MONITORING PROJECTS AT SAWMILL CREEK

by Lori Walewski, Wolf Ridge Naturalist

Standing atop of Section 13 on the Superior Hiking Trail looking north you’ll see a large wetland complete with beaver dams and lodges. It’s the origin of Sawmill Creek. From here it meanders through wetlands and forest, drops into hidden trout pools, ducks under one roadway and over another in high water, and passes onto Wolf Ridge property. Five miles from its beginning, it empties into the Baptism River. While flowing through Wolf Ridge, three classes focus their studies around or in it: Beaver Ecology, Fisheries Management, and Stream Study.

Sawmill Creek is just a small part of Minnesota’s signature water resources. Monitoring the health of all our waters is important for protecting aquatic life, recreation, and consumption. The section of Sawmill Creek that traverses Wolf Ridge is the site of several water quality monitoring projects.

In August of 2014 the Minnesota Pollution Control Agency (MPCA) conducted testing at Sawmill Creek as part of their Watershed Approach monitoring project. The MPCA is responsible under both federal and state law to protect Minnesota water quality. On their visit, both fish and macro invertebrate samples were collected downstream of the new concrete culvert placed in Sawmill Creek in 2013.

Our science immersion credit camps also conduct monitoring of Sawmill Creek. In these camps we involve students in hands-on research projects and expose them to career opportunities. For 2-3 days high school students work with the Department of Natural Resources (DNR) to conduct a water quality survey of Sawmill Creek at Wolf Ridge. They start with identifying stream bank then aquatic plants. Students conduct water chemistry tests of dissolved oxygen, pH, and conductivity. Physical properties such as flow and turbidity are recorded. They shock the stream: count, weigh, measure, and ID species. A dip net is used to collect macro invertebrates such as stonfly and dragonfly nymphs, caddisfly larvae and water striders. We collect and save all this data.

Students at Wolf Ridge have been exploring water quality during Stream Study class for over forty years. They, too, examine physical, chemical, and biological aspects of the stream. Special delight is taken in the aquatic creatures. Nothing is more dramatic than a minnow caught in the grip of a giant water beetle, which is sucking out the minnow’s life juices to nourish its own life. At

continued on page 8
Spring is a wonderful time of year. This year in particular Wolf Ridge is experiencing an actual spring season, sometimes a rarity on the North Shore. With birds returning, plants appearing, and tree buds swelling it is so much fun to take children outdoors at this time of year. The excitement and energy around Wolf Ridge is perfectly matching this glorious spring season as we look to the future.

With over 40 years of history and success, Wolf Ridge is making big plans for our next strategic moves to our facilities, land, and learning experiences. It’s now a regular occurrence that maps, building sketches, and news documents are hanging in the office awaiting input from staff. Architects, engineers and fundraising consultants are interviewing teachers, parents, staff, and students in helping to guide our efforts for our next 40 years.

Early in this effort we did a survey of the Wolf Ridge community. Over 200 people including teachers, parents, staff, and board members contributed to the process. We learned what they feel to be the key issues for Wolf Ridge, and environmental education in general, to address in the coming years. Distinctly, at the top of the list is freshwater access and awareness. This was followed by, in order, climate change, the wealth gap, human activity impact, and connection to the natural world. With this in mind, we are making serious plans about the use of Lake Superior in our curriculum. We couldn’t ask for a greater resource in which to set the context of freshwater education in our future.

Our other plans include a major remodel of the West Dormitory, a new housing facility for our “Student Nats” and summer staff, as well as a major upgrade to our maintenance facilities. A survey of the natural assets of the land is underway that will result in our first land management plan.

We have important plans and know they are needed. We need to assure we manage student and youth housing appropriately in the 21st century. We need to assure that the power of experience in this living laboratory of learning will include living in “buildings of the future”. Look for more announcements in the near future as we unveil our projects and further strategic moves.

“Those who initiate change will have a better opportunity to manage the change that is inevitable.”

– William Pollard
Our trail cam guru, Ryan Pennesi, is downloading exciting new photographs on a weekly basis. In a 60-hour period his camera recorded beavers, otters, and a mink exiting from the same hole in a beaver dam.

In early February of 2014, staff made a plethora of reports of lynx at Wolf Ridge and several were photographed with a trail camera. It seemed to be a mother and five juveniles. Recently received DNA analysis of scat samples revealed it was mom with three of her own and two adopted kittens.

The March 20-22nd weekend of science immersion programs had a record 73 students. Activities had the students spread out all over the campus working on leadership and team skills. A group enjoyed warming up with hot cocoa in the storytelling tent.

The Lloyd K Johnson Foundation awarded a grant to Wolf Ridge to support the purchase of high-end equipment to upgrade our naturalist training and cover expenses to host experts in natural sciences interpretation. Our naturalists are already excitedly using a digital microscope, parabolic receiver/recorder, animal radio collars, hand lenses, cameras, and GPS units to extend our collective knowledge about the natural communities at Wolf Ridge.

Maple tapping was a sweet success. Forty trees were tapped as part of Ojibwe Heritage class resulting in 3 gallons of liquid gold.

National Geographic’s Heart of the Continent website launched on March 19th, 2015 at www.traveltheheart.org. This website promotes geotourism in northeastern Minnesota and southwestern Ontario. Several Wolf Ridge programs are featured and our staff served as part of the design team. Visit traveltheheart.org to find everything from great places to eat, community events, outdoor adventures, educational programs and more. Click ‘like’ on the Wolf Ridge programs.

New technology is now being used in our Stream Study class. (See box on page 8.) Students are excited about the awesome pictures of macroinvertebrates they can take with the new iPad Air tablets and attached microscope.

A fieldstone retaining wall is under construction between two of the high tunnel greenhouses at the farm. Finishing work on the pizza oven is in progress. The first greenhouse is planted and classes at the farm begin in mid-May.

A hellgrammite, larva stage of a dobsonfly.
Afton-Lakeland Elementary
Andersen Elementary
Andersen United School
Annandale Middle School
Arcadia Charter School
Assumption School
Augsburg Fairview Academy
Badger School
Bancroft Elementary School
Barnum Elementary
Beacon Academy
Benilde-St Margaret’s
Bethany Academy
Bethlehem Academy
Birch Lake Elementary
Bluefin Resort
Breck School
Carleton College
Carlton High School
Cathedral
Cavalier Middle School
Central Cass Middle School
Central Lutheran
Central Middle School
Chisago Lakes Middle School
Church of Christ
Churchill Elementary
Congdon Park Elementary
Cooper Elementary
Covern Elementary
Cumberland Middle School
Diamond Path Elementary
Dugsie Academy
Ed Visions Cooperative
Emanuel Lutheran
Epiphany
Five Hawks Elementary
Fox West Academy
Franklin Elementary
Frassati Catholic Academy
Friends School of MN
Girl Scouts Troops 4054 & 4056
Girl Scouts Troops 11255 & 11442
Glen Lake Elementary
Glendale Elementary
Grainwood Elementary
Great Expectations School
Giovventu Studentsca Program
Heritage Sports Camp
Home Educated Youth - St Cloud
Hibbing Community College
Highlands Elementary
Hilltop Primary
Hinkley-Finlayson Elementary
Heilicher Mpls Jewish Day School
Holy Name Of Jesus
Holy Rosary School
Holy Trinity School
Homecroft Elementary
Hope Community Academy
Hopkins Community Ed
Int’l Spanish Language Academy
Jeffers Pond Elementary
John Ireland
Jordan Middle School
King Of Grace Lutheran
Lake Superior Youth Choir
Lakewood Elementary
Laura MacArthur Elementary
Lester Park School
Lowell Elementary School
Loyola Catholic School
Manvel Public School
Maple Lake Elementary
Marquette Catholic
Marshall County Central HS
McGuire Middle School
Memorial Middle School
Midway School
Murray Jr High
New London/Spicer Middle School
Niigaane Ojibwemowin Immersion School
Norman County West Elementary
North Shore Community School
North Star Academy
Nyquist School
Oak Crest Elementary
Oak Grove Middle School
Oak Park Elementary
Odyssey Academy
Onamia Junior High
ONE Retreat
Orono Intermediate School
Our Lady of Grace Catholic School
Our Lady of the Lake
Park River School
Piedmont Elementary
Pine Island High School
Prairie Creek
Presentation Of Mary
Providence Academy
Queen of Peace
Raleigh Edison School
Redtail Ridge Elementary
Road Scholars
Rockwood Community Education
Rogers Middle School
Sacred Heart - Grand Forks
Sacred Heart - Robbinsdale
Sawtooth Mountain Elementary
Schoolcraft Learning Community
Shell Lake
Shirley Hills Elementary
Sierra Club
Sojourner Truth Academy
South Ridge Elementary
St Anthony Park
St Charles Borromeo
St Croix Catholic
St Croix Montessori
St Francis de Sales
St James’s School
St John’s School
St Mark’s School
St Mary’s - Breckenridge
St Mary’s - Morris
St Pascal Baylon
St Patrick’s School
St Peter’s School
St Stephen’s School
St Thomas More Catholic School
St Vincent de Paul
Stowe Elementary
Superior Cathedral
Superior Hiking Trail
Trinity Lutheran/
Our Lady of the Prairie
Triton High School
Two Harbors 6th Grade
UM - Twin Cities Forestry
UMD Cultural Diversity
UMD Preservice Teachers
Valley Middle School
Valley View Middle School
VandenBerge Middle School
Warroad Middle School
Watershed High School
Watertown-Mayer Middle School
Wayzata Central Middle School
Wayzata East Middle School
West Central Area Schools
West Fargo STEM
Westwood Elementary
William Kelley Elementary
Willow Lane Elementary
Willow River Elementary
Winterquist Elementary
The 2016 Wolf Ridge calendar features the photography of Paul Sundberg. For 28 years, Paul worked as the manager of Gooseberry Falls State Park before retiring. From his home in the Grand Marais, MN area, Paul continues to pursue his passion for photographing the North Shore, Lake Superior, and the Boundary Waters Canoe Area Wilderness. He has been taking photos since the early 1970’s. You can see more of Paul’s work on his website, PaulSundbergPhotography.com. Calendars will be available in late spring for $14.00 for donor members and $18.95 for non-donor members, including shipping. They are also available at special prices, in lots of 25 for school fundraising and retail resale. Proceeds of all calendar sales directly support children attending Wolf Ridge school programs. Call Wolf Ridge at (218) 353-7414 for more information and to order.◆
Learning and magic have much in common. The “aha” moment of understanding can be equally as surprising and enjoyable as watching a magician pull a rabbit out of a hat. Look again! Did that rabbit just turn into a duck?!

The magic of illusions is a result of the biological fact that we can only perceive one thing at a time. Certainly we can toggle back and forth between perceptions, but only one image at a time can be truly observed and processed. Cognitive scientists refer to this as WYSIATI – “what you see is all there is”.

The visual reality of illusion is a great metaphor for all our thought. We can only see one thing at a time (it’s black or white). It’s at the root of debate, disagreement, and prejudice. The chasm between a gray world and a black and white world can only be bridged with humility, patience, and effort as we struggle to see more than one perspective. Some call this wisdom; others call it knowledge. It might be magic.

Magicians master the arts of misdirection and misperception. They use what they know about us to their advantage as they mysteriously manipulate objects and our minds in order to surprise us. The same is true of teachers who hopefully master the arts of direction and perception. Learning is magic in reverse. Teaching is about revealing the trick behind the magic.

Magicians know that while their audience is focused on one thing, nothing else can be truly perceived. I watched this unfold as a magician demonstrated a disappearance illusion with an audience member. The two sat face to face. Though the magician was simply tossing objects over the volunteer’s head, she could not see the flying objects and so they were magically “disappearing” from his hands. From afar it was comical. Up close it was a well-managed illusion.

Magicians use all sorts of techniques to focus our attention “away from” the critical action. They use bright flashes, explosions, and humor to distract the audience from the fact that the elephant simply walked across the stage and did not magically appear. They occasionally make small mistakes to play to our emotions as we in the audience empathize with their struggle, redirect our attention to their facial gestures of concern, and share in the magician’s amazement as the trick “surprisingly works”! The magicians were in total control all along.

Learning is simply seeing past the magic. It’s all about avoiding misdirection and misperception. Teachers have a thing or two to learn from magicians.

Before we can go any further, let’s recall the Spiral Learning Model (in The Almanac, October 2014). The model represents the four phases learners go through in any learning experience: Imagination, Perception, Reflection, and Connection. It isn’t necessarily a model of how to teach; it’s a model of how people learn the four distinct phases. In the first Imagination Phase we assess our current situation and set a plan of action. During the Perception Phase we engage in sensory perception of personal experience. In the Reflection Phase we process our perceptions through the filters of emotion. After acquiring an emotional tag, our perceptions are processed and connected to our developing story in the Connection Phase. True to the spiral process, we return to the Imagination Phase in a slightly different spot to begin again.

Wolf Ridge naturalists develop some of their educational plans and just-in-time decisions using theoretical tools such as the Spiral Learning Model. Teachers help learners gain the most from the Perception Phase by utilizing techniques influenced by magic. Master teachers focus the learners’ attention on the main point and avoid distractions. Master teachers help learners develop behaviors that increase awareness so they can pay attention. Finally, master teachers share and model appropriate and meaningful emotional responses from experience leading into the Reflection Phase.

Master teachers are much like magicians in reverse. While magicians aim to misdirect and confuse the audience, these teachers aim to direct and clarify the topic for their learners.

Learning is most definitely a magical process. And yet, we need to remem-
Joebber that magic is not the private realm of a privileged few. Magic is defined as "the power of apparently influencing the course of events by using mysterious or supernatural forces". We all influence the course of events every day. It is only "magic" to those who don’t understand or don’t see it. As Sherlock Holmes once said to Watson, "I see no more than you, but I have trained myself to notice what I see."

Learning demands that learners pay attention to the sensory input they receive from experience. No matter how loud it’s said or how often, telling learners to pay attention is not enough. Teachers can help their learners achieve by 1) helping them to focus on the goal at hand, 2) identifying exactly where and when to pay attention, and 3) sharing in the joy of learning together.

Learning may appear to come easily to some, but it requires focused effort. When learners are more attuned to their perceptions they succeed more regularly. That’s simply a part of the magical nature of learning.★

JOHN BUSHEY: Lead Teacher - Magician

by Joe Walewski, Wolf Ridge Naturalist

John Bushey is one of the many lead teachers who create magic by organizing and managing students and chaperones for a trip to Wolf Ridge. Outside of his work at Piedmont Elementary in Duluth, John is also an amazing magician. Taken directly from his website: "His stage show is a recreation of a show Houdini might have done in the early part of the 20th century. With a great deal of audience participation, the show is filled with a comedic style of vaudeville that will both amaze and entertain." That is oh-so-true!

John provides a private magic show for his school during their last evening at Wolf Ridge. Solid rings mysteriously intersect and then come apart, scarves change colors without explanation, sliced ropes surprisingly mend themselves before our very eyes, and John always manages to escape from handcuffs in a matter of seconds.

After the most recent show at Wolf Ridge, I engaged John in conversation about the intersection of magic and learning. His ideas darted here and there like so many cards, coins, and eggs in his hands. At the core, magic is nothing more than misperception and manipulation of perspective. Magicians know more about what we notice than we do and they use that to their advantage. John eventually invited me to join him and some friends for an evening of sharing – magician with magician. I accepted.

The evening with John Bushey and a half dozen other magicians made my head spin. The words "seemingly impossible" preceded cards, coins, and other things appearing where they weren’t moments before. I have never seen so many dollar bills turn into hundreds or twenties in such short time. Evidence of sleight of hand was everywhere. Yet, just as much as they deceived, they also shared the "magic" in a way that uncovered the mystery for me. I still had to check for my wallet a couple times.

I learned some key points that evening. Laughter distracts the perceiver in a way that alters memory formation. Sometimes the banter means nothing; other times it is there to force predictable ideas into my head. Focus points and angles are everything in magic (all used to deceive in this case). Sleight of hand works only if it looks natural. "Natural" takes hours of practice. The best magicians develop a phenomenal awareness of self, topic, and audience. John believes that the best teachers do the same. It’s not "magic" – as we may think – that makes a teacher great. It’s simply working harder and harder to develop awareness.

Spending the evening with John and the other magicians was pure joy. I hadn’t laughed so hard in a long time. I hope to do them proud by remembering the lessons they shared and by working hard on the few tricks they taught me. Perhaps the most valuable lesson I learned they didn’t talk about, but only demonstrated. It’s fine to follow your passion, but it’s even more important to live your passion.★
Stream Testing continued from page 1

the end of class, groups share their findings. Sometimes results are way out of range and students learn the importance of careful measuring and double-checking calculations in scientific work. The students plug their findings into charts and create indexes of biotic integrity (IBI)*. With Minnesota being the land of ten thousand lakes (and streams), water is a very important part of our economy. Plants and animals, including humans need clean water to live. We use it for recreation and we eat its fish and wild rice. It’s important that we protect our waterways’ health. That starts with monitoring. Wolf Ridge joined the Citizen Stream Monitoring Program run by the MPCA in 2014. We do their stream monitoring activities with our Stream Study classes. Check with your local governing agencies to get involved as a volunteer citizen scientist to help monitor the health of a stream or lake near you.

In June of 2003, the DNR surveyed Sawmill Creek as part of the first ever-state wide freshwater mussel survey.

Wolf Ridge is happy that our stream has been so intensely studied by so many groups. We are even more pleased that test results from all the groups continue to show Sawmill Creek is a healthy cold-water stream.

*Index of biotic integrity (IBI) - uses multiple measurements that when combined depict the condition of a community.

MPCA Test Results of Sawmill Creek

<table>
<thead>
<tr>
<th>MPCA Visit Date</th>
<th>M-IBI</th>
<th>Threshold</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/15/2013</td>
<td>30.4</td>
<td>32</td>
<td>46</td>
</tr>
<tr>
<td>8/13/2014</td>
<td>40.6</td>
<td>32</td>
<td>53</td>
</tr>
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</table>

“The 2013 macroinvertebrate (M) IBI score is below the general use threshold, however there are several sensitive taxa present within the sample. The 2014 M-IBI score is well above the general use threshold, both samples indicate good water quality. The 2014 sample provides indication that this culvert replacement should have long-term positive impacts on instream aquatic communities.”

- Benjamin Lundeen, MPCA

<table>
<thead>
<tr>
<th>Species</th>
<th>Length Range (mm)</th>
<th>Weight (g)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creek Chub</td>
<td>30-132</td>
<td>232</td>
<td>38</td>
</tr>
<tr>
<td>Blacknose Dace</td>
<td>51-98</td>
<td>159</td>
<td>36</td>
</tr>
<tr>
<td>Longnose Dace</td>
<td>57-82</td>
<td>63</td>
<td>21</td>
</tr>
<tr>
<td>Central Mudminnow</td>
<td>53-85</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>Northern Redbelly Dace</td>
<td>45-61</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Brook Trout</td>
<td>77-222</td>
<td>174</td>
<td>7</td>
</tr>
<tr>
<td>Johnny Darter</td>
<td>39-75</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>Brook Stickleback</td>
<td>51-53</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rainbow Trout</td>
<td>183-195</td>
<td>126</td>
<td>2</td>
</tr>
<tr>
<td>Common Shiner</td>
<td>207-207</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

“A fish (F) IBI score of 55 was calculated for this survey, which is above the General Use threshold of 37, and indicates a healthy coldwater fish assemblage.”

- John Sandberg, MPCA

Over the many years that Wolf Ridge has conducted the popular class of Stream Study, wet chemistry and non-electronic tools were used in measuring and recording the physical, chemical and biological properties of Sawmill Creek.

This changed in the fall of 2014, when students started using computers and electronic measuring devices to measure and record water temperature, stream flow, dissolved oxygen, pH, and stream biological diversity. This switch occurred so that data could be collected and stored easier. It means better stream data for students and Wolf Ridge to use in analyzing the health of Sawmill Creek. The increased speed of collecting data and the capacity to immediately make a digital record provides students the ability to analyze data during the three hour Stream Study class. The following are new:

• A hand held LabQuest computer about the size of a GPS unit connects to electronic probes that record stream flow, water temperature, dissolved oxygen and pH.

• Stream Tracker, a computer program designed by Rod Kuehn, Shannon Walz, and Peter Harris with a digital data sheet for numerical data and photographic documentation.

• Waterproof iPad Air tablets that run Stream Tracker. The iPads also work as a microscope and camera.

• A secchi tube for measuring turbidity.
I am looking forward to spring. I relish the sun on my face and the promise of green. What I don’t relish, and honestly, conveniently forget each year, is the return of the black flies, and their swarming itchy ambushes.

“What good is the black fly?” is a question Wolf Ridge naturalists will start hearing soon. I would answer it with the blueberry story. It goes something like this: Without black flies, our sweet plump, iconic symbol of the northwoods would not be pollinated. New research, conducted by Canadian scientists, suggests that there is no evidence that black flies increase the amount of fruit produced. It is now believed that the black flies do something called “nectar thieving.” The black flies enter the flower and consume the nectar without rubbing the flower stamen. No pollen is transferred.

Oh, dear. Pests AND thieves. Now, how do I answer that question?

Some black flies feed on nectar, while others have no need to feed, if they received an adequate diet as a larva. The female black flies we find in Sawmill Creek, in the genus Simulium, need a blood meal, a protein Slurpee, we could say, in order to lay eggs. They have four slashing teeth that cut the skin, causing the blood to well up. Not all black flies need human blood and none depend entirely on us. One species only feeds on the blood of loons.

Once the blood meal has been consumed, the female lays her eggs. She finds a suitable stream, and lays her eggs on vegetation in or near the water top. The eggs hatch out the next spring, when the water temperature reaches 40-50°F.

The worm shaped larva attaches to a secure structure with a silk pad. Firmly anchored, the larva is a suspension feeder, cleaning the water. If it finds the pickings slim, the larva can spin a long thread and head out into the current for better feeding. Fan like structures on their head sieve bacteria, algae and organic matter.

Turning vegetation into meat, the larva feeds fish, amphibians, dragonfly nymphs and other aquatic invertebrates. As most blackflies have a low tolerance for pollution, a healthy supply of larva indicates a healthy stream.

In early spring, the mature larva weaves a cocoon in which it pupates into a winged adult. Adult black flies provide food for birds, bats and other insects. The highest density of dragonflies at Wolf Ridge occur when the black flies are in the air, end of May and early June.

Fish, aquatic invertebrates, bats and birds all know the value of the black fly. Next time I am asked, “What good is the blackfly?” I will have my answer ready.

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The WOLF RIDGE Landscape DISSECTED— Sawmill Creek

Word on the street of Finland, MN, is that Sawmill Creek was previously named Poplar Creek.

Logging in the area, dominated by the Alger-Smith Company, altered the landscape. Soon, land around Poplar Creek was owned by the company or its railroad, the D.& N.M.R.R.

Lumber left on trains. The creek’s name changed.

I presume Poplar Creek was renamed soon after early settler Victor Sampson opened a sawmill on its banks.

The timber boom was short-lived. The railroad reached Finland in 1909. In 1923 the rail trestle was dismantled. Victor Sampson processed the trestle into lumber.

Today, land once owned by the Alger-Smith Company and a creek named for industry are a classroom to educate the next generation. And subtly remind them of the past.
**Programs**

**Summer Sampler:** (2nd-5th gr) June 24-27, Aug 19-22: $352


**Adventurers:** (8th-9th gr) July 19-25, July 26-Aug 1, Aug 2-8, Aug 9-15: $567

**Day Camp:** (1st-7th gr) June 22-26: $177

**Voyageurs 2-wk Ultimate Survival:** (6th-7th gr) Aug 9-22: $1200

**Angling to Archery:** (6th-7th gr) Aug 16-22: $602

**Camp Fish:** (7th-8th gr) July 12-18: $602

**Camp Rock Climbing:** (8th-9th gr) Aug 9-15: $602

**Ecology Credit Camp:** (10th-12th gr) July 5-11, Aug 16-22: $572

**Sailing Lake Superior:** (7th-8th gr) July 12-18: $800

**Counselor-in-Training:** (10th-12th gr) Aug 2-15: $1200

**Adventurers 2-wk BWCAW Canoe:** (8th-9th gr) July 12-25: $1278

**Adventurers 2-wk Isle Royale Backpack:** (8th-9th gr) July 26-Aug 8: $1278

**Apostle Islands Kayak:** (9th-10th gr) July 26-Aug 1: $668

**Isle Royale Kayak Expedition:** (10th-12th gr) June 28-July 11: $1400

**Jr. Naturalists 2-wk Quetico Canoe:** (10th-12th gr) July 19-Aug 1: $1343

**Jr. Naturalists 2-wk Apostle Islands Kayak:** (10th-12th gr) Aug 2-15: $1343

**NEW**

**Road Scholar Intergenerational:** (8-12 yrs) July 5-10, July 19-24, August 9-14

**Fees:** Starting at $579

Build lasting memories with your grandchildren ages 8-12. Become a voyageur, visit our Ojibwe camp, learn ecology, visit Lake Superior, paddle a canoe, experience a ropes course, climb our rock wall, and much more. Call Road Scholar at 1-800-454-5768 to register.

**Open House:**
June 13, 2015 9:00-4:30
Free and open to all ages

Join us for a day of outdoor fun at our annual open house. Donor members, locals, and curious travelers are all welcome to enjoy a day of rock climbing, adventure ropes, hiking, canoeing and meet our program animals. Come for all or part of the day.

**Family & Group Wilderness Trips**
Call for dates, ages, and prices.

Learning and laughter are the hallmarks of our custom group and family wilderness trips whether you are canoeing or kayaking. Wolf Ridge’s naturalist guide will teach you all the skills needed to meet the challenges of your trip.

**Family Camp**
July 26-Aug 1, Aug 2-8
**Fees:** $390 5yrs-adult, $195 2-4 yrs, 1 & under free

Imagine a family vacation with no hassles. With over 50 different activities to choose from during your stay, the only question you’ll face is, “Which adventure today?”

**Bird Banding:**
June 3, 17, 24, July 8, 15, 22, & Aug 5.
Free and open to all ages

Since 1993, Wolf Ridge has been a site for a long-term international study to learn about the lives and health of migratory songbird populations. Participants can observe and sometimes participate in the banding process. Meet at the Forest Ecology Building on any one of seven summer mornings.

**Camp Shuttle:**
Ride from the Twin Cities or Duluth to camp and back.
Twin Cities, one way $100, round trip $175. Duluth, one way $50, round trip $100. Reservations required.

**NEW**

Our youth camp programs offer unparalleled opportunities to explore clear lakes and streams, develop life-long connections to the natural world, make friends, create memories, and grow in self-confidence. With a wonderfully diverse campus and variety of activities, campers can return year after year for new experiences.
**Adv. & Beg. Bird Banding Courses**

**Fee:** Adv $834, Beg $2020

Wolf Ridge hosts the Institute for Bird Population’s workshops for seasoned and new banders. The beginner class provides both amateur birders and professional biologists with the skills necessary to participate in monitoring and research programs. The advanced class is designed for experienced banders who wish to improve their sexing and ageing skills.

**Fall Raptor Banding Weekend**

**Fee:** $355

Wolf Ridge sits high above Lake Superior, a natural flyway for the fall raptor migration. Learn field techniques in migration monitoring including banding owls, identifying and counting diurnal raptors.

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### WOLF RIDGE CALENDARS

- $14 donor members/$18.95 non-donor members per calendar (includes postage).

### PAYMENT

Registrations must be accompanied by a $150 non-refundable deposit, family programs $150/person. Program fee minus deposit due two weeks prior to program start.

**Payment Enclosed:**
- Donor Member $_______
- Program Deposit $_______
- Program Fee $_______
- Calendar $_______
- Total Enclosed $_______

- MasterCard
- Discover
- Visa
- Check (payable to Wolf Ridge ELC)

Card #_______-_______-_______-_______
Exp. Date.____ /____

Name on card - please print

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**BECOME A DONOR MEMBER**

- $35  $50  $120  $250  $1000  $_______

Your gift supports the Wolf Ridge mission.
Wolf Ridge is an accredited residential environmental school for persons of all ages. We offer immersion programs which involve direct observation and participation in outdoor experiences. Wolf Ridge programs focus on environmental sciences, human culture and history, personal growth, team building, and outdoor recreation.

Our mission is to develop a citizenry that has the knowledge, skills, motivation, and commitment to act together for a quality environment.

We meet our mission by:
- Fostering awareness, curiosity, and sensitivity to the natural world.
- Providing lifelong learning experiences in nature.
- Developing social understanding, respect, and cooperation.
- Modeling values, behaviors, and technologies which lead to a sustainable lifestyle.
- Promoting the concepts of conservation and stewardship.

Wolf Ridge thanks these $1,000+ donors:
- Christine Morse
- Harpreet Kaur
- Lloyd K. Johnson Foundation
- Margaret A. Cargill Foundation
- Sarah Stoltze

Upcoming Programs 10 & 11