THE PURPOSE OF THIS PROJECT WAS TO DEVELOP, IMPLEMENT, AND EVALUATE A CURRICULUM FOR AN ENVIRONMENTAL SCIENCE SUMMER CAMP FOR MIDDLE SCHOOL STUDENTS.

By

Jason L. Jansen

A project submitted in partial fulfillment of the requirements of the degree
MASTER OF SCIENCE

College of Natural Resources

UNIVERSITY OF WISCONSIN
Stevens Point, Wisconsin

August, 2002
APPROVED BY THE GRADUATE ADVISOR

Dr. Randy Champeau
Professor of Environmental Education
ACKNOWLEDGEMENTS

Thank you to my wife for encouraging me through every hoop along the way. I could not have done this without you.

Thank you to Scott Resch for being my camping buddy and study partner.

Thank you to my parents for nurturing my love of the outdoors by allowing me to discover nature firsthand.
Teachers at J.R.G. Middle School in Kimberly, Wisconsin, were provided with an environmental education curriculum guide and numerous EE resources to aid in their teaching of environmental topics. However, most teachers have not utilized these resources to their full potential. This project was designed to go beyond traditional classroom situations and supply students with an extra opportunity to experience nature first-hand. The project aimed to develop a weeklong summer school camp for middle school students and evaluate the effectiveness of the camp in raising environmental awareness and knowledge. The project included the development of curriculum focusing on three ecosystems: prairie, forest, and wetlands. One day was spent on each of the three ecosystems and an overnight camping trip ended the week. Activities were mostly hands-on and utilized local resources as living examples of the three ecosystems. Short answer response pretests and posttests were given to students to determine the effectiveness of the camp.
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CHAPTER ONE

THE PROBLEM AND ITS SETTING

Introduction

*We love (and make intelligent use of) what we have learned to understand.*

-Aldo Leopold

As cities spread out over the countryside plants and animals are becoming sacrificed for the popular modern American lifestyle. Houses sprout up almost overnight replacing pavement and lawn where fields and forests once thrived. Little thought is given to the amount of natural habitat that is consumed by every new subdivision. Most people will choose unknowingly to degrade the environment rather than inconvenience themselves in some small way. The immediate gratification of today's material world takes precedent over the long-term effects on the land. The effects of overconsumption are becoming evident in the loss of habitat and wildlife. For these reasons it is important to educate the children of today so they understand the toll that our current practices have on the land. Most schools have formal stances addressing the need for environmental education, but unfortunately fail to achieve an
adequate level of environmental literacy among their students. One possible component of a complete environmental education program is the summer camp. The summer camp can give students extra exposure to the natural world and show how humans' actions affect plants and animals. As students understand more, the likelihood of them making more Earth-friendly choices increases.

**Significance of Problem**

Section 121.02(1), Wis. Stats., requires that every school district develop a written sequential K-12 environmental education plan. Kimberly Area School District does have such a plan for its students. However, because of many issues such as limited funding, time constraints, and various personnel issues, environmental education has not been a priority (Ham and Sewing, 1987). As a general rule, environmental education is only in the classroom when teachers feel strongly enough to make it a part of their teaching (Disinger, 1998).

The Tbilisi Declaration(1977) states that environmental education should be interdisciplinary, using multiple content areas to infuse environmental topics into the curriculum. J.R. Gerritts Middle School, however, does a limited job of infusing Environmental Education into the curriculum. Most often, EE is taught only by science teachers and only when it fits into their specific curriculum. Students receive
mostly factual information regarding Ecology, Endangered Species, and the Earth Sciences. Besides two overnight camping trips in the 6th and 7th grades, few experiences in the outdoors are provided that offer meaningful connections to nature.

A summer Environmental Science camp would provide an extra opportunity to increase student’s awareness, appreciation, and knowledge of the environment. Camp students would benefit by developing a positive self-esteem, greater curiosity and interest about the environment and an increased likelihood to become more environmentally conscious citizens (Dresner and Gill, 1994). Districts that implement such an out-door camp will provide their students with a unique opportunity to experience nature firsthand, while developing people who will understand how their actions effect the planet they live on.

**The Statement of the Problem**

The purpose of this project is to develop, implement, and evaluate a curriculum for an environmental science summer camp for middle school students.
The Sub-problems

Sub-problem 1: What has research shown regarding the influence of environmental programs on students' environmental awareness and knowledge?

Sub-problem 2: What strategies and methodologies produce a positive effect on students' environmental awareness and knowledge?

Sub-problem 3: Development of the grades 6-8 environmental science summer school camp.

Sub-problem 4: Implementation of the grades 6-8 environmental science summer school camp.

Sub-problem 5: Development and implementation of an evaluation tool used to assess students' change in environmental awareness and knowledge.

The Hypothesis

Students who participate in a weeklong environmental science summer camp will increase their awareness of the outdoors and gain knowledge regarding the environment.

Limitations

- The camp is only for 6th, 7th, 8th and 9th graders.

- The camp has a short time period - only for 5 days.
-Long-term effects of the camp will not be measured.

-Participation in the camp is voluntary.

-The camp is limited to 25 students per session.

Definitions

1. Environmental Science – Activities that integrate awareness and appreciation of the environment, knowledge of environmental concepts and issues, and actions taken in response to those issues.

2. Summer Camp – A voluntary camp that encompasses 3 days and 1 overnight – 5 days total – to be held in the summer months.

3. Middle School Students – Students who are entering the 6th, 7th, 8th or 9th grade.

Assumptions:

1. There is a desire for students to attend the camp.

2. It is possible to create suitable assessment means.

3. It is possible to gather accurate assessment results.

4. Funding for the program will be available.

5. Administration will be supportive of the camp.
CHAPTER TWO
LITERATURE REVIEW

RATIONALE FOR ENVIRONMENTAL EDUCATION

The earth is an important place. Because of threats to the environment such as overpopulation, global warming, loss of habitat, and a culture of consumerism, the need for environmental education is imperative. In response to these imminent threats, the Wisconsin Department of Public Instruction has thus created a mission statement regarding environmental education so that people learn the importance and significance of the environment and ways to preserve the earth for future generations:

The goal of environmental education is to help students become environmentally aware, knowledgeable, skilled, dedicated citizens who are committed to work, individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things (WI DPI, 1994).

This main goal can then be broken down into five sub-goals of environmental education, which are (WI DPI, 1994):
Perceptual Awareness – Students develop the ability to perceive and discriminate among stimuli in their environment.

Knowledge – Students acquire a basic understanding of how the natural environment functions.

Environmental Ethic – Students develop a universal ethic on which they may act to defend, improve and sustain the quality of the environment.

Citizen Action Skills – Students develop the skills needed to identify, investigate, and take action toward the prevention and resolution of environmental issues.

Action Skills – Students gain experience in applying citizen action skills toward the prevention and resolution of environmental issues.

The aforementioned subgoals are based on the Tbilisi Declaration (1977), which provided the momentous statement on the need for environmental education and the specific goals that should addressed by instructors. Teachers can create environmentally conscious citizens by using various teaching methods that work towards achieving the 5 sub goals of environmental education.
RATIONALE FOR OUT-DOOR EXPERIENCES

One teaching method that aids in achieving the 5 sub goals of environmental education is using the outdoors as a classroom. Learning about the environment firsthand, students will gain greater familiarity and comfort with nature (Dresner and Gill, 1994). This type of education, traditionally termed “outdoor education” has been defined as education “in”, “for”, and “about” the out of doors (Ford, 1981). Learning in the outdoors is effective because the students can see, hear, touch, taste, and smell the things they are learning about. Merely holding class out of the regular classroom creates a special emphasis on the outdoors.

Informal settings offer opportunities to reach new levels of environmental learning beyond the traditional classroom (Koran and Longino, 1983). Furthermore, informal settings have a greater impact on the emotional part of students than more structured settings (Koran, Longino, and Shafer, 1983). New knowledge and beliefs gained through an environmental program may eventually lead to behavioral changes (Hungerford and Volk, 1990).

One specific type of outdoor education that is regarded as the “ultimate educational experience” is the outdoor camp, where students and teachers study in the wild for an extended period of time (Hammerman and Hammerman, 1964). The use
of an out-door-camp experience is an extremely effective tool used in teaching environmental education. Campers learn about natural processes firsthand, which leads to an increased familiarity and comfort level with the outdoors. As familiarity and comfort level increase students' knowledge of ecological systems, environmental awareness and values also increase (Dresner and Gill, 1994).

DEVELOPING INCREASED ENVIRONMENTAL AWARENESS AND KNOWLEDGE THROUGH OUT-DOOR EXPERIENCES

Summer camps are an effective method to teach environmental education. The outdoor setting allows the students to experience nature with their senses and eventually see how their individual actions can bring positive results to the camp environment. Another important finding shows that out-door educational experiences, such as a camp stay, help foster positive affective development (Crompton and Sellar, 1981). One implication of developing positive self-images in students is the obvious benefit to the student who feels good about him/herself. Another implication is the increased likelihood of a student who has a positive self-image to take positive action in response to an environmental issue (Sia et al., 1985). The significance of camp
experiences can not be overlooked. Students who attend outdoor camps benefit by achieving greater knowledge about nature, increasing their interest and curiosity about the natural world, developing a positive self-image, and increasing the likelihood of the student to take positive environmental action (Dresner and Gill, 1994). Through one activity – the out-door environmental camp - all of the goals of environmental education are met.

One important factor leading to developing awareness and increased knowledge is the active participation in camp activities. The camp program can involve activities that involve both the physical and emotional aspect of learning. Campers who participated actively in camp activities are more likely to become involved in environmental action after the experience. Campers who take part in issues investigations, meanwhile, are more likely to show positive changes in attitude and to become involved in environmental action towards those issues (Dresner, 1989).

One advantage of a camp program held in the natural environment is the flexibility of the setting in which the education takes place. Camp activities can include any number of different teaching situations. For example, students can learn indoors about a concept such as ecosystems, learn examples and attributes of different ecosystems, and then go out of doors to experience the ecosystems firsthand.
Students then can engage in an issues investigation about an ecosystem such as a wetland and the effects of encroaching residential development.

Other research has also shown how direct exposure positively influences students' awareness and knowledge of the natural world. Meg Keen studied the Sunship Earth program – a 5-day residential program conducted in a natural setting (Keen, 1991). In this study she found that students who visited the natural area in a camp setting had a significant increase in ecological knowledge. Furthermore, these visits also correlated with a positive attitude about nature. Keen concluded that direct exposure to a natural area produced an increase in positive attitudes about nature, ecological knowledge through fostering an interest in nature, and a positive attitude towards learning about nature (Keen, 1991).

DEVELOPMENT AND IMPLEMENTATION OF AN OUT-DOOR CAMP

The planning of an outdoor camp is extensive (Omernik, 1990). The purpose and mission of the camp must be determined. The goals of environmental education and the methods that these goals will be met must be considered. The number of students that will attend, and the length of stay must also be determined. When choosing an appropriate site for the outdoor experience, many factors influence the
decision (Donaldson and Schmidt, 1975). The length of the program, number of campers, types of activities taught, etc. all will effect the final choice of site. Activities that achieve the environmental educational goals will also need to be researched and chosen. Many factors influence how a camp is managed. Because of this it may be helpful to institute a strategic plan to help keep the planning and implementation of the camp going forward (Omerick, 1990).

One challenge of sound environmental education is the development of curriculum that produces the desired effect – an increased likelihood of environmental action. The number of variables found in curricula is tremendous: philosophy of the program, methodologies and teaching strategies used, etc. One aspect of curriculum development that always should be considered is the setting of the educational experience. The context of the local school, region, resources, and issues involved should be the core of educational experience (Hungerford and Volk, 1998). Students will see a relevance to their immediate world and become emotionally involved in issues that are close to their immediate experience.
ASSESSING ENVIRONMENTAL LITERACY

Environmental literacy is a term used to describe the awareness and sensitivity a person possesses concerning the environment (Roth, 1992). Assessing the effect of an out-door educational experience on the level of environmental literacy is a complicated process that must address the 3 levels of literacy (Disinger and Roth, 1992):

Nominal – The ability to recognize many basic terms used in communicating about the environment.

Functional – A broader knowledge and understanding of nature and the interactions between social systems and other natural systems.

Operational – The ability to evaluate the impacts and consequences of actions, gather and synthesize pertinent information, choose alternatives, advocate action positions and take action.

Written objective tests can determine the levels of conceptual and factual knowledge of students. The test should be given before the outdoor experience and then after to determine the change in the level of literacy. Attitudinal levels towards environmental topics can be measured using a Likert-type scale that is easy to develop, easy to use, valid, and reliable (Millward, 1975). Again, the assessment
should be given prior to the educational experience and after. Other options of assessment that will bring support to the findings include student journals, parent questionnaires, and counselor interviews (Dresner and Gill, 1994).

Many considerations must be made when gathering information on the amount of students’ attitudinal change as a result of an environmental program. Attempts at assessing the impact of such programs have always been considered quite difficult (Ryan, 1991). Parents and peers have an unquestionable influence on children’s attitudes, which inevitably poses a challenge to any educational program trying to change attitude. New attitudes must be developed around something that has some considerable meaning to the student.

SUMMARY

An outdoor camp can be a successful environmental educational experience. The extended stay out of doors brings nature to the hands of the learner creating a more sensitive, knowledgeable, and skillful person. The outcomes of such a well-planned, goals-based camp are more environmentally literate children. Students who are more environmentally literate are more likely to take action for the benefit of the earth.
CHAPTER THREE

METHODOLOGY

SUBPROBLEM ONE

Application of research regarding the influence of environmental programs on student’s environmental awareness and knowledge.

Environmental education should be a priority in today’s schools. The Tblisi Declaration reaffirms this well-documented statement. In 1977, the Tblisi Intergovernmental Conference on Environmental Education drafted this important document recognizing the need and importance of environmental education in sustaining the world’s environment. I have included in my review of literature many studies that determine that environmental education programs do positively influence students’ awareness and knowledge of the environment. Stewart Cohen states that teachers can assist students in developing responsible attitudes and knowledge (Cohen, 1992). He suggests a variety of methods that keep children active in the search for ecological problems. This awareness of the issues and knowledge of ecological concepts lays the framework for responsible actions to help the environment. Such research shows how environmental programs are effective in improving students’ awareness and knowledge of the environment.
Based on the stated research, I will be able to propose a summer school environmental program to the curriculum coordinator for approval. The program will be a positive activity for our students to participate in and an activity that will foster positive attitudes towards the environment in this community and beyond.

**SUBPROBLEM TWO**

**Strategies and methods that produce a positive effect on students’ environmental awareness and knowledge.**

There are many non-traditional methods of teaching that are effective in increasing environmental knowledge and awareness. Short, mini-lessons offer students pertinent information without turning students off to a longer activity. Using alternative sites such as parks, schoolyards, and natural areas actively engages students in the learning and allows students to see what the activity is teaching about. Hands on activities help students see the learning first hand. Also, students tend to remember activities more when they are a part of the learning. Games and simulations offer an alternative view of a larger situation. A habitat simulation about bears in the woods, for instance, may be about bears, but also teach about habitat in general. Guest speakers offer expert knowledge and experience that students tend to
accept more than a traditional lesson. All of the above techniques will offer students a fun, activity-based learning experience that will be very effective in teaching environmental education.

Educational sites also offer students unique opportunities to acquire new knowledge and awareness. Non-traditional sites such as the outdoors tend to foster an emotional connection and attachment to the specific site. Students also attain a higher level of understanding when out of the traditional classroom setting. Furthermore, students get more involved in the learning when participating in activities out of doors. Using nontraditional educational sites, coupled with a variety of activity-based experiences will provide a fun and exciting camp experience for students.

**SUBPROBLEM THREE**

**Development of the grades 6-9 environmental science camp.**

Eco Camp will be developed for students entering grades 6-9. The camp will meet for 3 half-days and will also include an overnight camping trip that will last two days(Appendix A). Age appropriate activities will be chosen that will increase environmental awareness and knowledge. Activities will be selected from a number of different teaching resources and modified to meet the specific needs of the camp.
An activity guide/journal will be developed that includes questions and activities that students can follow along throughout the day (Appendix B). Since the camp will be an enrichment class held in the summer session, keeping a high level of student interest will be a main priority. Lessons will be kept active, hands-on, and use alternative sites in the community. Since this is a school-sponsored function, the cost of the entire week of instruction will be paid for by the school district.

**SUBPROBLEM FOUR**

**Implementation of the grades 6-9 environmental science camp.**

The first step in implementing the summer camp will be to advertise the program to parents and students. The description of the course needs to be placed into the summer school packet (Appendix C) so that parents and students can determine if the camp fits their needs and interests. Also, personal invitations to interested students may ensure full enrollment.

After completing a proper amount of recruitment, the logistics of the trip will need to be addressed. The bus will need to be ordered, camping site reserved and paid for, camping equipment gathered and prepped, shopping list formed, and grocery...
trip planned. First aid kits and medication bags will be obtained to ensure we are ready for an emergency.

**SUBPROBLEM FIVE**

**Development and implementation of an evaluation tool used to assess students' change in environmental awareness and knowledge.**

The formal assessment of the amount of environmental awareness and knowledge gained due to the activities of Ecocamp will come in the form of a pretest/posttest situation. Each pretest will consist of 10 questions about each of the three ecosystems (Appendix D). The format of the tests will be short question and answer. The question will be given orally and students will supply a short written response. The posttests will be the same 10 questions as the pretest and be given after our return from the camping trip. Pretests and posttests will then be sorted and scored for environmental awareness and knowledge. An analysis of the data will determine if Ecocamp had a significant impact on the acquisition of environmental awareness and knowledge.
CHAPTER FOUR
RESULTS

SUBPROBLEM ONE - RESULTS

Application of research regarding the influence of environmental programs on student's environmental awareness and knowledge.

I designed a weeklong environmental education summer school camp, which I believed would increase students' environmental awareness and knowledge. Though I did include aspects within the curriculum that would hopefully influence their environmental behavior, I did not include this as a goal for the program due to the short timeframe of the camp. The general nature of the camp follows the guidelines of instructional emphases set forth by the Wisconsin Department of Instruction. According to this document, instruction for middle school aged students should focus on knowledge, skills, and behavior. Based on the minimal level of environmental literacy of students in past programs, the fact that students were enrolled from various schools with various backgrounds, I used the emphases for younger children, assuming that all would benefit from a cohesive program that stressed the acquisition of awareness and knowledge. Research cited in my Literature Review states that a
camp program is an effective means to raise students’ environmental awareness and knowledge.

SUBPROBLEM TWO - RESULTS

Strategies and methods that produce a positive effect on students’ environmental awareness and knowledge.

The format of Eco Camp was planned to be more informal and nontraditional for many reasons. Middle school students need to remain active in the learning process to maintain their interest. A 3.5-hour class should be broken up into smaller segments so students remain focused. Also, students just completed a year of study and expect a fun and exciting atmosphere for their summer activities. Therefore, Ecocamp activities were kept active, experiential, and utilized the outdoors as a classroom. Local examples of ecosystems were used as learning models of each type of environment, which brought some familiarity of the content to some students. The guest speaker was also quite effective as students enjoyed listening to another expert and the variety presented by another viewpoint. Students enjoyed the variety of activities that were presented to them; they were always eager to learn and willing to participate in all of the activities.
SUBPROBLEM THREE - RESULTS

Development of the grades 6-9 environmental science camp.

The camp was held the week after school let out for the summer, Monday, June 4 - Friday, June 8. Monday through Wednesday were half days running from 1:00 - 4:30. Thursday we left for our overnight camping trip, returning to school on Friday at 4:30 (Appendix A).

One of the main foci of the camp was to study various ecosystems within our community. One day was spent on each of three ecosystems: prairie, forest, and wetland. We used a portion of the day in the school facility learning about the ecosystem. Short, active lessons were gathered from teacher resource books such as Project Learning Tree (1990) and Aquatic Project Wild (1992). An activity guide (Appendix B) was also developed that contained a place for students to complete activities, answer journal questions, collect samples, and reflect on their experience. We then traveled to an area nearby that we could observe firsthand the ecosystem being studied. For instance, the first day of camp was devoted to prairie ecosystems. After a brief mini-lesson and activity on prairies in the classroom, we went out to the school playground to observe the different species of plants and animals in a large field of grass. The students recorded the different species of plants
and animals found during this activity in an activity book. Next, we biked to a nearby prairie-savanna. Here, we conducted the same studies on plants and animals as we did at the schoolyard and found many more types of species. We continued with this approach the next day with forests, and then wetlands. During the overnight camping trip, we again visited these three ecosystems in a natural setting at the park to make even more observations. Students used their journal during the overnight to record their thoughts, observations, and feelings about the many species of plants and animals observed in the 3 types of ecosystems observed.

**SUBPROBLEM FOUR - RESULTS**

Implementation of the grades 6-9 environmental science camp.

To ensure maximum enrollment in the program, short presentations about the class were given to all students entering grades 6-9. Using the description displayed in the printed summer school packet(Appendix C) we gave a short overview of the objectives of the camp and some of the activities. We emphasized the overnight camping trip and the "no fee" policy for the class. These information sessions lasted only 5-10 minutes in each morning homeroom class. We were able to visit all classes within a week. Though our time in each class was limited, much interest was
generated. Students seemed excited about learning more about this opportunity and asked many questions.

Obtaining the maximum of 25 students came quite readily. In fact, a waiting list with as many as 20 students was necessary. A week before the class started a letter was sent home welcoming the students, setting expectations, informing the parents of the timeline of activities, and notifying parents and students of necessary equipment (Appendix E). A portion of the letter was signed by student and parent and returned to class the first day.

Weeks before the start of camp planning needed to begin for the program. Activity guides were copied, guest speaker notified, bus ordered, camping site reserved, and menu formulated. Some time also had to be spent on covering liability issues. Emergency cards were gathered, permission slips collected, and student discussions on safe camping were given to all campers. Planning ahead and completing tasks early is imperative to a smooth-running camp. Camping with 25 middle schoolers requires much forethought and planning.

The cost of the camp was covered completely by summer school budget. The biggest expense to the district was staff pay. Two teachers were paid for 55 hours of summer school pay for the week. This included preparation time, planning time,
teaching time, and camping time. A third teacher was paid for 25 hours of summer school pay. This included just the overnight camping trip. Other costs included soil sample tools, bus, camping fees, and groceries, totaling approximately 400 dollars.

SUBPROBLEM FIVE - RESULTS

Development and implementation of an evaluation tool used to assess students' change in environmental awareness and knowledge.

The first day of camp we spent a portion of class completing the pretests in each of the three areas being tested: prairie, forest, and wetland (Appendix D). Since the tests took a considerable amount of time, we took one test and then participated in some short activities to break up the testing situation. I presented each question to the students orally. Students typically completed about one page of written responses for each test. After we returned from the overnight camping trip we again spent some time taking the posttests.

Each answer was given 2 possible points. An answer containing little or no validity was given a “0”.

Sample: “Describe the types of plants that live in a prairie.”

Answer: “A prairie is a small, dry place.”
Points: 0

An answer containing more knowledge of the concepts was given 1 point.

Sample: “Describe the types of plants that live in a prairie.”

Answer: “A prairie is a place that has a lot of grass. Many animals live in prairies and flowers too.”

Points: 1

An answer using scientific terms, more description, and accuracy was given 2 points.

Sample: “Describe the types of plants that live in a prairie.”

Answer: “A prairie is a dry, open field of grass and other plants. The plants have roots that dig deep into the dirt to suck up water.”

Points: 2

The pretests and posttests were scored and analyzed to determine if the camp made a significant impact on students’ environmental awareness and knowledge. The following tables display the data received from student responses:

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Table 6: Student Posttest Scores on Wetland Ecosystem

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</table>
Student scores were then analyzed to determine significance for each individual question. The following tables show the standard deviation and t-score for each question and whether there was a significant difference between pretest and posttest.

Table 7: Significance Data for Individual Forest Ecosystem Questions

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>STANDARD DEVIATION</th>
<th>DEPENDANT T SCORE</th>
<th>SIGNIFICANCE [T(dep)&gt;2.064]</th>
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<tbody>
<tr>
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Table 8: Significance Data for Individual Prairie Ecosystem Questions

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<th>DEPENDANT T SCORE</th>
<th>SIGNIFICANCE [T(dep)&gt;2.064]</th>
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Table 9: Significance Data for Individual Wetland Ecosystem Questions

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Tables 10 through 12 show students’ pretest and posttest averages for each ecosystem.

Table 10: Student Pretest and Posttest Averages for Forest Ecosystem

![Bar chart showing pretest and posttest averages for each student.](chart.png)
Table 11: Student Pretest and Posttest Averages for Prairie Ecosystem

![Bar chart showing pretest and posttest percentages for 25 students.]

Table 12: Student Pretest and Posttest Averages for Wetland Ecosystem

![Bar chart showing pretest and posttest percentages for 25 students.]

Averages were then determined for each ecosystem and significances were determined for each group of data. The following tables display this data.

Table 13: Significance Data for Forest Ecosystem

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<th>FOREST QUESTION</th>
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Table 14: Significance Data for Prairie Ecosystem

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<th>PRAIRIE QUESTION</th>
<th>PRETEST</th>
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standard deviation=8.92
total t(dep)=6.79
significance[t(dep)]
p=.05 yes

Table 15: Significance Data for Wetland Ecosystem

<table>
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<th>WETLAND QUESTION</th>
<th>PRETEST %</th>
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- standard deviation=7.45
- total t(dep)=9.58
- significance[t(dep)]
- p=.05
- yes

Each student also kept a journal in which they completed educational activities, answered questions, and recorded thoughts and observations about the ecosystems. Journals contained many interesting comments that supplied a more informal means of assessment. Students made comments that displayed a great awareness in some instances. For example, a young girl supplied an answer to a journal question about a wetlands that we studied near our camping site:

"Before they built a house acrossed the street from my house there was a swamp. We used to always play there. There used to be a swamp—with frogs and toads. They dug it out, and built a house."

Though the journal was not included in any part of the formal assessment, it provided many insights about the amount of awareness and knowledge of environmental concepts and issues that the students gained throughout the week of Ecocamp.
After completing an analysis of the data compiled from student surveys, the hypothesis that Ecocamp would positively influence student knowledge and awareness of the environment can be supported. Each of the three combined tests determined a significant influence on the three identified ecosystems. Also, 26 of 30 individual questions displayed a significant amount of influence on student acquisition of knowledge and awareness.

After reflecting on the entire process of planning, developing, implementing, and assessing Ecocamp, there is much evidence that the program is worthwhile. I feel the students benefited greatly from being exposed to the outdoors in a unique camping situation. Chaperone feedback was also positive. Comments such as, “It’s surprising how much these kids know once you get them outside,” reflect the influence of the camp. Some recommendations for adjustments and improvements can be made to ensure the program continues to maintain a high quality of environmental education.

The camp can only run if there is student interest. Therefore, appropriate “advertising” must continue in order to maintain high enrollment numbers. The class
description must be printed in the district summer school offerings booklet. The booklet allows parents and students to see what is available for summer activities. Also, a separate flyer sent home with district mailings might be effective so that parents see the camp as an extra offering. The short class presentations that we gave in each homeroom were quite effective in telling about the camp and generating quite a bit of enthusiasm about the camp. Direct student contact discussing the opportunity proved critical for maximum enrollment. To ensure district-wide coverage, an article in the district newsletter is excellent positive exposure.

The evaluation tool used to gather data throughout this study was a short, written response pretest and posttest. To gain a more comprehensive assessment more evaluation techniques should be utilized. Ecocamp students used a journal, but the responses were never used in a formal assessment. A scale could be developed, using responses and reflections in student journals, to determine the change in environmental knowledge and awareness. Other types of questions such as multiple choice, true/false, and scaled question and answers should be utilized to get more accurate results. I used strictly short, written answers for each question. This became a bit tedious for students since they had to complete 30 of these questions for the pretest and again for the posttest. The tests need to be made shorter to hold the
attention span of middle school students. I also recommend that the number of short
answer questions be mixed with some multiple choice and true/false. Scoring
accuracy would be improved since the answers would not be solely judged in a
subjective manner and the length of the testing situation would be shortened.

Activities during the daycamp portion of the program ran rather smoothly.
The entire day consisted of hands-on, experiential learning in an outdoor setting. The
only recommendation for this part of camp is to continue to discover new activities
for students to be engaged in actively. The students are in “school” during summer
and they respond much better when they are involved in the learning. Also, holding
class at different sites within the community was very effective. Students were
familiar with the sites and sometimes visited the areas giving the learning special
interest. Inviting a specialist in for a presentation also was an effective way to keep
students’ interest. Students look forward to hearing different viewpoints and different
voices regarding the topic of discussion.

Activities during the overnight could be more structured. I left the majority of
time during the overnight for exploratory learning. I did not teach specific lessons.
When we came upon an area of interest we stopped and talked about it. The area had
excellent examples of each ecosystem. For the most part this type of scenario worked
well. We stopped, for instance during a hike around the lake to discuss an area where a creek fed into the lake, producing a wetland. The class understood how this area could “soak up” high water during flood conditions. The students however, were more excited to be out of doors, run down wooded trails, and fish. They did not have much patience to sit very still and quiet to learn about the different types of soil of each ecosystem. However, short structured activities around each ecosystem could show students real-life examples of each environment and the different organisms that inhabit them.

Overall, the camp was a great success. I plan to continue the camp implementing the above recommendations. The school district also seems to be pleased with the class. I have received every indication that the program will be allowed to continue – barring budget issues - giving students an extra opportunity to learn more about the outdoors.
BIBLIOGRAPHY


APPENDICES
ECOCAMP SCHEDULE

MONDAY (1-4:30)
What is an ecosystem?
3 types of ecosystems
Hoola Hoop Habitat Activity – school yard and prairie
Bird count
Counting Creepy Crawlys
Soil Samples
Daily scavenger hunt

TUESDAY (1-4:30)
What is a wetland?
What is the value of a wetland?
Guest speaker on wetlands
Building a wetland model

WEDNESDAY (1-4:30)
What is a forest?
Hoola Hoop Habitat Activity – forest
Bird count
Counting Creepy Crawlys
Soil Samples
Making a new friend
Blind-fold Forest Walk Activity
Tent set-up and equipment check
Expectations for camping trip

THURSDAY
1:00 – arrive at school, begin loading bus
1:30 – leave school
3:00 – arrive at camp and set up
4:00 – explore camp
5:00 – dinner
6:30 – group activities
8:30 – campfire/snacks
10:00 – night hike
10:30 – lights out

FRIDAY
8:00 – breakfast
9:00 – group activities
11:00 – lunch
12:00 – pack up and load bus
12:30 – group activities
2:30 – load bus and depart
4:00 – arrive back at school
APPENDIX B

CAMP JOURNAL/ACTIVITY GUIDE
ECOCAMP 2001 ACTIVITY BOOK

NAME

MONDAY
What is an ecosystem?
3 types of ecosystems
Hoola Hoop Habitat Activity – school yard and prairie
Bird count
Counting Creepy crawllys
Soil Samples
Daily scavenger hunt

TUESDAY
What is a wetland?
What is the value of a wetland?
Guest speaker on wetlands
Building a wetland model

WEDNESDAY
What is a forest?
Hoola Hoop Habitat Activity – forest
Bird count
Counting Creepy crawllys
Soil Samples
Making a new friend
Blind-fold Forest Walk Activity
Tent set-up and equipment check
Expectations for camping trip

THURSDAY
Leave for Hartmann Creek State Park
Activities at the park

FRIDAY
Activities at the park
Leave park, arrive home about 4:00
DAY ONE

What is an ecosystem? ____________________________________________________

Describe the 3 ecosystems that we will study this week:

A. __________________________

B. __________________________

C. __________________________

Which ecosystem do you think will have the most plant and animal life? Why? _______

Do you know the location of one of these ecosystems? Which ecosystem and where is it?

_________________________________________________________________________
HOOLA HOOP HABITAT – SCHOOL YARD

How many animals (insects, worms, etc.) did you find in your area? ________________

Name the animals you discovered: ____________________________________________

How many different types of plants did you find in your area? ________________

Name as many types of plants that you found: __________________________________

________________________________________________________

Select 2 samples of plants from your area and tape them on the back of this page. Label them if you can.

**Bird Count** – Remain very still and quiet for 5 minutes. Count the total number of birds you hear or see. Keep a tally.

Total number of birds: ______

How many different types of birds did you hear? ______

Name the birds that you saw or heard: ____________________________________________

**Soil Sample** – Examine your sample of soil. Separate the plants that were living, the dead plants, rocks, sand, and soil into separate piles.

Describe the sample of soil: __________________________________________

________________________________________________________

**Counting Creepy Crawlys** – In 5 minutes search for and count as many insects as you can. Keep a tally.

Total number of insects: ______

How many different types of insects did you discover? ______

Name the types of insects you saw and how many of each: _______________________

________________________________________________________
Is the school yard a diverse habitat? Explain.

What would make this habitat more diverse? Explain.
How many animals (insects, worms, etc.) did you find in your area? ________________

Name the animals you discovered: ____________________________________________

How many different types of plants did you find in your area? ________________

Name as many types of plants that you found: __________________________________

Select 2 samples of plants from your area and tape them on the back of this page. Label them if you can.

**Bird Count** – Remain very still and quiet for 5 minutes. Count the total number of birds you hear or see. Keep a tally.

Total number of birds: ______

How many different types of birds did you hear? ______

Name the birds that you saw or heard. _______________________________________

**Soil Sample** – Examine your sample of soil. Separate the plants that were living, the dead plants, rocks, sand, and soil into separate piles.

Describe the sample of soil: _______________________________________

**Counting Creepy Crawlys** – In 5 minutes search for and count as many insects as you can. Keep a tally.

Total number of insects: ______

How many different types of insects did you discover? ______

Name the types of insects you saw and how many of each: ________________________
Is the prairie a diverse habitat? Explain.


Compare the prairie ecosystem with the school yard.
HOOLA HOOP HABITAT – FOREST

How many animals (insects, worms, etc.) did you find in your area? ________________________________

Name the animals you discovered: ____________________________________________________________

How many different types of plants did you find in your area? ________________________________

Name as many types of plants that you found: __________________________________________________

Select 2 samples of plants from your area and tape them on the back of this page. Label them if you can.

**Bird Count** – Remain very still and quiet for 5 minutes. Count the total number of birds you hear or see. Keep a tally.

Total number of birds: ________

How many different types of birds did you hear? ________

Name the birds that you saw or heard: _________________________________________________________

**Soil Sample** – Examine your sample of soil. Separate the plants that were living, the dead plants, rocks, sand, and soil into separate piles.

Describe the sample of soil: _________________________________________________________________

**Counting Creepy Crawlys** – In 5 minutes search for and count as many insects as you can. Keep a tally.

Total number of insects: ________

How many different types of insects did you discover? ________

Name the types of insects you saw and how many of each: ________________________________________
Is the forest a diverse habitat? Explain.

____________________________________________________________________

Compare the forest ecosystem to the prairie.

____________________________________________________________________

ADOPT A TREE

After the Blind Fold Forest Walk Activity observe your tree closely. Look at the leaves, bark, height, shape, branches, and surrounding area. List as many descriptive words about your tree as you can. Create a Haiku poem. Do a leaf rub, a bark rub, a sketch of your tree; be able to describe it to someone else.
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<thead>
<tr>
<th>LITTER</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>COLORFUL LEAF</td>
<td>INTERESTING TWIG</td>
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<tr>
<td>Seed</td>
<td>Feather</td>
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<td></td>
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<tr>
<td><strong>Natural Object – Living</strong></td>
<td><strong>Natural Object – Non Living</strong></td>
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</table>
DAILY SCAVENGER HUNT – DAY THREE
Tape as many of the following objects in your journal that you can find. Please label the items and write an explanation about what it is, where it was found, and any other interesting things you can add.

<table>
<thead>
<tr>
<th>LITTER</th>
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<tbody>
<tr>
<td>COLORFUL LEAF</td>
<td>INTERESTING TWIG</td>
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<td>SEED</td>
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<table>
<thead>
<tr>
<th>NATURAL OBJECT – LIVING</th>
<th>NATURAL OBJECT – NON LIVING</th>
</tr>
</thead>
</table>
**KIM-M2 Eco-Camp**
Students will learn about three different ecosystems around the surrounding area. Each day students will participate in hands-on, outdoor activities while learning about an ecosystem – prairie, forest, and wetland. Activities such as creek critters, marsh madness, hula hoop habitat, the blind forest walk, and various nature craft projects will bring students closer to the natural world around them.

Students will apply this new knowledge to a one-night camping trip to Hartmann Creek State Park.

Some camping equipment needed (tent and sleeping bag). No cost!

**Location:** J.R. Gerritts Middle School Rm 221
**Instructors:** Kurt Scholz and Jason Jansen
**Date/Time:** June 4-6 1:00-4:30
Overnight trip leaving June 7 at 1:00 returning June 8 at 4:00

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**KIM-M3 Beginning Band**
Open to all students in grades 5 and 6 with no previous band experience. A presentation on the beginning band program will be given to students in May. Each interested student will be tested on the instruments at that time to determine which instrument is suitable for them. Registration forms will be distributed at the May meeting.

**Dates:** August 6-10
August 13-17
**Instructors:** Carol Lenz and Mary Jean Shimek

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**KIM-M4 Intermediate Band**
A summer band registration form will be sent home with the students that are currently enrolled in the 5th Grade Band program in Kimberly. It is to be returned to the band director at each school.

**Dates:** August 6-10
August 13-17
**Instructors:** Carol Lenz and Mary Jean Shimek

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**KIM-H1 Summer Band Camp**
This two day August camp is required for all high school band members to prepare for the school year. The focus will be on marching fundamentals and study of the homecoming field show music. Please consult the music department calendar for times.

**Dates:** August 22 & 23
**Instructor:** Craig Gall

---

**Summer School Band Classes**
**Daily Schedule**
(same for both classes)

- **Percussion**..............9:00-9:45
- **Trombones**..............9:45-10:30
- **Trumpets**................10:30-11:15
- **French Horns**............11:15-11:45
- **Saxophones**.............12:15-1:00
- **Clarinets**..............1:00-1:45
- **Flutes**....................1:45-2:30
- **Baritones**..............2:30-3:00

**Location:** Westside Elementary
**Music Room**

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Registration is April 3 – May 4, 2001
APPENDIX D

PRETESTS AND POSTESTS
1. What is wetland?

2. Give two examples of a wetland type.

3. Describe a wetland that you have visited.

4. Name a plant that lives in a wetland and describe an adaptation that helps it survive.

5. Name an animal that lives in a wetland and describe an adaptation that helps it survive.

6. What percentage of wetlands has been destroyed since 1900?

7. List ways humans use a wetland.

8. List two ways that wetlands are helpful to the environment.

9. What groups do you know of that help protect wetlands? How do they help?

10. Do you feel that wetlands are important? Why or why not?
1. What is a prairie?

2. Describe the types of plants that live in a prairie.

3. Name a prairie plant and describe an adaptation that it has that helps it survive.

4. Name two animals that live on a prairie.

5. List two reasons why prairies are helpful.

6. Do you know people who plant prairies? Why do they plant them?

7. What percentage of Wisconsin was covered by prairie in 1800?

8. What percentage of Wisconsin is covered by prairie now?

9. What new things have you learned about prairies?

10. Do you feel prairies are important and should be protected? Why or why not?
PRE/POST TEST – ORAL
FOREST

1. What is a forest?

2. Describe the plants that live in a forest.

3. Name an animal that lives in a forest and describe an adaptation that helps it survive.

4. How does this animal use the forest? Be specific.

5. What is an “old growth” forest?

6. How much old growth forest did Wisconsin have 100 years ago?

7. How much old growth forest survives in Wisconsin now?

8. Name 3 ways humans use the forest.

9. How do humans try to protect forests?

10. Do you feel that forests are important and should be protected? Why or why not.
APPENDIX E

PARENT LETTER
Dear Parents,

Ecocamp Summer Class has begun. The following packet contains information about our daily schedule, necessary supplies, safety issues, and expectations. Please read it with your camper, sign, and return the bottom portion for tomorrow’s class. Thank you very much!

Ecocamp is an activities-based study of ecosystems. We will study 3 ecosystems – the prairie, forest, and wetlands – throughout the week. We plan to bike to nearby areas where students will participate in activities directly in the various ecosystems. During our overnight camping trip we will again participate in activities focussed on the 3 ecosystems. We will be camping at Hartmann Creek State Park in Waupaca.

Hartmann Creek State Park
Waupaca
Group site #2
715 – 258 – 2372

EQUIPMENT
The following is a complete list of gear. If your child does not have an item please try to borrow it or we will make arrangements to find it for them to use. Bikes will be needed every day except Thursday and Friday.

-tent(or a friend with a tent that you can stay with)
-sleeping bag       -swim suit
-fishing pole(?)    -flashlight
-watch            -rain gear
-healthy snacks    -camera/binoculars(?)
-clothes for warm and cool weather
-1 small duffel bag/suitcase with camp gear
-sunscreen/bug stuff

****DO NOT BRING:
-hatchet/ax    -knife       -any electronic device(radio, Gameboy, etc.)
FOOD
Campers may pack a light snack and drink for day activities if they wish. All meals and drinks on the overnight will be planned and provided by us. Snacks may be packed if campers wish.

SAFETY
During this camping experience, campers will experience many fun activities. However, camping can become dangerous if safety rules are not followed. We will teach proper and safe camping techniques that we expect all campers to follow.

Ecocamp should be a fun adventure for all participants. For this reason, inappropriate behavior will not be tolerated at any time. Parents will be asked to pick up their child should the need arise. Thank you for your understanding and cooperation.

Thank you very much!

Mr. Jason Jansen
Mr. Kurt Scholz

I UNDERSTAND AND AGREE WITH THE EXPECTATIONS OF ECOCAMP.

CAMPER____________________ PARENT____________________