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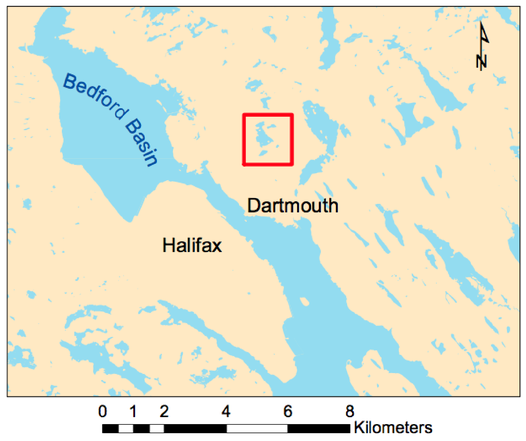
Restoration Design For Little Albro Lake

Scope of Work

Nymphoides peltatum, also known as Yellow Floating Heart (YFH), is an invasive aquatic plant that has taken over Little Albro Lake located in Dartmouth, Nova Scotia. The team has been tasked with designing a plan to remove the YFH from the lake as well as an ongoing monitoring and management plan to ensure water quality does not deteriorate once the plant is removed.

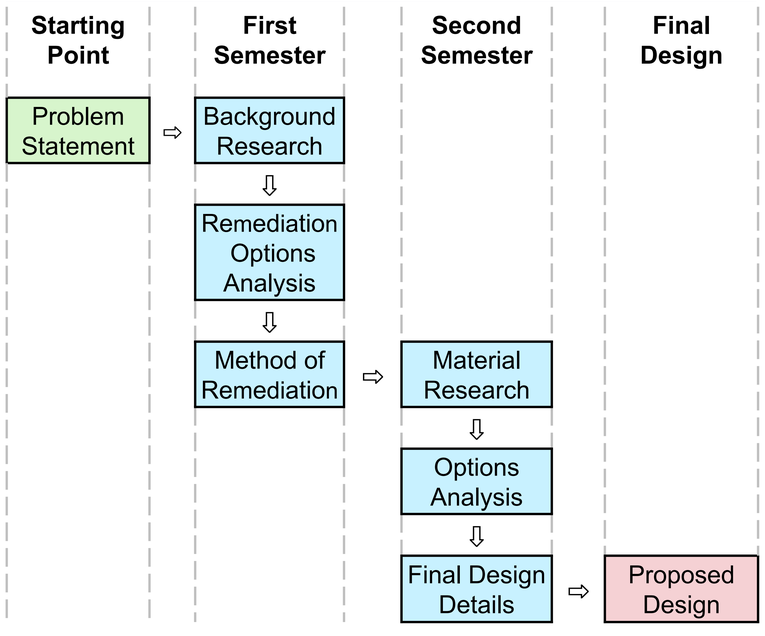
Project Site Specifications



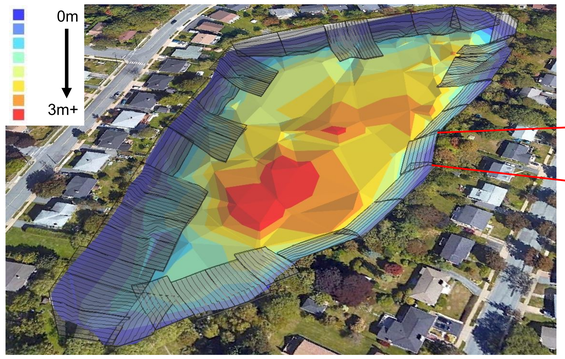
Lake Data:

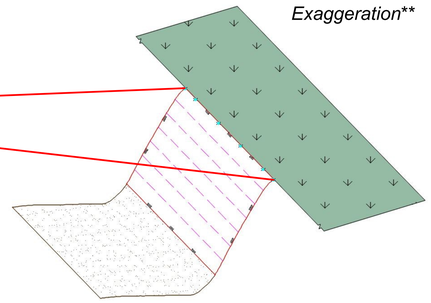
- Bottom area (3D): 32,500m^2
- Mean depth:1.89m
- Maximum depth: 3.80m
- Total volume: 61,300m^3
- Mean grade: 6%
- Maximum grade: 43%

Design Process



Benthic Mat (Phase 1)





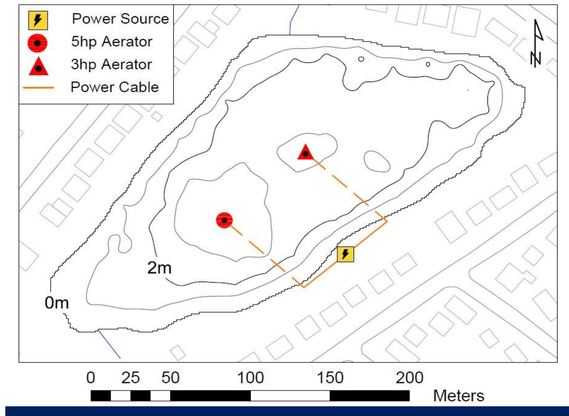
Overview:

- Design covers 44% of overall lake bottom or 91% of the 0-2m depth range to target area of YFH prominent growth
- Placement of benthic mats are both parallel and perpendicular along the perimeter of the lake
- 36 sections of stitched mats required

Specifications:

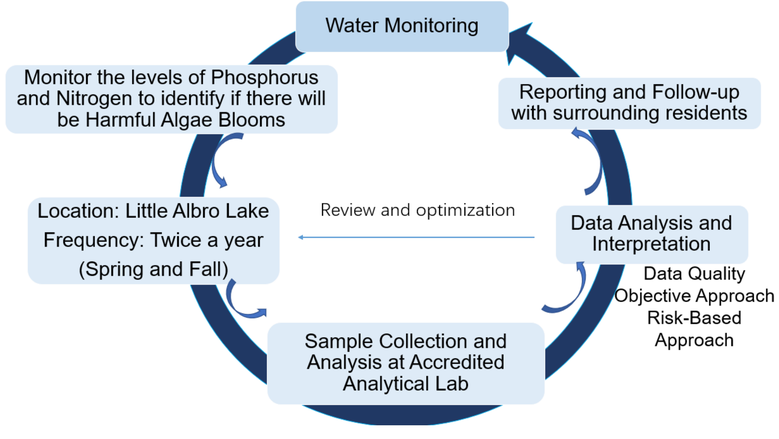
- Product: Aquascreen
- Stitched mat dimensions:
  - Width: 14m (7 sheets)
  - Length: 30m (1 sheet)

Aeration System (Phase 2)



- Two Kasco Surface Aerators for improving sediment and water quality as well as enhancing circulation to destabilize potential algae
- Purpose of aerators is to increase dissolved oxygen levels for aerobic bacteria which helps in reducing Harmful Algae Blooms
- Oxygen rate per hour is 3 lbs of Oxygen per 1 hp

Water Monitoring Program



Economic Analysis

DESCRIPTION	QTY	UNIT PRICE	AMOUNT
Non-Recurring Costs			
Aquascreen	252	$789	$198,702
Aeration system: 5HP	1	$7,336	$7,336
Aeration system: 3HP	1	$4,405	$4,405
Rebar: 3/8" by 3'	360	$5.1	$1,836
Ground Spikes	155	$0.83	$129
Recurring Costs			
Mat implementation labor	190	$24	$4,560
6 workers			$27,360
Mat removal/maintenance labor	190	$24	$4,560
6 workers			$27,360
		TOTAL	**$267,128**

Health & Safety

Risk Identification:

- Worker Drowning
- Aeration Hazard
- Benthic mat Hazard
- Electrical cord Hazard

Risk Mitigation:

- Wearing life jackets
- Surrounding aerators with Floating Barriers
- Securing mats with stakes and weight bags
- Marking cord with flashy hard sticking tape

Temporary safety signage put around the lake to make the public aware of potential risks

Recommendations

- The following permits and approvals should be applied for prior to mat installation:
  - Habitat alteration permit, watercourse alteration permit, and right-of-way development permit
- Further field work to verify the spatial extent of YFH to optimize mat placement
- The mats should be removed once a year for cleaning and maintenance, at this point it is recommended that the YFH root growth is checked in order to determine if the mats need to be reinstalled

References

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