

PROGRESS REPORT OUTLINE

USEPA-Great Lakes Restoration Initiative Projects

Grant Number: GL-00E00553-0

Project Title: Sensiba State Wildlife Area Wetland Restoration (pending project title change “Integrated Stream and Wetland Restoration in the Duck-Pensaukee Watershed of Lower Green Bay.”)

Reporting Period Covered: 9/1/11-3/1/2012 (Financial reporting through 3/31/2012)

Principal Investigator: Nicole Van Helden (Project Manager)

The principal investigator of grants, cooperative agreements, and interagency agreements (IAs) is required to submit to the USEPA project officer a semi-annual progress report. This report can be as brief as one page as long as you can provide the requested information. The items listed below should be addressed as appropriate:

- 1. What work was accomplished for this reporting period? Report should quantify results as measurable products, i.e. numbers, acres, contacts, improvements in water quality, habitat, etc.**

Project Administration:

The Nature Conservancy (TNC) submitted required reporting and invoicing and did general grant oversight of our 4 subawardees and 1 private contractor. Partner meetings and phone calls were held to share grant information and products. QA/QC reports were requested from all grant participants.

Tributary and Coastal Wetland Decision Support Tool:

TNC completed release 2 of the Tributary and Coastal Wetland Decision Support Tool and (in April) made it available online. Visit <http://maps.tnc.org/duckpentool/> to view. Enhancements included the addition of GIS data from the Watershed Wetland Mitigation Siting component as well as 11 other data layers. We will report on the partners we shared the tool with and their uses of the tool in the next reporting period.

Fish Barrier Analysis and Prioritization:

Wisconsin Department of Natural Resources (WDNR), in collaboration with University of Wisconsin (UW) and private contractor, developed the first generation model of the fish barrier prioritization (figure 1) and northern pike habitat suitability models (figure 2). Maps of predicted pike habitat suitability and road crossing passability were distributed to project partners prior to the field season. Preliminary results indicate that ~30% of road crossings are at least partial barriers to fish passage. This barrier rate is low compared to other studies in Wisconsin and elsewhere, and may be a function of the flat terrain in the project area. Verification of questionable barriers this field season will help refine this number.

Northern Pike Spawning Habitat Assessment

UW conducted adult and larval pike otolith microchemistry analysis (laser ablation inductively coupled mass spectrometry, LA-ICPMS) at a specialized lab in Boston. Otolith microchemistry data for 139 young of year (YOY) and 136 adults is now in hand from 2011 sampling.

The 2011 YOY data has been analyzed using a variety of statistical methods. Preliminary results of the YOY data are characterized in figures 3 and 4. Subtle, but detectable chemical differences exist between the sampled tributaries of Green Bay and were measured using otolith microchemistry. The 2011 adult pike data is still being processed and will be analyzed in the next reporting period.

For the 2012 sampling effort, UW has hired a field technician and preparations have been made to replicate otolith sampling for both YOY and adult pike. In addition, UW is prepared to repeat the spawner survey, and assess the quality and quantity of recruits produced from each watershed and sub-watershed.

Watershed Wetland Mitigation Siting (aka Watershed Approach)

TNC completed the Watershed Approach assessment and prioritization and began to disseminate the information. The final report can be found at <http://conserveonline.org/library/the-duck-pensaukee-watershed-approach-mapping/@@view.html>. The report has been shared with over 70 conservation practitioners within and outside the Duck-Pensaukee watershed. Two other groups have expressed interest in applying the Watershed Approach methodology developed for the Duck-Pensaukee in two other Wisconsin watersheds. Methods developed as part of this grant are being incorporated into national-level guidelines for the Watershed Approach to Sec. 404 mitigation.

Watershed Sediment and Nutrient Data Assessment

TNC finished sediment and nutrient data assessment and review, met with the technical team, and began the summary technical report.

TNC identified sediment and nutrient strategy team members and the team met once to begin creating sediment/nutrient strategy recommendations. The sentiment amongst the field managers in this region is a sense of frustration in the poor performance of the standard BMP approach to controlling non-point (i.e., agricultural derived) nutrient and sediment loading to the tributaries of Green Bay. Incentive approaches have worked well to improve structural (i.e., barnyard related) deficiencies on farms, but have not been sustainable on 'soft' improvements such as grassed waterways, stream buffers, etc. Economic conditions driven by national and often global commodity prices drive practices that jeopardize BMP acceptance and implementation. The lack of water quality monitoring and field level information (edge of field runoff, and field scale P levels) is hampering the most efficient use of BMP dollars to target P loading reductions. Lack of staff at the county level also hampers implementation and monitoring of targeted BMP programs.

Survey Plan and Wetland Restoration:

Ducks Unlimited completed engineering design and drafting associated with all project aspects of the Sensiba Unit restoration. Final plans were submitted for required permits/clearances. A “during construction” project sign was installed at the kiosk located near the main parking area at the Sensiba Unit. TNC obtained 2011 bird and amphibian monitoring data for the Sensiba Unit that was collected as part of the Great Lakes Coastal Wetland Monitoring Program. This information, along with vegetation surveys, invasive phragmites mapping, and photopoints will be used to monitor the restoration success.

Documenting and Sharing Habitat Restoration Impacts

Documentation of all restoration projects continues. The Sensiba Unit project profile was started and documentation of the DOT mitigation project upstream was added to demonstrate how a northern pike spawning ditch planned for the Sensiba Unit will connect with the mitigation wetlands. TNC visited the 2011 Brown County northern pike project sites and began documenting two restorations. TNC visited Oneida’s completed Lancaster Brook culvert replacement and wrote the project profile. Three project profiles were started for Oneida’s pending restoration projects on Trout Creek and the South Branch of the Suamico River.

Oneida collected final water level and temperature data through September/October. Dry conditions in mid-September through November and ice cover in December through February prevented collection of additional monthly and quarterly sampling at planned restoration sites. Planned sampling is expected to resume in March and data loggers will be redeployed after ice out. Benthic macroinvertebrate samples collected in June and July 2011 were prepared for analysis by UW-Superior and are now being processed.

Education and Outreach

Project information has been shared with various audiences at a variety of venues. UW presented the northern pike habitat model at the Wisconsin American Fisheries Society meeting and the Midwest Fish and Wildlife Conference. The Watershed Approach was shared at the Wisconsin Wetlands Conference and a regional Nature Conservancy Science and Stewardship Conference. An overview of our GLRI-funded work was also presented at a Lake Michigan Stakeholders meeting.

On September 8, Ducks Unlimited and the Healing our Waters Coalition hosted a Green Bay West Shores project bus tour to highlight GLRI and NAWCA funded wetland restoration projects, including a stop at the Sensiba Unit. Participants learned about the technical, partnership and funding aspects of the project, as well as greater landscape work being done on the West Shore of Green Bay. Wisconsin DNR, TNC and DU all spoke about this GLRI project.

TNC shared information about the GLRI project components both within Conservancy networks, including the Great Lakes program (formerly Three Bays Workshop), and with external audiences.

- 2. What, if any, changes were made from the Object Class Categories listed in Sec. B of the SF 424A?** No changes to Object Class Categories.

3. If a problem was encountered, what action was taken to correct it?

Project Administration:

Scott Thompson retired from The Nature Conservancy in November. Allison Shaw (TNC) has taken on the QA Manager role for all project components except her own. John Wagner (TNC) will manage quality assurance for Ms. Shaw's components.

Fish Barrier Analysis and Prioritization:

Road crossing passability estimates appear to be too conservative based on field observations of pike above some crossings classified as impassable. Further observations during the 2012 field season will help refine passability estimates.

Barrier photographs were named inconsistently and were difficult to access from the road crossing database. The private contractor is working with WDNR to rename the road crossing photographs with site ID naming conventions and will quality check attributes that may have been recorded incorrectly or interpreted incorrectly by examining photographs.

Northern Pike Spawning Habitat Assessment:

During UW's first otolith analysis trip, both young-of-year (YOY) and adult otoliths were analyzed. Unfortunately, an instrument failure made the data quality unacceptable for adult otoliths, though YOY otoliths were analyzed prior to the problems. Thus, a second trip was necessary, and was completed during the reporting period.

4. What work is projected for the new reporting period activity (March 1, 2012-September 1, 2012)?

Tributary and Coastal Wetland Decision Support Tool:

TNC will complete release 3 of the tool, adding the Migratory Bird Habitat Model, Threatened & Endangered Fish Waters, Fish Barrier Assessment, Northern Pike Occurrences and/or Northern Pike Spawning Habitat Model, and Wetland and Stream Restoration Sites. If permission is granted from WDNR, TNC will also add Lake Sturgeon Spawning Habitat, Small-mouth Bass Habitat, Trout Habitat, Impaired Waters, Outstanding & Exceptional Waters, and Macroinvertebrate Index of Biotic Integrity.

TNC will add metadata for map layers, perform necessary QCs and write a report documenting the process of creating the tool.

TNC will also refine the tool by incorporating information gathered in the peer review process.

Fish Barrier Analysis and Prioritization:

WDNR will complete the fish barrier prioritization model and present it at the March Road Crossing Workshop in Green Bay.

WDNR will refine passability estimates and rerun prioritization model if necessary.

WDNR and private contractor will complete QA steps and submit project report.

Northern Pike Spawning Habitat Assessment:

UW will complete the second field season. Replicate YOY otolith and adult northern pike will be collected during the Spring 2012 migration season. These otoliths will be sectioned, mounted, and analyzed in Boston.

UW expects to fully characterize the 2011 and 2012 otolith samples, which will provide insight into whether otolith microchemistry indicates natal homing or not. As a result, UW expects to be able to make management recommendations for the Duck-Pensaukee watershed.

UW will contribute a substantial effort with project partners to various aspects of the Spring 2012 sampling effort, i.e. larval pike sampling, northern pike habitat assessments and model calibration, road-stream crossing model calibration, etc.

Watershed Wetland Mitigation Siting:

TNC will continue to disseminate the work product to interested practitioners.

TNC will use results within the Duck-Pensaukee to promote wetland conservation in the watershed.

TNC will work with regulatory agencies on integration of plan results into the regulatory process.

TNC will work with partners to determine next steps for this methodology (how to improve and where to apply).

TNC will continue to incorporate Duck-Pensaukee results into development of national-level guidelines.

Watershed Sediment and Nutrient Data Assessment:

TNC will hold an additional meeting(s) with the sediment and nutrient strategy team to continue discussion of strategies to reduce nutrient loading.

TNC will interview individuals from the farm community to better inform the strategy report.

TNC will complete the technical and strategy recommendations reports.

Survey Plan and Wetland Restoration:

WDNR will secure permits and other needed project clearances. DU will make any required changes to the engineering designs, if needed.

DU, with input from WDNR, will submit the bid package to a list of qualified contractors, hold an on-site pre-bid meeting, and hire a contractor according to federal requirements. Necessary materials will be purchased and construction will begin.

Documenting and Sharing Habitat Restoration Impacts:

TNC will continue documentation of all restoration projects.

Post-project monitoring of the Lancaster Brook culvert replacement and additional pre-project monitoring of all other Oneida projects will be carried out by Oneida. They will calculate metrics such as the Biological Condition Gradient or the Index of Biotic Integrity with the resulting macroinvertebrate and fish data.

The Sensiba restoration, Brown County Pike Project, and three Oneida restoration projects are scheduled to begin construction.

Education and Outreach:

TNC will actively share grant products, primarily the Coastal Wetland Decision Support Tool, Fish Barrier Assessment and Prioritization, and Watershed Approach Tools with target audiences.

TNC and DU will host a community field trip to highlight the Sensiba wetland restoration.

TNC will feature the Fish Barrier Assessment in an upcoming newsletter and create a video about the grant work going on in the Duck-Pensaukee watershed.

TNC will host a Webinar to share work products with other Conservancy Great Lakes projects.

5. Is the project work on schedule? List activities from the Work Plan, and any required Quality System Documentation, and report as percent completed.

- a. **This reporting period:** Yes, the majority of project work is on schedule. See “Work Plan chart” below showing work activities, timeline, and % completed. As stated in our last report, the Sensiba Wildlife Area wetland restoration timeline was delayed in order to incorporate additional restoration needs identified through the site surveys. Additional funding was secured for the additional restoration projects. By completing site engineering plans for all the Sensiba restoration projects, we will gain greater efficiencies with permitting and construction. However, permits are still pending as of April 26 and construction has not started. Delays with other restoration projects have also delayed our documentation of those projects.
- b. **For the project:** The majority of project work is on schedule. The shift in the Sensiba restoration timeline was the biggest change as discussed above. Delays due to permitting and weather have also delayed three of the Oneida Nation restoration projects that were planned for Fall 2011. See 8 for additional details.

6. Does the project funding rate support the work progress? Report as percent spent of budgeted amounts for Federal and non-Federal. As of 3/31/2012, approximately 41% of the federal award has been spent. No non-federal portion of budget. This funding rate supports the work progress. Some project components are nearly or fully completed while

other components like the Northern Pike Spawning Habitat Assessment and Sensiba restoration have 50% or more work left to be complete.

7. **Is there a change in principal investigator?** No.
8. **Will the project take longer than the approved project period? If so, have you formally requested an amendment in writing?** Several project components will likely take longer than the original project period. Sensiba wetland restoration permits are still pending so the possible construction start date is unknown. Several restorations to be included in the “Documenting and Sharing Habitat Restoration Impacts” component were delayed due to weather conditions. Though the restorations will occur within the original project period, post-restoration monitoring and documentation of success would not be possible. An extended grant period would allow us to document all planned restorations and post-monitoring as well as take advantage of additional education outreach opportunities, sharing project results with targeted audiences. We have not requested a formal amendment in writing but plan to submit such a request to EPA once Sensiba permits are obtained.
9. **What is the date and amount of your latest drawdown request? If no request has been submitted, please explain.** The last drawdown request submitted was in the amount of \$117,875.69 on 01/31/12.
10. **What is the date of your latest entry into the Great Lakes Accountability System? If no recent entry has been submitted, please explain.** Latest GLAS entry on 4/11/2012.

WORK PLAN: Integrated Stream Wetland Restoration; Lower Green Bay - Fox River AOC

	2010	2011			Oct - Dec	2012		
	Oct -Dec	Jan - March	April - June	July - Sept		Jan - March	April - June	July - Sept
PROJECT MANAGEMENT								
Project Management								
<i>General Management</i>	75% complete							
<i>Reports</i>	●	●	●	●	●	●	●	Final Report
WHERE TO RESTORE								
Tributary & Coastal Wetlands Decision Support Tool								
<i>Integration of "Where to Restore" Data</i>	70% complete							
Fish Barrier Analysis and Prioritization								
<i>Fish Habitat Model Development</i>	95% complete							
<i>Road-Stream Crossing Inventory</i>	100% complete							
<i>Aquatic Invasive Sp. Road-Stream Crossing Inventory</i>	100% complete							
<i>Integration of Migratory Fish Inventory & Assessment</i>	85% complete							
<i>Road-Stream Crossing Restoration Prioritization</i>	85% complete							
<i>Aquatic Invasive Sp. Control Prioritization</i>	85% complete							
Northern Pike Spawning Habitat Assessment								
<i>Field Inventory</i>	50% complete							
<i>Spawning Site Fidelity Assessment</i>	50% complete							
Watershed Wetland Mitigation Siting								
<i>Inventory of Wetlands and Streams</i>	100% complete							
<i>Assessment of Functional Needs</i>	100% complete							
<i>Prioritization of Mitigation Opportunities</i>	100% complete							
<i>Prioritization of Wetland & Tributary Sites</i>	100% complete							
<i>National-level Recommendations and Reporting</i>	20% complete							
Watershed Sediment and Nutrient Data Assessment								
<i>Analysis of Existing Nutrient Run-off Data</i>	100% complete							
<i>Assessment of Nutrient Management Methodologies</i>	30% complete							

WORK PLAN: Integrated Stream Wetland Restoration; Lower Green Bay - Fox River AOC

	2010	2011			2012			
	Oct - Dec	Jan - March	April - June	July - Sept		Oct - Dec	Jan - March	April - June
HOW TO RESTORE								
Sensiba Wildlife Area - Survey Plan and Wetland Restoration								
<i>Site Surveys</i>	100% complete							
<i>Ditch Restoration</i>	0% complete	(moved to April-Sept 2012)						
<i>Dike Prep</i>	100% complete							
<i>Site Engineering for Structural Restoration</i>	85% complete	(won't be 100% complete until approved by permitting)						
<i>Permitting for Structural Restoration</i>	0% complete	(moved to Oct 2011-March 2012)						
<i>Construction</i>	0% complete	(moved to April-Sept 2012)						
<i>Documenting Management Practices</i>	15% complete							
Documenting and Sharing Habitat Restoration Impacts								
<i>Of Road-Stream Crossing Restoration</i>	75% complete							
<i>Of Dam Removal</i>	35% complete							
<i>Of Stream Re-meandering</i>	35% complete							
<i>Of Wooded Wetland Restoration</i>	35% complete							
<i>Of Native Migratory Fish Spawning Site Restoration</i>	35% complete							
<i>Expand Biological Condition Gradient to Watershed</i>	15% complete							
EDUCATION & OUTREACH								
<i>Publication of Management & Measures Practices (includes Biological Condition Gradient)</i>	0% complete							
<i>Road-Stream Crossing Workshops</i>	100% complete	(and able to hold an additional workshop in Spring 2012)						
<i>Enhanced Release of Decision Support Tool</i>	50% complete							
<i>Release of Connectivity Model to Partners</i>	0% complete							
<i>Community Field Trips at Restoration Sites</i>	50% complete							
<i>Release of Mitigation Site Prioritization</i>	100% complete							
<i>Three Bays Workshops</i>	50% complete							

Culvert Passability Assessment 2011

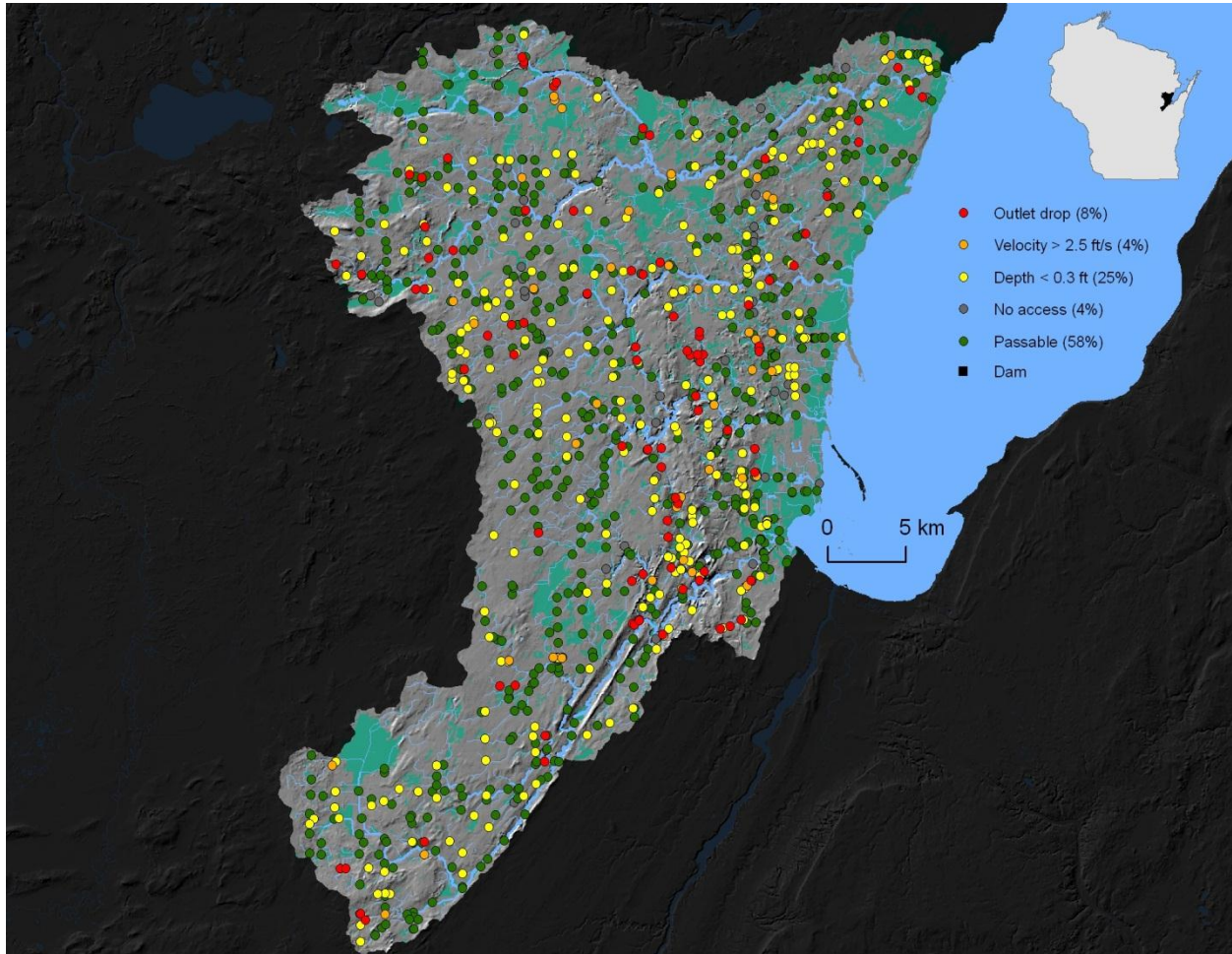


Figure 1: Result of first generation barrier passability model depicting culverts with various levels of passability. Green dots represent culverts that are passable and red (outlet drop), orange (velocity), and yellow dots (depth) represent potential barriers to pike movements. Further field calibration based on adult pike observations in spring of 2012 will greatly aid in increasing the accuracy of this model's predictions.

Young of Year Otolith Chemistry Analysis: PC1 vs PC2

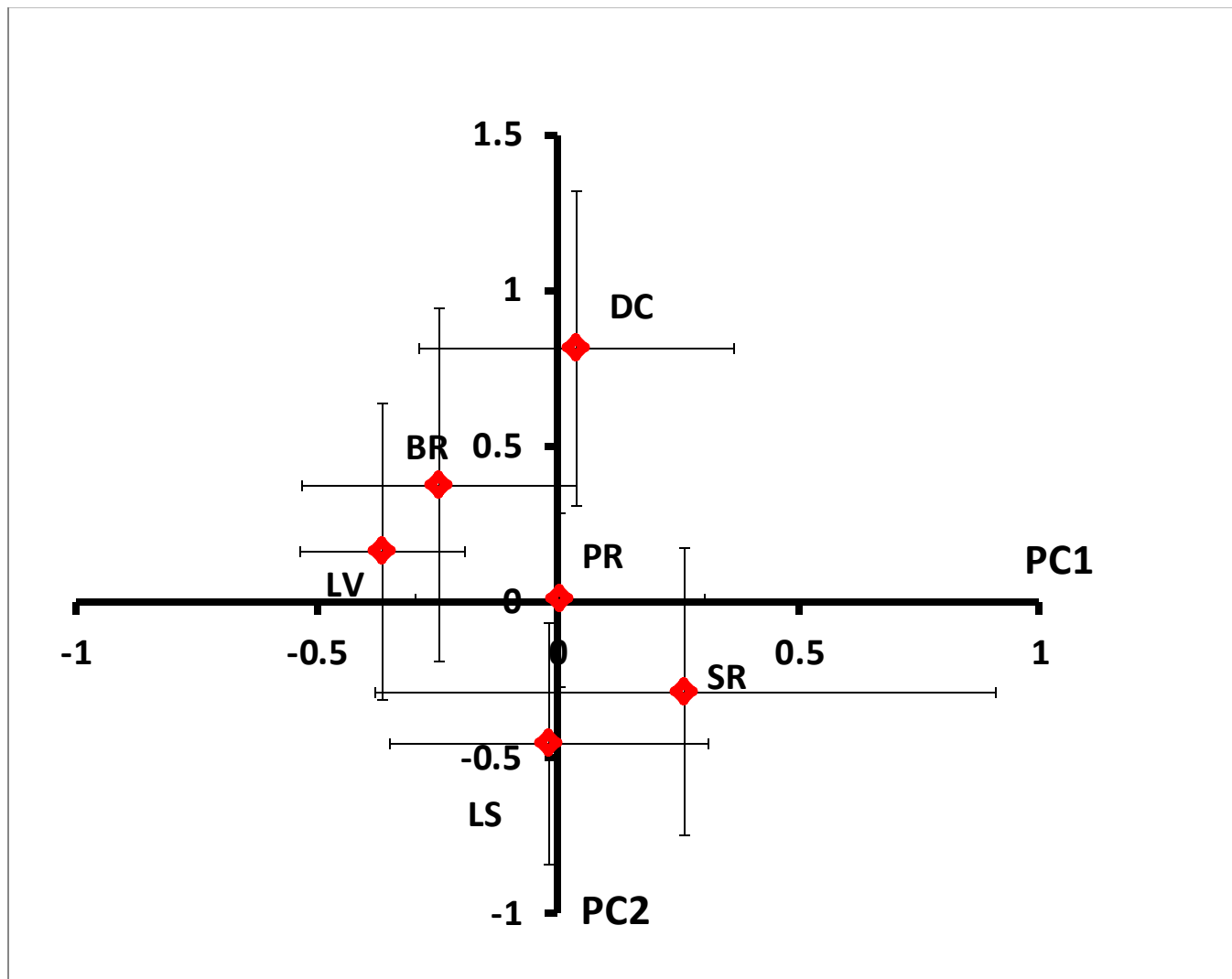


Figure 3: Principal component analysis of young of year pike from 6 watersheds sampled:

- BR=Brown Road Ditch
- LV=Lineville Ditch
- DC=Duck Creek
- SR=Suamico River
- LS=Little Suamico River
- PR=Pensaukee River
- Looking only at the red dots, you can see the different watersheds are separating themselves out based on the chemical differences between rivers/ ditches.
 - Take home message is that there are measurable chemical differences between the water bodies that we have detected with young of year pike otoliths

Discriminant Function Analysis: Site Level

n	Site	% Correct
7	BRA	14
10	DCA	60
8	LSA	38
8	LSB	75
10	LVA	20
8	PRA	63
8	PRB	13
25	PRC	76
8	SRA	25
11	SRC	36
103	Total	

Figure 4: Discriminant Function Analysis- This table depicts the accuracy of assigning YOY fish (based on otolith chemistry) to the correct stream from which it was caught/born.

Hypothetically, if you were to give me a YOY pike and ask me where it came from, the percentages on the far right are how accurate we are at correctly placing that fish back into its tributary based on otolith microchemistry.

Northern Pike Habitat Suitability Model and Observations

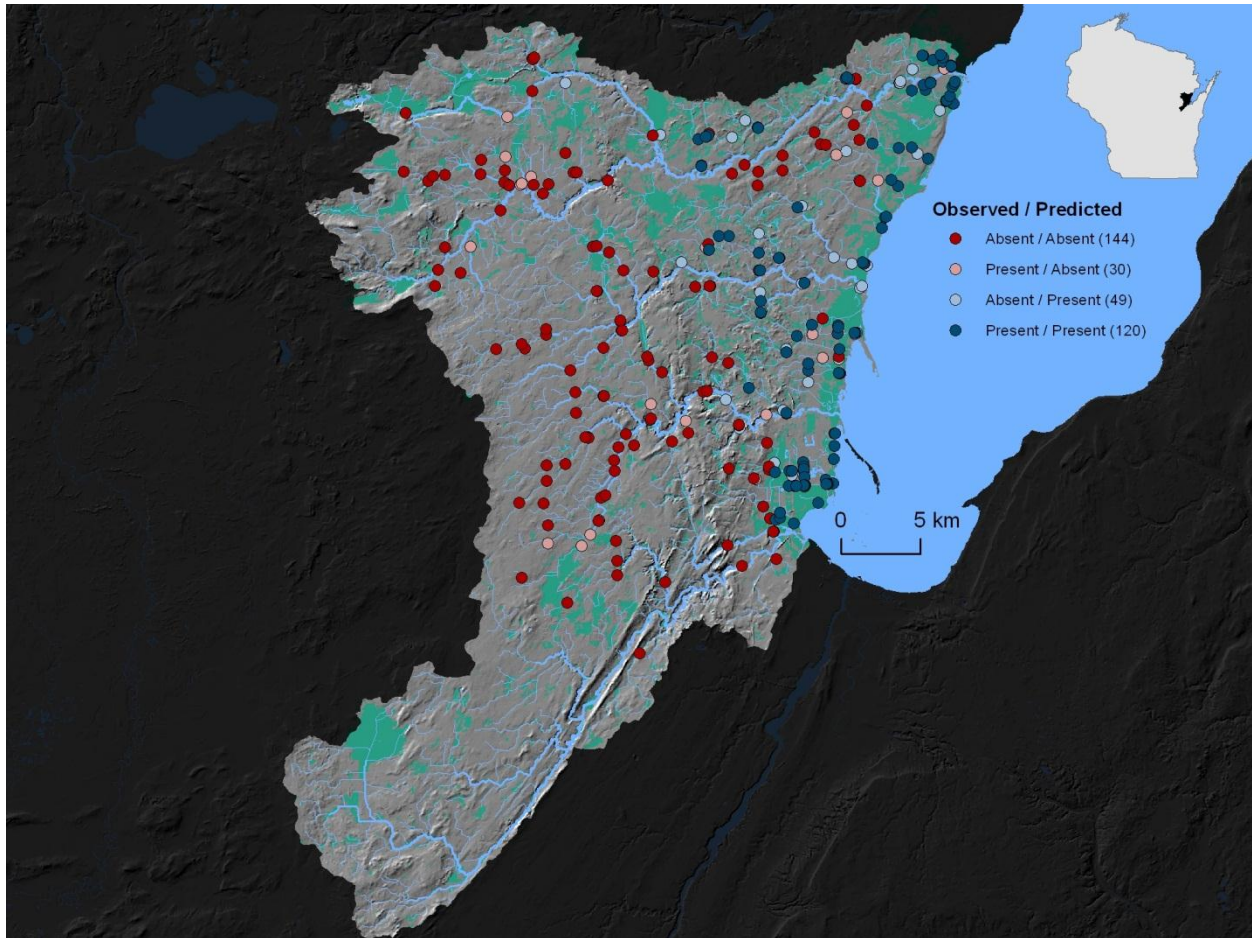


Figure 2: Northern pike habitat suitability model depicting areas where we observed/ or did not observe young-of-year (YOY) recruits along with our model predictions. Model inputs are elevation, stream distance traveled, number and passability of each culvert in the migration route, and type of land use (%wetland and %forest cover). Areas where we did not observe YOY's and the model predicted YOY's would be absent are depicted with dark red dots; model agreement with observations. Pink dots are areas where we observed YOY's, but the model predicted we would not. This discrepancy is due to the model inputs of elevation, distance traversed and number of barriers passed being important; that is, the adult breeders that reached these areas and produced YOY's traveled the furthest, up the steepest elevation, and through the most barriers. The dark blue dots represent areas where observed YOY's and the model predicted we would observe YOY's; model agreement with observations. The light blue dots are areas where we did not observe adult pike breeding but the model predicted that we should. These discrepancies are best explained by our sampling effort simply missing the YOY recruits in these locations.