Identifying and Removing Barriers to Increase Use of the Superior School Forest

By

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Implementing an outdoor education program within a school district involves more than logistics; it requires a belief that teachers and students should have the opportunity to experience teaching and learning in the outdoors, and that this setting offers positive benefits to those involved. I would like to thank Mr. Jay Mitchell, Superior's former Superintendent of Schools for initially listening and then offering me the chance to present my ideas to the Superior School Board to implement an outdoor education program at the Superior School Forest. Secondly, it is without doubt that the outdoor education program in Superior would not exist today without the support of Ms. Janna Stevens, Superior's Superintendent of Schools, and the support of members of the Superior Board of Education. Thank you all for supporting the belief that all children should learn about and spend time in the outdoors.

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Abstract

Research has shown there are many academic benefits for students when school districts integrate an environment-based curriculum using outdoor classrooms with regular classroom instruction (Pyle, 2002). These benefits are especially noticeable in at-risk students (Malone & Tranter, 2003). The purpose of this study was to investigate whether teachers in the Superior School District would take advantage of outdoor education opportunities on the District's school forest if perceived barriers to that use were reduced or eliminated. The hypothesis presented in this study was that reducing or eliminating perceived barriers would lead to increased use of the school forest property.

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Chapter One: Introduction

Introduction

In this recent age of accountability in education, school districts are searching for educational strategies that improve student academic performance. As a result, teachers are required to attend professional development classes and in-service days as district administrators strive to educate their teaching staff on effective strategies. Yet, there is one teaching strategy with an overwhelming amount of research supporting its positive academic, emotional, social and health benefits to children that is rarely included in professional development activities or publicized in the national debate, namely, outdoor education (Fraser, Heimlich, & Yocco, 2010)

Research studies consistently show that students being educated in school districts that use the environment as an integrating context for learning score higher on standardized tests (Lieberman & Hoody, 1998). There does not seem to be one simple reason why implementing outdoor education improves student learning, but research suggests several common themes. These include increased motivation by students to learn, increased job satisfaction by teachers, immersion of students in an environment that fosters critical thinking skills, involvement of students in lessons that seamlessly integrate subject areas, and development and stimulation of all areas of intellect in children as described by Dr. Howard Gardener's theory of multiple intelligence (Coyle, 2005).

There are currently 214 public schools, 9 private schools, and 7 institutes of higher learning in the state of Wisconsin that own land registered as a school forest (Marshall, 2011). The manner in which these districts utilize their school forests to enhance student learning is highly variable. The report suggests that many districts do not have a formal outdoor education plan and individual teachers use their outdoor learning environments as they desire. Other districts reportedly have developed formal school forest education plans registered with the Wisconsin Department of Natural Resources whereby they have developed kindergarten through grade 12 learning objectives. A common theme between the latter districts is they apparently value the importance of using the environment for student learning in the sense

they went through the effort to register their outdoor learning areas as registered school forests with the state of Wisconsin.

A recent study by Fraser et al. (2010) assessed adult attitudes and beliefs surrounding encouragement of children's nature experiences and found, in part, that "American adults generally believe that childhood experiences in nature are important for all children, and very strongly support the claim that they personally intend to support children in having these experiences" (p. 3). Despite these claims, many Americans do not act on these beliefs by providing nature experiences for their children.

Anecdotally, a large number of teachers in the Superior School District support outdoor education as a method to teach required classroom content. However, use of outdoor educational methods in the District has apparently been minimal. This raises several questions. Do teachers in the District value outdoor experiences for children? If yes, why are outdoor methods not more widely used? Are there perceived or real barriers to using the outdoors as a resource for learning? Will there be wider implementation of outdoor education if perceived barriers to outdoor education within the District are reduced or eliminated? This research attempts to identify barriers within the School District of Superior that reduce teachers' willingness or ability to use the school forest property and outdoor classroom as a context for learning. If identification and elimination of as many of these barriers is possible, this study asks whether use of the school forest facilities and outdoor classroom increases.

Problem Statement

The school forest of the School District of Superior consists of 720 acres and three classroom buildings situated 20 miles south of Superior. In 1987, this facility was developed as an off-site school program aimed to improve motivation for at-risk high school students in the school district. Many of these at-risk students were able to achieve a higher level of academic success in this setting compared to the regular classroom setting. From 1987-2002, regular education teachers outside of the at-risk program in the school district also would bring their students to the school forest where they would participate in outdoor learning activities led by the at-risk students. There is not a formal record of the number of teachers that

visited the site annually during this time. Many of the teachers that visited the site during this time relied on the expertise of the at-risk high school students in developing and leading the outdoor based lessons.

In 2002, the Superior School District eliminated the use of the school forest as an off-site school for at-risk students due to district budget cuts. It was after this time that the use of the facilities by regular education staff also dropped dramatically, with the site showing practically no use as an educational facility. Exceptions include use once a year by the Indian Education program for a summer immersion camp and use every February by local Boy Scout troops who held their annual Klondike Derby on site.

The question posed in this research is to ascertain why teachers are not using the Superior School District's school forest facilities as an outdoor classroom to enhance student learning. It asks, what impediments exist that may be preventing teachers from using these facilities? The research also asks whether removing these obstacles, real or perceived, result in increased teacher and student use of the Superior School District school forest property and thus increase the use of our environment as an educational context?

Rationale for Study

The City of Superior is surrounded by an abundance of undisturbed natural areas as well as Lake Superior, yet a high percentage of students seldom leave the city limits to explore these areas (Danz, 2012). The Superior School Forest is a unique educational site that provides opportunities to enhance and expand students' and teachers' learning in a natural environment. Exposure to natural environments improves children's cognitive development, according to Pyle (2002). Other studies have shown that nature buffers the impact of life stress on children and helps them deal with adversity. The greater amount of nature exposure, the greater the benefits (Wells & Evans, 2003). In Superior and the surrounding area, this need is great because a large percentage of the population is categorized as low income, and many students in the Superior School District exhibit high-risk social and academic behaviors (Wisconsin Department of Public Instruction [WDPI], 2013). Malone and Tranter (2003) hypothesize that exposure to natural environments reduces antisocial behavior such as violence, bullying, vandalism and littering, as

well as reducing absenteeism. An additional benefit which may be found in the research of Pyle (2002) is that the Superior School Forest potentially offers students and teachers the opportunity to become environmentally literate citizens.

Hypothesis

The research hypothesis is that by identifying real or perceived barriers that prevent or limit the use of the school forest property by teachers within the Superior School District, a program may be developed that may help reduce or eliminate the barriers, possibly increasing the number of teachers and students who use the school forest property as a classroom resource for student learning.

Assumptions

For the purpose of this study, it is assumed that members of this study sample responded honestly to the survey questions. In each of the two administered surveys, the anonymity of the respondents was protected. It is also assumed that the gender and age of the respondents do not influence the results of this study. It is also assumed that using outdoor education methods does not have a negative effect on student learning and academic performance. It is assumed that in general students and teachers in this study are not adverse to the use of the school forest as a learning tool.

Limitations

The fact that this study was conducted using a convenience sample from one school district is a limitation to this study. Due to the specificity of the geographic and demographics of this region, the results of this study may not generalize to other school districts. The use of nontraditional teaching practices, such as taking students to an outdoor setting, is a practice that not all educators feel comfortable with. The results of this survey may be applicable only to those educators in Superior, Wisconsin who have a desire to use the outdoor setting as part of their teaching practice. This may bias the result of the study.

The time span of this research is limited to five years. Although this time allows for the analysis of trends that may emerge from the study, the results cannot be generalized. The instrument used to gather

data for this study was not specifically designed for academic research. It is a tool developed by the Wisconsin School Forest Association to measure teachers' attitudes and perceived barriers related to outdoor education. While this survey provides validity in measuring perceived barriers to outdoor education, its validity was not tested for the uses in this study.

Delimitations

There are several delimitations that exist in this study. This study does not account for differences in gender, age or years of teaching experience within the study sample. The study does not seek to determine the effectiveness of outdoor learning experiences as measured by students' academic performance or motivation to learn, nor does it seek to measure effects on teacher performance or motivation. This study does not attempt to monitor or account for personnel changes within the Superior school district. This study also does not attempt to address ways to increase school forest use among educators who demonstrate no desire to utilize the school forest as a learning and teaching resource.

Obstacles that prevent the use of outdoor education are multi-faceted. Removing or reducing these barriers involves participation and involvement from many influences outside of the immediate school being studied. Therefore, mechanisms such as changes in the political climate in this state (which may have affect funding of specific educational programs such as outdoor education), changes in administrative personnel with different educational priorities, and changes in educational mandates at the state and district level could impact any long term changes seen as a result of this study and are beyond the control of this study.

Definition of Terms

Unless otherwise indicated, the following terms carry the specific definition found below.

Barriers – For the purpose of this study, barriers are defined as those variables, actual or perceived, that teachers believe limit or prevent their access to the Superior School District's school forest property and facilities.

Community Forest - Any tract of 10 acres or more, acquired and managed primarily for the growing of forest products (e.g., pulpwood, lumber, firewood, and seedlings) for community use or commercial sale, with secondary interest in erosion control, water conservation, and improved conditions for wildlife, and owned by a county, town, city, village, school district, and certain quasi-public agencies whose articles of incorporation permit the owning of land, and whose directors or trustees formally designate by resolution or otherwise the desired use of the land for forestry purposes. (Authority: Section 66.27, Wisconsin Statutes.1947. Repealed by 1949 C.474, Wisconsin Statutes 1969, section 28.20 Community Forests).

Outdoor Classroom – For the purposes of this study, outdoor classroom is a term that refers to the outdoor environment and classrooms located on the school forest property owned by the School District of Superior.

Outdoor Education – Education that takes place in the outdoors. Using the outdoors for a laboratory for learning. (Hammerman, Hammerman & Hammerman, 1994, p. 6).

School Forest - A specialized community forest that is owned by a school district (LEAF, WFREA, & WEEB, 2011, p.8).

Summary of Study

Through the use of a staff survey, this study seeks to identify real and perceived barriers that limit the use of school forest facilities as a resource for student learning. Upon identification of these barriers, attempts may be made to eliminate as many of the perceived barriers as possible in order to make the school forest available as a learning resource for staff and students in the Superior School District. Using attendance data to monitor if removing or decreasing the identified barriers affects site use, the study will examine if there is an increase in the use of the school forest facilities. This study takes place in Superior, Wisconsin and at its school forest property located approximately 20 miles south of the city of Superior in Summit, Wisconsin. Findings from this study may assist other school districts who wish to develop an outdoor education site and outdoor education program.

Chapter 2: Literature Review

In 2005, Louv published *"Last Child in the Woods"* which ignited a national debate about the physical and social effects of children's lack of exposure to nature and increased exposure to electronic forms of entertainment. The damaging effects of the dissociation from nature described in his book include diminished use of the senses, increasing childhood obesity rates, attention difficulties, and a variety of emotional difficulties. As a result of this debate, a plethora of research associated with this disassociation from nature has been published, including research studying the correlation between academic achievement and environment based learning.

Four areas of research will be addressed in this literature review. The first section of this literature reviews various school forest programs in the state of Wisconsin where barriers were removed, including summary data collected related to school forest use and costs associated with implementing that use.

In the second section of the literature review, academic benefits associated with outdoor learning environments will be reviewed, especially as these relate to the at-risk student population. This is relevant because demographic data on the student population of the Superior School District identifies this district as having a high percentage of at-risk students. (WDPI, 2013). WDPI identifies at-risk students as those pupils in grades 5 to 12 who are at risk of not graduating from high school because they are dropouts, or exhibit two or more of the following characteristics; are one or more years behind their age group in the number of credits attained, are two or more years behind their age group in basic skill levels, are habitual truants, are parents, adjudicated delinquents, or are 8th grade pupils whose score in each subject area was below the basic level, 8th grade pupils who failed the standardized state examination, and 8th grade pupils who failed to be promoted to the 9th grade. (WDPI, 2013). Examining ways to increase use of the environment into regular classroom curricula may increase academic benefit not only for the at-risk student population, but for all students in the Superior School District.

The third section of this literature review will focus on the barriers classroom educators and educational institutions face when attempting to implement outdoor education programs. Understanding

common barriers faced by educational institutions will be important in understanding if potential barriers identified by teachers in the Superior School District are unique to the school district or share commonalities with other studies from other institutions.

Finally, the fourth section of the literature review will analyze studies related to the impacts of removing identified barriers to outdoor education programs. This study seeks to find if removing identified barriers will have an impact in the number of teachers who use the school forest site as a resource for teaching.

School Forest Programs in the State of Wisconsin

The roots of the national movement of school districts to own land designated as "school forests" or "outdoor learning centers" was initiated in the state of Wisconsin in the early 1920's. In an on-line document reviewing the history of school forest programs in the state of Wisconsin, mention is made of the work of Russell, a professor at the University of Wisconsin-Madison college of Agriculture. "While visiting Australia, Russell watched school children planting trees on public tracts of land as an educational project" (Madison Metropolitan School District, 2013). Being that the early vision of the school forest program was to introduce young people to the idea of environmental stewardship by replanting trees on school forest property, many early school forest programs looked the same. However, in 1935 state legislation was passed that mandated that conservation education be taught in all high schools, vocational schools, and universities or colleges. A second factor affecting the school forest program was the fact that in 1949 schools became eligible to receive free planting stock from state nurseries. During this time many school districts were acquiring land at greatly reduced costs due to donations or by acquiring tax-delinquent land (Madison Metropolitan School District, 2013). The educational approach that school districts took to meet the legislation of 1935 started to diversify as school districts broadened their view of conservation education by utilizing newly acquired school forest lands.

In 1983 it became a requirement that every school district "develop and implement a written, sequential curriculum plan incorporating instruction in environmental education into all subject area curriculum plans." (WDPI, 2013). There were no specific directives as to what this curriculum plan would look like; school districts from around the state of Wisconsin interpreted and implemented assorted outdoor education programs, often utilizing school forest property if available, to meet this requirement. A review of individual school forest programs and facilities in the state of Wisconsin provided by the University of Wisconsin-Stevens Point (2013a) show a multitude of program designs ranging from little or no curricular structure, whereby teaching staff uses the forest on an individual basis, to highly structured k-12 curriculum plans integrated across all curricular areas and aligned with state standards.

As the implementation of environmental education curricula increased within school districts, the cost of maintaining outdoor education facilities also increased. According to the *2011-2012 Annual School Forest Survey Summarized Results* (University of Wisconsin-Stevens Point, 2013b) the cost of funding outdoor education programs varied greatly by school districts depending on such factors as whether they employ a school forest coordinator and/or an on- site teacher, transportation costs to the outdoor education site, facility maintenance and miscellaneous program costs and materials. In this report they found that school districts who responded to a survey that was used to prepare this report reported average annual operating budgets of $21,746.00. These same districts reported an average need of $46,902.00 to optimally operate their outdoor education programs.

According to the Madison Metropolitan School District (2013), due to recent budget cuts to public school districts in the state of Wisconsin, budgets of many education programs within school districts have been reduced or eliminated. Despite the fact that many school districts acquired the property that is used for outdoor education programs at low–cost to the district, school districts have had to procure nontraditional methods to continue funding outdoor education programs. Furthermore, school districts who responded to the *2011-2012 School Forest Survey*, (University of Wisconsin-Stevens Point, 2013b) reported timber harvests, community donations, grants, fundraisers, facility rental fees, use of school forest ropes courses, and hunter fees as methods of generating income.

A common theme expressed in school forest mission statements, discussed in the University of Wisconsin-Stevens Point (2013a) report, is to increase environment literacy and to increase appreciation for the environment. How can the success of school forest programs therefore be measured? In a paper titled *"Outdoor Education in the Schools: What Can it Achieve?"*, Neill (1997) argued that very little research evaluating student outcomes of outdoor education programs exists. Wisconsin school districts who responded to the *2011-2012 School Forest Survey* identified several indicators of successful school programs. (LEAF, WFREA, &WEEB, 2011). These indicators include increased use of the school forest, increased knowledge by students including knowledge of natural resource management issues, feeling of enjoyment by students when visiting and learning at the school forest, an increased feeling of value placed by teachers on the school forest, and an increased feeling of connection to their community by the students. What is not evident from this data is how and if school districts are measuring identified indicators.

Academic Benefits Associated With Integrated Outdoor Learning

As Lieberman and Hoody (1998) tell it, a group of education agencies from twelve different states became interested in trying to improve student learning by integrating the environment into school curricula. They designed a study to identify schools that were successfully implementing environment-based education programs, to describe the effectiveness of these programs, and to analyze the similarities and differences between these programs. As part of the study, fourteen of the study schools conducted comparative analysis of data from both students who were exposed to environment – based learning and traditionally taught students. The schools collected data including standardized test scores, student grade point averages, disciplinary actions, student attendance, and student attitude measures.

In *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning,* Lieberman and Hoody (1998) summarized the results of this study. They found that when 39 areas of academic achievement were compared within these 14 schools, 92 percent of the comparisons showed students in the environment-based learning classes outperformed their peers in all academic areas

(language arts, math, science and social studies) compared to students in traditionally taught classrooms. In addition, five schools compared and analyzed data related to student behavior and attendance. All of the comparisons showed that students in the environment-based learning programs recorded fewer discipline problems and exhibited improved attendance than their peers in traditionally taught classrooms.

Lieberman and Hoody (1998) also found that students exposed to environment – based learning demonstrated increased development in problem-solving and reasoning skills. Educators were also asked to respond to a Learning Survey as part of this study. Ninety-six percent of respondents to the survey reported an increase in students' higher-level, critical-thinking skills than those of their peers in traditionally taught classrooms. Higher-level, critical-thinking skills were demonstrated by an ability to think creatively and demonstrating a greater proficiency in solving problems and thinking strategically. The authors pointed to the fact that the outdoor environment serves as a rich context in which students usually engage all of their senses to explore their surroundings, gather and analyze information, and develop questions about the interrelationships they observe.

Lieberman and Hoody (1998) also reported that students exposed to environment-based learning demonstrated positive effects in interpersonal skills. Ninety-eight percent of educators who responded to the Learning Survey as part of this study reported that students demonstrated better abilities to work in group settings, ninety-four of survey respondents reported stronger communication skills within students, and ninety-three of survey respondents reported students working together with greater civility toward others. A common characteristic of outdoor-based learning projects that the authors discussed was that they are problem and project-based activities in which students and teachers must work together. The authors described an atmosphere of collaboration among teachers, students, and community members and conjectured that this atmosphere of collaboration may help students avoid feelings of isolation they may experience in traditional educational settings.

Coyle (2005) described the social and academic benefits of outdoor education and outdoor school time in an executive summary he prepared for the National Wildlife Federation. In an online survey of 1,878 educators, he found that 75 percent of the respondents strongly agreed that students who spend

regular time outdoors tend to be more creative and better able to problem solve in the classroom. Coyle further stated that despite these perceptions by educators, the trend was for students to spend more time indoors during the school day, with less time spent learning outdoors. He hypothesized the trend away from outdoor education may have to do with the shift toward accountability in education by emphasizing student performance on statewide tests.

Coyle (2005) described the benefits of outdoor learning on student behavior drawing from an earlier study of ten South Carolina middle schools that used the outdoors to integrate classroom content. School A, a school where all students were described as academically low performing and many students has serious past behavior issues, absenteeism was decreased by 22 percent and suspensions were decreased by 36 percent. In School B, student discipline referrals were decreased by 50 percent and interviews showed students had an increased interest in learning and an increased respect for their teachers.

Coyle (2005) also specified the benefits of outdoor education in raising academic scores of low-income students. He examined the results of test scores of students from Hawley Environmental Elementary School in Milwaukee, Wisconsin. Hawley Environmental Elementary School instituted an environment-based curriculum and includes students from a diverse ethnical background. 71% of the students at this elementary school came from lower-income families who qualify for free or reduced school lunches. Test scores from Hawley were compared to other low-income schools in Wisconsin as well as to test scores of all Wisconsin schools. On the 1998 Wisconsin Reading Comprehension Test 100% of Hawley students passed compared to 25% of the Milwaukee Public School population. On the 1998 Wisconsin Assessment of Proficiency Level in Reading and Math, 83% of Hawley students scored proficient in reading compared to 38% of low income Wisconsin schools and 69% of all Wisconsin schools. Finally, 48% of Hawley students scored proficient in math compared to 15% of low income Wisconsin schools and 52% of all Wisconsin schools.

In summary, both Lieberman and Hoody (1998) and Coyle (2005) advocated for implementing outdoor education programs that would increase the amount of time students spend learning while at

school. Their research pointed to not only improved academic performance, especially as it related to at-risk students, but to improved social and behavioral performance.

Real and Perceived Barriers to Implementing Outdoor Learning Programs

With research citing the positive educational outcomes demonstrated by schools that integrate outdoor education throughout their curricula, why is there a lack of school districts and teachers embracing this approach when educating students? Research indicates there are many real and perceived barriers that prevent educators and educational institutions from taking students outdoors to learn. Several studies describing these barriers are described in an attempt to compare common barriers cited in research to barriers identified by teachers in Superior, Wisconsin.

Rickinson et al. (2004), as part of a government undertaking in England, reviewed over 150 research articles on outdoor learning published between 1993 and 2003. In their review, they summarized five key barriers to outdoor learning in educational settings (pp 42-45):

(1) *Fear and concern about young people's health and safety.* This barrier included educator's fears and concerns related to liability also.

(2) *Teacher's confidence and expertise in teaching and learning outdoors.* Many teachers felt they were inadequately prepared to effectively teach concepts in an outdoor setting.

(3) *The requirements of school curricula.* With the increased implementation of state requirements on mandated testing, it was difficult to assess outdoor learning. Also, outdoor learning was often integrated into the subject area of science.

(4) *Shortages of time, resources, and support.* Many teachers expressed that planning outdoor lessons took too much time, there was a lack of funding to supplement outdoor lessons, and transportation to site was often complicated and costly.

(5) *Wider changes within the education sector and beyond.* Many teachers had increased class sizes, there seemed to be a movement to 'back to the basics' learning, and curricula timetables seemed to limit time for field work and outdoor learning.

In an attempt to find out why relatively few teachers implement outdoor education teaching strategies, despite the growing body of research that supports its effectiveness, Ernst (2007) described several reasons teachers might not incorporate environment based education into their classrooms. Ernst differentiated between environment based education and other forms of environmental education or outdoor learning. By defining environmental based education as "a form of school-based environmental education in which an instructor used the local environment as a context for integrating subjects and a source of real world learning experiences" (p. 16), Ernst described a broader classroom based approach encompassing environmental education as a pedagogical approach which integrates all subject areas and learning activities within the classroom, rather than a periodic use of the outdoors to teach an individual lesson.

Using a review of environmental education literature and a 69 question survey, Ernst (2007) analyzed factors that were potential influences on implementing environment based education strategies. The review of literature in her study pointed out three areas of concern: a lack of training in environment education as a major barrier to implementing environmental education into the classroom curriculum; the perception that environmental education was limited to the content of science and therefore perceive a lack of relevance to their curriculum; and a lack of funding and administrative support. Ernst (2007) challenged these perceptions in her study and described the following results. Of those teachers who did implement environment based education in their classrooms, the five barriers perceived as the strongest influence in their implementation of environment based education were: (1) emphasis on state testing, (2) lack of funding, (3) lack of planning time, (4) emphasis on state standards, and (5) lack of transportation. Other factors that were perceived as barriers but not ranked as high included: lack of training or professional development, concerns regarding safety, liability and classroom management, lack of administrative support, lack of environmental content knowledge and lack of comfort in the outdoors.

A common barrier identified in both the research by Rickinson et al. (2004) and Ernst (2007) was that many teachers do not feel adequately prepared to teach in an outdoor setting and thus lack confidence in teaching in that setting. To address this problem, Erickson (2012) specifically studied the effects of

outdoor education mentoring with teachers. In her research, Erickson completed a survey of primarily elementary and middle-school teachers before and after completion of the Bioregional Outdoor Education Project (BOEP) in the western US. This professional development and mentoring program for outdoor education included in-service days, participation in week-long summer environmental education courses, and bimonthly meetings with outdoor education mentors. Fifteen teachers were surveyed prior to entry in the program and 12 teachers were surveyed after completion of the program. Whereas both Rickinson et al. (2004) and Ernst (2007) identified the lack of confidence many teachers felt when asked to teach using an outdoor setting, Erickson's research measured the effects of providing specific training in outdoor education methods with educators, with her study showing an increase in the use of outdoor education methods by teachers who participated in outdoor education training with a mentor.

In summary, these studies indicated that teachers often identified similar barriers that inhibit their use of the outdoor setting to teach classroom content. With the exception of Erickson's study, none of the reviewed research analyzed the impacts of removing the identified barriers.

Impacts of Removing Perceived Barriers to Implementing Outdoor Education Programs

What percentages of teachers who express on interest in integrating outdoor education lessons into their regular classrooms are doing so on an ongoing basis when barriers to that use are removed? Despite conducting a literature review on this particular topic, there appear to be very few studies that addressed this question directly. Fraser et al. (2010) addressed this topic as it related to attitudes of American adults in general, though not specifically to teachers. In a summary report prepared by them for the Children and Nature Network, American's beliefs associated with encouraging children's nature experiences were studied. Two conclusions they reached in this study were that adults are willing to make an effort to encourage outdoor experiences in nature, even when they had concerns about safety risks associated with those experiences. However, the adults did not model those same behaviors by mentoring young people and taking them outdoors. A second conclusion reached in their study showed that although Americans demonstrate that they were well-intentioned about supporting children's contact with nature, there were

deficits in their beliefs that limited whether they were willing to act on those beliefs. In other words, it appeared that Americans showed a desire and expressed a belief in the positive benefits associated with nature exposure for children, yet they did not always act on those beliefs.

Erickson (2012) addressed the effects of removing a commonly identified barrier to outdoor education; the perception by many teachers that they lack the knowledge and skills needed to effectively implement a classroom in an outdoor environment. Her study demonstrated that when that barrier was addressed and teachers participated in an outdoor learning mentoring program, those teachers then increased their use of outdoor teaching strategies used in their classrooms. The BOEP program apparently resulted in dramatically greater use of the outdoors in their curriculum, with 83% of post-BOEP respondents using the outdoors frequently (at least weekly) compared to 93% of pre-BOEP respondents using the outdoors infrequently (at most 1-2 times per month). Moreover, 92% of post-BOEP respondents indicated more positive feelings towards their job, while 83% indicated increased student academic performance. The results of Erickson's study suggested an increase in the use of outdoor education strategies by participating teachers, as well as gains in students' academic achievement, especially as it related to student engagement in learning.

This review of the literature has traced the history and development of school forest use and outdoor education methods and programs. The University of Wisconsin-Stevens Point (2013b) described the rationale for the development of a school forest program in the state of Wisconsin. Both Coyle (2005) and Lieberman and Hoody (1998) described not only academic, but social and emotional benefits for students who regularly participate in outdoor education programs. Erickson (2012), Ernst (2007), and Rickinson et al. (2004) identified similar teacher-identified barriers that reduced or prevented teacher implementation of outdoor education strategies in the classroom.

Although these studies provide recommendations on how to address identified barriers to outdoor education, they do not provide insight into whether removal of these barriers will motivate teachers to increase their use of outdoor teaching strategies with their students. With the exception of Erickson (2012) who presented research that analyzed the effects of removing one commonly identified barrier,

that of the lack of teachers that they are not adequately prepared to effectively teach in the outdoor setting, very little research seems to exist that analyzes the effects of removing identified barriers as it relates to establishing and supporting outdoor education programs.

Knowing the academic benefits associated with students spending increased time learning classroom content in an outdoor setting, especially for those students identified as at-risk, this research study will attempt to increase the opportunities that students and teachers have to expose their students to outdoor learning. This study will attempt to assess whether teachers in the Superior School District will increase their use of the school district school forest as an avenue or outdoor learning when barriers are reduced or eliminated. Though not measuring the academic benefits of increasing outdoor learning time at the Superior School Forest, this research provides compelling evidence that an indirect result of this current study may be a positive result in student academic performance and reduced behavioral and discipline problems by students in the Superior School District who participate in regular outdoor learning opportunities.

Chapter 3: Methodology

Research has shown there are many academic benefits for students when school districts integrate an environment-based curriculum using outdoor classrooms with regular classroom instruction (Pyle, 2002). These benefits are especially noticeable in at-risk students (Malone & Tranter, 2003). The purpose of this study was to investigate whether teachers in the Superior School District would take advantage of outdoor education opportunities on the District's school forest if perceived barriers to that use were reduced or eliminated. The hypothesis presented in this study was that reducing or eliminating perceived barriers would lead to increased use of the school forest property. This study attempted to answer the following questions: (1) do teachers in the Superior School District have an interest in using the school forest property? (2) among teachers who expressed interest, how many were currently using the school forest property? (3) among teachers who expressed interest but were not using the school forest, what barriers were preventing them from using the school forest property? (4) if those barriers were reduced or eliminated would their use of the property increase? Although the School District of Superior has owned the school forest property considered in this study since 1968, no formal needs assessment has been conducted nor has a formal study tracking the use of this property been completed.

Participants

The participants in this study were elementary and middle school teachers employed with the Superior School District in Superior, Wisconsin during the 2006-2007 school-year. There were a total of 255 elementary and middle school teachers employed by the Superior School District during the 2006-2007 school year. Of the 255 employed teachers, 74 were employed as middle school teachers, 178 were employed as elementary school teachers, and 3 worked at both the middle school and elementary school levels. The participants consisted of both males and females, with a range of teaching experience from one year to 30 years in the classroom.

Instrumentation

The survey used in this study was created by the Wisconsin Forest Resources Education Alliance and published in a handbook titled *How to Grow a School Forest: A Handbook for Wisconsin Educators* (Mittermaier, 2002) (Appendix A). Slight editorial modifications were made to some survey items by staff at Learning Experiences and Activities and Forestry (LEAF) in 2010 (Appendix B). This survey was designed as a general needs assessment tool to be used by school districts in the state of Wisconsin to assess teachers' attitudes and knowledge related to their school district's school forest property. This survey was not developed as a scientific research instrument, but rather to assess individual school districts' needs related to their school forest property and outdoor education programs.

Participants' responses can be analyzed to determine a baseline regarding the number of teachers using the school forest as a teaching resource, the number of staff members interested in using the school forest as a teaching resource if they were not, and why staff members were not using the school forest as a teaching resource if they had a desire to do so. The questions on the survey were categorized according to school forest use, school forest facilities, school forest logistics, school forest administration, school forest equipment and materials, and professional development (Mittermaier, 2002). A sample of the types of questions found on the survey included the following: Do you know that the school district has a school forest? Have you ever used the school forest? If you aren't currently utilizing the school forest, do you have an interest in doing so? What areas do you feel need to be improved to better utilize the school forest? Do you feel you have enough knowledge of natural resources and environmental education to effectively utilize the school forest?

Although the survey instrument used for this research was not specifically designed for this research study, the questions on this survey adequately covered the topics and information being sought in this research study. The intent of this research study was to assess whether the school forest facilities in Superior were being utilized by teaching staff in the Superior school district, if so to what degree, and if not, what barriers were preventing that use.

Procedure

Approval for this study was obtained from the UW-Superior Institutional Review Board (IRB) and from the Superintendent of the Superior School District prior to administering the surveys. In autumn 2006 in the months leading up to the development and implementation of this study, discussions were held between the researcher and Superior school administration reviewing the value and district use of the school forest property. It was agreed that the survey created by the Wisconsin Forest Resources Education Alliance would be an appropriate instrument to administer as a tool to gather the information requested for this study.

The plan was to attend a faculty meeting at Superior Middle school meeting and explain the research to the teachers and ask for their voluntary participation. Informed Consent was to be given and explained to the teachers (Appendix C). Afterward, the survey and a brief explanatory cover letter (Appendix D) was to be handed out to all staff members who agreed to participate. Survey participants would complete the survey without the researcher present. One middle school staff member would volunteer to collect all completed surveys, and return them to the building principal's office, where they would be collected the next day.

There were six elementary buildings in the Superior School District therefore the plan to distribute the survey to the elementary teaching staff was different. The survey was to be sent to all elementary building principals with a cover letter describing the purpose and intent of the survey, asking for voluntary participation from their teaching staff. Informed Consent would again be given and explained to the teachers. Each building principal would then collect completed surveys, contact the researcher of this study, and arrangements made to collect the building surveys. The High School was not considered for this study in 2007.

In addition to collecting information regarding school forest use using the survey instrument in 2007, the research would collect data will be regarding the number of students visiting the school forest over the three year period covering school years 2008-2009 through 2010-2011. Throughout each school

year, data was to be kept as to how many students attend classes scheduled by their classroom teachers at the school forest facility.

Data Analysis

After the surveys were collected, the plan was that an attempt would be made to aggregate the data by analyzing the survey responses. Each question on the survey would be analyzed to find the average response. After reading through and summarizing the data and findings, the information would be put in a format for public sharing.

In addition, data regarding the number of school forest student visits over the three year period covering school years 2008-2009 through 2010-2011 will be analyzed to assess if the average number of school forest visits would change over the course of this study. The plan was that special attention would be given to questions that relate to barriers that limit or reduce the use of the school forest property so attempts could be made to start eliminating the identified barriers.

Chapter 4: Results

The purpose of this study was to investigate whether teachers in the Superior School District would take advantage of outdoor education opportunities on the District's school forest if perceived barriers to that use were reduced or eliminated. In order to achieve this goal, information regarding teacher's knowledge and present use of the school forest facilities was first gathered, including information as to why teachers were not using the site if they had a desire to do so.

The participants in this study were teachers employed with the Superior School District in Superior, Wisconsin. Participants voluntarily completed a survey (questionnaire) related to school forest use. The survey was delivered at two time periods four years apart (2007 and 2011). The 2007 survey was distributed to all middle school teachers (n = 77) and elementary school teachers (n = 170) as a paper printed copy. Seventy-one middle school teachers completed the 2007 survey, for a response rate of 92%. Fifty-one elementary teachers completed the survey, for a response rate of 30%. Total response rate among all teachers was 49%.

The original plan of this research was to administer one survey and to analyze the results. It was later determined it would be beneficial to administer a post-survey as a means of comparison to see if interventions identified in the initial survey had an influence on teacher views and use of the school forest. In 2011, the same survey as in 2007 was delivered to the entire Superior School District teaching staff (n = 336) using an on-line, electronic survey instrument known as *Survey Monkey*. At the time the 2011 survey was distributed, there were 162 elementary teachers, 75 middle school teachers, and 99 high school teachers employed by the Superior School District. Participation in this survey was again voluntary. Seventy-one elementary teachers completed the 2011 survey, for a response rate of 44%. Twenty-eight middle school teachers completed the survey for a response rate of 37%. Thirty-seven high school teachers completed the survey for a response rate of 37%. Five teachers responded they taught at multiple buildings. Total response rate among all teachers was 42%.

Although the participants in the 2007 survey were identified by their teaching level, and thus data were summarized by grade level of respondent (Table 1), the same is not true for the 2011 survey. Due to

the instrumentation method employed, the number of participants from each school building in the Superior School District was identified; however their responses were not summarized according to grade level. Thus, the data from 2011 reflect participant responses as one group. Comparisons of 2007 and 2011 survey responses use data combined across all grade levels of respondents.

The questions asked on the survey instrument used in this research were categorized into several key areas related to the school forest including use, facilities, logistics, equipment and materials, and professional development. The results of this research are listed according to each of these key areas, with comparisons made between 2007 and 2011 survey results.

Table 1. Results for school forest needs assessment survey for yes/no questions from 2007 pre-survey for elementary and middle school teachers.

		Elementary Teachers			Middle School Teachers		
Category	Question	Yes	No	No Response	Yes	No	No Response
Use	Do you know that the school district has a school forest?	29 (78%)	8 (22%)	0	42 (81%)	9 (17%)	1 (2%)
	Have you ever used the school forest?	16 (43%)	21 (57%)	0	17 (33%)	35 (67%)	0
	Are you currently using or do you intend to use the school forest this school year?	1 (3%)	35 (96%)	1 (3%)	0	51 (98%)	1 (2%)
	Did you ever encounter problems that prevented your use of the school forest	8 (22%)	21 (56%)	8 (22%)	7 (13%)	43 (83%)	2 (4%)
	If you aren't currently using the school forest, do you have an interest in doing so?	30 (81%)	3 (8%)	4 (11%)	33 (63%)	15 (29%)	4 (8%)
Facilities	Are the current facilities at the school forest adequate?	3 (8%)	3 (8%)	31 (84%)	8 (16%)	7 (14%)	37* (71%)
Professional Development	Do you feel you have enough knowledge of natural resources or environmental education to effectively utilize the forest?	9 (24%)	20 (54%)	8 (22%)	13 (25%)	34 (65%)	5 (13.5%)

*includes 24(65%) write-in answers 'don't know'

School Forest Use

The questions on this section of the survey related to participants' current use, interest in using, problems that prevented use, and how use of the school forest facilities might enhance classroom instruction.

According to 2007 survey results 80% of survey respondents reported they were aware the Superior school district had a school forest site, 63% reported they had not used the site. 17% of respondents reported they had encountered problems that prevented their use. The results of this survey also indicated that 71% of teachers who were not currently using the site expressed a desire to do so (Table 2).

Results from the 2011 post-survey showed 99% of survey respondents were aware the Superior school district had a school forest site with 62% reporting they had used the site. The number of teachers who reported they had problems that prevented their use of the school forest site in the 2011 survey was 28%. 92% of respondents indicated that they had a desire to use the school forest (Table 2).

The survey also provided open-ended questions related to how teachers might use the school forest to enhance their classroom instruction. In 2007, the majority of responses related to using the school forest site to increase environmental awareness or to enhance science related activities, with team building and community service project-based themes being repeated. An example of responses that related to these themes include "field trips for plant units", "interdisciplinary for science", and "ecosystem studies, plant identification." The responses shared by middle school teachers were related to using the school forest as a site to integrating subject material from core classes and to develop interdisciplinary units.

Table 2. Results for school forest needs assessment survey for yes/no questions from 2011 post-survey, with all respondents combined regardless of grade level.

		2007			2011		
Category	Question	Yes	No	No Response	Yes	No	No Response
Use	Do you know that the school district has a school forest?	71 (80%)	17 (19%)	1 (1%)	140 (99%)	1 (1%)	0
	Have you ever taken students to the school forest?	33 (37%)	56 (63%)	0	88 (62%)	53 (38%)	0
	Do you intend to use the school forest this year?	1 (1%)	86 (97%)	2 (2%)	85 (60%)	56 (40%)	0
	Did you ever encounter problems that prevented your use of the school forest?	15 (17%)	64 (72%)	10 (11%)	40 (28%)	101 (72%)	0
	If you aren't currently using the school forest, do you have an interest in doing so?	63 (71%)	18 (20%)	8 (9%)	130 (92%)	11 (8%)	0
Facilities	If you have been to our school forest, do you feel the current facilities are adequate?	11 (12%)	10 (11%)	68* (76%)	92 (65%)	17 (12%)	32** (23%)
Professional Development	Do you feel you have enough knowledge of natural resources or environmental education to effectively utilize the forest?	22 (25%)	54 (61%)	13 (15%)	68 (48%)	73 (52%)	0

*includes 24(65%) write-in answers 'don't know'
**an unknown number of respondents who had not visited the school forest left this question unanswered

School Forest Facilities

This section of the research survey related to the adequacy of the facilities found on the Superior school district school forest property.

Teachers were asked if they felt the current facilities at the school forest were adequate. In 2007, 12% of the teachers who participated in this research study felt the facilities were adequate, while 11% responded that they were not. 76% of teachers either did not respond to this question or stated that they did not have enough information to respond accurately (Table 2, p. 28)

In the post survey (2011), 65% of teachers responded that they did feel the facilities were adequate while 12% felt improvements were needed (Table 2, p. 28).

A list of potential improvements was included on both the 2007 and 2011 surveys. Teachers were asked to check all improvements that would enhance their use of the school forest. Results of this section are summarized in Figure 1. As shown on both the pre- and post-surveys, data indicated the areas that would most enhance teachers' use of the school forest were improving bathroom facilities, building an education center, and creating maps (of the trails found on the property and of the property in general).

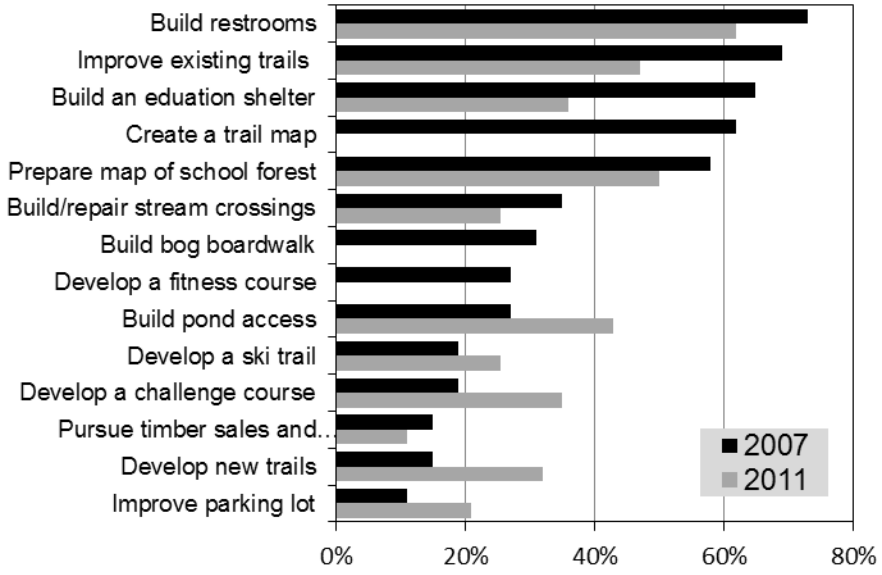

Figure 1. Proportion of respondents from the 2007 pre-survey that indicted the listed improvements would enhance their use of the school forest.

School Forest Logistics

A third area of data collected related to the coordination of scheduling and transporting classes, and ensuring the safety of students and staff while at the Superior school forest. Survey participants were asked to check the areas they felt needed to be improved to better utilize the school forest. They were then given three choices; transportation, scheduling, and safety.

Figure 2 summarizes the teachers' responses to this section of the survey. The area that ranked highest in need of improvement on both the 2007 and 2011 surveys is transportation; on both the initial survey and the post survey 57% of teachers indicated this as an area that needed improvement. All respondents listed transportation costs as the reason for their choice of this option on this survey section.

The second area of high need indicated on this section of the survey was scheduling of classes. In 2007 scheduling ranked 46%; in 2011 it ranked 29%.

Safety was expressed as an area in need of improvement by several teachers. In 2007 safety ranked 15%; in 2011 it ranked 6%. Suggestions listed by teachers as a way to improve safety on the 2007 survey related to marking trails, having a teacher on site, and concern related to poison ivy and ticks. There was one suggestion related to safety on the 2011 survey that expressed a concern about being informed about school forest procedures.

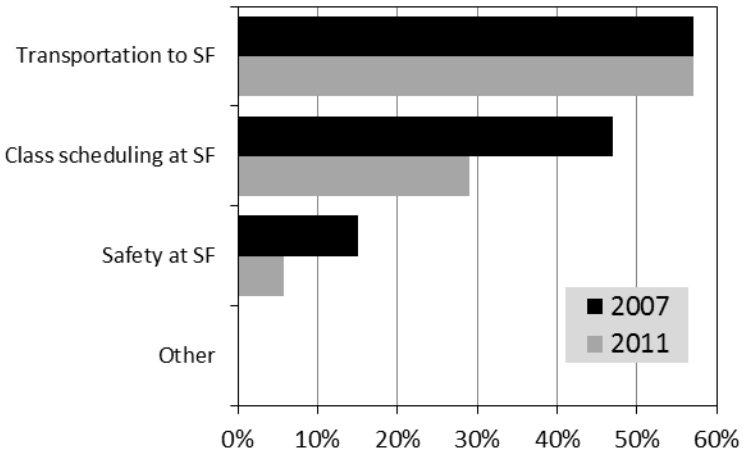

Figure 2. Percent of respondents that indicted logistical issues in need of improvement for better utilization of the school forest.

School Forest Equipment and Materials

On this section of the survey, teachers were asked to list materials and equipment that would enhance their activities at the school forest.

The list of materials generated by teachers on the 2007 survey indicated a need for various types of field equipment. An example of the types of equipment requested included various types of field guides, compasses, equipment to study wetlands and soil testing kits. There were also suggestions for materials that would improve the facilities, such as increasing handicap accessibility and increasing trails and trail signage.

The list of materials generated by teachers on the 2011 surveys included many types of field equipment, and five requests for development of larger outdoor learning areas. Examples of these types of requests included; restoration of a prairie area, a garden showcasing native plants, development of an Ojibwe village, wildlife displays in the main building, and development and access to a wetland or pond area.

Professional Development

This section of the survey had questions related to teachers' knowledge of natural resources and environmental education, their confidence level in teaching in an outdoor setting, and areas in which they felt they needed to gain additional training.

The first question on this section of the survey asked teachers whether they felt they have enough knowledge of natural resources and environmental education to effectively utilize the school forest. In 2007, 25% of the survey respondents indicated they did feel their knowledge was adequate to utilize the school forest effectively, while 61% responded that they did not feel their knowledge was adequate. On the 2007 survey 15% did not respond to this question.

On the post survey administered in 2011 48% of survey respondents indicated they felt they had adequate knowledge to effectively utilize the school forest, while 52% responded that they did not feel their knowledge was adequate.

Site Use

In addition to data collected on the survey, beginning with the 2008-2009 school year, data was collected that tracked the number of students visiting the school forest with their classroom teacher(s) during each school year. Upon administering the 2007 survey, an analysis was made of the survey data in an attempt to identify and prioritize barriers that were limiting teachers' use of the school forest site.

Beginning with the 2008-2009 school year, data were collected tracking school forest visits. These data is presented in Figure 3. In 2008-2009 approximately 750 students used the school forest. In 2009-2010 this was 1,248. 2010-2011 student use was 1,993. Finally, in 2011-2012 the number was 2,176 students who used the school forest site (Danz, 2011).

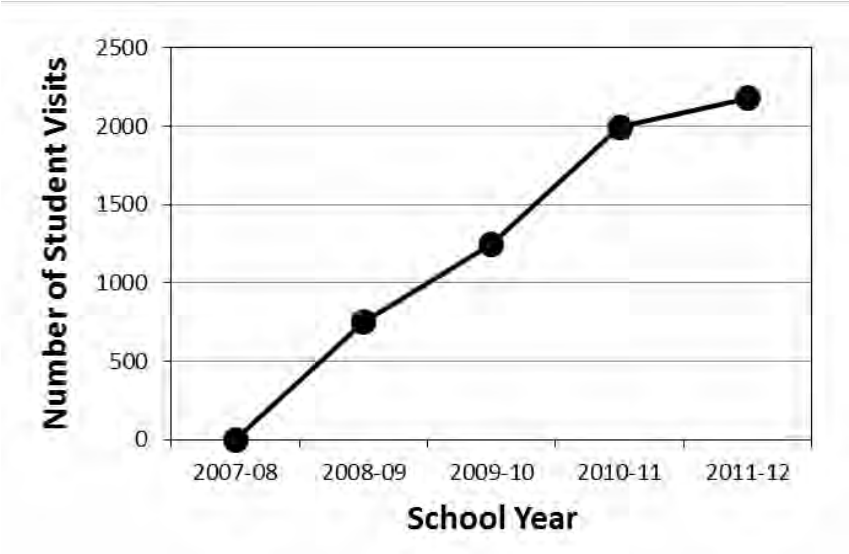

Figure 3. Student visits to the school forest.

Chapter 5: Discussion

Overview of the Study

There exists a wide variety of research supporting academic, social and emotional, and health benefits of integrating outdoor education experiences into the regular education classroom. Yet few teachers seem to take advantage of opportunities available for outdoor education. This study attempted to identify and examine reasons why teachers in the Superior School District, who indicated an interest in exposing their students to outdoor education experiences, were not doing so. The study attempted to answer the following questions: (1) do teachers in the Superior School District have an interest in using the school forest property? (2) among teachers who expressed interest, how many were currently using the school forest property? (3) among teachers who expressed interest but were not using the school forest, what barriers were preventing them from using the school forest property? (4) if those barriers were reduced or eliminated would their use of the property increase?

To assess these questions, a survey was administered to the 255 elementary and middle school teachers employed by the Superior School District in the spring of 2007. At the time this survey was administered, it was decided by school district administration that initial programming developed for the school forest would be targeted at the six elementary and one middle school in District. Therefore, the survey was administered to only those teachers employed at those schools.

Based on results of the 2007 survey, interventions were implemented between August 2007 and January 2011 to reduce or eliminate the identified barriers to increase school forest use. During this same time period, facility use data were collected to ascertain the number of students visiting the school forest annually.

To assess whether interventions affected the use of the school forest property, a post-survey was administered to all teachers in the District in spring 2011. The post-survey asked the same questions as the pre-survey administered in 2007.

The hypothesis presented in this study was that by identifying real or perceived barriers that prevent or limit the use of the school forest property by teachers in the Superior School District, a

program could be developed to reduce or eliminate the barriers, thereby increasing the number of teachers and students use of the school forest property as a classroom resource for student learning.

Discussion of Data

After analyzing the initial survey results, three common themes surfaced from participants' responses that prevented or limited their use of the Superior School Forest; (1) a lack of funding, especially as it related to transportation costs, (2) a feeling of lack of content knowledge and experience in teaching in an outdoor setting, and (3) a lack of materials and facilities needed to effectively teach in an outdoor setting. These survey results are representative of research in independent studies by Rickinson et al. (2004) and Ernst (2007), both of which identified real and perceived barriers that limited teachers' use of outdoor education strategies. The five key barriers identified in the research by Rickinson et al. were (1) fear and concern about young people's health and safety, (2) teacher confidence and expertise in teaching and learning outdoors, (3) requirements of school curricula, (4) shortages or lack of time, resources and support, and (5) wider changes within the education sector and beyond. Research conducted by Ernst (2007) echoed many of the same concerns by teachers and included (1) a lack of training in environmental education, (2) a lack of relevance to their curriculum, and (3) a lack of funding and administrative support. Other areas of concern cited by Ernst (2007) included safety of students, liability and classroom management, and lack of comfort in the outdoors. An area that did not rate highly as a concern on the 2007 survey was student safety when taking students outdoors. This is somewhat surprising because safety did rank as a significant concern in research by both Rickinson et al. and Ernst.

Another concern not expressed by participants in this research that is apparently inconsistent with other research is the relevance of outdoor education curricula to teachers' grade level curricula, and the perceived lack of time to expose students to outdoor education lessons due to the pressures of high stakes testing. Anecdotally, teachers have expressed this concern, but it may not have been indicated on surveys because there were no specific questions on the survey instrument that addressed those topics.

Research Interventions

Upon identifying the major barriers reported by participants preventing their use of the school forest facility, the researcher, School Forest Planning Committee, and District administration worked together to develop a school forest improvement plan that prioritized strategies to reduce or eliminate these barriers. The first priority addressed was funding; financial resources were needed to target several areas of concern, including student transportation to and from the site, purchasing educational supplies and materials, improving facilities, and developing teacher resources and professional development opportunities. The second priority was professional development, with the objective to increase development opportunities in several ways such as providing in-district professional development training on outdoor education techniques, creating appropriate grade level curricula that teachers could access and integrate into their regular classroom curricula, and providing an on-site teacher to lead those classes of students if requested by teachers. The final priority was to make site and facility improvements to create a safe and healthy environment for learning that could accommodate school groups, as well as purchase specific educational supplies needed for lessons. How each of these priorities was addressed is described in greater detail below.

Funding

As cited by Ernst (2007) the success or lack of success with outdoor education programs is largely dependent on administrative support. In an attempt to gain administrative support, in fall 2008 a proposal outlining initial goals of implementing a school forest program was presented to the Superior School District's superintendent. With superintendent support, this proposal was then presented to the Superior School Board. This proposal presented research citing academic benefits as well as the survey results that are part of this research which presented interest by teachers in using the school forest. That school year $5,000.00 was allocated by the Superior School Board to subsidize transportation costs to the school forest. In addition to this initial funding, the Superior School District's Buildings and Grounds administrator approved remodeling of the kitchen in the main building found at the school forest to

accommodate a hot lunch program for visiting students. The Food Service administrator approved a part time cook to have on site to prepare and serve hot lunches to visiting students on scheduled days. During the 2008-2009 school year a pilot program was initiated that provided all 5th grade students and teachers in the District three visits to the school forest. The goal of this program was to provide outdoor education lessons to the students and teachers and to introduce all 5th grade students in the District to each other by bringing classrooms from different elementary buildings together on scheduled days. Superior had recently integrated students from two middle schools into one new middle school. The proposal was a way to have students from the various elementary schools in the city meet each other before entering middle school as a sixth grader. This pilot program was deemed successful, and as a result the school board has continued to fund $5,000 for transportation to the school forest in their annual budget, with the funding being available for any interested classes on a first come first serve basis.

In addition to lobbying for financial support within the school district, attempts were made to identify funding sources from other sources within and outside the Superior community. Based on data collected by the University of Stevens Point (University of Wisconsin-Stevens Point, 2013b), the amount of money school districts are able to budget for school forest programs is not enough to sufficiently cover requested funds to cover all aspects of school forest programming. A common element present in successful school forest programs are community partnerships (University of Wisconsin Stevens-Point, 2013a). As a way to provide more classroom space and to accommodate the larger learning groups at the school forest, the school district partnered with the Department of Natural Resources to plan a timber harvest sale on the school forest property. The profits made from this sale were used to demolish two dilapidated buildings on site, and to build two new classrooms on the old classroom foundations. Solicitations were also made from a local Foundation that supported the idea of an outdoor education program. A donation of $5,000 was made to the school forest program to cover final construction costs on the new classrooms. In addition, this Foundation has donated an additional $5,000 annually as a means to cover transportation costs the funds allocated by the school district do not cover due to increased demand for trips.

In 2010, an alumnus of Superior Senior High donated $20,000 to the Superior school forest program. This grant was used to purchase supplies and materials indicated by teachers on the survey as materials that would enhance their use of the school forest. Supplies included binoculars, snowshoes, GPS units, compasses, digital cameras, field guides and forestry study equipment.

In order to qualify for state grants awarded through the Wisconsin Environmental and Education Board, a *School Forest Education Plan* was written and submitted to the state. This plan makes the Superior School District eligible to apply for annual grants in the amount of up to $20,000. In 2011, the Superior school forest program was awarded a grant in the amount of $10,000 from the Wisconsin Environmental and Education Board to implement a curriculum for all 4th and 6th grade students in the Superior School District.

Professional Development Opportunities

Erickson's research supported the importance of teacher mentoring and training as a way to build confidence among educators who show an interest in using the outdoors as a teaching resource (Erickson, 2012). In August of 2009, the Superior School District employed a School Forest Coordinator to assist teachers in the planning of and teaching of outdoor education lessons. The Coordinator prepared a collection of outdoor education lessons that aligned with grade level curricula and state standards. This person also coordinated and scheduled classes at the school forest, prepared and planned lessons in collaboration with classroom teachers, and taught students on-site when requested by interested classroom teachers. This position continues to be funded by the school district and the Coordinator continues to assist interested teachers with the support they need to successfully plan and implement outdoor education lessons.

In an attempt to provide interested teachers with training related to outdoor education techniques, during two successive school years (2009-2010 and 2010-2011), the school district provided teachers the option to spend three of their required staff development days attending professional development training at the school forest. During these days, staff was introduced to research explaining the academic,

social, and emotional benefits of outdoor education, outdoor education teaching methods, and curriculum and outdoor education lessons that could be integrated into classroom curriculum. Approximately 50 teachers employed by the District participated in this professional development during the two years this option was available.

During the 2010-2011 and 2011-2012 school years, the Coordinator met with all elementary teachers during their scheduled grade level meetings to discuss options available related to use of the Superior school forest. These meetings were scheduled as a way to increase visibility of the school forest program and answer teacher questions.

Facility and Site Improvements

The implementation of interventions related to this research began summer 2008. Prior to this, the school forest site and facilities had remained nearly vacant and unused since 2002. Due to lack of maintenance over the period of six years, some basic projects were completed prior to accommodating school groups in the fall of 2008. During the summer of 2008 a new holding tank for the septic system was installed to accommodate anticipated increased student use, the kitchen in the main lodge was gutted and remodeled with new appliances installed so students could be offered hot lunch services on site, and the grounds were mowed and cleared to increase safety by decreasing potential hazards.

During the summer of 2009, two of the original buildings on the school forest site were razed due to mold and deterioration issues, and two new classrooms were built on the existing foundations. These new classrooms were constructed to accommodate large student groups that were causing overcrowding in the old facilities. Due to transportation costs, several teachers would often team up to fill one school bus for a trip to the school forest. This meant that up to 73 students would visit from an elementary school. Also, students attending Superior Middle School are housed on one of three wings as part of a grade level team. Each team consists of approximately 120 students. When a middle school team planned a trip to the school forest, they often brought the entire team of students for one day. In this situation, students were divided into smaller learning groups for the day. The additional classroom space allowed

teachers the ability to assign different groups to various learning sites and classrooms for the day in an attempt to maximize the learning experience for the day.

In addition to documenting academic gains in students who regularly participated in environmentally based education program, Coyle's research summary indicated gains in students' self-confidence and problem solving abilities when exposed to regular outdoor education experiences (Coyle, 2005). During the summer of 2010 a low ropes challenge course was constructed at the Superior school forest in response to survey responses as indicated on the 2007 survey and as a way to incorporate problem solving challenges as part of the school forest curriculum. A challenge course is a set of physical challenges that offer a physical challenge and promote communication, problem-solving skills and team-building among groups of students. The challenge course constructed at the school forest consisted of six elements. An element is a term used to describe a single challenge within the course. Challenge courses are typically classified as "high-ropes" or "low-ropes". High-ropes courses are those in which the elements are constructed at greater heights above the ground. Low-ropes courses are those in which the elements are constructed closer to the ground. Upon completion of the course, a facilitator's handbook was written with staff training required so the course would be used appropriately and safely with students. This handbook has been made available to all teachers in the district.

Using funds from a substantial donation to the school forest program, outdoor equipment and teaching supplies were purchased for the school forest program. The supplies and equipment purchased were generated from the list of materials listed by teachers on the research survey as those materials that would enhance their use of the school forest as a site for outdoor learning. Outdoor field equipment included student and adult snowshoes, global positioning system (GPS) units, binoculars, digital cameras, forestry materials, and rubber boots. Other classroom supplies related to specific classroom lessons were purchased including materials for making casts of animal tracks, replicas of animal skulls, and instruments used to study weather and climate.

In an attempt to assist classroom teachers in integrating literature into outdoor education lessons, the school forest coordinator began collecting books with environmental themes that relate to established

grade level curriculum maps. A list of these books was developed during the summer of 2012. Teachers have access to this list of resources and are encouraged to use these resources.

During the summer of 2012 and throughout the school year of 2012-2013, additional construction projects were completed in an attempt to maintain the main lodge. These projects included the repair and replacement of the roof, remodeling of one room to accommodate a changing room for students where they could change into and out of outdoor winter clothing and store their personal belongings, and the remodeling of a storage room to organize and safely store newly purchased equipment and supplies.

Analysis of Research Interventions

By tracking and comparing the number of students who participated in learning activities at the Superior School Forest starting from fall 2008 to spring 2012 (Figure 3, p. 32) a steady increase in use was seen; there are currently over 2000 student visits annually. The increase in student use suggests that removing and reducing the barriers teachers identified in this research study did positively affect the number of teachers who chose to use the Superior School Forest to integrate outdoor learning activities in their classrooms. Student use leveled off after 2011, perhaps because annual transportation funding is spoken for each year, and teachers have not pursued or been able to find other sources of transportation funds. Another reason may be that no major interventions were implemented at the school forest between the time the challenge course was developed in the summer of 2010 and the purchase of new equipment and supplies was made in the fall of 2012. The purchase of this equipment was made after final attendance data was collected in the spring of 2012. Data will continue to be collected related to site use to determine if the number of teachers using the school forest as an outdoor learning site continues to increase, or if the number of teachers who are now using the site has been maximized and will remain relatively unchanged without further intervention.

While increases in student use since 2007 can be directly tied to research interventions, changes in teacher perceptions between the two surveys are somewhat more difficult to interpret because different teacher groups were included in the two surveys. In 2007, only elementary and middle school teachers

were included, while in 2011 high school teachers were included and comprised 26% of respondents. Although it is unknown how much the different respondent groups may have influenced survey results, it is possible survey items related to teacher use may have been most greatly influenced because high school teachers were much less likely to visit the site. Interpretation of results related to facilities and professional development are less likely to have been influenced.

It should also be noted that between 2007, when the initial survey was given, and 2011 the questions on the *School Forest Needs Assessment Survey* were edited slightly. Although all questions asked on each survey seek the same information, the wording on the 2011 survey has several questions that have been edited slightly. In general, the edits relate to open-ended questions asked on the 2007 survey, with the changes made offering teachers specific choices to those types of questions or statements. Therefore, the survey instruments used in 2007 and 2011 are not identical (Appendices A and B).

Results from the 2007 and 2011 surveys show an increase in the number of teachers using the school forest. In 2007, 15 fifth-grade teachers used the site. In 2011, 88 teachers responded they had used the school forest, indicating at least 73 new teachers had visited the site between 2008 and 2011. These results indicate that increased student numbers are not a result of a few teachers bringing their students to the school forest several times over the course of the school year. Between 2007 and 2011 there was also an increase in the number of teachers both intending to use the school forest (percent of respondents increased from 1 to 60%) and having an interest in using the school forest (71 to 92%).

By comparing data results from the 2007 survey and the 2011 survey, other questions addressed in this research were also analyzed. It could be hypothesized that if the barriers that teachers identified on the 2007 survey were removed, there would be a decrease in the number of positive responses on the 2011 survey which asked whether teachers ever encountered problems that prevented their use of the school forest. However, the number of positive responses to this question increased from 17 to 28% on the 2011 survey. This would suggest that barriers were not reduced or eliminated or that there are new barriers. However, another interpretation could be that as more teachers use and become familiar with this

nontraditional classroom setting, the more critically they evaluate the potential of what this site offers and therefore found new and different barriers they had not anticipated on the 2007 survey. It could also be that the addition of high school teachers raised a number of new perceptions on barriers and clouds the change among elementary and middle school teachers.

The greatest impediment identified that prevented school forest use on the 2007 survey was lack of funding, especially as it related to transporting students to the school forest. After securing funding in the amount of $5,000 in 2008-2009, and $10,000 annually between the years 2009-2012 it may seem surprising to see there was no change in the percent of respondents who indicated improvements needed to be made in transportation to better utilize the school forest. This can be explained by the fact that as more teachers use the school forest, it is gaining a positive reputation as a method of instruction. Therefore, more teachers want to use this site, resulting in competition for transportation funding. Despite the amount of money being allocated to transportation, there are more teachers requesting funding for transportation than the allocated funds allow for. Every school year there are teachers who are disappointed that their request for funding was denied. This could lead to a recommendation that additional funding sources be investigated so more teachers have the opportunity to use the school forest site.

The interventions made related to facility improvements have impacted teachers' perceptions regarding the adequacy of those facilities. 2011 survey results indicated that 65% of teachers in the Superior School District felt the facilities at the school forest were adequate. This represented a positive response increase of 53% when compared to 2007 survey results. When analyzing specific improvements that teachers listed that would increase their likelihood of using the school forest there is a difference in the types of responses found on the 2007 and the 2011 surveys. Suggestions for site improvements listed on the 2007 related to fixing or maintaining very specific sites such as improving building or improving boardwalks and trails and improving restroom facilities. Suggestions listed on the 2011 survey were broader in scope and indicated such improvements as creating interpretive exhibits and developing an

Ojibwe village. This could suggest that teachers are broadening their understanding of how they could integrate outdoor education to encompass more subject areas in their classrooms.

In 2011, teachers expressed a desire to use the school forest as a site to teach and enhance science related themes; however there was an increase in the number of responses that indicated using the school forest to integrate all subject areas including language arts, social studies, math, music and art. There was also an increase in responses to use the school forest to enhance classroom instruction by exposing students to experiential types of learning activities. An example of this more holistic approach to using this site included the following response; "exploration, discovery, confidence building, science instruction, bringing nature into every curricular area, promoting interaction with nature, promoting a healthy, active life-style, promoting physical fitness."

The fact that the number one issue that teachers suggested as a site improvement on both the 2007 and 2011 survey was to build restrooms cannot be ignored. As educators we learn that the basic needs of our students must be met before students will learn. The restroom facilities at the school forest are minimal and this survey data suggest that building improved restroom facilities would increase the number of teachers who use the school forest facilities.

Conclusion

The analysis of research studies done by Fraser et al. (2010) suggests most American adults generally believe that nature experiences are important for children and that because of this belief support children in having these experiences in nature. Despite these claims, many Americans do not act on these beliefs by providing nature experiences for their children (Fraser et al., 2010). In 2007, 81% of the elementary and middle school teachers in the Superior School District indicated a desire to use the Superior school forest by integrating outdoor education into their classroom curriculum. A question posed by this research was if the participants would substantiate their willingness to use the outdoors as a context for learning if perceived limitations were removed, or would they also not follow through on their desire and maintain traditional classroom methods of instruction?

The data collected in this research seem to indicate that when interventions were taken to reduce the limitations and barriers that teachers in the Superior School District identified as limiting their use of outdoor education strategies, an increase in use of the school forest site was documented. The results of this research can only be applied to the use of the Superior School District's school forest program; however there may be value in the research that can be applied to other school districts with interest in implementing outdoor education in their school curriculum and district philosophy.

The following recommendations are based on the last five years of work and data collection:

- Based on the literature and this research, first address the issue of funding the outdoor education program; funding is critical to other aspects of any program including transportation, professional development, purchasing equipment and supplies, and facility development and maintenance.
- Related to funding, a second recommendation is to clearly communicate the benefits of an outdoor education program to generate administrative support. Goals for a specific program must be identified including a clear education plan.
- Since teachers must feel adequately prepared to facilitate learning in an outdoor setting, a third recommendation is that professional development opportunities be provided. It is recommended that this professional development clearly addresses the needs identified by teachers.
- Finally, based on these results, it is recommended that the equipment and supplies needed to implement outdoor lessons be provided. Materials and supplies needed for this educational setting are unique and are typically materials an average classroom teacher would not possess.

This study did not address the long term benefits of using outdoor educational strategies on student learning. Future research should study the long term academic, social and emotional, and motivational aspects of students who are regularly exposed to and participate in learning in an outdoor setting compared to those students who are not exposed to learning in this type of setting.

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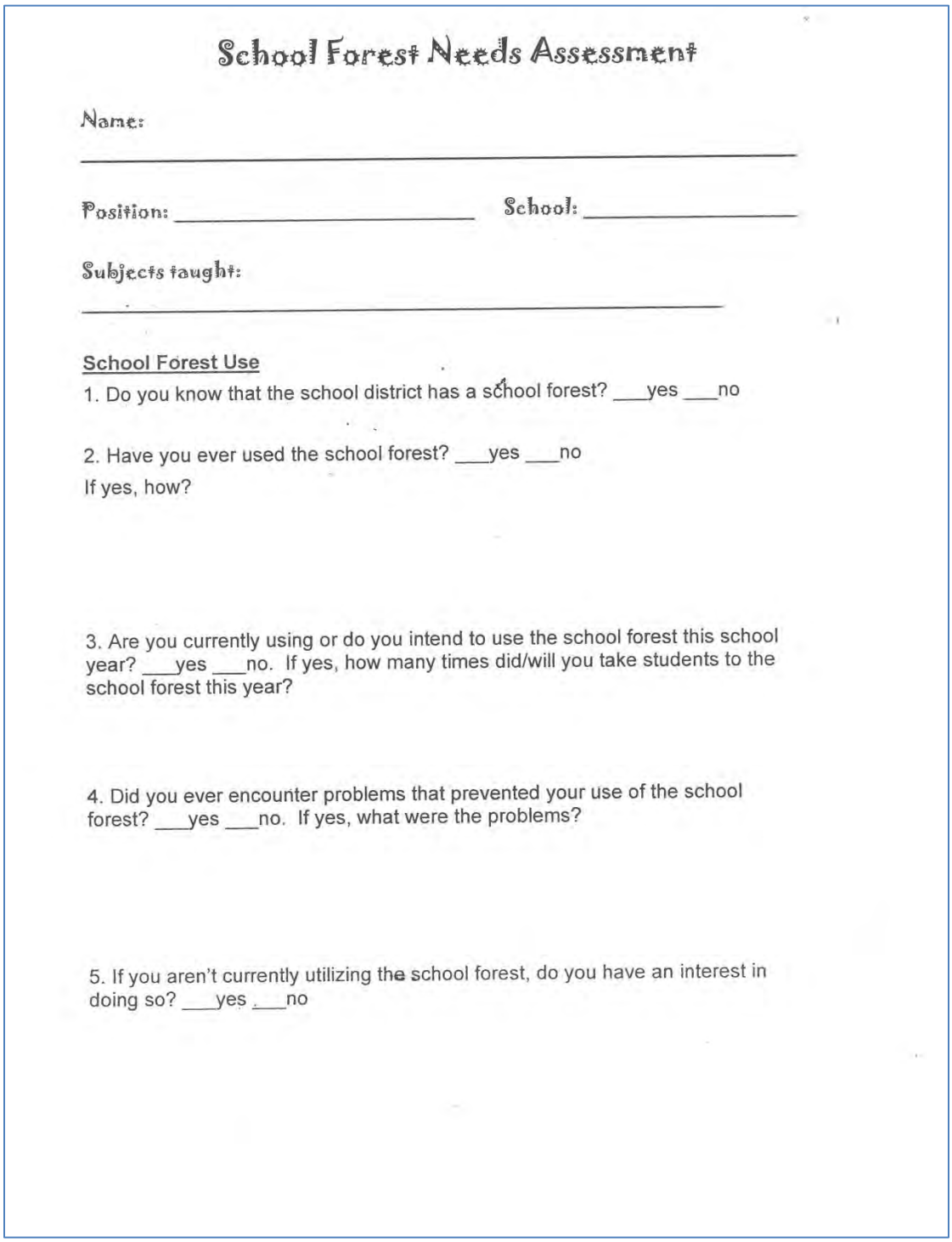
Appendix A. Page 1 of survey instrument used in 2007.



School Forest Needs Assessment

Name: _____

Position: _____ School: _____

Subjects taught: _____

School Forest Use

1. Do you know that the school district has a school forest? ___yes ___no

2. Have you ever used the school forest? ___yes ___no

If yes, how?

3. Are you currently using or do you intend to use the school forest this school year? ___yes ___no. If yes, how many times did/will you take students to the school forest this year?

4. Did you ever encounter problems that prevented your use of the school forest? ___yes ___no. If yes, what were the problems?

5. If you aren't currently utilizing the school forest, do you have an interest in doing so? ___yes ___no

Appendix A cont... Page 2 of survey instrument used in 2007.

6. How might you use the school forest to enhance your classroom instruction or other school-related activities?

School forest facilities

7. Are the current facilities at the school forest adequate? ___yes ___no

8. The following is a list of potential improvements to the school forest. Check all of the improvements that will result enhance your use of the school forest.

___Improve existing trails (clear and make accessible)
___Develop new trails
___Create a trail map
___Build/repair stream crossings
___Build pond access
___Build bog boardwalk
___Prepare map of school forest (and directions to get there)
___Improve parking lot
___Build restrooms
___Build an education shelter
___Develop a challenge course
___Develop a ski trail
___Develop a fitness course
___Pursue timber sales and harvesting practices
___Others – Please list:

School Forest Logistics

What areas do you feel need to be improved to better utilize the school forest?

___Transportation to and from the school forest
Suggestions:

___Scheduling of classes at the school forest
Suggestions:

Appendix A cont... Page 3 of survey instrument used in 2007.

___Safety considerations while at the school forests

Suggestions:

___Others – Please list:

School Forest Equipment and Materials

Please list materials and equipment that would enhance your activities at the school forest:

Professional Development

Do you feel you have enough knowledge of natural resources and environmental education (forestry, soils, wildlife, water, etc.) to effectively utilize the school forest? ___yes ___no

On what topics would you like more information?

Which professional development opportunities would be most valuable to you (select as many as you wish)?

___Content (background information on forests, wildlife, water, soils, etc.)

___Outdoor education methods

___Environmental education (background information on EE, how can it be used, state EE standards)

___Environmental education curriculum (e.g., LEAF, PLT, WET, Wild)

___Forest management

___School forest development and administration

___Other – Please list _____

Appendix B. Page 1 of survey instrument used in 2011.

School Forest Needs Assessment

Name: _____ School: _____
Position or subjects taught: _____

School Forest Use

1. Do you know that the school district has a school forest? ___yes ___no
2. Have you ever taken students to the school forest? ___yes ___no
   *If **NO**, what hinders you from using the school forest?*
3. Do you intend to use the school forest this school year? ___yes ___no
   If YES, how many times will you take students to the school forest this year?
4. Did you ever encounter problems that prevented your use of the school forest? __yes __no
   If YES, what were the problems?
5. If you aren't currently using the school forest, do you have an interest in doing so? __ yes __no
6. How might you use the school forest to enhance your classroom instruction or other school-related activities?

School Forest Facilities

7. Are the current facilities at the school forest adequate? ___yes ___no
8. The following is a list of potential improvements to the school forest. Check all of the improvements that will enhance your use of the school forest.

___Improve existing trails (clear and make accessible)
___Develop new
___Build/repair stream crossings
___Build pond access
___Prepare map of school forest (and directions to get there)
___Improve parking lot
___ Build a fire pit
___ Have bench seating areas
___Build restrooms
___Build an education shelter
___Develop a challenge course
___Develop a ski trail
___Pursue timber sales and harvesting practices
___***Others – Please list:***

Appendix B cont... Page 2 of survey instrument used in 2011.

School Forest Logistics

9. ***What areas do you feel need to be improved to better utilize the school forest?***

___Transportation to and from the school forests.

Transportation Suggestions:

___Scheduling of classes at the school forest

a. Do you need help developing lesson ideas to use with your classes at the school forest? ___yes ___no

b. If there was more time available, would you be better able (or willing) to take students to the school forest? ___ yes ___ no

Scheduling Suggestions:

___Safety considerations while at the school forests

a. What safety equipment should be required on field trips to the school forest?

Safety Suggestions:

___***Others – Please list:***

School Forest Equipment and Materials

10. Please list materials and equipment that would enhance your activities at the school forest:

Appendix B cont... Page 3 of survey instrument used in 2011.

Professional Development

11. Do you feel you have enough knowledge of natural resources and environmental education (forestry, soils, wildlife, water, etc.) to effectively utilize the school forest? ___yes ___no

12. What topics would you like to learn more about that would enhance your school forest lessons?

___ wildlife tracking
___ tree identification
___ wildflower identification
___ wildlife in general
___ forest industry
___ insects
___nature writing
___ geology of area
___ environmental music ideas

Other ideas: (please list)

13. Which professional development opportunities would be most valuable to you (select as many as you wish)?

___Content (background information on forests, wildlife, water, soils, etc.)

___Environmental Education (background information on EE, how can it be used, state EE standards)

___Environmental education curriculum (Select specifics you are interested in below...)

___ LEAF (WI's K-12 Forestry Education Curriculum... LEAF connects formal and non-formal educators in Wisconsin with quality forestry education materials.)
___ PLT (Project Learning Tree.... Is a multi-disciplinary environmental education program for educators and students in PreK-12. PLT is a program of the American Forest Foundation.)
___ WET (The mission of Project WET is to reach children, parents, educators and communities of the world with water education.)
___ WILD (A wildlife focused conservation education program for K-12 students)
___ Flying WILD (Introduces students to bird conservation through standards-based classroom activities and environmental stewardship projects)
___ KEEP (The Wisconsin K-12 Energy Education Program (KEEP) was created to promote energy education in Wisconsin.)
___ Pollinator LIVE (Educational materials sponsored by the US Forest Service that focus on pollinators. Includes lessons, grants, and teacher opportunities.)

___Forest management

___School forest development and administration

Other Professional Development Ideas – Please list:

Administration of the School Forest

14. Are you interested in serving on an advisory committee for the school forest? ___yes ___no

15. Are you interested in helping write the school district's school forest education plan (a stipend may be available)? ___yes ___no

THANK YOU!

Appendix C. Letter of informed consent.

PLEASE DO NOT PUT YOUR NAME ANYWHERE ON THIS SURVEY. There is no need to identify yourself.

You are being asked to complete this survey to help a researcher better understand your understanding and use of the Superior School Forest. The questions on this survey ask about your awareness of the school forest facilities, whether you use or have used the school forest facilities, problems you may have encountered when attempting to use the school forest facilities, and your recommendations for improvement. Please be as honest as possible and answer all questions to the best of your knowledge. You should be able to complete the questionnaire in about 10 minutes.

Once the study is completed, a summary of the results will be made available through school district communication.

Your participation in this survey is entirely voluntary. By completing this survey you are giving your consent to be involved in the research. If at any point you decide that you do not want to complete the questionnaire, please return it to your building principal. Your participation in this research by completing this survey is completely voluntary.

Please feel free to ask any questions you may have of the person who is giving you this survey, especially if there is a word or phrase you do not understand. Feel free to write in the spaces provided if you feel you need room to express or explain an answer.
Thank you for your cooperation and the time that you have put into completing this survey.

If you should have concerns about your treatment as a subject in this study, please call or write:

Provost Christopher Markwood
Old Main 210
Belknap and Catlin
P.O. Box 2000
Superior, WI 54880
(715)394-8449

Appendix D. Cover letter sent to elementary building principals.

Dear (Name of building principal),

Enclosed is a copy of the School Forest Needs Assessment and Informed Consent documents I emailed you about last week. I appreciate your help in administering this survey to your staff. If you feel you are unable to have your staff complete this survey, please contact me.

If your staff has questions as to the purpose of this survey, the following information may be helpful. The Superior school board recently approved a proposal presented to them regarding the use of the Superior school forest. My graduate research project involves assessing the school forest use, and identifying ways to increase availability of the site for all interested teaching staff. The enclosed survey is one method of gathering information from the teaching staff to make this possible. The feedback and suggestions that I receive from teachers will influence how curriculum and program planning progresses at the school forest.

It is not necessary for teachers to identify themselves on the School Forest Needs Assessment Survey. The only reason I would need this information is if any individual would like to be a member of the school forest planning committee.

I am requesting that the surveys be completed and returned to your office by May 15th. I will contact you after this date to arrange a convenient time for you to pick up all completed surveys. If you have any questions regarding this survey or request, please contact me at 715 394-8740.

Thank you for assistance in administering this survey.

Sincerely,

Lori Danz
School Forest Coordinator