact on the environment are to be reported to the Conservation & Environment Office and Board of Management of the Toronto Zoo.

There were four environmental incidences in 2023.

- Erosion along the culvert adjacent to the Service Road behind the Caribou enclosure significantly undermined both the culvert and the integrity of the road. TRCA collaborated with Zoo personnel to replace the culvert and fortify the embankment with a robust stone structure, ensuring its stability and longevity.
- A natural gas leak was reported and repaired at Zootique.
- Sinkholes emerged within Waterside Theatre following periods of heavy rainfall, likely exacerbated by recent ground excavation activities in the vicinity. Prompt action was taken to fill and stabilize all the sinkholes, ensuring safety and integrity of the area.
- An unmarked natural gas line was broken during sign installation, resulting in a leak. The affected area was secured, and the damaged pipe underwent repair. Additional measures are underway to confirm the location of underground services to reduce the potential for this type of incident.

Harnessing Nature's Resilience

In our ongoing efforts to mitigate erosion risks and promote sustainable land management, we have implemented bioswales as a proactive solution. These innovative features not only help control erosion but also remediate it by effectively managing stormwater runoff and filtering pollutants. By incorporating bioswales into our landscape design, we are not only addressing erosion concerns but also enhancing biodiversity, improving water quality, and conserving natural resources. Through this strategic approach, we are not only safeguarding our environment but also contributing to the resilience and long-term health of our ecosystems.

