

Northview Pond Remediation

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Project Overview

The Northview Homeowners Association (HOA) oversees the maintenance of the pond in the Northview neighborhood and has noted a decrease in water quality and clarity over the years. In the summer, there are a large number fish kills and what appears to be algae on the surface of the pond. The objective of this project was to identify the material floating on the pond and give the HOA suggestions on how to improve the water quality of Northview pond.



Image 1: The state of the pond in October, 2017.

Research

This team conducted research on Stormwater Control Methods (SCMs) and managing algae blooms to better understand the problems of Northview Pond. Additionally, the team spoke with the city planner to establish the watershed that fed into the pond to understand what sources were contributing to the poor water quality. The team also looked at case studies and pond standards to develop recommendations to deliver to the HOA so that they might improve the water clarity.

Testing

A site visit was conducted to pull five water samples from different locations in the pond to test for temperature, pH, Chemical Oxygen Demand (COD), 5-day Biochemical Oxygen Demand (BOD₅) as well as nitrogen and phosphorus concentrations in the pond. Three samples were taken from the lower basin, and two from the upper basin. Sample #1 was taken at a pond inlet.

The temperature was measured on-site, while the rest of the tests were conducted at the Environmental Engineering Lab at Kansas State University.



Image 2: The testing apparatus used to pull water samples.



Image 3: The sampling points from which water was collected to be tested.

Results

Tests revealed that the floating material on the surface of the pond was duckweed and not algae. Duckweed is not as harmful as algae, but it is unappealing for a residential pond and must be mitigated.

Sixteen species of algae were also identified, however they are not as prevalent in the pond as originally believed.

Sample	Temperature (°C)	pH	COD (mg/L)	BOD ₅ (mg/L)
1	23.5	8.81	94.7	-72.6
2	24	10.09	106	28.2
3	22.5	8.88	45.2	27
4	24	9.43	19.3	17.1
5	No Data	10.08	27.9	-7.2
Average	23.5	9.46	58.6	-1.5

Additional Findings

Three major plant species were identified at the Northview pond. These native plants are very beneficial to their environmental because they filter out sediment and nutrients such as nitrogen and phosphorus.

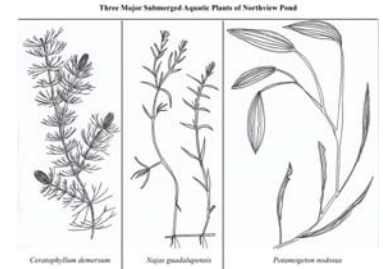


Image 4: Native plants in the pond

Additionally, site visits showed the poor erosion control practices in place at the pond. Erosion socks are used around the banks, however they slip into the water and do not do enough to control runoff into the pond. Image 5 shows the failure of erosion control at the site.



Image 5: Erosion control at the pond

Recommendations

- The Northview HOA would benefit from implementing Stormwater Control Methods (SCMs) such as increasing the number of plants present in and around the inlets feeding into the pond. It may also be beneficial to increase circulation of the lower pond to allow the plants to sequester nutrients and other harmful material in the pond.
- Fertilizers and lawn clippings from the surrounding neighborhood can contribute to the high levels of nitrogen and phosphorus in the pond. Measures should be put in place to keep runoff from lawns from getting into the pond such as requiring residents to dispose of lawn clippings and other waste in the garbage.
- It is also recommended that the HOA invests in a manual pond skimmer. One can be seen in Image 6 below. It will help remove duckweed from the water.



Image 6: A Parachute manual pond skimmer