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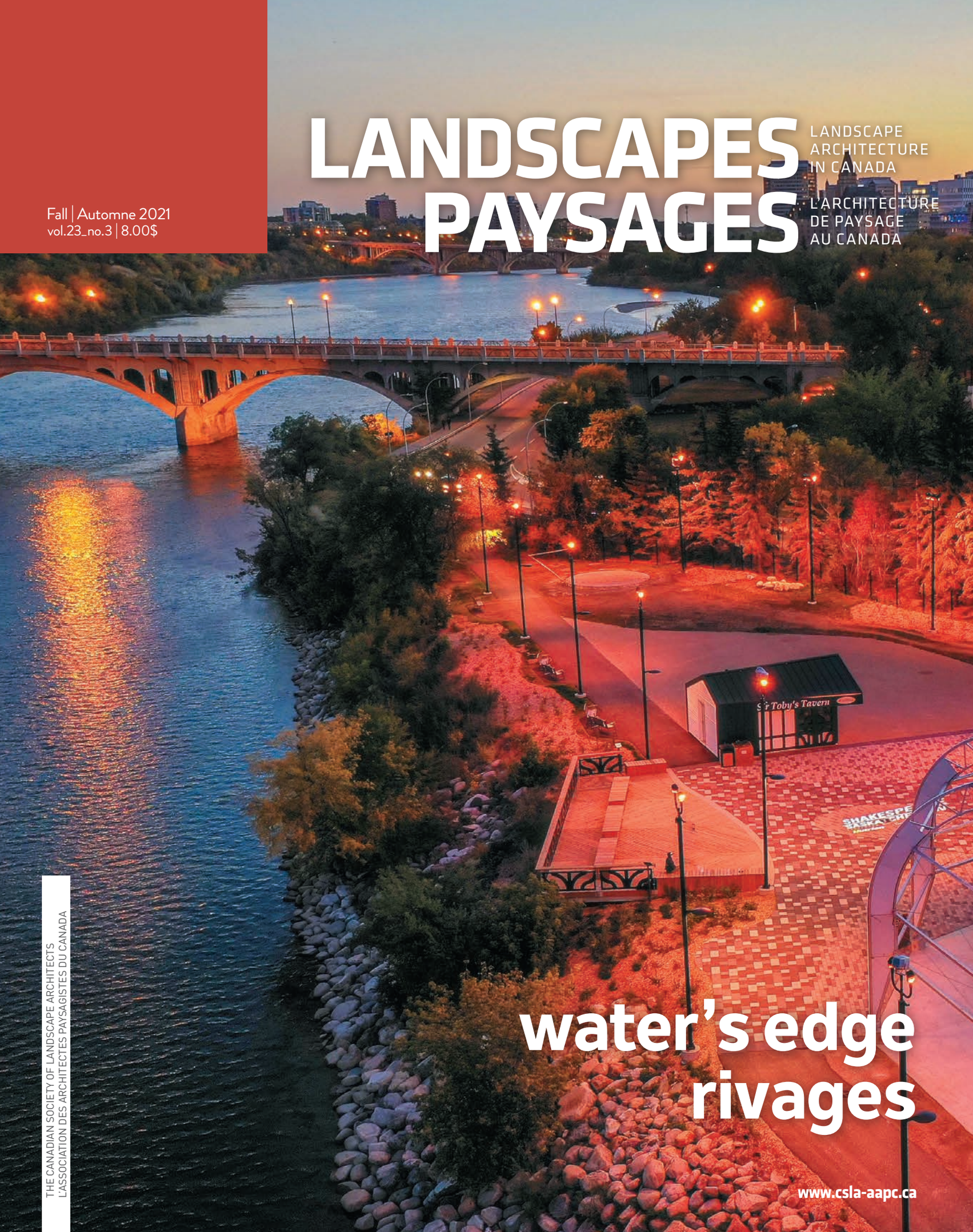


## water's edge
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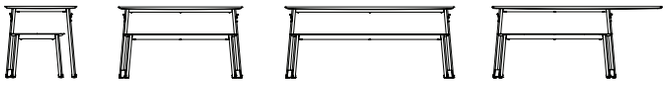

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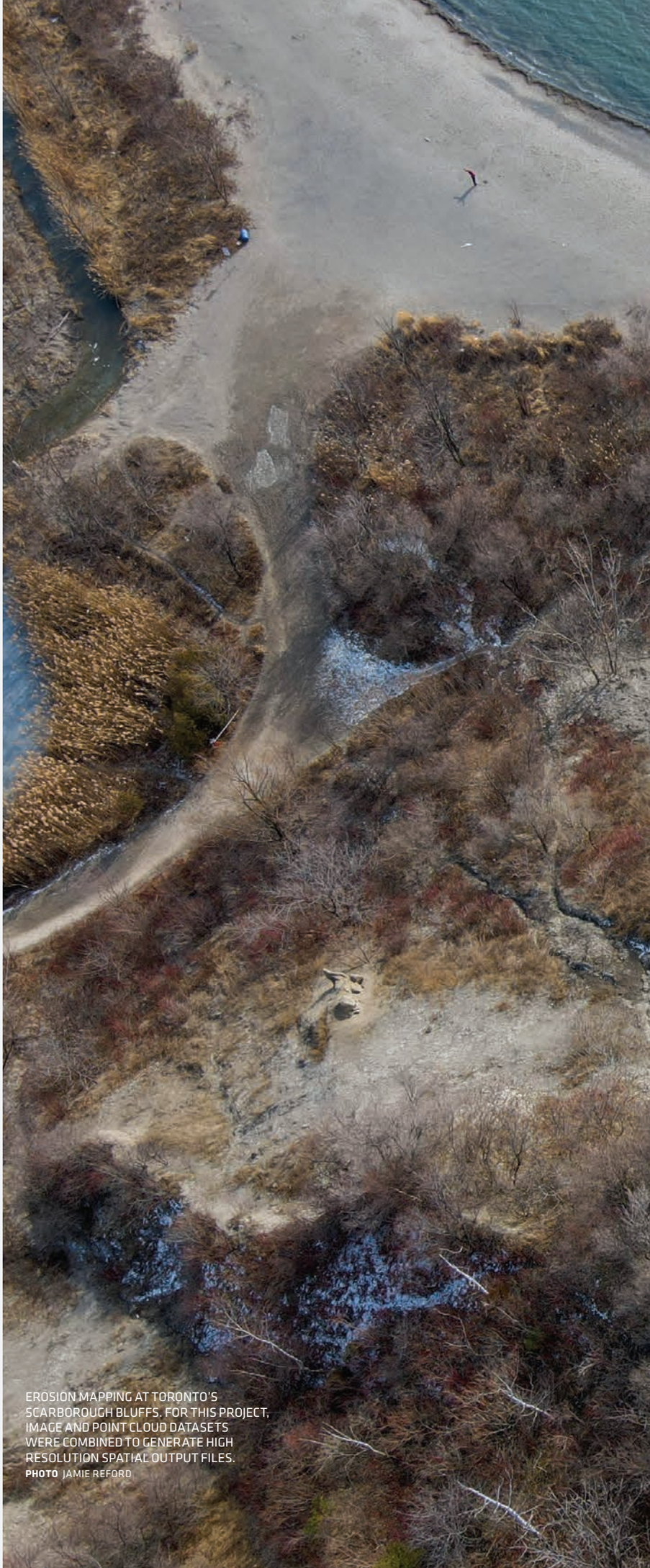
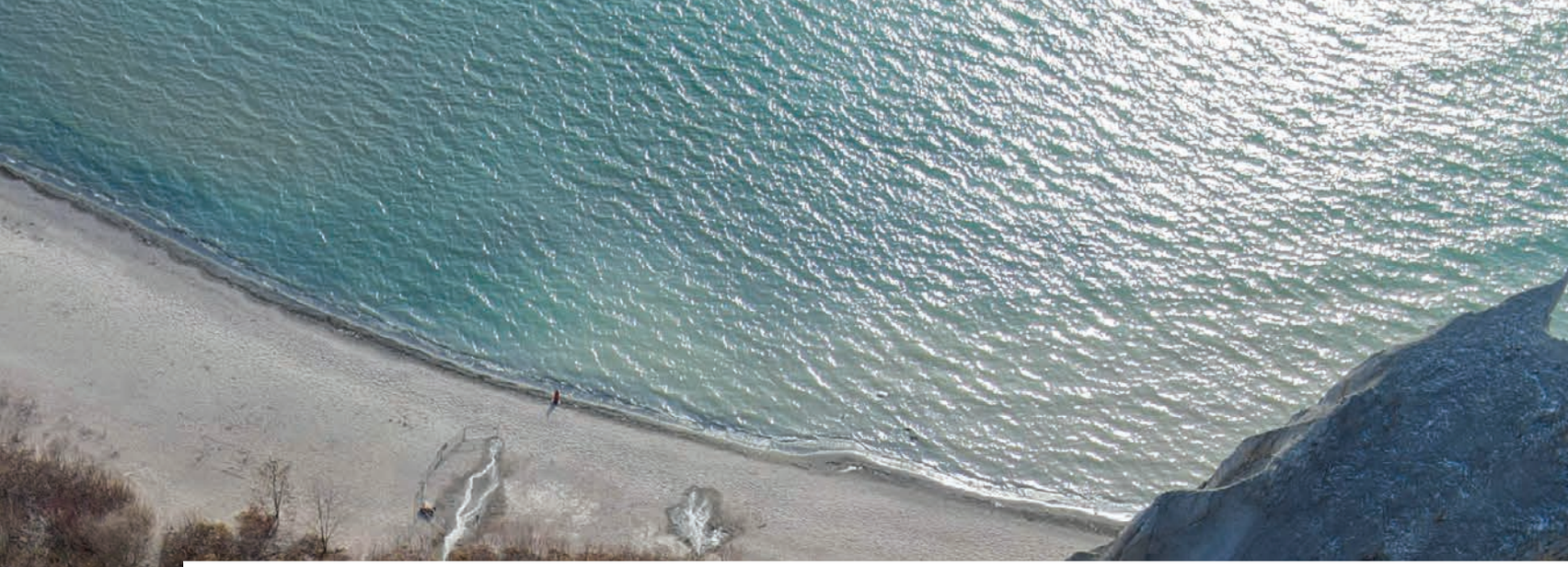


EROSION MAPPING AT TORONTO'S SCARBOROUGH BLUFFS. FOR THIS PROJECT, IMAGE AND POINT CLOUD DATASETS WERE COMBINED TO GENERATE HIGH RESOLUTION SPATIAL OUTPUT FILES.
**PHOTO** JAMIE REFORD



# WATER'S EDGE
# RIVAGES



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## upcoming issues

spring 22 | renovation
**deadline nov 30**

summer 22 | awards of excellence
**deadline march 14**

## prochains numéros

printemps 22 | rénovation
**date de tombée 30 novembre**

été 22 | prix d'excellence
**date de tombée 14 mars**

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For submission guidelines | Pour connaître les normes rédactionnelles :
**Laurie J. Blake,**
**Editor** | **Rédactrice**
**lp@csla-aapc.ca**

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LANDSCAPES | PAYSAGES est publiée par l'Association des architectes paysagistes du Canada pour servir de plate-forme nationale destinée à l'échange d'idées sur la profession. Les opinions exprimées dans LANDSCAPES | PAYSAGES appartiennent aux auteurs et ne reflètent pas forcément celles de l'AAPC. Nos rédacteurs invites contribuent bénévolement. Nous attendons, en français ou en anglais, vos propositions d'articles.

**PHOTO** VIRGINIA BURT

JOANNE MORAN
**GUEST EDITOR | RÉDACTRICE INVITÉE**

# REFRESHING CHANGES AT WATER'S EDGE

**PEOPLE AND WATER** are magically and magnetically connected for many reasons ranging from transportation, recreation and aquaculture to soul-soothing aesthetics. The water's edge has evolved from a barrier to utilitarian corridor to an irreplaceable experience. It can be different for everyone, but the same for all.

How do you interact?

Just listening to the wind building the lapping waves?

Feet first on a sandy bottom, letting the cold-water shock pass and the welcome, refreshing water temperature envelope you?

Headfirst, all in, breathless but no transition?

Equipment laden for artificial breathing, plunging to greater depths to view the silent worlds beneath the surface? Or airlessly freediving to become a part of the underwater landscape?

Buoyed in a vessel to skim across the surface and appreciate the biomes of the environments occurring in the vicinity of the edge?

Racing across the surface towed or surfed for a short but exciting feeling of flight on the water?

As you interact, do you appreciate the changes occurring along the edge from climate change? The varying seasonal water levels? The effect on the edge habitats and species?

Governments have proactively rallied and expanded authority in an effort to protect these species and their habitats. What once was a simple project contracting shovels to create a recreational beach in a local park has now become a careful exercise in specialist flora and fauna protection: survey, documentation and careful management of those species.

I recently undertook this type of work and was wholly impressed with the planning and research rigour required for any physical change at the water's edge. Take a look at the Prologue story "Not Just Any Swimming Hole, Not Just Any Clam Dig" for more about this project.

The contributors for this issue explore many water's edges – from fresh to salt water, brooks to oceans, inland lake to ocean edge... and even underwater!

Dive in...and enjoy!

# CHANGEMENTS RAFRAÎCHISSANTS LE LONG DES RIVES

**L'EAU FAIT PARTIE** intégrante de l'histoire de l'humanité et prête son côté pratique aux transports, son côté ludique aux loisirs, son côté vital à l'aquaculture...et son côté magique à sa beauté apaisante. L'eau, ainsi que sa rive, autrefois considérée comme un obstacle, est devenue un couloir utilitaire et une source d'expériences irremplaçables. Elle exerce un effet différent sur chacun bien qu'elle demeure unique pour tous.

Et vous, comment interagissez-vous avec l'eau?

En écoutant simplement le clapotis des vagues sous l'effet du vent?

En remuant vos pieds sur un fond sablonneux, d'abord surpris par sa froideur, vous laissant ensuite envelopper par sa fraîcheur?

En y allant tête première, tout de go, sans même reprendre votre souffle?

En vous munissant d'un appareil de respiration afin d'en explorer ses profondeurs silencieuses? Ou encore, en apnée pour vous fondre aux multiples paysages sous-marins?

En effleurant sa surface, confortablement assis dans une chaloupe pour en contempler les multiples biomes riverains?

En la survolant, tiré par un bateau, ou en y surfant pour une période trop courte, mais combien palpitante?

En interagissant avec l'eau, constatez-vous les changements qui se produisent le long des rives en raison des changements climatiques? Les variations saisonnières des niveaux d'eau? L'effet sur les habitats et les espèces riveraines?

Les gouvernements se sont mobilisés afin d'accroître leur autorité et protéger ces espèces et leurs habitats. Ce qui était autrefois un simple projet consistant à déployer des pelles mécaniques pour créer une plage récréative dans un parc local est devenu un exercice spécialisé de protection de la flore et de la faune comprenant étude, documentation et gestion attentive de ces espèces.

J'ai récemment entrepris ce travail d'analyse et j'ai été fort impressionnée par la rigueur de planification et de recherche requise pour effectuer tout changement physique le long des rives. Jetez un coup d'œil à l'article en préface intitulé "Not Just Any Swimming Hole, Not Just Any Clam Dig" afin d'en apprendre davantage sur ce type de projet.

Les collaborateurs de ce numéro explorent de nombreuses rives – de l'eau douce à l'eau salée, des ruisseaux aux mers, des lacs intérieurs aux abords de l'océan – et s'aventurent même sous l'eau. Maintenant, plongez et amusez-vous!

# OUR WRITERS | NOS RÉDACTEURS

OUR GUEST EDITOR |
**NOTRE RÉDACTEUR INVITÉ**

### JOANNE MORAN

Joanne Moran, OALA, FCSLA, IFLA, is a full member of the Ontario Association of Landscape Architects and a Society Fella. She worked in the private landscape sector for 10 years, then in the municipal public sector for 33 years and is currently working at the City of Ottawa as a Senior Project Manager in Landscape Architecture.

Joanne's primary practice focus has been landscape architecture, recreation planning, park design and capital development & renewal. In that role, Joanne managed a number of award winning projects.

Joanne believes in the importance of volunteering and continues to contribute significant time to many groups primarily with professional associations including the OALA.

**PHOTO** ISABELLE LALONDE, STANTEC

### MEGAN TURNOCK

Megan Turnock, MSC, MLA, is a Principal at LEES+Associates, in Vancouver, focusing on bringing the benefits of biodiversity, resilience, equity and health, to public parks, trails, recreation, and conservation areas. She would like nothing more than to dip her toes in an ocean or lake right now.
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### DG BLAIR

DG Blair, MSc, Executive Director, Stewardship Centre for BC, provides overall leadership, technical expertise and project management for Green Shores® in Canada: coast to coast to coast. DG is an instructor for Green Shores Level 1 and Level 2 training; is a member of Natural Resources Canada's Coastal Management Working Group; and manages the BC Green Shores Local Government Working Group.
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### AMÉLIE GERMAIN

Amélie Germain, M.Sc.A., AAPQ, CSLA, est architecte paysagiste à la Ville de Québec depuis 2012 et co-responsable du Plan de mise en valeur des rivières de Québec. Titulaire d'une maitrise en aménagement et détenant 18 années d'expérience dans le domaine, elle a aussi œuvré dans les milieux universitaire, communautaire et privé. Amélie affectionne particulièrement les projets qui mettent en scène la nature en ville, en trouvant le juste équilibre entre la préservation des milieux naturels et l'appropriation citoyenne. Son terrain de jeu de prédilection, les rivières!

### SUSAN FISHER

Susan Fisher, OALA, CSLA, is a senior landscape architect at the National Capital Commission, where her projects include Westboro Beach, Champlain Node and the National Holocaust Monument. Before then, she managed sustainable community initiatives at Canada Mortgage and Housing Corporation and founded an 84-unit housing co-op that represented Canada in the Green Building Challenge. She has an M. Arch from McGill and a BLA from Guelph.

### BRAD SMITH

Brad Smith, OALA, APALA, CSLA, ASLA, has a passion for integrating the natural and built environments and enhancing the biological and ecological features of sites through each design. The context of a site is always Brad's point of departure on a project, serving as inspiration and framing all of his work. Brad strongly believes that it is both the opportunity and responsibility of landscape architects to give back to their communities and educate on design and the profession. As an invited studio design critic at the University of Guelph, he has enjoyed the opportunity to engage students in dialogue about design. Brad volunteers his time for various community initiatives (public art juries, community events, active transportation initiatives) and the Bruce Trail Conservancy.
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## WILLIAM HRYCAN

William Hrycan, SALA, CSLA, leads the landscape architecture team in Crosby Hanna & Associates' Saskatoon office. He is also the Horticultural Editor of *The Gardener,* photographer, baker, devoted dad and self-confessed gardening addict who gardens wherever and whenever he can.
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## MICHELLE TUSTIN

Michelle Tustin is a project Landscape Architect for Crosby Hanna & Associates' Saskatoon Office. She is the Landscape Representative for Design Council of Saskatchewan and is passionate about making environmental and ethical decisions as part of design, and everyday life. Michelle is an animal lover and enjoys gardening and expanding her skills on the piano.
**mtustin@crosbyhanna.ca**

## YVONNE BATTISTA

Yvonne Battista, OALA, ASLA, CSLA, LEED AP, is a landscape architect with over 20 years of experience in the design and construction of urban streetscapes, waterfronts, campuses, and parks. Yvonne has worked on many of DTAH's most complex landscape and stormwater management efforts, designing technically and aesthetically adept solutions to infrastructure challenges.

## JAMES ROCHE

James Roche, OALA, APALA, BCSLA, FCSLA, is an award-winning landscape architect with over 20 years of public realm experience, encompassing urban parks, plazas, waterfronts, campus master plans, revitalization developments, streetscapes and transportation-related urban design. James is currently leading DTAH's design of Edgeley Pond and Park, Fort McMurray Waterfront and Brampton Riverwalk.

## ZIAD HADDAD

Ziad Haddad, AAPQ, CSLA, ADUQ, est depuis octobre 2018 président et directeur de création de WAA Montréal, firme au sein de laquelle il œuvre depuis 2005. Architecte paysagiste et designer urbain, il est titulaire d'une maîtrise en architecture et d'une maîtrise en design urbain. Sa formation et son expertise vastes et variées dans le monde interdisciplinaire de l'architecture et du design l'ont amené à travailler sur des projets d'échelles, de types et de complexités variés. Il a œuvré à la réalisation de plusieurs projets primés, tant au Canada qu'à l'international. Il s'implique aussi dans la révision de projets en tant que membre du CCU du Sud-Ouest et du Comité Jacques-Viger.

## DANIÈLE ADIB

Danièle Adib, AAPQ, CSLA, Diplômée en agronomie, elle a acquis une expérience diversifiée en horticulture dans les secteurs privé et public. Après trois années de travail dans l'administration de chantier et un second baccalauréat cette fois en architecture de paysage, elle a travaillé sur des projets résidentiels de moyenne et grande envergures. Depuis 2019, elle a rejoint l'équipe de WAA Montréal pour toucher à l'architecture de paysage dans les domaines institutionnel et municipal et relever de nouveaux défis.

## DON HESTER

Working as a landscape architect and planner in an interdisciplinary office has been a life-long learning experience for Don Hester, FCSLA, RPP, MCIP, over the past 44 years. Riverbank projects in particular address a range of complex issues related to hydrology, soils, vegetation, and human use. Don is a Senior Planner and Landscape Architect with AECOM Urbanism + Planning. He has served as project manager/coordinator and landscape architect for urban design, Riverbank Greenways and bank stabilization projects along the Red, Assiniboine and Seine Rivers, as well as Bunn's Creek in Winnipeg.

## VIRGINIA BURT

Since founding Virginia Burt Designs (VBD) in 1996, Virginia Burt, APALA, OALA, BCSLA, RLA (Ohio), FCSLA, FASLA, has designed and directed healing landscapes for private residential, educational and public clients. VBD has established a reputation for creating gardens and landscapes of meaning. Virginia's work has achieved international recognition receiving multiple awards from the ASLA, Palladio and the CSLA. She is one of seven women in the world with Fellowships from both societies for outstanding contribution to the profession. Clients appreciate and value her deep respect for place and for the human dimensions of each project.

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# PROLOGUE

01/

## WELLBEING AT THE WATER'S EDGE

**ALAN DĄBROWSKI**

**ASIDE FROM THE** many ecological, recreational and aesthetic services waterscapes, or blue space, offer us, they also provide many benefits for our mental and physical health. When you think about it, our very first "landscape" – amniotic fluid – is aquatic, so it's hardly surprising that numerous studies have found a positive correlation between water and our wellbeing. The water's edge is particularly beneficial to us because it provides positive attributes from both blue and green spaces. Research has found that blue space in urban and natural contexts have restorative qualities that, among other things, reduces cardiac disease, anxiety disorders, depression and asthma.

A 2011 study done by Sebastian Völker and Thomas Kistemann on the impact of blue space on human health and wellbeing found that in order to have a well-designed waterscape it needs to create meaning and have a coherence with water, vegetation and sequential experience that gives a sense of involvement through complexity and mystery. Further, Andrew J. Howell (*et al.,* 2011) says the enhanced sensory impact of experiences in natural environments strengthens nature connectedness and restores cognitive functioning.

**PHOTO** ALAN DĄBROWSKI

While working on my master's degree, I explored and developed a keen interest in the relationship between multisensorial experiences and riverbanks. Reflecting on my studies and personal experiences, I realized the obvious importance of the role the edge plays in defining the quality of our experience with the landscape, nature and ourselves. The edge's sense of place stimulates our senses and creates a connection with the landscape and our wellbeing.

So, the key is diversity and creating a dialogue with the landscape and elements. Generally, I found open-engineered and hard-edged public blue spaces quite homogenous. The landscapes may be different geographically and culturally, but the design and materiality are similar in that they carry the same postmodern global feel and experience. The interface is commodified and reduced to a touristic gaze, a mere visual backdrop for other activities such as bike paths along a shoreline that does not create any or little opportunities for exploration. This is unfortunate, as sight is the least intimate of our senses and it leaves nothing to the imagination.

On the other hand, informal secluded spots with soft(er) natural or even semi-natural edges along the water/land interface typically offer their own unique experience that is sensorial immersed with the landscape. These spaces are not usually designed, rather the user is attracted by their inherent qualities due to their need for an authentic contact with blue space.

Unfortunately, these informal trails are really not in the spotlight and sometimes administrative bodies view them as a blight – sometimes with good reason as there is often some form of garbage, such as beer cans beside a makeshift fire pit – not a good combination for a public space. In certain cases, the paths may also lead to an increase in erosion therefore reducing slope stability.

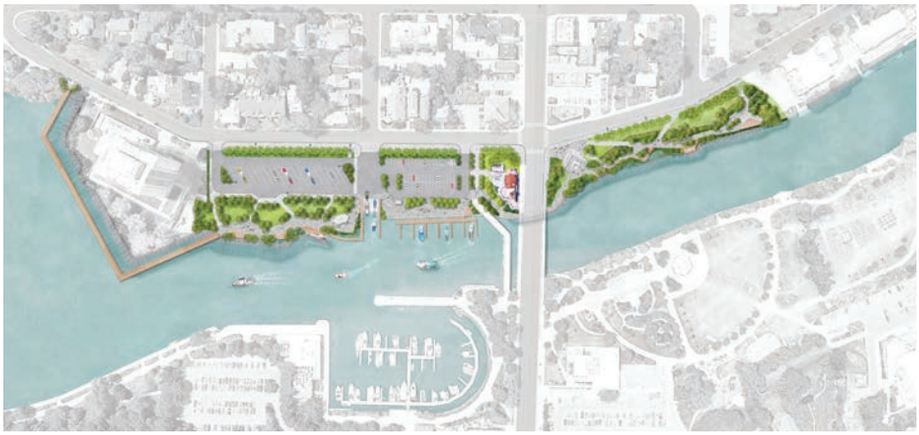
Here's the thing: these informal trails and spots gives us an opportunity to reflect how our designs can provide therapeutic spaces to cope with our sense of wellbeing. With proper design interventions we can allow people to discover new possibilities with authentic and enriching experience while creating safer and cleaner places. In addition, by re-naturalizing our shorelines we establish a symbiotic relationship with the local ecosystem by increasing biodiversity, reducing erosion and improving stability while we benefit from the cognitive and aesthetic ecosystem services they provide us.

---

***Alan Dąbrowski**, AAPQ, is a landscape architect with a human geography background and is also currently a member on the CSLA's committee of Human Health & Well-Being. He is passionate about blue space and the relations between landscapes and ecology, psychology and spirituality.*

# 02/
# MISSISSAUGA'S WATERFRONT PARKS STRATEGY

**JAYSEN ARIOLA (DILLON CONSULTING) + JANE DARRAGH (CITY OF MISSISSAUGA) + EHA NAYLOR (DILLON CONSULTING)**



**"LIFE THRIVES AT THE WATER,"** the vision statement of the City of Mississauga's Waterfront Parks Strategy, captures the spirit of how the waterfront influences the well-being of all the communities and ecosystems along Lake Ontario's edge. Mississauga's shoreline stretches approximately 22 km along the edge of Lake Ontario between the City of Toronto and the Town of Oakville. Twenty-six existing parks and five planned parks are connected by the Waterfront Trail.

In 2019, the City of Mississauga updated the Waterfront Parks Strategy (WPS Refresh), which was first approved by City Council in 2008. The WPS Refresh provides the City with a renewed approach for planning, design and budget decision-making to achieve environmental and economic sustainable development along the waterfront. The report incorporates current trends in waterfront planning and sets goals for creating a resilient and dynamic waterfront parks system that is more accessible and diverse.

Design strategies address today's challenges such as climate change and seasonal fluctuations in water levels along the shoreline, increased usage as well as finite resources. In Mississauga, community redevelopment and intensification is creating opportunities to expand water-based recreation resulting in more continuous public access along the water's edge and new parks that have economic development benefits. The WPS Refresh demonstrates that there is no need to undermine ecological integrity of the existing natural heritage because through comprehensive planning and design, all desired outcomes for the waterfront can be achieved.

Existing parks offer a variety of experiences from the natural shoreline of Lakeside Park, popular beach at Jack Darling Memorial Park, recreational activities at Lakefront Promenade and quiet reflection at the Adamson Estate. The next generation of public open space includes Credit Valley Conservation's Jim Tovey Lakeview Conservation Area and others that are a result of waterfront acquisition through intensification including the Lakeview Waterfront Community and the redevelopment of Port Credit's waterfront including the Port Credit Harbour West Parks, 1 Port St. E. and Brightwater.

The WPS Refresh sets out a comprehensive vision for the Mississauga's waterfront for the next 25 years. It is a City planning effort to establish an accessible and interconnected waterfront parks system that has a celebrated identity and will be enjoyed by residents and visitors alike. While each park and public space will be unique in its programming and characteristics, the "whole is greater than the sum of the parts," and all the spaces play an essential role in a vibrant and liveable waterfront city.

JIM TOVEY CONSERVATION AREA
**IMAGE** CREDIT VALLEY CONSERVATION

# 03/
# NOT JUST ANY SWIMMING HOLE, NOT JUST ANY CLAM DIG

2

**THIS PARTICULAR WATER'S** edge, Britannia Beach, in Ottawa, was situated on a major river, part of a 44-acre (18 hectare) waterfront park. A preservation need was identified at the beach to address sustained cumulative impacts from sedimentation on the shoreline.

From summer to fall, the riverbed in the swimming area underwent dredging work to restore the grade and proper water depth, removing silt and sand that had collected on the riverbed from 30 years of currents, waves and weather. The reconstruction included adding a a gradual slope to 2.4 metre depth for the width of the existing beach within a defined supervised swimming area. A swimming hole.

In-water work dates were constrained to respect the habitat and needs of species in an attempt to avoid impacts to fish and wildlife and their habitats, including species at risk. The schedule for construction was defined by adjacent amphibian activity such as turtles and in-water restriction for fisheries, timing windows from various provincial and federal agencies. In accordance with the Department of Fisheries and Oceans (DFO) and Ministry of Environment, Conservation and Park (MECP) regulations, the dredging work could only be carried out between July 15 to October 15, 2020.

Significant work by the team was undertaken to ensure all approvals, including environmental, were in place prior to commencing. Permits and/or letters of advice were obtained from the following municipal, provincial and federal agencies:

- Rideau Valley Conservation Authority (RVCA)
  - *Conservation Authorities Act (O. Reg. 176/06)*
- Ministry of Natural Resources and Forestry (MNRF)
  - *Fish and Wildlife Conservation Act, 1997*
  - *Public Lands Act*
- Ministry of Environment, Conservation and Parks (MECP)
  - *Endangered Species Act, 2007*
- Fisheries and Oceans Canada (DFO)
  - *Species at Risk Act*
- Transport Canada (TC)
  - *Canadian Navigable Waters Act*

Under the *Species at Risk Act* (SARA) permit issued by the Department of Fisheries and Oceans Canada, specific conditions were placed for minimizing impact on a nationally endangered species: the Hickorynut mussel (*Obovaria olivaria*). The conditions were specific to how specialists could relocate the Hickorynut mussels, including detection methods, identification and relocation of mussels in the area. To ensure minimal harm against the Hickorynut, the specialists undertook extensive relocation efforts by counting all species, measuring and transferring any mussels between buckets by hand.

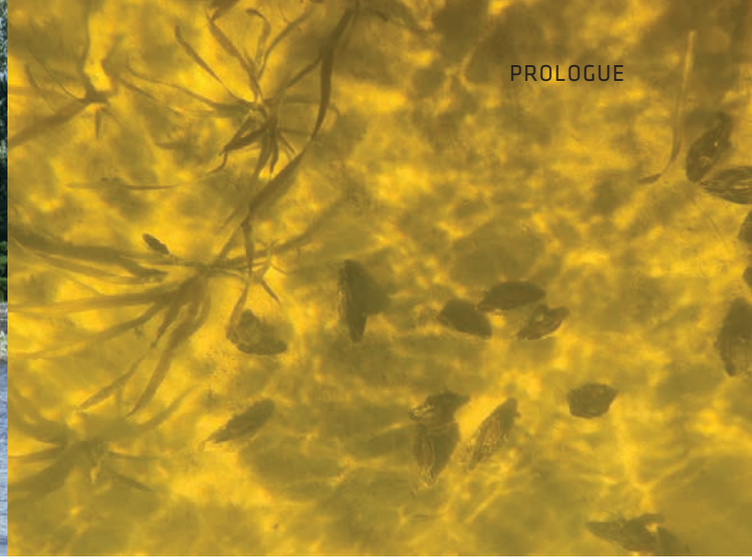
The project site work began in late June with environmental preparation, including:

- Construction hoarding was placed to enclose the work area.
- A turtle exclusion fence was installed.
- Turtle and wildlife screening was carried out.
- The turbidity curtain (to reduce suspended silt in the water from migrating outside the work area) was installed and the marker buoys for the curtain were laid out.
- Professional divers and biologists were mobilized to site and provided training on mussel salvage protocols.

A systematic approach was taken for mussel relocation. Divers were limited to a diving area, by quadrants, approximately 1 $m^2$ in size. Each quadrant was systematically searched to a depth of 10 cm, from left to right and then again from top to bottom – until each quadrat had been covered twice. Mussels encountered through this exercise were collected, identified and relocated to an area approximately 100m downstream of the beach.

The Department of Fisheries and Oceans Canada said that this project was one of the largest mussel relocations efforts (based on area) under a *Species at Risk Act* permit that they were aware of. A real clam dig.

1



3

The mussel relocation work took approximately nine days to complete. A final summary of the team's findings included:

- No Hickorynut mussels (SARA listed species) were observed.
- In total, 6 mussel species consisting of 42,615 mussels were successfully removed from the study area and relocated, approximately 100m downstream of the beach. This included the following species of mussels:
  - 41,268 Eastern Elliptio *(Elliptio complanata)*;
  - 1,289 Eastern Lampmussel *(Lampsilis radiata)*;
  - 47 Plain Pocketbook *(Lampsilis cardium)*;
  - 5 Giant Floater *(Pydanodon grandis)*;
  - 4 Triangle Floater *(Alasmidonta undulata)*; and
  - 2 Black Sandshell *(Ligumia recta).*

The proposed dredging area was fully contained within a weighted silt curtain that was inspected on a regular basis to ensure containment. With the mussel survey and relocation activities completed, the next phase was fish relocation using nets to collect and relocate fish outside of the dredging area. All mussels and fish in the work area were protected.

This was not just any swimming hole and not just any clam dig, but it may be indicative of the environmental care being required in current years with regards to any work on the water's edge.

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*Credit for some source text, edited by Joanne Moran, extends to Ashley Eddisford, City of Ottawa, Planning, Infrastructure & Eco Dev Dept., Business Communications, Quality Management Branch, Infrastructure Projects Support Unit*

**1** EXCAVATOR **2** PROTECTING NATIONALLY ENDANGERED SPECIES **3** MUSSELS IN GOLDWATER
**PHOTOS 1** FULLER CONSTRUCTION, OTTAWA
**2** AMY MCPHERSON CITY OF OTTAWA BIOLIGIST
**3** JOSH MANDELA, STANTEC BIOLOGIST

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# GREENER SHORES FOR CANADA

>FR_LP+ DES RIVES VERDOYANTES AU CANADA
Les collectivités et propriétaires riverains sont également confrontés à des enjeux pressants, car les structures construites il y a des décennies s'effondrent en raison de leur âge ou d'une conception qui n'a pas tenu compte de l'élévation du niveau de la mer ou des inondations plus fréquentes et plus imposantes des lacs. Les berges, considérées comme stables, subissent maintenant des changements – érosion ou dépôt – qui tirent la sonnette d'alarme sur la nécessité d'agir.

**OVER THE LAST** century, Canada's shorelines have been modified with seawalls, gabions, groynes, and diking systems, primarily to prevent erosion and protect property. While these structures are generally considered long-term solutions, the uncertainties facing coastal and lakeshore communities are putting that claim under the spotlight. These hardened shoreline tools also come with significant costs, both direct and indirect. The act of hardening shorelines fails to recognize coastal and lake shorelines as systems that are indelibly linked to

**This [Piper's Lagoon] project means so much to me. I have been working on acceptance of the ideas embodied in the Green Shores programme all my working life as a landscape architect.**

**— Victoria Drakeford, Landscape Architect**

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adjacent shorelines and both aquatic and terrestrial ecosystems. What happens to the shoreline in one location nearly always affects nearby properties, and the unintended consequences can include increased shoreline erosion, loss of habitat, increased wave energy (up to 10 times), and reduced potential for community access and shoreline amenities.

Communities and shoreline property owners are also now faced with urgent decisions, as structures that were built decades ago are failing because of age or because the designs did not account for sea level rise or more frequent and severe flooding in lake environments. Shorelines that were once considered stable may now be seeing changes – either erosion or deposition – raising alarm bells for the need for action.

### Creating Resilient Shorelines

So much of landscape architecture is about synthesizing diverse information, finding the linkages, and layering benefits for people and nature through design. Themes of recent conferences and planning initiatives increasingly focus on connectivity and resilience. One could plausibly argue that in no other setting are these concepts more evident and critical than on our shorelines. Whether landscape architects are leading a project or part of a larger team, there is a role to play in looking beyond the immediate problem to help communities make better decisions.

Within this context of change and fear of loss, there is an opportunity to increase awareness and understanding – and to build, and rebuild, with the goals of connectivity and resilience at the core. The Stewardship Centre for BC (SCBC) is a leader in education on shoreline environments and solutions that work with nature rather than against it. SCBC offers information, training, tools and a certification program aimed at supporting greater understanding of shoreline systems.

**1** PIPERS LAGOON AFTER **2** NEW BRIGHTON PARK AFTER **3** NEW BRIGHTON PARK BEFORE
**PHOTOS 1** KELLY LOCH **2+3** VANCOUVER FRASER PORT AUTHORITY

**2, 3**

Along with its funding partners, the SCBC started the Green Shores program in 2005. The initiative promotes healthy shore environments that provide significant environmental, economic and social values to coastal communities. Originally, the program focused on coastal shore development, but now includes all kinds of shoreline development (single family residential, mixed use commercial and institutional developments), as well as public parks and open spaces. It is applicable to lakeshores as well as marine shorelines and has recently expanded to the Maritimes. SCBC is on its way to providing training and resources across Canada through its three main programs: Green Shores for Homes, Green Shores for Shoreline Development, and Green Shores for Local Government.

**The [New Brighton Park] design creates a regenerative healthy ecosystem and enhances nature in the city and included: public consultation, salt marsh and habitat island, viewing platforms, trail network, biodiverse vegetation restoration, picnic, enhanced beach access, and off-leash dog park. The project has Green Shores Certification.**

**— Ken Larsson, Principal | BCSLA, CSLA, ASLA Connect Landscape Architecture**

The four guiding principles are simple enough for the public, but there is a wealth of complexity and detail behind each one. To meet the Green Shores standard, all projects must incorporate the following principles:

1. Preserve or restore physical processes – the natural actions of water and sediment movement that maintain healthy shorelines.
2. Maintain or enhance habitat function and diversity along the shoreline.
3. Prevent or reduce pollutants entering the aquatic environment.
4. Avoid or reduce cumulative impacts – small individual effects that add up to large impacts on shoreline environments.

Where landscape architects can expand their understanding of shorelines lies primarily in the first and fourth principles. The physical processes along shorelines are not static and cannot be considered in isolation. Sediment moves along shorelines through wave and wind action; there are a variety of shoreline conditions that affect the size of rock, pebbles or sand and whether the shoreline is expanding or retreating. Detailed technical expertise aside, landscape architects need to understand the basics of shoreline processes and dynamics to start building confidence toward creating new typologies for shoreline design.

Landscape architects and designers can be instrumental in restoring our shorelines and designing for the future. Our graphic and narrative skills can present a strong vision, helping to build commitment on the part of the client and project team. Using lifecycle thinking, we can push for consideration of the impacts of the project over its entire lifecycle, and our whole-system thinking takes into account the interactions and relationships between different components to ensure that they work together. Our role is essential to integrating diverse technical information such as the ecology, geomorphology, coastal or lake processes of the site to take advantage of landscape features during early project planning.

### Case Study: Piper's Lagoon

In Nanaimo, BC, a home on a coastal shoreline with a bulkhead and fence was transformed into an integrated shoreline with natural materials and native vegetation to stabilize against erosion and create shoreline habitat. This project is an example of challenging the assumption that once you have a bulkhead or other hard erosion protection, that it must be maintained or replaced like for like. The bulkhead was exacerbating wave energy, causing scouring at the base of the wall. It was also preventing movement of materials and wildlife from the uplands to the shoreline and disconnected the property's yard from the beach.

The transformation achieved protection of the property by regrading the slope and placement of boulders and downed wood to dissipate wave energy. Native plants were incorporated throughout the design to further stabilize the shoreline and create micro-habitats and for aesthetics. Other site improvements that further benefited the shoreline included removing septic system remnants, reducing impervious areas, and capturing roof rainwater for irrigation. The existing property now blends seamlessly into the context of the site and is no longer the single-family home model that could be located anywhere. With the bulkhead gone, so is the fear of catastrophic failure and the uncertainty of future damage to the property due to sea level rise, king tides and increased winter storms.

### Case Studies: New Brighton Park and Jericho Beach, Vancouver

The Vancouver Park Board undertook substantial restoration projects in two of its waterfront parks. Each had remnants of industrial uses and included removal of contaminated materials and infrastructure such as creosote piles, groynes, riprap, fill and paved surfaces. Both restoration projects improved sediment transport along the shoreline and created natural beach and foreshore habitats.

The New Brighton Park project restored the channel connecting Hastings Creek to the newly created saltwater marsh areas, while also creating new riparian habitat along the creek channel.

The Jericho Beach Park project removed an extensive wharf and concrete debris, restoring a section through beach nourishment with materials specific for surf smelt and sand lance spawning. The marine riparian vegetation was expanded with native shrubs and trees to provide additional shade and refuge for migrating juvenile salmonids and other small fish. Sea level rise considerations informed the project design and elevations, while a monitoring program is ensuring that the design continues to function over time. The Jericho Beach Park project received the City of Vancouver's 2014 Urban Design Awards in Landscape, Public Space, and Infrastructure.


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All three of these example projects included landscape architects within the multidisciplinary teams. While the technical aspects should be done by the appropriate professionals such as coastal geomorphologists, hydrogeologists, engineers and biologists, there is a need for landscape architects to recognize the possibilities and to challenge assumptions when faced with shoreline projects, particularly around cost and the feasibility of removing hard armoring. Communicating the urgency of a different approach and bringing forward the multiple benefits of soft shoreline protection and restoration is vital.

Municipalities are starting to lead the way, recognizing that there will be increasing competition for provincial and federal funding to address risks and damage from climate change, as well as the cost of raising all existing dikes. Certainly, in some places, there may be no choice. But at every turn, the question should be asked whether there is an alternative and what opportunities there may be to save money and get additional benefits for the community and the environment. SCBC is working with local governments to find ways to encourage and enable better shoreline development practices through development guidelines and bylaws, as well as through city-led projects on public lands. Communities are seeking out better ways to adapt to climate change and an uncertain future.

Whether through Green Shores or another avenue, this is an important time for professionals to increase their understanding of coastal processes and to work together to shift to a more connected and resilient approach to shoreline stewardship and design. Shoreline professionals can access Green Shores training that is offered through post-secondary institutions (the University of Victoria, British Columbia Institute of Technology, Saint Mary's University) in collaboration with SCBC. This training helps to expand awareness and use of Green Shores guidance materials for professionals (landscape architects, biologists, engineers and planners) and to make connections for multi-disciplinary teams that are so critical for Green Shores designs.

Green Shores projects can protect shoreline ecosystems in the face of rising sea levels and can be used on a variety of shoreline types, but they also bring numerous additional benefits for communities and ecosystems at the water's edge. Using Green Shores through a multidisciplinary and collective effort will create a sustainable future for shorelines.

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**CASE STUDY PROJECT TEAMS AND AFFILIATED ORGANIZATIONS:**

**Piper's Lagoon:** Victoria Drakeford, BCSLA; Knappett Industsries Ltd.; Toth and Associates Environmental Services; Green Thumb Nursery and Saanich Native Plants.

**New Brighton Park:** Vancouver Fraser Port Authority; Vancouver Board of Parks and Recreation; Musqueam, Squamish and Tsleil-Waututh Nations; Moffat & Nichol; Hemmera Envirochem Inc.; GL Williams & Associates Consulting; Wilco Civil Inc.; Connect Landscape Architecture

**Jericho Beach Park:** Vancouver Board of Parks and Recreation; Moffatt & Nichol; Raincoast Applied Ecology; Sharp & Diamond Landscape Architecture, Inc. (not Connect Landscape Architecture); Sumas Remediation; Vancouver Pile Driving; City of Vancouver

**4** JERICHO BEACH PARK DURING CONSTRUCTION
**5** JERICHO BEACH PARK AFTER
**PHOTO 4+5** NICK PAGE

AMÉLIE GERMAIN

# LE PLAN DE MISE EN VALEUR DES RIVIÈRES DE QUÉBEC 2020-2040

## DES RIVIÈRES VIVANTES AU NATUREL!

1

**>EN_LP+** QUEBEC CITY'S RIVERBANK ENHANCEMENT PLAN, 2020-2040
In this era of climate change and urban densification, Quebec City has developed a vision for its rivers that centres them as the priceless legacy of a sustainable, resilient city for generations to come.

**LA VILLE DE** Québec se lance dans la mise en valeur de ses quatre grandes rivières, une richesse naturelle indéniable sur le territoire de cette ville québécoise de près de 600 000 habitants. Au cœur de cette planification ambitieuse, les architectes paysagistes redessinent la ville en redonnant aux rivières leur place dans les milieux de vie des citoyens. Ils recherchent le juste équilibre entre la préservation de la nature et la création d'expériences en berges et sur l'eau qui soient accessibles à tous. Une démarche collective et une conception sensible mènent le projet, de l'échelle du territoire jusqu'aux fins détails d'aménagement.

**1** OFFRE RÉCRÉATIVE HIVERNALE SUR LA RIVIÈRE SAINT-CHARLES **2** ACTIVITÉ DE PARTICIPATION PUBLIQUE EN PLEIN AIR (2018)
**PHOTOS 1** ROUSSEAU LEFEBVRE **2** AMÉLIE GERMAIN

### UNE VISION : QUÉBEC, UNE FIÈRE VILLE D'EAU

L'eau fait partie intégrante de l'ADN de la Ville de Québec. Elle constitue le fil conducteur de son histoire; le fleuve Saint-Laurent fut la voie de découverte des explorateurs et les berges de ses quatre grandes rivières furent des axes d'implantation des peuples fondateurs. Après l'époque industrielle et les décennies de développements urbains qui lui ont fait tourner le dos à ses cours d'eau, puis devant la réappropriation citoyenne des rives depuis plusieurs années, la Ville de Québec porte un nouveau regard sur la place des milieux riverains en ville. En effet, le territoire de la ville se démarque par un patrimoine naturel d'exception qu'elle se doit de protéger et de rendre accessible à la population pour communier avec la nature et pratiquer des activités récréatives et culturelles variées. À l'ère des changements climatiques et de la densification urbaine, Québec se dote d'une vision pour ses rivières, un legs précieux d'une ville durable et résiliente pour les générations à venir.

Les succès populaires tels que le parc linéaire de la Rivière-Saint-Charles (2008), qui a impliqué la renaturalisation des berges du centre-ville à compter de 1996 ainsi que les aménagements au bord du fleuve Saint-Laurent comme la promenade Samuel-De Champlain (2008), motivent le projet. Ces parcours riverains font désormais partie de l'image de Québec et constituent des lieux d'appropriation hors pair par la population et les visiteurs.

C'est ainsi qu'en 2016, la Ville a amorcé une planification unificatrice pour ses quatre rivières principales, soit les rivières du Cap Rouge, Saint-Charles (et son affluent, la rivière du Berger), Beauport et Montmorency. Cela représente plus de 100 km de corridor de rivières naturelles, dont 46% des citoyens habitent à moins de 1 km. Cette démarche audacieuse vise à intégrer les cours d'eau de la ville comme composantes structurantes du développement urbain, en faisant d'eux des éléments clés de l'accessibilité à la nature à partir des quartiers. Cette planification s'est concrétisée en 2020 en un Plan de mise en valeur des rivières de Québec.



2

## UN GRAND CONCEPT D'AMÉNAGEMENT : CRÉER UN PARC NATUREL HABITÉ

Afin de favoriser une mise en valeur remarquable, un concept d'aménagement a été retenu : la création d'un vaste parc naturel habité de 30 km$^2$ sillonnant tout le territoire. À l'image d'un parc national qui s'insère dans la ville, il constitue la pièce maîtresse du Plan de mise en valeur des rivières de Québec. L'ossature principale de ce parc se compose des quatre grandes rivières qui, coulant du nord jusqu'au fleuve, influencent l'aménagement des quartiers qu'elles traversent en les rendant plus verdoyants, plus perméables et mieux connectés aux berges. S'y ajoutent, des corridors de biodiversité et de déplacements actifs entre les rivières, neuf pôles d'activités et onze aires d'accueil pour profiter du plein air, puis sept entrées de ville signatures qui marquent le paysage. Tous ces éléments réunis, incluant les citadins, forment le parc des Grandes-Rivières-de-Québec!

Dans ce grand parc, moult scénarios quotidiens et saisonniers se dessinent. Les citoyens fréquentent aisément les rivières pour se déplacer à pied et à vélo, à la garderie et au boulot; ils pêchent et pagaient en fin de journée et prennent l'apéro entre collègues sur une terrasse flottante au centre-ville! L'eau et les milieux riverains sont facilement visibles et accessibles.

Des familles s'initient au camping et à la géologie sur la rivière Montmorency; des couples découvrent des cascades enneigées et des sites archéologiques mis en valeur le long de la rivière Beauport; des amis participent à une exposition artistique automnale au bord de la rivière du Cap Rouge; puis des travailleurs pratiquent le yoga et le ski de fond à l'heure du lunch sur les berges de la rivière Saint-Charles. Voici un aperçu du potentiel de ces rivières où une foule de combinaisons d'activités socioculturelles et de plein air s'intègrent naturellement au mode de vie des citadins de Québec.

Les vingt prochaines années seront consacrées à la mise en œuvre de ce grand parc pour faciliter et multiplier les rencontres entre les citoyens et les rivières.

3

## UN PROJET RÊVÉ AVEC LES CITOYENS ET RÉFLÉCHI AVEC DES EXPERTS

Un vaste processus collaboratif a accompagné l'élaboration de la vision et a favorisé une appropriation positive du projet auprès des citoyens. En effet, entre 2016 et 2018, la Ville a réalisé, auprès de 3 000 personnes, une dizaine d'activités de participation publique innovantes sous la bannière « Rêvons nos rivières ». Cela incluait des consultations grand public en plein air, des ateliers avec les organismes locaux et les citoyens, un sondage sur les habitudes de fréquentation et la construction d'un musée mobile « Le Rivièroscope ». Cette démarche a fait ressortir la protection et l'accessibilité à la nature comme des valeurs fortes partagées au sein de la population.

En 2017, un concours international a été réalisé afin de colliger une banque d'idées pour alimenter la planification. Vingt et une propositions provenant de dix pays ont été déposées et trois équipes (Cadaster, White Arkitekter et Joo Hyung Oh) ont été nommées lauréates par le jury. Par la suite, des ateliers de travail multidisciplinaires avec les professionnels de la Ville et la firme Rousseau-Lefebvre ont permis d'esquisser le Plan de mise en valeur des rivières de Québec. Plusieurs échelles de conception se sont dessinées : une planification territoriale, des plans directeurs personnalisés par rivière et des concepts d'aménagement pour les pôles.

## DES DÉFIS EN AMÉNAGEMENT

Toute cette démarche suscite maintes réflexions notamment sur les meilleures pratiques en aménagement pour favoriser une accessibilité durable et égalitaire aux espaces de nature en ville.

### L'équilibre entre l'accessibilité et la préservation

Dans le contexte de la pandémie, l'appropriation sans précédent des lieux de plein air met en lumière la nécessité des espaces de verdure à proximité des quartiers pour jouer et se ressourcer. Le processus de consultation publique auprès des citoyens démontre aussi ce besoin, tout comme le désir de préservation de la nature. Cela révèle une belle dualité : donner accès à la nature en ville et ne pas compromettre son intégrité écologique et paysagère. Devant ce défi d'équilibriste, la Ville prend le pari d'offrir plus d'accessibilité aux rivières tout en les protégeant davantage, et ce, en aménageant adéquatement et aux bons endroits.

Actuellement, le manque d'aménagement menant aux attraits des rivières et la méconnaissance des enjeux environnementaux créent des problématiques importantes de multiplication de sentiers informels dans les berges et les milieux humides adjacents. Les gens, naturellement attirés par l'eau, trouvent le chemin pour s'y rendre. Malheureusement, la répétition de passages aux endroits non prévus crée des problèmes de compaction et d'érosion des sols, et incidemment, des impacts sur la qualité des paysages, la biodiversité, et sur les services écologiques rendus par les berges végétalisées. Pour remédier à cette situation, la Ville travaille à définir les meilleurs aménagements et parcours pour mieux canaliser les circulations et usages, pour ensuite, renaturaliser et protéger certaines zones abimées.

Entre autres, un réseau de sentiers efficaces, à accessibilité universelle et minimisant les impacts sera aménagé pour bonifier l'offre actuelle. Un sentier principal multifonctionnel structurera le cœur du réseau et des ramifications spécialisées par type d'activités s'y grefferont. Par exemple, des accès secondaires piétonniers bien identifiés mèneront vers les attraits recherchés comme les plages naturelles et vers de nouvelles infrastructures tels que des belvédères, des observatoires fauniques et des rampes de mise à l'eau.

En parallèle, un travail de restauration des berges détériorées sera réalisé. Pour dissuader les marcheurs de s'y aventurer à nouveau, un enchevêtrement de troncs d'arbres et plantations massives recouvriront le sol afin d'effacer toute trace de passage. Au besoin, certaines zones très achalandées seront clôturées temporairement, le temps

4

**3** PLAN D'ENSEMBLE DU PARC DES GRANDES-RIVIÈRES-DE-QUÉBEC **4** AMPHITÉÂTRE ANIMÉ ET SITE PATRIMONIAL DÉVOILÉ SUR LA RIVIÈRE BEAUPORT **5** NOUVELLES OPPORTUNITÉS D'ACCÈS À L'EAU **6** IMMERSION DANS LA BIODIVERSITÉ RIVERAINE AU CŒUR DE LA VILLE
**PHOTOS 3-6** ROUSSEAU LEFEBVRE

5, 6

que la végétation s'installe durablement. En plus d'une signalisation performante, de l'affichage et de l'animation seront aussi essentiels pour sensibiliser les utilisateurs aux maints enjeux. La population doit être partie prenante de la protection du patrimoine naturel.

À terme, les citoyens bénéficieront de meilleures infrastructures d'accueil (pavillons de services, aires de stationnement pour vélos et voitures), d'un réseau de 200 km de sentiers pédestres et multifonctionnels quatre saisons (ski de fond, patin à glace, raquette, vélo de montagne, *fat bike*) et de parcours nautiques bien établis (kayak, canot, planche à pagaie). La mise en valeur des paysages riverains pour contempler et socialiser, des parcours d'art public et d'interprétation s'ajoutent à la liste. Toute cette offre permettra de mieux contrôler les usages et de profiter davantage des rivières, et ce, tout en préservant les milieux sensibles d'un achalandage trop éparpillé. Les nouveaux aménagements se concentreront dans les pôles, là où se retrouvent les principaux attraits et potentiels d'activités en berges comme sur l'eau. Les aménagements seront dictés par des gestes de design humbles et durables, pour pleinement mettre en scène la nature. Une collection de mobilier urbain est en cours de conception et permettra de donner une signature cohérente et distinctive à l'ensemble des projets riverains.

### Les rivières au cœur des développements urbains

Les lotissements d'autrefois ont privilégié des parcelles de terrains privés en bordure des cours d'eau, déconnectant ainsi les berges de l'espace public. Le concept du parc naturel habité consiste à redonner une équité d'accès aux citoyens en ajoutant plusieurs points d'entrées aux berges à partir des quartiers existants. Dans les (re) développements urbains, l'opportunité est là pour ne plus cacher les rivières en arrière-cour, afin que celles-ci regagnent une place au centre des milieux habités.

Pour atteindre cet objectif, plusieurs stratégies d'aménagement sont déployées. Des îlots de voisinage de petit gabarit sont créés et génèrent une plus grande perméabilité dans le quartier. Profitant de cette trame, plusieurs axes piétonniers perpendiculaires à la rivière mènent à celle-ci. Une rue conviviale longe la berge et accueille des bâtiments du côté opposé à la rive seulement, engendrant ainsi une pleine vitrine publique sur la berge. Les façades avant des lieux d'habitation, de commerce et de travail sont orientées vers les rivières et à échelle humaine. Des espaces publics avec promenades, quais, belvédères, terrasses, aires de jeux, pistes cyclables bordent les rives conservées naturelles ou restaurées. L'ajout de passerelles favorise des liens entre les quartiers et offre des parcours en boucle. Le rythme de ces infrastructures est dicté par la densité urbaine avec l'intention de créer un maillage cohérent entre les générateurs de déplacements. Les rivières se retrouvent au centre de toute cette animation et participent à influencer un mode de vie plus actif.

À l'échelle de la ville, de grandes artères routières se réaménagent en promenades vertes et bleues, c'est-à-dire avec des allées de transport actif et des infrastructures vertes pour gérer les eaux de pluie. Ces aménagements distinctifs, qui rendent le parcours de l'eau visible, créent des axes paysagers reconnaissables qui guident les gens jusqu'aux rivières. Des corridors de biodiversité sillonnent le territoire et permettent le maintien de certaines espèces fauniques en ville.

C'est un changement de paradigme dans la façon de dessiner le territoire et certainement un défi de conciliation, mais c'est avant tout un projet collectif qui vise à mettre en scène l'eau et la nature en ville.

## CONCLUSION

La Ville de Québec bénéficie de tout un réseau de cours d'eau naturels qui culminent au fleuve, incluant ses quatre principales rivières qui traversent 21 de ses 35 quartiers. La concrétisation du parc des Grandes-Rivières-de-Québec permettra de mieux les protéger et de les rendre plus accessibles à la population d'aujourd'hui et de demain. Le besoin est là, et ce, plus que jamais. Plusieurs défis nous attendent certes, mais la mission se veut résolument noble et bienveillante.

**Pour plus d'information sur le projet :**
ville.quebec.qc.ca/rivières
**Équipe principale de projet :**
Ville de Québec : Amélie Germain (a.p.) et Marysela Rubiano (cons. env.)
**Consultants :**
Daniel Lefebvre (a.p.) et François Fortin (a.p. et urb.) de Rousseau Lefebvre

SUSAN FISHER

# A RIVER REFUGE IN THE CAPITAL: OTTAWA RIVER SOUTH SHORE PARK

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**1** SUNSET AT REMIC RAPIDS **2** PLAN OF RIVERFRONT PARK **3** ROCHESTER FIELD CROSSING
**PHOTO 3** LEMAY

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**>FR_LP+** UN REFUGE FLUVIAL AU CŒUR DE LA VILLE : PARC RIVERAIN DE LA BERGE SUD DE LA RIVIÈRE DES OUTAOUAIS
La nécessité de revoir la conception du parc découle des changements environnementaux et de son usage au fil du temps. Les inondations sont en hausse, dont deux crues gravissimes au cours des cinq dernières années. L'habitat se dégrade en raison de la colonisation d'espèces envahissantes et de parasites. Le parc accueille de plus en plus de visiteurs arrivant à pied, à vélo ou en transport en commun, créant une forte demande d'installations sûres pour les piétons et les cyclistes. Le plan adopte une approche holistique pour gérer cette évolution.

**THE OTTAWA RIVER** is the natural and cultural heart of Canada's Capital Region. Fossils that are visible today connect us to pre-human times. Ancestors of the Algonquin Anishinaabe people have lived on the shoreline for thousands of years, when the river provided a major travel route. Europeans, who first came to the region about 400 years ago, exploited the river for trade, settlement and industry. Today, the powerful rapids, dramatic ice forms, migratory birds and sunsets remind us of natural cycles we depend on and need to experience for our well-being.

This article focuses on a 9km Riverfront Park just upstream of Ottawa's urban core, surrounded on one side by urban neighbourhoods and on the other side, by the river. Many of the park's features on the 220 hectares of land owned and managed by the National Capital Commission (NCC) were built in the 1960s. Responding to the need for revitalization, the NCC created a long-range plan for the park in 2018 entitled *Ottawa River South Shore Riverfront Park Plan*.

The need to re-imagine the park stems from environmental and public use changes that have occurred over the decades and that will continue to evolve in the future. Severe flood events are on the rise, with two in the past five years. Habitat is degrading due to colonization of invasive species and pests. Public use of the park is growing, as is access by visitors arriving by foot, bike or public transit as well as demand for safe pedestrian and cycling facilities. The plan takes a wholistic systems approach to addressing these and other changes.

The plan received a Merit Award for Planning Excellence from the Canadian Institute of Planners and can be viewed at bit.ly/ORSSRP_NCC.

## Connecting People Safely to the River

The Capital Pathway, stretching the full length of the park along its shoreline, is heavily used by pedestrians, cyclists and skiers. The Pathway connects the destinations they, along with kayakers, swimmers and birdwatchers, enjoy.

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However, a four-lane scenic parkway along the full length of the park, with only nine crossing points, limits the ability of non-motorists to safely access the shoreline.

The plan proposes to add new pedestrian and cyclist crossings throughout the park, including two new underpasses and three signalized at-grade crossings in the next few years around a stretch of the park currently under construction for the City of Ottawa's LRT Confederation Line West extension. The LRT will traverse a roughly 1.3km length of the park, mostly underground. The proposed crossing at Rochester Field is an example. The parkway will also be reconfigured in this area to reduce speeds, including narrowing the median, adding curves and reducing the speed limit to 50km/hour.

Heavy use of the multiuse pathway has resulted in conflicts between users. As a result, the pathway will be reconfigured, separating pedestrians and cyclists. Where they need to cross paths, pedestrians will be given priority. Pathway users will also enjoy new amenities such as washrooms, activity nodes and resting areas to enjoy the views.

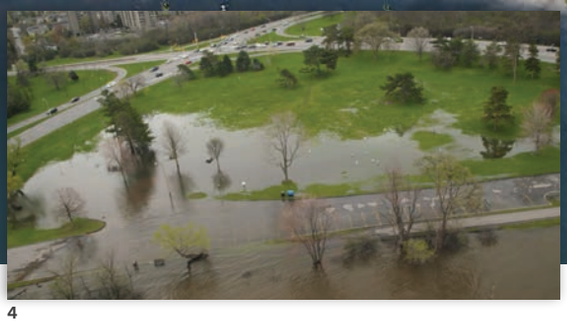
### Flood reliance and stormwater improvements

In 2017 and 2019, the Ottawa River experienced 1:100-year flood events, damaging pathways and infrastructure and eroding shoreline sections in the park. The long-term plan is to move all parking away from the river and out of the 100-year floodplain and all pathways out of the 20-year floodplain.

At the Champlain Node, just downstream of the Champlain Bridge, the floods inundated much of the node and caused the collapse of an aging storm-sewer resulting in a sinkhole in a 65-stall parking lot. In 2019, the NCC removed the parking lot which was directly adjacent to the river and built a new one further away from the river and above the 100-year floodplain. The resulting new greenspace will enhance the node's flood resilience, habitat and user experience since shoreline and pathway users will no longer be squeezed up against a parking lot.

All stormwater from the parking lot is now treated in a 90m long bioswale, targeting 80% Total Suspended Solids removal prior to release into the river. This will also be the goal of a series of bioswales that will be added along the reconfigured parkway stretch mentioned earlier.

The other parking lots in the park will also be converted to greenspace including the one at Westboro Beach. The NCC will remove this 65-stall parking lot beside the shoreline and place it on the other side of the parkway. Since the original parking lot dominates the node, converting it to



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greenspace will allow for more public enjoyment and habitat near the shoreline. All stormwater in the new parking lot will be treated in a bioswale and the new lot will include permeable surfaces.

The shoreline is subjected to strong water flows and ice, making it susceptible to erosion. In 2017, scouring of base materials and wave action combined with receding flood waters caused significant erosion and displacement along the edges of some pathway sections. For example, in a bay near the Carleton Avenue underpass, the floodwaters topped the pathway, eroding the shoreline and undermining its base and surface. In 2018, the NCC regraded the damaged slope and placed very large riprap, both in size and layer thickness, mounded up at the top edge of the riprap to trap soil and wood debris, reducing erosion as the flood waters recede. Existing vegetation, including Red Osier Dogwood, was cut to 30cm above grade, adding riprap around the cut stems. The vegetation re-emerged and has thrived so far.

The 2018 repairs held up well against 2019 flooding. No major erosion occurred at these locations and those techniques were used to repair new flood damaged sections after 2019, which continue to perform well.

Riprap and existing vegetation are the preferred solutions compared to retaining walls, because riprap shifts with the ice and water movement, settling in overtime, making it more self-adjusting. Vegetation is self-repairing and has other environmental benefits, so established non-invasive vegetation will be protected on these repaired shoreline sections. However, attempts to establish new vegetation in heavily eroded slopes elsewhere on the river have been challenging due to the heavy flows and ice, so the NCC continues to try new techniques. Heavily planting the top of the repaired slopes is an important design feature that has worked well.

## Habitat enhancements

The 1960s park design featured sinuous clusters of native trees, including Red and White Pines, set within a matrix of lawn. Over the years, the NCC has reduced the mowing frequency in many of the park's lawn areas, to just once a year, late in the season. The plan is to phase out most lawn areas to enhance the park's habitat value.

In the next few years, a 2.5km stretch of the park from Woodroffe Avenue to Westboro Beach will be planted with a diverse range of non-invasive species – roughly 18,000m$^2$ of pollinator meadows and 4,000 new trees, which far exceeds the minimum 2:1 compensation ratio for trees that were removed for the City of Ottawa's LRT in that area. A monitoring and maintenance program several years after installation will be key to the long-term success.

A key objective is to protect and enhance sensitive habitat, including breeding and overwintering sites, wetlands, as well as aquatic and riparian habitat. For example, in 2015, complex habitat was created by transforming a 1,500m$^2$ area of invasive species into a wetland at Remic Rapids in partnership with the Rideau Valley Conservation Authority. The construction created diverse depths and substrate materials, including sand and fine gravel for nesting turtles. Some excavated materials from the site were reused for habitat,

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**4** FLOODING AT CHAMPLAIN NODE IN 2017, PRIOR TO CONSTRUCTION **5** CHAMPLAIN NODE DESIGN SHOWING COMPLETED PARKING LOT RELOCATION **6** BIOSWALE AT CHAMPLAIN NODE **7** WESTBORO BEACH IMPROVED PATH **8** WETLAND HABITAT AT REMIC RAPIDS. **IMAGES 5** CLAUDE CORMIER + ASSOCIÉ **8** RIDEAU VALLEY CONSERVATION AUTHORITY

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including root wads and basking logs from dead Ash trees and snake shelters from excavated boulders. Native shrubs and trees were planted around the perimeter and a wetland and shoreline seed mix was applied in the wetland and riparian areas. A five-year monitoring program confirms the successful establishment of native flora and fauna in the wetland.

Invasive species, including Common Buckthorn, dominate much of the shoreline. The Capital region suffered catastrophic loss of its Ash trees due to the Emerald Ash Borer starting roughly 12 years ago, causing significant tree canopy loss in the park. Invasive species colonized large areas where dead trees were too numerous to remove but the plan is to remove them on the shoreline side of the parkway.

In 2018, the NCC completed a second phase of the habitat restoration at Remic Rapids adjacent to the wetland described above. It involved an 8,600m$^2$ area where dead Ash trees and invasive species were removed by excavating the roots, except immediately around existing trees to be protected. Invasive species in those areas were supressed by cutting them just above the ground and wrapping the stumps in black plastic for at least two years. The disturbed areas were seeded with pollinator meadow mixes and planted with diverse shrubs and trees species and sizes, re-establishing the woodland overtime. Interpretation panels explain the project to the public.

Views to the river will also be improved by removing invasive shrubs that block views. The NCC will replace them with non-invasive species that provide a low understorey and tall canopy of mostly deciduous trees to keep eye level views open. To protect the night sky, the park will remain dark, except at some activity nodes where downlighting will provide minimal lighting to accommodate nighttime uses.

### Activity Nodes for Waterfront Enjoyment

The plan proposes improvements at nine activity nodes offering visitors year-round destinations to explore and enjoy the waterfront, offering access to the water for kayaking, canoeing, swimming, dipping a toe in the water or sitting and enjoying the views. The nodes are connected by the Capital Pathway and the winter trail, offering those users comforts such as washrooms and food services.

An example is Westboro Beach, which is already a popular attraction, featuring a public beach and a pavilion for lifeguard space, washrooms and a café, which are open in the beach season. Built in 1967, the pavilion is a designated federal heritage structure, although its condition today needs improvement. The NCC will rehabilitate and refresh the pavilion, responding to significant consultation from the public and stakeholders. It also plans a new zero-carbon, 375m$^2$ building, for four-season use, featuring a restaurant, public washrooms and community space.

The nodes are place-making opportunities, celebrating the park's natural and cultural history. For example, Westboro Beach features the stone ruins of Skead's Mill, a sawmill that was destroyed by fire in 1888, but was an important site in the history of the Capital Region. While today it is hidden by weeds and lacks signage, the design will reveal and protect the ruins and educate the public through interpretation panels and other features that celebrate the site's history, such as an adjacent play feature.

### Pandemic Resilience

The pandemic has reinforced how crucial public open space is to our health and well-being. With indoor recreation closed or limited, the public has flocked to the Riverfront Park not only for exercise, but also to socialize safely. The park also enables visitors to connect to natural cycles, breath fresh air and enjoy majestic views, so crucial to our emotional well-being in these challenging times. It will play an increasingly important role in our resilience to climate change and other challenges in the years ahead.

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BRAD SMITH

# LIVING SHORELINES

## OAKVILLE'S APPLEBY COLLEGE SHORELINE RESTORATION

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**>FR_LP+** RIVAGES VIVANTS : RESTAURATION DES BERGES AU COLLÈGE APPLEBY D'OAKVILLE
On considère que la rive nord du lac Ontario est érosive et de nombreux propriétaires fonciers ont construit des épis ou des brise-lames pour arrêter ou réduire le processus érosif. Ironiquement, ces structures accélèrent fréquemment l'érosion, perturbent les processus naturels du rivage et fournissent peu d'habitats aux espèces aquatiques, terrestres et aviaires.

**1** RESTORED SHORELINE
**2** EXISTING DISTURBED SHORELINE.
**PHOTOS** SEFERIAN DESIGN GROUP

**THE WATER'S EDGE** at Appleby College in Oakville, Ontario, is a busy and special place. It is filled with flora, fauna, birds and wildlife in the shallow water along the shore, the banks and on land. The habitat at a water's edge has a rich ecosystem that is essential for wildlife and needs to be maintained to preserve the web of life and provide a safe space for users and students. Appleby College is a place where students learn the fundamentals of education to prepare them for their personal journey through life. The College is a leader in education within Halton Region and the Province of Ontario.

The northern shoreline of Lake Ontario was generally considered to be erosional with many landowners hardening the shoreline and constructing groyne or breakwater structures to stop or reduce erosive processes. Ironically, these structures often increase the rate of erosion, remove the ability of the shoreline to carry out natural processes, and provide little habitat for aquatic, terrestrial and avian species. The Seferian Design Group team, led by Brad Smith, Senior Landscape Architect, worked with the water resource engineering team of Ecosystem Recovery Inc. to implement natural bank stabilization techniques, such as a "living shoreline."

Living shoreline projects utilize a variety of structural and organic materials, such as native plant species (grasses, trees, shrubs, submergent and emergent aquatic vegetation), restorative seed mixtures, geotextiles, natural fiber logs, biodegradable materials, stone, sand fill, woody debris (logs, root wads) and various other measure of habitat creation. The benefits of a living shoreline include:

- Stabilization of the shoreline;
- Protection of surrounding riparian and intertidal environment;
- Improvement of water quality via filtration of upland run-off;
- Creation of habitat for aquatic and terrestrial species; and
- Functioning as a vital ecosystem that supports and promotes biodiversity.

The Appleby College shoreline has remained predominantly natural and has gradually eroded over time, with accelerated shoreline erosion due to high lake water levels. The continued loss of

**By blending ecological science with educational stewardship, we can rethink the way we live, we produce, and even how we consume.**

property placed Topher Point, a memorial area and lookout, at risk to student safety. Seferian Design Group developed a shoreline restoration strategy that built upon previous concepts developed for the College. The intent of the shoreline stabilization work was to protect the existing shoreline from further erosion while maintaining a natural appearance and reducing safety hazards for the College's student population. Seferian Design Group worked with Appleby College to improve and enhance experiences of nature for all students, and to increase an understanding and awareness of nature and ecology on the campus.

An original study of the Appleby College shoreline was undertaken in 2012 and the Seferian Design Group was retained in 2015 to continue the restoration works and to complete geomorphic and environmental investigations of the shoreline and environs. Additional site investigations were performed to determine the presence of species at risk and to provide input into the design from an ecological perspective. Seferian Design Group, Conservation Halton and Appleby College staff reviewed the site conditions through field visits. Ultimately, we developed detailed restoration plans were implemented between 2017-2019. Studying the existing conditions of a site, its relationship and connectivity to the surrounding context and understanding the overall identity and feel of the space, greatly impacts the overall program goals and project vision and leads to a successful design. The existing conditions of the Lake Ontario shoreline at Appleby College were studied extensively by multiple involved parties.

The shoreline was previously subdivided into distinct beach areas. This spatial organization included the west, central, revetment and east beach areas. In

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addition to the study of the existing site, historical aerial imagery of the Appleby College shoreline was examined to gain an understanding of the extent and rate of changes along the Lake Ontario shoreline and McCraney Creek. The images were obtained from several sources and included the years 1931, 1954, 1970, 1983, 1993 and 2015. The intent of the review was to observe changes in shoreline configuration over the years.

Through site investigations, it was found that along the 400m long shoreline, various works have previously been implemented to provide a measure of erosion protection from Lake Ontario wave action. This included concrete walls at the McCraney Creek outlet and at the east end of the central beach area, rock revetment behind private residences, and concrete rubble at the lakeward ends of the concrete walls. The west, central and east beaches were also characterized as shingle beaches.

## Geology

Review of surficial geology mapping prepared by the Ontario Geological Survey[1] (OGS, 2010) indicated that the vertical sequence of geologic materials within the study consisted of Paleozoic bedrock that was overlain by clay to silt textured till (i.e., derived from glaciolacustrine deposits or shale). The till was overlain by coarse textured glaciolacustrine deposits (sand, gravel, minor silt and clay). The Paleozoic bedrock, which was exposed on the lakebed was defined as the Georgian Bay Formation which consisted of shale and limestone (Armstrong and Dodge, 2007).[2]

**3** DISTURBED SHORELINE **4** COMPLETED SHORLINE
**PHOTOS 3+4** SEFERIAN DESIGN GROUP
**5** NORTH-SOUTH ENVIRONMENTAL INC.

## Shoreline Erosion Hazard and Erosion Process

Review of the erosion hazard within the study area was completed with reference to the MNRF (2002) Technical Guide. Erosion is a normal and necessary process along all-natural shorelines and is typically associated with wave impacts. In 2012, it was observed that the beaches at Appleby College were aligned perpendicular to the highest wave energy direction. Wave impacts tend to be greatest during stormy seasons and with higher lake water levels. Other factors that contributed to direct or indirect erosion of the Appleby College shoreline are weathering (wetting-drying and freeze-thaw), ice, wind, precipitation, mechanical (operation of machinery) and maintenance (placement of yard waste near the slope, or the removal of fallen trees along the beach).

## Vegetative Communities

A variety of different wildlife and vegetative communities were found on site that helped with the proposed design. All areas are shown in the Land Classification Map.

## Bank Swallow

Bank Swallow holes were observed on the western bluff in 2015 and there was the potential of the holes to be occupied by these birds even after the erosion that occurred in 2017. These small songbirds nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits and where the soil is stable enough that it will not collapse but soft enough to allow excavation.

Bank Swallows were assessed by the Committee on the Status of Endangered Wildlife (COSEWIC) as Threatened in 2013. In 2014, Bank Swallow was listed as Threatened under Ontario's *Endangered Species Act*.

## Chimney Swift

Chimney Swift is considered Threatened in Canada and Ontario. Chimney Swifts were noted foraging on the site, but there was no evidence that they were breeding. Threats mainly included loss of chimneys for breeding habitat and declines in aerial insects used for foraging.

## Bird and Fish Species

Fish habitat along the shoreline was conserved and restored to promote ecological stability. Thirty-four fish and minnow species, including American Eel, were observed on site which need to be taken into consideration while revitalizing the shoreline.

The proposed design aimed to create a balance between reducing the risk of bank erosion while at the same time, maintaining to the extent possible a natural shoreline. The design concept incorporated natural elements into the erosion mitigation measures that had the potential to enhance aquatic and terrestrial habitat. A breakwater structure was proposed along the central beach area to dissipate wave energy so that a substantial reduction in the erosive potential of the waves occurs at the shoreline bluffs. One groyne was proposed at the east end of the central beach to intercept waves from the east and the longshore current. Placement of a gradation of round gravel and cobble material was proposed on the shingle beaches to enable dissipation of wave energy at the shore. Restoration of failed erosion protection at the southwest corner of the Appleby College shoreline was proposed to provide continued protection of the neighbouring property. Lastly, the removal of the failing concrete bank protection that occurred along both the east and west creek banks was proposed from the pedestrian bridge to the McCraney Creek outlet.

## Landscape Restoration – Planting Plan

A comprehensive native planting plan was developed to enhance the shoreline restoration and erosion control measures. The plans encompassed the entire length of the Appleby College shoreline, from the west property line to the east property line

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as well as the proposed enhancements to Lower McCraney Creek, the groyne and breakwater structures (over 400m total length). All species on the plans complied with Conservation Halton's Landscaping and Tree Preservation Guidelines.[3]

The riparian plantings along McCraney Creek have been specifically designed to enhance aquatic habit conditions by enhancing riparian functions such as overhanging cover, shading, detritus influx, woody instream cover production and bank stabilization. Additionally, plantings were proposed in the 3m-wide, no-mow zone to mitigate surface erosion and stabilize the banks. In these areas, slopes were covered in erosion control blankets, seeded with native seed mixes, and augmented with shrub plantings and live staking with groups of suckering and deep-rooted shrubs.

Plant species and sizes were selected to increase the structure and diversity of the shoreline vegetation communities. Generally, plantings were arranged in clusters to create nuclei that, through the process of succession, will expand, colonize and modify the landscape naturally. The gaps in between the clusters serve an important function in this stage of the succession sequence because they create heterogeneity in soil moisture and temperature and light availability.

## Slope Grading

The riparian corridor and shoreline experienced significant erosion which created steep slopes that became unsafe to the students, staff and users of Appleby College. These degraded slopes were also at risk of further erosion. The slopes were graded to a maximum of 2:1 in a few areas along the shore and were tapered out to gentler slopes where appropriate. The work that was being carried out along the west beach allowed for the preservation of the bird nesting sites. The nesting sites located in the bluffs, immediately east of the McCraney Creek outlet, were also to be preserved.

## Legislation and Permitting

The shoreline restoration required several permits by municipal, provincial, and federal regulatory agencies. The proposed works were on Ministry of Natural Resources Crown Land and were also within Conservation Halton jurisdiction.

By blending ecological science with educational stewardship, we can rethink the way we live, we produce, and even how we consume. Educational programing focused on projects that bring together cultural traditions and new ways of using locally available materials to explore creativity and learning.

The shoreline at Appleby College is a unique project that offers plentiful ecological, environmental, and cultural benefits. The restored shoreline included several educational opportunities and stewardship initiatives including adding new trail connections along the waterfront, creating interpretive signage kiosks educating students on the importance and benefits of watershed education, water quality and stormwater pollution, wetlands, shorelines, and streambanks and invasive species prevention and management, creation of wildlife habitat structures for increased biodiversity, construction of a "Nature Classroom' with exploratory trails and the promotion of environmental training/ workshops and education for students and teachers.

1. Ontario Geological Survey
2. Armstrong and Dodge, 2007
3. Conservation Halton's Landscaping and Tree Preservation Guidelines (April 2010)

ZIAD HADDAD + DANIÈLE ADIB

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# LA PLAGE URBAINE DE VERDUN

## LE RÉCIT DE LA MÉTAMORPHOSE D'UN SITE DE TRIAGE EN UNE PLAGE URBAINE ACCLAMÉE

>EN_LP+ VERDUN'S URBAN BEACH
The tale of how a wasteland was transformed into a beloved urban beach

### LE DÉFI

Situé sur l'Ile de Montréal, Verdun est un arrondissement où l'eau constitue un élément important du paysage. Bien que bordé au nord par le Canal de l'Aqueduc et au sud par le Fleuve Saint-Laurent qui caresse ses rives et entoure son Ile-des-Sœurs, jusqu'à dernièrement, cet arrondissement n'offrait à ses citoyens que des expériences physiques en bordure de l'eau ou tout au plus au-dessus de l'eau.

**1** UN DESIGN MINIMALISTE, CONTEMPORAIN, RÉFLÉCHI, ÉPURÉ ET HARMONIEUX MÉTAMORPHOSE UN SITE DE TRIAGE EN UNE PLAGE URBAINE ACCLAMÉE, ET PARFAITEMENT INTÉGRÉE DANS SON MILIEU
**2** PHOTO ET DIAGRAMME CONCEPTUEL ILLUSTRANT COMMENT WAA TIRE PROFIT DES BRÈCHES CRÉÉES PAR LES ARBRES MORTS, FAIBLES ET MALADES, AINSI QUE PAR LES SENTIERS INFORMELS AFIN D'Y AMÉNAGER « DES SERVIETTES » POUR PALLIER LES DÉNIVELLATIONS DU TERRAIN ET ACCUEILLIR LES USAGERS EN LEUR DONNANT UN ACCÈS PHYSIQUE ET VISUEL VERS LE FLEUVE ST-LAURENT ET SES RIVES.
**PHOTOS 1** GBI **2** WAA MONTRÉAL, ZIAD HADDAD

C'est en 2016 que l'arrondissement se lance le défi d'offrir aux Montréalais(es) et aux habitant(e)s de Verdun un accès unique au fleuve Saint-Laurent, et pour ce faire, le choix cible une parcelle en bordure du fleuve jusque-là vouée à l'oubli et l'abandon. Cette friche urbaine de 15 000 m2, ancien site de triage, est un remblai contenant des sols contaminés. Elle est cependant proche de l'important réseau de pistes cyclables qui fait l'orgueil, à juste titre, de l'arrondissement, et elle est de plus facilement accessible par métro et autobus. À quelques pas de là, se trouvent aussi l'Auditorium de Verdun, l'Aréna Denis-Savard, et le Parc Arthur-Therrien. L'emplacement est certes de choix vu la proximité des services et la facilité de l'accès, mais les conditions existantes de la parcelle ne rendent le défi que plus corsé. En effet, à la gestion de ses sols contaminés s'ajoutent la maîtrise d'un dénivelé notable, et le domptage de courants fluviaux substantiels jumelés à une bathymétrie irrégulière.

Mettre en valeur la rive, offrir des percées visuelles, restaurer la faune et la flore qui survivent tant bien que mal depuis plusieurs années, mais surtout créer une plage ouverte et accessible à tous, offrant des expériences dans l'eau et hors de l'eau tout aussi saines que sécuritaires, c'est en ces quelques mots que s'est exprimé le rêve de l'arrondissement quand le projet a été confié à l'équipe de WAA Montréal et qu'il fut alors baptisé : La Plage Urbaine de Verdun.

### LES ENJEUX

Projeter des espaces qui mettent en valeur le paysage et le fleuve, offrent une programmation diversifiée et améliorent la qualité de vie des citoyens, cela fait partie des enjeux habituels de la profession.

Mais dans le projet de la Plage Urbaine de Verdun, toute une série d'enjeux peu communs vient se greffer aux défis usuels.

**Les enjeux du fleuve :**
Ils concernent autant la maîtrise de la puissance du fleuve que la prise en considération de la circulation fluviale.

Car un fleuve c'est de l'eau en mouvement, des courants, une force sous-jacente, mais aussi des métamorphoses saisonnières dues à la présence de glaces, de débâcles, et de variations significatives de volume à la fonte des neiges. C'est aussi une profondeur marine qui résulte de toutes ces composantes, et des berges qui résistent à l'avalement et accueillent une faune et une flore particulières et adaptées.

Un fleuve, c'est aussi une voie de circulation importante (autant commerciale que récréative) et qui a défini le portrait de Montréal depuis son origine. Cette circulation est aujourd'hui hautement réglementée, et relève de la juridiction fédérale.

Un fleuve, c'est aussi un lien entre différentes villes, municipalités, et communautés. C'est un médium qui renvoie l'écho de tout ce que l'on prononce au-dessus de ses eaux.

Réapprivoiser le fleuve pour y insérer une plage publique et gratuite, c'est donc étudier ses composantes physiques, hydriques, bathymétriques, floristiques et fauniques, et les approfondir pour pouvoir les maîtriser. C'est aussi prendre contact avec de nombreuses instances et communautés toutes concernées, pour bâtir un projet faisant l'approbation de tous et répondant à tous leurs besoins et attentes.

**Les enjeux de la terre :**
Enjeu commun en architecture de paysage, le volet sécurité, dans le cadre de ce projet, prend une envergure multidimensionnelle.

En plus des standards habituels à considérer dans tout projet d'aménagement (visibilité, distanciation, largeur et tracé des chemins), à la Plage Urbaine de Verdun, le terrain est contaminé et il faut innover pour parvenir à gérer parallèlement décontamination et respect des budgets. Le design va donc tâcher de minimiser les excavations, et on innove en ayant recours à l'encapsulation pour assurer la sanité des lieux.

**Les enjeux de la sécurité et de l'accessibilité :**
Sur terre, la sécurité et l'accessibilité se déclinent en étude de pentes, de volées de parcours, en balisage discret et plaisant desservant tous les différents sous-espaces à venir, alors que dans l'eau, elles se retrouvent à plusieurs niveaux : il faut bien sûr ralentir les courants et délimiter la zone de baignade sans compromettre le sentiment d'ouverture sur le fleuve, mais il faut aussi assurer un fond tout aussi stable que fiable, et agréable. Et que dire du défi d'amener jusque dans l'eau l'accessibilité universelle, et d'ancrer dans le sable mouvant un passage répondant aux normes universelles, qui résistera aux cycles saisonniers de gel et de dégel, et qui s'intègrera dans le paysage et le dynamisme de cette plage urbaine ouverte à tous?

**Les enjeux de l'environnement :**
Enfin et surtout, un dernier point central et névralgique est l'environnement. Le site, très minéralisé, doit aussi être naturalisé, et tout doit être mis en place pour protéger la flore et la faune existantes, respecter leurs cycles de vie respectifs (nidification, fraie…) et renforcer leur présence en leur offrant de nouveaux lieux favorables à leur établissement.

Les travaux de la plage entraînent des travaux connexes. Ainsi, pour contrebalancer les remblais effectués sur le fond fluvial afin de niveler la plage et la rendre sécuritaire, des sites de compensations sont créés et aménagés en baies agencées d'enrochements et d'herbiers aquatiques.

De plus, parmi la faune présente, se trouve la couleuvre brune. La plus rare des couleuvres du Québec, elle est dans notre

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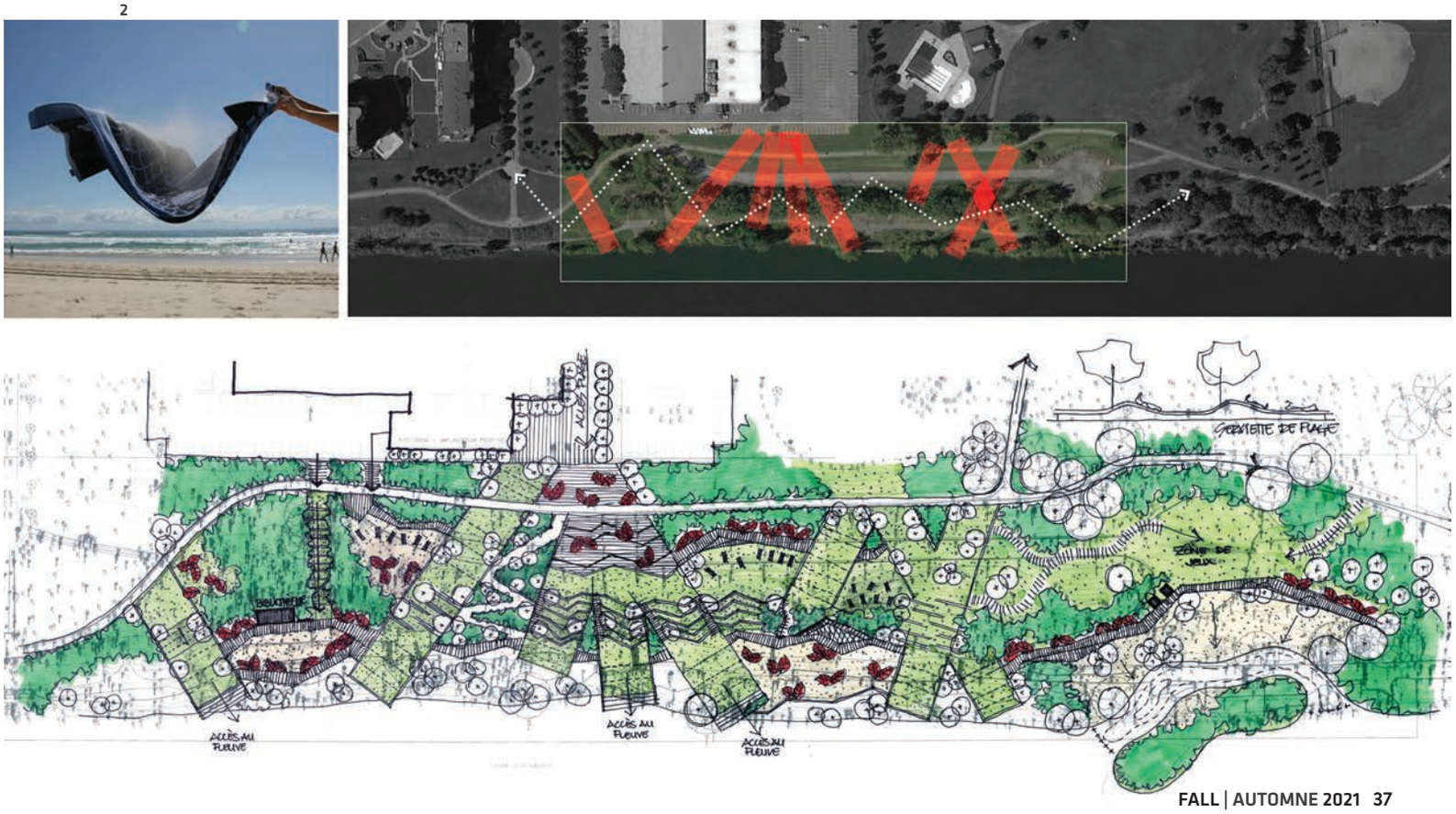

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belle province une espèce susceptible d'être désignée menacée ou vulnérable. Plusieurs de ses emplacements sur l'ile de Montréal ayant disparu à cause de l'étalement urbain, sa présence sur le site requerra tout au long du projet, différentes actions pour assurer sa protection.

## MÉTHODOLOGIE

Premier projet de son genre sur l'ile, la Plage Urbaine de Verdun est un précurseur qui se doit de mettre la barre haute, pour dicter de manière consciencieuse et responsable un précédent inspirant dans la tendance actuelle et croissante de réappropriation du fleuve et ses berges.

Afin de répondre à tous les enjeux, et garantir ces éléments primordiaux au design, WAA s'allie avec des professionnels de différents horizons pour obtenir toute l'expertise, les connaissances pointues et le soutien nécessaires. Il faut ensuite vulgariser les informations, les communiquer, et surtout traduire ces connaissances et expertises en propositions de design, dessins et détails.

Consacrer l'engagement environnemental, c'est accepter que les travaux ne puissent être réalisés dans les délais ni selon la méthodologie initialement prévus. Notre travail débuté en 2016-2017, se manifeste en un premier déploiement sur le terrain en 2017, hors de la période de nidification et de la reproduction de la couleuvre brune.

Durant ce déploiement, les arbres morts, faibles et malades sont abattus. Ils ne seront essouchés qu'après avoir déplacé et relocalisé les couleuvres brunes, et entouré leur nouvel emplacement de barrières de chantier recouvertes de membranes d'exclusion. Le projet prévu pour un été doit être subdivisé en deux lots (terrestre et aquatique) avec deux entrepreneurs et six mobilisations plutôt qu'une, afin de respecter périodes de fraie et de ponte.

Durant les travaux, nuisance sonore, pollution, et toute autre source de préjudice pour la faune, la flore et les citoyens sont continuellement surveillées. Deux rideaux de turbidité sont mis en place pour capter les eaux de ruissellement et leurs particules en suspension, mais parallèlement, il faut soutenir le rythme des travaux pour les finaliser avant que le gel et la glace ne s'en prennent à ces installations. Toutes les machines utilisées sur le littoral et dans l'eau sont certifiées; elles roulent à l'huile végétale (appelée aussi huile biologique), et des procédures rigoureuses de lavage et séchage sont appliquées avant et après chaque déploiement dans l'eau ou sur ses abords. Suite à certains relevés et prises de mesure, il nous faut même parfois retourner à nos tables à dessin, esquisser des méthodologies et les présenter aux instances concernées pour obtenir l'autorisation de poursuivre les travaux.

La nature de ce projet, soumis à de grands degrés de changements et de variables, fait de la communication une composante très présente et primordiale dans son évolution. Bien sûr il y a la communication avec le client, et celle entre les consultants et professionnels concernés et engagés, mais aussi plus de dix instances, communautés, associations, organismes et ministères, ont leur mot à dire, ce dernier allant du simple commentaire, aux recommandations et conseils, aux exigences et règlementations.

WAA accompagne et seconde son client dans les rencontres et présentations publiques pour aller au-devant des communautés, soutenir une participation continue de la part des parties prenantes, et s'assurer auprès de tous de l'acceptation du projet.

Ainsi des échanges avec la communauté des Premières Nations de Kahnawake mettent en lumière son inquiétude face à la migration des poissons. La digue prévue au design représente une menace pour les bancs qui naturellement, se déplacent le long du littoral. Bloqués par cette avancée rocheuse, ils chercheront à la contourner et de ce fait, se trouveront soumis aux dangers de la navigation et des courants. Deux ponceaux sont donc ajoutés en conséquent dans le design de la digue; ils permettront aux poissons de dépasser l'obstacle rocheux sans grands changements à leur comportement naturel.

Contrairement aux processus habituels en gestion de projet, le risque et l'incertitude ne diminuent pas lors de l'avancement de ce projet et son exécution. Au contraire même, ils augmentent avec la découverte d'éléments totalement inattendus sur

**3** ACCESSIBLE, PERMÉABLE ET ACCUEILLANTE DEPUIS SON INAUGURATION OFFICIELLE EN 2019, LA PLAGE URBAINE DE VERDUN EST VICTIME CHAQUE ANNÉE DE SON SUCCÈS AUPRÈS DES CITOYENS, SUCCÈS QUI NE DÉMORD PAS AU FIL DU TEMPS. **4** NETTOYAGE, NATURALISATION DES BERGES, CRÉATION DE FRAYÈRES, D'HERBIERS AQUATIQUES, DÉMINÉRALISATION, DÉCONTAMINATION DES SOLS, BIODIVERSITÉ, CORRIDORS ÉCOLOGIQUES, CONTRÔLE DES COURANTS, SÉCURITÉ SOUS PLUSIEURS FACETTES NE SONT QU'UNE PARTIE DE DE LA TOTALITÉ DES OBJECTIFS CIBLÉS ET ATTEINTS **5** CETTE SEMAINE OÙ LES TRAVAUX DE LESTAGE DE LA MEMBRANE SE SONT DÉROULÉS SOUS L'EAU À -30 DEGRÉS CELSIUS RESTERA À JAMAIS GRAVÉE DANS NOTRE MÉMOIRE.
**PHOTOS 3** ARRONDISSEMENT DE VERDUN, JEAN BEAUDIN **4** WAA MONTRÉAL, ZIAD HADDAD **5** GROUPE DERIC

le site lors des excavations. Il faut aussi composer avec les aléas de Dame Nature, comme ce jour où l'on a dû installer une membrane encapsulant le sol contaminé et remblayer par-dessus 1m de sable propre, alors que la plage était inondée sous six pieds d'eau… ou cette semaine où les travaux se sont déroulés sous l'eau à -30 degrés Celsius. Alors que les plongeurs installaient des membranes et les lestaient avant l'épandage des sables, chacun d'entre eux était accompagné en surface par une équipe de quatre personnes pour assurer sa sécurité, sa provision en oxygène, ses besoins, et tous étaient prêts à réagir en cas de problème.

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## LE DESIGN

Dès la première visite, le site se révèle à nous, offrant ses contraintes et potentiels. De prime abord, un grand rideau végétal, friche souffrante piquée d'arbres et d'arbustes entremêlés, bloque l'accès visuel et physique vers le fleuve. Est-ce malgré cela ou plutôt à cause de cela que des sentiers spontanés et clandestins sillonnent l'espace, utilisant dans ce terrain pentu les racines des arbres pour en faire des marches d'escaliers?

Toujours est-il qu'instinctivement, nait en nous le souhait d'ouvrir des percées vers le fleuve, de mimétiser cette descente en paliers pour apprivoiser le relief et coller à la topographie (minimisant de ce fait les excavations), et d'officialiser ces passages clandestins plutôt que de les court-circuiter.

Relevé arboricole et caractérisation du boisé permettent d'identifier les arbres morts, faibles et malades, et WAA tire alors profit de ces brèches naturellement créées afin d'y aménager « des serviettes » pour pallier les dénivellations du terrain et accueillir les usagers en leur donnant un accès physique et visuel vers le fleuve St-Laurent et ses rives. Ces interventions ponctuelles et stratégiques permettent en même temps de ne pas interrompre les corridors écologiques, et préservent ainsi les lieux de passage et de migration fauniques.

Pour répondre aux goûts de tous, différentes plateformes sont déployées avec des niveaux de dynamisme, d'intimité et d'ambiances variés. Plage de sable clair à pente douce bordée par une digue de roches granitiques aux dimensions et à l'empilement habilement étudiés, cabines de plage colorées - élément identitaire incontournable des paysages balnéaires d'ailleurs-, profonds paliers gazonnés et en gradins, propices autant à la paresse et l'abandon qu'aux regroupements et à la fête, surfaces d'escalades innovantes, éléments de glisse, carré de sable pour les tous petits, tous ces espaces s'inscrivent au milieu d'une végétation qui naturalise ce lieu. Le design contemporain, audacieux et novateur intègre discrètement trois catégories végétales bien distinctes : le littoral et le boisé avec leurs plantes indigènes, et une zone urbaine ornementale où des plantes rustiques s'ajoutent aux plantes indigènes pour coloniser l'espace. Ici, l'accessibilité universelle n'est pas un mythe; c'est une réalité joliment ancrée dans les allées à pente douce qui zigzaguent parmi les plantes, et desservent d'un même geste chaque sous-espace d'activité, jusqu'à lécher la surface de l'eau et y pénétrer.

Nettoyage, naturalisation des berges, création de frayères, d'herbiers aquatiques, déminéralisation, décontamination des sols, reboisement et biodiversité, corridors écologiques, contrôle des courants et de la bathymétrie, sécurité sous plusieurs facettes, inclusion et accès universel jusqu'à la zone de baignade font tous partie des objectifs ciblés et atteints par un design réfléchi, épuré et harmonieux.

L'acceptabilité sociale est telle qu'avant même la fin des travaux, plusieurs impatients défient les clôtures et barricades, et se baignent dans le fleuve parmi les composantes du chantier! Depuis son inauguration officielle en 2019, la Plage Urbaine de Verdun, perméable et invitante, est victime chaque année de son succès auprès des citoyens, succès qui ne démord pas au fil du temps, et qui même, s'allonge et s'étale curieusement au fil des saisons.

Quant à nous, nous sommes tous extrêmement fiers d'avoir été partie prenante de ce magnifique défi, et nous pouvons dire que nous avons accompli une excellente première pour Montréal, et ce malgré toutes les embuches, humaines, naturelles et techniques rencontrées.

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**Croquis :** Ziad Haddad, WAA Montréal

**Design :** WAA Montréal: Ziad Haddad, Coordonnateur et Concepteur Principal, Nadine Mouawad, Conceptrice, Antoine Crépeau, Concepteur

**Consultants :** GBi : Génie civil, électrique, structure; Lasalle/NHC : Hydrologie et comportement des glaces; Amphibia-Nature : Biologistes; Groupe ABS : Géotechnique

**Entrepreneurs :** Les Constructions H2D, pour les travaux terrestres; Le Groupe Deric, pour les travaux dans le fleuve

DON HESTER

# A TALE OF TWO RIVERBANK PROJECTS

## ON WINNIPEG'S RED AND ASSINIBOINE RIVERS

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>FR_LP+ LE RÉCIT DE DEUX PROJETS SUR LES RIVIÈRES ROUGE ET ASSINIBOINE DE WINNIPEG

**1** PHOTO OF THE COMPLETED PROMENADE TACHÉ DOCK AND STAIRWAY-RAMP
**2** MANITOBA'S LEGISLATIVE BUILDING, SOUTH FAÇADE **3** RENDERING OF THE PROMENADE TACHÉ DOCK AND STAIRWAY-RAMP
**PHOTOS 1, 2** HENRY KALEN **3** KEN FORBISTER

**IN THE 1980s** and 1990s, AECOM (legacy UMA Engineering Ltd.) was privileged to work on two award-winning projects on the Red and Assiniboine Rivers in Winnipeg, with similarities in their relationship to historic structures, riverbank geotechnical and hydrological concerns, along with differences in terms of enduring functions and long-term maintenance and upkeep.

Both projects incorporated design approaches to mitigate bank slippage and significant seasonal changes in river levels. Both had to address significant grade changes between normal river water level and upper bank elevations. Both link major historic structures to the rivers: the St. Boniface Cathedral to the Red River and the Manitoba Legislative Building to the Assiniboine River.

Officially opened by Queen Elizabeth II in 1984, Promenade Taché received an Honourable Mention in the Premier's Awards for Design Excellence in 1985. Throughout the 1980s and 1990s, Promenade Taché was a focus of riverbank activity, as a tour boat and powerboat dock and a major gathering place for events along the Red River. With the demise of riverboats on the Red and continuing development of The Forks on the opposite bank, and with only minimal maintenance by the City of Winnipeg, the dock and promenade along Rue Taché fell into disrepair.

The Completion of Downtown Assiniboine River Walkway/South Legislative Building Grounds Redevelopment/Louis Riel Park project was opened in time for the 125th

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## How these multi-stakeholder, interdisciplinary projects were conceived, designed and constructed are complex stories, involving a landscape architect in the lead role...

Anniversary of the Province of Manitoba in 1995. Its design was a major part of a submission by the City of Winnipeg to the International Waterfront Center in Washington, DC, where it was awarded Project of the Year in 1993. The project is still vibrant, drawing people for photos, events, tourism and passive recreation; it has been well-maintained by the Province of Manitoba.

How these multi-stakeholder, interdisciplinary projects were conceived, designed and constructed are complex stories, involving a landscape architect in the lead role: collaborating with architects and engineers; working with federal, provincial and municipal government agencies and officials; engaging stakeholders and the general public; managing and coordinating design and engineering; recognizing and respecting heritage resources; designing for active riparian environments; lobbying for additional government funding; dealing with contractors; and creating iconic urban riverbank spaces.

### Promenade Taché and Whittier Park Dock (St. Boniface Docks and Riverbank Project)

Designed and constructed between 1982 and 1983 as part of the Canada-Manitoba Agreement for Recreation and Conservation on the Red River (ARC), Promenade Taché includes a concrete tour boat and powerboat dock on the Red River, slightly off-axis with the St. Boniface Basilica. Ramps and a short flight of stairs lead to a lower plaza with planter seating and a removeable canopy. In line with the centre of the main dock and Basilica is a stairway and ramp connection to Rue Taché, topped by a narrow plaza flanked by large Tyndall stone signs. The top-of-bank promenade along Rue Taché originally had ornamental lighting, and wayfinding/interpretive signage telling the story of the historic centre of Old St. Boniface: the Provencher Bridge and historic ferries; Provencher Boulevard "Main Street"; Archbishop's House; St. Boniface Basilica; Louis Riel's Grave; Grey Nuns Convent; The Forks, and St. Boniface Hospital. The project also included the addition of decorative lighting to the old Provencher Bridge, a canoe dock in Whittier Park accessed by a gravel path and timber stairs through riverbank forest near the replica fur trade fort in Whittier Park, a central site for Festival du Voyageur.

AECOM initially investigated potential dock locations north and south of the Provencher Bridge. The main dock location was proposed to be on axis with the St. Boniface Basilica, linked to a riverbank walkway along the top of the bank. This was somewhat controversial but addressed some important issues. First, it had been determined that the riverbank and roadway in front of the Basilica was in danger of sliding into the river. Second, proposed dock locations closer to the Provencher Bridge would potentially infringe on plans for a new vehicular bridge and separate pedestrian bridge. In addition, a pathway along the water's edge would have limited use for long periods, particularly in the spring, due to significant water level fluctuations and would also be within an area of active riverbank. The Catholic Church had some concerns about our focus on the Basilica, but the historic structure provides a strong focal point.

Geotechnical investigations of the active riverbank in front of the St. Boniface Basilica were primarily concerned with the depths of active slip planes, and significantly impacted the design of the main dock and the staircase leading up the bank, as well as the top-of-bank promenade. The tour boat dock is constructed over a wide, compacted gravel toe-berm, which stabilizes the major slip plane; the pre-cast concrete stairway, modeled on Rome's Campidoglio, sits on deep piles and floats over a re-graded section of riverbank. The promenade south of the stairway along Rue Taché extends over the bank on deep piles – the carriageway itself is protected by timber piling. Seasonal flooding of the dock and

lower plaza was addressed through use of demountable aluminum railings on the stairway and ramp, as well as a removable canopy on the lower plaza.

By 2018, changing needs and a lack of maintenance funding had severely impacted the project. Large, bleached trees lined the nearby riverbank, victims of more frequent flooding and Dutch Elm Disease; there were signs of minor bank slippage, with the large Promenade Taché signs tilting toward the river; tour boats were no longer running; dock floaters were no longer attached for smaller boats; the lower plaza canopy structure was gone, as were all of the carefully scripted interpretive and wayfinding signs. The site was no longer used as a take-off point for skating on Winnipeg's Winter River Trail.

Very recently, the Belvédère St. Boniface Project has been added to the south promenade and an Active Transportation Path and new sidewalk provided along the riverbank to the north, along with upgrades to lighting and removal of dead trees. The project is gaining new life.

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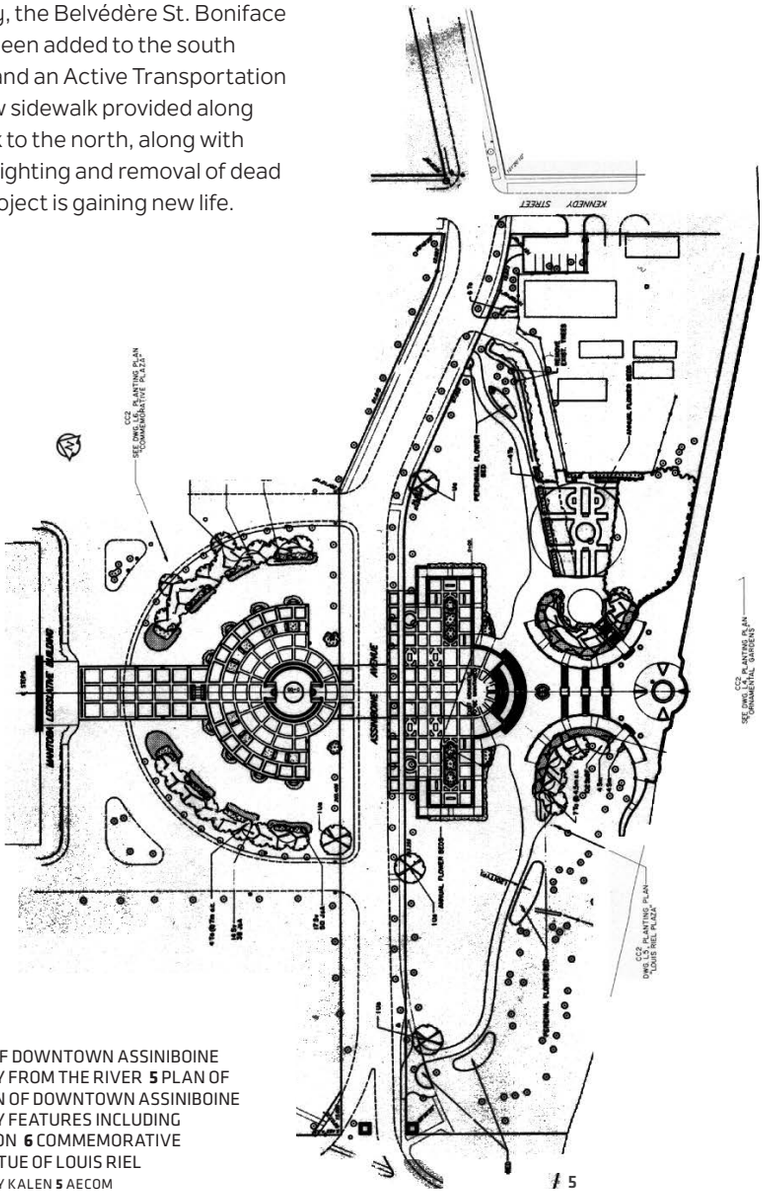


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**4** COMPLETION OF DOWNTOWN ASSINIBOINE RIVER WALKWAY FROM THE RIVER **5** PLAN OF THE COMPLETION OF DOWNTOWN ASSINIBOINE RIVER WALKWAY FEATURES INCLUDING DESIGN ELEVATION **6** COMMEMORATIVE FOUNTAIN **7** STATUE OF LOUIS RIEL
**PHOTOS 4,6,7** HENRY KALEN **5** AECOM

### Completion of Downtown Assiniboine River Walkway (South Legislative Building Grounds Redevelopment and Louis Riel Park)

Unlike Promenade Taché, the South Legislative Building Grounds project was developed as the termination of an existing downtown riverbank walkway system, with carefully designed components that are still relevant to its purpose. AECOM and Gaboury Associates Architects Inc. prepared their 1988 proposal drawing on Placemaking considerations defined in the City of Toronto's "Five Inner City Parks" study, addressing context support, design framework and social milieu. Our proposal also recognized the 1911 plan for the Manitoba Legislative Building and Grounds, with an axial connection to the Assiniboine River. The plan also addressed Provincial heritage recognition requirements, as well as the need for connectivity with the Downtown Assiniboine River Walkway, Osborne Bridge and adjacent neighbourhoods. Originally planned to be constructed in three separate phases, the final project was executed in design and construction phase in time for Manitoba's 125th Anniversary.

Site redevelopment recognized the intent of the original Legislative Building site plan, with a strong axis from the building's south entrance to the Assiniboine River. The final design is consistent with the context of one of the best examples of neo-classical architecture in North America and repeats design elements of the façade, including

use of Tyndall stone and decorative green panels. Outdoor spaces were planned to provide a variety of larger and smaller gathering areas, with opportunities for animation and viewing. Key elements within the main axis include: the Commemorative Fountain in Manitoba Plaza, intended to recognize Manitoba's cultural mosaic; Louis Riel Plaza, with a large statue of Manitoba's Father of Confederation; and a dock feature on the Assiniboine River intended to recognize Manitoba's First Peoples. Conceptually designed as part of the project, the dock connects to the Downtown Assiniboine River Walkway. Facing the river, the massive Tyndall stone walls of the Louis Riel Plaza are reminiscent of historic forts. Development of the lower bank included upgrading of the Legislative Building Gardens, although a proposed pavilion overlooking the river can only be remembered by a staircase from the river.

Assiniboine Avenue was redesigned as a one-way street and bicycle path, to provide "eyes on the park," particularly since the project had been initiated after the Provincial Lieutenant Governor was accosted on the Legislative Building grounds. High lighting levels and security cameras are part of the design. As much as possible, existing riverbank vegetation was retained on either side of the dock, with informal riverbank trails extending west to the Osborne Bridge. Retention of vegetation went along with careful design of pilings for massive walls and stairways to protect the stability of the upper and lower banks.

The project evolved with a variety of challenges. The original design retained a twisted gargoyle sculpture of Louis Riel, largely hidden within two concrete buffers; however, following construction a large new statesman-like sculpture of Manitoba's Father of Confederation was installed. Intense lobbying by the Manitoba Metis Federation included threats to blow-up the original sculpture. The creator of the original sculpture protested by chaining himself to it during construction, which was dealt with by surrounding him with construction hoarding.

Although the project included careful and successful measures to protect the root zones of large elms, leaving out large sections of unit paving in favour of sod in Louis Riel Plaza, two elm trees had been intended for removal to create the historic axis from the Legislative Building to the river. Ultimately, they were retained due to intense lobbying by members of Winnipeg's Coalition to Save the Elm, including threats to chain themselves to the trees. The decision went right up to the Provincial Premier. As a result of keeping the trees, however, copious amounts of elm seed and leaves fall into fountain, requiring additional screening for pumps and significant maintenance to regularly clean out the basin. The fountain feature, initially cut back to a "sprinkler" due to budget considerations, had been significantly enhanced, as a "tongue of fire," based on AECOM lobbying. Now it's permanently set to a lower height: despite installation of a wind governor, fountain spray would wash windows on the Legislative Building in periods of strong southerly winds. Today the Commemorative Fountain is a favoured spot for major events, graduation, and wedding photos (and daycare tours).

While our architect partner envisioned a grand stairway, with an accompanying ramp (the equivalent of a ski jump), the landscape design eventually required broad Tyndall stone walls to accommodate accessibility ramps on both sides of the major staircase, long enough to transition down the high riverbank. Unlike the Promenade Taché dock, the Assiniboine Walkway Dock only provides an opportunity to catch a water taxi or rest from winter skating, as well as a transition to the riverside walkway heading toward The Forks.

Today, the Louis Riel Plaza has new interpretive panels commemorating the 100th Anniversary of the construction of the Manitoba Legislative Building in 1920; John Norquay, the first Premier of Manitoba born in the province; and Father Joseph-Noël Ritchot, who negotiated with the Government of Canada on behalf of the Métis. The problematic large elm tree on the axis, too close to the fountain, has been removed, but another tree has been planted a little further away, still in the middle of the axis from the Legislative Building to the Assiniboine River. Lower bank seating has been updated with green metal benches matching the railings of Riel Plaza, but traffic signage meeting provincial safety requirements on Assiniboine Avenue somewhat detracts from the overall image of the space. The fountain is lovely but now somewhat tame.


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In recent years, the Downtown Assiniboine River Walkway has been flooded more frequently and for longer periods than originally intended. Designed in a relatively dry period, when the Assiniboine River was at a lower normal level, it now requires a higher level of maintenance with less time in service, although it remains heavily used when open.

### Legacy Projects

Promenade Taché and the Completion of Downtown Assiniboine River Walkway were both part of tripartite government initiatives to reclaim Winnipeg's riverbanks as places for all citizens to gather, recreate and learn. The projects reflect the various challenges of and different approaches to engaging the rivers. One key lesson was the need for active ongoing maintenance programs as well as periodic rejuvenation to address the dynamic nature of urban riverbanks.

The projects were both team efforts involving a range of engineering and design specialists coordinated by a landscape architect.

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JAMES ROCHE + YVONNE BATTISTA

# 21ST CENTURY WATERFRONTS: RESILIENT, INTEGRATED, INSPIRING + TRANSFORMATIVE


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**>FR_LP+** LE SECTEUR RIVERAIN AU 21e SIÈCLE : RÉSILIENT, INTÉGRÉ, INSPIRANT ET TRANSFORMATEUR
Les rivières et leurs affluents, qui jadis n'étaient guère plus qu'une extension industrielle utile, jouent aujourd'hui un rôle écologique et récréatif de premier plan.

**WITHIN ONE GENERATION,** the way we think and relate to our waterways has evolved significantly. Our perception of rivers and tributaries has changed from backdoor industrial effluent dissipaters to front-door ecological and recreational assets.

As a result of urban growth, infill and increasing density toward our waterways and floodplains, important ecological spaces were removed and often framed with impenetrable hardscapes and infrastructure. Little consideration was given to the increasing pressure these landscapes would experience due to accelerating climate change, flash storm events, rising water levels, as well the social demand for increased public outdoor space.

**1** BRAMPTON RIVER WALK: THE REGIONAL SYSTEM-WIDE APPROACH TO FLOOD CONTROL AND DESIGN EXCELLENCE CREATES SYNERGIES WHILE CATALYZING URBAN DEVELOPMENT AND STIMULUS. VIEW OF ENHANCED BYPASS CHANNEL FROM THE NEW JOHN STREET PEDESTRIAN BRIDGE LOOKING NORTH ACROSS ETOBICOKE CREEK **2** HISTORICAL IMAGE OF ETOBICOKE RIVER FROM CHURCH ST. BRIDGE IN BRAMPTON WAS ONCE A DYNAMIC WATERWAY THAT SUPPORTED THE TOWN **3** EDGELEY POND AND PARK IN VAUGHAN MERGES STORMWATER TREATMENT WITH AN URBAN PARK, AND OUTDOOR DESTINATION FOR THOUSANDS OF NEW RESIDENTS IN A NEW GROWING DOWNTOWN CORE. VIEW OF STRATEGICALLY-PLACED LANDFORMS AND TOPOGRAPHY, NEW HABITATS AND SOCIAL SPACES, WITH A HIERARCHY OF PATHWAYS AND TRAILS, BRIDGES, AND PASSIVE AND ACTIVE PARK AMENITIES.
**PHOTOS 1** DTAH **2** CITY OF BRAMPTON ARCHIVES **3** DTAH

3

A sustainability focused design approach to these landscapes has emerged with more intensity as of late, defined by thoroughly integrated stormwater solutions, community-supported parks that include pollinator species, riparian habitat and a greater understanding of sites that are in dynamic flux. This noticeable paradigm shift has come as a result of property damage, severe flooding and, in extreme cases, loss of human life due to discernable increase in natural disasters. The social, ecological and financial impacts of global warming have accelerated the push to create more resilient landscapes.

This is not an entirely new approach; it is just more urgent now than it was a few decades ago. In fact, renowned Scottish landscape architect Ian McHarg spoke of the importance of embracing natural systems in landscape architecture over half a century ago. His book *Design with Nature* (Natural History Press, 1969) included research, observations and methods of working with *the processes of the land*, respecting natural systems and protecting floodplains. These ideas have formed the basic teaching for planning and landscape design for several decades, and because of recent more dramatic changes in climate, we are once again reminded of the importance of designing our spaces and cities *with* nature.

There are numerous community-transforming water's edge landscapes that provide a contemporary and innovative application of McHarg's philosophy. The three projects below are redefining the urban waterfront landscapes through the lens of a greater understanding of the dynamic properties of water; challenging our perceptions and our relationship with water; examining and demonstrating how we can positively impact and enhance ecosystems while simultaneously welcoming and controlling human access and interaction.

**1_Brampton River Walk** is an urban design master plan that re-imagines our relationship to a once dynamic waterway. The project is an example of a system-wide approach will create synergies and catalyze urban development and stimulus.

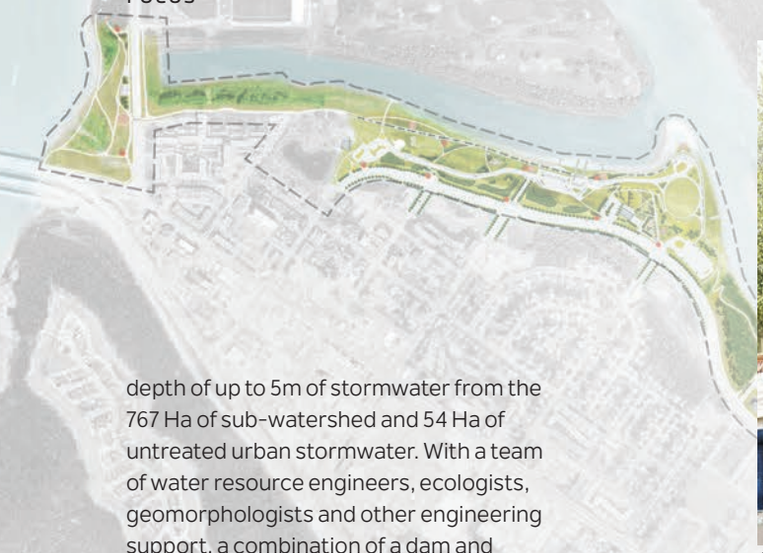
**2_**Currently under construction, **Edgeley Pond and Park** in Vaughan, Ontario, merges stormwater treatment and recreational destination for thousands of new residents in a new growing downtown core.

**3_**Finally, we examine the **Fort McMurray Waterfront Revitalization Master Plan**, in early stages of design, proposes a design solution that allows for seasonal flooding, while also creating spaces that celebrate community-building and Indigenous history.

## Embracing the Dynamic Properties of Water

The City of Brampton, Ontario, has had a long and complicated relationship to Etobicoke Creek. The settlement was originally established adjacent to the waterway, which was the lifeline for the small community. Over time, the community grew into a city, with the downtown core built directly within the floodplain. Over several decades, the downtown area experienced occasional flooding and damage, with the worst flood occurring in 1948. As a result, an engineering solution was developed to channelize the waters of Etobicoke Creek, diverting the flow away from the downtown core. This channeling created a removed condition with only one purpose: to divert water, with no social or ecological value, in effect, concealing all memory of the original creek and forgoing the opportunity to connect with or celebrate the natural landscape. The new Brampton Riverwalk Master Plan has a revised purpose: to re-define and reintroduce the Etobicoke Creek into the identity of the downtown and, where possible, restore natural ecologies while enhancing social amenities.

In the last two decades, the City of Vaughan has seen two 100-year storm events impacting the Black Creek and Vaughan Metropolitan Centre (VMC). In both cases, significant flooding, infrastructure, and property damage was sustained. Following a series of environmental studies and the creation of a funding model to support significant municipal improvements, the 7.5 Ha Edgeley Pond and Park was identified as the nucleus project for the VMC. A new fully accessible public park has been designed to support a regional storm



4, 5

depth of up to 5m of stormwater from the 767 Ha of sub-watershed and 54 Ha of untreated urban stormwater. With a team of water resource engineers, ecologists, geomorphologists and other engineering support, a combination of a dam and softscape interventions with a functional accessibility and maintenance layer, create the only city-owned parkland.

This is a community that is experiencing a significant increase in density. In the next 10 years, over 7,000 new residents will fringe Edgeley Pond and Park. Controlling the dynamic water is key to unlocking the development within this new community. This project is a series of resilient landscapes that celebrate fluctuating water levels within the dynamic outdoor destination.

Like Edgeley Pond and Park, Fort McMurray anticipates seasonal flooding with the added occurrence of ice impacts with fluctuating water depths up to approximately 5m. As a result, the balance of formal site programming and capital investment within the floodplain on one hand, and the precious few areas that are protected from the flood water on the other, creates a significant design challenge. Recognizing the fundamental reality that the spaces along the water's edge will flood and will see continued impact of seasonal ice jams is essential. This fact Is a guiding principle, and forefront to any design proposal.

The six-kilometre-long site is dynamic – with strong ecological forces, as well as social considerations at work – it is not only intended to be a destination linear park, but a regionally significant outdoor event space within the floodplain.

**4** FORT MCMURRAY SITE PLAN OF THE WATERFRONT MASTER PLAN FOR THE SIX-KILOMETRE SITE ALONG THE CLEARWATER AND SNYE RIVERS IN THE REGIONAL MUNICIPALITY OF WOOD BUFFALO
**5** FORT MCMURRAY WATERFRONT REVITALIZATION PROPOSES A DESIGN THAT ALLOWS FOR SEASONAL FLOODING, AN OPPORTUNITY TO PROVIDE HEALING LANDSCAPES WITHIN A FLOODPLAIN AS WELL AS CELEBRATE COMMUNITY-BUILDING AND INDIGENOUS HISTORY. **6** BRAMPTON RIVER WALK: VIEW OF ENHANCED WETLAND AND BOARDWALK FROM THE NEW CLARENCE STREET PEDESTRIAN BRIDGE AT CENTENNIAL PARK
**PHOTOS 4, 5** URBAN SYSTEMS + DTAH **6** DTAH

## A Relationship in Flux

Both Etobicoke Creek, in Brampton, and Black Creek, in Vaughan, were treated as convenient conduits to direct and manage stormwater. The urban fabric pushed and pulled creek alignments and formed horizontal barriers to the creek extents. The impacts of these decisions, combined with compounding stormwater, erosion and flooding issues, has caused a growing awareness of a disconnect to these spaces, as well as contributing to a shift in public opinion and dialogue about the effects of climate change and the growing likelihood of more severe flooding. As a result, a movement pushing for positive change has emerged, inspiring the general public and local governments to support sustainable green initiatives that are good for both the community and the bottom line, proving that increased parks/green spaces lead to economic growth.

The Brampton Riverwalk Master Plan identifies new opportunities in which formerly undefined, underutilized areas are transformed into vibrant sites, new programmable spaces and gateway landscapes. Through strategic removals and enhancements, a system of new trails, look-outs and connections are created with increased physical and visual access to the water's edge, as well as connectivity to (and between) adjacent neighbourhoods and the downtown. The master plan provides a framework, a structure that allows the city and community to reimagine the possibilities.

The result: A renewed physical and social relationship to the Etobicoke Creek by way of a series of connected public spaces and landscapes.

One of the challenges for Vaughan's Edgeley Pond and Park was to combine requirements for stormwater treatment, seasonal flooding realities and the creation of new social spaces and trails. Lower trail systems are designed to allow for flooding, with higher pedestrian bridges creating new access and greater connections to the changing community. Located in the downtown core of the VMC, the park design uses topography to organize the site, creating loops and pathways and amenity spaces. Through integrated wayfinding, the dynamic story of the site unfolds as visitors navigate the landscape.

Fort McMurray, a community overwhelmed by recent natural disasters, has been reminded of nature's powerful extremes and the need for resilient design that addresses the complex and ever-changing relationship to the water's edge. As design professionals, it is an exciting opportunity to confront

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this complex relationship and push the boundaries of landscape architecture while creating robust and inviting public spaces.

The Fort McMurray Waterfront Revitalization Plan involves numerous strategies that expand this important role, while reconnecting visitors to the water and adjacent landscape. The number one strategy is access. Connecting people to the shoreline by providing a series of walking/cycling routes and lookouts at key locations, re-establishing a relationship and civic pride-of-place.

While every project has many layers of site-specific considerations, the Fort McMurray waterfront holds a rich Indigenous and Métis importance with both celebratory and turbulent histories. There is a unique opportunity to have meaningful conversations and design collaborations that enable culturally respectful landscapes and interventions that strengthen connections and respect for water.

## Healthy Ecosystems & Healthy Communities

Be it through rehabilitation, enhancement or interpretation, the principles of the Brampton Riverwalk Masterplan aim to create a place for people to enjoy an important natural open space that weaves through the City's core. The Etobicoke Creek Valley and Riverwalk site is an important amenity for local and regional communities and the implementation of the Masterplan will contribute to key principles related to community health also identified in the City's Eco Parks Strategy.

Providing opportunities for nature-based recreational experiences is key to building healthy communities, but over-use and subsequent degradation of urban open space systems is a risk inherent in rapidly urbanizing centres. Therefore, expanding and enhancing terrestrial and aquatic habitat for native flora and fauna, as well as protecting and preserving of the most sensitive natural areas is key. The Riverwalk plan also establishes new view corridors, vistas and visual connections from surrounding streets, bridges and neighbourhoods within the study area, as well as sustainable best practices that offer stormwater management strategies and details. The Plan aims to facilitate an active lifestyle by providing a variety of experiences, places to congregate and opportunities to engage with nature, while fostering community involvement, physical activity and social engagement.

To further support the ecological health of the project, a low flow conduit in the channelized portion of the creek will be designed to encourage fish passage to the more naturalized reaches upstream, with opportunities for the low-flow channel itself to meander where possible, within the bottom of the larger bypass channel, with changes of width and depth, incorporating riffle-pool sequences and features such as boulders or overhangs to provide in-stream cover. Making nature visible though design provides a way for visitors to reconnect with nature by allow visitors to feel like they are a part of nature and become stewards of the ecological systems that govern the site.

The 10 Ha that comprise the Edgeley Pond and Park has witnessed dramatic changes over the past 100 years. Formerly used for farming, the site now takes in untreated flows from adjacent development to the Black Creek. The design maintains this relationship, however, incorporating low impact development treatment areas and forebays. New grading and topography define pathways and lookouts, direct flows of the dynamic creek and define new ecological zones comprised of meadows, wetlands and woodlands. In addition, new civil infrastructure removes existing fish barriers and begins to establish an improved quality ecosystem that has not been present on site for over a century.

One of the primary goals of the Master Plan for Fort McMurray is the importance of respecting and planning for the dynamic nature of the sites' water's edge. The preliminary design response is to identify new opportunities for creating and expanding the riparian enhancements. This supports flood mitigation measures, allows for creation of habitat, while addressing the desire to connect to the water, while defining appropriate areas to invite people to come together as a community. In addition, through the manipulation of grade, opportunities are created to allow for flooding and seasonal inundation, integrated within stormwater design.

As landscape architects, we have the foresight and ability to imagine landscapes that work on multiple levels and move past a single use. To dream and create dynamic waterfront spaces that will also contribute positively to our society for future generations, our designs must tackle all of the complex social and ecological design challenges that face us daily. These include balancing programming requirements with stormwater quality and quantity controls, geomorphological design, flooding in publicly accessible spaces, reduced heat-island effects, establishing aquatic, riparian and terrestrial habitat, and many more considerations that can be broadly summarized by the need for resilient and sustainable design.

Regardless of what part of the project we personally touch, whether it be master planning, engagement, design, coordination, contract documents or construction, we become deeply invested, often creating visceral and personal connection with our work. Upon completion, our designs start to grow, respond and evolve within their public space and community and the larger ecosystem's domain. Sustainable and resilient design makes an impact when combined with a network of similar intentioned systems of flow and occupation, and as landscape architects, we begin to transform, integrate and heal our public waterways and their surrounding landscapes.

WILLIAM HRYCAN + MICHELLE TUSTIN

# SHAKESPEARE ON THE SASKATCHEWAN: PERMANENT RIVERFRONT FESTIVAL SITE

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**>FR_LP+** SHAKESPEARE ON THE SASKATCHEWAN : SITE RIVERAIN PERMANENT DES FESTIVALS
Le projet de réaménagement, achevé à l'été 2020, offre désormais un espace permanent et souple sur les rives de la rivière Saskatchewan Sud au festival Shakespeare. L'aire des festivals célèbre la culture et les arts locaux de Saskatoon en ouvrant l'espace riverain à d'autres groupes et festivals communautaires, renforçant ainsi la vocation du site en tant que ressource communautaire annuelle.

**SHAKESPEARE ON THE** Saskatchewan (SOTS) has been operating as a Shakespeare festival since 1985, and despite being a fixture of Saskatoon's arts community, it has always operated on an impermanent site. When operating as a seasonal facility, the Shakespeare on the Saskatchewan festival has been a popular river-side attraction, but its seasonal presence defined the site's function exclusively to the timeline and structure of the Shakespeare festival and related events.

Redevelopment of the SOTS' site and creating a permanent Riverfront Festival Site has cemented the Shakespeare festival to a fully realized and defined space, nestled on the banks of the South Saskatchewan River. The redevelopment project, completed summer of 2020, provides a permanent and flexible space suited for the festival. The site further celebrates local Saskatoon culture and arts by opening the riverside space for use by other community groups and festivals, strengthening the site as a year-round community resource.

## Activating the South Saskatchewan River Valley

The City of Saskatoon boasts a vibrant and healthy river valley, in large part due to the proactive leadership and resource management provided by the Meewasin Valley Authority (MVA). Meewasin's mandate is to coordinate development, land use and maintenance within the South Saskatchewan River valley, finding the balance between preservation and enhancing biodiversity, with development and activation of the river valley for human enjoyment. The Shakespeare festival site is within the areas managed by the MVA, and endeavors to further the Authority's mandate.

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**1** EVENING AERIAL VIEW **2** ILUMINATED AMPHITEATRE SEATS **3** THE MVA TRAIL CONNECTIONS THROUGH THE SITE **4** THE MAIN ENTRANCE WITH ORIGINAL SITE GATE, REPAIRED, REFINISHED, AND RELOCATED
**PHOTOS 1** PCL CONSTRUCTION **2** JJ NEUFELD **3** TAYLOR J. SUMMACH **4** TIMKIP IMAGING

**The redeveloped site opens itself up to the river, embedding the river valley into the identity of the site, while protecting and enhancing the river edge for considerations of stability, ecology and biodiversity.**


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A significant component of the Shakespeare festival's central identity has always been the large white tent housing the seasonal theatre, erected at the beginning of the season and signalling to the public that the festival season has started. This sense of character and reveal was preserved with the installation of a permanent amphitheatre, enclosed by a steel-frame tent structure and a seasonal fabric cover. Assembly and disassembly of the temporary covering preserves the seasonal visual cue for festival opening and closing. The permanent concrete amphitheatre provides a year-round stage that is available for other events and user groups.

Site improvements also include a permanent box office and dressing rooms, a large central plaza, and flexible multi-use spaces that provide the potential for year-round use by SOTS and other community groups. A fixed bar and deck provide social gathering spaces for the SOTS festival and the public, situated to take advantage of stunning views up and down the river valley.

The large, accessible deck was designed as a bar-patio for SOTS patrons (the wide top rail functions as a drinks ledge) and as a seating and gathering space for public use outside of performance times. Constructed of wood and extending over the slope of the river valley, the deck firmly embeds the site into the surrounding landscape and offers unobstructed views of the natural riparian zone. Custom railings are similar in style to those on nearby City of Saskatoon riverfront developments, linking SOTS to other important open spaces, but the decorative panels match the contemporary Tudor-like panels on the new buildings and unify the site and the built form.

Integral LED lighting within railings and benches provides evening illumination. The lighting visually connects these elements to the concrete amphitheater with similar lighting components embedded into the risers, and programmable projectors can be used to illuminate the tent or ground plane of the plaza. Light standards provide conventional trail and site lighting outside of festival use and can be programmed to display any colour or intensity, to suit the needs of any event or user group. Glowing stones within asphalt pathways add playful and unexpected drama to the ground plane, and together with theatrical site lighting strategies, use of the space is extended into the night, introducing visitors to new and unique experiences depending on the time of day.

The site development also strengthens connections between the Shakespeare site and the Meewasin Valley Authority River Valley trail system, a network of river-side trails that bind together a collection of cultural and recreational amenities and provide connections to many areas of the City.

Prior to redevelopment, the Shakespeare festival site main entrance opened onto Meewasin's primary trail system; the site was a significant destination but wasn't an integral part of the trail network. Site redevelopment opened the permanent perimeter fences, and the primary trail that once dead-ended at the main gates now extends through the multi-use plaza, terminating at the new bar deck and a stunning vista of the South Saskatchewan River Valley. A new section of secondary trail was also created to extend through the site and provide additional connections to the trail network. This section of trail brings users close to the river.

The Meewasin trail network and the permanent festival site are now integrated as one, and adjacent parks and open spaces, the Nutrien Wonderhub (Children's museum) and other riverside amenities now function congruently as a significant public node.

## Protecting the River

While the seasonal Shakespeare site has always been an important cultural node on the South Saskatchewan Riverbank, prior to redevelopment the orientation and use of the site did not acknowledge or integrate the river's edge in a significant way.

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Major driving forces behind establishing a permanent festival site were to activate the river valley, emphasize the importance of the South Saskatchewan River, and strengthen the site's relationship to the river and the river's edge. The redeveloped site opens itself up to the river, embedding the river valley into the identity of the site, while protecting and enhancing the river edge for considerations of stability, ecology and biodiversity.

The original mandate of the project was also to minimize impact to the water's edge, with particular effort to protect and retain the edge of the river and slope of the riverbank. The site's proximity to the river made the development a challenge without impacting the river in some way.

The existing riparian edge was previously stabilized by large boulders and rip rap reinforcing, installed by Meewasin Valley Authority. All existing rip rap and boulders on the riverbank were retained in place, and additional boulders were placed between the river-edge path and the top of the bank to extend slope stabilization in select areas and to continue the aesthetic quality of the existing condition into new development. This additional reinforcement was also used to establish narrow planting strips between the bank and the river-side trail system that passes through the site. Boulders unearthed during building foundation excavation were re-used for reinforcement, reducing the volume of new material imported to site.

MVA also provided some revegetation of the riverbank with shrub and tree species endemic to the South Saskatchewan River Valley. This project continued the slope revegetation initiative and planted rooted cuttings and small containerized stock of native shrubby species between boulders, along the armored river edge. Plant species include red osier dogwood *(Cornus sericea)*, sandbar willow *(Salix interior)* and yellow willow *(Salix lutea)*. As the vegetation matures it is replacing volunteer non-native woody species and is providing valuable river-side habitat. It also strengthens the stormwater intercepting capacity of the slope and provides much needed screening to soften the appearance of the boulders used to armor the riverbank.

Much of the site is internally drained through a conventional underground storm drain system, however a significant portion of the site, including the peripheral trails, bar plaza and parts of the amphitheatre, use land-based strategies. For instance, some runoff from these areas was intercepted by the newly installed vegetation strips at the top of the riverbank, and runoff from other areas was directed into existing nearby bioswales installed by MVA as part of a previous trail upgrades projects. Stormwater flows through these elements before draining through the adjacent boulder-reinforced and vegetated riverbank.

Lighting was designed to be not only theatrical, but also sensitive to the riparian habitat. Outside of active festival times, trail lighting is programmed to dim when the site is not occupied and is activated by motion sensors when visitors approach the site.

Where vegetation was removed or disturbed, it was repaired with plant species locally found along the South Saskatchewan River Valley, including trembling aspen *(Populus tremuloides)*, pincherry *(Prunus pensylvanica)*, saskatoon berry *(Amelanchier alnifolia)*, prickly rose *(Rosa acicularis)* and Canada buffaloberry *(Shepherdia canadensis)*. Where possible, invasive tree species including European buckthorn *(Rhamnus cathartica)* and Russian olive *(Elaeagnus angustifolia)* were removed and replaced with native stock.

New plantings around the site perimeter were designed to reinforce the existing intimate character of the site, and native plant species were used to strengthen connections to the naturally vegetated river valley and increase biodiversity. In select areas, plantings are augmented with theatrically themed planting elements in select areas, including Romeo and Juliet sour cherries *(Prunus* x *kerassis* 'Romeo' and 'Juliet'*)*.

## A Place of Balance

The Permanent Shakespeare festival site now sits nestled in the riverbank as a place that balances human connection and riparian protection. The site continues to activate the banks of the South Saskatchewan River through the celebration of culture and arts, protection and reclamation of the riverbank plantings, and establishing the long-running festival as a permanent resident and steward within the river valley.

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**Design team:** Group 2 Architecture and Interior Design (Architect); Crosby Hanna & Associates (Landscape Architect); J C Kenyon Engineering (Structural Engineer); Catterall & Wright Consulting Engineers (Civil Engineer); PWA Engineering (Electrical Engineer); Daniels Wingerak Engineering (Mechanical Engineer)

**Contractor and Construction Management:** PCL Construction Management Inc.

**5** RIVERSIDE BAR DECK
**PHOTO 5** TIMKIP IMAGING

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VIRGINIA BURT

# WATER'S EDGE: A STUDY OF ART AND SCIENCE

**Walden is blue at one time and green at another, even from the same point of view. Lying between the earth and the heavens, it partakes of the color of both.**

**— Henry David Thoreau**

**>FR_LP+** RIVAGE : ÉTUDE DE L'ART ET DE LA SCIENCE
Les rivages canadiens sont diversifiés, un chapelet de rives délicatement tissé, vulnérable aux changements climatiques et aux interventions humaines.

**NATURAL WATER AND** access to it is one of our most cherished landscapes, playing a fundamental role in our psychology. The myriad of human use abounds from shipping and travel to expressing and worship, to drinking and washing to name a few. These places are captivating in their diversity. Where land meets the water's edge – be it salty ocean to river to freshwater lakes – these places touch us.

**1** CONNECTING TO OUR SOURCE
**PHOTO** RICHARD MANDELKORN PHOTOGRAPHY

Professors Stephen and Rachel Kaplan's work in environmental psychology, and the effect of nature on people's relationships and health, suggest ways to make these spaces highly favourable particularly how the water is perceived at the edge: with natural edges with natural form and presence of vegetation. Mary Oliver, William Wordsworth and Thoreau express the magic. As landscape architects in these natural places, we have the opportunity to both apply known methods and to explore the new in order to protect and restore, connect, capture and captivate.

Our Canadian shores are diverse, an interstitial fabric delicately woven, vulnerable to climate change and human intervention. Rising ocean levels and dramatic storm events that flood over shores are integral to our work and we must continue to act.

Several examples of private projects describe lessons learned from outer coast to inland coast to lakeside – and consider the potential for application at larger scales.

### Acadia Point

Located on the outer tip of the Aspotogon Peninsula, this Nova Scotia project was the site of Canada's last existing whaling plant. Abandoned in 1986, the property was purchased in 2008 by a couple from New York City. Their goal was to re-claim and restore the property from its heinous past and build a summer home to escape the city. Design principles were simple – make it look like the building arrived without any disturbance; ensure the building is safe yet bring it close to the shores to experience its powerful and rugged beauty; and "no hydrangeas, Virginia."

The house had been sited and was partially built upon our engagement. The conundrum: the finished floor set by others had resulted in the kitchen being three metres above the adjacent cobble beach and was at the edge of regulation setbacks. We did not have the option of moving the building, bringing in soil and regrading; soil depths in this area were minimal, 6 to 8 inches (150 – 200 mm) to bedrock and exposed to wave action in the near future.

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The power of "High High Water Levels" (highest tides of a full moon combined with storm surge and high winds) cannot be overstated especially given rising ocean levels. To address this challenge, a series of technical protection layers were proposed and implemented. The first layer was a 1.5 m high board-formed concrete retaining wall pinned to the bedrock. The wall also formed a buttress for steps descending to the beach. This achieved several goals: protection of the building foundation; creation of an upper living area; connection to the water's edge; and definition between a cultural and wild landscape. The second layer was placement of salvaged blast rock (created during utility corridor blasting) on the outer edge. This protective pile of four-to-six-ton granite pieces breaks up and disperses wave energy. The last layer included plantings and a multi-levelled deck for entertaining and meals and steps. Deck levels were carefully curated to ensure views to this dramatic and wild coast were uninterrupted.

On the more protected side, a lower Sunset Terrace was created. Local slabs of slate were used and planted with native grasses and spruces. Connecting stone steps integrated into the natural bed rock outcrops were nestled into place.

Lessons learned:

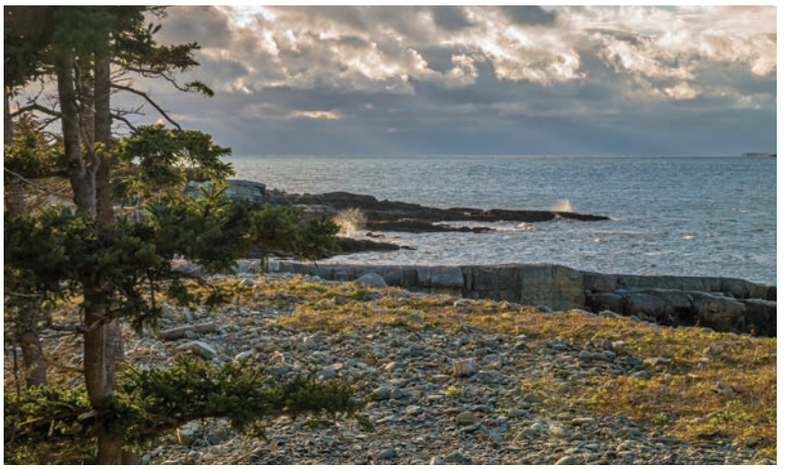
- Strive to add beauty to the technical requirements (i.e., the niche for pebble collecting and display connects our heart and endless magic);
- Never underestimate the power of mock-ups for client understanding – the intricacy of the weaving various levels with selection of colour, texture and scale;
- Grading is ALWAYS important (especially on bedrock);
- Find creative ways to keep soil in place so plants can thrive and stabilize;
- Re-use resources at hand and explore creative ways to handle supply and harvest of native plants.

**2** SALVAGED BLAST ROCK BREAKS UP WAVE ACTION IN FRONT OF BOARD-FORMED BREAKWALL – COLOUR, TEXTURE, AND TECHNIQUE (ART AND SCIENCE) MADE MANIFEST **3** PLANTS WERE CHOSEN TO CAPTURE WIND AND BACKLIGHTING TO EMPHASIZE SPARKLING WATER **4** RESTRAINT IN THE FOREGROUND IS A DISCIPLINE ON EXPANSIVE SEASCAPES **5** EPHEMERAL QUALITIES ARE CAPTURED THROUGH PRESERVING CRITICAL EDGE CONDITIONS
**PHOTOS** RICHARD MANDELKORN PHOTOGRAPHY

### Bluff Point

A rocky granite point in one of Ontario's most beautiful Muskoka Lakes was to be reconstructed to create a family recreational cottage and retreat. While a freshwater lake is, perhaps, not as challenging as bigger waters, creating a "landscape first" approach where buildings recede on rocky barrens requires intense intentional design collaboration. Five smaller and yet beautiful buildings and hidden utilities were critical to the program. Plantings were to be "of this place" and not ornamental.

1. **Preservation:** Extensive tree protection of resilient yet vulnerable 120-year-old white pines was required. These beauties cling to crevasses and small cracks that seem unlikely to support mature trees. To ensure the design team was clear about how vulnerable the trees were, several near the building footprint were named for the architect's best friends including John and Phyllis. As this was a granite outcrop, typical tree protection fencing and stakes were out, surface support and bags of sand were in.
2. **Minimize Disruption:** Intentional and careful utility location on this steep and challenging site resulted in a parking platform with utility room concealed below. Horizontal boring under the granite shoulder allowed connection between main cottage and utilities while minimizing surface disruption and hiding telltale conduits and pipes. (Unable to be buried



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## I go down to the edge of the sea. How everything shines in the morning light!

**— Mary Oliver**

in bedrock, this challenge is inevitable.) By reducing visually and physically impactful utility lines, the landscape functions without disruption, the need for restoration or visual competition.

3. **Create Critical Construction Sequences:** Access was complicated. Terraces and path access to the south dock were therefore constructed even before the building. Creating a multiphase, re-wilding strategy that would make Cornelia proud: 600 native trees; 30,000 1-gallon and plug sized herbaceous native grasses and woodland species; collecting native seed onsite; and gently harvested mosses (rescued from a nearby property soon to be developed).

Lessons:

- Tree protection techniques that last for five years of contractor parking, staging and construction activity. Use logs from any felled trees, add trunk protection, employ robust fencing materials.
- Hire a horticulturist or ecologist to harvest seeds from native on-site grasses as early as possible in the process.
- Re-wilding on tight schedules with restricted access is a logistical challenge to get timing and weather right.... sometimes success and sometimes pivot! Work with trusted nurseries for contract growing and on time delivery schedules.
- Use green infrastructure techniques developed in urban conditions to handle water in bedrock conditions: desiccation, compaction, and soil depths are challenges to be met regardless of "town or country" locations.
- Collaboration with design team and contractors at every turn is critical to creating and restoring construction access to special places.

### An Island on Georgian Bay

Islands have their own special enchantment – particularly in logistics. Add to that one of the largest freshwater lakes in the world, and one has the combination of both big waters and big winds. This project was an exercise in re-wilding a disturbed landscape: editing both natural succession and invasive plants to reduce their effect; placement of native plants; and restoration of a disturbed landscape created by septic tank installation. Georgian Bay's archipelago is a world biosphere reserve. In this, plant selection and sourcing were crucial. Although local sources were explored, quantities and timing were unable to align so contract growing to match onsite plants was undertaken.

Access by barge, docks in place and site visits by water taxi and work boats have been some of the typical logistical activities. Watering plants on site when folks were not there, and timing of planting sequence is magnified on these windy bumps of granite with shallow soils.

Lessons learned:

- Understand the logistics of island work;
- Skilled contractors are worth every penny as their experience in handling what weather and the Bay send is invaluable to you and your client;
- Timing isn't always perfect for a storm to come in or a client to overwater or underwater plants awaiting planting. Allow enough days to get those little plants to their home;
- Be flexible and ready to pivot at any moment...When handed lemons, make lemonade.

It is my privilege to work on the diverse water edges in multiple locations of our fabulous country. The sites are both rugged and beautiful. Our work as landscape architects is to: enhance and protect our water is to elevate the conversation on protection and restoration; research and use of re-wilding techniques to help our water's edge filter and support clean water; use every and all of the necessary exterior architectural and supportive green infrastructure techniques; and research, research and research to find the balance of all things.

It is our highest call as landscape architects to exercise restraint and create as if Mother Nature had done it herself. My mother once visited one of our remote projects and, after walking this site for 25 minutes, she asked, "Where did you do your work, dear?" She had been walking through it since exiting the car...truly one of the greatest compliments one could receive.

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1. Kaplan, R., Kaplan, S., & Brown, T. (1989). Environmental preference: A comparison of four domains of predictors. *Environment and behavior*, *21*(5), 509-530.


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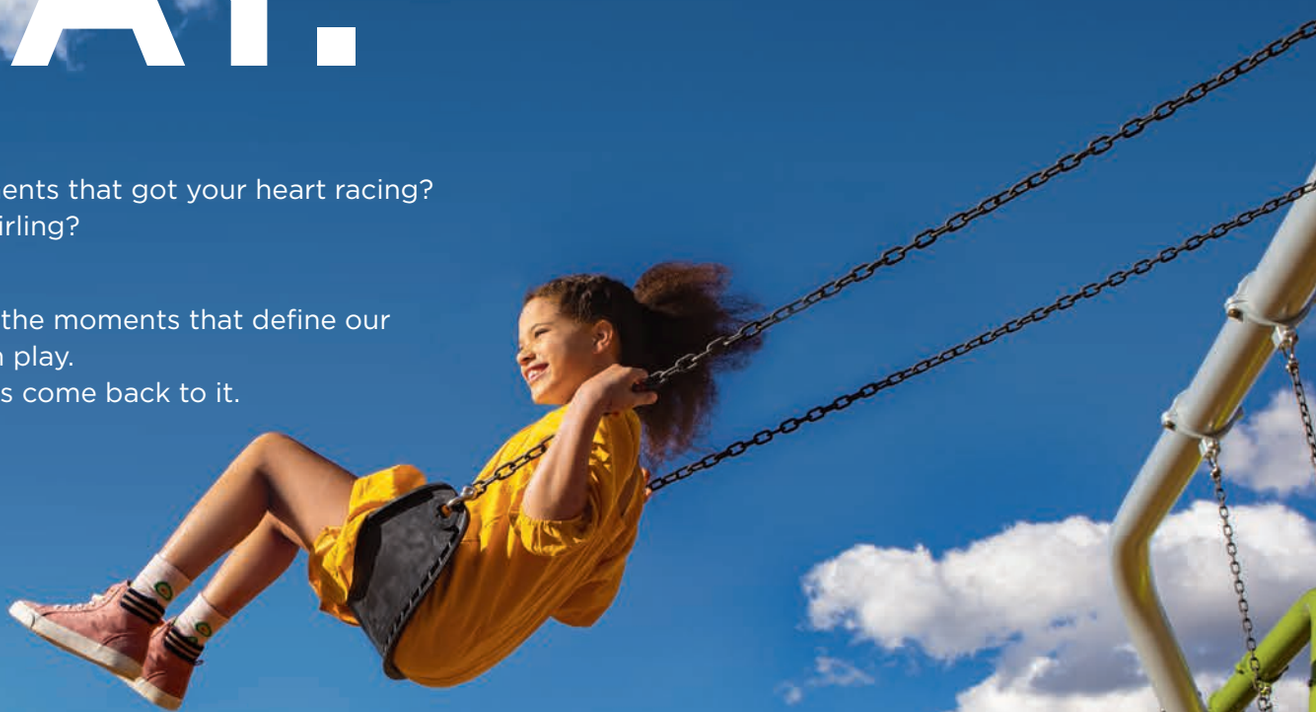

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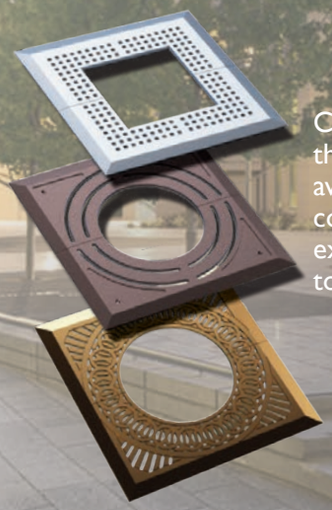

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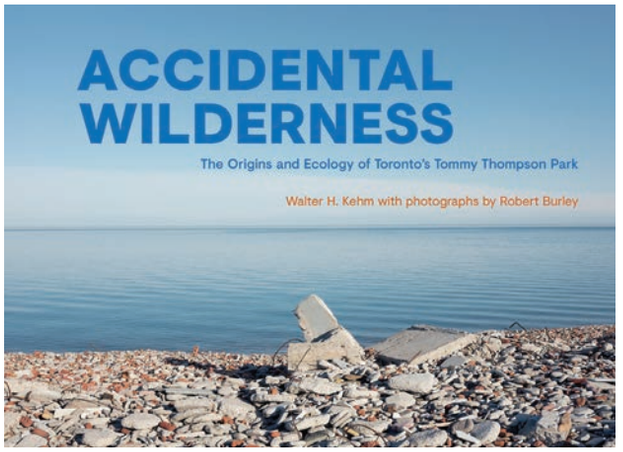


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# FROM PILES OF RUBBLE –

## THE URBAN MIRACLE OF THE "LESLIE STREET SPIT"

REVIEWED BY TINA LIU

### ACCIDENTAL WILDERNESS: The Origins and Ecology of Toronto's Tommy Thompson Park

**Walter H. Kehm, with photographs by Robert Burley**

**University of Toronto Press, Scholarly Publishing Division, 2020**

**ISBN - 13:9781487508340**

**SUBMERGING YOUR SENSES** in the wilderness of Tommy Thompson Park, also known as the Leslie Street Spit, it's hard to believe that this astonishing, timeless, natural landscape was created as a construction wasteland in the 1950s. From piles of rubble, rebar and broken concrete, the Spit has now been adopted by Mother Nature and spontaneously turned into an urban miracle, just minutes away from downtown Toronto, the largest and most populated city in Canada. I don't think a better name can be found for Walter H. Kehm's new book than *Accidental Wilderness*.

**1** BOOK COVER – SHORELINE OF THE ENDIKEMENT **2** LIGHTHOUSE POINT, 2020 R. BURLEY **3** TRIANGE POND, 2020 **4** HAWTHORN TREE ON THE TIP OF THE ENDIKEMENT, 2020
**ALL PHOTOS** ROBERT BURLEY

My first encounter with this site was about 15 years ago while I was on a site visit in the adjacent brownfield beside Lake Ontario. A flock of birds flew over my head toward the lake, igniting my curiosity and drawing me into this wildlife refuge. As I walked down the footpath to the rough shoreline, I was totally surprised by the number and varieties of birds that I saw, in the trees, by the shore and in the water. It was a fascinating experience.

Author Walter H. Kehm is an internationally recognized landscape architect, a past professor, and former director of the School of Landscape Architecture at the University of Guelph. In addition to his genuine and intriguing narrative storytelling, in *Accidental Wilderness* Kehm has also curated a collection of essays by contributors including past and present government officials, TRCA personnel, specialists, activists and a First Nation's Chief. The pages are complemented by stunning photographs by renowned landscape photographer Robert Burley, a professor in the School of Image Arts at Ryerson University.

The book begins with an enthralling introduction and a series of captivating photographs of whimsical and spontaneous artworks made of bent rebar, broken bricks and scrap metal created either by nature or by park visitors. Then follow images of mixed vegetation and landscape, from wildflower meadow, grassland, shrubbery thickets to wooded forest; from the calm lakeshore, rubble beach, lush wetland and rolling hills to the urban skyline of Toronto framed

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by untamed greenery. You can almost hear the birds singing in the trees with the sound of waves washing up on the beach in the background; subconsciously, the reader is connected to the peacefulness and tranquility of the Spit.

With his love for nature and the outdoors cultivated since his childhood, Kehm and the park seem to have a natural connection. His interests and professional training were essential to the design and development of the park. As the original designer of Tommy Thompson Park, he has provided a rich and highly informative collection of historical and technical material that documents the entire development of the site. The contents are divided into three sections: ***Epiphany, Process, and Evolution***. Each section is supported by essays written by the author and contributors, as well as associated photographs.

***Epiphany*** reveals that the original Ashbridges Bay Marsh at the base of Don River consisted of 1,000 acres of sandy bay and marshland that was once one of the largest and most productive coastal wetlands in the Great Lake system. The construction of the Port Industrial District filled and replaced the wetland by 1930. The Leslie Street Spit was first built with an Outer Harbour for Toronto in the plan. This project created a convenient site for disposing of construction waste in a rapidly growing capital city. The daily dumping and filling went on for over 20 years with trucks bringing in loads from building demolition, subway, skyscraper excavation and construction debris. The artificial landfill was formed into a roughly triangular shape of 250 hectares and stretching an impressive 5.2 km into Lake Ontario.

As the demand for a new harbour diminished, different plans for the Spit were proposed over the years. By the mid-1970s, peninsulas and embayments were created, endikement and wetland cells were formed, and a public marina was built. As nature began to reclaim the land, vegetation and wildlife made the Spit their home. Many outdoor activities started to happen in the park, such as rowing, cycling, and nature study. By this time, the Spit had drawn enough local attention that people began to realize this precious gem in their backyard needed their voices to advocate for its conservation, and the Friends of the Spit (FOS) was formed. This section includes plans of the different ideas and options proposed, including an airport, an amusement park, an aquatic park, a recreation park, a natural resource park, and a combination of mixed recreational uses. Without the efforts of the Metropolitan Toronto and Region Conservation Authority (MTRCA, now TRCA) and the advocacy of the Friends of the Spit, the park may not have survived to become a nationally recognized wildlife sanctuary with more than 300 recorded species to call home.

The ***Process*** section explicates the principles and objectives of the first design of the park by the author himself in 1986. Intricate detailed drawings and plans demonstrate the train of thoughts of the concept of conservation by design. From analyzing natural seed sources, taking into account prevailing wind and sun exposure; reshaping landform and altering drainage systems; restoring and enhancing a variety of habitats to encourage natural succession of plants, fish, reptiles, amphibians, insects, and mammals; to the management of overcrowding and invasive species. These thoughts are reinforced by the essays and data from the contributors who are specialists in the fauna and flora of the park. This section outlines the importance of natural resource management, the site research process and the integration of ecological and aesthetic values in landscape design. Any landscape architect, ecologist, environmentalist, or nature lover will find this entire section both compelling and illuminating.

The ***Evolution*** explores people's relationship with nature. Greenspaces are essential for our mental and physical health and foster social connections with others. Tommy Thompson Park has played an important role in nurturing its inhabitants and providing visitors opportunities to explore its natural wonders in this unique, secluded wilderness. It is not an ordinary neighborhood park. There is no need for play structures because the rubble, rebar, random bricks and branches invite exploration and spark imaginations. There is no need for high maintenance garden beds because there are wildflowers on the meadow, aquatic and terrestrial plants in the wetlands and ponds, and intriguing scenery all year-round. There is no need for shade structures because there are plenty of tree canopies in the park. There is no need for benches because the giant broken concrete from construction foundations have become benches for people and the rugged and bonafide rubble beaches are picturesque enough to make them linger longer. There are more different forms of human interaction with nature in this park than other green spaces in the city, and nature art can be created and appreciated in every corner. The chapter concluded with a beautiful and haunting poem: "Home," by Chief R. Stacey Laforme of the Mississaugas of the New Credit First Nation (MNCFN) (p.161).

The appendix provides more supportive documentation, such as the bird species recorded with frequency and seasonal information. Tommy Thompson Park was declared an "Important Bird Area" by BirdLife International in 2000. (p.165) There is also a comprehensive list of plant species found in the park and an image key map showing the locations of all the remarkable photographs taken by Robert Burley. I appreciate the set of comparative aerial photos of the 12 well-known urban parks from around the world, overlaying the outline of Tommy Thompson Park which illustrated how these cities can increase urban wildlife density and "Accidental Wilderness" is possible everywhere.

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# WATER IS LIFE

SHEILA BOUDREAU

**I AM FORTUNATE** to never be far from the water's edge, be it Lake Ontario, the Don River or the many lost rivers that run beneath my feet. The winding street near my home stands out in the urban grid as unique, suggesting water once flowed here. And it still does: If you stop and listen, you can hear it running through the storm drain grate 24/7. At the end of the street, there is a colourful mural with the image of Indigenous children playing in the creek painted on the rear of a building.

Looking back, moving to this location was likely not a coincidence. Throughout my education and career, water has figured prominently. When I plan and design, my heart pulls me to consider the water connections from the site to the watershed scale, the combined interactions of people on the land – either causing significant damage or creating an opportunity for ecosystems and community. What is now referred to as "green infrastructure," working with nature to help us do our work, has always really been just good landscape architecture.

Early in my career, working on creek restoration projects at the City of Waterloo, teaching students about watersheds before the community plantings, I decided to do a master's degree in Planning, focused on community-based planning for the Don River Watershed. I was fascinated to learn about what brought strangers together across political divides and cultural differences, to collaborate in planning for an immense, complex landscape, difficult to fathom at the human scale. In landscape architecture, we were taught to consider stormwater volumes and flows, how to move it from the surface effectively and safely throughout the seasons. Water as an object, although an evermoving, transforming one. I knew that this understanding wasn't the driving force behind the passions I witnessed and felt.

Years later, I was fortunate to join Indigenous Water Walkers, led by Anishinaabe Elder and water rights advocate, Grandmother Josephine Mandamin, along the edge of Niigaani-gichigami (Lake Ontario) from Scarborough to the downtown ferry docks. Elder Mandamin, from her love of Nibi (water), called for the protection and respect of water as living and as sacred. I became teary, carrying the copper pot of water as we walked past Waterfront Toronto projects I had worked on while at DTAH, thinking of the many Water's Edge Promenade trees that I had selected at nurseries, planted in healthy, generous soil in Silva cells below the granite pavers, thriving with the stormwater they received. When landscape architects use creativity and passion to develop details inspired by thinking deeply about what we do, and who we do it for, beautiful things happen. My water story continues with a fight to protect Small's Creek from degradation, due to a Metrolinx railway expansion that fails to prioritize one of the few natural tributaries and wetland complexes that remain in the heart of the city. This project has galvanized the community to unite and speak up for the ravine, once again, demonstrating how water is life.

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***Sheila Boudreau*** *is the Principal of SpruceLab, a Toronto planning and landscape architecture social enterprise consultancy focused on nature-based solutions, and supporting Indigenous initiatives and youth, and emerging professionals. She is a landscape architect and a registered professional planner with over 25 years of experience in both the private and public sectors.*

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**1** 2017 SACRED WATER WALK AT TORONTO WATERFRONT
**2** SMALLS CREEK IN EARLY SPRING WITH MARSH MARIGOLDS
**PHOTOS** SHEILA BOUDREAU

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