Nippersink Watershed Association

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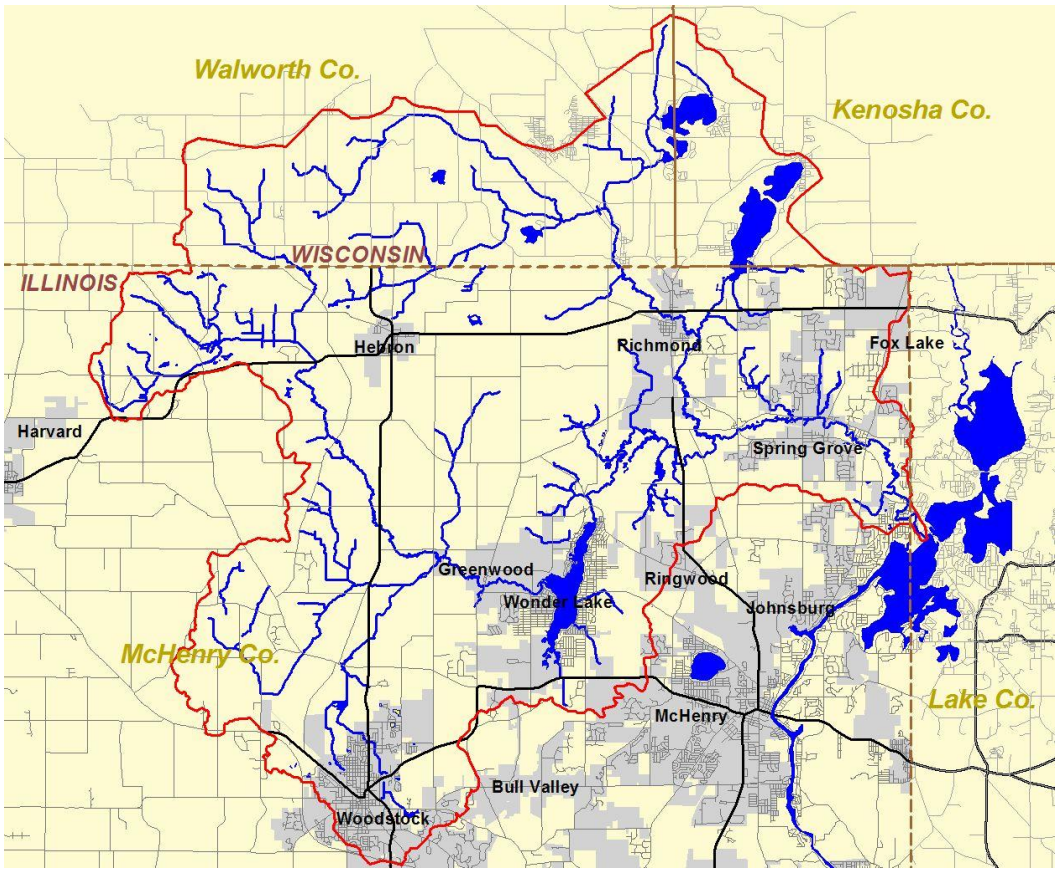
Final Report for Shaw Property - Nippersink Creek Stream Corridor Enhancement Project

FAA 3191510

November 22nd, 2016



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This report was prepared using U.S. Environmental Protection Agency funds under Section 319 of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations herein are not necessarily those of the funding agencies.

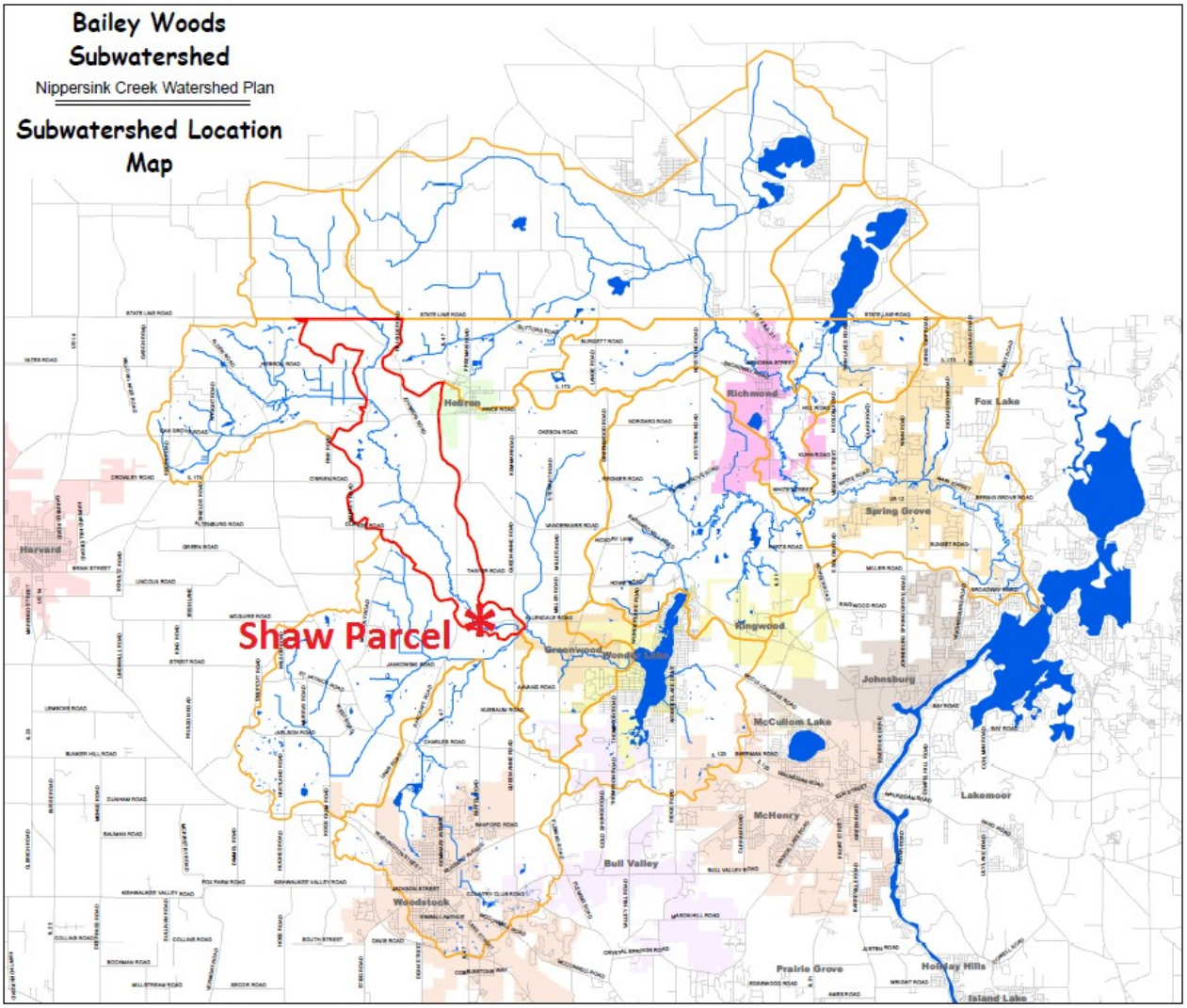
Project Overview:

In July 2014, the Nippersink Watershed Association (NWA) applied for (and in July 2015 received) Section 319 funding for a water quality Best Management Practice (BMP) project recommended in the 2008 Nippersink Creek Watershed Plan. This project is intended to provide water quality improvement benefits to the watershed, and to serve as a demonstration area for watershed stakeholders to observe these types of best management practices being implemented. This project implemented elements of Nippersink Creek Watershed Plan Recommendation # 10-4.

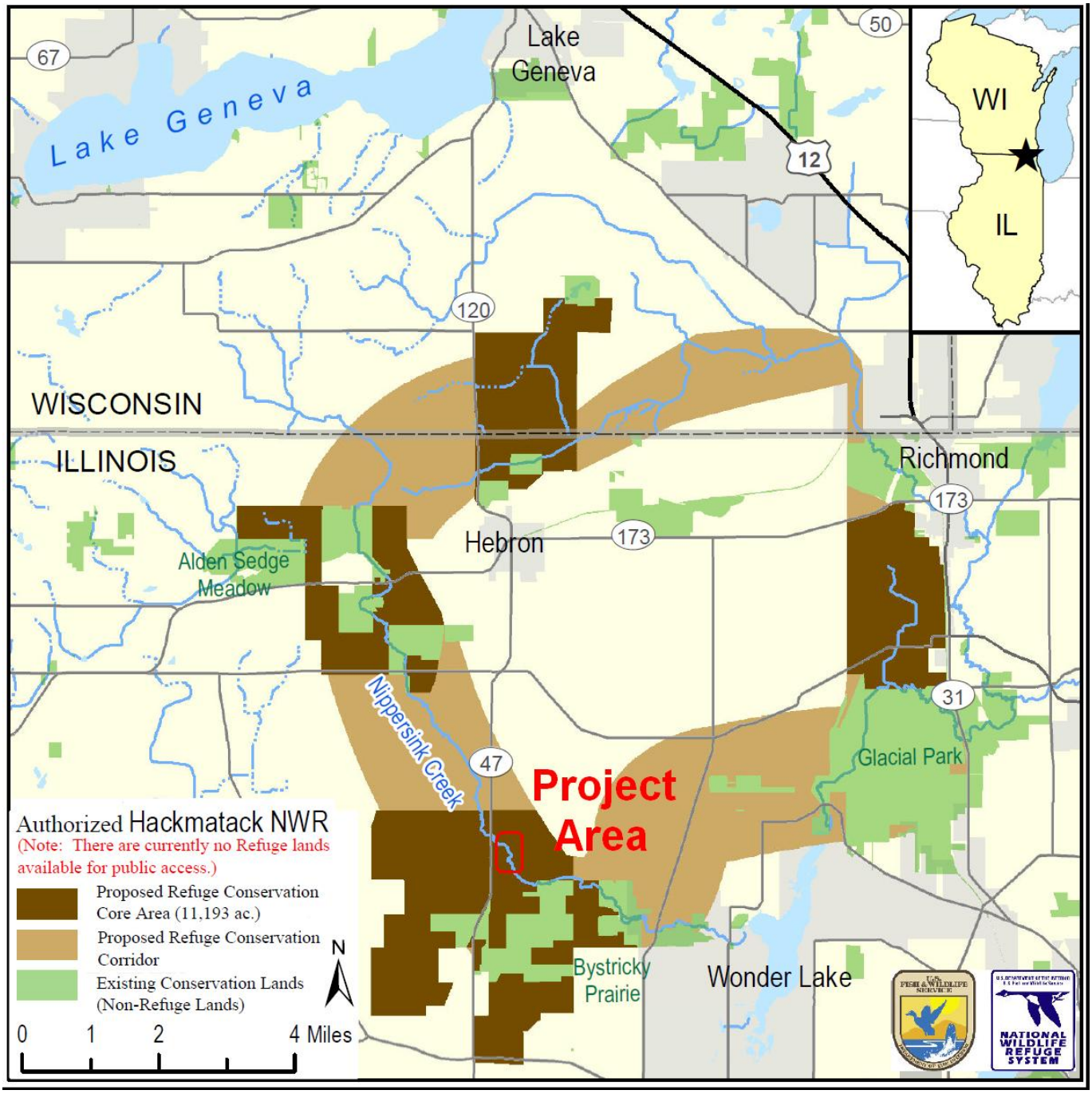
The IEPA Section 319 contract with the NWA was for the period of July 16, 2015 – December 1, 2016.

The approved 319 project was for stream corridor enhancement on the "Shaw" parcel, a 26 acre tract of land bisected by Nippersink Creek in McHenry County, Illinois. The landowner, Dr. Lloyd Shaw, had expressed his desire to have a conservation easement placed on the entire 26 acres, as well as to have his on-going efforts to enhance the environmental quality of the property continued. This approach has additional conservation benefits as the Shaw parcel is located in the "core" of the recently established U.S. Fish and Wildlife Service – Hackmatack National Wildlife Refuge.

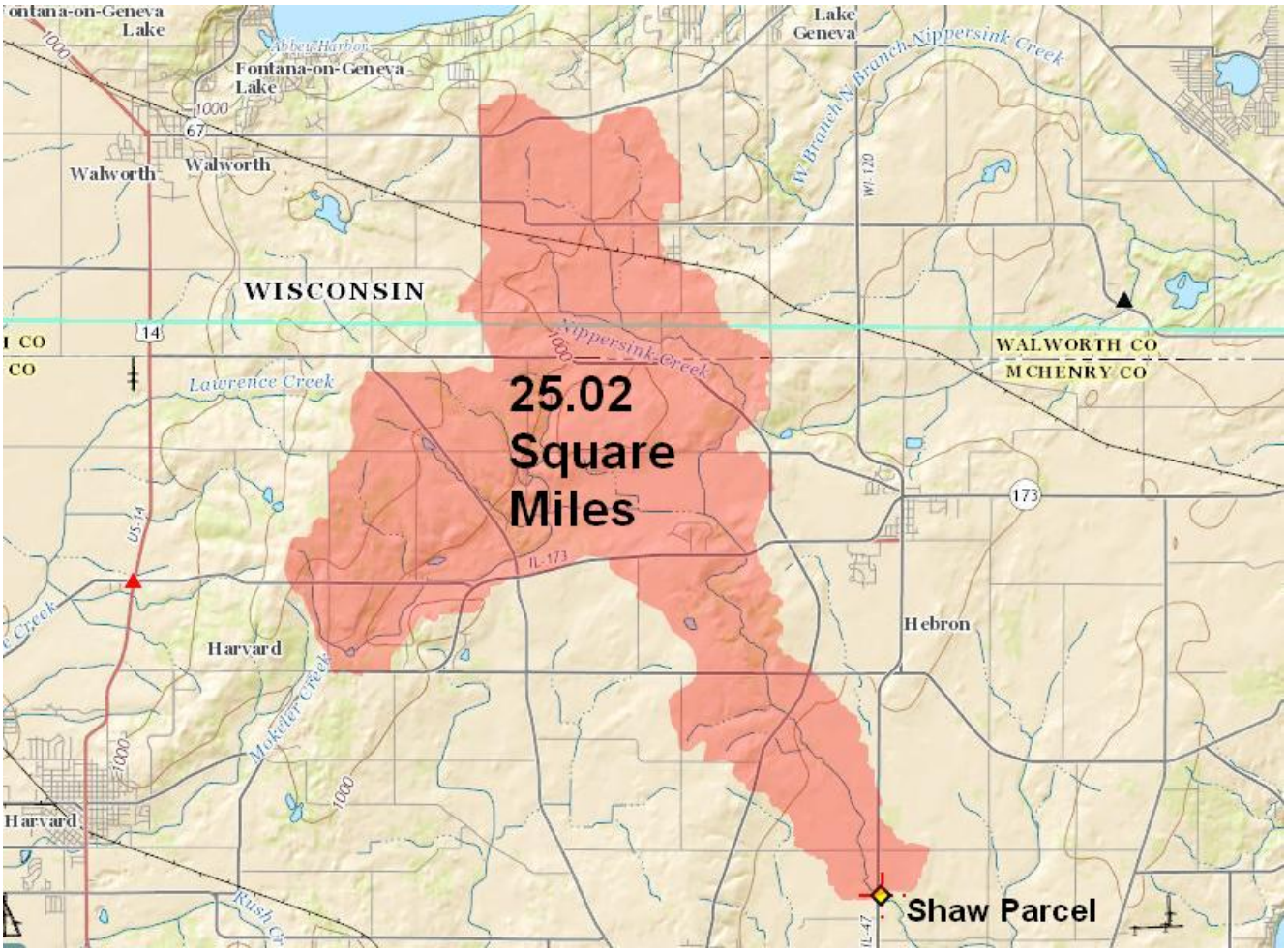
Project Area Location Map - Shaw Property – Woodstock, IL



Hackmatack National Wildlife Refuge Boundaries



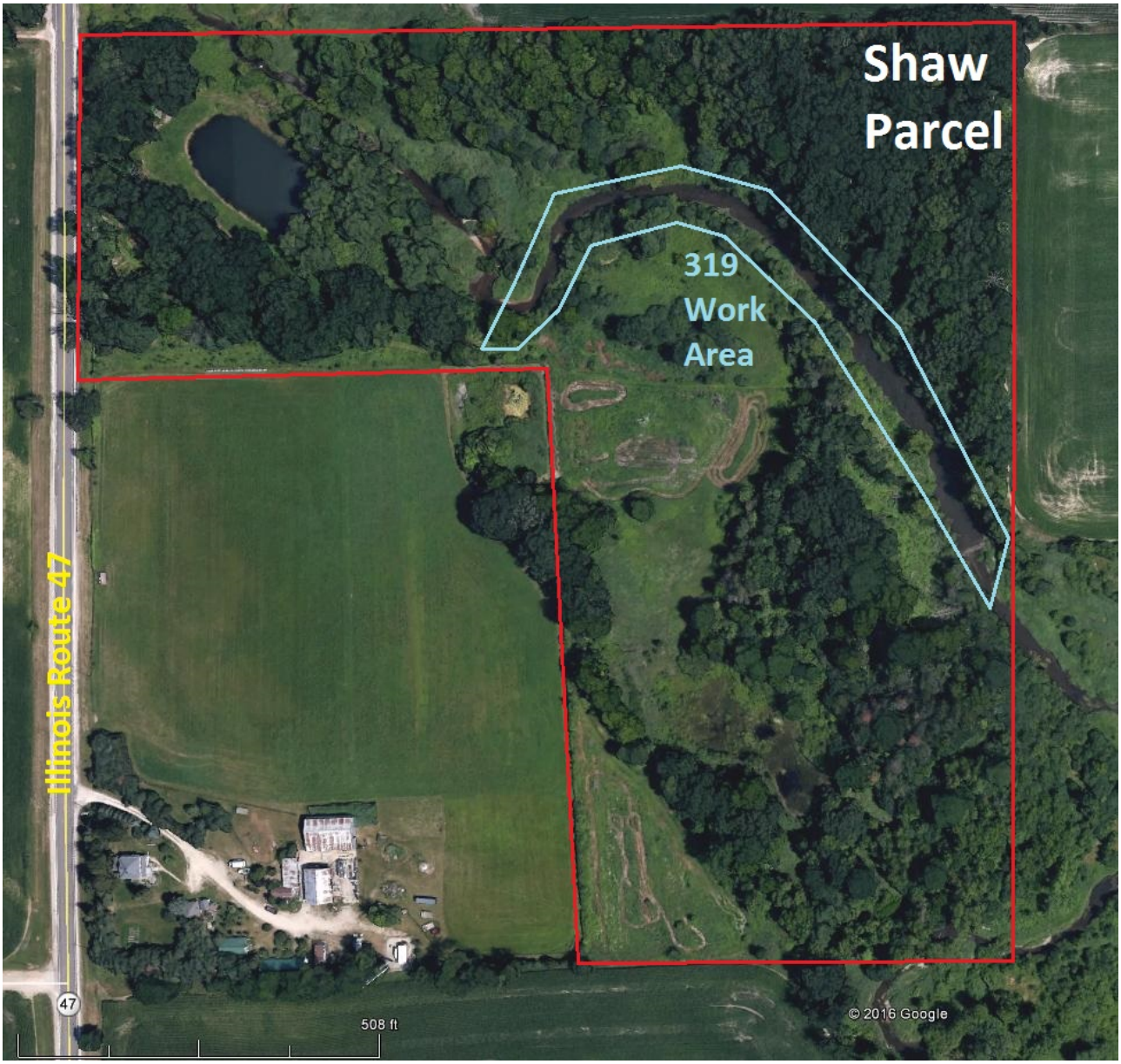
At the Shaw Parcel, the upstream tributary area of Nippersink Creek is 25 square miles. While the upstream watershed is largely agricultural, significant runoff events are still experienced.



Nippersink Creek enters the northwest corner of the Shaw Parcel, and flows southeast through two meander bends before entering a relatively straight channel segment. On the outside arc of these meander bends, and along the straight segment, the creek has migrated to the edge of the valley floor, such that steep, eroded slopes are found immediately adjacent to the channel. The presence of significant brush cover of invasive shrubs, namely Common Buckthorn, Honeysuckle, and Autumn Olive, cast dense shade on the streambanks, making them much more prone to erosion.

Compounding these conditions, a large beaver dam had been present for many years at the downstream end of the Shaw Parcel, creating an impoundment which inundated the lower streambanks, and prevented the growth of soil-stabilizing vegetation. The beaver population also created numerous bank dens along the west side of the channel, using the root fans of large trees as the structural canopy of these dens. Many of these dens and associated burrows have since collapsed, creating conduits for flows from adjacent upland areas to concentrate and form gullies. The actual beaver dam was blown out by a flood prior to the start of the 319 project.

Shaw Property – 2016 Aerial Photograph



Project Planning & Permitting:

At the time the Section 319 Grant application was submitted, it was proposed to implement:

- A permanent conservation easement to be placed on the entire 26 acre parcel.
- 800 feet of streambank stabilization on each side of the channel. As proposed, this was to include "cut-and-fill" bank re-grading / seeding / blanketing of the west bank; and the installation of a small rip-rap stone-toe along the east bank.
- 1 Artificial Riffle to provide a stable low-water crossing for the landowner to access the "land-locked portion of the property east of the channel.
- 0.40 acre of filter strip / buffer seeded to native vegetation.

The process of establishing the proposed conservation easement first required that a specialized real estate appraiser conduct an appraisal of the Shaw parcel to determine its fair market value in an unencumbered state. The appraiser then needed to determine the loss in fair market value caused by the placement of a legally binding encumbrance, such as a permanent conservation easement, on the property. The difference between these two values is the appraised value of the conservation easement, which in this situation was being applied towards the local-match for Section 319 funding.

Concurrent with the appraisal process, the landowner worked with the local land trust that would eventually hold and enforce the terms of the conservation easement, to develop the contract that defined all of the relevant obligations, and was also in compliance with applicable Internal Revenue Service regulations. Upon both parties signing the easement contract, the conservation easement was formally recorded with the McHenry County Recorder of Deeds.

Preliminary discussions with the McHenry County Department of Planning and Development, which implements and enforces the McHenry County Stormwater Management Ordinance, quickly determined that the proposed Artificial Riffle would greatly complicate the County permitting process, so the Riffle was omitted from the final project design.

In anticipation of 319 grant funding, a consultation request was submitted to the Illinois Historic Preservation Agency (IHPA) in February 2015, which indicated that an Archaeological Survey would be required before they could issue clearance. That archaeological survey was conducted in November 2015, and concluded that no archaeological material was present. As a result, IHPA issued its clearance in December 2015.

A consultation request was also submitted to the Illinois Department of Natural Resources (IDNR) through its ECOCAT website in February 2015. That request resulted in IDNR requiring that a mussel survey be conducted of the project reach. That mussel survey was conducted by the biology staff from the McHenry County Conservation District in June of 2015, and revealed the presence of one (1) Ellipse; four (4) Giant Floater; three (3) White Heelsplitter; and one (1) Slippershell. This assemblage resulted in a Mussel Classification Index (MCI) of 11, which indicates a Moderate mussel resource value, described as: *Species richness &/or abundance typical for stream of a given location and order. May be a resource of local significance or recovering from degradation*.

As a result of the presence of the Slippershell mussel, which has an endangered status in Illinois, IDNR indicated that the only way any in-stream work could be authorized would be following their issuance of an Incidental Take Authorization (ITA). As described on the following weblink, the ITA process requires a significant expense to generate the required documentation, and typically involves a minimum of six (6) months to process. Both the added expense and timeline were not compatible

with the available Section 319 budget and timeline, so it was agreed that the project design would be amended to ensure that no in-stream work would be conducted. https://www.dnr.illinois.gov/conservation/NaturalHeritage/Pages/ApplyingforanIncidentalTakeAuthorization.aspx

A further issue arose with IDNR when they indicated that the Nippersink Creek streambed between Wonder Lake and the Alden Sedge Meadow (roughly 13 miles upstream) had been designated as Illinois Natural Area Inventory (INAI) site # 1506. As a result, any impact to the 49.77 acres of streambed over this 13 mile reach would be subject to much more stringent IDNR review and likely mitigation requirements under the Illinois Interagency Wetland Policy Act. Again, a compromise was reached by agreeing to amend the project design to ensure that no in-stream work would occur.

Under this agreement with IDNR, no modifications to the proposed west streambank practice were needed. However, as the rip-rap stone toe was not feasible for the east bank, an alternative approach had to be devised that would provide the desired measure of erosion control, but could be installed with no in-stream impacts.

The selected alternative was the use of "CocoBeds", a manufactured mattress comprised of a coir (coconut) fiber stuffing, wrapped in a coir fiber netting. Each individual CocoBed is approximate 3 inches thick, 3 feet wide, and 15 feet long. As shown in the typical detail at right, the CocoBeds are installed with the lower edge at the normal water level of the creek, and staked in place onto the exposed clay pan lower streambank slope in a continuous fashion along the entire horizontal length of the streambank to be treated. Once in place, the CocoBed can be planted or seeded with native vegetation into the dense coir substrate, which can also help trap streamborne sediments, or soil eroding off the upper (untreated) streambank slope.

CocoBeds installed along shoreline with installed native vegetation

One additional modification to the project plans was implemented. At the upstream end of the 319 project reach, surface runoff from an adjacent, off-site field was concentrating and forming a gully at the first meander bend of the creek. The approved plans called for the minor re-grading and subsequent importation and placement of rip-rap to allow the overland runoff to be conveyed down to the stream in a stabilized rip-rap lined swale. Again, this treatment was to have no-instream impact.

With the project plans complete, they were submitted to IEPA for review and approval; and were subsequently submitted to the Chicago District of the U.S. Army Corps of Engineers (USACE) in late April 2016. The USACE Section 404 permit was received in early June 2016, which automatically granted IEPA Section 401 Water Quality Certification.

Project plans and a McHenry County Stormwater Management Ordinance (MCSMO) Permit application were then submitted to the McHenry County Department of Planning and Development in early May 2016. McHenry County had recently updated the MCSMO to create a General Permit for these types of projects, with the intent of greatly expediting the review and issuance of MCSMO permits. After numerous discussions between County staff and the NWA project engineer, and three (3) edits and resubmittals of the project plans, the MCSMO permit was issued 2 ½ months later in mid-July 2016.

Project Implementation:

The project was successfully completed in October 2016, timed to take advantage of seasonal low water levels. The 319 project budget allowed the length of streambank actually treated to be increased from the 800 linear feet (per bank) proposed under the original Section 319 grant application up to 1,000 linear feet per bank. The 1,000 foot length is the maximum distance allowed under the MCSMO.

As part of the streambank treatment work and associated Soil Erosion and Sediment Control efforts, all disturbed areas were initially seeded with a temporary cover crop of Oats, followed by the dormant seeding of 0.4 acres of stream buffer with native wetland and wet prairie species.

An additional modification was also required for the rip-rap swale. Due to the fact that the only access to the Shaw Parcel is through a narrow entrance gate off Route 47, and the presence of numerous large oak trees at the entrance and along the access route on the property itself, it was not possible to import the required truckload volume of rip-rap. Instead, the eroded gully was graded, seeded, and covered with a North American Green C-350 turf reinforcement mat (TRM), which has similar channel stabilization characteristics to rip-rap. A small volume of rip-rap was imported by wheelbarrow to allow a small check dam to be installed in the constructed swale.

The Land Conservancy of McHenry County, as holder of the conservation easement on the Shaw property encompassing Nippersink Creek, has executed an operation and maintenance plan to be implemented for at least ten years, from the date of implementation, to ensure the effectiveness of the Best Management Practices.

Due to the Shaw Parcel only having frontage on a rural but heavily traveled state highway, with no room for roadside parking for viewing of a typical Section 319 project informational sign, no signage was proposed or installed.

Project Plan:

Project Photos:

Nippersink Creek – Typical Before Conditions (While beaver dam was intact)

Nippersink Creek – Typical East Bank Before Conditions (After beaver dam flood blowout)

Nippersink Creek – Typical East Bank Undercut

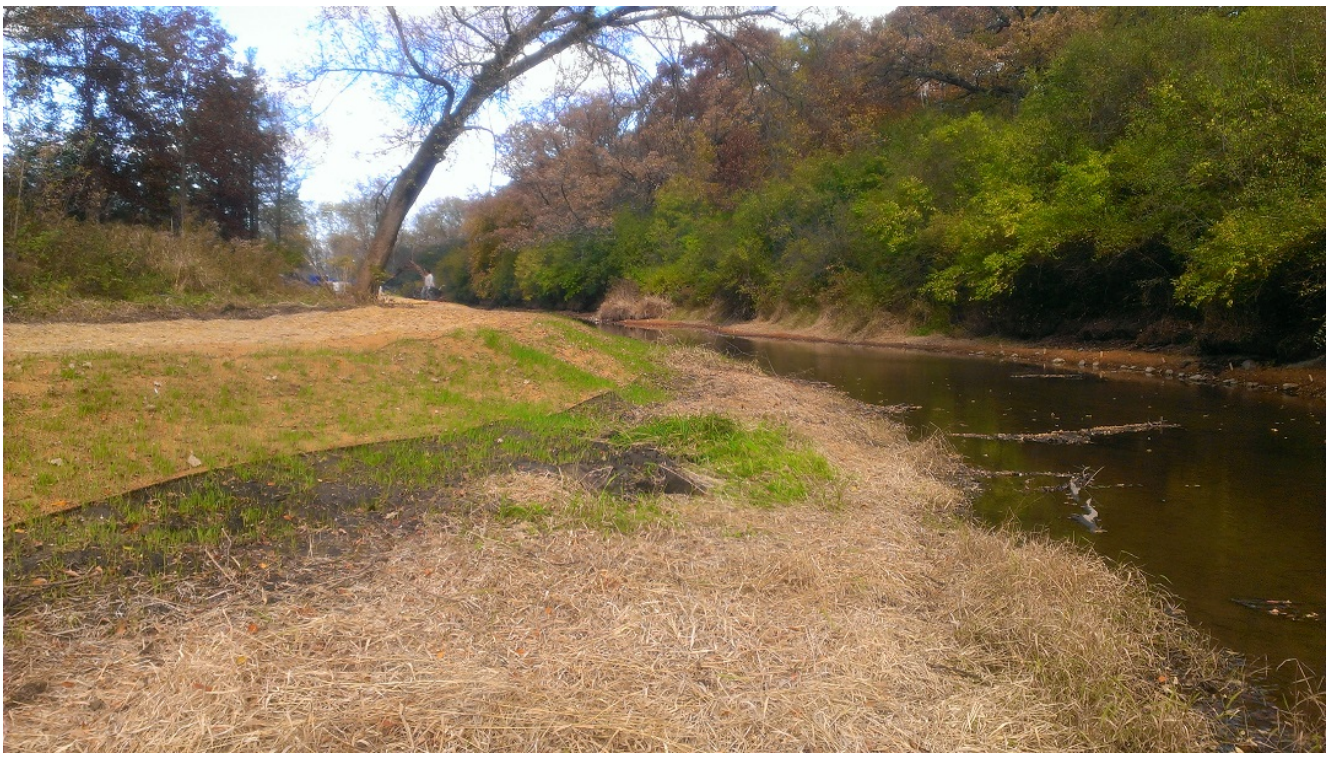
Nippersink Creek – Construction Phase – CocoBed Installation

Nippersink Creek – Construction Phase – West Bank Slope Re-Grading

Nippersink Creek – Construction Phase – West Bank Slope Re-Grading / East Bank CocoBeds

Nippersink Creek – Construction Phase – West Bank Slope Blanket / Temporary Seeding

Nippersink Creek – Construction Phase – West Bank Slope Blanket / Temporary Seeding



Nippersink Creek – Gully Repair

Nippersink Creek – Gully Repair

Project Cost:

The FAA 3191510 contract approved by IEPA reflected a total cost of $195,000 to implement the project. Of this amount, Section 319 funding would provide $117,000 (60%), while a local-match amount of $78,000 (40%) would be provided by the landowner.

The local-match amount was to be provided as the "value" of placing the entire 26 acre parcel into a permanent conservation easement, the value of which was estimated (at the time of the Section 319 grant application submittal) by a local land trust at $78,000.

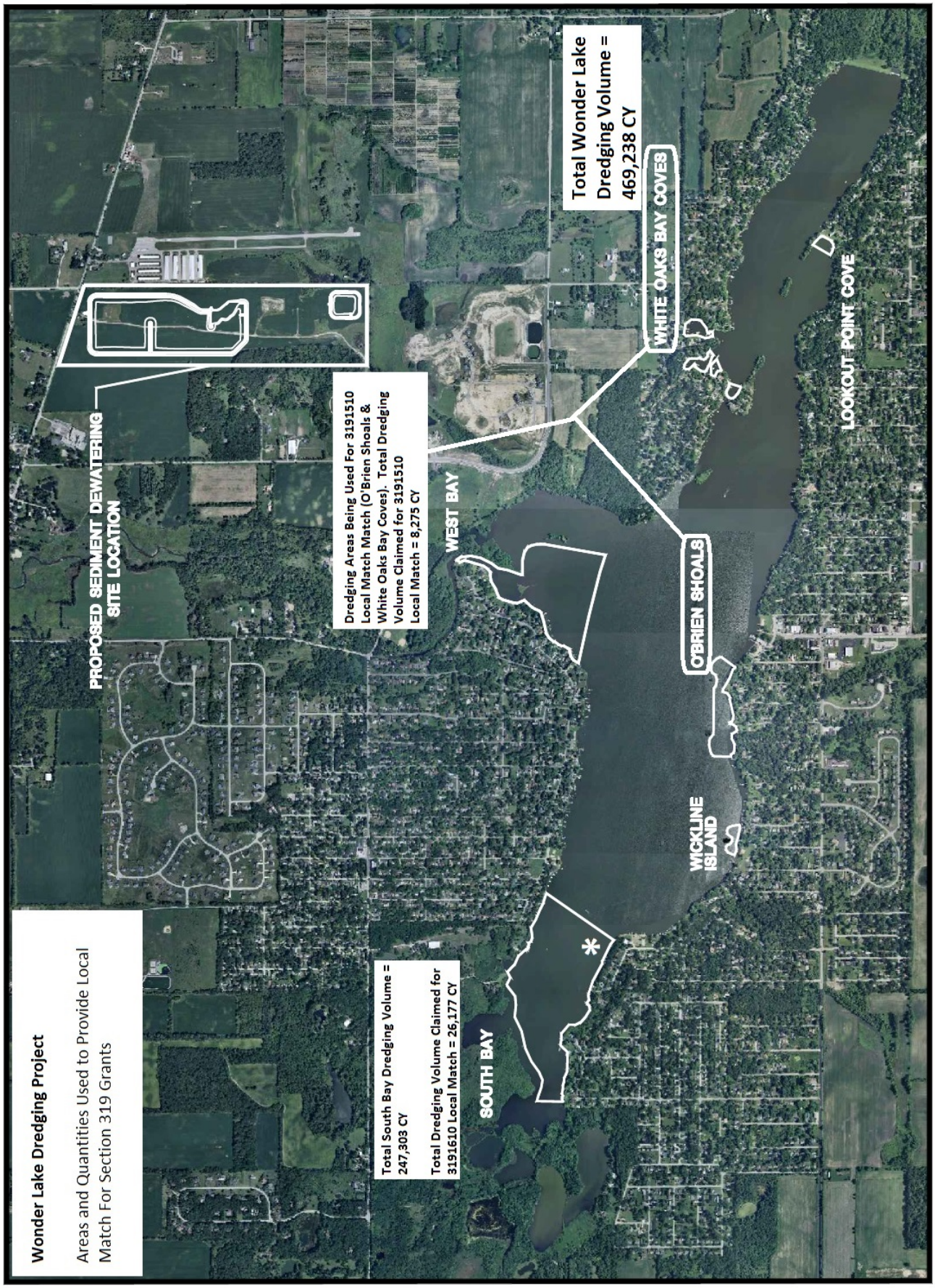
However, once the actual conservation easement appraisal was conducted, subsequent to the Section 319 grant being awarded, it was determined that only a much lower value could be attributed to the recording of the easement, namely the amount of $30,000. Subsequent discussions with IEPA resulted in their allowing the use of $48,000 in Wonder Lake Dredging value as the remaining balance of required local-match. An additional $600 in donated services was also provided as local-match.

The Wonder Lake Dredging project, a $ 7.9 million lake restoration project, is being funded through the creation of a Special Service Area taxing district and local contributions. No Section 319 funding has been provided for the Wonder Lake Dredging project. As a result, since dredging was included as a recommended water quality BMP in the 2008 Nippersink Creek Watershed Plan, IEPA agreed that the implementation and funding of that project by the lake owner (The Wonder Lake Master Property Owners Association) met watershed protection goals, and as such, would be eligible to count as "local-match" towards other Section 319 funded projects. The two areas where Wonder Lake was dredged (White Oaks Bay and O'Brien Shoals) to provide local- match for this grant are shown on the following page.

Ultimately, the actual project costs incurred totaled $195,6000. Of that amount, Section 319 funding provided $117,000 (59.8%), while a local-match amount of $78,600 (40.2%) was provided by the local partners.

FAA 3191510 PROJECT BUDGET PER ORIGINAL IEPA CONTRACT			
	Total Estimated Cost in 319 Grant Contract	3191510 Estimated IEPA Share	3191510 Estimated Local Match
Percentage		60.0%	40.0%
Direct Labor			
Administration	$3,000.00	$3,000.00	
Professional / Technical	$3,000.00	$3,000.00	
Subcontracts			
Design / Engineering	$9,000.00	$9,000.00	
BMP Construction	$102,000.00	$102,000.00	
Conservation Easement (MATCH ONLY)	$78,000.00		$78,000.00
TOTAL	$195,000.00	$117,000.00	$78,000.00

ACTUAL PROJECT COSTS INCURRED			
	Actual Project Cost	3191510 Approved IEPA Share	Actual Local Match Percentage Provided
Percentage		59.8%	40.2%
Direct Labor			
Administration	$3,000.00	$3,000.00	
Professional / Technical	$3,600.00	$3,000.00	$600.00
Subcontracts			
Design / Engineering	$7,944.60	$7,944.60	
BMP Construction	$103,055.40	$103,055.40	
Conservation Easement (MATCH ONLY)	$30,000.00		$30,000.00
Wonder Lake Restoration (MATCH ONLY)	$48,000.00		$48,000.00
TOTALS	$195,600.00	$117,000.00	$78,600.00


Wonder Lake Dredging Project
Areas and Quantities Used to Provide Local Match For Section 319 Grants
PROPOSED SEDIMENT DEWATERING SITE LOCATION
Dredging Areas Being Used For 3191510 Local Match Match (O'Brien Shoals & White Oaks Bay Coves). Total Dredging Volume Claimed for 3191510 Local Match = 8,275 CY
Total Wonder Lake Dredging Volume = 469,238 CY
WEST BAY
WHITE OAKS BAY COVES
LOOKOUT POINT COVE
OBRIEN SHOALS
WICKLINE ISLAND
SOUTH BAY
Total South Bay Dredging Volume = 247,303 CY
Total Dredging Volume Claimed for 3191610 Local Match = 26,177 CY

Project Summary:

As the grant administrator, the Nippersink Watershed Association would like to thank all the project partners, including the Shaw Family, the McHenry County Conservation District (MCCD); the Land Conservancy of McHenry County; as well as the U.S. Environmental Protection Agency and Illinois Environmental Protection Agency for providing and administering the funding.

The implemented project will help achieve the "As Constructed" sediment, phosphorus, and nitrogen Pollutant Loading Reductions goals, as calculated in the project BMP spreadsheet form, and summarized below. Those load reductions increased over what had originally been proposed due to being able to treat additional streambank distances with the available funding.

3191510 - Projected Pollutant Load Reductions - As Initially Proposed			
Grant Project Location	Sediment Load Reduction (ton/year)	Phosphorus Load Reduction (lb/year)	Nitrogen Load Reduction (lb/yr)
Shaw Parcel	153	153	305
TOTALS	153	153	305

3191510 - Projected Pollutant Load Reductions - As Constructed			
Grant Project Location	Sediment Load Reduction (ton/year)	Phosphorus Load Reduction (lb/year)	Nitrogen Load Reduction (lb/yr)
Shaw Parcel	168	168	336
TOTALS	168	168	336

In the Nippersink Creek watershed, there are other potential indices of the success of watershed plan implementation projects, and those are social indicators. Working in cooperation with Illinois State University, extensive social research has been conducted on how Nippersink watershed stakeholders perceive the quality of their watershed, and how human action / inaction can affect that quality. This research effort, funded by two Section 319 funded grants (3190913 & 3191116), has long-term implications not only for the Nippersink watershed, but watersheds across the country as well.

As has been experienced in other Nippersink watershed projects, the actual implementation of the BMP practice(s) is typically the easiest and quickest component of the project. The challenge remains in the number of regulatory agencies involved, all of which have very well-intentioned regulations to protect environmental and cultural resources. Unfortunately, sometimes these regulations operate at cross-purposes, making projects harder to design and implement in a cost-effective and timely manner.