SIDECAR WETLANDS

A WILD MILE OF MODULAR PLANTERS IS A TEST CASE FOR INDUSTRIAL SHORELINES EVERYWHERE.

BY JEFF LINK

On a warm, quiet morning in September 2018, Michael Skowlund, ASLA, peered down at the churning water in the North Branch Canal of the Chicago River. With at least a three-foot drop from where he stood atop a corrugated sheet-pile wall to the water's surface, there was no way he was going to drop in his canoe and risk the jump.

Accompanying him were Rachel Momenee, Affiliate ASLA, then a senior urban designer at Skidmore, Owings & Merrill (SOM), and Allie Hubert, a former colleague at the design and innovation firm Omni Ecosystems, where Skowlund is the director of landscape architecture.

A short distance upriver, near a rowing shed, the three spotted a hole in a barrier fence. Skowlund crawled through, dragging behind him the green fiberglass canoe he and his father had taken out in Wisconsin hundreds of times. The others jumped the fence and followed. After putting in at the boat launch, they began the first of several trips to catalog the edge conditions of a half-mile-long canal, flanked by sheet-pile walls, boulders, and eroded, sparsely vegetated edges.

Much has changed since that inventory of the shoreline four years ago. Now the eastern shoreline of the North Branch Canal east of Goose Island is defined by an archipelago of modular floating habitats designed by Urban Rivers and installed, in part, by volunteer teams comprising SOM, the Shedd Aquarium, the British International School of Chicago, and the National Geographic Society. The modular system includes heat-treated pine walkways that rise and fall with the wake, and floating polyethylene pontoons wrapped in coconut husks and linked together by stainless steel flanges.

ABOVE
A public boardwalk runs alongside floating planter beds along the Wild Mile in Chicago.

DAVE BURK

WILD MILE PLAN

1. WEED ACCESS POINT
2. EXISTING RIVERWALK
3. CONTINUOUS WALKWAY FROM EASTMAN TO WEED
4. VIEWING PIERS
5. EXISTING ACCESS RAMP
6. KAYAK LAUNCH
7. PLANNED LEARNING DOCK
8. MURAL
9. FLOATING HABITAT AND NATURALIZED SHORELINE

Situated along the edge of a 1,260-foot-long steel-lined bank that extends from a Whole Foods to an REI store, the rafts are planted with native wetland species—sedges, swamp milkweed, hibiscus—whose feathery root systems extend beneath the water to draw in nutrients and attract fish to feed and spawn. Alongside the most recent addition, a 400-foot-long floating boardwalk, a submerged bunker is stocked with roughly 100 giant floater mussels *(Pyganodon grandis)* that are fed oxygen by solar-powered pumps. The mussels, capable of filtering an estimated 365,000 gallons of water per year, are part of a growing wetland ecosystem that includes more than 10,000 new plants representing 50 wetland species.

"We want to transform the river from being an old industrial relic to a natural habitat and park space," says Nick Wesley, one of the three founders of Urban Rivers. "A magical place where the attraction is not just amenities; the attraction is wildlife."

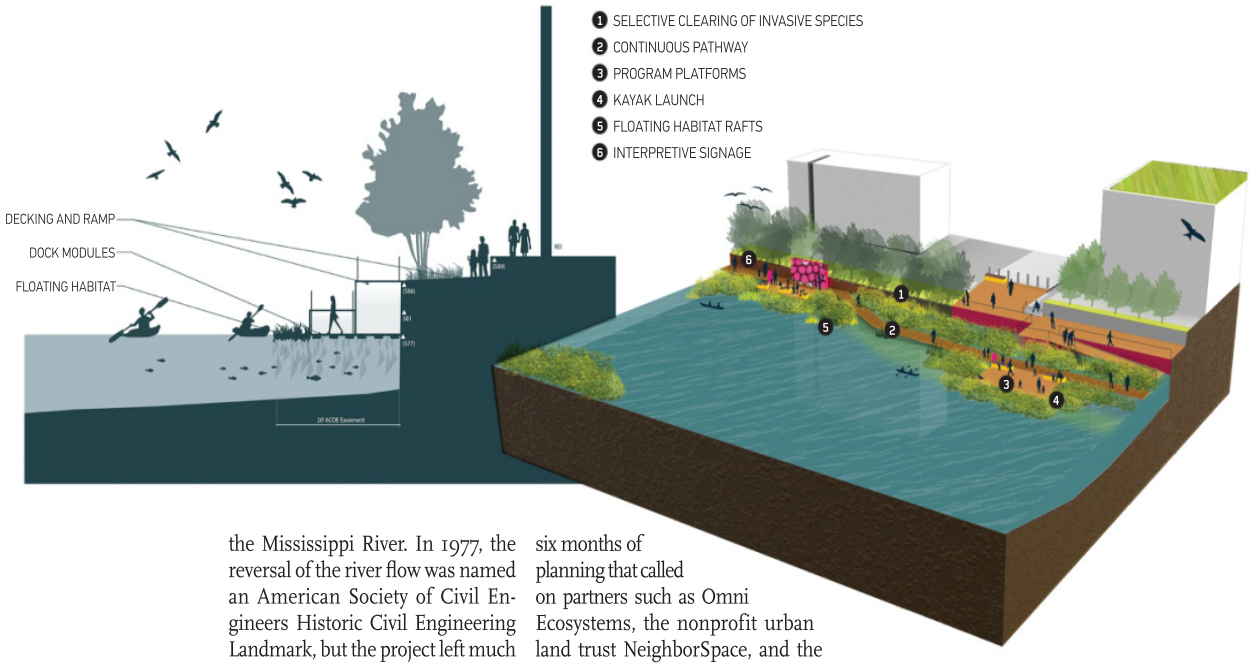
BELOW
Originally built to accommodate shipping vessels, the Chicago River's North Branch Canal is lined with concrete, timber, and sheet pile.

For Skowlund, the emphasis is on increasing access. "A lot of it becomes a study in section because the city level is sort of a story above the water level."

Floating plant beds exist in a handful of U.S. locations. Baltimore's Inner Harbor outside the National Aquarium, the Charles River in Cambridge, Massachusetts, and the shoreline of Seattle's Duwamish River estuary are among the best known. But Chicago could represent a particularly revealing test case for the scalability of the modular systems, which in essence create land where there was none. For decades, city agencies, civic and nonprofit organizations, and local communities have been working to clean up the Chicago River by improving stormwater conveyance and disinfecting systems, naturalizing shoreline edges, and building parks and trails that increase public access to the river. Since 1974, shortly after passage of the Clean Water Act, when the Metropolitan Water Reclamation District of Greater Chicago (MWRD) began collecting fish samples, documented species have jumped from 10 to 77.

Yet the legacy of a channelized river that once thronged with cargo ships, and in 1900 saw its direction reversed by the Sanitary District of Chicago (now MWRD), confounds efforts to provide public access and restore healthy aquatic habitats, Skowlund says. To protect the water quality of Lake Michigan, the city's drinking water source, the agency built a 28-mile canal that redirects the flow of water—and sewage—away from the lake and south toward

SKIDMORE, OWINGS & MERRILL



ABOVE
The *Wild Mile Framework Vision* includes plans for a continuous riverwalk at West Eastman Street.

BELOW
Josh Yellin, a cofounder of Urban Rivers, stands before the first floating habitat installed in the Chicago River.

the Mississippi River. In 1977, the reversal of the river flow was named an American Society of Civil Engineers Historic Civil Engineering Landmark, but the project left much of the river cut off from the shoreline, severing the natural ecological transition between land and water and impeding public access.

"The interesting thing is how this park was created, really, from nothing," says Doug Voigt, an urban design and planning partner at SOM, which led the development of the 170-page *Wild Mile Framework Vision* plan. "By that, I mean it was built without purchasing real estate; it comes through agreements. I'm sure this has been done elsewhere, but the fact that this park has no title was incredibly exciting, because it could unlock potential not only in other parts of the Chicago River, but industrial waterfronts around the world."

For the 17-acre vision for the Wild Mile, SOM led six months of planning that called on partners such as Omni Ecosystems, the nonprofit urban land trust NeighborSpace, and the local community organization Near North Unity Program to lead a series of community meetings. The resulting framework, recognized with an ASLA Illinois Honor Award for Planning and Analysis in 2019, articulated the scope and dimensions of the project and sketched out a road map for the implementation of the first of three planned phases: the construction of the floating gardens and boardwalk from West Eastman Street to West Weed Street, roughly half of which is finished.

The modular design allows for gradual implementation of six proposed river edges that meander, like connected honeycomb cells, along a half-mile stretch of riverfront from West North Avenue to West Chicago Avenue.

"We were really interested in the geometries of the floating puzzle pieces and emphasizing more diverse edge conditions," Skowlund says. "So instead of having just straight lines, actually jagging that edge where the floating element meets the water. Microorganisms, all the way up to charismatic megafauna, benefit from a maximized edge condition."

But that expansive vision began with a much smaller idea. The first floating raft Urban Rivers introduced in the canal was charmingly crude: a "five-by-ten, mattress-sized Brillo pad" made of foam tubes, Wesley told me. "Pool noodles, basically." Cofounder Josh Yellin, then a student at the University of Illinois and now a chief of staff at Google Brain, was studying the modular fish habitat as part of his master's thesis project. During his investigation, he noticed something curious happening: The raft was attracting more indigenous fish species, such as bluegill and spotfin shiners, than the open water surrounding a nearby dock.

Confident the rafts could be deployed on a larger scale but lacking the money and regulatory approvals to do it,

SKIDMORE, OWINGS & MERRILL, TOP; NICK WESLEY, BOTTOM LEFT

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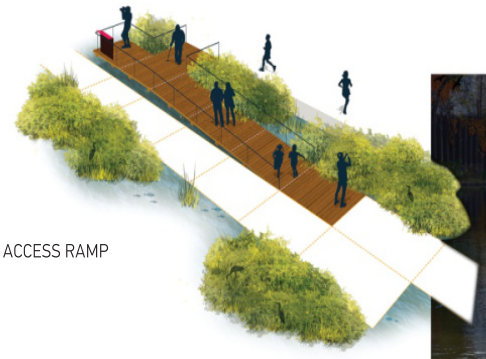

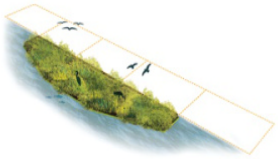

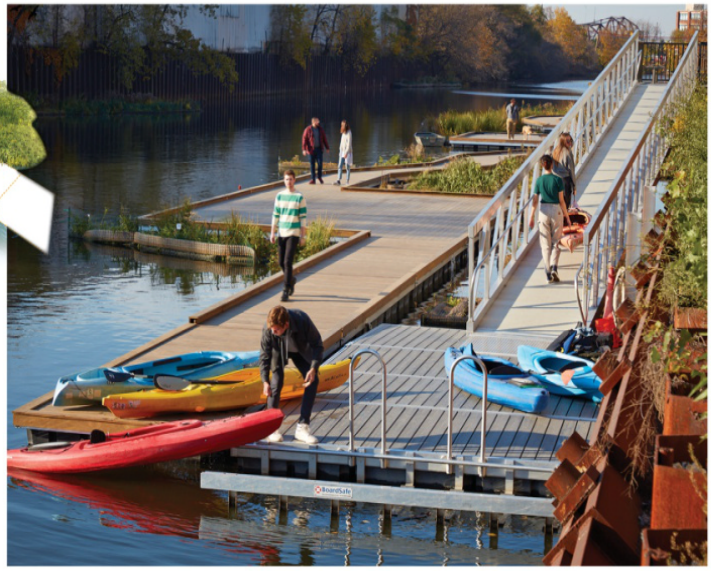

TOP RIGHT
A ramp leading from the street grade to the river level allows public access to a kayak launch and the Wild Mile boardwalk.

the three founders, Wesley, Yellin, and Zachary Damato, who is now the chief operations officer at the plant-growing technology company Niwa, started emailing Chicago architecture firms seeking help to formalize a design plan. No one was biting, but at last Voigt and his colleague Phil Enquist, Honorary ASLA, a consulting partner at SOM who now serves on the City of Chicago Rivers Governance Task Force, agreed to take a meeting.

Urban Rivers came into SOM's office assured of their vision but lacking design expertise. They won Voigt's interest with evidence of their Kickstarter funding (to date, $28,984 from 368 funders) and the modularity of the floating structures. Their vision also aligned with one of the goals in the Chicago Central Area Plan, prepared by SOM and adopted by the city in 2003: to create "continuous public access along the river."

The boardwalk and floating habitats represent an incremental step toward that goal, and they also appear, within a limited range, to promote species diversity. In 2019, Austin Happel, a research biologist who runs a research program at the Shedd Aquarium focused on urban freshwater ecosystems, identified 10 species of fish spawning near the islands, including several he says do not appear elsewhere in the North Branch of the river. Rowing out in small boats at twilight, he and his research team set clover-leaf-shaped fish traps lit with rechargeable LED lamps to attract fish within a 30-meter radius. An hour later, they retrieved the traps and compared the fish they found with those caught in pole nets upstream and downstream.

A multiyear study will provide a more comprehensive view of what is attracting the fish, but the appearance of native species, such as bluegill, spotfin shiners, and golden shiners, is a preliminary indication that the Wild Mile may be better suited to support fish populations than other areas of the Chicago River.

"We have about five sites where we go each week throughout the summer and try to collect larval fish. We don't get very many, and usually we only get common carp. At the Wild Mile, though, we're getting [more].... There seems to be at least a lot more zooplankton right next to the islands," Happel says.

SKIDMORE, OWINGS & MERRILL, LEFT; DAVE BURK, RIGHT

ABOVE
Floating pontoons are wrapped in coconut husks and secured inside polyethylene mesh. They contain a lightweight clay aggregate that allows plants to establish root systems beneath the water.

JEFF LINK

One possible explanation for the spawning is that the floating rafts offer shade and shelter to protect adult fish against predation, while assisting in reproduction. "Fish species like to spawn on something," Happel says. "Often we'll see fish broadcast eggs over a downed tree limb, submerged vegetation, or a bunch of leaves on a tree that's hanging into the waterway. And so these [rafts] sort of provide that structure."

A food chain effect may also be at play, says Peter Nagle, the curator of aquatics at the Chicago Botanic Garden. Grown in a soluble lightweight expanded clay aggregate, plants on Wild Mile rafts take root in coconut fiber and colonize, sending out dendrite-like rhizomes that add biomass beneath the water. These extended root systems, Nagle says, offer habitat for bacteria and periphyton that feed the zooplankton that fish eat.

Moisture-tolerant sedges *(Carex comosa, Carex stipata)* and grasses *(Panicum virgatum)* spread particularly well underwater, while sucking up nitrogen and phosphorus—nutrients that, in excess, can create algae blooms and oxygen-deprived dead zones. When nutrient levels are kept in check, it's easier for fish to survive and grow.

In a study published in the journal *Hydrology,* Eric Peterson, a professor of geology at Illinois State University, and Phil Nicodemus, the director of research at Urban Rivers, found that during the growing season, concentrations of nitrogen and phosphorus in water samples collected near the floating wetland were 7 and 6 percent lower, respectively, than samples collected in open water upstream and downriver.

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—DOUG VOIGT

So far, about $1.5 million has been spent on the Wild Mile. To connect the boardwalk near the REI store to the islands at Whole Foods and expand research efforts—a goal the team has set for 2023—more money is needed. But Urban Rivers has found money in the past, and Wesley is confident they will find the dollars to keep building, ultimately creating a flourishing habitat that will serve as a model for landscape architects and urban designers elsewhere.

"The concern with the legacy of our industrial past is not isolated to Chicago," Voigt said, echoing Wesley's sentiment. "Many cities throughout the Midwest have this context. And, at the same time, all these cities—Milwaukee, Detroit, Cleveland—are rediscovering their waterfronts. A modular system and approach that provide a light touch but huge benefit by putting public access along the waterways could be adapted around the country." ●

JEFF LINK IS A JOURNALIST BASED IN CHICAGO. HIS WORK HAS APPEARED IN *FAST COMPANY, DWELL,* AND *ARCHITECT,* AMONG OTHER PUBLICATIONS.