Charles River Floating Wetlands

A collaboration of the Charles River Conservancy, Max Rome, Ph.D Candidate, Northeastern University, and Penelope Taylor Studio

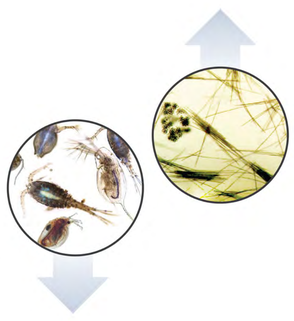
WHY ?

History

Before urban development, the Charles River was a free-flowing tidal estuary. A complex habitat of wetlands and mud-flats surrounded the main channel and supported a diversity of species including shellfish, migratory birds, and anadromous fish.

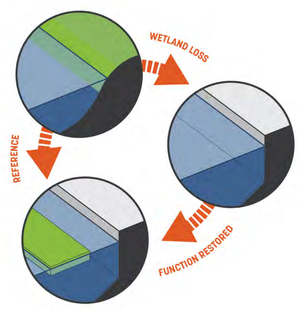
Urban Condition

Today, the Charles' lower basin is a typical urban waterbody. Dams maintain a near-constant water level and hardscape covers much of the watershed. Wetlands and littoral vegetation are largely absent.



Challenges

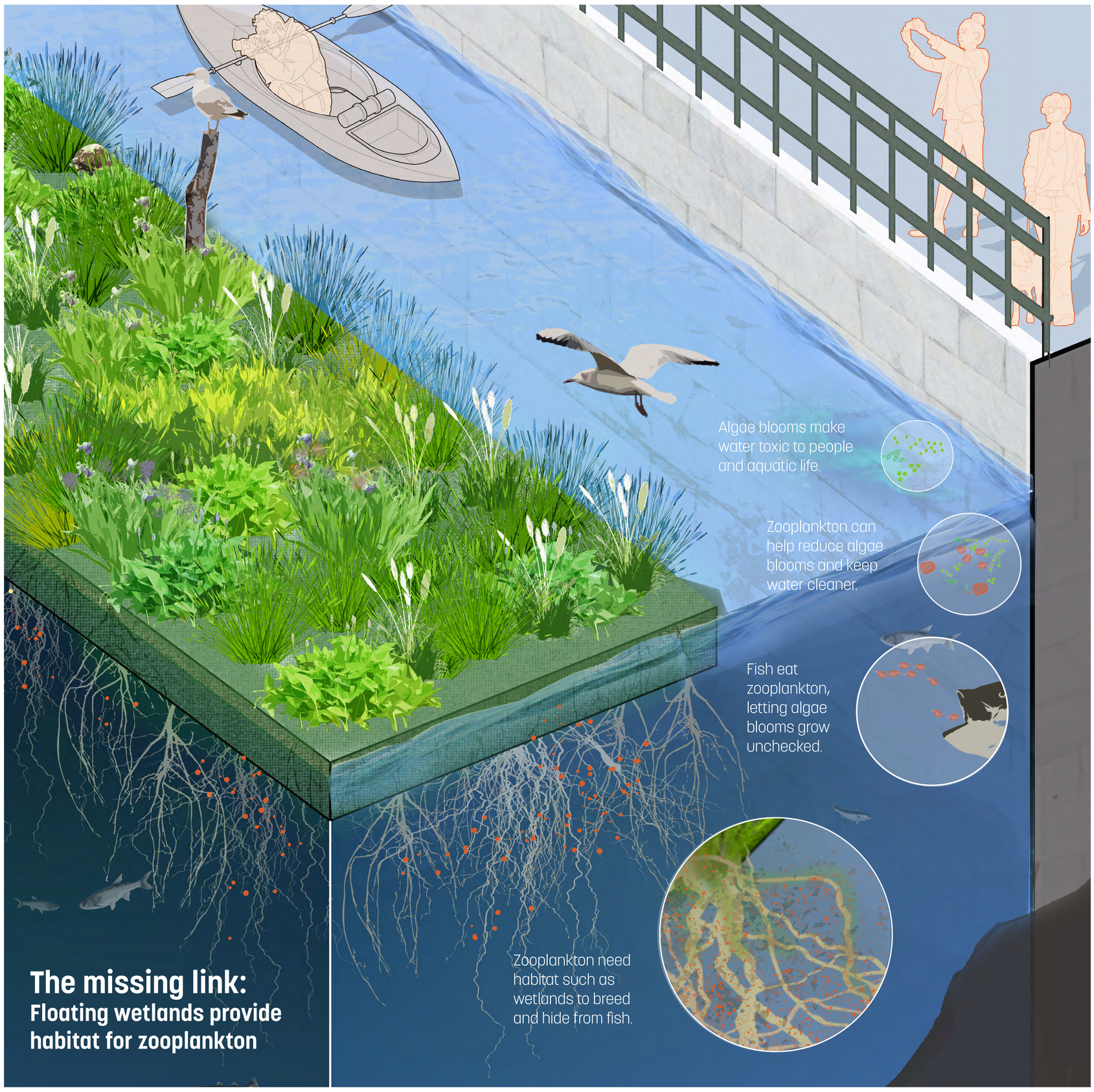
Nutrients, carried by rainwater running off the city streets, act as fertilizers fueling the growth of algae. Ecological feedback loops exacerbated by the lack of wetland vegetation result in frequent algal blooms and depleted zooplankton populations.



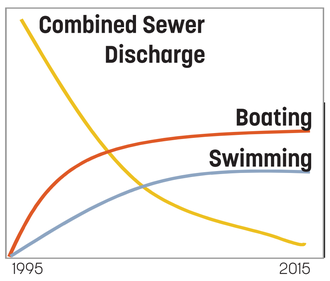
Intervention

Floating wetland roots reintroduce plant habitat, providing zooplankton refuge from predation. This process can locally increase zooplankton populations to aid in the control of algal blooms and help restore ecological balance.

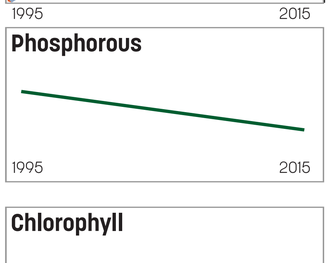
FLOATING WETLANDS CONCEPT



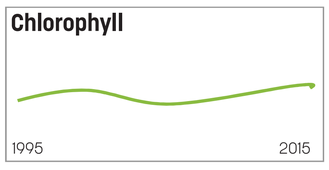
WATER QUALITY



The virtual elimination of combined sewage overflows have resulted in rapid improvement of bacterial water quality.



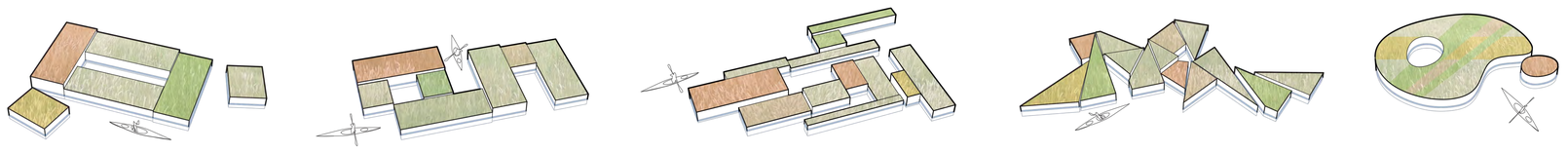
Phosphorous concentrations have decreased but remain elevated.



Chlorophyll, commonly used to assess the ecological health of a waterbody, is more then double the target set by MassDEP.

SCENARIOS

MULTIPLE CONFIGURATIONS of wetlands are possble building from 600sf of material in rectangular blocks or custom organic shapes



PROGRESS

SUMMER NEU researcher imagines insitu experiment for controlling cyanobacteria

WINTER Various designs take shape to address a range of installation timelines, from a streamlined permitting process to more complex implementations.

2017

JUNE Charles River Conservancy and Northeastern University collaborate on daily testing of E.coli and cyanobacteria at North Point Park

2018

FALL Team plans Floating Wetland (FW), receives Sasaki Foundation Design award, and meets with stakeholders and permitting agencies.

2019

SPRING: Volunteers install FW. Educational signage and engagement events take place with local groups and schools.

2020

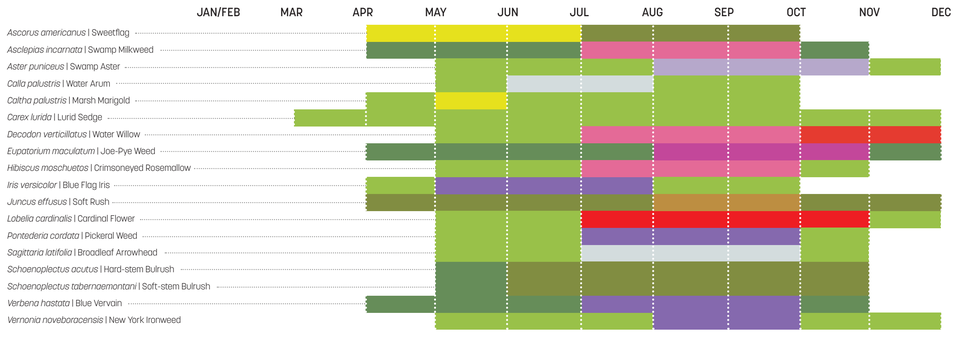
THROUGH FALL FW is in place for 3 years, allowing for data collection. It is moved to a winter location for preservation.

2021

LOOKING AHEAD: Three years of data will quantify the impact of FW on zooplankton size, concentration and diversity. This data can evaluate the feasibility of controlling algal blooms through enhanced herbivory (e.g., more and bigger zooplankton eat more algae!).

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.



Sasaki Foundation