A photograph of a naturalized playground area. In the foreground, there is a dark, paved path. The middle ground shows a grassy area with a few trees and a basketball hoop. In the background, there is a dense line of trees with green and yellow foliage. A faint rainbow is visible in the sky above the trees.

The Naturalized Playground at Wexford Montessori Academy

Lansing, Michigan

An urban K-8 school

About the case study

This case study of place-based stewardship education (PBSE) at Wexford Academy is one of 11 case studies developed by staff of the Great Lakes Stewardship Initiative (GLSI), staff of the GLSI's nine regional hubs, and the educators whose work is featured in the study.

This case study focuses on a PBSE effort that began in 2013 and continued through the 2015–16 school year. At most of the sites featured in these studies, including Wexford, the PBSE approach has been developed over the course of several years.

Each school featured in a case study works with the GLSI through a regional hub. Hubs provide professional development for educators, help schools connect

and partner with community-based organizations, and provide funding and other PBSE supports with an environmental stewardship emphasis. Wexford Montessori Magnet School has a longstanding relationship with its hub, the GRAND Learning Network.

The Naturalized Playground at Wexford Academy

December 2017

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Cover: A rainbow shines over the playground at Wexford Montessori Academy.

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Conventions in this document

As you read this study, you will see special icons in the text.



This icon marks a teaching tool, resource, or product that you can access and download from the case study.



This icon marks a connection between the work being described and the GLSI's Guiding Principles for Place-based Stewardship Education, developed by GLSI central and hub staff to describe the GLSI's vision for exemplary place-based stewardship education. Certain aspects of each case study illustrate how one or more of the principles can be enacted in classrooms and communities.



Quick Summary

Students were empowered to become stewards of one of the few environments that remains constant in their lives: the playground at school

They reestablished habitats for animals on school grounds and in the adjacent woodlot.

Wexford Montessori Academy is an urban, public elementary and middle school in Lansing, Michigan. Students set out to reestablish animal habitat on their playground, which includes a vernal pool. In so doing, they explored equity of access to natural green space for themselves and other urban students whose families move often and for whom school changes are frequent.

The project was important to students and families because it reversed decades of negative human impacts on this land and created food sources and habitat for wildlife, while celebrating the vernal wetland and adjacent woodlot as a special place.



Students plant native trees around the playground to create habitat and food sources for wildlife.

Question: “What do you want to know or be able to do about animal habitat?”

Student answer: “Everything.”

—Fifth-grade student



Community Context



Context is essential in place-based stewardship education

There is perhaps no more distinctive characteristic of PBSE than its treatment of place as the context for learning.

Our sense of place does not exist in only one geography, and it changes as we age. When we are very young, we may experience our strongest sense of place in our homes, neighborhoods, and favorite places for play. As we grow, we begin to understand that we are members of other communities, too—a school community, a city or town, a watershed, a state, or a bioregion such as the Great Lakes.

PBSE relies on place—including lands and waters, people and organizations, history, and culture—as a starting point for teaching and learning. Reading about rainforests or deserts may be interesting, but environmental learning grounded in students' home communities builds on a foundation of community attachment and place-based knowledge.

For students at Wexford Montessori Academy, that foundation includes their school, its grounds, and the adjacent woodlot.

The regional economy is diverse, but state government is the largest employer in Lansing

Auto manufacturing, insurance, health care, and higher education are important contributors to the local economy.

The greater Lansing area is Michigan's third-largest metropolitan area, after Detroit and Grand Rapids. The city's population has declined somewhat since the 1980s. State government employs nearly 15,000 people in the Capital region.

Lansing has been an important location for Michigan auto manufacturing since Ransom E. Olds founded Oldsmobile in Lansing in 1897. Today, Cadillacs and Chevy Camaros are manufactured in Lansing, and other General Motors products are made in nearby Delta Township.

Lansing is also noted as a headquarters for insurance agencies. Jackson National, Accident Fund Insurance, Delta Dental of Michigan, Auto-Owners Insurance, Farm Bureau Insurance of Michigan and Michigan Millers Mutual Insurance are all headquartered in the city.

Western Michigan University - Cooley Law School and Lansing Community College are within the city limits, and Michigan State University is in neighboring East Lansing.



A view of downtown Lansing. The state Capitol Building is in the distance; the Grand River flows through downtown. Photo by Dustin J Grimes.

The Grand and Red Cedar Rivers are important environmental assets for Lansing

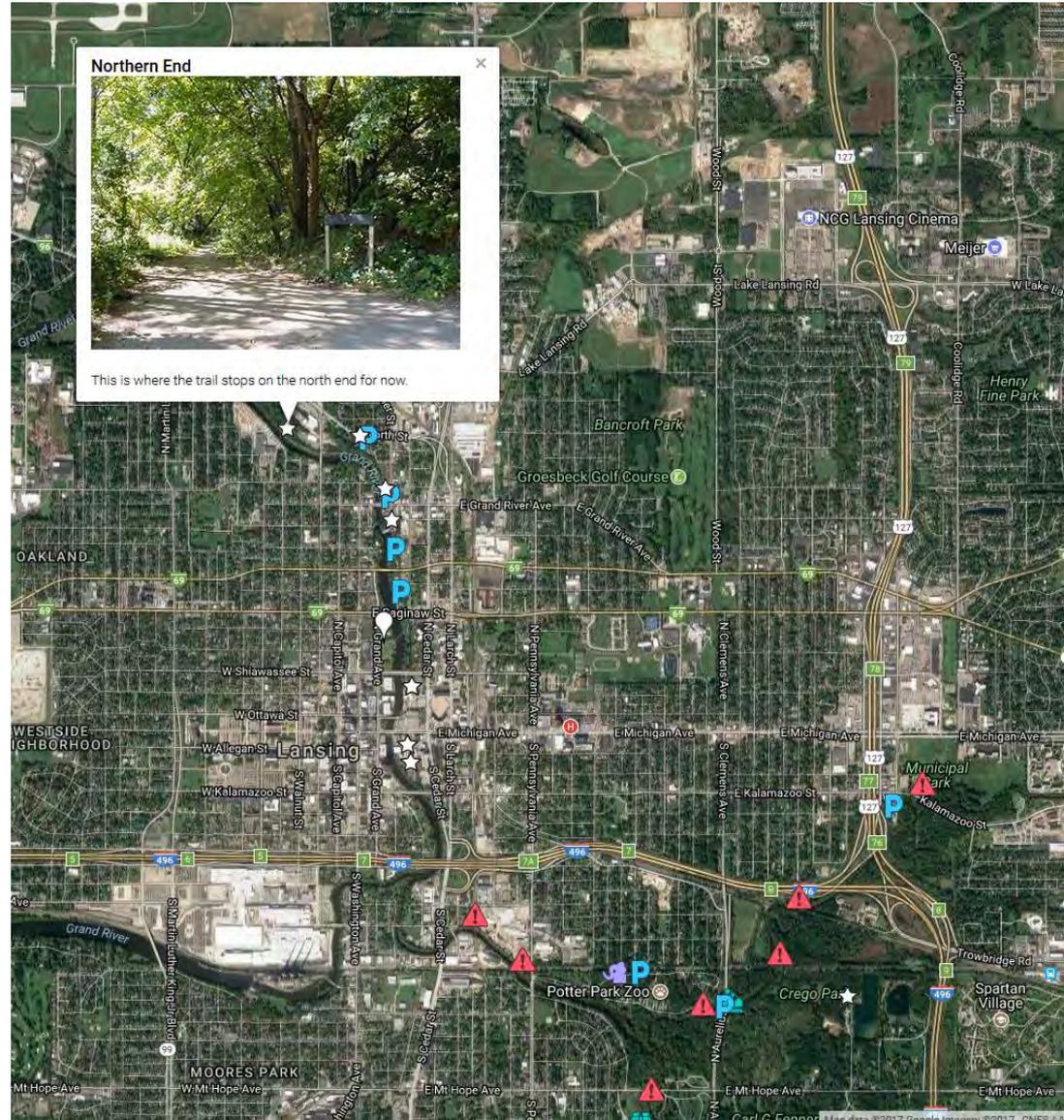
The Lansing River Trail runs alongside the Grand River and the Red Cedar, connecting many parks, canoe and kayak launch sites, and other destinations in and near the city.

The first section of the Lansing River Trail opened in 1975. The trail now provides more than 20 paved miles for hiking and biking along Lansing's river systems.

Parts of the trail follow the Red Cedar River, a tributary that joins the Grand River in Lansing's southeast corner. The trail continues along the Grand River, ending north of the city. Markers on the map to right show the general course of the trail.

LINK: [LANSING RIVER TRAIL](http://lansingrivertrail.org)

A map on the Lansing River Trail Web site includes pictures, marks important historical and recreational destinations, and identifies parking. See <http://lansingrivertrail.org/Map>



Wexford Montessori Academy is located in southwest Lansing

School buildings and grounds are aging, and many families are struggling economically.

The Lansing School District is the fifth largest district in the state. The average age of its buildings is 55 years old. The district served 11,421 students in 2015-16, of whom 71% were economically disadvantaged (Lansing School District 2017).

The playgrounds surrounding the schools were built during the 1950s and 60s and designed for sports themed, competitive play. Animal food sources and shelters were not just ignored, they were eradicated. Good playground design equaled absence of clean up and ease of mowing.

The rusted play structures held little interest, and many have been removed due to age. They have not been not replaced

due to budget constraints.

The Lansing School District is in a period of reinvention. It strives to make its 24 schools desired destinations for students and families. Wexford was reconfigured in 2005 as a Magnet School for Montessori Education, and in 2014-15 celebrated its tenth year.

Students at Wexford Montessori study in multiage classrooms. Upper elementary classrooms serve 4th, 5th, and 6th graders, and 7th and 8th grade students are clustered into middle-school classrooms.





“Our kids need places to explore the natural world... the beauty and complexities of it... a place that can revitalize and soothe them. Our playground may be the only place for our urban kids to find that connection!”

—Amy, “Mrs. D,” Parent Teacher Association Vice President



Lessons and Activities



PBSE adapts to fit different students, curricula, and communities

A long list of factors affect the design of PBSE projects in a given teaching and learning context:

- Students' ages/grades/readiness
- Students' interests and questions
- Community stewardship needs and opportunities
- State and local curricular expectations
- Participating community partners and their interests, needs, and assets
- Access to transportation and funding
- Climate and weather

Wexford's students engaged in varied activities that evolved over time as student and teacher awareness, understanding, and relationships developed.

To learn more about the work represented in this section, look for links to additional tools and student-generated products; "Teaching Tools" icons, which bring attention to forms or strategies readily adaptable for use in other contexts; and "Guiding Principles" icons, which bring attention to practices that support one or more of the GLSI's guiding principles for PBSE.

The naturalized playground at Wexford was developed in multiple phases

The Optimist Club of Lansing provided the grant that was the initial impetus to improve the playground.

In Phase I, students worked alongside AmeriCorps volunteers to lay paths and dig a swale. As they worked, they discovered a feature they never knew was special: a vernal wetland. Only part of the vernal wetland was on the school property. Students observed that in winter it consisted of puddles and ice, but in the spring, it was home to tadpoles and nesting ducks.

The students determined the grass turf did not support a healthy ecosystem for urban wildlife and the edge of the vernal wetland was becoming compacted and worn. Docks and rocks were brought to the edge of the wetland to encourage low impact viewing.

A rain runoff area near the parking lot was redefined and prepared for plants. Curved walking paths were installed so walkers could enjoy the edge of the woodlot and wetland.



Above: Every upper elementary student took a turn digging the area to capture rainwater runoff (the swale). More than 130 students took turns working that day.

Right: Students worked with wheelbarrows and rakes to spread wood chips over a quarter-mile path.



A weeklong, immersive environmental education experience spurred additional thinking

After twelve classes participated in Annie's BIG Nature Lesson, involving a week of immersion in the natural environment at nearby nature centers, four classes of Wexford students and teachers began to question if they were doing all they should as stewards of their outdoor space.

Students inventoried the human impact on the playground, and found that the human/environment interactions were overwhelmingly detrimental to the plants and animals that share the school's play space.

“How come animal habitats are not so easy to see compared to us and our ‘habitats?’”

—J., 4th grader



Top left: Students removed three dumpsters of garbage. Top right: A student enjoys nature journaling; all students keep nature journals throughout the school year. Bottom: A fifth grader talks with an AmeriCorps volunteer on clean-up-day.

The EPA grant supported phase II, which focused on habitat restoration

Two upper elementary classrooms with 56 students and both middle-school classrooms with 52 students participated in Phase II of the Naturalized Playground Project.

Phase II included the development of a butterfly waystation, clean-out of a newly donated woodlot adjacent to the school, and improvement of a trail through the woodlot. Students also learned about bat conservation and built bat boxes for the area.



Items found during the Wexford Woodland cleanup.

“Why does the human impact on our playground have to be bad for the animals?”

—Wexford student

Wexford Montessori Academy students became data collectors, map makers, and habitat researchers in their multi-phased playground naturalization project

The project has spanned multiple years and is ongoing.

2014 Phase I: Playground improvements (Optimist Club Funding)

Mar '14 Students begin a species inventory and playground ecosystem study.

May '14 AmeriCorps Volunteers help students build new pathways and berms; boulders are delivered.

Oct. '14 New bushes and grasses are planted on the playground.

Nov. '14 New observation decks for the vernal wetland are installed.

Mar. '15 Students participate in Annie's BIG Nature Lesson

Apr '15 MSU Spartan Day of Service includes playground clean-up

Phase II: New habitat on the playground and improvements to the woodlot (GLSI/EPA Funding)

Sept. '15 The Lansing Public School District turns the donated woodlot adjacent to the playground over to Wexford Montessori Academy; students participate in Annie's BIG Nature Lesson for the second time.

Oct. '15 Middle-school students plant native flowers and milkweed on the playground to create a Monarch butterfly waystation.

Winter '16 Students consider various possibilities for the woodlot and make plans.

April '16 On two Saturdays, and with the support of families, local businesses, and MSU volunteers, neighbors are notified of the students' plans, the woodlot is thoroughly cleaned, and trails are laid. Students learn about bat conservation.

2016

May '16 Students plant additional native species and remove invasive species, visit natural areas for planning ideas, and build bat houses for the naturalized playground.

The EPA grant led to a substantial expansion of the school's natural space

A woodlot adjacent to the playground had been donated to the district, and the district turned the land over to the school for students to manage and use as an outdoor learning space.



One good thing leads to many others. Because of the grant, the student commitment and the possibilities, the Lansing School District officially turned over neighboring, donated land to Wexford in September 2015. This began a new path, literally, in teachers' and students' planning and work.

Above: Front of the Wexford Woodlot, in the spring before full leaf-out. Photo by: Dustin J Grimes

Right: Three dumpsters of garbage included truck parts, two sofas, toilets and a hot tub. Photo by: Dustin J Grimes



In fall 2015, Wexford middle-school students began making improvements to offer food and shelter to wildlife in the playground area



The initial planting of the butterfly waystation. Students take inventory of their native seedlings.

Middle-school students identified the Wexford play space as a perfect waystation for Monarch butterflies. They also saw a need to create habitat for other invertebrates that are food



Middle school students on planting day. Students put their math skills and their study of measurement and area to use.

sources for birds and bats. They planted milkweed and other native flowering plants to begin to establish a more complete food web, as well as sheltering options for invertebrates.

After a winter of planning, students and partners begin creating trails through the new Wexford Woodlot



Arborists from Ellis Tree Service donated their time and tools for the job.



Volunteers donated their time to clean up the Wexford woodlot. Volunteers included parents, students and a Boy Scout troop.



A neighbor was happy to learn about the project from a letter students wrote.

Once the woodlot was given to Wexford Montessori Academy, work could begin on a new set of trails that would allow students to make observations and connect with nature. Students wrote letters to neighbors in the area explaining what they planned to do in the woodlot; arborists from Ellis Tree

Service donated their time and began cutting back any unsafe, dead wood in the lot; and students and volunteers began the clean up process.

In April, the Organization for Bat Conservation shared expertise on habitat creation



Dawn Vezina of the Organization for Bat Conservation shows a bat box to Wexford students.



Dawn shows the students an owl and talks about food webs.

In the beginning of Phase I, during the playground wildlife assessment, students had recorded the available food sources and sheltering options on the playground. One immediate observation was that trees only grew “over there,” beyond the tree line. Students identified squirrels and birds as being affected, but it wasn’t until a walk at Annie’s BIG Nature Lesson that students realized how important dead trees are for habitat. They soon connected why bats were flying around the classroom during math the year before. Wexford lacked trees, alive and dead!

So, during Phase II, students invited Dawn Vezina from the Organization for Bat Conservation to come to Wexford and share

her expertise in urban habitat creation. She helped further illustrate the interconnected web that includes Wexford’s butterfly garden, which provides habitat not only for butterflies, but moths and beetles (which feed the bats, which eat the mosquitoes that the frogs also like, but that the humans don’t...). The students decided to support the bats.

By this time, they had scheduled the arborist to cut down deadfall hanging over the trail. The students discussed how to balance the needs of humans and the needs of bats and other ‘standing dead wood dwellers.’ Many students felt the dead trees should stay and that the humans should just “run fast” if branches began to fall.

Inspired by the Organization for Bat Conservation, students built bat houses for their playground habitat project

Students used math and English language arts when constructing the bat houses.

Upper elementary students worked to build bat houses for Michigan's Big Brown Bat. They researched its shelter needs, saw a live bat during Dawn Vezina's visit, and found building blueprints online. Their favorite facts about bats were that they nursed their pups while hanging upside down and that they ate hundreds of mosquitoes each night! The first job, in language arts class, was summarizing and simplifying the very technical directions.

Then, with a grandfather, father, and a community volunteer, they worked one afternoon putting their easier-to-follow directions into action. Students were empowered, with power tools!



The Wexford classroom becomes a conservation workshop for each stage of making bat boxes.

In May, Wexford students traveled to Michigan State University's campus to gather more ideas for their woodlot and playground habitat restoration

The essential question for the visit was, "What ideas do you find that will be good for the humans and the wildlife that share our playground?"

Four classrooms of students in 4th-8th grades visited Baker Woodlot, an old growth forest, the Landscape Arboretum, the Horticultural Gardens, and the 'wonder-full' Children's Garden on Michigan State University's campus. Their task was to observe and record ideas that would restore habitat and be fun playground and woodlot additions.

They recorded the names of plants they would like to grow, sketched pictures of benches they liked, and almost unanimously agreed that Wexford should plant a hedge maze like the one they ran through.



Nature journaling at Baker Woodlot and the botanical gardens at Michigan State University. Fourth graders record plant ideas for back at their school.

Wexford students have developed their voices over multiple years through nature journals

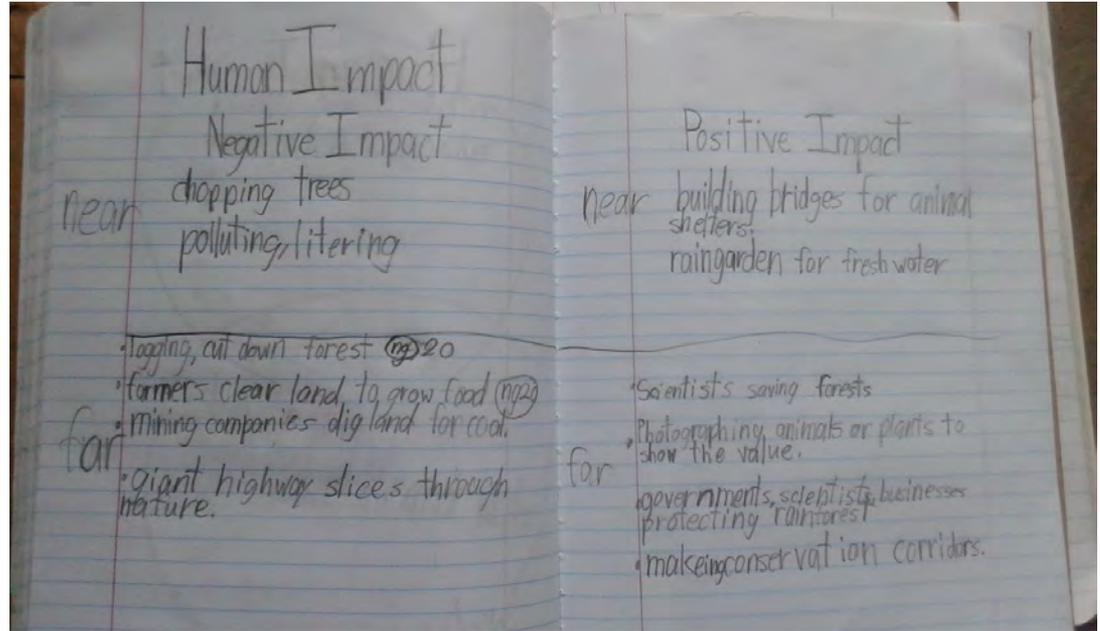
There is nothing like a blank sheet of paper on which to record one's thoughts about the natural world revealing itself.



GLSI Guiding Principle 9:
Incorporate opportunities for students to develop and clarify their personal values related to nature and community, and to develop the social competencies essential to stewardship.



LINK: [ACCESS NATURE JOURNALING TOOLS FOR THE CLASSROOM FROM THE CALIFORNIA NATIVE PLANT SOCIETY](#)



A student's nature journal shows thoughts on negative and positive human impacts on the playground and woodlot as well as places further away.

Students each had a plain, hard-covered composition book, which they decorated with the images from nature that were important to them. Because of the multiage span in the Montessori classrooms, students can read and reflect over years of entries. They can see how their ideas have grown and changed.

Nature journals in Ms. Small's class contain prose and

poetry, charts and graphs, key questions and the students' predictions and findings as they go out into the Wexford environment and local community nature centers and parks.

When it is time for assessment, a rubric for understanding can be as easily applied to a student's precious book as to a worksheet or set of test papers.

One opportunity for assessment is the student-created food web layout

Each 'layout' is as unique as the child who creates it.



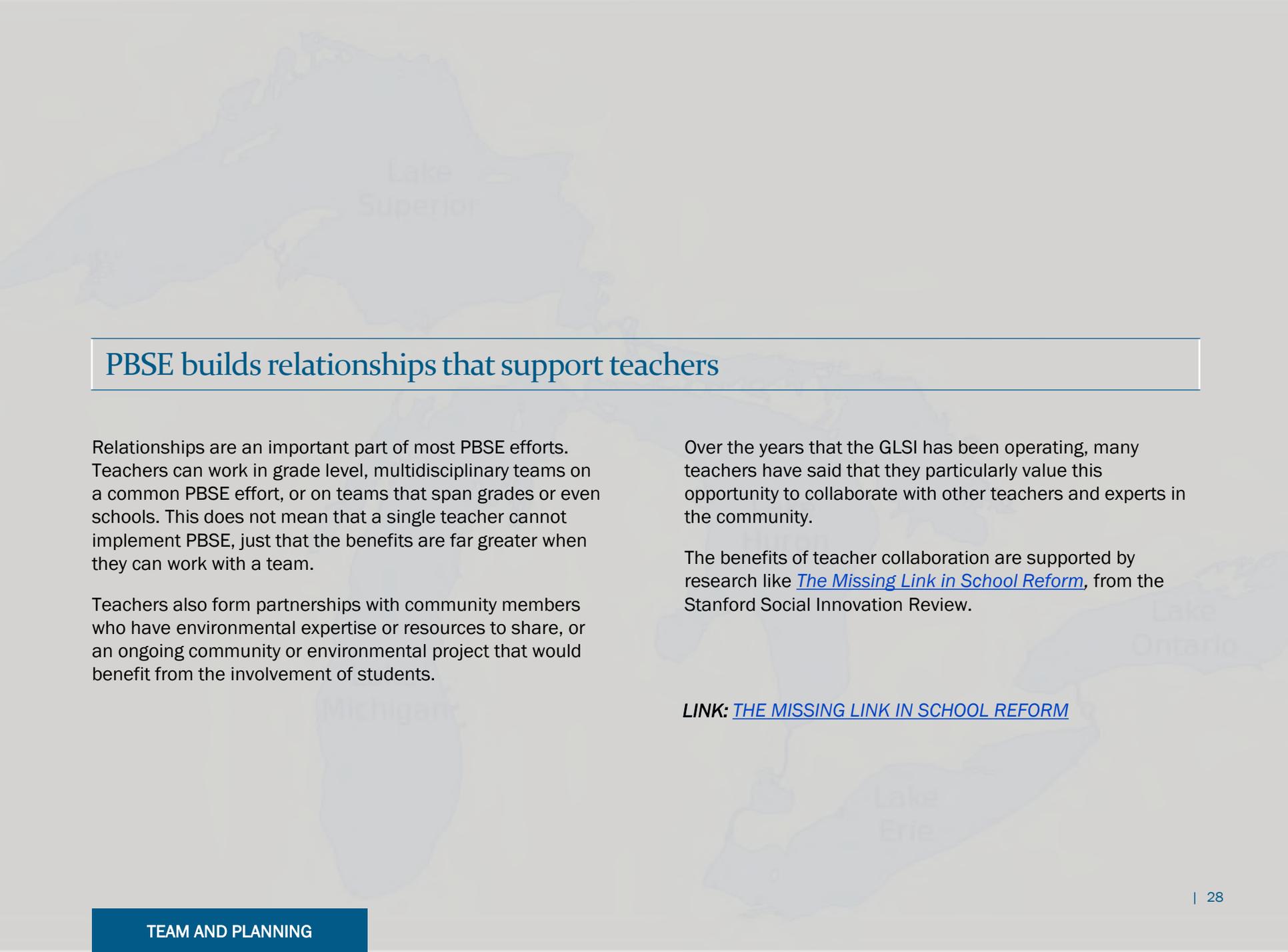
A typical Montessori "layout" of a food web that could be found in the Wexford playground and woodlot.

One assessment used by teachers during the playground project included a food web based on the plants and animals observed on or near the playground. Each card was prepared from sketches or photos. The arrows represent the path of energy through our urban ecosystem. The cards, relationship

string, and arrows are kept in a basket and laid out by students first as a learning tool, and used to assess their understanding. Teachers not only assess the visual representation of the food web, but also the dialogue that occurs during the 'laying out' of the food web by the student.



Team and Planning



PBSE builds relationships that support teachers

Relationships are an important part of most PBSE efforts. Teachers can work in grade level, multidisciplinary teams on a common PBSE effort, or on teams that span grades or even schools. This does not mean that a single teacher cannot implement PBSE, just that the benefits are far greater when they can work with a team.

Teachers also form partnerships with community members who have environmental expertise or resources to share, or an ongoing community or environmental project that would benefit from the involvement of students.

Over the years that the GLSI has been operating, many teachers have said that they particularly value this opportunity to collaborate with other teachers and experts in the community.

The benefits of teacher collaboration are supported by research like [The Missing Link in School Reform](#), from the Stanford Social Innovation Review.

LINK: [THE MISSING LINK IN SCHOOL REFORM](#)



“I can hardly believe all the people power and energy that has been mobilized around the various aspects of this project... all the partners that have come forward to play a part, for the kids. Each part of the project has led to a fork in the path. New ideas, new opportunities and with them, new people ready to get involved.”

—Kristan Small

A strong teacher team pulled in participation across several grades, building administration, and a liaison to parents



A team of teachers forms around a common commitment and is strengthened by the project.

Dr. Nancy Lubeski is the principal at Wexford Montessori Academy and the liaison to the Lansing School District's many departments involved in this project. She has made it possible for 12 classes at Wexford to participate in the Grand Learning Network, as well as Annie's BIG Nature Lesson at five local nature centers.

Kristan Small has been involved with environmental education for much of her 28 years of teaching. She teaches a 4th, 5th, 6th grade multiage class at Wexford and is the coordinator for the various playground naturalization projects.

Eric Royston taught a 7th-8th grade inclusion middle school program at Wexford. He participated in the BIG Lesson Model for five years and was the drive behind the Butterfly Safe Haven on Wexford's Playground. He is now a school principal in the Leelanau area of Michigan.

Melissa Prebeck began her interest in environmental education coordinating an organic gardening program at her previous school and continued that work with Wexford students until her recent retirement.

Erika Bushey partners in the middle school program at Wexford, serves as the liaison to the PTA, and coordinates parent volunteer efforts.

Numerous partners
have offered
inspiration,
expertise, funding,
and volunteer labor



A team of Spartan volunteers helped to clean up the woodlot and playground at Wexford.

BIG Lesson Programs spurred new thinking. As students journeyed to local nature centers during Annie's Big Nature Lesson for a week of immersive environmental education, their eyes were opened to the possibilities on their own playground.

City of Lansing Parks & Recreation kindly supplied the Work Trailer, full of tools and wheelbarrows for students and families to use on playground naturalization projects.

AmeriCorps volunteers came and worked side by side with students, digging the rain garden, building plant berms, and laying pathways.

M.S.U. Day of Service offered Spartan volunteers to work with families during the 2015 and 2016 'Spring Spruce Up' and Woodlot Restoration.

The Wexford P.T.A. has consistently supported the grant requests and work days by providing organization, volunteers, and food.

The Optimist Club of Lansing graciously funded phase I of the Naturalized Playground Project, which started the momentum growing.

Gray's Property Maintenance Co. worked determinedly to bring in the rocks and to place the docks, all at a reduced cost.

Ellis Tree Service sent two arborists to identify and remove deadfall from the Wexford Woodlot, donating time and expertise.

Mr. Karl Prebeck was Wexford Montessori Academy's resident building expert!

Mr. Vern Stephens of Designs by Nature LLC provided expertise and native plants.

Mr. Pat Lindemann, Ingham County Drain Commissioner, visited the site to provide advice about water resources.



“This is a blank canvas here. You have all the elements for a diverse habitat and you can make any learning experience happen for the kids.”

*—Pat Lindemann, Ingham County
Drain Commissioner*

Technology played an important role in bringing the teachers together, despite a lack of shared planning time during the school week

Teachers relied on Google Drive for many coordination tools.

Original planning documents were established in Google Drive, and teachers learned this new platform for planning together throughout this project.

A clear division of labor was established: individual teachers would determine the curriculum standards and individual lessons, and embed them within their class instructional plans. Students gave input during lessons and discussions within their class community.

For joint, cross-classroom activities, a calendar was established with culminating events, such as the planting day for bushes and grasses, the building of bat and bird houses, and the family day of service for hanging these shelters. The calendar was always evolving as the team worked with the PTA, the City of Lansing's Tool Cart availability, and other entities.

Text messages, after hours phone calls and 'hallway meetups', those spur of the moment times when teachers share new information, should not be undervalued, since they played an important role in teacher planning.

Teachers mapped the work to curriculum standards as the project developed

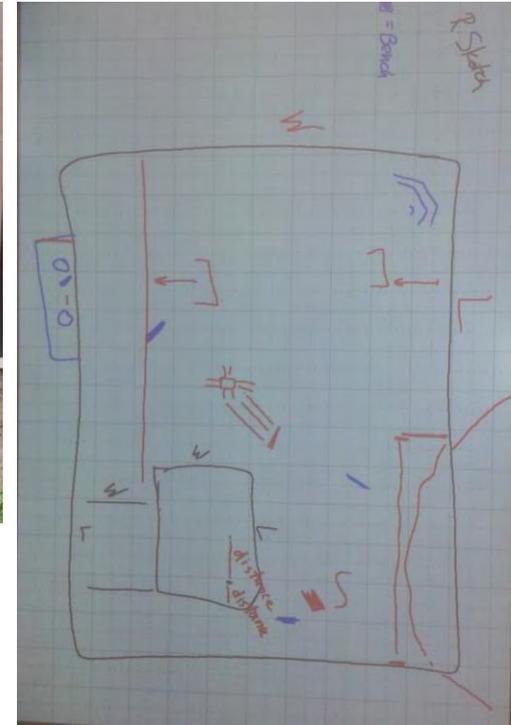
Letting the students take the lead in determining needed projects, the teachers then had the task of matching these projects to the curriculum standards that would be highlighted and assessed in each phase of the project.

One of the overarching math standards addressed in the project, “Make sense of problems and persevere in solving them,” was put into action measuring the perimeter and area of the playground, including each smaller component, like the native plant garden. Students and teachers came back to the classroom for problem solving and new solutions many times as abstract arithmetic and geometry ideas took shape as real maps for playground planning.

One challenge teachers new to PBSE often face is in balancing opportunities for student voice with the need to address grade-level content standards. Wexford teachers balanced these goals through ongoing planning and adaptation.



Above: A Wexford fourth grade student takes measurements for a new native plant garden. Right: Students drew up an entire playground map, then made plans for garden spaces, using math skills to calculate perimeter and area.



GLSI Guiding Principle 3d: Establish clear but flexible learning goals that relate to robust standards for student achievement.

GLSI Guiding Principle 7: Cultivate student voice and involve students in democratic practices throughout the course of a PBSE effort.

Many lessons were learned along the way

These lessons will help teachers, partners, and students adapt as the project moves forward.

Things learned by Wexford Montessori Academy staff:

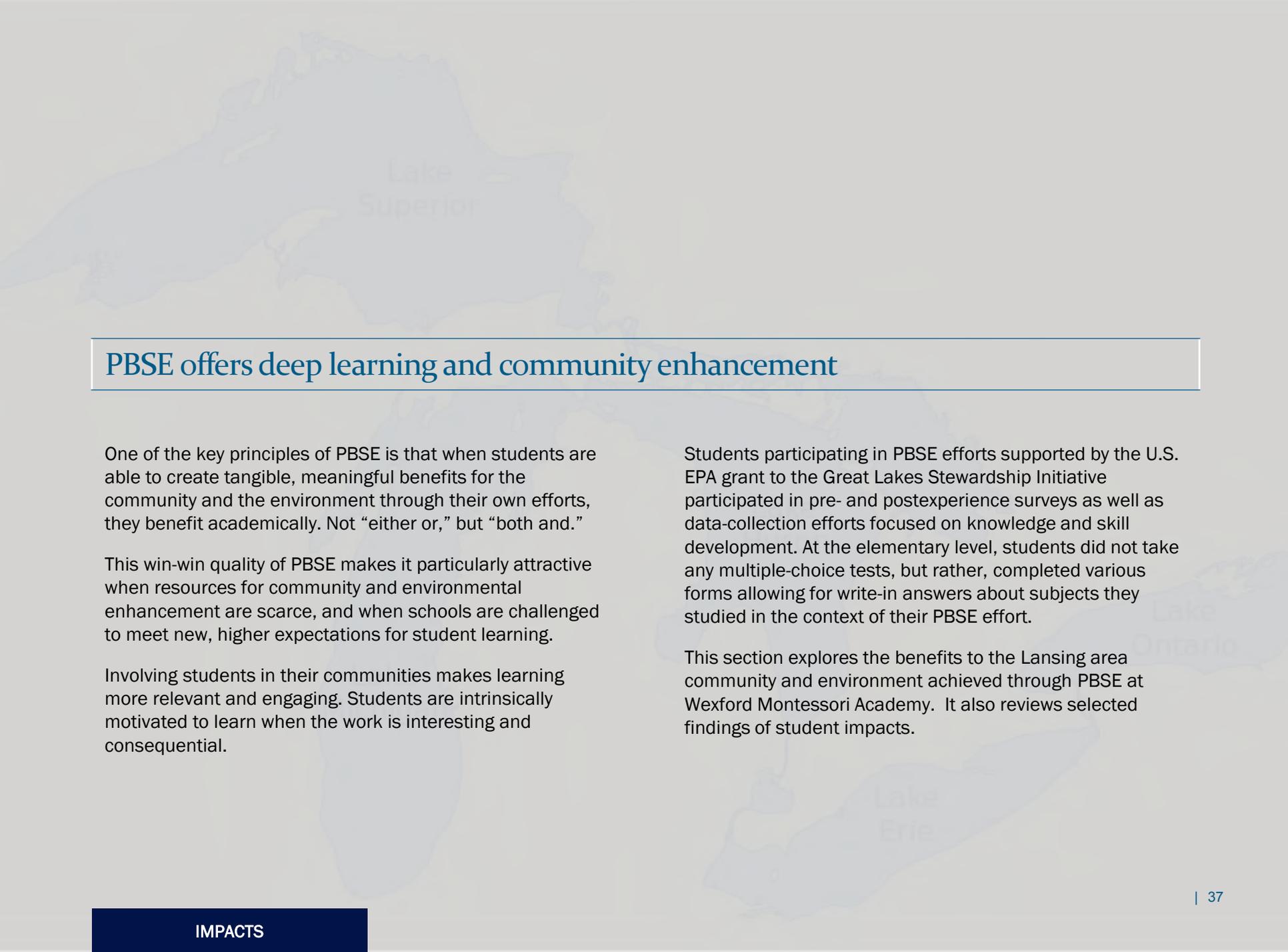
- Narrow rough trails aren't fun (or accessible) for kids on crutches.
- Perennials don't grow well without a lot of protection at first. Deer eat a lot.
- Lawn mowers can do a lot of harm without solid communication with school maintenance staff.
- Poison ivy loves wet, woody areas. Humans need a plan.
- Everybody needs mud boots, and for some kids, the school should supply them.
- Funds don't always come through on time; deliveries get delayed. It all works out in the end.
- Communication is key, and there can never be too much of it!
- Technology is fundamental when trying to reach all stakeholders.



Wexford students at the end of one of their nature immersion trips respond to the prompt: 'Gimme Five' if you had a good time!



Impacts of the Project



PBSE offers deep learning and community enhancement

One of the key principles of PBSE is that when students are able to create tangible, meaningful benefits for the community and the environment through their own efforts, they benefit academically. Not “either or,” but “both and.”

This win-win quality of PBSE makes it particularly attractive when resources for community and environmental enhancement are scarce, and when schools are challenged to meet new, higher expectations for student learning.

Involving students in their communities makes learning more relevant and engaging. Students are intrinsically motivated to learn when the work is interesting and consequential.

Students participating in PBSE efforts supported by the U.S. EPA grant to the Great Lakes Stewardship Initiative participated in pre- and postexperience surveys as well as data-collection efforts focused on knowledge and skill development. At the elementary level, students did not take any multiple-choice tests, but rather, completed various forms allowing for write-in answers about subjects they studied in the context of their PBSE effort.

This section explores the benefits to the Lansing area community and environment achieved through PBSE at Wexford Montessori Academy. It also reviews selected findings of student impacts.

The Naturalized Playground project at Wexford Montessori Academy has had tangible environmental benefits

So-called “vacant” landscapes in urban areas are not truly vacant—they have many important environmental and social values. Such areas are green spaces that connect wildlife habitats to other wildlife corridors along the Grand River watershed throughout the City of Lansing.

The stewardship work of the Wexford school-neighborhood-community partnership has created valuable habitat for species that use vernal spring waters for breeding. The work to naturalize the school grounds brings butterflies, birds, and beauty to the local environment. And, because of this good work, the school received additional woodlands to enhance and enjoy. All of this provides great benefit to the Grand River watershed environment for generations to come.

Above: Students prepare to plant native plants in new garden spaces. Below: A wetland visitor interrupts a field day event, and the student admires the visitor.



Feedback on the student-driven project from neighbors and volunteers has been overwhelmingly positive

*Top: A Wexford neighbor gives an enthusiastic thumbs up after receiving his letter from students explaining the project (and noise).
Bottom: Volunteers clean up the Wexford Woodlot alongside students before creating trails and habitat.*



“It’s about time somebody did something in there. I’m really glad it’s the school!”

—Wexford neighbor

“Hello, I volunteered with a group of MSU students a few weeks ago and I should let you know how much I enjoyed it. Your students were a true pleasure to be around and they are extremely intelligent. I was so impressed by the ease with which they spoke and how they interacted with the ‘big kids.’ The work you and the rest of the staff are doing there is incredible and I was honored to be even a small part of it.”

—MSU Student Shelby Hull

Relationships of all kinds have been enhanced

The Wexford Elementary school has built strong relationships with its immediate neighbors by communicating with them about their work to enhance and enjoy the greenspace that is nestled among the houses and around the school.

Kristan and other Wexford teachers have established strong relationships with diverse partners, including the Ingham County Drain Commissioner, Pat Lindemann, a central leader in watershed stewardship for the city of Lansing.

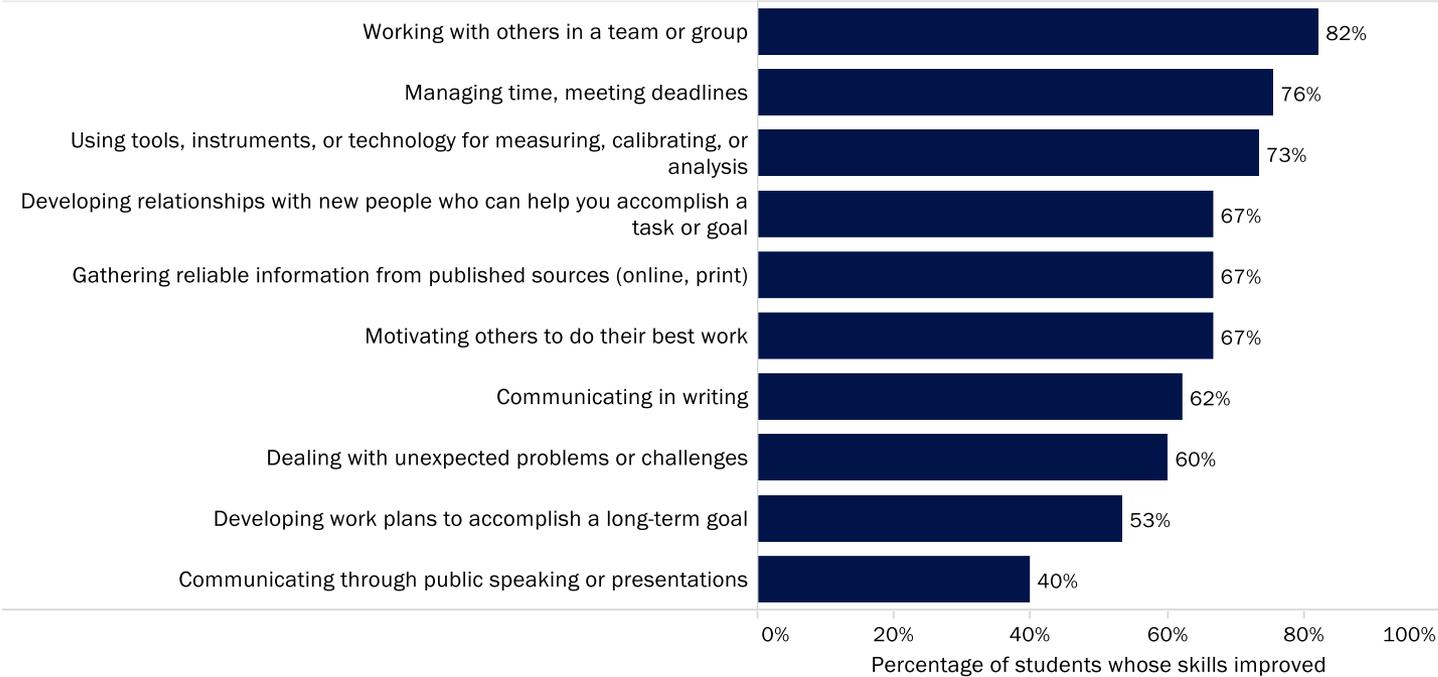
Wexford teachers believe deeply in building relationships among students, with the parents of students, among community partners, and among mentors. Wexford Montessori has worked with MSU during University-wide service days to provide ethnically diverse college-age adults into contact with the students, parents and neighborhood. This extended partnering helps to invigorate and inspire the pride in place that is so important in human and community development, particularly in the Montessori model for learning.

“As a Montessori school, we greatly value the environment and all that it teaches us. Place-based education is the way teaching and learning is supposed to be—stimulating, lively, purposeful, relevant, educational, and connected to the real world.”

—Nancy Lubeski, principal

Students reported gains in many different professional skills

Students responding to the survey checked more than six skills, on average, that they felt they had developed through stewardship work.



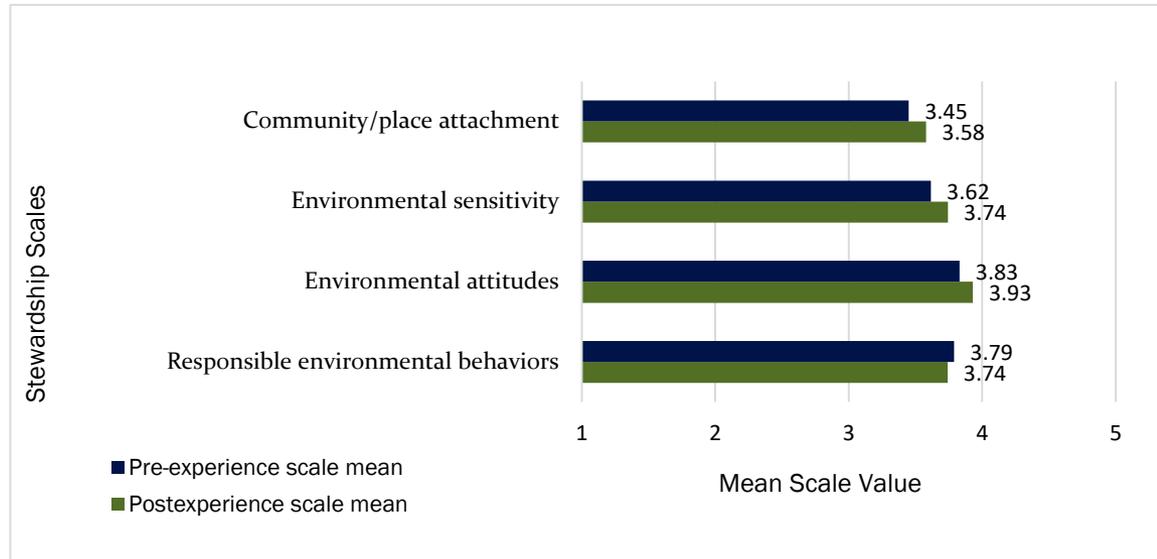
Results from the post-only portion of the stewardship survey taken by upper elementary students at Wexford Montessori.

In the postexperience survey (after students had completed their stewardship projects), students were presented with a list of skills and asked to check any that their stewardship work helped them develop.

Wexford Montessori Academy students were particularly likely to

say they learned to collaborate with others; manage their time to meet deadlines; and use tools, instruments, or technology for measuring, calibrating, or analysis. Of nine schools with this age range of students that have taken GLSI surveys, Wexford students rank very close to the top in terms of their reported skill gains.

Upper elementary students' pre- and postexperience surveys revealed growth in several measured stewardship attributes



Pre- and postsurvey results for Wexford Montessori Academy upper elementary students. Only students with a matched pair of surveys are included in the analysis.

Students took surveys before and after their work on the playground. The surveys contained multiple agree-disagree questions that, as a group, measured key aspects of environmental stewardship (see box, right). Each scale ranges from one to five, with larger values representing a stronger stewardship position. The scales each represent a student's averaged responses to several thematically related questions.

Students improved on all three of the four stewardship attributes, although the effect sizes were very small. An effect size is a standardized measure of change based on the standard deviation—an effect size of 0.5 is a change equal to half the standard deviation of the underlying scores. Student changes were measured over the course of two years, and measures of improvement may be muted by a general downward trend in such scores as students grow older.

Meaning of the Scales

Community/place attachment includes the sense that a place or community is “part of me,” that one is known in the community, and that the community is a good place to do “what I like to do.”

Environmental sensitivity is a feeling of care for nature and connection to nature.

Environmental attitudes are a set of beliefs about the importance of environmental protection and conservation.

Responsible environmental behaviors are choices (such as turning off the water when brushing one's teeth) that are within our capacity to make, and that are beneficial for the environment.

K-W-L charts were used to identify what students knew and wanted to learn at the project’s beginning, and what they learned—and learned to do—at the project’s end

The K-W-L chart (“Know,” “Want,” and “Learned”) is a widely used formative assessment.

Fifty fourth-, fifth-, and sixth-graders in Ms. Small and Mrs. Prebeck’s classes responded to the prompts shown below at the beginning of the two-year project. The most common types of responses are shown in the table. At the beginning of the project, students showed some understanding of ways in which

humans impact habitat (building, tree removal), and some misunderstandings, too. For example, in responses to the prompt about ways to improve animal habitats, several students described the needs of wildlife as if the animals were pets.

What do you <i>already know</i> about how humans impact or change animals’ habitat?	What do you know how to <i>do</i> to improve animal habitats?	What do you <i>want to know</i> or <i>be able to do</i> about animal habitats?
<ul style="list-style-type: none"> • Through building (“Humans build things that destroys how much area an animals habitat has.”) • Through cutting down trees (“when you cut down trees its takeing away animals habitats”) • Killing animals, including hunting (“They hunt or kill animals!”) • Disturbing animals’ “homes” or dens (“Step on it. Hitting it. Poking it.”) • Pollution, littering (“building factories that create smoke in the air that makes it hard for animals breath”) • Unspecified damage (“People can sometimes ruin animals habitats”) • Positive actions (“At nature centers humans protect habitats”) 	<ul style="list-style-type: none"> • Leave animals/their homes alone (“Don't mess with their homes”) • More trees (“Leave trees in forest. Grow trees in city.”) • Create/improve habitat (“Fix there habitats when there broken”) • Environmental stewardship (“You can pick up trash so they don’t try to eat it and get sick.”) • Feed/take care of animals (“Feed them. Help them. Take care of them. Save them. Care for them.”) • Leave nature alone (“Leaving it alone. Not going near it.”) 	<ul style="list-style-type: none"> • Information about animals (“Why do bees sting you for no reason?” “How do animals make their home?”) • Protect/help animals (“I want to protect them”) • Information about habitats (“To be able to watch animals build their habitats”) • How to protect or help animals or the environment (“Do electric cars hurt the environment?”) • Why/how is habitat being impacted (“I want to know more about why people would plow the field out”) • To build things (“I want to build more”)

At the end of the year, students described what they learned and what they learned to do to protect or improve animal habitat

For the 21 students submitting both an initial K-W-L chart and a post-program K-W-L chart, the evaluation team compared the responses. Postprogram responses were scored on a 1-to-5 change scale, where “1” indicated the postprogram response was of substantially lower quality than the initial response, and

“5” indicated the response was of substantially greater quality than the initial response. The mean change score was 4.29 for the question about knowledge of human impacts, and 4.14 for the question about what the student can do to improve habitat.

What did you learn about how humans impact or change animals' habitat?	What did you learn to <i>do</i> to improve animal habitats?	How did you learn these things?
<ul style="list-style-type: none"> • Ways that humans damage habitat <ul style="list-style-type: none"> • “Humans destroy plants and that hurts the insect population which hurts the frog population which hurt the squirrels and bunnys population which hurts the fox and coyote population.” • “I learned that humans impact habitat for animals by building houses, making roads, cutting grass and stepping on plants.” • Ways that humans create, restore, and respect habitat <ul style="list-style-type: none"> • “Humans help by not cutting down trees.” • “Plant trees, flowers, and plants. Build houses for animal for shelter such as bat houses, bird houses, and toad houses.” 	<ul style="list-style-type: none"> • Ways to protect habitat <ul style="list-style-type: none"> • Preserve vegetation • Don't litter/clean up • Don't touch organisms • Protect wetlands, ponds, and lakes • Ways to create/improve habitats <ul style="list-style-type: none"> • Protect animals from foot traffic (bridges) • Restore wetlands • Build shelters (bird houses, bat houses) • Plant trees and flowers • Develop rain gardens • Provide food and water 	<ul style="list-style-type: none"> • Annie's BIG Nature Lesson (17) • Field experiences at MSU (14), “first look” (4), and in the wood lot (9) • Research, including Internet (21) • My teacher (24) • Experts including Dunn (8) and Vezina (20) • By doing (planting, building, planning) (11) • By telling others (3) • From friends or family (3)

Students' drawings and writings of what made them "happy or proud" show multiple types of learning and the students' varied personalities and desires

What about our stewardship project makes you happy or proud?

about saving the wildlife and keeping
The earth clean, not cutting down the
Dead tree's for the Bats to live in and
d The water for the Spring-peepers to
live in and lay Their eggs and The
Monarchs to get nectar they need
to fly to Mexico to get the heat they need
to fly back to lay their eggs onto the milkwe
ed

The response at left is an example of a student who was proud of contributions to nature. The writing has a variety of specific details about species encountered. The response below is an example from a student who enjoyed using tools and working with friends to build a bat house (shown in the center of the drawing).

Students were asked what made them "happy" or "proud" about their stewardship project at the end of the postprogram survey. Some students wrote; some drew. Students focused on:

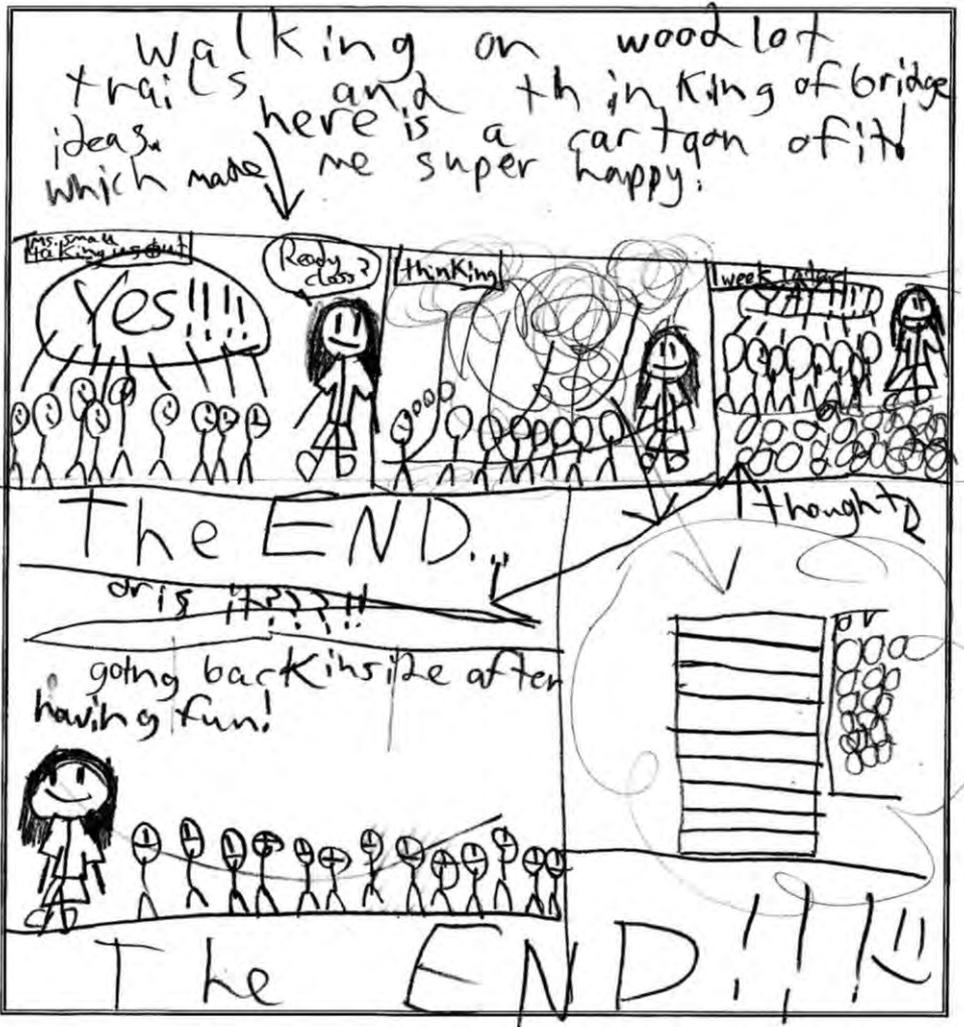
- the positive feelings they had about helping animals;
- interest in novel species or artifacts discovered;
- their enjoyment of trips into the community;
- their enjoyment of designing and building projects;
- positive feelings about cleaning up litter and making a contribution at the nature center;
- working in the field with friends; and more.

What about our stewardship project makes you happy or proud?



One student's cartoon exhibits how students explored, envisioned, then built a bridge

What about our stewardship project makes you happy or proud?



In place-based stewardship education, students, teachers, and community partners are co-creators. This student's cartoon dramatizes the opportunity Wexford students had to think creatively and be a part of the process of defining solutions.



GLSI Guiding Principle 7:
Cultivate student voice and involve students in democratic practices throughout the course of a PBSE effort.

The drawing to left shows the students and Ms. Small "walking on woodlot trails and thinking of bridge ideas." Arrows depict how student thoughts translated into a bridge in the naturalized playground.

Wexford students were deeply impacted by their Naturalized Playground Project and the connections they made with nature in their own place

“I learned that every single human can make a change to the environment by just planting stuff that humans and wildlife enjoy.” D., 5th grade

“You can plant flowers or trees after you cut or mow to build up the organism’s habitat!” J., 5th grade



“If we cut animals’ homes down, at least we should improve them with something better.” M., 6th grade

“...another thing I would do is make sure our environment is safe for all of our animals...” A., 6th grade

“Getting to see animals in their habitat made me happy and excited, that they can live here forever because we are protecting and improving it.” D., 6th grade

Other PBSE efforts could yield a different set of benefits

There is a lot of freedom within the PBSE framework, so many benefits are possible depending on the direction taken.

BENEFITS OF PLACE-BASED STEWARDSHIP EDUCATION CAN INCLUDE:

STUDENT ACADEMIC GAINS

- Improved academic scores and grades
- Improved critical thinking skills
- Increased engagement in school and motivation for achievement
- Increased professional skills, such as leadership, persistence, taking responsibility, teamwork, developing plans to reach a solution, managing time, motivating others, and dealing with unexpected challenges
- Deeper learning and action competence
- Increased awareness of career options

POSITIVE YOUTH DEVELOPMENT AND STEWARDSHIP GAINS

- Social-emotional development, including increases in self-esteem, a sense of empowerment and agency, social interaction skills and capital, and awareness of cultural diversity
- Sense of place and community attachment
- Civic-democratic competencies and

attributes

- Pro-environmental attitudes
- Environmental sensitivity and awareness
- Responsible environmental behaviors

TEACHER BENEFITS

- Opportunity to pursue their interests and advance their values
- Skill development
- Motivated students

SCHOOL AND DISTRICT BENEFITS

- Teacher engagement and satisfaction
- An integrated option to reach numerous and robust standards and curricular priorities as well as youth development priorities
- Increased awareness from the community of the conditions, needs, and efforts of the schools
- Stronger connections with community-based organizations, parents, and individual community members
- Access to grants, funders, and recognition

PARTNER ORGANIZATION BENEFITS

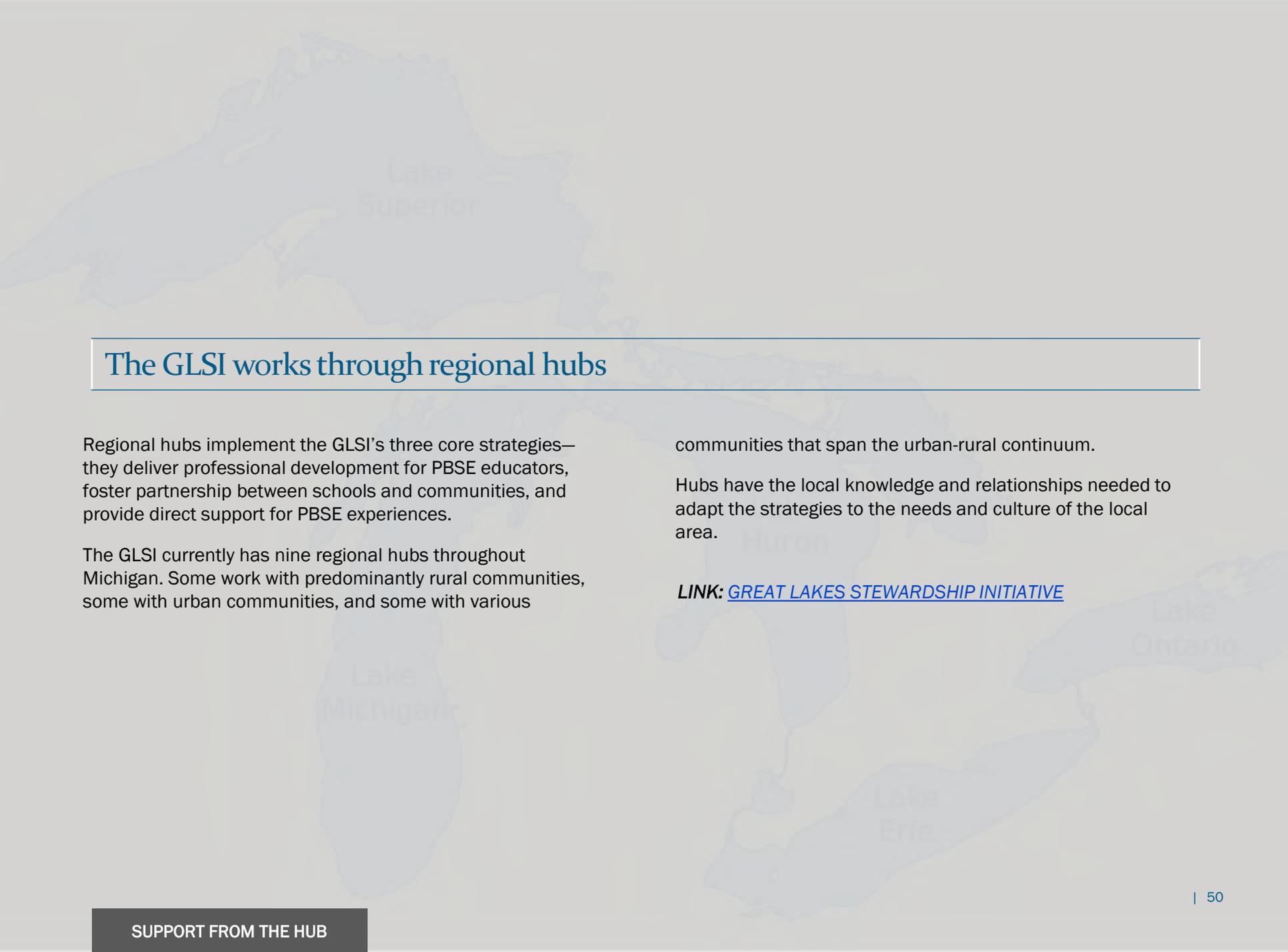
- Engaged youth and schools in their work
- Raised awareness of the mission
- Increased capacity
- Networks with other organizations in the field
- Access to grants, funders, and recognition

LOCAL BENEFITS

- Community revitalization and environmental improvements
- Sense of place
- Social capital and community capacity



Support from the Hub



The GLSI works through regional hubs

Regional hubs implement the GLSI's three core strategies—they deliver professional development for PBSE educators, foster partnership between schools and communities, and provide direct support for PBSE experiences.

The GLSI currently has nine regional hubs throughout Michigan. Some work with predominantly rural communities, some with urban communities, and some with various

communities that span the urban-rural continuum.

Hubs have the local knowledge and relationships needed to adapt the strategies to the needs and culture of the local area.

LINK: [GREAT LAKES STEWARDSHIP INITIATIVE](#)

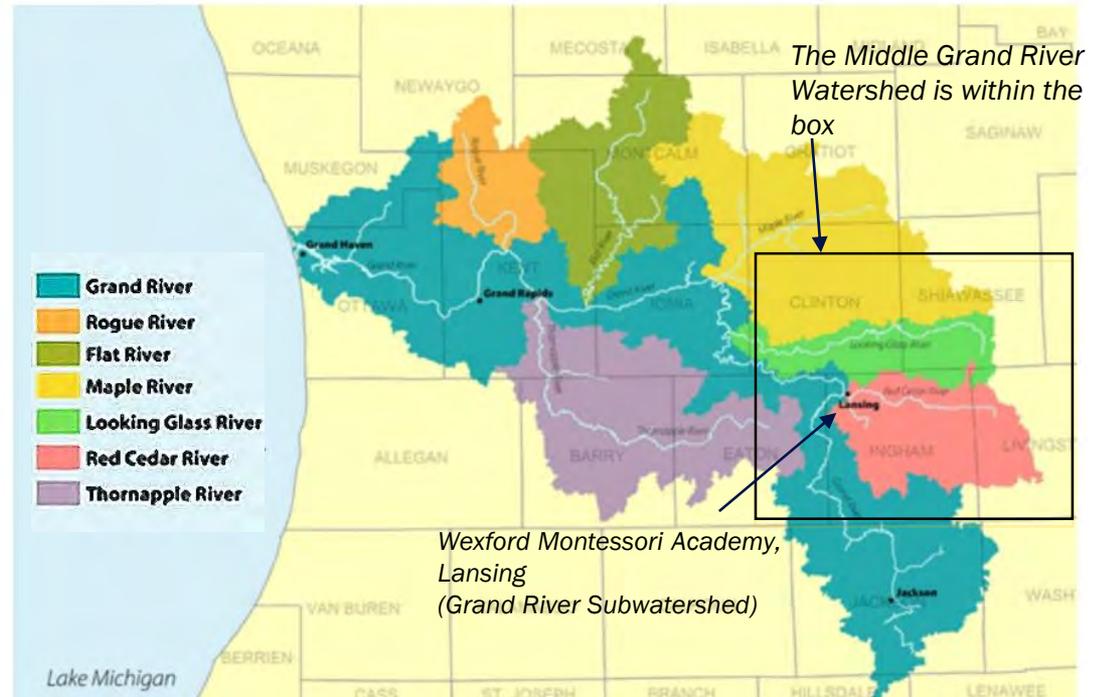
The GRAND Learning Network serves mid-Michigan communities in the Grand River Watershed

The hub has strategic priorities related to pedagogy and content.

The GRAND Learning Network, with visioning by teachers and community partners, is building relationships and improving the watershed. Since 2007, this GLSI hub has partnered with the school districts of Bath, DeWitt, Haslett, Holt, Laingsburg, and Lansing, all of which are located in the Middle Grand River Watershed.

The GRAND Learning Network has focused on:

- The headwaters of the Great Lakes region
- A collection of schools that spans urban, suburban, and rural contexts
- The elementary grades
- Teacher leadership, whereby educators are intentionally recruited and supported as leaders within their grade levels, buildings, districts, and communities
- Reflective practice and community engagement



The Grand River watershed, its subwatersheds, and the GRAND Learning Network's focal area—the Middle Grand River Watershed (in the box).

LINK: [GRAND LEARNING NETWORK](#)

LINK: ["BECOMING A REFLECTIVE TEACHER," AN ARTICLE FROM THE NATIONAL ASSOCIATION FOR THE EDUCATION OF YOUNG CHILDREN](#)

Hubs implement three core strategies for stewardship

Each GLSI hub provides a program of sustained professional development, brokers school-community partnerships, and supports place-based education. Their strategies are not inherently tied to environmental stewardship—that theme and content must be infused into each aspect of the work.

The GLSI’s hubs have developed approaches that reflect the environmental character and needs of their respective communities, the interests and goals of their school districts, the strengths of the hub staff and the host organization, and the mix of community organizations engaged in stewardship work with youth.

Every hub shapes their strategies to meet the needs of its people and places.



The hub is housed at Michigan State University and operated in partnership with BIG Lesson Programs

At Michigan State University (MSU), the hub has access to faculty in the Department of Community Sustainability and other related academic departments, as well as access to the MSU Extension system. MSU Extension has offices in every county and works to bring the knowledge of the university to bear on opportunities and challenges faced in Michigan communities. It is part of the Cooperative Extension service established in the early 20th century and overseen by the nation's land grant colleges.

The BIG Lesson Programs was established in 1999 by Margaret Holtschlag, Michigan teacher of the year in 1999–2000. BIG Lesson Programs are weeklong immersion experiences in which students and their teachers and parent volunteers learn off-site for a week at the nature center, the zoo, or the history or science museum. Teachers are supported with professional development on immersion and experiential learning, and students engage in service as part of their week in the community.

LINK: [MICHIGAN STATE UNIVERSITY EXTENSION](#)

LINK: [THE BIG LESSON PROGRAMS](#)



MSU Extension districts across Michigan.

The GRAND Learning Network provides sustained professional learning through a variety of events and opportunities

Hub-sponsored professional development focuses on four themes: the Grand River watershed, sense of place, community engagement, and stewardship.

The GRAND Learning Network's professional development offerings include an annual summer institute and experiential learning opportunities featuring such topics as robotics, art, fishing, and canoeing.

From 2007 through 2016, the hub involved 260 teachers in professional development. Those teachers spent more than 7,700 hours in professional learning and reached more than 13,000 students in mid-Michigan.



GRAND Learning Network teachers learn the value of deep-rooted, native plants for watershed quality at the Summer Institute.

Teacher leadership is central to the hub’s professional learning and PBSE strategies

Teacher leaders are developing leadership skills and using them to support other teachers’ PBSE efforts.

The GRAND Learning Network has emphasized teacher leadership since its inception in 2007. Teacher leaders seek to influence their colleagues in the classroom as well as the administrators of their buildings and districts. One of the important benefits of teacher leadership for organizations like the GRAND Learning Network and the GLSI is that teacher leaders can provide continuous, onsite support for the practice of PBSE in school buildings and districts.



GLSI Guiding Principle 3e.1: GLSI PBSE informs school building and district priorities.

LINK: [TEN ROLES FOR TEACHER LEADERS](#)

LINK: [TEACHER LEADERSHIP THAT STRENGTHENS PROFESSIONAL PRACTICE—AN ASCD BOOK](#)

“The term ‘teacher leadership’ refers to that set of skills demonstrated by teachers who continue to teach students but also have an influence that extends beyond their own classrooms to others within their own school and elsewhere. It entails mobilizing and energizing others with the goal of improving the school’s performance of its critical responsibilities related to teaching and learning.”

—Charlotte Danielson, from Teacher Leadership that Strengthens Professional Practice

Teacher leaders meet often to support each other and the hub

When teacher leaders in the GRAND Learning Network meet, they reflect upon their shared learning experiences, discuss and develop strategies to support teachers who are new to PBSE, and help hub staff identify and plan the hub's upcoming offerings in professional development.

In addition, a subset of teacher leaders who are retired from the classroom provides coaching and support to teachers and community partners who work with the GRAND Learning Network.



Teacher Leaders Ruth Pearson and Dave Beutel conduct water quality testing with other teachers and with students. Schools like Wexford get to benefit from veteran teachers' expertise and willingness to serve.

The GRAND Learning Network provides small grants to offset PBSE costs

Quality PBSE actively involves collaboration among the students, teachers, and partners who carry out purposeful work to address local stewardship needs or opportunities. The focus of a PBSE effort is determined in part by students who work with community partners and the school to identify learning that will be meaningful to them and work that will benefit the local community, its watershed, and the Great Lakes.

The hub provides modest funding for PBSE efforts. Teachers who have attended professional development supported by the GRAND Learning Network are eligible to apply for grants of up to \$400 per year. These small grants help offset the costs of transportation, materials, equipment, or other expenses related to a PBSE effort. Many teachers receive additional cash or in-kind support for stewardship projects from or through their community partners.



Mid-Michigan students who participate in the GRAND Learning Network proudly show the result of their efforts to remove invasive garlic mustard plants from a local site.

The GRAND Learning Network helps teachers learn to build school-community partnerships

The GRAND Learning Network hub is based at MSU's Department of Community Sustainability with MSU Extension ties. Through these ties, the hub can connect educators like those at Wexford to state and local agencies, nonprofit organizations, and businesses interested in community stewardship.

During summer institutes, the hub has fostered connections between its teachers and local drain commissioners, the Michigan Departments of Natural Resources and Environmental Quality, regional "friends" groups (such as Friends of the Looking Glass River), native plant growers, native animal experts, and MSU faculty and outreach specialists. At summer institutes, partners have shared ideas about community assets and about watershed challenges that can be addressed through PBSE.

Nineteen Wexford educators, including the principal, have participated in at least one GRAND Learning Network professional development event. For Kristan Small, professional learning has helped her to meet staff at area nature centers and the Potter Park Zoo. As teacher leaders build partnerships, the hub staff serve as coaches, listening ears, referral-providers, and "guides on the side," letting the ownership of the PBSE efforts rest with the partners themselves.



Wexford teacher Jennifer Goellner with Fenner Nature Center staff.

The GRAND Learning Network helped Wexford Montessori Academy teachers make connections

The ultimate impact of this hub is strong local engagement to improve watersheds and strengthen sense of place among teachers, learners, and community partners.

Through the GRAND Learning Network, Ms. Small and her fellow teachers became interested in the school neighborhood as a center for developing young students' sense of place. With the guidance of the hub, Ms. Small reached out to community partners and developed, over time, support networks of organizations and individuals with the knowledge and capacity to enhance wildlife habitats and community assets in the vicinity of the school.

Ms. Small applied on behalf of Wexford Montessori Academy for a grant from the hub to offset some of the costs of their work on the playground and woodlot.

The staff of the GRAND Learning Network served as facilitators, coaches, and helpers to Wexford Montessori Academy teachers over the course of this effort and more. This sustained support for PBSE from the hub has forged a strong relationship between it and the school, which will help ensure the future of PBSE at Wexford Montessori Academy.

“My students are becoming stewards, developing skills and values I cannot manufacture in the classroom.”

—Kristan Small, Wexford Montessori Academy teacher



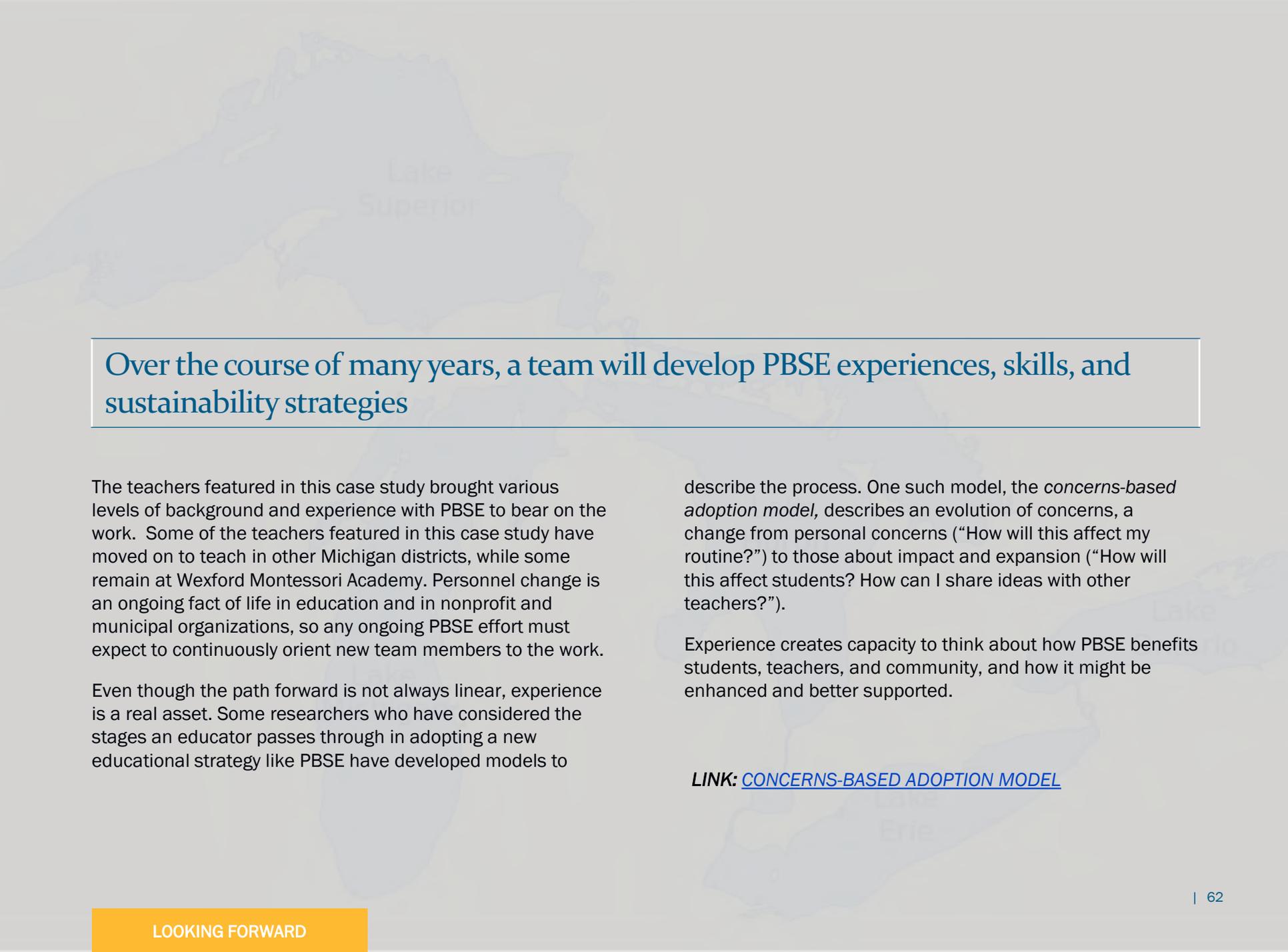
Dr. Shari Dann by the vernal pool at Wexford Montessori Academy. Image courtesy of MSU University Outreach and Engagement.

“Wexford students, teachers, parents, and partners are an inspiration in their neighborhood. Principal Dr. Nancy Lubeski fully supports her staff in sustained PBSE, because it is complementary to the Montessori context, and since PBSE is a valuable way to learn.”

—Dr. Shari Dann, Michigan State University, Dept. of Community Sustainability and hub co-facilitator



Looking Forward



Over the course of many years, a team will develop PBSE experiences, skills, and sustainability strategies

The teachers featured in this case study brought various levels of background and experience with PBSE to bear on the work. Some of the teachers featured in this case study have moved on to teach in other Michigan districts, while some remain at Wexford Montessori Academy. Personnel change is an ongoing fact of life in education and in nonprofit and municipal organizations, so any ongoing PBSE effort must expect to continuously orient new team members to the work.

Even though the path forward is not always linear, experience is a real asset. Some researchers who have considered the stages an educator passes through in adopting a new educational strategy like PBSE have developed models to

describe the process. One such model, the *concerns-based adoption model*, describes an evolution of concerns, a change from personal concerns (“How will this affect my routine?”) to those about impact and expansion (“How will this affect students? How can I share ideas with other teachers?”).

Experience creates capacity to think about how PBSE benefits students, teachers, and community, and how it might be enhanced and better supported.

LINK: [CONCERNS-BASED ADOPTION MODEL](#)

Teachers see opportunities for ongoing place-based education rooted in the naturalized playground

There are many ideas and many people who want to be involved.

Some of the concepts for future work being considered are:

- Establish school-wide protocols with all students about how we will react when, for example, we see a frog, find a fawn nestled in the Woodlot, or find frog egg strands in the shallows of the vernal wetland. Are our first impulses the best choice?
- Create signs to better inform weekend basketball players and neighborhood kids who don't attend Wexford about the Naturalized Playground. Often, they see the plant stakes as playthings and the flowers for picking. How do we create an inclusive, respected natural setting?
- Create an opportunity for our older students to use everything they have learned to enhance the "Little Kids Playground" with naturalized play spaces designed with preschoolers in mind.



This fawn was spotted June 8, 2016, eight inches off the Wexford Woodlot trail.

Wexford educators are also committed to the ongoing use of place-based education to foster stewardship in the urban context

Urban environmental education is a priority for the environmental education community.

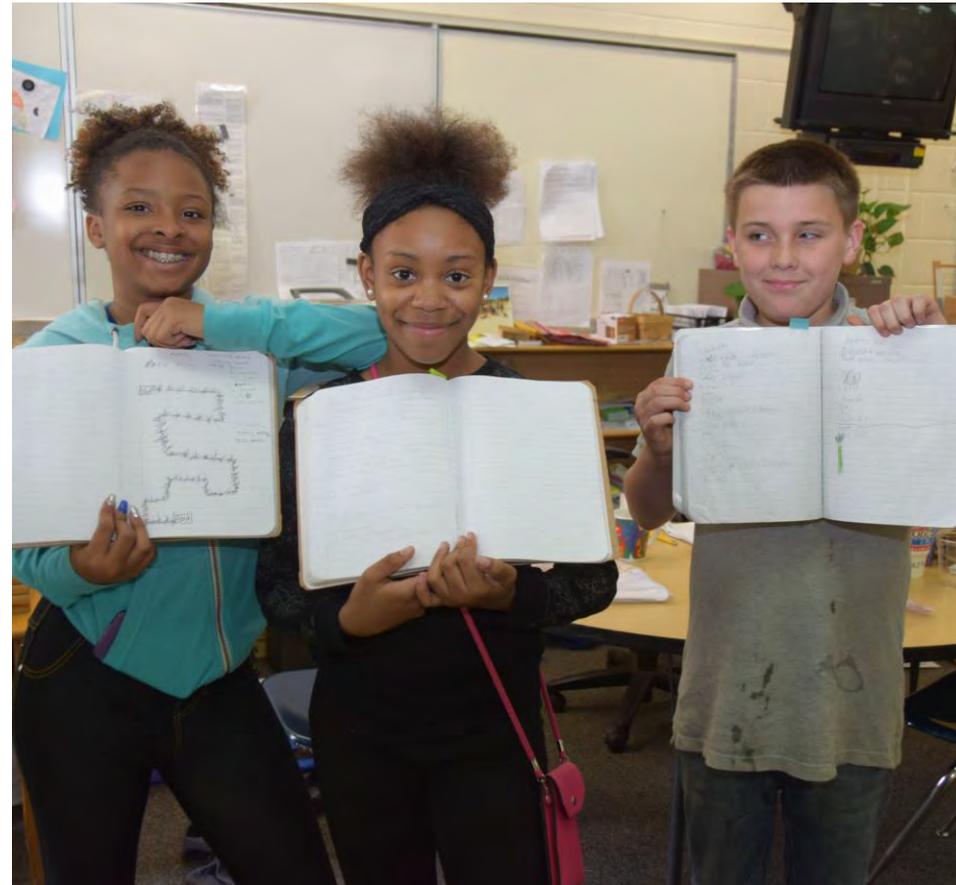
Wexford Montessori educators say:

“We want to connect with all Wexford families and the larger Lansing community to maintain and share our space.

We plan to continue experiencing the power of project driven, place-based learning, and to share our experiences with other educators.

We’ll work to establish a consortium of Lansing schools interested in strengthening student-led stewardship in our urban setting. We can then work together inform policy and empower our kids.”

[LINK: URBAN ENVIRONMENTAL EDUCATION, A CORNELL UNIVERSITY PUBLICATION](#)



Wexford students display their nature journals. Image courtesy of MSU University Outreach and Engagement.



Kristan Small in her classroom. Image courtesy of MSU University Outreach and Engagement.

“My greatest hope is that the work here becomes a natural part of schooling, no pun intended. My students come alive as they research, plan, build and plant, all for the animals they innately love. Exploring in this space, and reacting to its unfolding possibilities, is the ‘real world’ work that they crave. It is the type of work that may, indeed, be the answer to reaching every child.”

—Kristan K. Small



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About the Great Lakes Stewardship Initiative

The Great Lakes Stewardship Initiative was launched in 2007 to develop knowledgeable and active stewards of the Great Lakes and their ecosystems.

The GLSI enacts three key strategies (place-based stewardship education, sustained professional development, and school-community partnerships), mainly through the efforts of its nine regional hubs. A small central staff helps coordinate the work and provides technical assistance and support to hubs.

Hubs are funded, in part, by the Great Lakes Fishery Trust, which in 2007 pledged to provide more than \$10 million through 2017 to support the GLSI's work. The GLSI and its hubs solicit and receive additional support from foundations, federal and state agencies, local and regional partners, and individual donors.

From 2007 through the 2014–15 school year, the GLSI has worked with more than 1,500 teachers in more than 280 schools across Michigan, engaged hundreds of community partners, and supported rigorous place-based stewardship experiences for more than 80,000 students—and the work continues.

LINK: [GREAT LAKES STEWARDSHIP INITIATIVE](#)

LINK: [GREAT LAKES FISHERY TRUST](#)



The GLSI's 2014 grant from the U. S. Environmental Protection Agency supported this case study and other knowledge products

In 2014, the U.S. EPA awarded the GLSI a \$150,000 grant through its Environmental Education Grant Program. Through this grant, the GLSI funded a collection of exemplary place-based stewardship projects across Michigan and documented these projects through case studies.

The grant also supported the development of several knowledge products to support the practice and spread of place-based stewardship education in K–12 schools and communities. The first knowledge product is a set of guiding principles that describes the GLSI's vision for place-based stewardship education in K–12 schools and communities. The principles can serve as a compass for practitioners, and also highlight the ways that place-based education connects to important goals and initiatives in education.

The second knowledge product is a rubric that supports the guiding principles. The rubric describes in detail the actions and practices that characterize various developmental stages in place-based stewardship education. It can be used for several important purposes, including a self-assessment of practice.

A third knowledge product is a white paper that focuses on expectations for and the educational, community, and environmental benefits of place-based stewardship education across urban, rural, and suburban contexts.

This document was developed under Assistance Agreement No. 00E01327-0 awarded by the U.S. Environmental Protection Agency. It has not been formally reviewed by EPA. The views expressed are solely those of the Great Lakes Fishery Trust and EPA does not endorse any products or commercial services mentioned.

LINK: [OTHER EPA KNOWLEDGE PRODUCTS](#)

LINK: [FULL SET OF CASE STUDIES](#)



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With assistance from participating educators, civic leaders, and community partners, the GLSI:

- Helps young people become effective and motivated environmental stewards
- Encourages schools and community organizations to work together for mutual benefit
- Creates a sustained effort across Michigan to expand classrooms, strengthen communities, and improve the environment