



PHOTOGRAPHY: COURTESY OF STANTEC | PICTURED: OPENLANDS LAKESHORE PRESERVE, STANTEC EMPLOYEES COMPLETING HERBICIDE APPLICATION TO CONTROL INVASIVE SPECIES AT A RESTORED COASTAL PRAIRIE

Restorative work

Text: R.J. Weick

Stantec is a global design and delivery firm known for its work in sustainable engineering, architecture, and environmental consulting. Headquartered in Edmonton, Alberta, with office locations across the world, Stantec has worked on projects across industries, designing solutions at the intersection of community, creativity, and client relationships to redefine what's possible. Over the years, the firm has been recognized for its award-winning work and global initiatives, one of which is quietly redefining the reciprocal relationship between people and nature, and the built environment and natural systems.

Dynamic, complex, and often painstakingly long-term, Stantec's ecosystem resto-

ration initiative seeks to enhance human, ecological, and infrastructure resilience through nature-based solutions. Its holistic and results-oriented approach plays the long game, so to speak, informed by a passionate, multidisciplinary team dedicated to re-establishing ecological function to damaged or degraded environments that ultimately benefit habitats, people, and future generations.

"Simply put, humans rely on healthy nature for our survival. We are part of the ecosystem and must interact with it in a sustainable manner," said Amy Flansburg, ecologist and project manager; Aaron Feggstad, senior ecologist; and James Melledy, senior project manager with Stantec's Ecosystem Restoration team in Madi-

son, Wisconsin, and Illinois, respectively.

To date, the Stantec Ecosystem Restoration team is backed by more than 10 disciplines and has worked on roughly 68,630 acres of land restoration across the United States, assessed and restored more than 1,130 miles of waterways, and completed projects in over 50 states and provinces. Feggstad said the societal benefits of a healthy ecosystem and ecological function really can't be understated, from hydrological and carbon cycling processes to flood protection, water quality, and the well-documented physical and mental health benefits. He also noted his own connection to the land stems from spending his formative years in a rural area being outside every day, which has under-



scored the importance of greenspace, equitable access to nature, nature play, and healthy ecosystems over the years.

“We need to protect the natural resources that we have and it is probably not enough just to protect our existing natural areas—it is certainly the most important thing we can do—but we need restoration. It is an absolute critical part of the recipe to use nature-based solutions in a way that benefits both nature and people by providing resiliency. The takeaway is that healthy ecosystems are just much more effective at providing those ecosystem services for humans than degraded ecosystems and, again, we just need more of it; more restoration than we are doing today,” Feggestad said.

“We really try to be at the leading edge of a lot of this work. We are invested in ecosystem restoration, we have developed our practice regionally, but also nationally and internationally. We gravitate toward these really challenging and large-scale, more complex, longer-term projects and that is something we take a lot of pride in, because we get to see the benefits year over year, and we get to see the impacts they make in the community,” Feggestad added.

Feggestad also noted the team embraces a mission to really design with the community in mind, working with community and interested parties to ensure there are benefits across the board—despite the temptation as an ecologist to “get very in the weeds” on highly detailed elements of the work. And when it comes to embarking on a multi-year-long project, Flansburg, Feggestad, and Melledy, or the team, said each one presents a unique set of challenges that require project-specific solutions.

“Ecosystem restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed—this could be anything from an eroded coastline and a stream impacted by urban run-off to a prairie or woodland overcome with invasive species. Their shared, overarching goal is to alleviate the impairments that contribute to degradation, damage, or destruction to rehabilitate a functional ecosystem for the benefit of people and nature. It reverses biodiversity loss that underpins the many ecosystem services that are critical for human health and well-being,” the team said.

“Our multidisciplinary team of biologists,

climate scientists, geologists, biogeochemists, engineers, landscape architects, and restoration ecologists collaborate throughout the project lifecycle. On the front end, we assist our clients and project stakeholders to develop a well-defined plan that outlines meaningful and predictable outcomes. On the back end, we monitor outcomes to evaluate success and to formulate adaptive ecosystem management plans,” the team added.

Stantec’s Ecosystem Restoration team provides services like assessment and permitting, assesses existing conditions and determines potential impacts, and eDNA or sampling the environment for DNA shed by organisms in the ecosystem without disruption. It also offers land use planning, natural capital and natural resource economics, nature-based solutions, and remediation and revitalization services. Flansburg, Feggestad, and Melledy noted they work closely with clients and interested parties to define results that are important for achieving success, and context is critical given the natural complexity of ecosystems across geographic areas, wide-range of impairments that may be present, and project-specific results outlined.



“An understanding of local ecosystems paired with a baseline assessment to document existing conditions is critical to inform design and planning. As part of this, we ask: ‘What was the ecosystem historically? What potential does the ecosystem have given the recent land use, impairments, and future anticipated conditions [due to climate change]? How can the ecosystem serve as a nature-based solution? Does that align with the desired results that have been identified to achieve success?’ We don’t want to force a design on the landscape that is ultimately not sustainable,” the team said.

“No matter the location, understanding the local setting is critical to minimize impacts to both nearby functional ecosystems and built environments. In a natural setting, we wouldn’t want the hydrologic design to restore a degraded wetland to impact a nearby functional ecosystem or ecological resource. Similarly, in a built environment, we wouldn’t want the hydrologic design to impact nearby infrastructure, whether that be a roadway, farmland, building, or trail,” the team added.

For Openlands Lakeshore Preserve in Highland Park of Illinois, Chicago Park District

in Chicago, and ComEd Pollinator Habitat Restoration in various locations in the Midwest, all three projects represent the complexity, nuance, and time often required in the restoration, rehabilitation, and ongoing adaptive management strategies dedicated to self-sustaining ecosystems. However, all three were informed by goals like the protection and stewardship of remaining high-quality natural communities such as the last vestiges of prairies, and the strategic restoration of natural communities from scratch in areas where they are not present due to historic land use. Openlands Lakeshore Preserve and Chicago Park District also sought to integrate recreational opportunities within its habitat restoration goals.

“The three projects could generally be defined as programmatic, comprise multi-year, where we work collaboratively with our clients, stakeholders, and the community on multiple ‘mini-projects’ with the overall programmatic project. In these cases, we typically provide the full life cycle of ecosystem restoration services, from baseline assessment through design, implementation, and ecosystem management,” the team said.

“For the Openlands Lakeshore Preserve, the primary vision was to protect and restore a representative portion of the Lake Michigan shoreline, bluff, and ravine environment. As such, the restoration heavily focused on enhancement of existing natural communities through stormwater improvements, stream restoration, invasive species control, native seeding and planting, and site stabilization,” the team added.

Designated a Nature Preserve under the Illinois Natural Areas Preservation Act as part of the project, Openlands Lakeshore Preserve is an ongoing effort that has included stormwater infrastructure mapping and modeling, engineering assessments, geotechnical analysis, detailed plant community mapping, rare species surveys, and shoreline management. The team noted given its location, historic land use, and the plant species and prairie, forest, ravine, bluff, and foredune plant communities, challenges ranged from addressing prior high lake levels with ongoing slumping of the bluff face, sensitive nature of remnant plant and wildlife, and ongoing public use. There was also the added challenge of the area’s previous use as a naval training and oper-



ations facility, which heavily altered the natural functioning of hydrology; and a heavy outreach component due to the run-off from nearby urban and residential areas.

“In areas that may be utilized by the public, outreach to understand what will be acceptable to site users and the local community is important to garner support and long-term acceptance of restored ecosystems,” the team said.

“For Chicago Park District, we wanted to continue to support and aid CPD in its long-standing commitment and goal of maintaining, restoring, and expanding the almost 1,900 acres of CPD’s Aquatic and Terrestrial natural areas at over 100 parks,” Melledy also added.

Chicago Park District, or CPD, is considered one of the largest municipal park managers in the nation with more than 8,800 acres of greenspace and more than 600 parks within its umbrella. CPD has partnered with Stantec over the years on a variety of projects, such as native flora management, prescribed burning management, invasive species management, and the design and construction of new natural play spaces—restoring, creating, and protecting habitats and increasing recreational opportunities for Chicagoans. Melledy noted for over eight years, Stantec has provided daily maintenance of natural areas and restored hundreds of acres by installing over one million plants,

45,000 pounds of seed, 2,200 submerged plant clusters, and more than 6,000 trees and shrubs. The firm has also expanded and converted industrial sites into prairies, wetlands, and savannas, totaling more than 300 acres, and navigated working with community groups, stewards, various funding sources, and the politics inherent to a major city like Chicago.

“CPD is adept at handling it and does a great job,” Melledy said. “CPD is committed to enhancing the quality of life in Chicago by becoming the leader in providing recreation and leisure opportunities throughout the park system. Stantec has aided in this endeavor by working closely with CPD to create, design, and install over 12 Nature Play Spaces in local communities throughout the city. Nature Play Spaces are designed for play with elements of nature to have a beneficial impact on children’s health, attention, and stress levels.”

For many young children, play and learning are inherently linked in early childhood development and often considered a major aspect of life. Play is often the vehicle in which cognitive, social, and emotional skills are developed, and researchers have studied how the quality of the physical environment in which children play can have a direct relationship with the value of explorative, active, creative, and imaginative play that they engage in with others and their

environment. This idea of play, learning, curiosity, and interaction—that more than just being in nature, but rather engaging with it and its diversity—can lead to an understanding that they are part of a larger, living system. Recognition of this has led to the establishment of organizations like Children & Nature Network, which embraces the idea that the wellbeing of children and the wild places people love are inextricably linked, and programs such as Mighty Acorns®, which is a stewardship-based education program that connects students in meaningful ways to their local ecosystem. For Stantec’s Ecosystem Restoration team, these ideas of play, interaction, and wonder are important in their work and has led to a number of partnerships that engage community members—particularly young students—in their projects.

“When appropriate, we seek out opportunities to involve people of all ages and education levels in ecosystem restoration projects. One specific way that play intersects with the ComEd Pollinator project is by including school children in our habitat creation and enhancement work. ComEd and Stantec partner with The Conservation Foundation in Illinois to get elementary school children planting plugs, collecting seed, cutting brush, and playing games specifically tailored to the prairie restoration,” the team said.



“Many of these children are initially apprehensive about stepping off the trail, but by the end of the day, they’re running around, catching insects, and asking questions non-stop. That kind of joy and play are incredibly rewarding to see for us, especially in environmental justice communities. Getting kids to love nature is our best insurance policy against ecological decline,” the team added.

Feggestad also noted Stantec will frequently partner with other organizations as well to engage interns and those entering the industry out and into the field, learning about ecosystem restoration and why it is important.

“I think there is a personal experience that everybody has with the land or with nature in general. There are piles of research showing the benefits of nature and the benefits of access to nature for everyone, and in these long-term restoration projects, what has been fascinating to see is the community response to looking at a site that has been degraded, like an oak savanna that has been overgrown with invasive brush and trees for as long as anybody can remember and you are just used to seeing it that way,” Feggestad said.

“To the average layperson, there is nothing wrong with it. It’s just trees and shrubs and greens, so it must be good, right? They

certainly can still connect with nature, because they are outside, seeing green, hearing some birds, seeing some wildlife, so they are still able to connect with nature in a degraded ecosystem. But once we restore it, get rid of the invasive brush, open it up, and have these large, beautiful, majestic open-grown oak trees, and they see the wildlife return and see all the textures, shapes, patterns, and colors of the native wildflowers that grow underneath the oaks, it’s really rewarding to hear the comments from people that they feel a boost of energy or feel safer,” Feggestad added.

While the design, plan, and implementation of nature-based solutions takes time in its own right, perhaps one of the most integral services the team provides is the ongoing, adaptive management and monitoring of habitats long after its initial work has been, on paper, completed. The team noted they manage natural communities, or the remaining vestiges of landscape characteristic of the region prior to European settlement—wetlands, prairies, woodlands, forests—and often, human intervention played an integral role in many of the Great Lakes ecosystems.

“Given the importance of ecosystem management, a management and monitoring plan with measurable outcomes is a critical compo-

ment of a successful restoration design. As such, ecosystem restoration is a core service provided by Stantec’s Ecosystem Restoration implementation and construction teams. We work in some of the rarest and most sensitive natural communities in the region, of all sizes and locations,” the team said. “We rely on principles of adaptive management to assess ongoing restoration outcomes, using data gathered from traditional ecosystem monitoring techniques as well as application of innovation technology, including eDNA and drones.”

In this area, the team provides services like seedbed preparation, erosion control, prescribed burning, vegetation management, invasive species control, and native seeding and planting. One such project, ComEd Pollinator Habitat Restoration, has included on-the-ground management and monitoring, and Stantec has been involved for at least 15 years incorporating native prairies on ComEd’s rights-of-ways to conserve and enhance the habitats to benefit pollinators, particularly bees and monarch butterflies. However, ComEd’s investment in restoring natural bee and wildlife habitats can be traced back to the ’90s when the electric utility launched its program in 1995.

“ComEd wanted to protect remnant prairie habitats on rights-of-way and connect them



PHOTOGRAPHY: COURTESY OF STANTEC | PICTURED: COMED POLLINATOR PROJECT, BLOOM OF DENSE BLAZING STAR AT COMED PRAIRIE SITE

to other habitats by restoration. These rights-of-way can serve a unique purpose in habitat connectivity between otherwise disjointed nature preserves used by pollinators and other wildlife. By protecting these narrow, high-quality sites, we're allowing wildlife to use habitats more easily throughout the heavily urbanized Chicagoland area," the team said. "By using predictive models and working with neighboring landowners and the community, our goal is to protect and create an entire network of high-quality urban habitats. The primary challenge is restoring high-quality plant communities on relatively narrow rights-of-way that may or may not have compatible land use."

The team also noted pollinators are largely responsible for some of the most recognized natural beauty and diversity of plant life on earth and can't be taken for granted. Habitat restoration, with pollinators in mind, also requires attention to plant diversity, timing of flowering, seasonal availability of those resources, and whether it is suitable for nesting, overwintering, and migrating—for both short-tongued bees and long-tongued butterflies. In the Great Lakes region, the team said the rusty patched bumble bee is one of the most famous pollinators, and considered one of 21 species of bumble bees known to

the eastern United States. Characterized by its yellow upper thorax, black spot or band between its wings, and abdominal segments that are either yellow and patched with rusty hairs, or yellow and black, the rusty patched bumble bee was listed as endangered by the U.S. Fish & Wildlife Service in 2017.

"One of the most famous factoids you might see discussing the pollinator decline is 'one out of every three bites' of our food comes from pollinators. That phrase is eye-catching for people who may not know exactly what a pollinator is, or why they are important. But it really doesn't capture enough how important the pollinator decline is," the team said.

"Food security is a really important service that pollinators provide, but pollinators—especially native pollinators—do more than that. They underpin the diversity of flowering plants; the flowers you see in your garden or in nature first evolved to be beautiful and fragrant because of pollination. Without them, many plant species would have reduced or eliminated the ability to reproduce, which could mean huge declines or extinction," the team added.

With an estimated \$200 billion value, insect pollination is a critical component to global environments, economies, and food production.

In 2022, Stantec also partnered in the United Nations Decade on Ecosystem Restoration effort that runs from 2021 through 2030. The initiative is aimed at restoring, halting, and preventing ecosystem degradation, which in turn will help provide more food, energy, and clean water to communities across the globe.

"The beauty of nature-based solutions is that the applications are endless. We can do this on buildings, building development projects, transportation projects, power energy projects, you name it, there is an application for nature-based solutions. There is really a wider recognition of that now and a mandate in some sense to integrate natural processes into engineering design," Feggstad said.

"I am a trained ecologist, so I see all the wounds of the world. And on a very innate level, we all know when an ecosystem is healthy. People can just sense it, they can feel it, they can feel the energy of the ecosystem, they can see the vibrance of wildlife. I mean, at the end of the day, when I go out to do a hike, I find the healthiest habitats I can and to see people still caring for them, people still stewarding them, to see plants and wildlife interacting the way they've been interacting for thousands of years, it's so therapeutic for me, and it honestly keeps me going," Feggstad added.