



FLOATING TREATMENT WETLANDS (FTWs): PLANT-POWERED PHOSPHORUS REDUCTION THROUGH COOTES PARADISE

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PROBLEM

How Might We... lower phosphorus levels in the Hamilton Harbour to improve the aquatic environment?

- Phosphorus is found in **everyday products** such as fertilizers, lawn care products, detergents, and decaying organic matter (OM)
- Phosphorus **fuels blue-green algae** that **blocks sunlight**, reducing oxygen production underwater & **killing wildlife**
- There are **no ongoing efforts** to reduce the phosphorus levels within the water body

SOLUTION

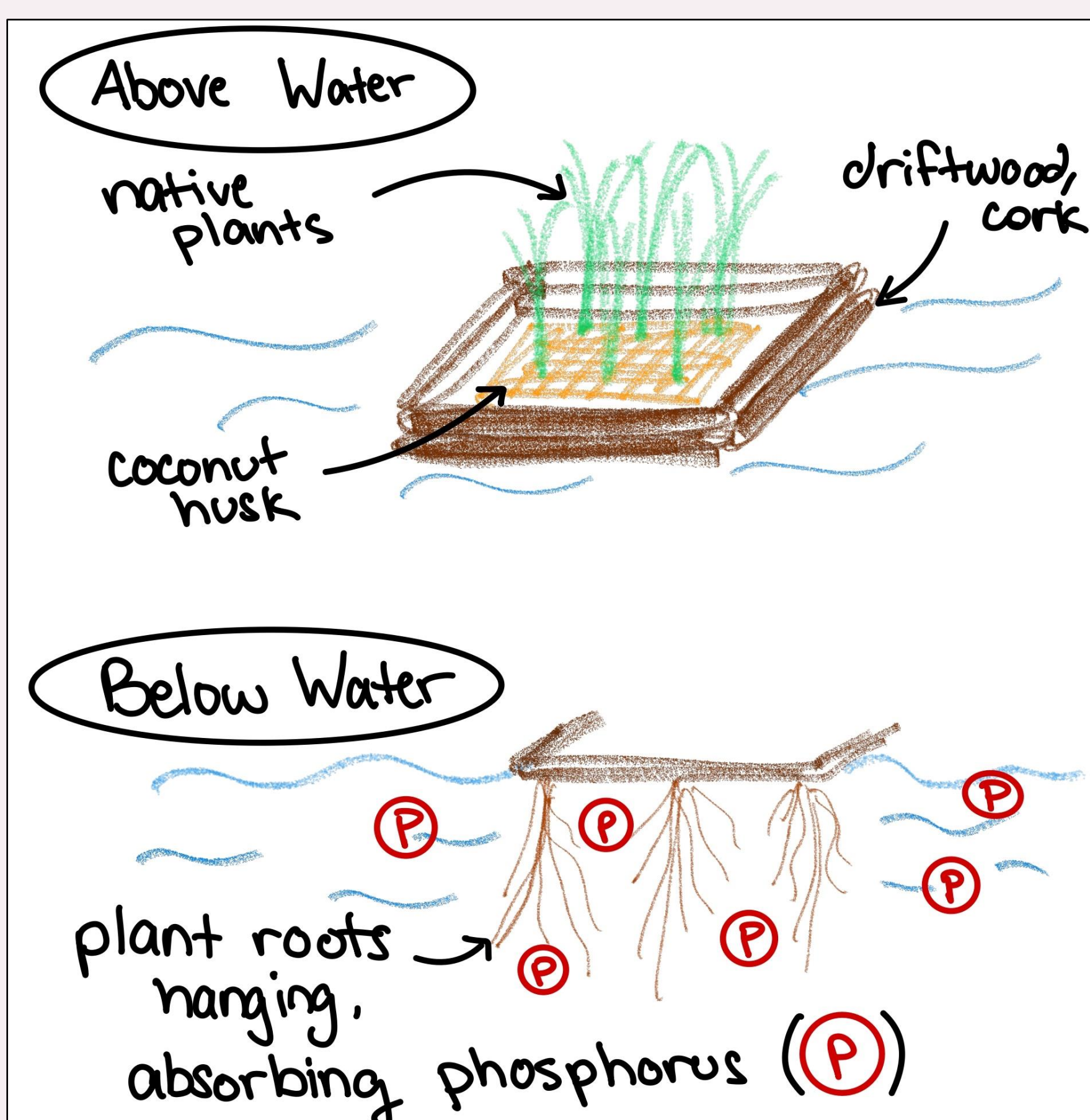
After consulting with Fishery Organization Representatives and McMaster Researchers, to reduce the phosphorus content in the water body, we recommend **reconstructing active FTWs** in Chedoke Creek. FTWs are **engineered floating beds** that house **native plants**, allowing hanging plant roots to **absorb phosphorus** from the water.

How our FTWs are different:

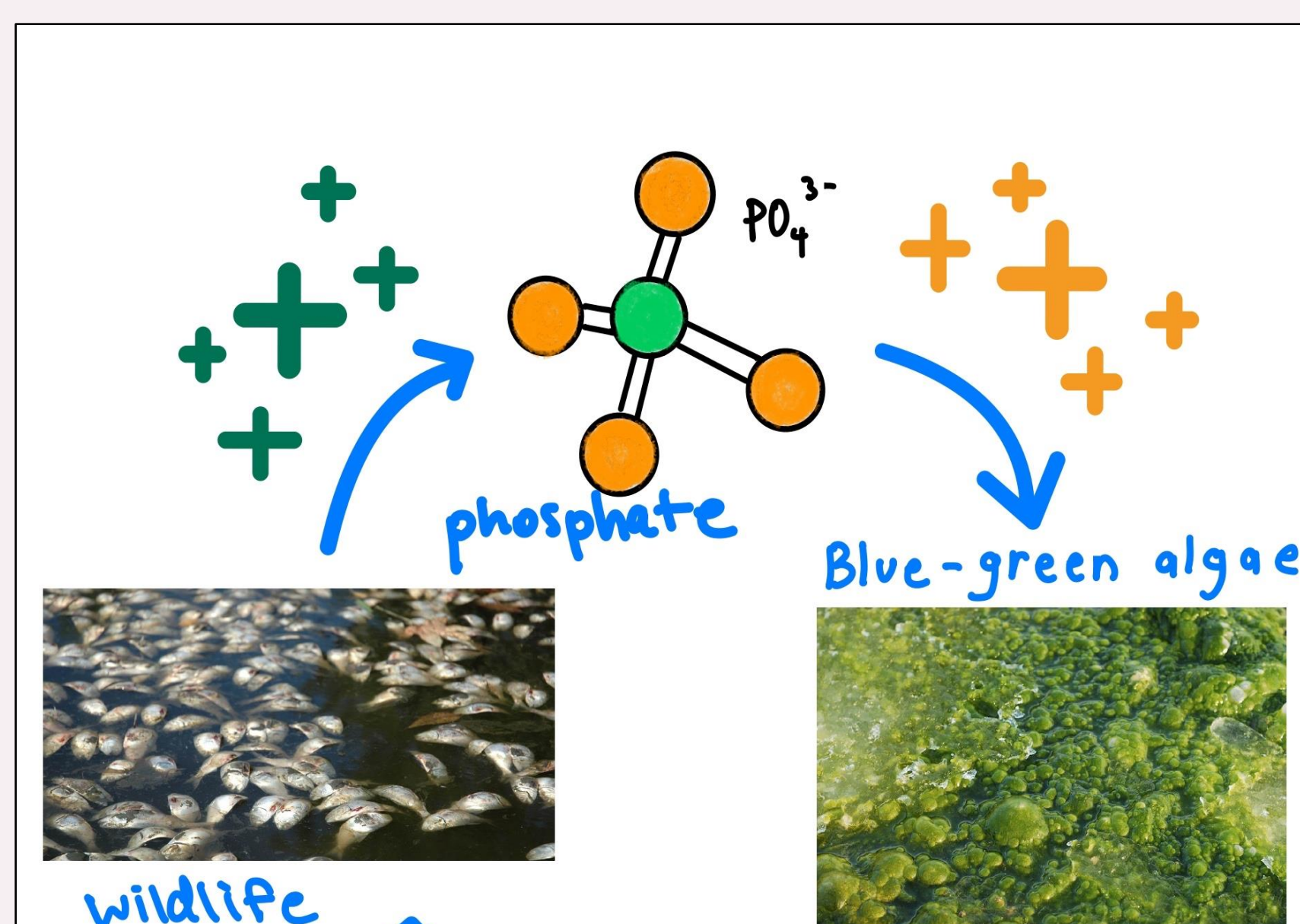
- **Current FTWs** are made using **pre-made plastic beds** shipped from Northern Canada, we propose using **cork, driftwood & coconut husk** as the base
- Would be functional from **May to October**
- Would require **biweekly cursory checks**, and **monthly maintenance** for replacing plants

Successful FTW implementation instances:

- Pelican Lake, Manitoba: **5% coverage** with an estimated **10-50% decrease** in phosphorus³
- Chedoke Creek, Hamilton: **0.45 tons of phosphorus removed/hectare** with projected **10-year lifespan**⁴



Initial Prototype Draft



Phosphorus Life Cycle in Harbour

The Hamilton Harbour
has

2x

the acceptable
phosphorus level for
any water body¹

NEXT STEPS

1. **Create partnerships** with Royal Botanical Gardens, Nature @ Mac, and Mac Outdoor Club
2. **Consult and coordinate** with Chedoke Creek FTW implementers to improve our solution
3. **Collect data** on implemented FTWs simulate new project locations, **expand coverage** to other feeder water bodies



Map of Cootes Paradise with potential FTW placement²

REFERENCES

- 1: CBC/Radio Canada. (2014, May 27). Hamilton Harbour Cleanup's biggest challenge: Excessive phosphorus | CBC news. CBCnews. <https://www.cbc.ca/news/canada/hamilton/headlines/hamilton-harbour-cleanup-s-biggest-challenge-excessive-phosphorus-1.2655722> Cootes Paradise Trails.
- 2: Royal Botanical Gardens. (2024, April 24). <https://www.rbg.ca/gardens-trails/by-attraction/trails/trail-maps/cootes-paradise-trails/>
- 3: Grosshans, R., Lewtas, K., Gunn, G., & Stanley, M. (2019, October). Floating treatment wetlands and plant bioremediation. Floating Treatment Wetlands and Plant Bioremediation: Nutrient treatment in eutrophic freshwater lakes. <https://www.iisd.org/system/files/publications/floating-treatment-wetlands.pdf>
- 4: Wood Environment & Infrastructure Solutions. (2021, July 23). Cootes Paradise Work Plan. Cootes Paradise Work Plan . <https://www.hamilton.ca/sites/default/files/2022-08/chedoke-cootes-paradise-workplan-july2021.pdf>

ACKNOWLEDGEMENTS

