

A photograph of a stream with a log bank stabilization structure. The stream flows from the background towards the foreground. On the left bank, several large logs are stacked horizontally to form a retaining wall. The water is clear and reflects the surrounding greenery. In the background, a house with a white railing is visible, partially obscured by trees and bushes. The overall scene is lush and green.

All Woody Streambank Stabilization

Restoration on HOA Budget

PROBLEMS

- Loss of streambank and HOA property along pool
- Tidal action during dam release and high storm water flows
- Stormwater flow from parking lot/street drainage
- Double rise of creek due to high storm water and dam release
- Extreme erosion due to loss of vegetation and straightened channel
- HOA BUDGET





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- Original plan proposed j-hooks and rock weirs to be tied into a 3:1 slope with toe wood placed along the left and right banks.
 - Due to tight location of pool house and width of the stream, this existing condition did not allow for originally proposed 3:1 slopes.
 - The HOA only owned the right bank downstream so full in-stream structures were not practicable.
 - Expense of full instream structures and toe wood not practicable for HOA's budget.

Existing Conditions 2014

- Lack of streambed variation – all run/pool
- No stream vegetative cover (high stream temperatures in extreme heat)
- Heavy erosional forces and loss of streambank



- Lack of instream habitat
- No LWD – large woody debris



2014 Existing Conditions

- Ephemeral channels – increase stormwater flow unrestricted actively eroding right bank (pool property)
- Direct runoff from streets
- Heavy sediment deposition from roadway runoff



2014

SOLUTION

- Log stabilization
- Root wad insertion
- Use of riprap fill on ephemeral channels
- Large boulder insertion to lessen stormwater influence on stream
- Heavy planting of vegetation along stream banks and upland riparian areas
- Budget Solution
 - Donation of logs from Arborist Service
 - Donation of Boulders from neighbor (landscaping company)





GOALS of Project

- Strengthen stream bank to control erosion and loss of HOA pool property.
- Improve conditions of Heards Creek (fish habitat, dissolved oxygen content, high water temperature)
- Vegetate the stream banks – strengthen natural soil stabilization
- Reduce sedimentation from stream banks within project area
- Perform all proposed tasks under a strict HOA budget.



Details

- minimum construction equipment such as mini-excavators; relying mainly on manual labor, and ingenuity.
- anchoring of trees approximately 4-6 feet in length with 20–30-inch diameter at breast height. The design called for 2 to 3 trees per impacted area to be anchored together for a stabilization height of approximately 5-6 feet along each streambank.

Construction Details

- One-foot-deep trench excavated at toe of bank;
- Rip rap placed at base of trench;
- Log surrounded with non-woven black fabric and placed within the excavated trench;
- Logs were anchored in place with t-posts and secured on to one another with 1'x6" galvanized nail spikes.
- Logs were stacked at a 2:1 slope 3-4 high
- Logs secured into the banks with large boulder and root wads within open spaces
- Banks heavily vegetated with black willow (*Salix nigra*) and silky dogwood (*Cornus amomum*)



Ephemeral Channel Stabilization

- Staked geotextile black woven fabric laid within bottom of channel;
- Both channels received medium sized rip rap from point of origin to the toe of slope at edge of creek.





Construction









EPHEMERAL CHANNEL CONSTRUCTION





As-Built





AsBuilt





As Built Ephemeral Channels





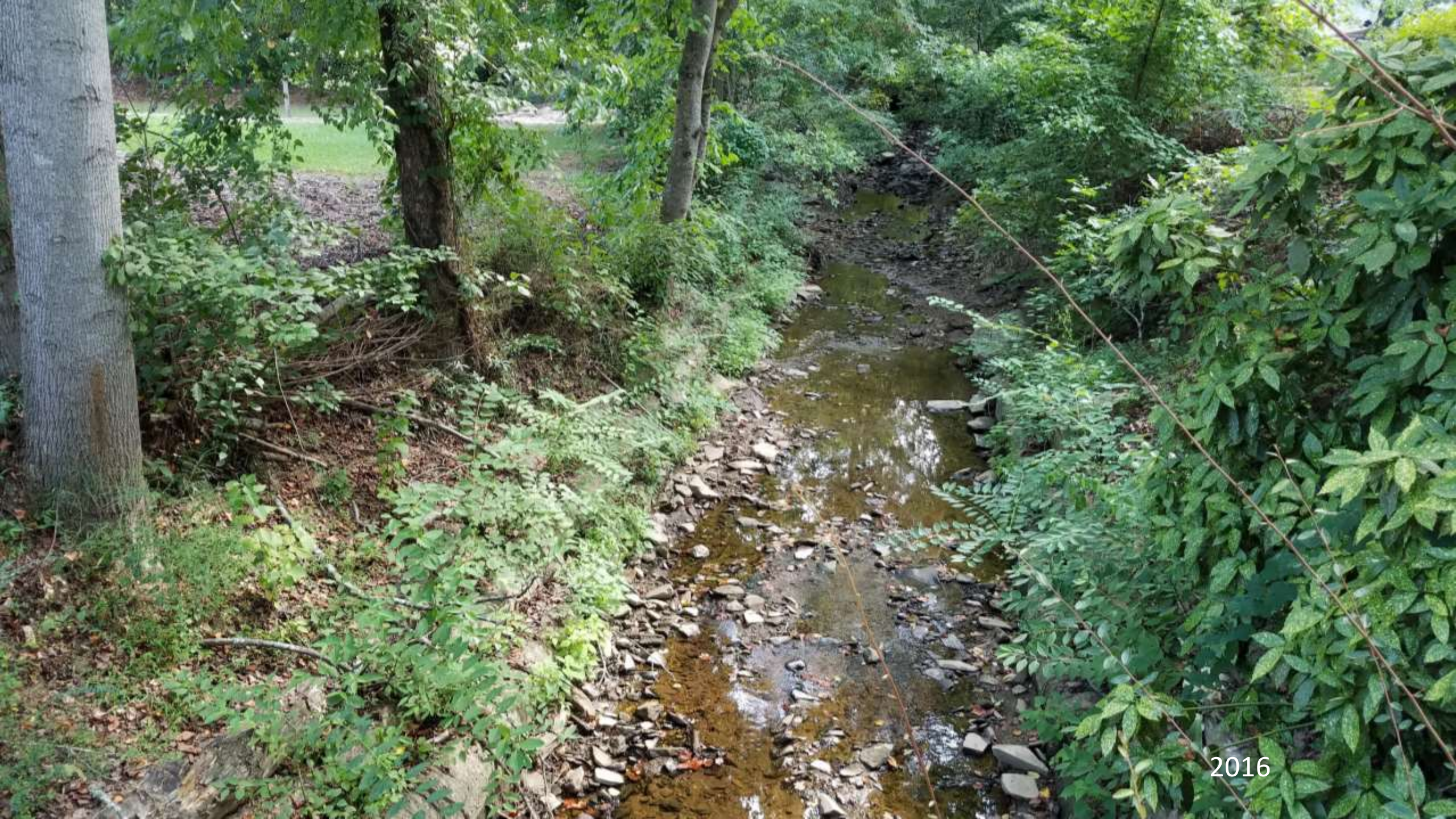
2015



2015



2016



2016



2016



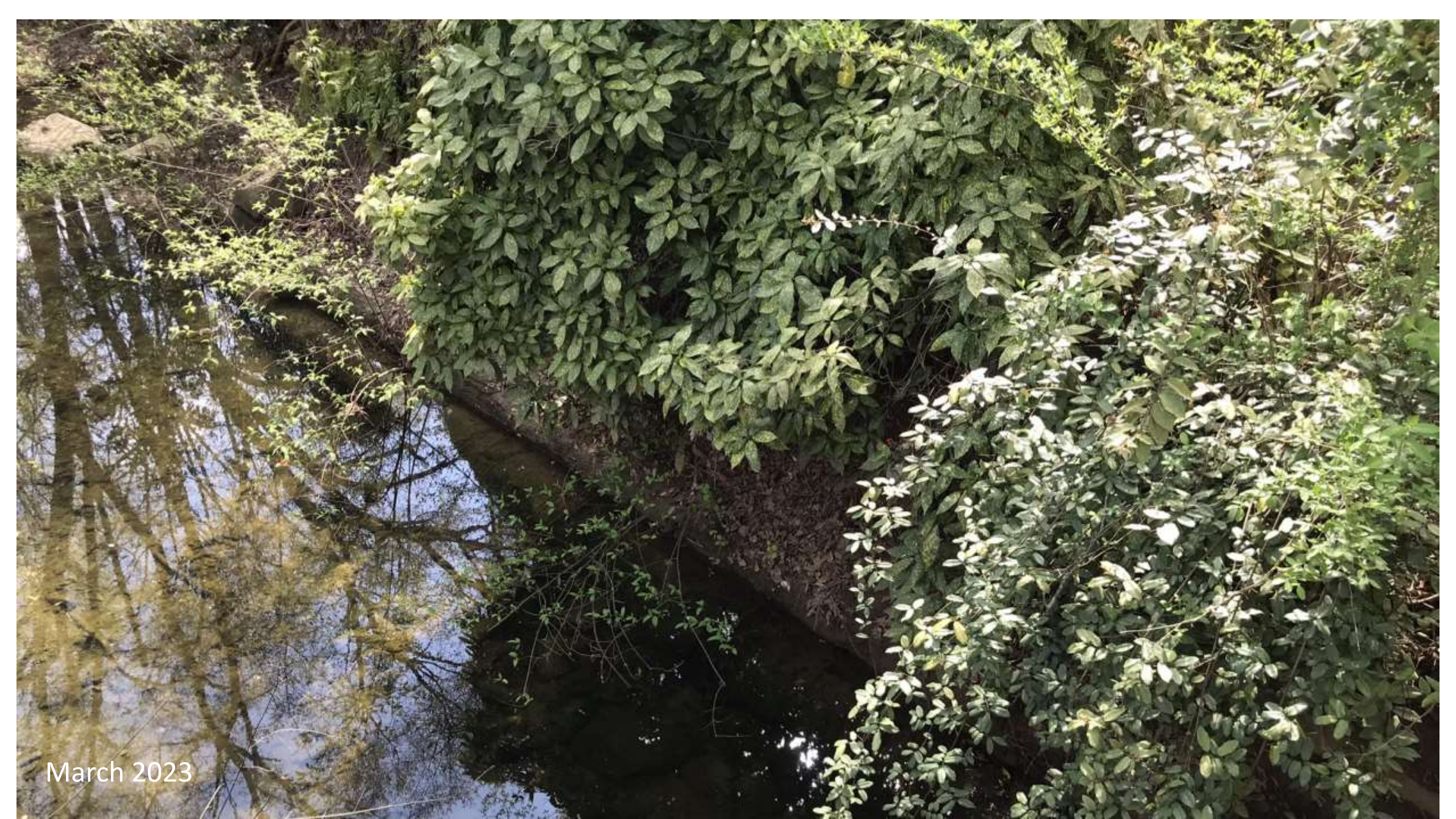
2016



March 2023



March 2023



March 2023



JULY 2023



JULY 2023



JULY 2023



JULY 2023



JULY 2023



JULY 2023



Overall Results of Stabilization

- Improved shading of stream
- Improved interstitial spaces within stream bed due to intermixing of sediment and streambed gravel
- Insertion of root wads and boulders increased fishery habitat
- Reduction of overland flow into stream with large boulder reduced streambank erosion
- HOA budget met with donated logs and boulders
- No loss of trees and minimal stream impact due to small machinery and manual labor during low flow events.

