Project Name: Anthony Island Habitat and Shoreline Restoration Project
Project No. LPT4517
Sponsor Lake Sinisippi Improvement District
Contact: Ellen Perkins, Commissioner
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Jim Gronowski, Chair and Commissioner

Site Background

Lake Sinissippi is an impoundment on the Rock River in central Dodge County. The lake has a large watershed of 511 square miles. The lake and the many surrounding wetlands provide habitat for a variety of wildlife species and also migrating birds. Lake Sinissippi is an impaired waterway on the 303(d) list for impairments of eutrophication and habitat destruction due to nutrient enrichment by phosphorus and excessive sedimentation. Eroding shoreline and loss of islands are major resource problems in Lake Sinissippi and the upper reach of the Rock River. Over the past seven decades, water erosion has caused four of the original twelve main islands, as well as shoreland wetlands, to disappear. Unprotected lake shoreline and undeveloped islands continue to experience recession and soil loss due to exposure to erosive forces from wind-driven wave energy, current flow, waves created by recreational boating and ice action. Soil loss from erosion contributes to sediment loading and deposition in the lake, loss of shore vegetation and aquatic plant communities, and degraded fish and wildlife habitat.

Anthony Island is one of the eight major islands on Lake Sinissippi that remain today. Anthony Island is a 30 acre drumlin located on the southeast area of Lake Sinissippi. The northern half of the island is for residential use, containing cottages and outbuildings. Each resident of Anthony Island owns a deeded section of the south half of the drumlin. This southern 15 acres is heavily forested and free from development. The 18 residents of Anthony Island realize the significance of habitat loss on this beautiful area of the lake. In order to formulate a plan for habitat restoration and enhance shoreline protection, Anthony Island Home Owner's Association, Island Wood, LLC (a Home Owner's Association), and Lake Sinissippi Improvement District (LSID) joined into a partnership for land access to the undeveloped and pristine areas of the island.

Surface Water Grant

The Anthony Island Project started as a low funded resident-led attempt to decrease erosion. However, funding was not sufficient by using resident contributions and LSID money. A Surface Water Grant Application was submitted to Wisconsin Department of Natural Resources (WDNR) Water Resource Management Department by LSID in January 2017. The grant was awarded in April 2017 as Grant Number LPT4517. The objective of this grant was to control invasive woody plants on the island, restore native plants, and control shoreline erosion.

The activities proposed for the grant included:

1 Evaluation of island topography and wave action on the shoreline
2 Clearing and herbicide application for invasive plants by a landscaping company
3 Planting native shrubs and flowers along 500 feet of shoreline to enhance wildlife

habitat

4 Utilize trees that have fallen into the lake as fish sticks and wildlife habitat.
5 Stabilize shoreline frontage to prevent additional trees from falling into the lake causing further erosion.

Additionally, LSID planned an educational component of the project by sharing the investigation and results of the island study with residents of Anthony Island and the surrounding community at a meeting on July 7, 2019, summer editions of the LSID newsletter, and at the LSID annual meeting that was held on August 10, 2019.

Field Activities

Invasive Species

In the summer of 2017, Jim Gronowski, Chair of LSID and I met with contractors to begin the investigation of the Anthony Island topography and habitat. Several meetings were held with Rose Chmielewski, Senior Ecologist with Ecological Service of Milwaukee and Lisa Reas of LJ Reas Consulting Corporation. They viewed the island and determined that this project was too large for their companies. Jim and I then met with Ben Swanson, Ph.D. of Inter-Fluve in Madison. Ben stated that the main issue with the island is shoreline erosion. Inter-Fluve felt that our project would involve mostly rip rap and was too small for their company.

We then met with Steve Hjort, Director of Ecological Services at Eco Resources Consulting (ERC), who was then contracted to investigate and make recommendations for habitat restoration and protection. On October 31, 2017, Clayton Frazer, Senior Ecologist with ERC conducted the investigation of the southern half of the island. An email of his findings included "*The assessment went very well last week. We ended up surveying the island and shoreline from kayaks. Overall, the bank would benefit from restoration/stabilization work. But the good news is the density of woody invasive species (buckthorn, Asian bush honeysuckle) on the island is actually VERY low. There is a very diverse array of native shrubs that comprise the understory of the woods and dominate the shorelines*." The ERC investigation confirmed the low density of invasive woody plants.

On February 13, 2018, the ERC investigation and report was presented to the Anthony Island residents, members of the Homeowner's Association, Marc Garlock of Ultimate Excavating, Richard Wolff of Wolff Excavating, and LSID Board members. Steve Hjort and Clayton Frazer from ERC presented their findings and made recommendations. Some of the major points are:

1 While there was significant erosion on the island, there were minimal amounts of invasive species. Figure 1 below shows erosion from 1940 versus 2017 with shoreline loss of 1.57 acres.
2 There was a healthy diversity of native plants that could easily be encouraged to expand once erosional areas are addressed. Figure 2 shows the locations of buckthorn, black locust, Asian honeysuckle, and other invasive plants.
3 Steep banks on the island would benefit from shoreline recovery with hard armoring

FIGURE 1

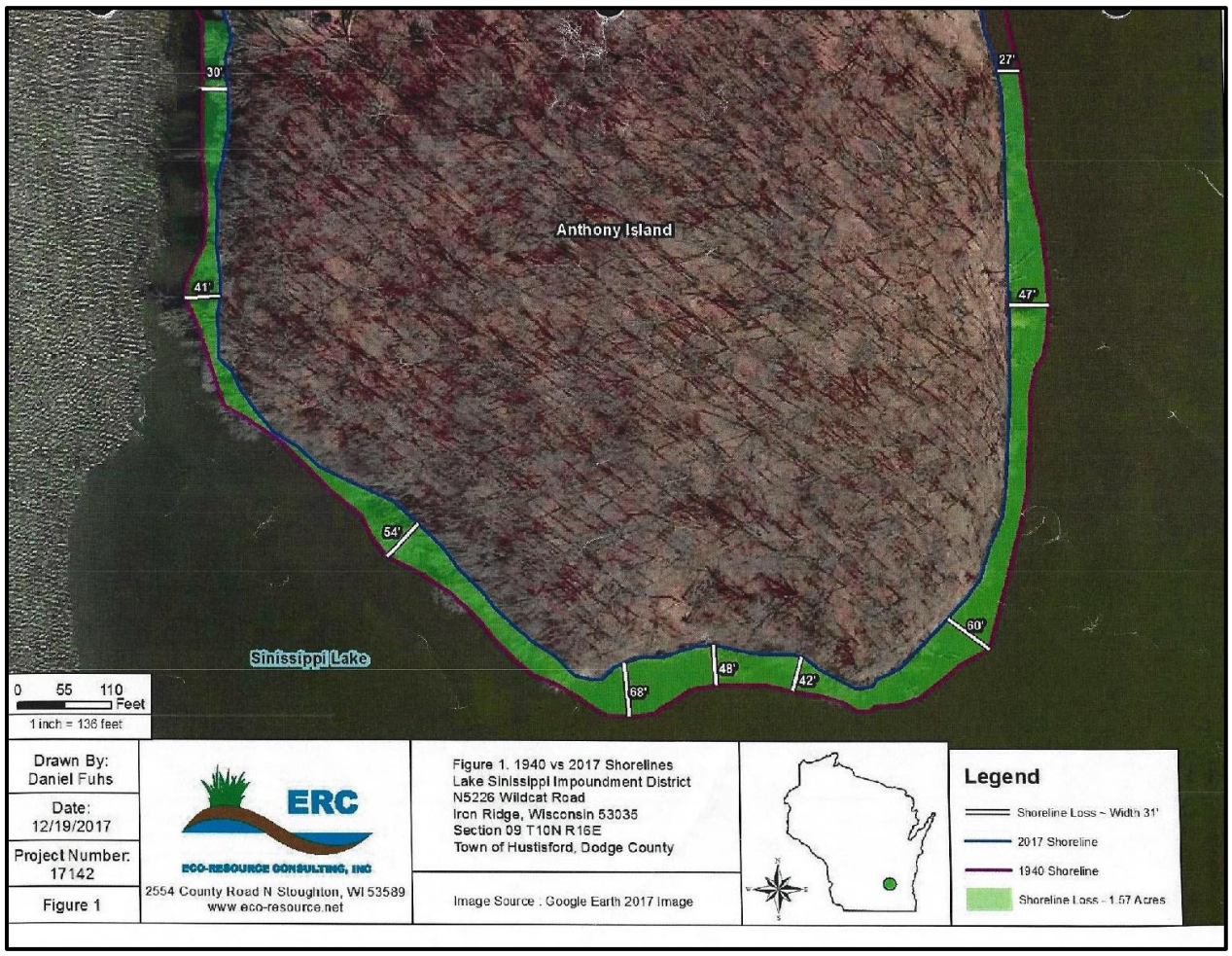
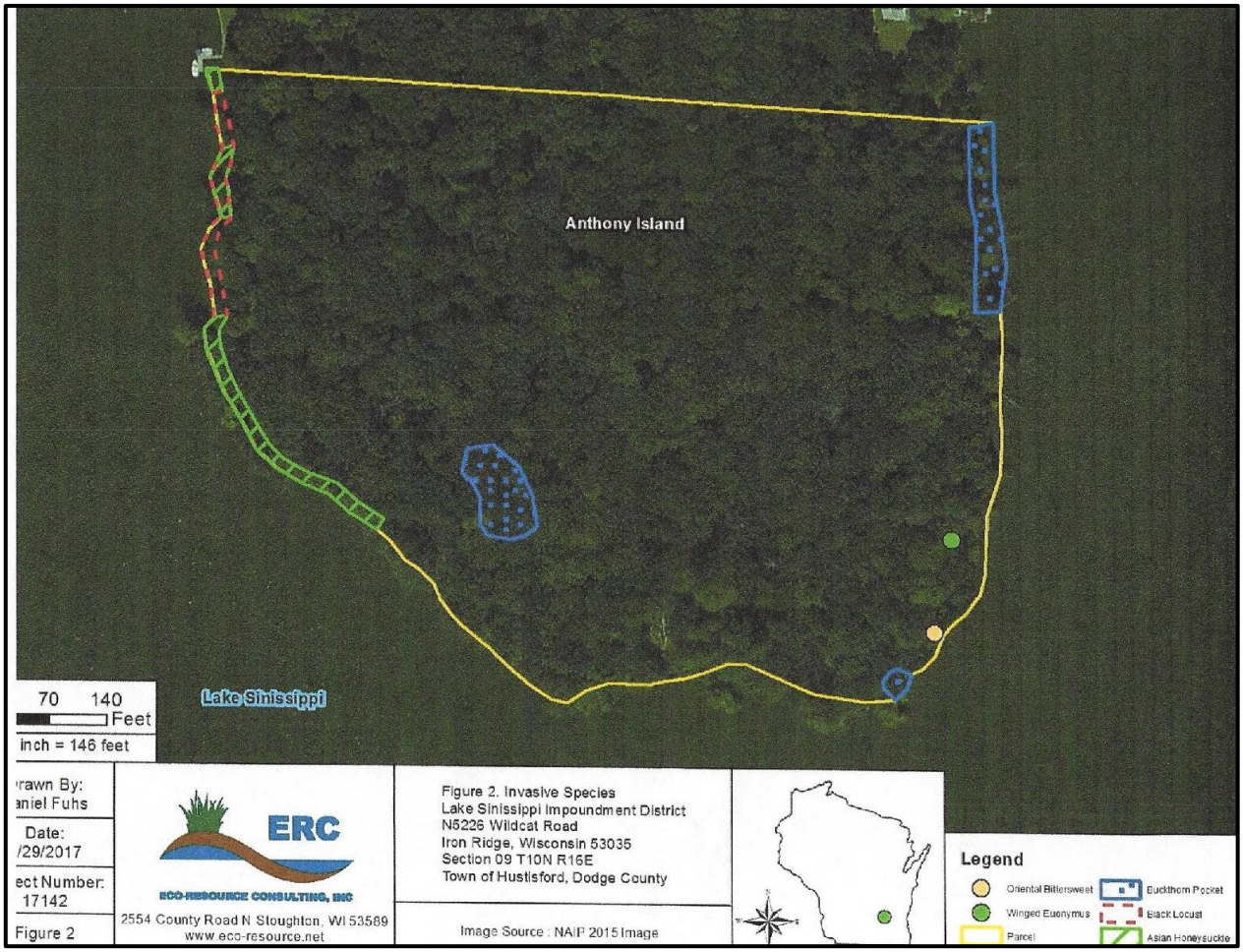

30'
27'
Anthony Island
41'
47'
54'
60'
Sinissippi Lake
48'
42'
68'
0 55 110 Feet
1 inch = 136 feet
Drawn By: Daniel Fuhs
Date: 12/19/2017
Project Number: 17142
Figure 1
ERC
ECO-RESOURCE CONSULTING, INC
2554 County Road N Stoughton, WI 53589
www.eco-resource.net
Figure 1. 1940 vs 2017 Shorelines
Lake Sinissippi Impoundment District
N5226 Wildcat Road
Iron Ridge, Wisconsin 53035
Section 09 T10N R16E
Town of Hustisford, Dodge County
Image Source : Google Earth 2017 Image
Legend
Shoreline Loss ~ Width 31'
2017 Shoreline
1940 Shoreline
Shoreline Loss - 1.57 Acres

FIGURE 2


Anthony Island
Lake Sinissippi
70 140
Feet
inch = 146 feet
rawn By:
aniel Fuhs
Date:
/29/2017
ect Number:
17142
Figure 2
ERC
ECO-RESOURCE CONSULTING, INC
2554 County Road N Stoughton, WI 53589
www.eco-resource.net
Figure 2. Invasive Species
Lake Sinissippi Impoundment District
N5226 Wildcat Road
Iron Ridge, Wisconsin 53035
Section 09 T10N R16E
Town of Hustisford, Dodge County
Image Source : NAIP 2015 Image
Legend
Oriental Bittersweet
Winged Euonymus
Parcel
Buckthorn Pocket
Black Locust
Asian Honeysuckle

During the meeting, various armoring options were discussed with island representatives and the two excavators who attend the meeting. Also at the meeting, funding from island residents was committed to the project along with LSID funds.

Eco-Resource Consulting conducting the first herbicide treatment on March 29 and 30, 2018 for cost of $3,000. ERC technicians used chainsaws and backpack sprayers to cut, remove, and treat woody invasive plants. Species that were targeted were common buckthorn, black locust, Asian honeysuckle, winged euomymus, and oriental bittersweet within 35 feet from the shoreline along the entire length of the southern half of the island.

On June 10, 2019, Eco-Resource Consulting conducted another herbicide application for a cost of $1,500. Clayton Frazer reported: "*there were approximately 20-30 common buckthorn saplings that were treated from the northeast, along the project area. ERC provided foliar-treatment of numerous black locust trees ranging from 6 inches to 5 feet tall. We also treated several prickly ash, buckthorn saplings and numerous honeysuckle that was less than 5' tall*." Treatments were made within 35 feet of the shoreline along the southern half of the island.

ERC technician treating invasive species

Rip Rap

LSID entered into a contract with Marc Garlock of Ultimate Excavating from Fort Atkinson, WI on March 23, 2018. Photographs of the shoreline were taken prior to the rip rap work

Before Work

Permits were obtained for this project from the WI DNR on July 11, 2018 and Dodge County on July 12, 2018 . Rip rap work began on the east side of the island at the northern point of the undeveloped shoreline and continued south in October 2018. A large 24" fieldstone boulder was trenched deeply into the lakebed as a toe rock. Smaller fieldstone (12-18 inches) was placed at a 2:1 slope over filter fabric. The distance from the center of the toe stone to the bank was 72 inches and the height was 24 inches. Work progressed to 197 feet of rip rap and 171 feet of shoreline cleaning for a cost of $60,000. LSID paid for this expense on November 2, 2018. The attached pictures show the shoreline after rip rap was completed. Note, there is wood along the shoreline. We worked with Susan Graham and others at the DNR and it was decided to leave the wood to decompose so that there would be no bare

ground exposed.

View of rip rap along shoreline

Closeup of rip rap

In October 2019, an additional 190 feet of rip rap was completed so that the shoreline protection is located over one-half of the eastern side of the island. Below are pictures of the 2018 regrowth of the shoreline plants and completed rip rap project in 2019.

Vegetation regrowth from 2018

Completed Project 2019

Habitat Restoration

Habitat restoration was an important component of this project. Fish sticks of fallen trees and wooden debris were left in the lake to promote wildlife habitat. There are 6 areas in the completed armored area of the shoreline that use wood and trees that fell into the lake for fish sticks. Plants have reclaimed the areas that was cleaned and are growing over the rip rap. Native shrubs and vegetation in the area will grow over the rip rap and hide the structure for a natural habitat.

Fish Sticks

Results Meeting

On July 7, 2019, LSID Commissioners attended the Anthony Island Home Owners Association annual meeting. There were approximately 50 residents in attendance. Hand-outs were provided with an outline, diagrams of shoreline loss, invasive plant locations, and topography of the island provided by ERC. We discussed options that residents can do to prevent erosion like rain gardens and rain barrels. Some residents spoke of how they regularly work to control invasive plants. They stated they would continue to track and control invasive plants.

LSID holds and annual meeting for lake residents each August. Commissioners have discussed the Anthony Island Project with attendees for the past two years. In 2018, we discussed the Surface Water Grant and explained the specifications of the project. LSID newsletters have included information and updates of the Anthony Island Project for 2018 and 2019.

Conclusion

The Anthony Island Project started as a low funded resident-led attempt to decrease erosion. The Lake Sinissippi Improvement District was happy to facilitate the discussion. With the help

of the DNR Surface Water Grant Program, this project has grown to a three-year endeavor that will cover a substantial amount of the east side of Anthony Island.

This project has been a very beneficial educational process for the Lake Sinissippi Improvement District, lake residents, and island homeowners. It has generated multiple discussions with residents on how to control erosion and provide shoreline protection to safeguard the natural beauty of the lake environment.