

# Floating Wetlands



Source for above photo: Carolina Clear

# *Floating Wetlands*



# *Natural Floating Wetlands*



Plastic Platform



Native Plant Platform

# Conventional, purchased floating islands



“It is the same EPA-approved plastic (PET) used in drinking water bottles that millions of people use every day without harm.”

“PET does not contain... Endocrine Disruptors.”

~ Manufacturer’s website

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> [Environ Sci Pollut Res Int.](#) 2009 May;16(3):278-86. doi: 10.1007/s11356-009-0107-7. Epub 2009 Mar 10.

**Endocrine disruptors in bottled mineral water: total estrogenic burden and migration from plastic bottles**

[Martin Wagner](#)<sup>1</sup>, [Jörg Oehlmann](#)

## Conventional, purchased floating islands




**“Discussion and conclusions:** Our results demonstrate a widespread contamination of mineral water with xenoestrogens that partly originates from compounds leaching from the plastic packaging material. These substances possess potent estrogenic activity... Overall, the results indicate that a broader range of foodstuff may be contaminated with endocrine disruptors when packed in plastics.” (Wagner, 2009)



This material is similar to a Scrub Daddy



A photograph of a lake with a floating island and a canoe. The floating island is a small, rectangular platform made of dark material, with several thin, bare trees growing from it. In the foreground, a canoe with three people is on the water. The canoe is white with "HARBORCRAFT" written on the side. The background shows a forested shoreline.

“These artificial floating islands are constructed using a framework of non-woven PET [polyethylene terephthalate] plastic fibers sourced from BPA-free recycled plastic beverage containers. Marine-grade foam is injected into the framework to enhance buoyancy.”

“Exposure to environmental conditions does not alter PET's safety.”

~ Manufacturer's website

“The drinking water or groundwater is getting contaminated with PET plastic or the products leached from the PET plastic. Some studies have described the migration of microplastic from PET plastic into the water.”

Dhaka, et al, 2022. Occurrence, toxicity and remediation of polyethylene terephthalate plastics. A review. Environmental Chemistry Letters, 20(3).



# Conventional, purchased floating islands



“To make sure that the plastic does not break down, even after years of use, all [brand name] floating islands leave our factory with a protective coating covering the top and sides. This coating is the same as that used for lining municipal concrete water tanks and is certified safe for potable water and food-grade standards. It protects the islands from UV damage and keeps them intact even under heavy wildlife pressure (from waterfowl and muskrats, for example).” ~ Manufacturer’s website



What is the cost?

*Example cost:*



**Floating Island 5'x5'**

☆☆☆☆☆ 0 Reviews

\$1,899.99

**QUANTITY:**

▼	1	▲
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**ADD TO CART**

**PayPal**



*Eco-islands are fully rooted at our nursery prior to shipping.*

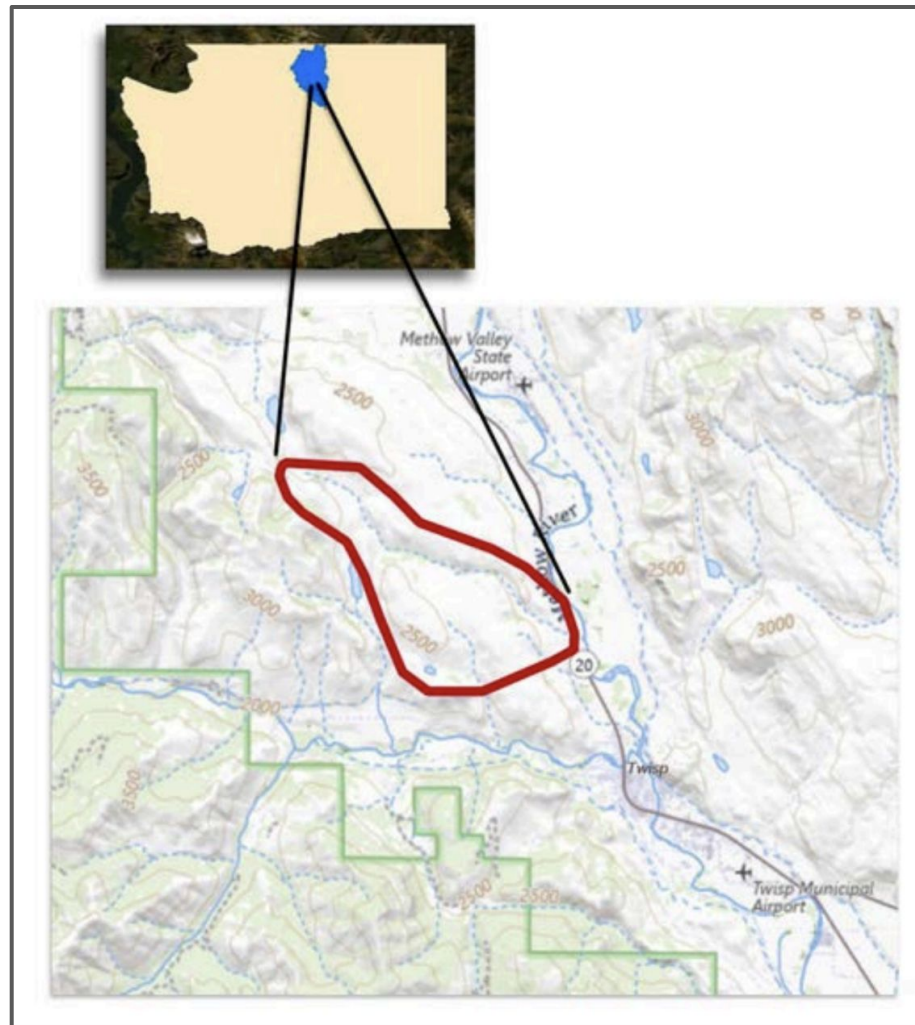
# Twisp Uplands Ecological Restoration Project

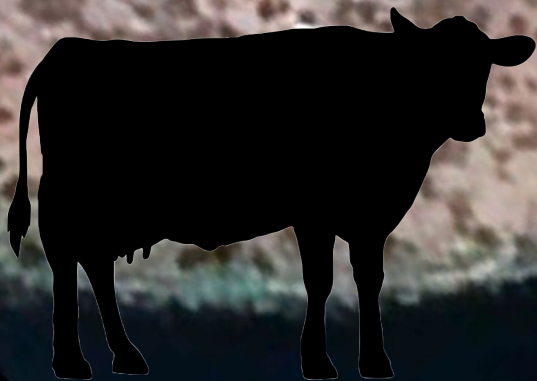


*A program of*

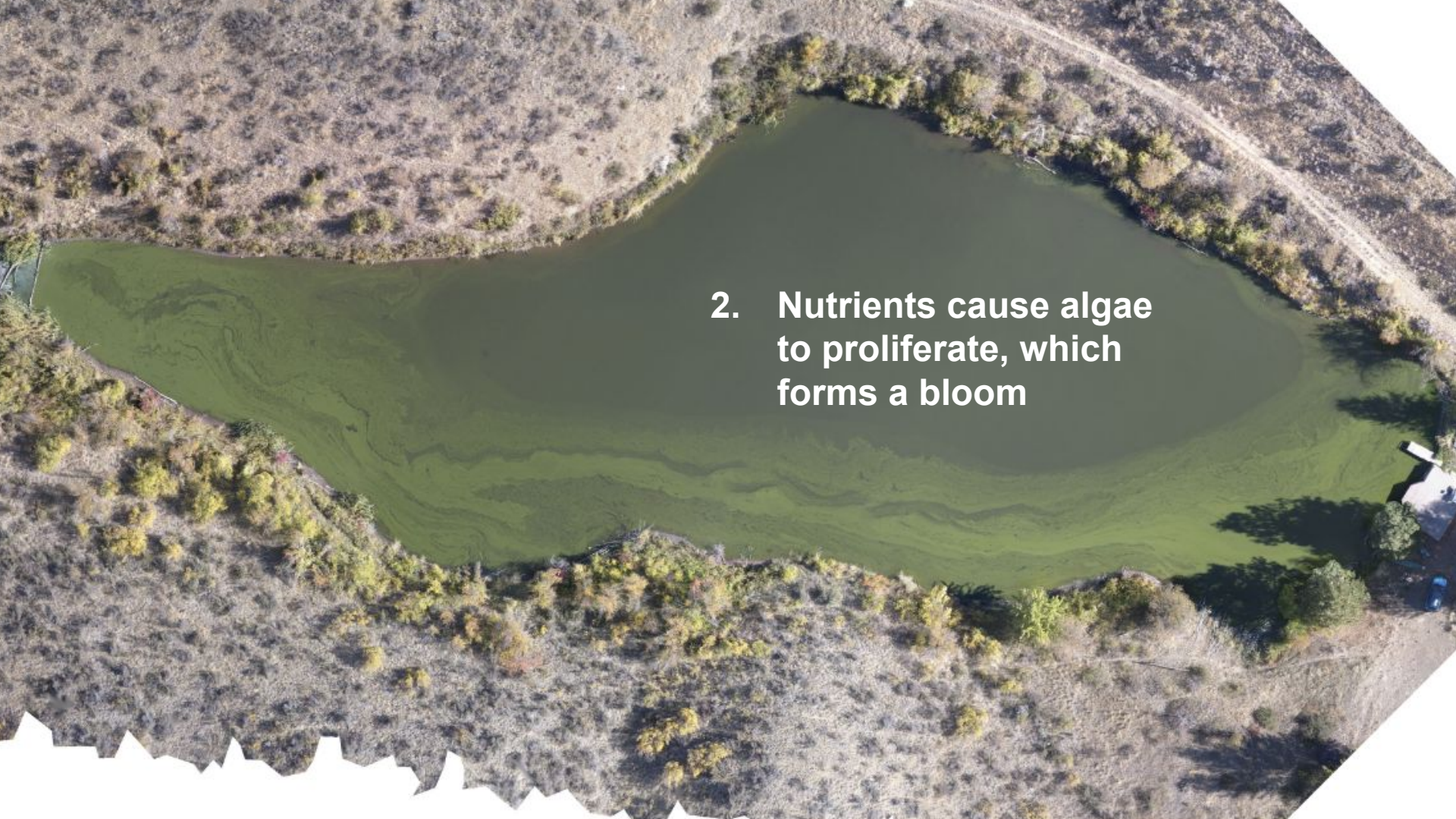


METHOW SALMON RECOVERY FOUNDATION





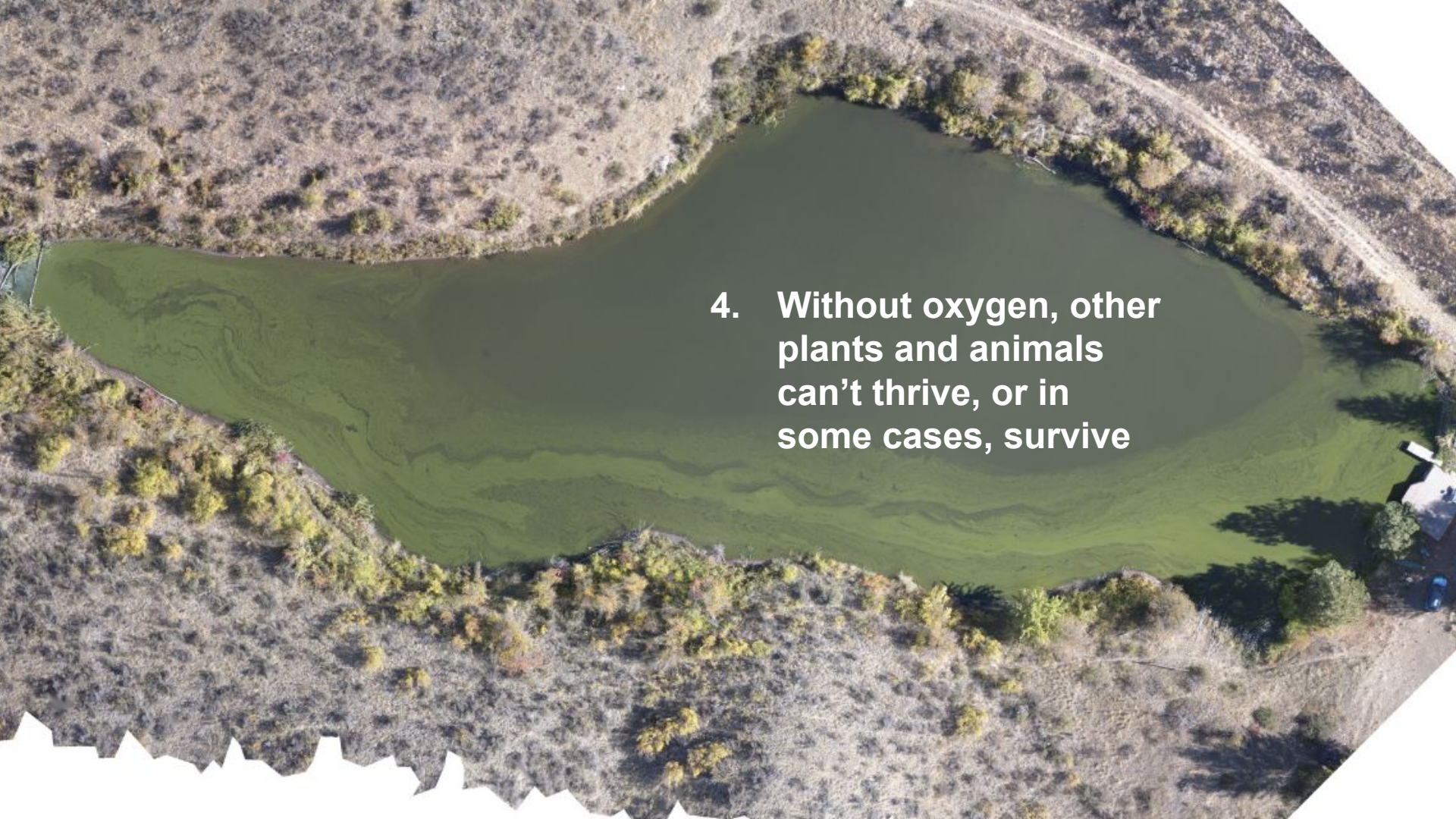
**1. Excess nutrients**

An aerial photograph of a pond surrounded by dry, scrubby vegetation. The water in the pond is a deep, dark green color, indicating a significant algal bloom. The bloom is most concentrated in the center and right side of the pond, with some lighter green areas towards the left. The surrounding land is covered in sparse, brownish-green bushes and trees. A dirt road or path is visible on the right side of the pond. The image has a white, jagged border at the bottom and top right corners.

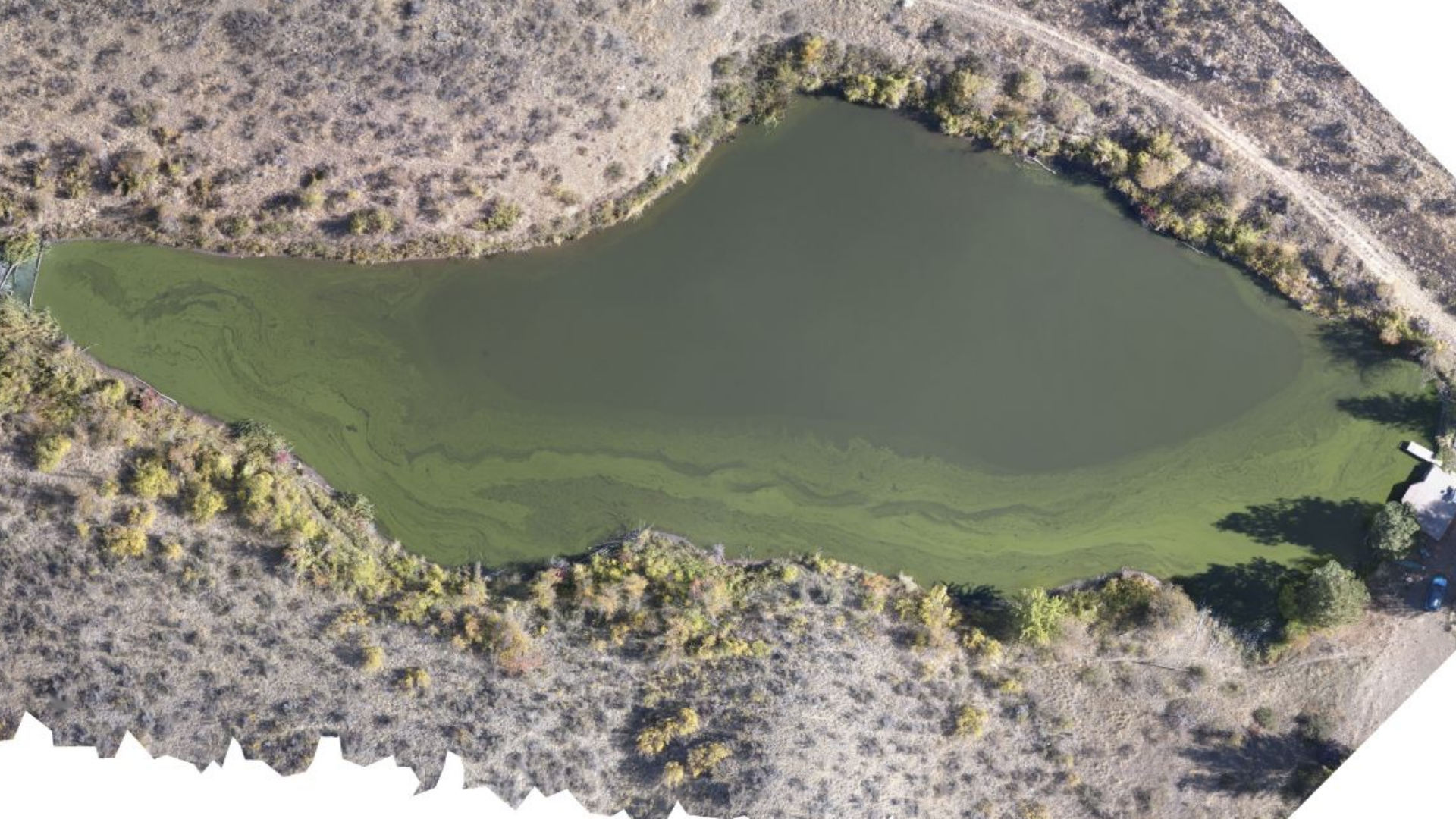
**2. Nutrients cause algae to proliferate, which forms a bloom**

An aerial photograph of a pond surrounded by dry, scrubby vegetation. The water in the pond is a deep, dark green color, indicating a significant algae bloom. The algae appears to be concentrated in the center and spreading towards the edges. The surrounding land is covered in sparse, brownish-green bushes and trees. A dirt road or path is visible on the right side of the pond. The overall scene suggests a natural water body in a semi-arid or arid environment.

**3. Algae block the sunlight and use up oxygen in the water**

An aerial photograph of a pond surrounded by dry, scrubby vegetation. The water in the pond is a deep, opaque green, indicating a significant algae bloom. The surrounding land is covered in sparse, brownish-green bushes and trees. A dirt road or path is visible on the right side of the pond. The image has a white, jagged border at the bottom and top right corners.

**4. Without oxygen, other plants and animals can't thrive, or in some cases, survive**



*Heavy  
grazing can  
lead to  
predictable  
kinds of  
degradation...*





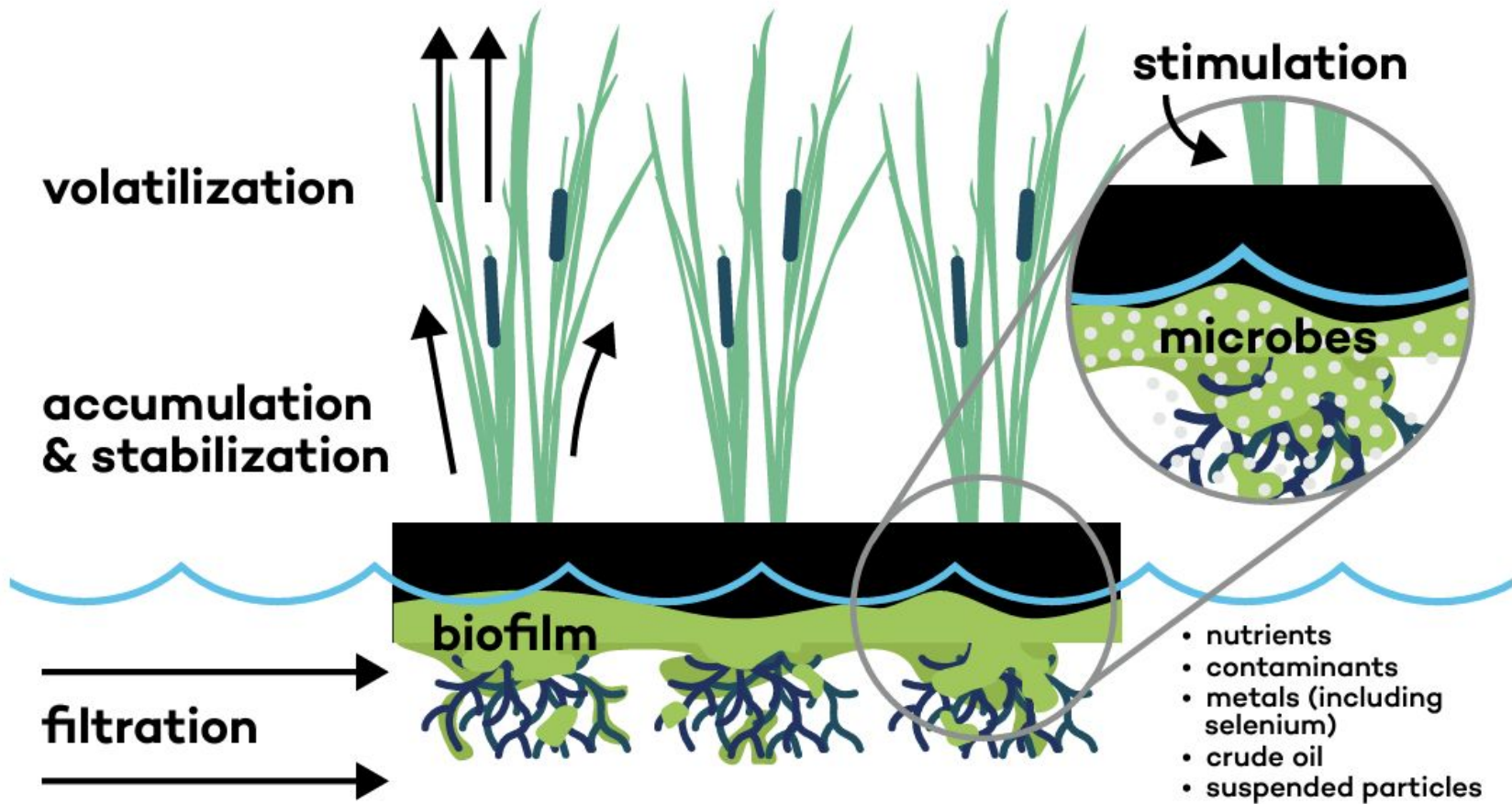
*...including nutrient loading of waterways*



*...and associated algae blooms*

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total (SM 4500 P E)	0.43		0.060		mg/L			09/09/24 13:38	1





Cross-sectional diagram of a typical floating treatment wetland system.

Source: International Institute for Sustainable Development (Grosshans et al, 2019)



- Water quality
  - Nutrient uptake
  - Fine particulate matter capture
- Fish
- Birds
- Pollinators
- Amphibians
- Snails
- Impact on food chain
  - Zooplankton, other species eating algae as it grows

# How are Floating Treatment Wetlands usually made?



Example:  
Plastic Net  
Pots





Alternatives  
to Plastic  
Net Pots

## Luffa Gourds

Alternatives  
to Plastic  
Net Pots



## Alternatives to Plastic Net Pots



# How are Floating Treatment Wetlands usually made?





# Materials Used

Willow, red osier dogwood, elderberry, cottonwood



# Plant Species Installed





Students



Restoration Practitioners

Land Stewards



# Basket Weavers Sharing Skills



## Monitoring and Assessment by High School Students





**Woven Willow  
Wetland**

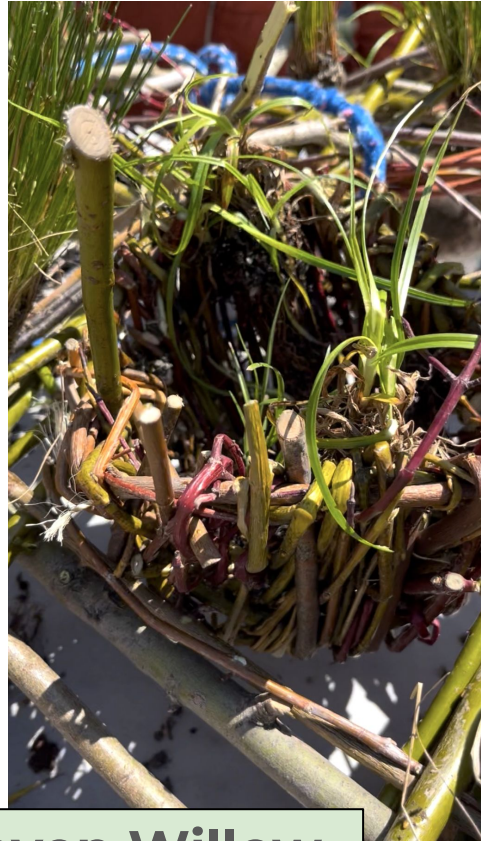


**Woven Willow  
Wetland**





**Woven Willow  
Wetland**



**Woven Willow  
Wetland**



**Woven Willow  
Wetland**



**Woven Willow  
Wetland**

## Benefits:

- Excellent plant growth and root development
- Sufficient buoyancy
- Lower turtle pressure
- No adaptive management needed in year one

**Woven Willow  
Wetland**

## Drawbacks:

- None





**Woven Willow  
Wetland**



**Woven Willow  
Wetland**



**Woven Willow  
Wetland**



**Student Woven Willow Triangle**



July 17



August 27



## Benefits:

- If willow cuttings had not dried out, plant growth would be much greater

## Drawbacks:

- Plant growth not very robust
- Replanting needed
- Buoyancy greatly decreased from July to August



**Rancher Woven Willow Triangle**





**Rancher Woven Willow Triangle**





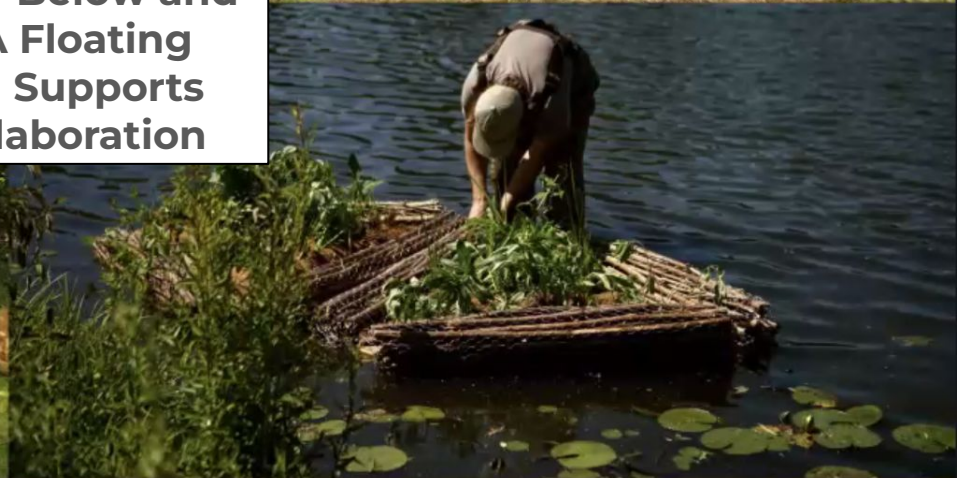
**Rancher Woven  
Willow Triangle**

**Benefits and drawbacks not yet known**





**Inspiration:**  
Alexandra Ionescu  
and the “Below and  
Above, A Floating  
Wetland Supports  
Life” collaboration




Construction, Assembly & Planting the Structure

Utilizing Invasive Japanese Knotweed



**Inspiration: Alexandra Ionescu and the “Below and Above, A Floating Wetland Supports Life” project**



**Instead of  
Japanese  
Knotweed:  
Elderberry!**



**Elderberry  
Triangle**



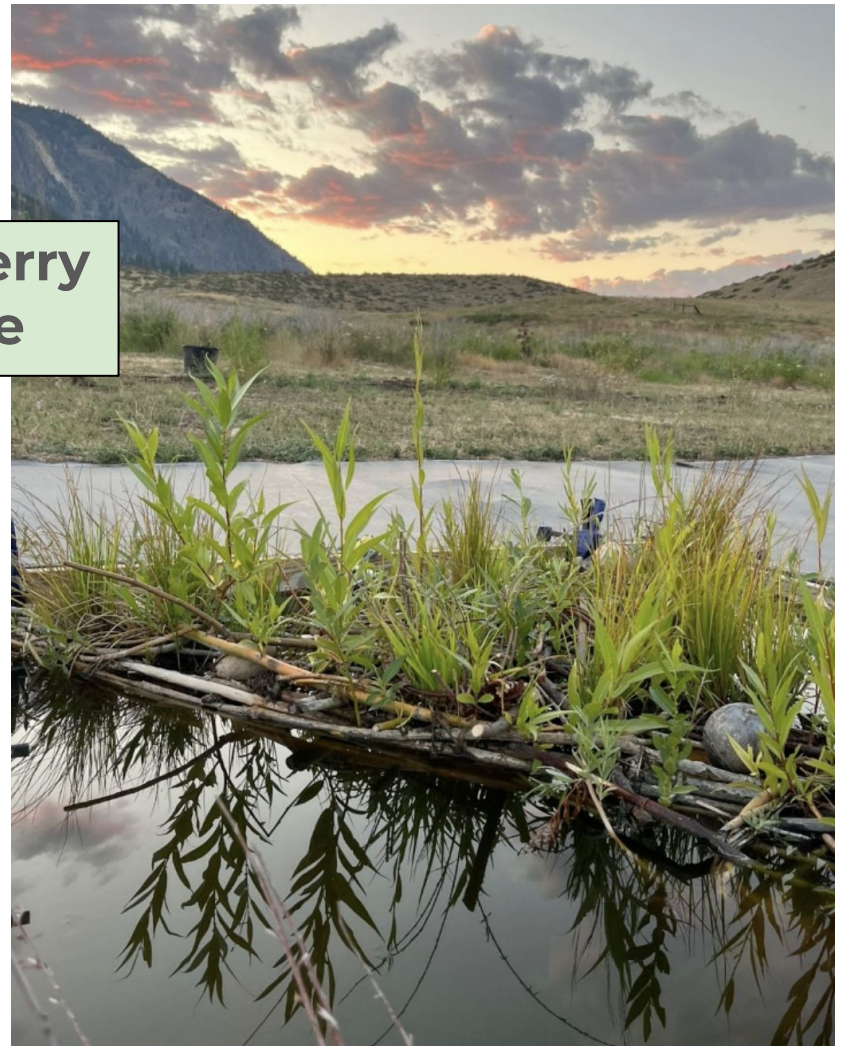
**Elderberry  
Triangle**

A close-up photograph of the Elderberry Triangle structure. It features a central woven basket filled with dark soil and several green plants with long, narrow leaves. The basket is supported by a dense arrangement of dry sticks and branches, creating a floating platform. The structure is situated in a body of water.

## Elderberry Triangle

### Benefits:

- Robust plant growth
- Living platform
- High aesthetic value
- Consistent buoyancy
- Readily modular



**Drawback:  
Corner weakness**



## **Drawback: Corner weakness**



## **Improvements going forward:**

- More robust willow weaving at corners
- Additional live cuttings

# Elderberry Pontoon







## **Benefits:**

- **Easier to hike into remote sites**
- **Simple to make**
- **Moderate buoyancy**



### **Drawbacks:**

- **Balance  
(tips over later  
in season)**
- **Small amount  
of living  
structure**



### **Drawbacks:**

- **Balance  
(tips over later  
in season)**
- **Small amount  
of living  
structure**

### **Improvements going forward:**

- **Three bundles for  
a wider, more  
stable base**
- **Additional live  
cuttings**

# Cedar Frame Woven Wetland



# Cedar Frame Woven Wetland





## Cedar Frame Woven Wetland

### Benefits:

- Excellent buoyancy; no gourds needed
- If willow cuttings had not dried out, plant growth would be much greater
- Willow dowel corners held fast

### Drawbacks:

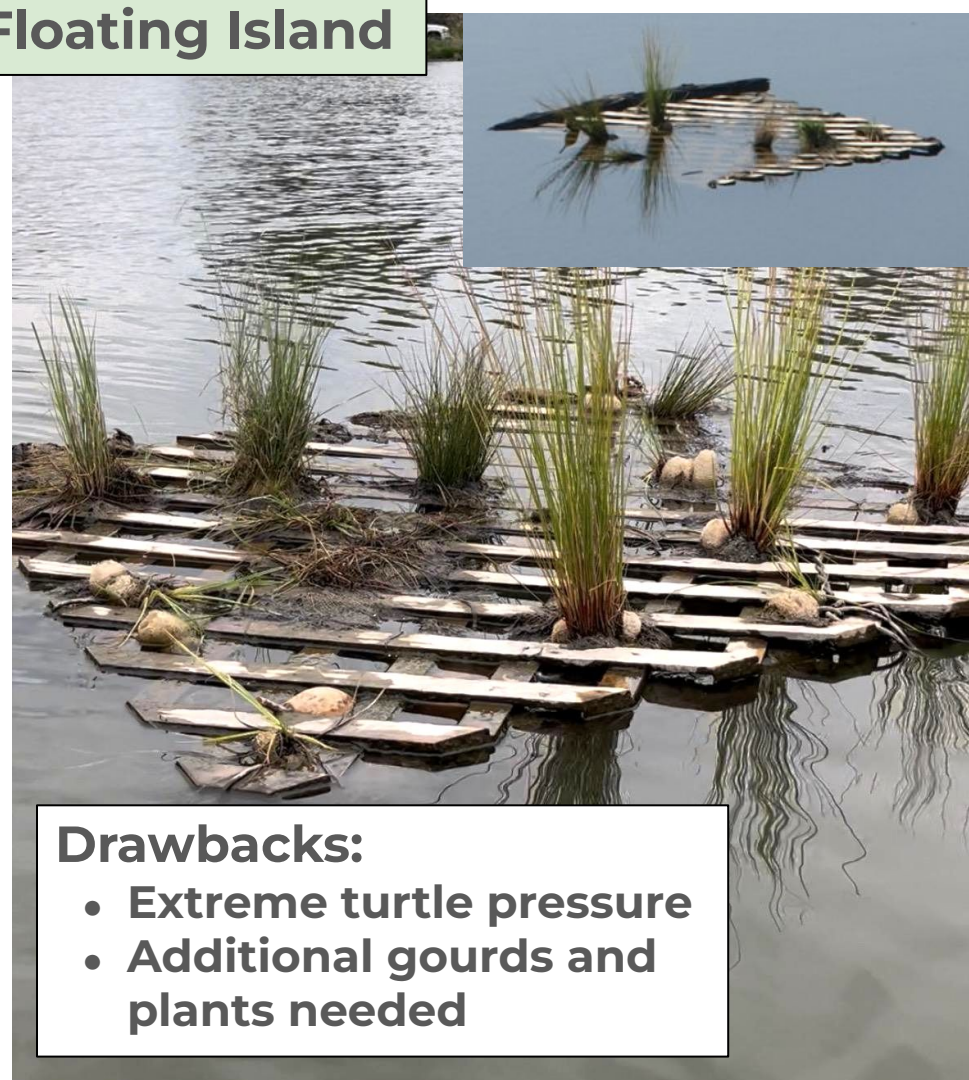
- Cedar is not locally abundant
- High turtle pressure; replanting needed

# Log Trellis Floating Island



## Benefits:

- Moderate buoyancy
- Ease of planting



## Drawbacks:

- Extreme turtle pressure
- Additional gourds and plants needed

June 5

## Pallet Floating Island



July 17



Sept. 24



### Benefits:

- Simple to build
- Cost effective

### Drawbacks:

- Required hardware
- Extreme turtle pressure
- Replanting needed
- Lost buoyancy by fall

# Lessons Learned: Summary



**Live willow and red osier dogwood in the structure makes a big difference in root surface area!**

**Takeaway:  
Use more live cuttings,  
wherever possible**



**Live willow and red osier dogwood in the structure makes a big difference in root surface area!**

**Takeaway:  
Use more live cuttings,  
wherever possible**



**Turtle pressure is greater on smooth, flat surfaces.**



**Turtles do not  
prefer to eat  
Juncus genus  
plants!**



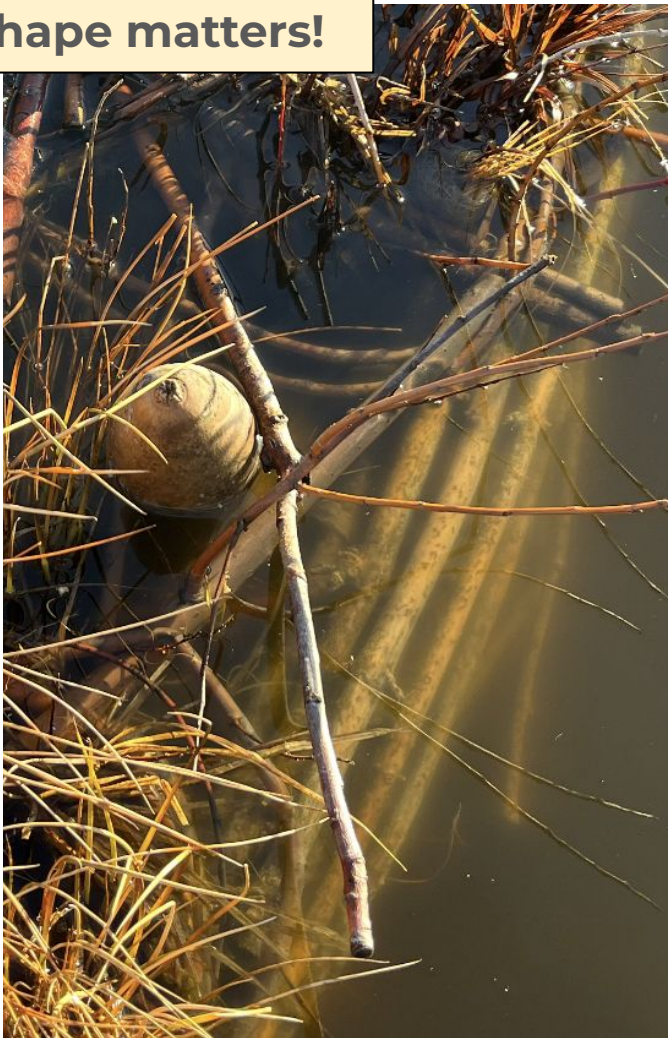


**Willow can  
successfully  
hold bundles  
together.**

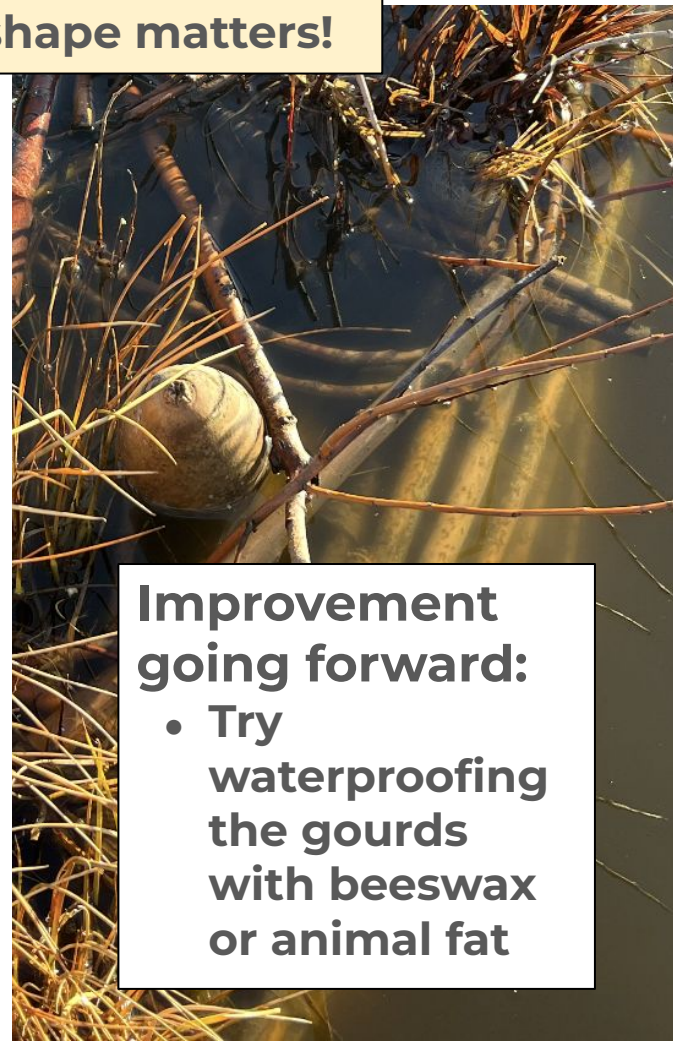
**Willow dowels can successfully hold a wooden frame together. (Metal hardware is not needed. Log diameter matters.)**



**Birdhouse Gourds: Orientation and shape matters!**



## Birdhouse Gourds: Orientation and shape matters!



**Improvement  
going forward:**

- Try waterproofing the gourds with beeswax or animal fat

## Birdhouse Gourds: Orientation and shape matters!

**Horizontally installed birdhouse gourds fill with water in both bulbs.**



**Smaller-bulbed tops don't hold as much air, so provide less buoyancy.**



**Corners can be a weak point.**



**Circles are inherently stronger than triangles.**





**Plastic is not  
necessary to make  
floating wetlands!**



# Natural Floating Wetlands Project Partners



a program of:



METHOW SALMON RECOVERY FOUNDATION



This work is supported through funding from Washington's Climate Commitment Act (CCA). The CCA supports Washington's climate action efforts by putting cap-and-invest dollars to work reducing climate pollution, creating jobs, and improving public health. Information about the CCA is available at [www.climate.wa.gov](http://www.climate.wa.gov).



Colville Reservation Conservation District



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