

# **Green Lake Floating Ecosystem Project**

## **FOGL Meeting Update**



**Rob Zisette**  
**March 23, 2021**



**Friends of Green Lake**



# Presentation Outline

- Background
- Benefits and Examples
- Conceptual Design
- Costs
- Funding



# Project Background

**Taiga Hinkley Donation of \$9,000**

**Additional Donations of \$6,000**

**Started with Projects on FOGL To-Do List**

**Evaluated Alternative Projects at FOGL meetings and selected:**

**1. Floating Treatment Wetlands**



**Friends of Green Lake  
Green Lake  
“To Do” List  
July 20, 2016**



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Copies of this document are available on FOGL's website.



# Floating Treatment Wetlands

## Background

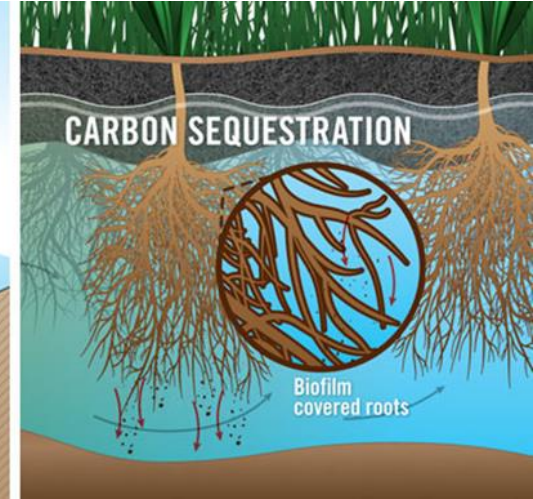
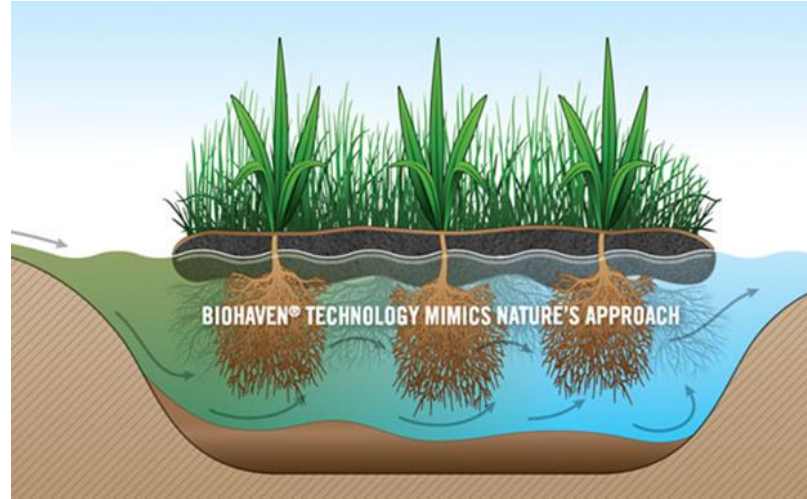
Inexpensive and easily constructed wetland habitat that mimics floating bog mats

Mat provides waterfowl and fish habitat without land cost and plant loss

Root biofilm takes nutrients from water reducing algae blooms and supporting invertebrates for fish food

Three types:

- Traditional Commercial
- Homemade
- Biomatrix Water



# Floating Treatment Wetlands

Traditional – Floating Islands International



**Fish Fry Lake, Montana**



**Westown Lake, Pennsylvania**



# Floating Treatment Wetlands

Traditional – Floating Islands International



**Barrington Stormwater Pond, Illinois**



**Baton Rouge, Louisiana**



# Floating Treatment Wetlands

## Homemade Versions



**King County Brightwater WWTP  
Stormwater Ponds, WA**



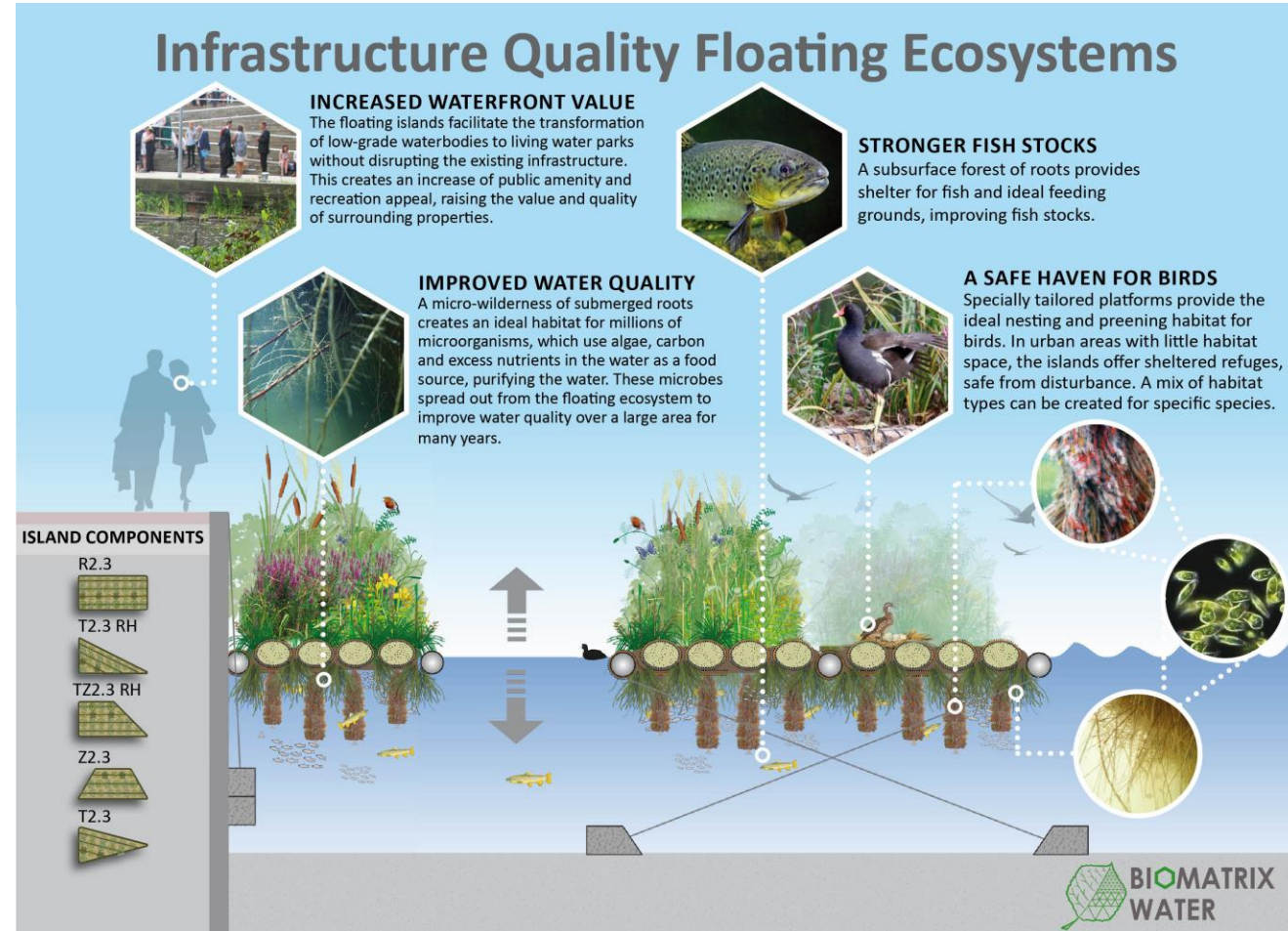
**Spokane River, Stevens County, WA**



# Floating Treatment Wetlands

## Biomatrix Water Floating Edge and Active Island Ecosystems

- High buoyancy, strength (2,500 kg), and longevity (>>20 years) of HDPE tubing and stainless-steel connections
- Design flexibility with 5 interlocking shapes and quick-connect SS flanges
- Recycled HDPE structure and coir matrix with zero waste production
- No microplastics, phthalates, PVC, or polyurethane foam
- Increased nutrient uptake with media columns

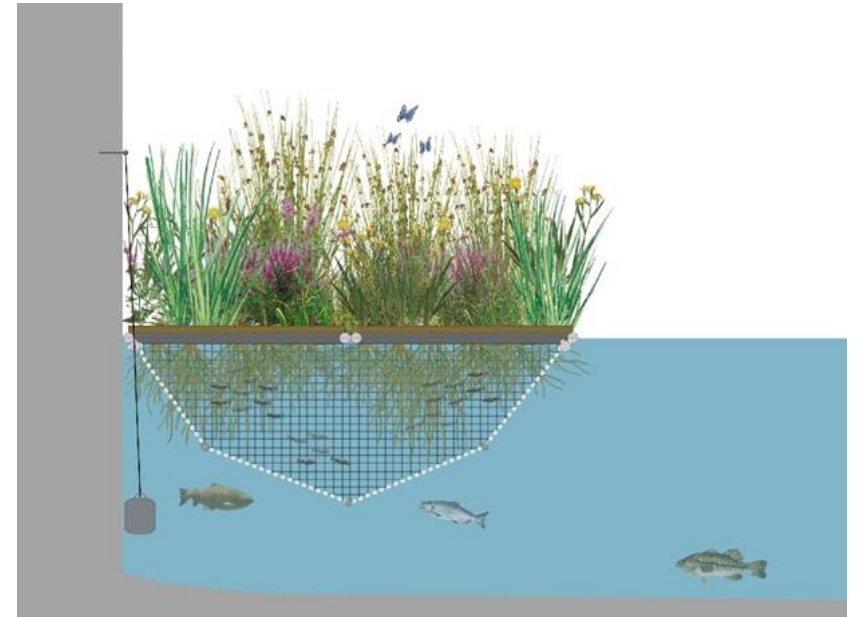




# Floating Treatment Wetlands

## Biomatrix Water Design Innovations

- Media columns increase biofilm
- Waterfowl exclusion netting and wildlife access ramps
- Predatory fish exclusion netting





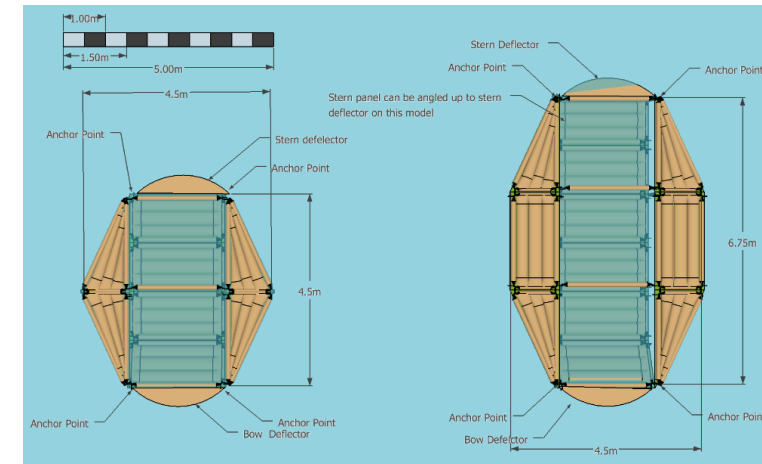
# Floating Wetland Alternative

## Biomatrix Water Design Innovations

- Tree pods
- Wave deflectors



- Submerged platforms for shallow water plants and salmon smolt foraging habitat





# Floating Treatment Wetlands

## Hicklin Lake

- Two 600 ft<sup>2</sup> islands in 4.5-acre eutrophic lake in White Center, WA
- One day construction by Youth Conservation Corps
- Minimal maintenance since 2013

Biofilm sample  
at 3 months  
with 9 mg/L TP

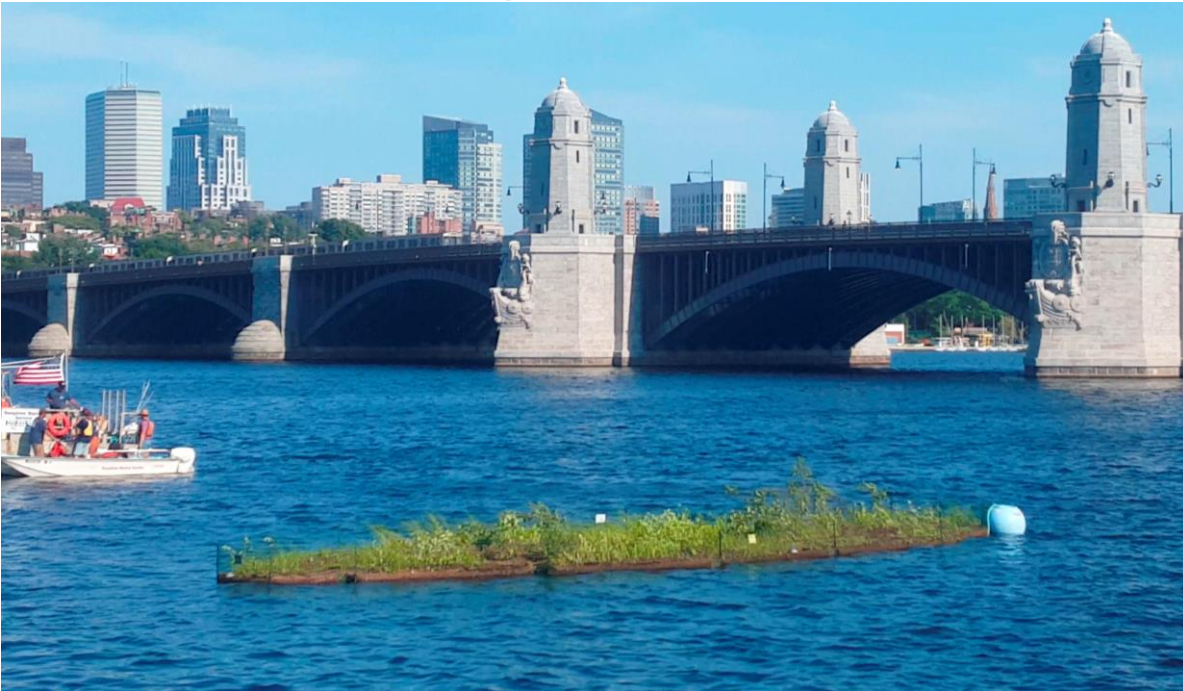




# Floating Treatment Wetlands

## Charles River in Boston

- One 700 ft<sup>2</sup> island in Charles River in Boston, MA in 2020
- Charles River Conservancy and Northeastern University Engineering
- Hauled and overwintered at dock
- Interpretive signs





# Green Lake Floating Wetlands

## Team of Volunteer Professionals

- Rob Zisette – Project Manager/Design Lead
- Monica Hinkley – Assist. PM/Treasurer/Community Liaison
- Sally Abella – Planting Plan and Water Quality Lead
- Martin Muller – Wildlife Habitat Specialist
- Eliza Spear – Wetland/Permitting Specialist
- Jeff Howard – Project Specifications
- Eric Marshall – Project Drawings
- Pete Hinckley – Materials Procurement
- Jo Sullivan – Education/Signage Lead
- Joe Markman – Volunteer Coordinator
- Daniel Kujawinski - Maintenance Lead



# Green Lake Floating Wetlands

## Site Selection

Two islands with habitat and water quality benefits that vary by location and not in crew lanes or high use:

1. Stormwater treatment at Densmore Drain
2. Native bird habitat W of Duck Island
3. Public View/Bulkhead Protection at NE Bay





# Green Lake Floating Wetlands

## Duck Island Site

Preferred site because:

- Most isolated for best bird habitat
- Most isolated for low vandalism
- Easy launch at Duck Island beach
- Easy viewing from north and west

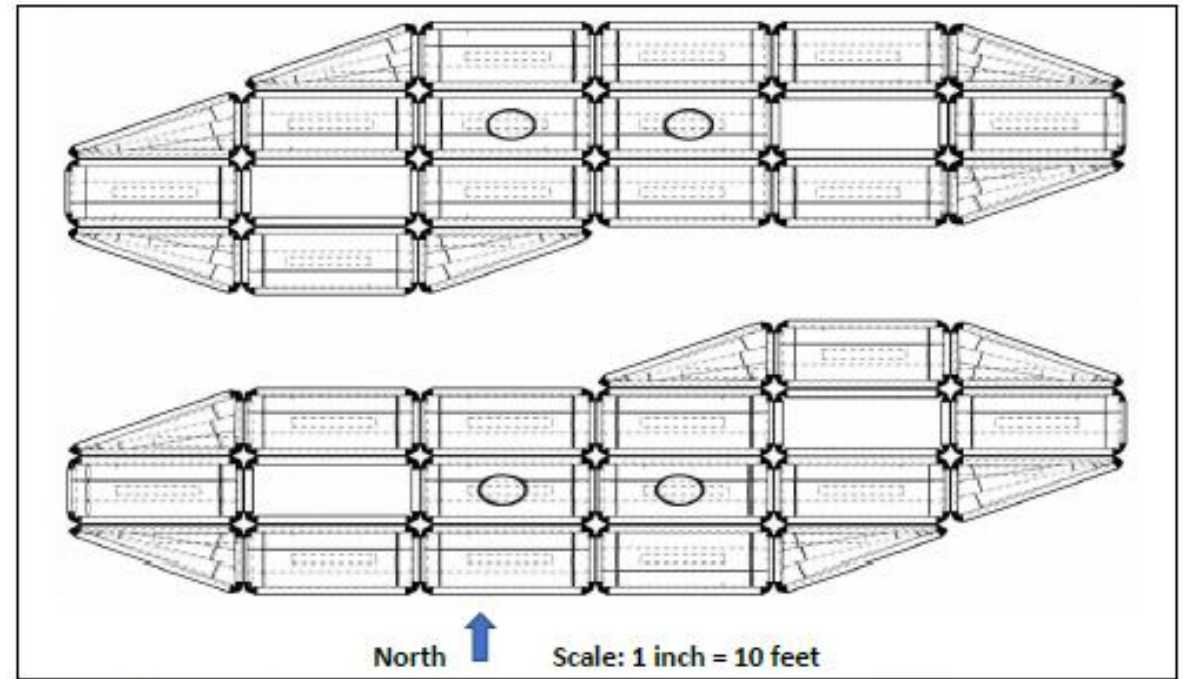




# Green Lake Floating Wetlands

## Conceptual Design

- Curvilinear natural shape with open water between paired islands
- Maximum water quality and habitat
- Variety of habitats (tree pods, open water, submerged platforms)
- Unloaded, planted, connected, and anchored by volunteers in 1 day
- Easy access for maintenance by volunteers
- Goose fencing on perimeter
- Education signage on shore and islands



Ecosystem= 60 feet long by 16 feet wide x 2 Ecosystems = 1,360 ft<sup>2</sup> total area



20 Standard Rectangle (10x4 feet each) = 800 ft<sup>2</sup>

4 High Buoyancy Tree Planter (10x4 feet each) = 160 ft<sup>2</sup>

4 Open Pool (10x4 feet each) = 160 ft<sup>2</sup>

4 Right Hand Triangle (10x4/2 feet each) = 80 ft<sup>2</sup>

8 Left Hand Triangle (10x4/2 feet each) = 160 ft<sup>2</sup>





# Green Lake Floating Wetlands

## Conceptual Cost

Two 680 ft<sup>2</sup> wetlands at \$35/ft<sup>2</sup> = \$47,600 plus plants, anchoring, and signage

JARPA Permit by FOGL and Seattle Parks

Total Cost of \$60,000+:

- Grant fund of \$35,000
- FOGL Funds of \$15,000
- Volunteer labor of \$20,000

	Unit Cost	Total Cost
Floating Wetland 1 (16 x 60 ft)	\$35/ft <sup>2</sup>	\$23,800
Floating Wetland 2 (16 x 60 ft)	\$35/ft <sup>2</sup>	\$23,800
Education Signs	Total	\$3,000
Plants/Anchoring	Total	\$3,000
Contingency	Total	\$7,400
Volunteer Labor	free	\$0
Total		\$60,000



# Green Lake Floating Wetlands

## Funding Options

Preferred grant source:

- Seattle Neighborhood Community Partnership Fund (\$50k max, 50% match)

Alternative grant sources:

- King County WaterWorks Grant (\$20-250k, 10% match)
- Ecology Water Quality Funding Program (Over \$100k max, no match)
- WDFW ALEA Grant Program (\$40k max, no match)

## Neighborhood Matching Fund

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**Community  
Partnership Fund**

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Up to \$50,000

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***2021 Round One***

February 5, 2021 -  
application open  
April 5, 2021 -  
application deadline

***2021 Round Two***

July 13, 2021 -  
application open  
September 13, 2021 -  
application deadline



# Green Lake Floating Wetlands

## Project Schedule

Activity	Period
First Neighborhood Grant Application (failed)	September 2020
Project Meeting, Planning, and Conceptual Design	Nov. 2020 – January 2021
Project Permitting	Feb 2021 – Aug 2021
Second Neighborhood Grant Application	September 2021
Project Design, Public Meetings, and Material Procurement	Oct 2021 – March 2022
Floating Wetland Planting and Installation	April 2022
Monitoring and Maintenance	Each Summer



# Green Lake Floating Wetlands

## Conclusions

- Green Lake is a valuable resource
- Floating wetlands are a cost-effective resource benefit for urban waters
- Local demonstration project needed
- Improve impaired water quality
- Restore impaired fish habitat and native bird habitat
- Provide needed environmental education
- No environmental impacts
- No recreational impacts





# Questions?

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**April 2013 Installation**



**September 2013**

**River Brent, Hanwell, UK (BioMatrix Water)**