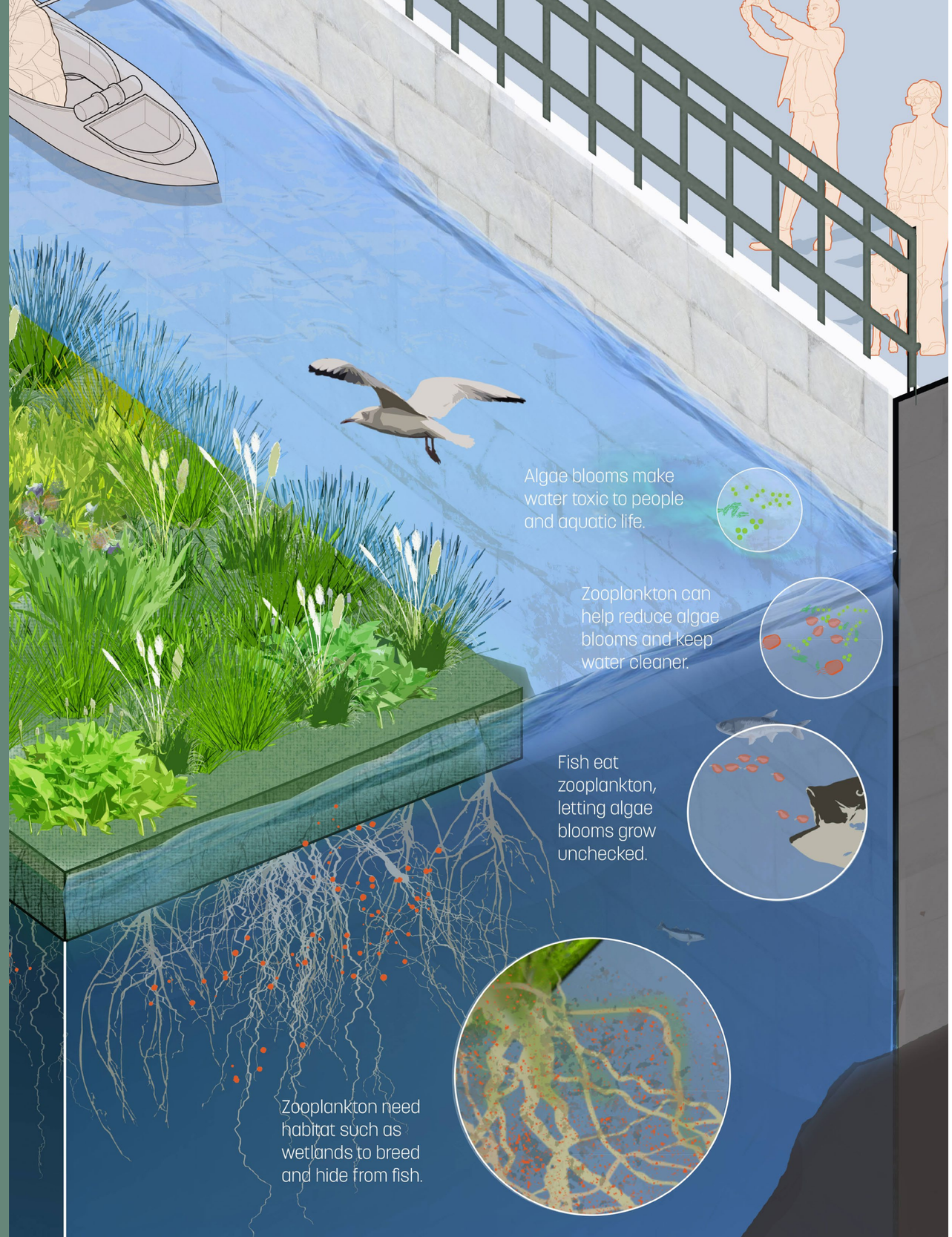
# Sasaki Foundation

## 2018-2019 DESIGN GRANTS RESEARCH

Sasaki
Foundation




# Charles River Floating Wetland

Max Rome, Vanessa Nason, Penelope Taylor, Laura Jasinski

EXECUTIVE SUMMARY

**By installing a floating wetland on the Charles River, the team plans to create a visually impactful statement about missing habitat, to engage the public in an important conversation about the relationship between ecology, pollution, and water quality, and to conduct unique research that can be used to design and size future installations in order to curb harmful algal blooms through increased herbivorous control.**

The Charles River Floating Wetland, an initiative of the Charles River Conservancy (CRC), will be the first project of its kind in Greater Boston. An important aspect of this project is the role that it will play in informing future work by serving as a case study for designers and river advocates and as a point of reference for regulators unfamiliar with a project that does not fit easily within the typical permit process.

The floating wetland island will be assembled from self-buoyant modules, which will be roughly 57 feet by 19 feet when assembled and will be anchored to the bottom of the river. The island will be planted with a variety of native wetland plants. Those plants will grow through the matrix, their roots reaching into the water to serve as additional habitat for microscopic zooplankton. A research program will examine whether the additional habitat has a meaningful impact on zooplankton species distribution and size. Because zooplankton can be efficient grazers of cyanobacteria, supporting their population could provide another tool for controlling harmful algal blooms.

On a fundamental level, the health of the Charles River is an issue of equity. As recently as the 1950s, the banks of the Charles River were a public space where, during the hottest days of the summer, families of all incomes and backgrounds gathered to swim and cool down. The hope is that this project will contribute to the restoration of the Charles River and that this installation will help visitors to imagine a future in which plantings and restored ecology lead the way to a river that is healthy, safe, and swimmable.

◂ *Floating wetland concept graphic | Charles River Floating Wetland in partnership with Sasaki*


▲ *At the Kendall Square Challenge, a CRC staff member explains the ecological concepts behind the floating wetland | Flavio D. Photography*

## COMMUNITY

The community for this project is broad and diverse. Engagement, one of the project's main goals, has occurred from the beginning, looking to reach different segments of that community.

One group is composed of state agencies with missions that oversee and influence the Charles River, including the Massachusetts Department of Public Health, Massachusetts Water Resources Authority, and the Massachusetts Department of Conservation and Recreation.

A second group is other river advocates, whom the team connected with through meetings and panels to share the project and gather insights.

The third and most important community is the public. This project aims not only to study and improve an important public resource—the Charles—but also to educate about and engage around it.

Through many engagement opportunities, the team has discussed this project with each group, including the reasons for it, and what the team will study. Installation will serve to deepen and further this work with the community.

## STAKEHOLDERS

The project involved the following stakeholders.

- Massachusetts Department of Environmental Protection, a regulatory agency interested in the health of the river
- Cambridge Conservation Commission, the regulatory agency that oversees the Wetlands Protection Act
- Boston Conservation Commission, which may see similar project applications in the future
- Massachusetts Department of Conservation and Recreation, which owns the project site and provides access and permission for construction, installation, and research
- Massachusetts Department of Public Health, which issues water-quality related public health advisories that may be informed by research conducted as a part of this project
- Design community, to promote placemaking and interesting design
- Watershed community, with a strong interest both in river health and potential interventions
- Potential program partners that provide educational services and community engagement, which include, among others, the Museum of Science, Cambridge Public Schools, CitySprouts, and Boston Duck Tours

**ANALYSIS**

**48**

**days each year recreational activity is restricted by algal blooms**

**OUTREACH**

**7**

**events for public outreach and engagement**

**DESIGN**

**800**

**wetland plants selected for the island**

**ECOLOGY**

**20+**

**native species represented on the island**

▲ *Team member Laura Jasinski speaks at the Sasaki Foundation Speaker Series: Resilience Through Climate Adaptation and Water Management, part of the Cambridge Science Festival, April 2019 | Sasaki*

## IMPACT

During the design and permitting process, the team engaged numerous state agencies to have meaningful discussions about improving the health of the river. Navigating the permitting process will ultimately lead to the installation and realization of the goals for the wetland. The expectation is that it will also pave a path for other novel ecological interventions, thus providing an even broader impact.

Engagement opportunities encompass both a short- and long-term range. Through the Cambridge Science Festival, the team reached two different audiences: designers who attended a water panel at the Incubator at Sasaki one evening, and those who attended a family-friendly STEAM event on a weekend. The team developed an ecological tag game for participants of the Kendall Square Challenge, which can be adapted to other venues like school groups. At the Climate Action Extravaganza area of the Cambridge River Arts Festival, the team developed and utilized a card game to demonstrate habitat and food chain concepts. These events have provided great conversations, which will inform future lessons and communications, and will also be enhanced through the physical example of the wetland once installed.

Overarching all of this is the long-term ecological goal on the health of the river itself through research. While this installation will not solve the river's challenges, it will provide valuable information that can aid the team and others in implementing solutions.

## COMMUNITY AWARENESS

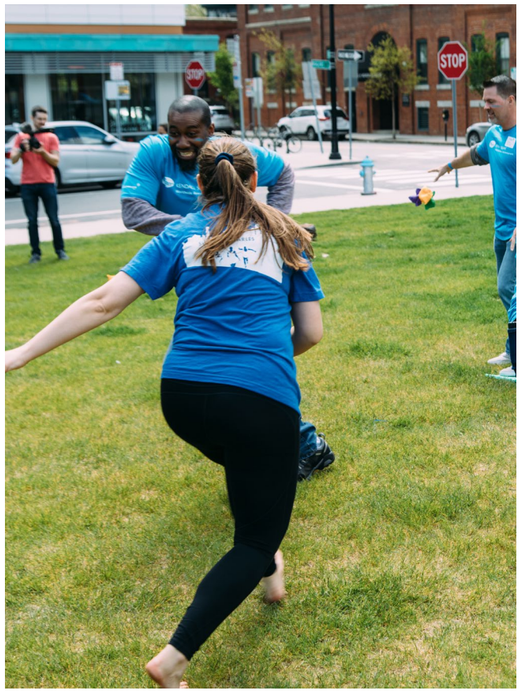
The broad segments of communities encompass state agencies, water and river groups, and the public. Because a central component of the project has been engagement and meetings, each of these groups has had the opportunity to learn about the project's impacts.

The team met with numerous state agencies and will continue to do so through the remainder of



◀ *CRC staff demonstrate the river food chain through a card game at the Cambridge Arts River Festival, June 2019 | CRC*

▼ *Participants at the Kendall Square Challenge play an ecological tag game with CRC staff, May 2019 | Flavio D. Photography*




permitting, once the wetland is installed, and when there is research to share. The team intends to continue the dialogue with other river groups to share lessons from permitting the floating wetland, as well as the data gathered once it is in place.

Finally, the team is grateful for the opportunities it has had to engage the public on the project, but recognizes there are many more people to reach. The team looks forward to learning from those experiences and expanding their reach.

## PROJECT VISIBILITY

As of June 2019, the project is visible through public presentations, stakeholder meetings, and public permit submissions and hearings. The CRC has featured the project in a number of its e-newsletters, social media posts, and on its website. A website dedicated to the floating wetland, developed during the grant cycle, provides more detailed information on the project and water quality issues in the Charles (www.charlesfloatingwetland.com).

Once installed, the project will be more physically visible to the community. Part of what makes this project so exciting is the opportunity to demonstrate the ecological concepts through placemaking. Not only will the island be visible from adjacent North Point Park, but also from the surrounding buildings, the Green Line Lechmere Viaduct, and from kayaks and Duck Tours (with whom the team met so they are aware and can point it out). Planned signage will inform observers on what the floating island is and will direct them to more information.

## COMMUNITY MILESTONES

Because the project's community shares a desire for the Charles to be a healthy ecosystem, the planning, permitting, and engagement that has taken place to date has already supported similar ideas that agencies and other environmental non-profits would like to see.

Once installed the Charles River Floating Wetland will be a reference project for others in the region. This was something the team had not considered when beginning the project but was really highlighted

in many of the meetings with regulators. Floating wetlands are a tool that many have heard of and have curiosity about, but local examples and well-documented case studies are lacking. In meetings with local agencies, the team learned about previous interest in installing floating wetlands to aid in protecting reservoirs from roadway runoff. The team heard from local watershed groups who are interested in these types of projects, and for whom the floating wetland hopefully can provide a road map for similar new interventions.

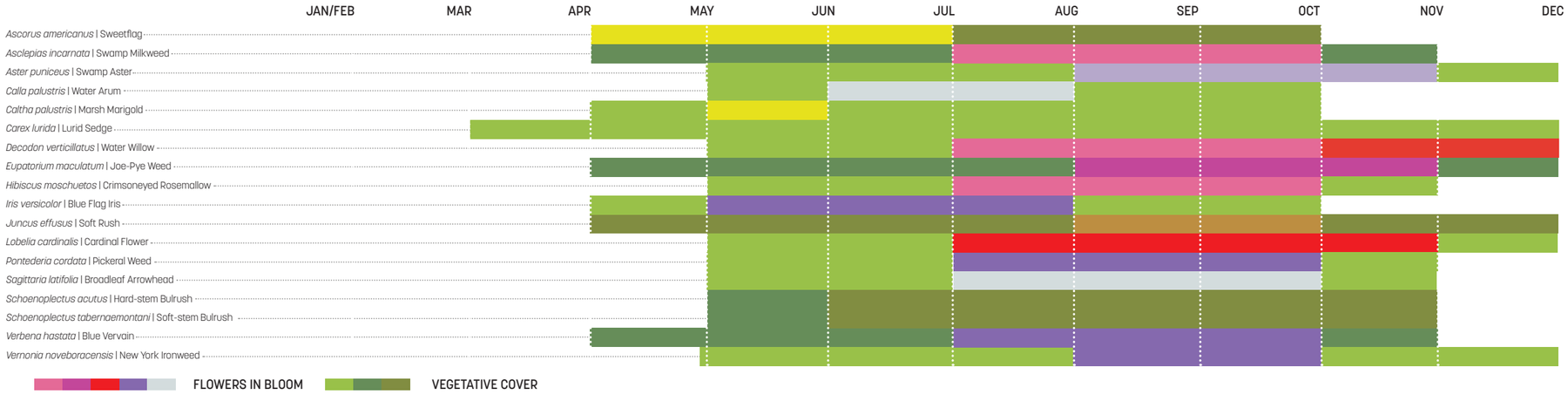
## ALIGNMENT WITH THE FOUNDATION

The Sasaki Foundation positions itself at "the intersection of research, practice, and community." Once installed, the floating wetland will be a living exemplar of these three elements. This project is unique because of the way that science, design, and public education are all wrapped up together. Each element supports the others and contributes to the success of the whole. In keeping with the mission of the Sasaki Foundation, this is a public project that will enable any park visitor to learn more deeply about the challenges facing the river. At the same time, the project may be recruiting a new generation of advocates who understand the role that restored ecology has to play in safeguarding the health of the river.

The team's hope is that this project will start many conversations about what is next, what it would mean to take these ideas to scale, and how similar ideas and bold interventions might be applied across the Boston area to help make our cities more livable and more resilient in the face of changing climate. These are conversations that have been elevated through the work of the Sasaki Foundation.

# PLANTING STRATEGY

**GOALS** for plant selection include (a) maximizing roots for habitat, (b) creating a visually captivating design, and (c) selecting varieties appropriate for the growing conditions.





*Asclepias incarnata*


*Aster puniceus*


*Calla palustris*


*Caltha palustris*


*Carex lurida*


*Decodon verticillatus*


*Eupatorium maculatum*


*Hibiscus moschuetos*


*Juncus effusus*


*Lobelia cardinalis*


*Pontederia cordata*


*Sagittaria latifolia*


*Schoenoplectus acutus*


*Schoenoplectus tabernaemontani*


*Verbena hastata*


*Vernonia noveboracensis*

***Planting strategy | Charles River Floating Wetland in partnership with Sasaki***

## NEXT STEPS

The team's time in the Incubator at Sasaki coincided with design, fundraising, and permitting. While a major milestone was achieved during the hearing with the Cambridge Conservation Commission, there are a few permits and agreements to be obtained before installation. The team is continuing to make progress to install the island in spring 2020. A community event is anticipated to allow the public to see the island product up close, learn about native wetland plants, and help plant the floating wetland matrix before installation.

Planned signage will be visible to the public from North Point Park. Visitors who want more information can visit the website and attend events and talks describing the purpose of the installation and the ecology of the river. The team hopes to expand programming each year. The project team has met with curriculum developers and will explore opportunities to engage school groups around the floating wetland.

Sampling on the river has already begun and once the island is installed, researchers will measure changes in zooplankton abundance, species composition, and mean body size. The team will take baseline data in summer 2019, which will be supported by two more years of data collection in 2020 and 2021. Each year the team will share information learned from both the logistics of installation and from ongoing research in a meeting with the Cambridge and Boston Conservation Commissions. These reports will be made public and accessible through the project website.


▲ *Charles River Floating Wetland design charrette in the Incubator at Sasaki | Sasaki*

## SPONSOR ORGANIZATION

Established in 2000, the Charles River Conservancy (CRC) is a 501(c)(3) nonprofit organization dedicated to the renewal and active use of the Charles River parks from Boston Harbor to the Watertown Dam.

The Conservancy works in partnership with the Massachusetts Department of Conservation and Recreation (DCR), the managing agency of the parks and parkways, as well as the Massachusetts Department of Transportation (MassDOT), the managing agency of the historic bridges that traverse the Charles.

Each year, the CRC works with approximately 2,000 volunteers to renew and maintain the Charles River parks. The Conservancy also collaborates with other organizations and coalitions to advocate for increased state funding to enhance the landscape, structures, paths, and amenities of the Charles River Basin.

A leader in forming public-private partnerships, the Conservancy has successfully leveraged funds for many projects that make the parks more active, attractive, and accessible for all. This includes building the popular Lynch Family Skatepark, organizing volunteer park maintenance events, hosting community river swims, and working to build a Charles River Swim Park.

## STAY CONNECTED

www.charlesfloatingwetland.com

www.thecharles.org

CharlesRiverConservancy

@charlesrivercrc

@CharlesRiverCRC



## RESEARCH TEAM

### Max Rome

Max Rome is a PhD candidate in environmental engineering at Northeastern University. For two summers, Max conducted daily water quality testing at North Point Park sponsored by the Charles River Conservancy. His research focuses on harmful algal blooms and understanding the role that increased trophic interaction can play in curbing eutrophication.

### Vanessa Nason

Vanessa Nason is the Charles River Conservancy's Project Manager, focusing on operations of the organization and shepherding its river swimming initiative. Vanessa has a graduate degree from Georgetown University. Her prior experience includes administration at an architecture firm and program coordination at an urban planning foundation.

### Penelope Taylor

Penelope Taylor designs and manages digital and analog interpretation resources, installations, and games for science and art education, focusing on river ecology for the Charles River Floating Wetland. She has curated science communication exhibitions at the Harvard Forest Fisher Museum and the Somerville Museum. She is also a community and labor organizer.

### Laura Jasinski

Laura Jasinski is an urban planner with over ten years in development and activation of urban open space, including at the Trustees of Reservations and the Rose Fitzgerald Kennedy Greenway Conservancy. As the Charles River Conservancy's Executive Director, she is continuing the legacy of improving the Charles River with projects like the Floating Wetland.

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