

**DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF
INTERGENERATIONAL NATURE-BASED PROGRAMS AT
SCHMEECKLE RESERVE**

By
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A Thesis

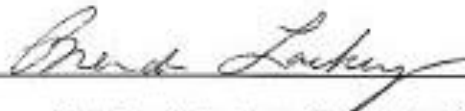
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**MASTER OF SCIENCE
IN
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(ENVIRONMENTAL EDUCATION AND INTERPRETATION)**

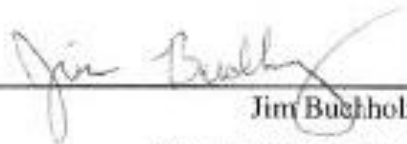
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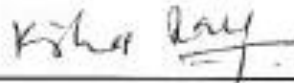
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ABSTRACT

Natural and cultural history programs serve as a learning tool and social outlet for visitors, yet the Stevens Point, WI area does not have many available during summer months. Schmeckle Reserve, a natural area associated with the University of Wisconsin – Stevens Point, found that stakeholders are interested in program offerings in the summer. A series of summer programs was developed and evaluated to determine the best ways to engage intergenerational groups during nature-based programming to influence behavior change that will potentially increase participation in outdoor activities. The program content focused on using group based activities to explore various habitats found in the Reserve to study interactions between group members through a qualitative approach. Thirty-seven individuals participated in programs. Sixteen participants were adults and twenty-one were youth. Throughout this research, observations, focus groups, murals, and post-program interviews were used to collect data. This information provided insight into family interactions as well as their experiences during the program. The programs were successful in providing an overall positive experience for participants and exposing them to various habitats at Schmeckle Reserve. The study found that intergenerational groups are best engaged through physical learning and exploration. Using a variety of techniques during programming helps reach all types of learners. Participants from this study went on to explore more outdoor areas on their own or reviewed information from programs. Additional nature-based programs given in the winter or skill-based programs could benefit the residents and visitors in the Stevens Point area.

KEYWORDS: Intergenerational groups, nature-based programs, program development, interpretation, environmental education

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CHAPTER I: INTRODUCTION TO THE STUDY

In a time when technology and the fast-paced world pull us away from the outdoors, nature centers, schools, and other natural resource entities are working to connect people with the natural world. Using various tools and strategies, groups from the local to federal level are fighting nature deficit disorder. National programs such as No Family Left Inside and Every Kid in a Park are just some of the many ways groups are trying to get people outdoors. Nature centers can develop their own nature-based programming. To make sure those efforts are effective, this study uses Schmeckle Reserve, a 280-acre natural area that is part of the University of Wisconsin - Stevens Point, as a case site to determine what techniques best engage intergenerational groups outdoors.

PROBLEM STATEMENT

The development, implementation, and evaluation of a summer program series at Schmeckle Reserve was used to determine the best ways to engage intergenerational groups during nature-based programming to influence behavior change that will potentially increase participation in outdoor activities.

SUB-PROBLEMS

This research looked at three sub-problems:

Sub-Problem 1: The first sub-problem was to create a nature-based series of summer programs for intergenerational audiences at Schmeckle Reserve using environmental education and interpretation goals and principles and to advertise to encourage program participation.

Sub-Problem 2: The second sub-problem was to design and conduct a method of evaluation to test the program's success as an addition to Schmeckle Reserve programming.

Sub-Problem 3: The last sub-problem was to determine what the results mean for Schmeckle Reserve and provide recommendations to decision makers.

SIGNIFICANCE OF STUDY

The importance of this study is to (1) develop nature-based programming for intergenerational populations that encourage group learning and discovery, (2) determine factors necessary in developing, implementing, and evaluating a new intergenerational program, and (3) provide other nature centers and educators with a case study of planning and developing intergenerational programs. Even with various types of natural and cultural history programming offered in the Stevens Point area, Schmeckle Reserve staff have seen an increase in requests for more programs to be provided. In Swatek's (2015) study, a demand was identified to increase programming for youth and community audiences in and around Stevens Point. Although many needs were found, decision makers felt that increasing summer programming, which homeowners in the area indicated as important, would be most feasible and cost effective for the Reserve.

LIMITATIONS OF STUDY

1. Data collection was limited to the participants involved in the six programs presented in summer of 2016.
2. The results are only generalizable to the group of participants who were sampled during the 2016 programs.
3. The programs targeted children 4 to 10 years of age.

4. The programs targeted groups that had at most a ratio of 4 children to 1 adult or at most 2 adults to 1 child.
5. The researcher was not able to remain disconnected from participant experiences during all programs.

DEFINITIONS

Intergenerational Group – A group of program participants that represent more than one generation and for the purpose of this study participants were made up of either a maximum ratio of 4 children to 1 adult or a maximum ratio of 2 adults to 1 child. These individuals may include more than just family members (e.g. a family group, guardian with youth, Big Brother, Big Sister, etc.)

Nature-Based Programming – An interpretive or environmental education program that focuses on content related to the natural world

Nature Deficit Disorder - The decrease in humans connecting with and spending time outdoors from generation to generation which may influence how someone perceives the natural world (Louv, 2005)

Thought Listening - A method for assessing the extent to which an interpretive product provokes thoughts in an audience (Ham, 2013)

Zone of Tolerance – A subjective area within which an interpreter judges the thoughts provoked by an interpretive product to be acceptable (Ham, 2013)

CHAPTER II: LITERATURE REVIEW

This chapter reviews literature about benefits of nature-based programming, intergenerational learning, differences and similarities between environmental education and interpretation, program series development, and program evaluation through a qualitative methods approach.

BENEFITS OF NATURE PROGRAMMING AND PEOPLE'S INTENTION TO PARTICIPATE

With the world becoming more disconnected from nature (Louv, 2005), it is important to get people outside or at least thinking about their environment. Nature has positive effects on humans, some of which can be seen in a study Ulrich (1984) conducted focusing on surgery recovery patients and the view from their hospital room. It was found that those patients who had a clear view of trees, versus those who could see only a brick wall, had a less negative attitude during recovery and needed lower doses of painkillers. Nature-based programming is one way to expose people to the outdoors. Nature-based programming provides an opportunity to connect with nature, whether actually being out in it or watching nature videos or other nature related media. In a study by Mayer et al. (2009), participants were separated into three groups and taken into an outside natural area, to an outdoor urban setting or exposed to nature through video. The study revealed that exposure to nature can increase emotional well-being and even help individuals reflect on issues in their lives. Physically being in an outdoor setting had greater effects than viewing it through videos.

This study used the Theory of Planned Behavior (TPB) (Ajzen, 1991) as a foundation for the project's development. This theory has roots from the Theory of

Reasoned Action (TRA) (Fishbein & Ajzen, 1975). TRA looks at behavioral beliefs, what a person believes about the consequences of a behavior, and normative beliefs, how an individual thinks others would want them to perform a behavior. The theory takes into account that people use the knowledge they have about a behavior, whether this information is indeed accurate, to help determine if they should do this behavior. They use the information to develop a positive or negative attitude towards the behavior. TPB goes one step further and looks at the control one has over a behavior. The theory looks at whether individuals feel they have the skills, knowledge, and ability to perform a behavior. Orzanna's (2015) visual representation of TPB in Figure 1 shows that whether an individual sees a behavior as positive or negative, how others may see performing a behavior, and how much control a person has over a particular behavior affect a person's intention to go through with a behavior. In this study, the behavior being looked at is the intention to get outside more with intergenerational groups. Programs gave the opportunity for participants to have an experience getting outdoors. The goal was to give participants a positive experience. This could affect their attitudes towards getting outdoors. Another component affected by this program was the perceived behavioral control. Programs gave participants an opportunity to experience different outdoor activities with an educator. After programming was complete, the hope was that participants would feel comfortable doing these activities on their own.

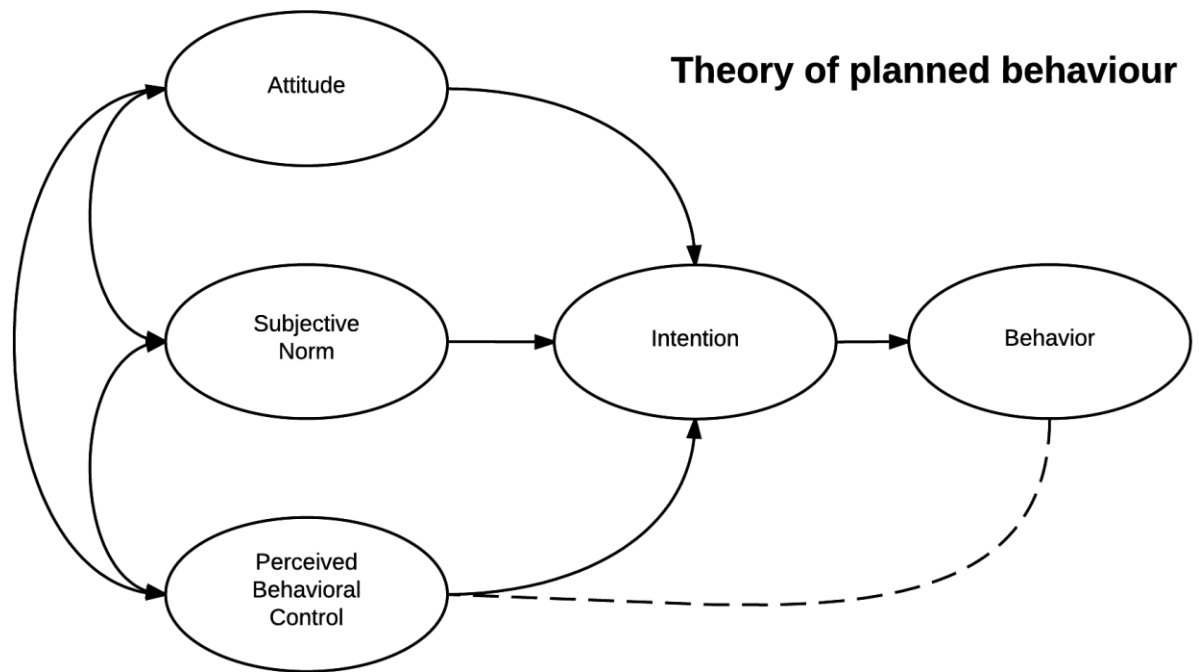


Figure 1. A visual representation of the Theory of Planned Behavior (Orzanna, 2015)

When it comes to nature-based programming, the educators or interpreters are not just passing along facts about a topic; interpreters aim to provoke the audience to expand their knowledge and make connections with the world around them (Tilden, 1977). It is not only the intellectual and emotional benefits interpreters are interested in. Nature programming also has the potential to help visitors appreciate the natural world around them, which could lead to a change in their behaviors to help protect it. Ham (2009) looked at a well-known phrase to determine how interpretation can really help people understand, appreciate, and protect the world around us.

Through interpretation, understanding; through understanding, appreciation; through appreciation, protection. – anonymous U.S. National Park Service ranger

Ham points out that an interpreter's goals are not to teach, but rather to provoke thoughts in visitors about the site's resources. He explored the Elaboration Likelihood Model (Petty & Cacioppo, 1986) to illustrate that those thoughts can lead visitors to create personal connections with the subject. These connections do not necessarily mean that visitors remember the facts presented, but rather "what the message meant to them." From these thoughts, people form beliefs that lead to the development of an attitude toward a subject. How a person feels about a subject can influence any behaviors they develop toward it. If visitors have positive attitudes associated with a certain behavior, they are more likely to participate in this behavior. Interpreters have the opportunity to pass on information that helps visitors connect with their environment and see what they can do to protect it. A first step can be getting those visitors to attend outdoor education programs.

INTERGENERATIONAL LEARNING

There are many methods one can choose when developing a nature-based program, so a careful plan should be created based on the needs of the audience and what is being interpreted (Edwards, 1994). This study focused on developing a program series for intergenerational groups. When working with these groups, it is important to keep in mind the reasons they may be participating in your program. As a family or social unit, they may be just as focused on spending time together as the learning aspect of a program (Buchholz et al., 2015). When planning programs for these groups, Buchholz et al. (2015) point out that the presenter should use various techniques to teach the different ways people understand material and age groups in the audience. Some ways in which one can target different learning styles and ages is by using more images for visual-spatial

learning, build models for bodily-kinesthetic learners, or do listening activities for those more musical. For young children, one might include tactile options at their program (fur, rocks, etc.), songs or stories, or exploration activities.

Two youth age groups were targeted for this research: pre-operational and concrete operations. According to Piaget's theory of cognitive development (1964), the pre-operational stage (ages 2-7) is the beginning of symbol and word associations. Youth have begun to speak at this stage. During this stage, it is important to allow children time to listen to stories, sing, and talk to others. When playing, children in the pre-operational stage role-play. They may play the role of cowboy or astronaut. They may use props to assist in becoming different characters. For example, a box may be a space ship. After this stage youth enter the concrete operations stage. In this stage children begin thinking logically. They develop inductive reasoning, which means they can determine a general idea from specific pieces of information. Children begin understanding amounts, whether quantities or volumes. This should be used to the advantage of an educator. Simatwa (2010) suggests using concrete materials to help youth understand abstract concepts. Like the pre-operational stage, youth should be given time to talk to others.

When interacting in a group setting, individuals learn differently than on their own. Zimmerman et al. (2013) found that members of a family play different roles during an educational program. This was discovered by looking at how a family makes use of magnifiers (binoculars, hand lenses, bug boxes) while participating in a public nature walk. Members helped one another understand different aspects of the program and provided different levels of information. For example, some members suggested the use of the magnifier to better understand what the group was observing, while others would

play the teacher role and help with use of the magnifiers within their group. The roles participants played could result from prior knowledge or allowing for discussion to take place for better understanding. Zimmerman et al. (2014) looked at what learning processes are used when families participate in natural resource programs. This particular study involved families participating in a birds of prey program and then drawing the bird's habitat. Observations, surveys, and interviews were used to collect data. Researchers found that families used prior knowledge to better understand the topic. Interacting with one another during activities led to everyone discussing the topic and participating equally. Liu and Kaplan (2006) looked at a different perspective of intergenerational programming. In this study, senior volunteers helped with an outdoor school program. The seniors were asked to simply participate in the program. It was found that students felt the seniors brought a lot of knowledge to the program. Researchers also observed that the seniors were able to not only increase the amount of information in the program, but also shed light on topics from their personal experience. For example, one senior talked about her experiences with environmental issues in the past. This helped the children see how long some environmental concerns have been taking place. Whether a family unit or an unrelated group, intergenerational programming shows how different individuals play diverse roles in the learning process.

ENVIRONMENTAL EDUCATION AND INTERPRETATION

The terms environmental education and interpretation are often used interchangeably, yet there are differences. When looking at the goals, objectives, and principles of both, one is able to see the differences and similarities. Environmental education is “a process aimed at developing a world population that is aware of and

concerned about the total environment and its associated problems, and have the attitudes, motivations, knowledge, commitment and skills to work individually and collectively towards solutions of current programs and the prevention of new ones” (UNESCO, 1977). Interpretation is “a communication process that guides visitors to discover meaning in objects, places and landscapes” (Buchholz et al., 2015). Freeman Tilden (1977) developed six principles of interpretation. Environmental education is based more in education, while interpretation is based more in recreation. One principle found in both fields is to relate the content to the audience’s experiences or community. Both processes are art forms that require using multiple skills and disciplines to deliver a message, and content should be tailored to the age group of the audience.

While containing many similarities, these two processes are different.

Interpretation and environmental education aim to provoke the audience to think about the topic, but environmental education generally has clear objectives that need to be met during a program to help create a more environmentally responsible individual. As a recreation or leisure-based activity, interpretation has different types of goals. These may include using the program theme and various interpretive techniques to connect the visitor with the resources presented, hopefully inspiring participants to protect those resources, and provide a different type of recreational opportunity for visitors to enjoy the site and/or enjoy the social aspect of the program. Environmental education programs target certain age groups depending on the program being given, while interpretation often focuses on a mixed-age audience. The intent of environmental education is that an individual will build on their knowledge over a long period of time. Interpretation is generally a short-term experience. Audiences may participate in programs for various

reasons. An environmental education program is often made up of a captive audience that is part of a school field trip or classroom, whereas those participating in an interpretation program are typically there of their own free will, choosing which recreational activity they will participate in (Buchholz et al., 2015; Ham, 2013; Tilden, 1977; UNESCO, 1977).

In this study, a mixed approach was used in the development of programming. The series of programs mainly followed an interpretive form of thematic program development, with the addition of a few learning objectives. This allowed the researcher and Reserve staff to see what participants took away from the messages presented. The researcher also aimed program content at a certain age group range, which helped when developing the programs and objectives (discussed in the Program Series Development section).

PROGRAM SERIES DEVELOPMENT

The aim of this study was to develop family friendly programs that allow for bonding and connecting between family or group members, while also encouraging them to feel comfortable during outdoor activities. For this to occur, the program not only had natural resource content, but also allowed for free time and personal exploration of the topics. To do this, programs needed to be longer than an average interpretive program. The programs for this study were designed using techniques and principles described in *The Interpreter's Guidebook* (Buchholz et al., 2015) and *Outdoor Education: Methods and Strategies* (Gilbertson et al., 2006). *Outdoor Education: Methods and Strategies* helped with the development of lesson plans and objectives for each program. *The Interpreter's Guidebook* helped in the development of theme planning worksheets for

each program, focused on specific audiences, and provided ideas for connecting with the audience, such as the types of props and techniques to use. The theme planning worksheet also helped when developing the theme of the program. According to Buchholz et al. (2015), “a theme states specifically and concisely the main idea you hope to convey to your audience.” This statement helps connect the tangible resources with the intangible meanings that can be associated with them. A theme statement was created for each program.

PROGRAM EVALUATION

To determine the success of this program series, evaluation tools were used. Ballantyne et al. (2001) looked at six different education programs, formal and non-formal, with a range of topics. Participants of these programs were students ranging from 5th to 12th grade. Students were asked to complete questionnaires, and some agreed to phone interviews about the programs. Parents were also asked to fill out a questionnaire. Information about environmental knowledge, attitudes, enjoyment of programs, and other topics were collected. In a previously mentioned study, Zimmerman et al. (2014) used observations, surveys, and interviews to help determine the learning processes used when families participate in nature-based programs.

There are also guides and toolkits that can be used. The *Fearless Evaluation Manual* (Post, 2012) looks at different forms of evaluation that can be used during the different stages of program development and implementation, along with evaluation for media. This particular resource was used to generate questions and ideas for the current research. A guide called *Measuring the Success of Environmental Education Programs* was published by Canadian Parks and Wilderness Society, The Sierra Club, and Global

Environmental and Outdoor Education Council to help evaluate environmental education programs (Thomson & Hoffman, 2005). This guide helps educators understand the reasoning behind evaluating programs, what evaluation is, and how to evaluate a program.

This study looked at intergenerational groups participating in nature-based programming. To gather information that shows how this population interacts together, the researcher used observations as a source of data collection (O’Leary, 2010). When using this method, there are many things to consider. Will the researcher be removed or immersed/participating? Will participants know they are being observed and understand the study being conducted? What types of data collection will be used: pre-determined checklists or a log of what is seen? Not only does the researcher have to consider all of these items, but should also work to remove their bias from recordings made and assure that participants are comfortable with the type of observations. There should be a systematic way of taking field notes. This may include developing shorthand to quickly jot down notes in the field (Mack et al., 2005). Mack et al. (2005) also recommends expanding notes as soon as possible after observations are made.

Using observations in a study is normally only one piece of the evaluation process. This may be because the information gathered is only what is observed by the researcher. To help validate this information, additional methods are used (Mack et al., 2005). For the current research, a focus group was used after each program to help validate the information collected in the study. A focus group is a group interview that includes open-ended questions to address a certain topic (O’Leary, 2010). There are various options to consider when planning a focus group. For example, will the

researcher conduct the interview in a formal manner or relaxed? Will the interview be highly structured? How will the researcher keep biases at bay? How will the researcher be sure that questions will be interpreted correctly (O'Leary, 2010)? Researchers also have to keep in mind that time and effort goes into being a good moderator and make sure to have a plan for collecting information (Mack et al., 2005). When moderating, the researcher must remember the role they are playing in this group and listen more than talk. They also need to consider whether only note taking will be used to collect data, or if the use of a recorder will come into play. After data is collected, themes that emerge from the information are coded.

Not only were the above-mentioned methods included in the current work, but also a less complex method called thought listening was used to determine the program success (Ham, 2013). When using thought listening, the researcher looks at the zone of tolerance they have set for a given theme and asks participants questions about the messages they feel the program portrayed. The researcher may be using an unrestricted (visitors are not pushed to think a certain way), wide (slightly pushed towards a certain way of thinking) or narrow (leave thinking about one specific thing) zone. The researcher listens to each individual's thoughts and, if the participant's answer reveals the meanings the program developer had intended, that answer is considered to be in the zone of tolerance.

To help determine what content the youth grasped during the program, the researcher asked all youth to participate in a mural activity. Art/drawings has been one way used to determine what information a child gains from certain experiences.

Anderson et al. (2014) used a Draw-A-Plant Instrument based off the Draw-A-Scientist

instrument. The researchers were looking to see what information is shown through images after young children (kindergarten and 1st graders) experience a lesson or reading regarding a certain topic. In their study, youth were asked to draw the different parts of a plant and any elements that help a plant function and grow. Afterwards, youth were exposed to information regarding the structure of a plant and what aids in its survival. Many misconceptions of plants had been seen in the initial drawings. After gaining new knowledge of plant growth and structure, youth added elements to their images they had not had before. This may include air, water, or sun. The work also used a survey to better determine the youths' understanding of plants. In the current research, youth were asked to draw an image representing what they learned about the habitat they explored.

SUMMARY

As people become more disconnected from nature, the appreciation for our natural resources dwindles. One way to combat this is to get people outside and make connections to the world around them. When people learn together, they take different things away from the experience. This research uses nature-based programs to get intergenerational groups outdoors together, while exploring specific techniques that will pique their interest to explore more on their own.

CHAPTER III: METHODOLOGY

In spring 2016, a series of nature-based programs, Habitat Adventures, was developed for intergenerational groups at Schmeeckle Reserve. The three different programs in this series targeted groups with youth from ages 4-10. These programs were developed using different interpretive and educational techniques to spark the visitors' interest in spending more time outside.

DATA

Data was retrieved from adults and children through qualitative research methods to determine the success of a new program series, what roles participants play in an intergenerational setting, and what techniques can be used during nature-based programming to get these participants outdoors more on their own. Observations, focus groups, youth murals, and follow-up phone calls were used for this study. A qualitative approach was used in hopes of getting responses outside of a potentially predetermined list from the researcher or a short response a participant may give. When presented with a written survey or questionnaire, participants may not be as motivated to put a longer response. Using a focus group allows participants to not only give their initial response, but also allows them to hear what others say which may spark additional comments or thoughts. Using observations backs up responses given by participants.

RESEARCH METHODOLOGY

An exploratory approach using observations, focus groups, and post-program interviews was used for this research. Nature-based programs were developed and limited to twenty to twenty-five participants. Participants were sought through social networks

(Facebook) and promotional materials (posters, news release, etc.). During the programs, observations were recorded to determine various interactions between intergenerational group members. After each program, participants were asked to participate in an intergenerational focus group to determine the success of the program. The adults then participated in a focus group to look at various intergenerational factors, during which youth were asked to construct a mural representing the habitat presented throughout each program. All observations and answers from the focus group were transcribed, analyzed, and evaluated.

TREATMENT OF EACH SUB-PROBLEM

SUB-PROBLEM 1: THE FIRST SUB-PROBLEM WAS TO CREATE A NATURE-BASED SERIES OF SUMMER PROGRAMS FOR AN INTERGENERATIONAL AUDIENCE AT SCHMEECKLE RESERVE USING ENVIRONMENTAL EDUCATION AND INTERPRETATION GOALS AND PRINCIPLES AND TO ADVERTISE TO ENCOURAGE PROGRAM PARTICIPATION.

Front-end Questions

When planning these programs, first the researcher looked for insight into program content and logistics from a parent's perspective. To achieve this, the researcher used a snowball sampling process to locate parents in the area. The parents targeted were those who may participate in nature-based programs and who have an educational background. These individuals not only represented a parent population, but also could contribute to program development. These parents were invited to participate via e-mail (Appendix A). A group discussion with Stevens Point parents in May 2016 looked at potential program logistics and the types of activities that could be beneficial to the program based on a child's age. A set of questions was developed prior to meeting. These

questions were asked of all participants and the responses were recorded. If parents were unable to attend this meeting, the researcher asked questions via e-mail. Questions asked during this early stage were as follows:

- What do you and your family enjoy doing outdoors?
- What don't you enjoy doing?
- What do you think other families like doing and not doing outdoors?
- What types of programs would your family be interested in?
- What are the best times of year, days of week, times of day, and length for programming?
- Do you have any additional comments?

Program Development and Implementation

While developing the programs for this study, the researcher had to keep in mind different learning styles and levels of cognitive development of the younger participants (Siomatwa, 2010). This is important because of the various ages involved. The researcher prepared activities that could get all ages engaged and allow for understanding and enjoyment individually and as a group. The program content targeted 4-10 year olds. These ages fall under two of Piaget's (1964) stages of cognitive development. On the younger end, children are still unable to make logical connections and may rely on their senses to help them understand a concept. For this study, games were created to help much younger children understand the animals and plants being discussed. In one program, everyone was asked to act out or dance like a certain animal. This helped kids remember and understand those animals later on. The older youth involved are beginning to think logically and make connections on their own. They are beginning to understand

ideas such as time and the use of symbols to represent things. Activities designed to appeal to them included using freshwater invertebrates and a tolerance chart to determine the water quality of a pond.

To reduce potential bias in focus group responses, the researcher did not lead the Habitat Adventures programs. Two UW-Stevens Point students majoring in environmental education and interpretation were hired during the summer of 2016 as naturalists specifically for this research project. These students must have completed relevant environmental education and interpretation courses at the point of interviews. Naturalists were interviewed in late May and were trained in July. Training included an introduction to Schmeckle Reserve, an in-depth look into the research project, and a walkthrough of summer program materials. Naturalists were given lesson plans and theme sheets that were developed by the researcher for each program. Lesson plans and theme sheets can be seen in Appendix B and Appendix C respectively. Although these materials were already developed, naturalists had some freedom to develop interpretive techniques to use during programming. The researcher discussed these ideas with naturalists before each program.

Program Advertisement and Registration

Various types of media were used in distributing program information. The researcher used many Schmeckle Reserve resources when developing marketing. An online program e-mailing list was used to reach several hundred people who signed up to hear about other Schmeckle programming. Schmeckle also has a list of potential poster locations throughout Stevens Point that was used for this study. To participate in the Habitat Adventures series, people were asked to register in advance. When registering,

participants were asked various demographic questions. The information was stored in a registration spread sheet (Appendix D). Participants were informed of the study during registration so they would understand the evaluation time commitment. This included informing them of a follow-up survey that would take place a few months after programming. The day of programming, adults were given an informed consent form to read and sign (Appendix E). The project was described to youth verbally (Appendix F) and the accompanying guardian was able to sign for any youth in their group.

SUB-PROBLEM 2: THE SECOND SUB-PROBLEM WAS TO DESIGN AND CONDUCT A METHOD OF EVALUATION TO TEST THE PROGRAMS' SUCCESS AS AN ADDITION TO SCHMEECKLE RESERVE PROGRAMMING.

A presenter can conduct an assessment of a program to determine what the participants learned, how their progress in the subject matter has changed throughout the program, or what effects the program has had on the individual (Biehler et al., 1982). There are various tool kits and evaluation guides that can be used to determine an appropriate method for a given study. The current study looked at a summative evaluation. This type of evaluation helps determine if goals were met and occurs after a program has been given (O'Leary, 2010). To make sure enough information was collected to determine if the series of programs was a success, the researcher looked at multiple forms of data collection, including observations, focus groups, interviews, etc. An application was submitted to the Institutional Review Board explaining the target participants, the procedures, and other topics surrounding the target population. Due to the participation of youth, a full review board was needed to approve this research. After

meeting with the board and making adjustments, the research plan was approved on May 5, 2016 (Appendix G).

Using a qualitative approach to this study, the researcher aimed for 40-60 participants. This would allow for enough information to be collected to support the study (Post, 2012). For this particular study, an aim of 20-25 people per program was the maximum. Based on the Theory of Planned Behavior, the researcher asked participants if they plan or intend on using the knowledge, skills, and experiences gained to change their outdoor recreation habits.

Observations During Programs

For this study, observations were collected throughout the programming using the chart in Figure 2. The researcher played a non-participant role and was candid with participants about the study and their role in the research. During each program, the researcher looked for various social interactions among participants. Three components of the program were focused on when making observations. First, during the presentation components of the programs, the researcher looked for various responses participants had to the program as well as how the families participated during the program (together, alone). Also, each program contained an activity where a tool was introduced and used by participants, as well as an activity where participants were given time to explore a certain aspect of the topic habitat. Observations were made during both of these activities to determine how participants interacted based on the roles they played in their groups. Some of the potential roles were included on the observation sheet the researcher used throughout each program. These roles include the tool suggester, teacher, and exploration leader. Zimmerman et al. (2013) defined these roles as:

- Tool suggester: participant that suggests using tool provided
- Teacher: participant that explains how tool works
- Exploration ender: participant that stops doing activity

Zimmerman et al. (2013) used these roles to better understand how families work together and frustrations families may face. Although her work looked at how families interacted using a magnifier during a nature-based program, these roles may still be found using a different tool, in this case a dichotomous key. The only role that was modified for the current research is the teacher. This role can be played not only by the participant who explains how the tool works, but also anyone who contributes already known knowledge to the program.

July 30, 2016 Prairies	Group		Group		Group		Group		Group	
	Adults	Youth	Adults	Youth	Adults	Youth	Adults	Youth	Adults	Youth
Interest & Attentiveness										
Understanding & Approval										
Resistance or Disapproval										
Confusion										
Boredom										
Tool Suggester										
Teacher										
Exploration Ender										
Teacher										
Exploration Ender										
Sharing Experiences										
Innovator (encourages imagination)										
Notes										

Figure 2. Observation Tool

Focus Groups

Participants were asked at registration to join the researcher following the program in a focus group setting to evaluate the program. The questions asked were open-ended and reflected how participants felt about the programming as well as their perspectives on the intergenerational components. Two focus groups took place. The first included both adults and youth. The questions asked were:

- What is one big thing you learned today?
- How did the program make you feel?
- Is there anything you will do differently now that you know all about _____ habitats?

After the first focus group, youth were asked to work on another task while adults participated in another focus group. The questions asked were:

- Describe the main idea of today's program.
- What specific parts of the program helped you to learn best together as a group?
- What did you like about learning as a group?
- What didn't you like about learning as a group?
- What behaviors towards the outdoors do you think will change over the next few months after participating in this program?
- Would you like to add anything else?

These conversations were recorded and later transcribed. Using Express Scribe Transcription Software, the researcher slowed and repeated recordings to type all responses to questions asked. After transcribing data, the researcher went through the data to determine themes occurring throughout. This allowed for similar topics or themes to surface in the responses (Taylor, 2010). To do this, the researcher viewed data from each question asked at each program in typed form. Looking at each question

individually, the researcher started categorizing responses by the different types of responses. This led to certain themes, or key ideas, emerging from the data. After all of the programs were complete, themes were determined for the entire series as a whole. Any program specific responses were noted. After coding was complete, the themes were looked at by an advisor.

The responses to “*Describe the idea of today’s program*” were treated differently during data analysis. The main idea of a program represents what the individual feels was the theme of the program they participated in. The researcher developed an individual theme for each program. When reviewing responses, the researcher used thought listening (Ham, 2013) to determine how close participants were to the actual theme using a zone of tolerance. As mentioned in the literature review, there are three zones of tolerance: an unrestricted zone (visitors aren’t pushed to think a certain way), wide zone (slightly pushed towards a certain way of thinking) or narrow zone (leave thinking about one specific thing).

The researcher used a wide zone when looking at participants’ responses. Even though there were specific objectives set for each program, the researcher did not focus solely on the precise message of the program content, but also the experiences visitors described following the program. This zone included any comments related to learning about the entire habitat, seeing the connections between habitat residents and between the habitat and humans, as well as just getting out in nature more. After all evaluations were completed, participants were thanked for their time.

Murals

After the first focus group, youth were asked to draw a mural of what they learned during the program. Before doing this, they were given a prompt by the naturalists (Appendix H). Prior to the program, a short list of topics were developed that the researcher expected to see, such as various components of the program. These topics include different pieces of information the presenter hoped the audience would learn about and better understand. This list of topics were used when analyzing the murals. Unlike the drawing activity done in Anderson et al. (2014), this activity would not have a drawing representing preprogram data.

Follow-up Interviews

To determine what effect these programs had on participants, the researcher conducted follow-up phone interviews after October 2016. These questions explored whether participants followed through with the intentions they mentioned during the focus groups at the end of programs. The questions asked included:

- How did this program affect your attitudes towards engaging in outdoor activities together? (Ballantyne, Fien, & Packer, 2001)
 - What parts of the program caused this affect? (Ballantyne, Fien, & Packer, 2001)
- How did this program affect your behaviors towards engaging in outdoor activities together? (Ballantyne, Fien, & Packer, 2001)
 - What parts of the program caused this affect? (Ballantyne, Fien, & Packer, 2001)
- Describe any ways this program influenced your group to participate in similar outdoor activities. (Ballantyne, Fien, & Packer, 2001)

- Describe any conversations your group had about the programming after participating. (Ballantyne, Fien, & Packer, 2001)
 - What parts of the program did you discuss?
- What types of activities do you think would aid in getting families to interact more?
- If Schmeekle Reserve were to charge fees for future group programming, would you consider attending?

This data was transcribed and coded. Post program-responses were compared to focus group data to determine if participants' actions were similar to their intentions stated.

SUB-PROBLEM 3: THE LAST SUB-PROBLEM IS TO DETERMINE WHAT THE RESULTS MEAN FOR SCHMEECKLE RESERVE AND PROVIDE RECOMMENDATIONS TO RESERVE DECISION MAKERS.

After data was analyzed, the researcher developed major themes that would assist Reserve decision makers in deciding on whether or not to expand current intergenerational nature-based programming. To determine what steps would follow this research, Reserve decision makers and the researcher discussed findings.

CHAPTER IV: RESULTS

The purpose of this study was to use nature-based programming to determine the best ways to encourage intergenerational groups to spend more time outdoors, as well as provide information to Schmeckle Reserve about expanding current nature-based programming. Results of the three sub-problems are reported.

SUB-PROBLEM 1: THE FIRST SUB-PROBLEM WAS TO CREATE A NATURE-BASED SERIES OF SUMMER PROGRAMS FOR AN INTERGENERATIONAL AUDIENCE AT SCHMECKLE RESERVE USING ENVIRONMENTAL EDUCATION AND INTERPRETATION GOALS AND PRINCIPLES AND TO ADVERTISE TO ENCOURAGE PROGRAM PARTICIPATION.

IDEAS FOR PROGRAMMING

Before program development could occur, the researcher met with parents to ask their opinions on programming elements such as topics for programs, best times for programs, and what other families may enjoy during programming. There were seven parents who participated. Five of them were involved in a face-to-face discussion. Two of the parents replied to the questions via e-mail. All seven of these parents have a professional background in education.

When asked “What do you and your family enjoy doing outdoors?” there were many responses. All parents mentioned common recreational activities such as biking, hiking, camping, wildlife watching, etc. Key items mentioned included collecting things (rocks and other natural items, etc.), playing (climbing on things, role-play), and other recreational activities (geocaching, journaling). Some parents mentioned that their children enjoyed using their senses to explore and be outdoors (i.e. walking barefoot),

reading, creating art, eating (i.e. picnicking), and having their own space (i.e. rock garden in the backyard).

Parents were then asked “What don’t your families enjoy doing?” as a follow-up question. The responses illustrated some of the challenges these families face with getting outdoors. Some things people did not enjoy include issues with their comfort level. These included being bitten by bugs and being cold. Parents also mentioned that doing activities not suitable for the outdoors can be frustrating for youth (ex. coloring). Parents also responded about lack of time to do everything and not having the knowledge or skills to participate in certain recreational activities (e.g. fishing or hunting).

Since these parents were all outdoor enthusiasts with education backgrounds, the researcher asked them what they thought other families may or may not like doing outdoors. Parents discussed how others may not only lack the experience to participate in specific activities, but also may be uncomfortable about being outdoors in general, and may feel incapable of identifying things or answering their children’s questions. The parents participating in these front-end questions suggested having varying levels of programs. An initial program could be an introduction to a topic that takes place within the comfort of the Visitor Center, and the next program builds from that introduction to move out on nearby trails.

Parents were then asked what programs their families would be interested in. Many parents mentioned specific topics. These included mountain biking, identifying plants, learning about snakes, and exploring living things in the forest. Themed programs were brought up as a way to attract people. One example was using a Star Wars theme to

explore how Ewoks would survive in the forest. Parents were interested in programs where youth were able to build or create something, such as using watercolors in the snow or building a birdhouse. Parents also mentioned learning a skill or exploring a specific activity (e.g. using nets to capture things and citizen science).

After discussing types of programs, participants were asked “What are the best times of year, days of week, times of day, and length for programming?” When looking at the times of year or seasons programming works, parents mentioned summer as being a very busy time with recreational activities and summer school. Parents did like the idea of winter programs that helped participants get outdoors. There were no specific days of the week suggested. The only thing mentioned was to keep in mind cultural and religious traditions (ex. some families will have church on Wednesdays and Sundays). Responses regarding the time of day were very different depending on the family’s routines. Families did agree that programs should not start late in the evening, unless the theme or topic was specific to nighttime (ex. stars). The group also mentioned that morning weekend programs would be attractive to parents. The length of program was discussed and participants responded that youth have shorter attention spans when their needs are not being met during longer programs (i.e. bathroom breaks, hunger, etc.).

A few other things were mentioned by the group when asked if they had any other comments. One parent suggested having someone at Schmeckle Reserve that could answer questions about the flora and fauna in the Reserve. For example, provide an “ask a ranger” program. Other participants suggested including activities that allow families to be silly together during programs and finding activities that would allow older youth to lead younger children. Also building time for families to discover and learn at their own

pace would be conducive to their learning. Having an incentive for participating, such as a giveaway, could attract more visitors to programs. A multi-lingual program was also suggested.

PROGRAM DEVELOPMENT

Using the information from parents, a series of nature-based programs, Habitat Adventures, was developed using a thematic approach. These programs looked at various types of habitats found at Schmeckle Reserve and targeted intergenerational groups.

Themes for each program were as follows:

- **Prairie Program:** While some only see grass, prairies are diverse systems that have unique relationships with the many unnoticed plants and animals call home as well as humans.
- **Wetland Program:** Humans can look at the unique adaptations of flora and fauna of wetlands to identify species, determine the health of the ecosystem, and contribute to ongoing research regarding specific wetland areas.
- **Forest Program:** Woodlands are home to misunderstood and underappreciated plants, animals, and fungi that help tidy up the forest floor in ways humans can adapt to reduce waste in their own environment.

The themes created for these programs were developed to help participants see how many connections humans have to each particular habitat. Using three common habitats that can easily be found in Schmeckle Reserve means these individuals may see them again in Schmeckle or find them elsewhere. Exposing participants to how various

organisms within each habitat interact may encourage a greater desire to explore any habitat and take time to observe organisms closely, no matter the size.

The three programs developed were each given twice. They were developed so a participating group could attend one or multiple programs and not feel obligated to attend them all. Trying to reach as many groups as possible, programs were given once on a Saturday and then again on the following Tuesday. Programs took place July 29 and August 2, 2016 (prairies), August 6 and 9, 2016 (wetlands), and August 13 and 16, 2016 (forests). The length of the programs was two-and-a-half hours with a focus group session built into the end. This length, while considered long, provided time to fit in various activities to explore family interactions. Programs started at 10 a.m. The programs were developed to include a few of the factors mentioned by parents. There was time built in for families to explore various habitats in Schmeckle Reserve on their own. This allowed families to get their hands dirty and physically interact with the environments, whether they were holding freshwater invertebrates or flipping rocks and leaf litter in the forest. The educators also walked families step-by-step through activities to help with their comfort levels. Programs did not include all suggestions from parents because of the logistical aspect of finding materials and planning for certain types of activities and because of the timeframe of the research project.

Each individual program was made up of similar components and structured the same. Programs included a presentation component, a tool-based activity, another presentation component, and an exploration activity. The presentation components varied based on the content. If there were many involvement activities, the presentation sections could take longer. The tool activity would last anywhere from 10-25 minutes depending

on the group and their understanding of the tools. The exploration activity was always given thirty minutes. Each program's content breakdown can be seen below.

Prairie Program

1. Presentation – What is a prairie? What lives in the prairie? Introduction to signs of life in the prairie.
2. Tool-based Activity – Scat dichotomous key using images for scat examples.
3. Presentation – In-depth look at signs of life.
4. Exploration Activity – Looking for signs of life in the prairie.

Wetland Program

1. Presentation – What is a wetland? What lives in a wetland?
2. Tool-based Activity – Freshwater invertebrate dichotomous key using images for invertebrate examples.
3. Presentation – How invertebrates can be used to determine water quality.
4. Exploration Activity – Dipnet for invertebrates and try to figure out how healthy the water is.

Forest Program

1. Presentation – What is a forest? What are the different levels of a forest (canopy, understory, floor)? Who lives in these levels?
2. Tool-based Activity – Use dichotomous key to identify organisms found on the forest floor.
3. Presentation – How do some forest floor organisms assist in decomposition?

4. Exploration Activity – Search the forest floor for organisms living under rocks and leaf litter.
5. Presentation – How can humans help with decomposition?
6. Ending Activity – Learn how to build a simple compost bucket.

During each program, a booklet was given to participants. These booklets allowed for participants to have take-home information, have images to help them in finding the organisms mentioned in the presentation, but also gave them room to record their own findings. An example booklet can be found in Appendix I.

PROGRAM ADVERTISEMENT/REGISTRATION FORM

Once programs were developed and dates had been chosen, various forms of advertisement took place throughout the summer for the Habitat Adventures programs. All advertising mentioned that participants would need to preregister for the programs. When an individual registered, they were asked to provide demographic information. Various types of outreach were used to find participants. Posters were created for each program and distributed around the area. Each program had a different poster that was distributed to a dozen or more locations. These locations included the university (academic and residence halls), the local library, the YMCA, local grocery stores and other local businesses. Facebook events were created for each program and additional posts were used to remind the public about the upcoming programs using the Schmeckle Reserve Facebook page, which has over 2,400 followers. A MailChimp campaign was sent to the 500+ subscriber list. This list includes Friends of Schmeckle Reserve members, volunteers and others interested in Reserve news. A news release was created

and distributed to the public through UW-Stevens Point University Relations and Communications. The researcher was a guest on the 97.9 WSPT morning show on July 27. This allowed for a brief discussion about the upcoming programs. Program advertisement media can be seen in Appendix J.

Participants had many ways of finding program information. Participants were asked where they heard about the program during the registration process (n=12 groups). Facebook was the source participants used the most, with 42% of people finding program information there. Seventeen percent of people found the information through an e-mail via Mailchimp. Another seventeen percent did not say where they found their information. For the remaining sources one person each reported the campus announcements, the Schmeckle Reserve website, and just stumbling upon the program. Responses are represented in Figure 3 below.

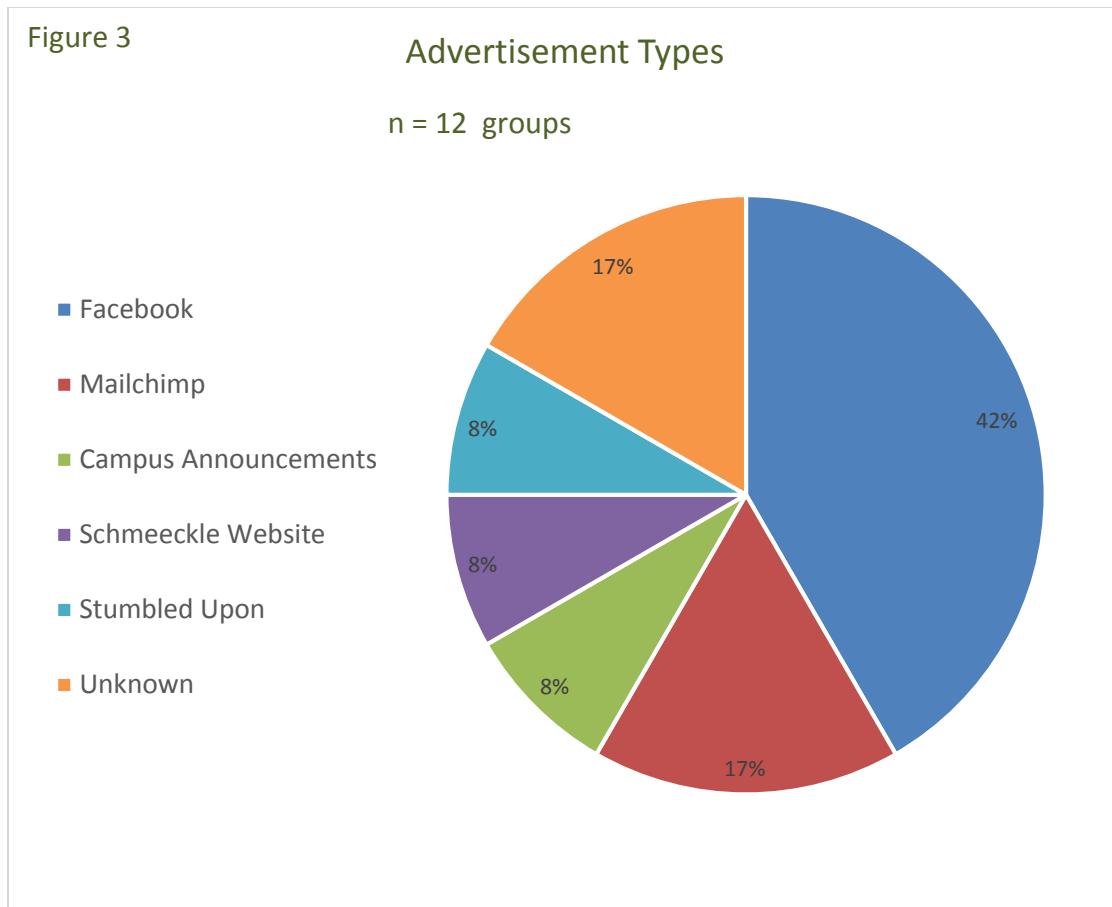


Figure 3. Advertisement types used by participants.

Overall, there were 37 participants in twelve different intergenerational groups. Sixteen of these were adults and twenty-one were youth. Eleven of the youth were between the ages of seven to ten, and ten of them were between the ages of four and six. The adults that registered their group for the program were asked how they were related to the youth. Out of twelve registering adults, only one person was not related to one of the youth in their group. Two registering adults were grandparents and only one individual was not a parent or grandparent, but a great-aunt. Seventy-five percent of participants were the parents of the youth in their groups. Participant numbers for each program can be seen in Table 1.

Habitat Adventures					
Program	Group	#Adults	#Children	Ages of Youth	Relationship to Youth
Prairies, July 30, 10-12:30	A	1	2	6, 9	Mom
	B	2	2	6, 9	Grandparents
Prairies, August 2, 10-12:30	A	1	1	5	Mom
	B	1	1	4	Mom
	C	1	2	5, 8	Mom
Wetlands, August 6, 10-12:30	A	2	2	4, 8	Parents
	B	2	2	4, 9	Parents
Wetlands, August 9, 10-12:30	A	2	2	7, 9	Grandma
	B	1	3	5, 7, 10	Mom
	C	1	1	5	Mom
Forests, August 13, 10-12:30	A	1	1	6	Greataunt
Forests, August 16, 10-12:30	B	1	2	8, 8	Mom/Friend
Totals		16	21		

Table 1. Participant numbers for each program.

Those that registered a group were also asked if they had attended any Schmeckle programs in the past. Five of those adults that registered, or 42%, had been to the Candlelight Hike Festival at Schmeckle Reserve. Four said they had participated in programs but did not specify what programs. Three people had never attended programs. Two said they had been to the cultural and natural history programs given each semester.

PROGRAM NATURALISTS

Two UW-Stevens Point environmental education and interpretation students were hired to present the Habitat Adventures programs. These students allowed for the researcher to focus on recording observations and conducting focus group questions. While an important part of the research process, these individuals also brought to light some limitations to working with less experienced naturalists. From time to time, the researcher was brought into different programs as more of a participant or an expert on information. This was generally due to a naturalist's uncertainty in specific program

content. One potential solution to this problem may have been conducting a pilot program. This would allow educators to become comfortable if they have a lack of experience with public programs.

SUB-PROBLEM 2: THE SECOND SUB-PROBLEM WAS TO DESIGN AND CONDUCT A METHOD OF EVALUATION TO TEST THE PROGRAMS' SUCCESS AS AN ADDITION TO SCHMEECKLE RESERVE PROGRAMMING.

To describe a well-rounded picture of how effective the programs were, multiple data collection methods were used during this research project. Observations, focus groups, a mural drawing activity, and follow-up interviews were the methods used to gather data.

OBSERVATIONS

During each program, the researcher recorded observations of individuals' responses to the program as well as how they participated in activities as an intergenerational group. An example can be seen in Appendix K.

Presentation

While giving a presentation, educators/interpreters can gather some idea of how the audience is reacting to their program. The researcher looked at audience reactions mentioned in *The Interpreter's Guidebook* (Buchholz et al., 2015). These reactions include interest and attentiveness, understanding and approval, resistance or disapproval, confusion and boredom. There were 16 adults and 21 youth included in these observations. For interest and attentiveness, 14 adults (88%) and 19 youth (90%) showed interest in programming by asking questions, leaning forward, etc. in the program. Twelve adults (75%) and 12 youth (57%) showed understanding and approval by

smiling, nodding, etc. Only one individual, a youth, showed confusion during programming.

Those that showed resistance or disapproval (arms folded, shifting body, etc.) included 2 (13%) adults and 6 (29%) youth. The resistance shown during programs did not seem to last the entire time. For example, one adult sat away from everyone else at the beginning of the presentation and by the end he had joined his group and was talking to his grandson about the program. One youth started the program terrified of spiders and daddy longlegs and ended the program holding one. Boredom seemed a bit high to the researcher. Those who showed boredom through fidgeting, talking to neighbors, etc., included one adult (6%) and 11 youth (52%). After programs were complete and the researcher spoke with participants, it seems program length could have been a major factor.

Tool Activity

During the tool activity, the researcher looked for roles that participants played in each intergenerational group while groups used dichotomous keys, like the one found in Figure 4 to identify different scat, aquatic invertebrates, or leaf litter invertebrates, depending on the program. Of all tools that could have been chosen, a dichotomous key was used for two main reasons. After speaking with parents during the front-end questions, it was mentioned people may not participate in certain activities because they lack the equipment. Dichotomous keys were provided for each group to take with them. This would allow them to continue the same type of exploration after programming had ended. The dichotomous key also allows for group members to work together using one tool, giving it a social aspect. While the younger youth may not be able to understand

concepts as well, the preoperational youth were still able to participate in this activity because of the adult assistance, but also because images are used to determine if one thing looks like another to move along the dichotomous key.

The roles of interest include the tool suggester, teacher, and exploration ender. Eleven adults (69%) and 2 youth (10%) played the role of tool suggester. While adults more than dominated this role, there were two youth that served as tool suggesters. Both happened to be on the older side of the spectrum (8 and 9 years old) and were suggesting tool use to other youth participants. Seven adults (44%) and one youth (5%) played the role of teacher during this activity. This means they gave information they already knew or reminded youth of information given in the program. One 8 year old played this role when helping a friend. The role of exploration ender only included youth, with three participants (14%) abandoning the activity.

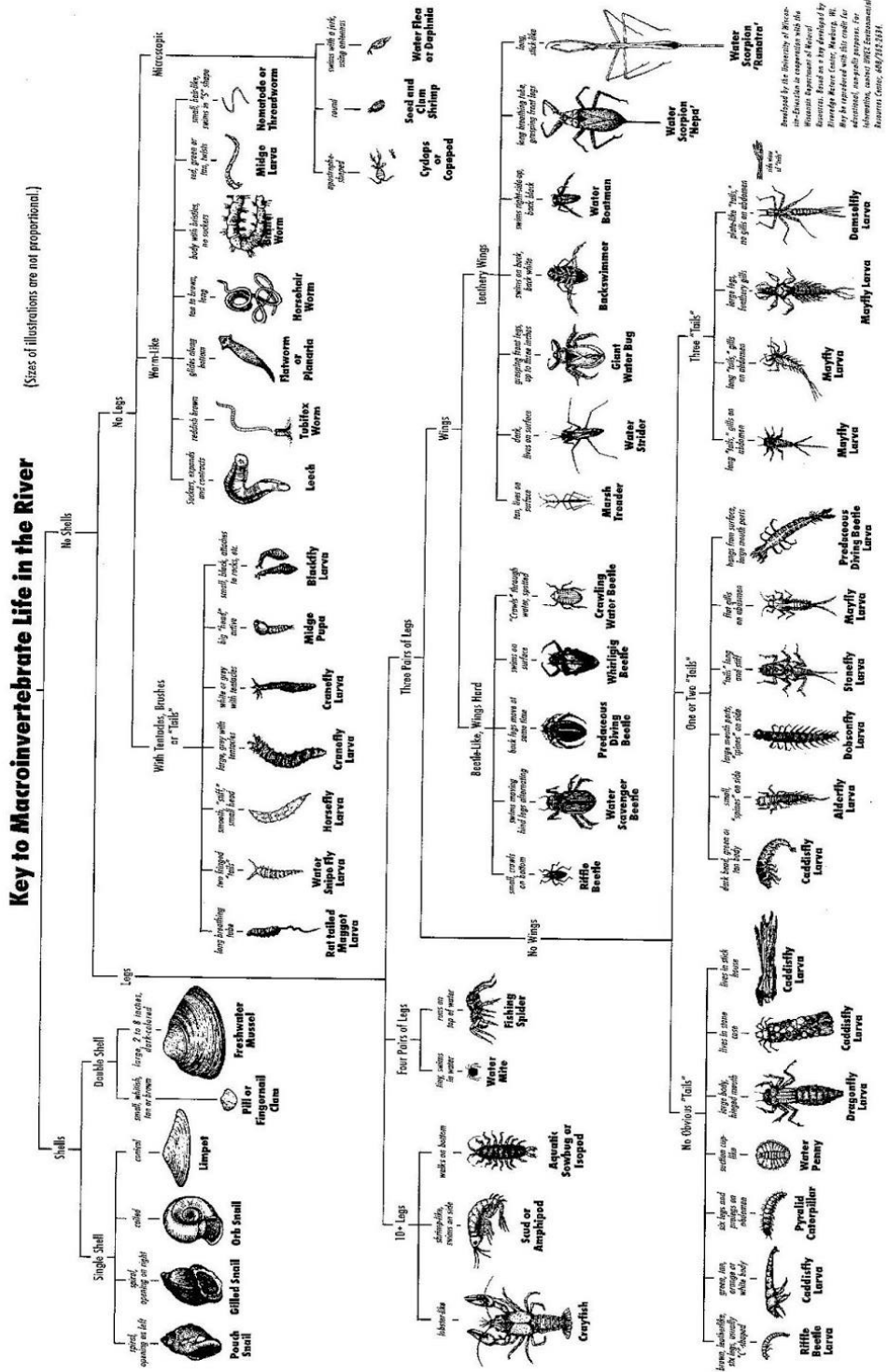


Figure 4. Dichotomous key used as tool for wetlands program.

A summary of observations noted during programming is found in Table 2.

Observations Taken During Programming				
		Adults	Youth	Notes
During Lecture	Interest & Attentiveness	14	19	Some showed attentiveness and resistance (ex. Older gentleman).
	Understanding & Approval	12	12	
	Resistance or Disapproval	2	6	Some resistance was stamped out by the end of programs. Some youth were scared of different things and slowly became more comfortable.
	Confusion	0	1	
	Boredom	1	11	Program length could have been a factor.
Activity 1 Tool Based	Tool Suggester	11	2	Older youth (8 yr, 9 yr)
	Teacher	7	1	Youth helped friend (8 yr), helped fam (8 yr)
	Exploration Ender	0	3	
Activity 2 Explore Based	Teacher	8	2	Educators sometimes played this role. Older youth (9 yr, 7 yr)
	Exploration Ender	3	5	
	Sharing Experiences	5	4	
	Innovator (encourages imagination)	2	3	
Total Participants Observed		16	21	

Table 2. Observation Totals

Exploration Activity

The exploration activity involved intergenerational groups working together on an activity in the habitat being discussed. The researcher was looking for who played the teacher, exploration ender, experience sharing, and innovator roles. Roles were determined by those who gave additional information about a topic, those who terminated continuation of an activity, someone contributing by explaining a personal experience, or someone who uses their imagination differently respectively. Eight adults (50%) and 2 youth (10%) used information they already knew or learned at the program to teach

another group member. The two youth who played this role were again older on the age spectrum at 7 and 9 years old. Three adults (19%) and five youth (24%) ended exploration. For example, two groups who participated in a prairie program (both composed of one adult and one youth) started the exploration activity as instructed, but eventually the adults broke off from their groups and began talking, and the youth tried leaving the prairie and played on rock piles. Those sharing their experiences included five adults (31%) and 4 youth (19%). Innovators included two adults (13%) and 3 youth (13%).

FOCUS GROUP

After programming was complete, all participants were asked to join in a focus group. With adults and youth in the initial group, the researcher was able to ask questions to understand participants' experiences during the program. After questions directed towards youth and adults were complete, youth were asked to participate in a mural drawing activity while adults were asked to participate in another focus group looking at the intergenerational components of the program.

Focus Group – Intergenerational

What is one big thing you learned today?

Of 36 respondents, 16 were adults and 20 were youth. The responses given fell into four themes: 1. related to organisms, 2. related to activities, 3. related to habitat, and 4. nothing or information not related to the program. The two themes that made up the majority of responses were related to organisms and related to activities. Nineteen participants (52%) responded with a specific organism or group of organisms. For example, “*There are jellyfish in the lake*” and “*That mushrooms can be orange and red.*”

There were 12 responses (33%) that mentioned certain activities from programs, with seven adult (44%) responders and 5 youth (25%) responders answering this way.

Example responses included “*How to use a dichotomous key.*” and “*The invertebrate aerobics and their characteristics.*” The most responses were related to the organisms category.

There were six responses (17%) related to the habitat being explored. Examples of this included “*A prairie has a lot of life*” or “*We learned about the different layers of the forest.*” As with other questions, some respondents answered with information that was not related to the program. These were generally youth and made up two (10%) of the responses given for this question.

How did the program make you feel?

The codes used when analyzing the responses to this question included 1. positive, 2. negative, and 3. unsure. There were 32 total respondents, 17 adults and 15 youth. Twenty-nine (91%) participants had positive feelings about the program. Some responses included “*I felt it was really interesting. It was pretty much everything new to me. I was not a wetlands girl prior to today*” and “*More encouraged with nature.*” These positive feelings help create a positive attitude towards the program’s activities in the outdoors. As seen in the theory of planned behavior, those positive feelings coupled with the participants’ confidence in later doing those activities on their own may lead to a change in participants’ behaviors towards the outdoors. Two participants had negative feelings about the program. This group was composed of one adult who said “*Frustrated*” and one youth who said “*A little bored.*” Only one youth was unsure after the experience responding with “*I don’t know.*”

Is there anything you will do differently now that you know all about _____ habitats?

There were 30 participants that responded to this question, 16 adults and 14 youth. The primary themes included 1. appreciation; 2. spending time outdoors; 3. education; 4. interacting with or looking for certain species, habitat, etc.; 5. not related or nothing; and 6. not sure. The highest number of responses were related to interacting with different species, habitat, etc. with 14 respondents (47%), 7 adults (44%) and seven youth (50%). Some examples of these responses included “*We’ll probably look for more things than just crayfish*” and “*Look under rocks and stuff and see if there are any bugs there.*”

Three adults responded that their appreciation for the outdoors would change. Three said the time they spend in the outdoors would change. Some examples included “*I think I have a greater appreciation of why we are trying to preserve them*” and “*We’ll probably go out exploring now.*” Three participants (20%) said nothing would change. Three people mentioned using the experience and techniques to educate others or further educate themselves. There were three youth who were unsure of what would change for them.

Focus Group - Adults

After youth left the focus group to participate in the mural activity, adults were asked questions regarding the intergenerational components of the programming. The number of adults responding to each question was not consistent. During one of the programs there was an intergenerational group made up of grandparents and grandchildren. Halfway through the program, the children’s mother joined. In total, 17

adults participated. The questions asked during the focus groups, an overview of responses given, and codes for each question can be seen below.

Describe the idea of today's program.

Below are the themes the researcher developed for each program.

- **Prairie Program:** While some only see grass, prairies are diverse systems that have unique relationships with the many unnoticed plants and animals call home as well as humans.
- **Wetland Program:** Humans can look at the unique adaptations of flora and fauna of wetlands to identify species, determine the health of the ecosystem, and contribute to ongoing research regarding specific wetland areas.
- **Forest Program:** Woodlands are home to misunderstood and underappreciated plants, animals, and fungi that help tidy up the forest floor in ways humans can adapt to reduce waste in their own environment.

Sixteen adults were asked to describe the program's theme. These individuals made up six groups, one for each program. Since respondents were able to feed off the responses others gave, each program's collective group of adults will count as one response or one attempt to fall within the researcher's zone of tolerance. Five of the six responses fell within and one did not. Many participants saw the program as a way to gain information about the habitat, some saw that connections occurred within and with those habitats, and others saw it as a way of getting people more involved in an outdoor setting. The one group that did not fall within the zone of tolerance only mentioned one activity that was presented during the program. While the results show that most groups

uncovered the meaning of the programs, it is important to note that four of the five groups that fell within the zone had more than one intergenerational group associated with the program, which means more than one adult was involved in the focus group questions. The one response that did not fall within the zone was given by an individual who was part of the only group at that program. To determine if groups are really understanding the theme of the programs, it would be best to have more participants involved in each.

What specific parts of the program helped you to learn best together as a group?

Sixteen adults responded to this question. Major themes for this question included 1. program design; 2. physical learning style; 3. visual learning style; 4. group learning; and 5. exploration. Physical learning style includes active ways of learning subject matter. Exploration is related to the group being able to explore topics at their own pace in the habitat discussed.

The two themes with the highest numbers of responses were physical learning and exploration. Nine participants (56%) said physical learning helped. One example is “*The pictures with the little like motions to help you remember about the animal, especially for the kids.*” Six participants (38%) said that exploration helped their group learn. An example was “*Hands-on. Digging for critters.*” Nineteen percent of participants’ responses related to visual learning. An example was “*pictures to spark our memory.*” Two responses related to general program design and two participants mentioned group learning; example “*Sharing some facts as a group.*”

What did you like about learning as a group?

There were 17 adults who participated in this question. The responses were 1. related to the children (their learning, excitement, etc.); 2. social interaction; 3. program content; and 4. getting outdoors. Eleven participants (65%) had responses that were related to the children. Some of these responses include “*Uninhibited joy when we discover something*” and “*Finding out that they knew more than we did in some cases.*” Five participants (29%) said they liked the social interaction. One response was “*I homeschool my kids, so I’m always teaching them. So it’s fun to do stuff together.*” Program content and getting outdoors each had one response.

What didn’t you like about learning as a group?

The themes developed from responses were: 1. no problems; 2. program issues; 3. youth getting sidetracked; and 4. not feeling like a “group.” Sixteen participants responded to this question. Issues with programming had seven responses (44%). Examples of program issues included “*The dip nets were great, but if we could spread out a little more*” and “*I would say if I had anything it would be that it was definitely slow enough for [my son] but yeah probably a little could have been quicker for [the group].*” Six participants (38%) said they did not have any problems. Two participants said that it was hard for them to feel like a group with only two members, one adult and one youth. One person said that youth getting sidetracked was something they did not like.

What behaviors towards the outdoors do you think will change over the next few months after participating in this program?

Themes developed for this question included: 1. be more observant while in nature; 2. connecting with nature or expanding how they connect with nature; 3. revisit

material learned; and 4. education (educate others or be inquisitive). Sixteen participants responded to this question. Seven participants (44%) had responses related to connecting with nature. Examples include “*At Iverson we were always just focused on the crayfish and the turtles on occasion. Now there is another dozen things in the repertoire*” and “*We may explore more wetlands.*” Six participants (38%) indicated they would be more observant in nature. One example of this is “*Just being more observant when they are outside instead of just running.*” Four participant (25%) responses were under education. An education example was “*[I’ll] just be wondering what will happen to them in winter.*” Two participant responses related to revisiting material learned.

Would you like to add anything else?

This question brought on many types of responses. Some participants wanted to comment on how much they enjoyed the program. Some brought up things to consider for the programs themselves such as shortening the time, having different equipment (dipnets), and the pace of the programs. Needing more active time during the program was suggested. Hosting more events like the Candlelight Hike and more programs in general was brought up a few times. Having more programs in the summer specifically was mentioned. There were individuals interested in specific topics, such as different biomes.

HABITAT MURALS

After the intergenerational focus group, youth were asked to complete a drawing activity to determine what they learned from the program. The researcher used a few planned topics to code and added any that emerged during analysis. The codes used include organisms spontaneously found or discussed during one program (i.e. something

seen during only one program such as a snake), organisms introduced during presentation (i.e. big blue stem), nonrelated images (i.e. aliens), indecipherable drawings, whole habitats vs. certain organisms, smiley faces on animals, and organisms represented that had to be learned prior to programming (i.e. bison). After all images were processed, the researcher separated the amount of times each code occurred by age group. Youth ages were separated between 4-6 years old and 7-10 years old to determine if there were any differences based on their stage of cognitive development. Table 3 shows the number of times each of these topics occurred.

Code	4-6yrs.	7-10yrs.	Total
Organisms spontaneously found or discussed during one particular program	2	4	6
Organisms introduced during presentation	5	10	15
Nonrelated images	2	3	5
Indecipherable drawings	4	1	5
Whole habitats vs. certain organisms	2	6	8
Smiley faces	3	2	5
Organisms learned prior to programming	1	2	3

Table 3. Frequency of Mural Components

Nineteen youth participated in this activity. The majority of youth (79%) drew at least one organism that was discussed during programming. Eight youth (42%) drew a complete habitat with various organisms that interact together, while the others drew individual species explored during programs. More of the individuals that drew complete habitats were in the older age range. Three youth drew organisms that were not discussed during the presentation and had to have been learned prior to programming. Examples of youth drawings can be seen in Figures 5 and 6. Figure 5 is a great example of how older youth were drawing whole habitats and not just specific species explored during

programs. Figure 6 shows how some youth, like this 5 year old, included species that had not been seen or discussed during the program and therefore had to have been known to exist in that habitat prior to programming. Some young youth drew indecipherable drawings without labels or descriptions. When presenting the description of the mural activity, educators failed to mention that youth should label their images. The researcher had to ask educators what youth were drawing. Educators did not always remember to ask or did not always remember what was drawn.



Figure 5. Drawing from 10 Year Old Girl Boy

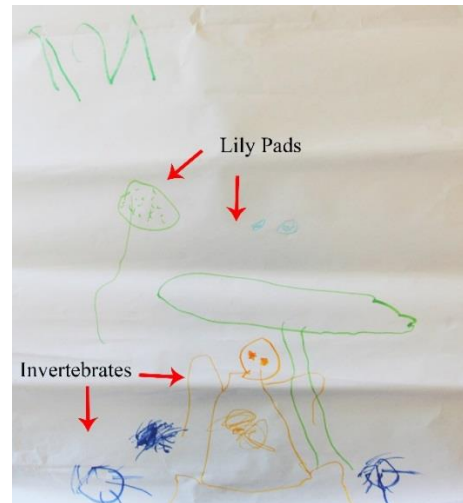


Figure 6. Drawing from 5 Year Old

POST-PROGRAM INTERVIEWS

Two to seven months after programs, the researcher called participants to follow-up on any changes that may have occurred in their attitudes or behaviors towards the outdoors. Out of the twelve participants that registered, four participated in post-program interviews.

How did the program affect your attitude in engaging in outdoor activities together?

Three of the four participants indicated they were positively affected. One participant mentioned the program made them “*want to explore the outside a little bit more.*” The fourth participant said their attitudes had been unchanged.

How did the program affect your behaviors in engaging in outdoor activities together?

Overall, the responses were positive. Two participants mentioned an increase in exploring the same habitats experienced during programming. One parent mentioned her son being more willing to explore the same prairie used during programming over the summer. These individuals visit Schmeeckle Reserve often. She mentioned him being “*more inclined to want to go to the prairie now and explore.*” The other participant mentioned going for more walks in the wooded area on their property. When asked what part of the program may have affected that behavior, the participant said “*looking under rocks and logs for particular types of bugs and that sort of thing.*” Of the other two participants, one mentioned the program giving them more ideas to do with their youth. This same participant mentioned that their youth generally has an issue with finding things “scary.” During the forest program they participated in, the educators did not act negatively towards any of the invertebrates found and would find tiny things for the youth to explore. The adult believes that made the youth more comfortable and has allowed her to find small things a little more appealing. The final participant said that the program may have got them outside and doing more, but mainly it was a test to see if her son would like going to programs. Since, they have participated in other programs Schmeeckle has provided.

Describe any ways the program influenced your group to participate in similar outdoor activities.

During the previous question, some parents had mentioned similar things they have done to the activities completed during programming. The parent whose youth became more interested in exploring the prairie at Schmeeckle Reserve mentioned that it would be interesting to see whether or not her child is more interested only in that piece of land or if they will be excited by all prairies. One participant mentioned hoping to find time to attend more Schmeeckle programs. The other two individuals had no new responses for this question.

Describe any conversations your group had about the program after participating.

Three of the four participants mentioned having conversations directly following the program about enjoying it or relaying what they had learned to family members. One participant mentioned talking about what they found under logs during the forest program. The fourth individual had mentioned using the booklet provided to quiz her youth on the material for a few weeks after the program.

What types of activities do you think we could start including to get more interactions between your group members?

Two participants mentioned having specific tasks or roles to give to group members. One participant said that members can all complete their part and later come together to discuss findings. The other two participants had comments on program logistics. One (who came to a Tuesday program) mentioned offering programs on

different days of the week, and the other participant said having shorter programs to keep the attention of the youth would be best.

If Schmeckle Reserve were to charge fees for future group programming, would you consider attending?

All four participants said they would be willing to pay for programs depending on what was being offered. Snacks, take home information, a building project, and length of program were all factors. One participant mentioned being willing to pay if there were a hands-on component to construct a bird box, bat box, etc. that required a materials fee.

UNUSED DATA

During the August 2nd prairie program, a large group from a campus daycare participated. This group was made up of sixteen individuals, four adults and twelve youth. This group was not included in data analysis. The main reason for this decision is a lack of organized, complete data. The researcher decided to use groups with a ratio of 4 youth to 1 adult or a maximum of 2 adults to every 1 youth. This would help keep data organized during observations and focus group questions. This large group was divided into four small groups prior to the start of the program, each having one adult to four youth. While the program continued, these groups would get mixed up from youth moving from one adult to another. It made recording specific group actions very difficult. During the focus group, the youth from this large group would come and go, leaving many questions unanswered. Not knowing exactly who was in what group at a time and not having all the focus group data helped the researcher in deciding not to include this information.

SUB-PROBLEM 3: THE LAST SUB-PROBLEM IS TO DETERMINE WHAT THE RESULTS MEAN FOR SCHMEECKLE RESERVE AND MAKE RECOMMENDATIONS TO RESERVE DECISION MAKERS.

The information in the results chapter was analyzed by the researcher. The findings from these results were summarized and included in the Discussion and Recommendations chapter. This information was used to help determine recommendations for Reserve staff as well as look at future research opportunities.

CHAPTER V: DISCUSSION AND RECOMMENDATIONS

The purpose of this research was to explore the best ways to get intergenerational groups outdoors more using nature-based programs at Schmeckle Reserve. This chapter will interpret and discuss the value of the findings and make recommendations for Schmeckle Reserve as it decides whether and how to expand public programming. There are a few questions that need answering when it comes to how intergenerational participants were engaged during the Habitat Adventures programs and if these programs had an effect on participants' behavior.

1. Were Habitat Adventures programs successful?
2. What techniques helped to best engaged intergenerational groups?
3. What other information was learned about intergenerational groups and how can it be used in future programs?
4. Did experiencing nature-based programs as an intergenerational group and the techniques used have any effect on participants' future behaviors towards similar outdoor activities?
5. Should Schmeckle Reserve continue intergenerational nature-based programs?

The answers to these questions will be addressed throughout the sections of this chapter.

ENGAGING INTERGENERATIONAL GROUPS

PROGRAMMING CONTENT

In terms of having a successful outcome, the Habitat Adventures programs met the mark. Observations of the program participants coupled with responses from the focus group showed that the majority of participants did enjoy and benefit from the programming. Some respondents mentioned how the program made them feel more inquisitive or brought them back to their own childhood. All programs were designed to connect the participants to the resources. Education is part of Schmeckle Reserve's mission, and participants walked away with positive feelings towards specific species, habitats, and ways to interact with the resources. Using a themed approach was successful in helping focus the researcher and educators to develop appropriate activities and content for the programs.

What specific activities help intergenerational groups explore the content presented? This study shows that it takes many forms of engagement and learning style techniques to please most people. Making sure to incorporate a well-rounded variety of techniques for different learning styles is very important for youth and adults. Whether it is having pictures of a historic forest or a goose wing for participants to feel, those visual and tactile props are helpful when making a connection to the material. Parents during the front-end questions mentioned their children like the physical contact with the elements. Ways this can be accomplished include giving visitors activities that allow them to interact with the surroundings (ex. digging in the dirt) and more opportunity to use many senses (ex. smell leaves, feel algae, etc.). One area that dominated the responses was

being active. This could take the form of an exploration activity or just learning through physical activity. While varying learning styles are important to keep in mind, it is also good to consider ways to help participants learn together. Participants seemed to enjoy and understand material better when working together or having time to soak in the content at their own pace. This was one of the more enjoyable aspects of the programming for adults. Making sure that naturalists keep this idea of variety in mind is important to the success of their programs.

When a program is over, participants may remember only a few pieces of information or activities explored. Therefore, take-home materials are a great addition to a program. The workbooks that were part of this study were used throughout the program by participants. One parent mentioned using the information learned during the program for a Girl Scouts meeting. Another parent used the workbook to review program content with their son. Giving participants something to take with them may help motivate them to continue exploring the material covered during programming. This piece of media may include just information or even examples of activities the groups can do together on their own.

The program topic seemed to be a big factor during front-end questions. Parents were looking for themed type programs or programs that would keep their youth entertained. Developing programs with a specific theme such as Star Wars, pirates, Pokemon, etc. could bring in those families less inclined to go to programs. Parents mentioned some of the “phases” their youth are going through. From collecting items to experimenting with how one piece of nature interacts with another, incorporating these

phases into programming could be helpful in attracting visitors and keeping them interested.

While the programs were overall successful, there were a few things that came to light that can be improved upon. There are always those who choose not to get as involved, even when the programs are shorter and packed with activities. While that response was rare in the programs associated with this research, the few observed were good reminders of this issue. Youth sometimes become sidetracked, and adults sometimes feel programs are for youth and forget they too can participate. One thing to consider is including roles for group participants during the activities in an intergenerational program. Whether the roles are assigned, or group members are asked to decide among themselves, roles give younger participants something to focus on and older participants a way to connect with their group members and the program.

Whether they are outside every day or barely leave the safety of a building, people can be unsure of the outdoors and what they can do while out there. During the front-end question phase of this research, it became apparent that even those who find themselves outside everyday may be uncomfortable with specific skill-based recreational activities. Parents mentioned that programs which involve the building of something is a great way to expose visitors to a topic and help them develop a skill. Other programs could focus specifically on skill-based activities such as fishing, snowshoeing, outdoor cooking, etc. All of these recreational activities not only make a program more enjoyable, but also help participants discover new bonds or hobbies they can have in the outdoors.

PROGRAM ADVERTISING

When advertising programs, the researcher reached out using posters, Schmeekle Reserve's website, Facebook, messages to UW-Stevens Point students, faculty, and staff, among other outlets. Schmeekle's participants mainly referred to online sources. Seventy-five percent of participants found their information online. While other advertising methods do work, the Reserve should continue using various online sources to distribute programming information. During the spring semester of 2017, the Reserve began using Peachjar, a system that sends e-mails to parents in the entire Stevens Point school system about events and after-school programs. The Reserve began using this site to send information about the spring programming put on by environmental education and interpretation students. This source has helped bring in more family groups than seen at previous semester's programs. Participation increased by 150% in the spring semester programs at the Reserve. Continuing to use Peachjar is highly recommended by the researcher not only for spring and fall programs, but for any additional programming added in the future.

Study participants for this research were all individuals that already get outdoors. Not only did most groups mention they were outdoor enthusiasts to begin with, but many of the groups said they had already been to Schmeekle. The Reserve should consider reaching out to other organizations such as the Boys and Girls Club, the YMCA, and similar nature centers to find new locations to distribute hard copies of programming dates and Reserve events. It would be beneficial to determine what forms of communication reach those who are not already visiting the Reserve and getting outdoors on their own.

PARTICIPANT COMFORT LEVELS

Once participants are found, it is important to make sure visitors feel comfortable and capable to participate in program activities. Parents mentioned comfort levels and abilities as potential barriers during the front-end question phase of this research. During one program, a young girl refused to participate in prairie exploration activities because spiders could live there. Throughout the program, fellow program participants and the educators slowly introduced her to invertebrate species. One in particular was a daddy longlegs. As many people do, the young girl assumed this was a type of spider and stayed away. By the end of the program, however, she held a daddy longlegs.

Other ways to cater to varying comfort levels include walking participants through activities and considering programs with varying levels of outdoor comfort in mind. Some visitors will not be familiar with the plants, animals, and concepts, presented during programming. Make sure they understand those components so they feel more comfortable when finding these things after programming. Schmeckle could consider a series of programs developed to get people comfortable with being outside. A “safe” indoor setting or staying close to the Visitor Center could be the initial program where participants get a first glimpse at an outdoor topic. Then the series could continue by working toward participants exploring the outdoors on their own.

PROGRAMMING LOGISTICS

Length of programming was the main cause of participants’ negative experiences in this study. Schmeckle Reserve and other centers should consider shorter programs when developing them for an intergenerational audience. Parents who met for front-end questions had mentioned a shorter program is better for young children. Two-and-a-half

hours provided enough time to complete data collection, but left youth fidgety and some parents frustrated. Having shorter programs would be more appealing for parents. Programs lasting an hour would be ideal, unless a workshop setting with some kind of project or a longer program with plenty of breaks was developed. After listening to parents' feedback prior to and after programming, the parents and research suggest that the only long programs given should be those with plenty of activity, or those where breaks, such as a lunch break, could be included. One suggestion would be having a longer program where groups spend time building something, such as a bat house or birdhouse. Regardless of the programming plans, keeping participants' needs and attention spans in mind is important to program development. Make sure participants are comfortable. The parents involved in the front-end questions, who all get outdoors, said that those basic discomforts were things their families did not enjoy about being outdoors. Presenters need to make sure participants' needs are being met. One recommendation is that naturalists/educators should carry a first aid kit, bug spray, snacks, etc., in their prop bags. During the Habitat Adventure programs, naturalists carried a first aid kit and bug spray in their bags. The bug spray was used by various groups. Snacks were also given to participants during the programs.

Equipment that is difficult to use can make an activity frustrating for a participant. During this research, participants found one of the tools, dipnets, challenging to use if the net was made of heavy material or the mesh did not allow water to drain fast enough. These seemingly small things made for a difficult time during invertebrate collecting activities and left the users unsatisfied. Acquiring more dipnets or changing the collection site may be of help with this problem. If collecting on a sloped bank and not a dock, it

may be easier to pull the heavier nets out of the water. Planning the appropriate types of tools and materials for groups is important to keep in mind. One comment mentioned by the front-end question participants was that people might not own their own fishing pole, dipnet, or GPS unit. Being able to provide these things is a way to help those who have not invested in this type of gear to experience it. Schmeeckle Reserve could find partners to help with donating or lending the equipment needed. Some materials can be found in stock rooms on campus, and other materials could be donated or borrowed from another nature-based facility. Giving participants the opportunity to use various types of equipment may encourage them to acquire their own and continue participating in that outdoor activity.

CHANGING BEHAVIOR

The theory of planned behavior tells us that a person's behavior is partially based on their attitudes towards this behavior and their intention of doing it. During focus groups, there were two questions that helped judge what intentions participants had about their future behaviors in the outdoors. These questions were "*Is there anything you will do differently now that you know all about _____ habitats?*" and "*What behaviors towards the outdoors do you think will change over the next few months after participating in this program?*" Speaking with adults during post-program interviews helped gauge if their actual behaviors compared to what they had intended on doing. Out of the twelve individuals that registered groups for programs, only four adults participated in post-program interviews. The data from this cannot be generalized to other audiences. With a small initial pool of twelve participants, the lack of response made for an even more limited study group.

Of the few that responded, participants did go through with their intentions in one way or another. One participant had planned on reviewing material with her son after programming. When interviewed during the post-program interview, she said she reviewed material with him from the booklet for a few weeks after the program had occurred. Another participant had said they wanted to get their youth out observing nature and appreciating it. After programming had occurred, the youth started petting grasshoppers and started noticing bird songs during hikes. One parent who participated in a forest program expected that she and her daughter would find themselves more willing to learn about and explore nature. After programming, this mom mentioned they did start exploring more and particularly going on more walks in the woods. One individual thought she and her son would be more aware of nature and get their hands dirty. She later mentioned that they got out more together. This particular group has also been to more Schmeckle programs since. Even if the change was small, it appears that nature-based intergenerational programs affected some of the participants in a positive way to convince them to make a change in their behavior towards the outdoors. Just getting participants appreciating the outdoors more is a success in itself.

ADDITIONAL PROGRAMMING

As mentioned above, the Habitat Adventures programs were found to be successful during assessment. The researcher not only feels they were successful, but should continue at the Reserve. These programs not only got intergenerational groups engaged, but also helped them connect with the Reserve in ways they may not have otherwise. Some participants mentioned the desire for additional event and program opportunities at Schmeckle during the focus group questions. Swatek (2015) found that

summer was one time of year groups were interested in increased programming at Schmeckle Reserve. After speaking with local parents, winter is just as, if not more, appealing. Other seasons bring on a plethora of different program opportunities, but winter programs are lacking in the Stevens Point area at this time. Schmeckle may want to consider developing another series of programs that gets families out when central Wisconsin is covered in snow. Parents that participated in front-end questions also mentioned this would be a great time for activity-based programs such as snowshoeing or ice fishing. While the weather does affect the needs of participants, discovering what activities would be appealing for those colder months would be yet another way to get people connecting with the outdoors.

If additional programming is to take place, Reserve decision makers will have to consider how to implement it. Having a full-time or seasonal naturalist would be beneficial for Schmeckle. This individual can focus on the summer and winter which lack programs given by environmental education and interpretation students. With a minimal budget, the Reserve can consider reallocating the duties of the graduate assistant, reaching out to their partners, the Friends of Schmeckle Reserve, the Wisconsin Master Naturalists, the Environmental Educators and Naturalists Association chapter at UW-Stevens Point, and other volunteers. Once they have completed their training, Master Naturalists are required to volunteer hours to nature centers, parks, etc. Asking the local members to help with programming can give these Master Naturalists experiences and help them accumulate required hours. The Friends of Schmeckle Reserve may also be willing to help with program implementation. When reaching out to community members to develop the current Friends of Schmeckle Reserve group, Espe (2013) found that 46%

of the retired UW-Stevens Point faculty, homeowners in the area, and individuals were somewhat or very interested in helping with education programs. Reaching out to the Friends of Schmeckle Reserve and the Master Naturalists group may benefit the Reserve by potentially finding volunteers to play the role of naturalist during additional programming.

While having naturalists is important, it is also a question of who will be developing these new programs. There are a few options the Reserve can consider. A future graduate assistant could work on developing season-appropriate programs for volunteers to implement. Retired naturalists or educators in the area could also help with program development. It would be best if these individuals had prior education or interpretive skills. One option that could be implemented is having current environmental education and interpretation students at UW-Stevens Point develop future programs. Students are required to take an Oral Interpretation Methods course as well as Interpretive Media before they enter their practicum experience in the major. These students currently present two public programs, perform a character interpretation skit, and present a short, informational program on a cultural history topic to fulfill their course requirements. Reserve staff and the interpretation instructor could consider including a way these students can help prepare future programming. For example, students could work together as a group to develop a program. These programs can be developed into written lesson plans that can be presented by volunteer naturalists.

To assist in material costs and maybe even educator fees, the Reserve can consider charging for future programs. During the post-program interviews, participants mentioned being willing to pay for programming. These individuals mentioned length of

programs, what they get from programs (snacks, take home information), and materials as factors when considering paying.

FUTURE RESEARCH

Following this project, the researcher hopes to see new intergenerational programs given at Schmeeckle Reserve. There are a few potential research topics that may help continue exploring what programs are appropriate for the Reserve. 1. Parents in the front-end evaluation identified skill-based programs as being of interest. 2. One topic of research would be to compare the effectiveness of skill-based programs with nature-based programs. 3. How can the Reserve attract more diverse audiences to nature programs?

If people are not connecting with the outdoors due to feeling uncomfortable, this may be an opportunity for naturalists and educators to find specific activities to get people outdoors. Giving them the opportunity to have someone guide them may help visitors be more willing to try the activity. There are places already moving towards or adding skill-based programs to their sites. For example, Crab Orchard National Wildlife Refuge in Marion, Illinois is currently holding Becoming an Outdoors-Family programs every month. These programs introduce participants to different skills such as outdoor cooking, nature photography, etc. Is this move towards skill-based programs something more centers should be considering? How do interpretive messages get weaved into a program that is based on a recreational activity? Future work could explore what techniques are effective for incorporating an interpretive message into skill-based programs. It is not just better understanding what types of programs are most effective, but how do educators and naturalists reach those that are not already participating in their

programs. The people who participated in Habitat Adventures programs were all groups who already spend time outdoors. It would be of interest to all nature centers to determine how to market and attract those who do not regularly participate in outdoor activities or programs.

SUMMARY

Successful programs and insight into what techniques help engage intergenerational groups leads to a recommendation to continue additional programming at Schmeckle Reserve. This research not only helps Schmeckle, but also adds to research focused on intergenerational groups participating in nature-based programs. This study also added to the studies that show the methods used by interpreters and environmental educators are effective.

LITERATURE CITED

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- Anderson, J. L., Ellis, J. P., & Jones, A. M. (2014). Understanding Early Elementary Children's Conceptual Knowledge of Plant Structure and Function through Drawings. *CBE Life Sciences Education*, 13(3), 375-386.
- Ballantyne, R., Fien, J., & Packer, J. (2001). Program Effectiveness in Facilitating Intergenerational Influence in Environmental Education: Lessons from the Field. *The Journal of Environmental Education*, 32(4), 8-15.
- Biehler, R. F., & Snowman, J. (1982). *Psychology Applied to Teaching* (4th ed.). Boston: Houghton Mifflin.
- Buchholz, J., Lackey, B., Gross, M., & Zimmerman, R. (2015). *The Interpreter's Guidebook: Techniques for programs and presentations* (4th ed.). Stevens Point, WI: UWSP Foundation Press, INC.
- Edwards, C. (1994). A Region 6 Interpretive Series Aid: Interpretive Project Guide. Portland, OR: U.S.D.A Forest Service.
- Espe, M. (2013). *An exploratory study of how a community involvement program can benefit both Schmeckle Reserve and potential participants (Masters thesis)*. Available from Stevens Point, WI: University of Wisconsin, College of Natural Resources.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior*. Reading, MA: Addison-Wesley.
- Gilbertson, K., Bates, T., McLaughlin, T., & Ewert, A. (2006). *Outdoor education: Methods and strategies*. Champaign, IL: Human Kinetics.
- Guidelines for Obtaining Assent from Minors. Retrieved from <http://www.csueastbay.edu/orsp/forms-policies-procedures/irb/guidelines-for-minors.html>
- Ham, S. H. (2009). From Interpretation to Protection: Is There a Theoretical Basis? *Journal of Interpretation Research*, 14(2), 49-57.
- Ham, S. H. (2013). *Interpretation - Making a Difference on Purpose*. Golden, Colorado: Fulcrum Publishing.

- Liu, S. & Kaplan, M. (2006). An Intergenerational Approach for Enriching Children's Environmental Attitudes and Knowledge. *Applied Environmental Education & Communication*, 5(1), 9-20.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Mack, N., Woodsong, C., MacQueen, K. M., Guest, G., & Namey, E. (2005). *Qualitative Research Methods: A Data Collector's Field Guide*. North Carolina, USA: Family Health International.
- Mayer, F. S., Frantz, C. M., Bruehlman-Senecal, E., & Dolliver, K. (2009). Why is Nature Beneficial? The Role of Connectedness to Nature. *Environment and Behavior*, 41(5), 607-643.
- O'Leary, Z. (2010). *The Essential Guide to Doing Your Research Project* (2 ed.): SAGE Publications Inc.
- Orzanna, R. (2015). Theory of planned behaviour. Retrieved February 1, 2017, from https://commons.wikimedia.org/wiki/File:Theory_of_planned_behavior.png
- Petty, R. E. & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of Persuasion. *Advances in Consumer Research*, 11, 673-675.
- Piaget, J. (1964). Part I: Cognitive Development in Children: Piaget Development and Learning. *Journal of Research in Science Teaching*, 2(3), 176-186.
- Post, M. (2012). Fearless Evaluation Webinar for the National Park Service: Participant Guide.
- Siomatwa, E. M. W. (2010). Piaget's theory of intellectual development and its implication for instructional management at pre-secondary school level. *Educational Research and Reviews*, 5(7), 366-371.
- Swatek, C. (2015). *A community needs assessment to explore the feasibility of expanding environmental education programming (Masters thesis)*. Available from Stevens Point, WI: University of Wisconsin, College of Natural Resources.
- Taylor, C., & Gibbs, G. (2010). How and What to Code. Retrieved from http://onlineqda.hud.ac.uk/Intro_QDA/how_what_to_code.php#Coding_video
- Thomson, G., & Hoffman, J. (2005). *Measuring the Success of Environmental Education Programs*. Ottawa: Canadian Parks and Wilderness Society and Sierra Club of Canada.
- Tilden, F. (1977). *Interpreting our heritage* (3d ed.). Chapel Hill: University of North Carolina Press.

Ulrich, R. S. (1984). View through a Window May Influence Recovery from Surgery. *Science*, 224(4647), 420-421.

UNESCO. Final Report: Intergovernmental Conference on Environmental Education organized by UNESCO in cooperation with UNEP, Tbilisi, USSR, 14-26 October 1977. Paris: UNESCO, 1977.

Zimmerman, H. T., McClain, L. R. (2014). Intergenerational learning at a nature center: families using prior experiences and participation frameworks to understand raptors. *Environmental Education Research*, 20(2), 177-201.

Zimmerman, H. T., McClain, L. R., & Crowl, M. (2013). Understanding How Families Use Magnifiers During Nature Center Walks. *Research in Science Education*, 43(5), 1917-1938.

APPENDIX A: E-MAIL TO POTENTIAL FRONT-END QUESTION PARTICIPANTS

Good morning/afternoon,

My name is Melissa Alexander, and I am the Graduate Assistant at Schmeeckle Reserve. Currently, I am pursuing my master's degree in Environmental Education and Interpretation, and for my thesis research, I am looking at the development of intergenerational/family programming at Schmeeckle Reserve.

This work will help the Reserve determine if summer programming is a good fit and help other nature centers better understand the development of programs. I am contacting you because, as a member of the community and a parent, you have experiences and opinions that may help determine the structure of the programs I will be developing and the best time to offer them.

I will be holding a meeting on May __, 2016 at _____ a.m./p.m. with other area parents. You will be asked to answer a few questions and all information given will remain be anonymously reported.

Thank you in advance for your help, and I look forward to talking with you soon,

Melissa Alexander
Graduate Assistant
Schmeeckle Reserve

APPENDIX B: LESSON PLANS

Habitat Adventures: Prairies

Essential Questions

- What makes up a prairie?
- What types of habits and adaptations allow plants and animals to live in prairies?
- How can we tell there is animal life in prairies if we don't see them?

Learning Outcomes

- Visitors will be able to describe what a prairie habitat is and what types of plants and animals live there.
- Visitors will be able to use scat, tracks and other signs of life to determine there are animals living in certain habitats.

Materials and Resources

- Laminated cards with various types of scat, tracks, and other signs of life.
- Laminated cards with various types of plants and animals that might live in a prairie.
- Props for dressing up as various species described.
- Sound clips of different animals, including birds and small mammals, you may find in a prairie.

Age Level: intergenerational (4-10 yr. old content)

Duration: one two-and-a-half-hour session

Group Size: 20-25

- Printed logs and pencils for visitors to record what they see during their explorations.

Background

What is a prairie?

Prairies are habitats that consist of grasses, sedges, flowering plants, and sometimes have trees (What is a Prairie?). Once upon a time, North America had millions of acres of prairie. Now, only a small percentage is not being used as agriculture. (Encyclopedic Entry: Prairie) This could be due to prairies having rich soils which make them good for growing.

Although people may feel they only see grass, and possibly the same type of grass, prairies can have 40 to 60 different species of grasses. There may be over 300 flowering plants in the same prairie. There are various conditions one may find in prairies. Prairies may have different types of soils, moisture levels, wind, and various niches for life.

(Tallgrass Prairie) Prairie ecosystems thrive with disturbances such as fire and grazing. Bison use to roam much of the prairie land that once existed. These animals help the ecosystem by stimulating plant growth.

Who lives in Prairies?

Introduce who lives in the prairie by creating a detective game. Have participants develop detective skills and knowledge about these organisms to help them determine who is living in the prairie. This will be part of an activity later.

Although you won't be seeing bison in Schmeckle Reserve prairies, there are many other residents that call this habitat home. Prairies are home to many plants, mammals,

birds, reptiles and insects. The animals may not all be residents. Prairies make a good habitat for animals to live or pass through providing shelter, food, and breeding grounds for various species. To better understand who might live in the prairie and how they have adapted, we'll look at various examples of these animals. There are many more animals that live in this habitat than the ones we will discuss.

There is an abundance of vegetation that gets overlooked in prairies as well. Although grasses make up a large portion of prairies, forbs and some trees can be found there as well. Prairies can have various levels of moisture and varying elevations that cause different vegetation to exist in these environments. Many prairie plants have developed to handle drought with long root systems that can reach lower water tables. These roots can be multiple feet long. The underground portions of these plants also make them tolerant of fires. Enough of the plant is underground to make regrowth possible. Prairie plants also thrive when there is a grazing animal, such as bison or cattle, because these animals add nitrogen to the system and help turn up soil. (North American Prairie)

American Goldfinch

This common bird is a year-round nesting resident of Schmeeckle Reserve. The goldfinch male is bright yellow during breeding season with a black cap on their head and white and black stripes on their wings and tail. Females are duller in color. Both sexes are dull in color with blackish wings during the winter. These birds nest in shrubs that may be located on the outskirts of prairie habitats. These nests are around 3 inches wide and 2-4.5 inches deep. They are vegetarians, mainly eating seeds. Prairies provide a great source of seeds for these birds. (American Goldfinch)

Big Brown Bat

This light to dark brown bat has a wingspan from 13 to 16 inches. These social mammals could be found in small or large colonies and will generally form maternity colonies.

Babies, or pups, are born at the beginning of summer. They learn to fly between 3 and 5 weeks. Although bats may not be living in the prairie, they are visiting from dusk until dawn locating dinner, insects. These animals use echolocation to find mosquitoes, moths and other insects. These bats can eat their body weight in insects and prefer beetles to other insects. (United States) The Reserve has a bat monitoring station that records the different frequencies of bats living here. This data is sent to the state.

White-tailed Deer

White-tailed deer are reddish-brown animals with white stomachs. They get their name from the white tail they throw up when they are alarmed. Males have antlers that are shed and regrown. After birth, fawns will stay with the doe for almost a year. These animals are herbivores and will eat acorns, plant, fruits and even twigs. Prairies provide these animals plenty of food. (White-tailed deer)

Eastern Garter Snake

Checking in at 4 feet long, this snake can be identified by the long stripes running down its body. The rest of the body may be one solid color or a checkered pattern. These snakes can be found near streams, meadows, forest edges and many other habitats. These are not picky eaters. These animals will eat various amphibians, fish, small mammals, and many invertebrates. (eastern garter snake)

Monarch Butterfly

Being anywhere from 3.5 to 4 inches in wingspan, Monarchs are larger on the spectrum. These butterflies have black veins running through bright orange wings. They have white dots along the edges of their wings and over their bodies. Males and females can be told apart by the scent glands one can find on the males' wings. These glands help attract mates. These animals hop from habitat to habitat during various seasons. During the summer months, you will find them in any habitat they can find milkweed. Milkweed shares a very special bond with this species of butterfly. Monarchs will lay their eggs on the bottom side of milkweed leaves. After the caterpillars have hatched they will eat the milkweed leaves. This gives them a defense against predators. The milk they get from the plants make them taste bad to other animals. They eat and eat and eat and grow until they form a cocoon or chrysalis. After hatching, they take their orange and black form. Some of these adult butterflies will one day make the long migration monarchs take while others will live shorter lifespans and stay closer to where they were born. (monarch butterfly)

13-lined Ground Squirrel

This small mammal was given its name from the solid and dotted lines running down its back. This animal is around 11 inches long and will live anywhere with grassy areas. They dig tunnels with multiple ways in and out. They will eat seeds, leaves, insects, and other small animals. (13-lined ground squirrel)

Big Bluestem

The native grass is tall and can be seen during warmer months. It can reach 6 to 8 feet tall and can live in various environments. The seeds of this grass look like a turkey foot which is one way to identify this grass. This grass can be used to assist in erosion control, is a great food source for grazing animals and can provide habitat for nesting or small animals. (USDA, 2002)

Black-eyed Susan

With its yellow petals and dark brown center, this forb is easy to identify. Standing around 1-meter-tall, this flowering plant can be found in various habitats, but prefers well-drained, sandy soils. You can see this plant through the summer months. This plant is used to assist in erosion control and makes a great addition to the habitat as a food source and shelter. (USDA, 2002)

Milkweed

This plant that can reach 6ft. tall is well known for its association with Monarch butterflies. Common milkweed has broad leaves and clusters of pinkish flowers. When breaking a leaf, one will find a milky substance that seeps out. The seeds are held in a pod until that pod breaks open. The seeds have a fluffy end that allows the wind to pick them up and help them travel. Many animals including milkweed bugs, buckeye butterflies, honey bees and bald-face hornets use this plant as a food source. Others are able to use its broad leaves as shelter. (Common Milkweed)

Have participants dress up as these organisms using props. For example, a big brown bat may put on a furry vest or a milkweed may have thick leaves.

Clues of life!

Even if we don't spot all of the animals that live in a prairie, we may be able to find evidence that they were there. This evidence may come in the form of tracks, scat, disfigured food sources, or disturbed habitat. Some common signs of life include: tracks, trails, scat, pellets, nests/dens, browse/carrion, feathers, fur, skin, bones, seeds, leaves, bark. You can find these signs near food or water sources, near animal trails, in wet soil, in nesting or shelter habitat.

Tracks

You can identify tracks by the movement pattern, type of animal group the track falls under, and specific characteristics of the track prints. Determine if an animal is trotting, hopping, bounding, or waddling. Then determine if they are part of the canine family, rodent family, etc. Finally, look at the width of the pattern and the spacing of patterns. Also consider the habitat that the tracks are found and whether the animal was in a group or by itself. (Levine & Mitchell)

Scat

When you find scat, you can narrow down who it belongs to using a simple dichotomous key. You will be looking for what shape it is; sphere (round or elongated – small or large) or cylinder (pointed, broken, twisted, blunt, misc.). Make sure that you are not handling the scat unless you have gloves on or are using a stick or other tool. If you find seeds, bones, fur or other particulates in the scat, you can use those to help narrow down what animal it came from. Considering the habitat that you are in will also help in determining the animal. (Levine & Mitchell)

Trails

You may find grass that has been lain flat by continuous usage. You may find worn ground.

Nests/Dens

There may be holes in the ground where an animal has been living. If you don't find holes, you may find a trail where the ground has been pushed up as if someone is tunneling through the soil. There are various birds' nests that may be seen.

Browse/Carrion

Leaves or dead animals may be a food source for residents or animals passing through.

Feathers, Fur, Skin, Bones

These can be left behind by animals passing through, living in the area or those that are leaving food scraps.

Seeds, Leaves, Bark

These can be dropped or broken off from a resident plant. These also may be left by traveling animals.

Activity 1

Scat Identification

1. Opening/Pow

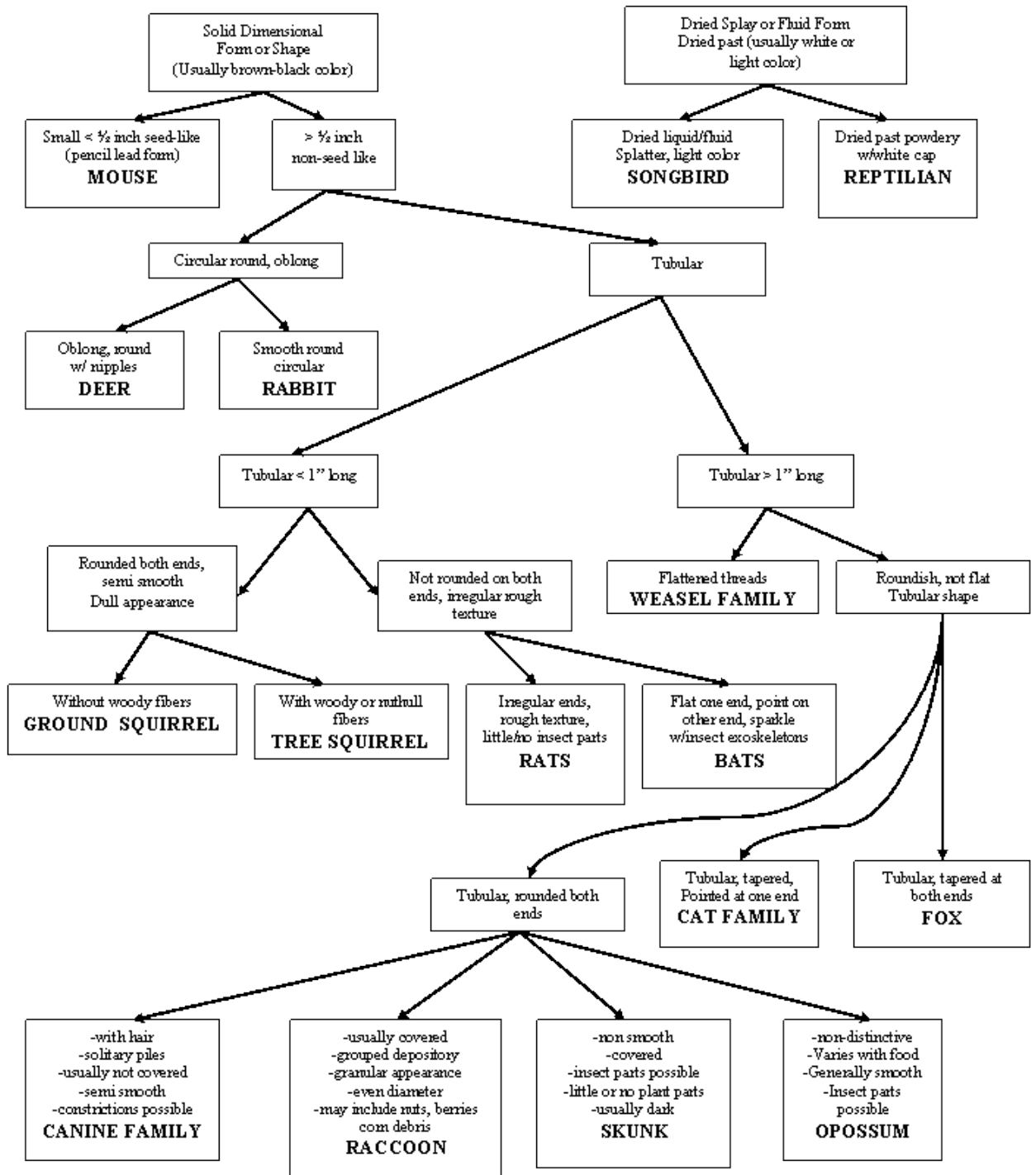
After discussing the various signs of life, explain that participants can determine who has been living in their yard by simply looking at scat!

2. Activity

- a. Give each group prairie booklets and images of scat.
- b. Have families use the dichotomous key in the booklet to identify the scat.
- c. Let each group announce what animal they have and how they determined it.

3. Closure

Discuss how scat and other signs of scat can help determine who is living in a certain habitat.



Activity 2

Putting It All Together: The Great Field Detective

1. Opening/Pow

After discussing prairies, residents, and signs of life, tell families that it is time to become a nature detective and see who is living in this habitat. Make sure to use images when discussing different animals and signs of life.









2. Activity

- a. Ask families to review the different residents and signs of life. Review any big points they may have missed.
- b. Tell families to walk throughout the prairie looking for signs of life. Have them fill out the Field Detective sheet in their booklet as they go. Let them explore for 15-20 minutes.

3. Closure

After groups have finished, go over the findings.

Discuss who these signs may belong to and what to look for while you are out hiking on your own.

Mouse	Vole	Squirrel	Rabbit	Fox	Deer	Cat	Dog
 front 0.3 x 0.3 in / 0.8 x 0.8 cm hind 0.4 x 0.3 in / 1.0 x 0.8 cm tail drag 4 x 4 bound 3 x 3 bound	 front 0.3 x 0.3 in / 0.8 x 0.8 cm hind 0.4 x 0.3 in / 1.0 x 0.8 cm feet trot bound trot	 front 1.5 x 1 in / 4.2 x 2.5 cm hind 2.6 x 1.4 in / 6.5 x 3.5 cm bound	 front 1.25 x 1 in / 3.2 x 2.5 cm hind 3.5 x 1 in / 8.9 x 2.5 cm hop walk	 front 2.18 in / 5.4 x 0.5 cm hind 1.9 x 1.7 in / 4.8 x 4.3 cm trot side trot	 front 3.1 x 1 in / 7.5 x 4.8 cm hind 2.6 x 1.5 in / 6.5 x 3.8 cm gallop prong	 front and hind 1 x 1 in / 2.5 x 2.5 cm Tracks	 front and hind 1.2 x 1 in to 4.3 x 3.1 in / 3 x 2.5 cm to 11 x 8 cm Tracks
Tracks	Tracks	Tracks	Tracks	Tracks	Tracks	Tracks	Tracks
Food Source	Food Source	Food Source	Food Source	Food Source	Food Source	Food Source	Food Source
Shelter	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter
Scat	Scat	Scat	Scat	Scat	Scat	Scat	Scat

Tracks and Illustrations are from Scats and Tracks of the Northeast (Halfpenny, Bruchac and Telander, The Globe Pequot Press, 2001) and <http://www.naturenorth.com>, a Manitoba online magazine.

Conclusion

Once the group has reassembled, discuss that they need to put their skills to the test to determine who has been living in your backyard. Show them images of various signs of life from a “case file.” After the group has uncovered the mystery animal, review key points from the day and discuss how they will now be able to determine who is living in Schmeckle when they go exploring.

Assessment

After the initial lecture opening about prairie habitats, participants will show their knowledge of prairie animals when shown images and asked what they know about said resident. This will allow educators to see what types of animal are known by the group and where they may need to be a little more descriptive.

After discovering who lives in the prairie and what types of signs they leave, participants will explore the habitat looking for various types of life. They will record all they see using the information they learned during the lecture components. The knowledge they gained throughout the program will also be shown in the mural each group's youth will develop after programming is complete.

Differentiation

The activities included do not hinder participants with physical disabilities. There may be a semi-difficult time navigating the prairie, but there are areas any disabled participants can explore. For those that may have visual impairments, the educators will be using large images as aids. If there are visitors with hearing impairments, the educators should

speak clearly and ask clarifying questions. Various techniques will be used to appeal to those with different learning styles.

Resources

American Goldfinch. (n.d.). Retrieved July 1, 2016, from https://www.allaboutbirds.org/guide/American_Goldfinch/id

Common Milkweed. (n.d.). Retrieved June 30, 2016, from http://www.fcps.edu/islandcreekes/ecology/common_milkweed.htm

Eastern garter snake. (n.d.). Retrieved July 1, 2016, from http://www.fcps.edu/islandcreekes/ecology/eastern_garter_snake.htm

Encyclopedic Entry: Prairie. Retrieved from <http://nationalgeographic.org/encyclopedia/prairie/>

Levine, L., & Mitchell, M. *Mammal Tracks and Scat: Life-size Tracking Guide*. East Dummerston, VT: Heartwood Press.

Monarch Butterfly - National Wildlife Federation. (n.d.). Retrieved July 1, 2016, from <https://www.nwf.org/Wildlife/Wildlife-Library/Invertebrates/Monarch-Butterfly.aspx>

North American Prairie. (n.d.). Retrieved July 8, 2016, from <http://www.blueplanetbiomes.org/prairie.htm>

Tallgrass Prairie. Retrieved from <https://www.nps.gov/tapr/learn/nature/a-complex-prairie-ecosystem.htm>

Thirteen-lined ground squirrel. (n.d.). Retrieved July 8, 2016, from
<http://www.dnr.state.mn.us/mammals/thirteenlinedgroundsquirrel.html>

United States. National Park Service. (n.d.). Big brown bat. Retrieved June 29, 2016,
from <https://www.nps.gov/shen/learn/nature/big-brown-bat.htm>

United States Department of Agriculture, NRCS. (2002, January 31). *Plant Fact Sheet:
Big Bluestem*. Retrieved June 30, 2016, from
https://plants.usda.gov/factsheet/pdf/fs_ange.pdf

United States Department of Agriculture, NRCS. (2002, February 5). *Plant Fact Sheet:
Black-eyed Susan*. Retrieved June 30, 2016, from
https://plants.usda.gov/factsheet/pdf/fs_ange.pdf

What is a Prairie? Retrieved from
<http://dnr.wi.gov/org/caer/ce/eeek/nature/habitat/whatprai.htm>

White-tailed deer. (n.d.). Retrieved July 1, 2016, from
http://www.fcps.edu/islandcreekes/ecology/white-tailed_deer.htm

Habitat Adventures: Wetlands

Essential Questions

- What makes up a wetland?
- What types of habits and adaptations allow aquatic invertebrates to live in wetlands?
- How can the organisms living in wetlands help humans better understand the resource?

Learning Outcomes

- Visitors will be able to describe what a wetland habitat is and types of animals that live there.
- Visitors will be able to identify common aquatic invertebrate groups and use this information to better understand the water quality in that wetland.

Materials and Resources

- Laminated cards that show different wetland habitats. (Images from Reserve)
- Laminated cards with various aquatic invertebrates.
- Dip nets, Trays
- Citizen science resources
- Dichotomous keys for each group

Age Level: intergenerational (4-10 yr. old content)

Duration: one two-and-a-half-hour session

Group Size: 20-25

Setting: outdoors, wetland

- Printed logs and pencils for visitors to record the species they find during exploration.

Background

What is a wetland?

A wetland is a habitat that has water, whether fresh or salt, covering the soil continuously or temporarily. Wetlands can take the form of a United States coast, ponds, bogs, or even the area in your backyard that floods after a rain. Schmeckle Reserve has multiple types of wetlands. Since wetlands are generally the middle zone between dry land and aquatic habitats, these systems can be home for both terrestrial and aquatic organisms.

These habitats come in all shapes and sizes. The areas surrounding the Reflection Pond, the small pools that form near Chilla Woodlot and the wetland floodplain at Moses Creek are all examples. Wetlands can expand and contract depending on the amount of rainfall an area has had. The water that enters these habitats either become part of an above soil water source (ex. River) or part of the aquifer. (Wetlands, Wetlands Classifications and Types)

Who lives in wetlands?

Wetlands are home to a large variety of plants and animals depending on where they are located and the structure of the system. The animals you may find in a wetland are reptiles and amphibians, waterfowl, wading birds, raptors, other bird species, mammals such as mink, many fish species, and invertebrates. The plants you may find include cattails, reeds, birch trees, milfoil and many other types of vegetation. All of these

organisms, along with soil, water, and other natural components function together to create the wetland ecosystem. (Animal Life, Madison & Paly)

One group that plays a large role in wetlands are the aquatic invertebrates. These animals play various roles in the food chain and can range from predators to detritivores. You may have dragonfly larvae eating other small invertebrates or snails scrapping algae. Some aquatic invertebrates help stimulate nutrient flow in a system by mixing the aquatic substrate. Some help clean up the system by eating dead organic matter. One very important role that these animals play is helping humans better understand the aquatic ecosystem and quality of the water they live in. (Covich, Palmer, & Crowl)

Aquatic Invertebrates and Water Quality

Wetlands are very susceptible to damage done by pollution, changing climates, and structural alterations by humans. One way to assess how these wetlands are faring is to look at the health of the water. There are many tests that can do this for us quickly, including dissolved oxygen, turbidity, total solids, pH level, flow rate, nitrates, fecal coliform, biochemical oxygen demand and phosphorous testing. These tests require varying amounts of education and equipment. One may need to understand the best collecting techniques for some of these tests or have flow nets to determine how fast the water is moving. Understanding the data collected is a completely different story as well.

This does not mean that any person interested in water quality or helping save wetlands cannot play a role. Citizens can participate in programs such as River Watch to help scientists collect data to determine the quality of water found in various areas. This

citizen science program asks volunteers to help collect information on macroinvertebrates, sediment health, or use a water testing kit.

When looking at all of the invertebrates one can collect, it can be overwhelming trying to determine what type of animal has collected. Having a simple understanding of invertebrate identification will help. Using a dichotomous key makes this easy.

Shells vs. No Shells

Some invertebrates have shells that are used for protection and shelter. These shells grow with the animals over time.

Legs vs. No Legs

Invertebrates can have six or more legs or have more or none.

No Legs: Tentacles, Worm-like, Microscopic

Legs: 3, 4, or 10+ Pairs

Animals with 3 pairs of legs are insects, those with 4 pairs are arachnids, and there are some with 10+.

Insects: Wings (Hard vs. Leathery) vs. None (# of tails)

Insects may have hardened wings that can be found on animals such as beetles. They may have leathery wings that can be found on true bugs. Those with no wings will either have none, one or two, or three “tails” on their posterior side.

Activity 1

Aquatic Invertebrate Identification

Procedure

1. *Opening/Pow*

Although you may not find yourself below the water's surface often, it is good to know what you may find. Let's test our dichotomous key skills and identify some invertebrates.

2. *Activity*

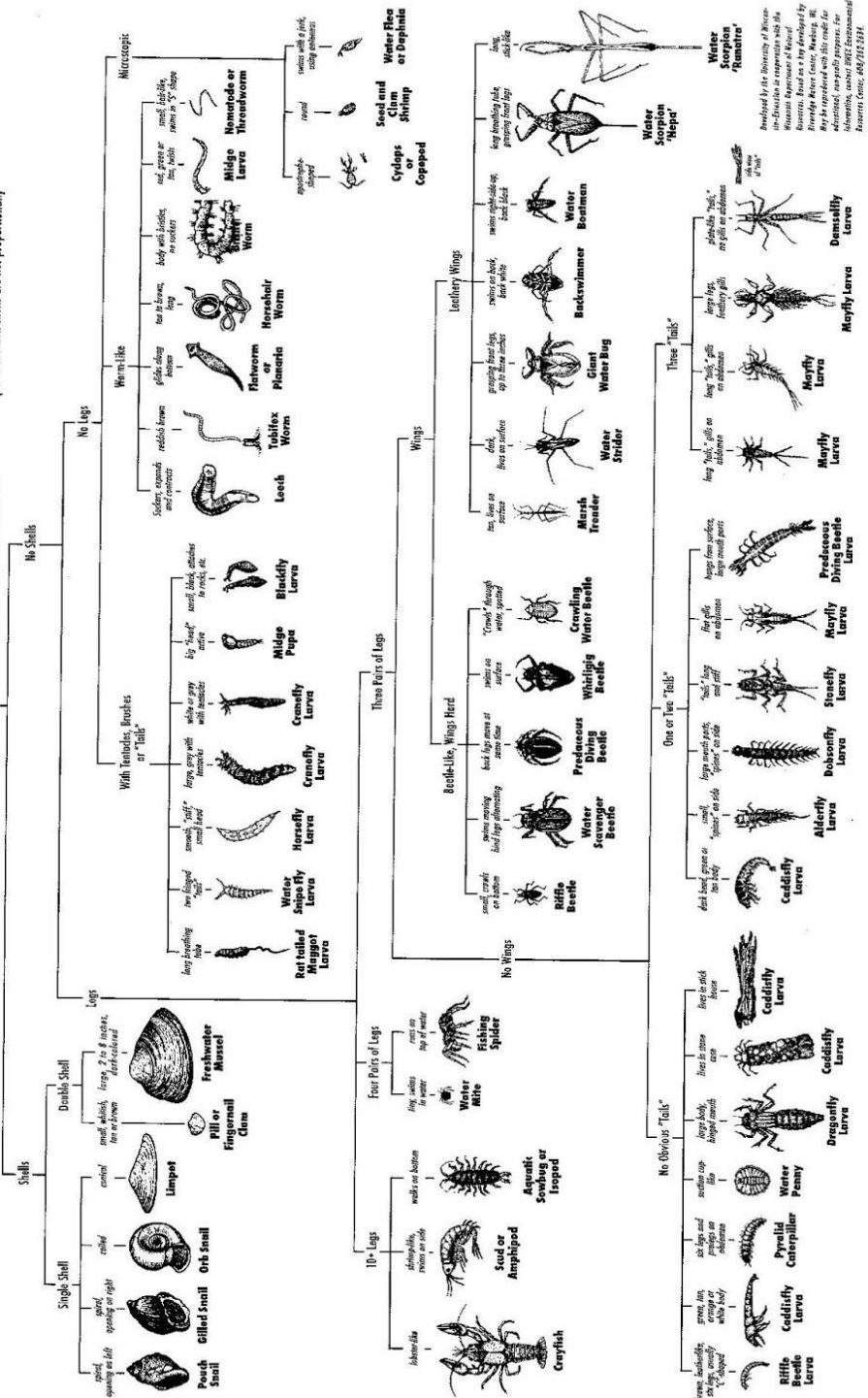
- Give each group a dichotomous key and image of invertebrate.
- Allow time for each group to go through the dichotomous key to identify the type of invertebrate they were given.

3. *Closure*

Once groups have completed this activity, go over the different invertebrates they have been given.

Key to Macroinvertebrate Life in the River

(Sizes of illustrations are not proportional.)



Adaptations and Tolerance Level

All aquatic invertebrates have interesting adaptations that allow them to survive in aquatic habitats. These adaptations also make the invertebrate more or less tolerant to disturbances such as pollution. Some of the invertebrate groups are:

Rat-tailed Maggots

Breathe out of a siphon on their posterior end. These animals can be found in really terrible water because of their ability to use the siphon.

Midge

This well-known fishing bait is also sometimes called bloodworms because of the sometimes red body color. They mainly eat plants and a few other invertebrates.

Mosquito

The juveniles are aquatic and only eat plant matter. Hang upside down and breathe out of their posterior end.

Snails

Snails use a radula (conveyor belt mouth) to scrap algae off of rocks and other substrate. You can use shell characteristics to identify them, such as does the shell open to the left or right.

Dragonfly & Damselfly

Adults of both are terrestrial, winged animals. The dragonfly is larger and holds their wings out to rest while damselflies are thinner and hold their wings up and back at rest.

Juveniles of both species live in the water. The dragonfly looks more robust (like a dragon!) and have pumps on their posterior end that allow them to take in water for oxygen. Damselflies look like damsels in a “dress” because of their posterior gills. These exterior gills make them prone to harm in high sedimentation areas.

Crayfish

Crayfish play multiple roles in the aquatic world. They can be shredders, predators, and collectors. They hold their eggs under their abdomen and swim backwards when something spooks them.

Mayfly

These invertebrates have gills along their abdomen. They come in all shapes and can become harmed in high sediment waters. Adults may emerge in swarms! These invertebrates are one of three indicator species.

Caddisfly

These animals are considered aquatic architects. They build their homes around their body. These homes can be made from rocks, sticks, leaves, sand, and other materials. These cases can help deter predators from eating the caddisflies. These invertebrates are one of three indicator species.

Stoneflies

These animals can be found in rocky streams, among other habitats, and required a healthy habitat to survive. The different species can be predators or detritivores. These invertebrates are one of three indicator species.

Activity 2

Invertebrate Exploration

1. Opening/Pow

Let's try our hand at being a scientist! We will dive in to invertebrate collection and see what we can determine about the water quality.

2. Activity

a. Give family groups nets, bins, sheets to collect data and dichotomous keys.

1. Explain each item and its use.

2. Go over safety while collecting.

b. Let groups collect and identify invertebrates they find.

c. Ask groups to record the invertebrates they find.

3. Closure

Discuss the findings of the groups and the potential health of the stream. Make sure participants understand that the more intolerant the species are the healthier the water.

Hoosier Riverwatch Biological Monitoring Data Sheet

Date ___/___/___ Volunteer ID _____ Site ID _____
 Stream Name _____ Latitude _____ Longitude _____
 Time ___:___ AM / PM Time Sampling _____ hrs Air Temp _____ C
 Current Weather: Clear/Sunny Overcast Showers Rain (steady) Storm (heavy)
 Worst Weather (past 48 hours): Clear/Sunny Overcast Showers Rain (steady) Storm (heavy)
 Check Methods Used: Kick Seine Net (3 times) Dip Net (20 jabs or scoops)
 Check Habitats Sampled: Undercut Banks Riffles Leaf Packs Snags/Vegetation Sediment

Pollution Tolerance Index (PTI)

Record the taxa (group) represented in your sampling by either entering the number of organisms you counted or by a

Group 1 - Intolerant	Group 2 - Moderately Intolerant	Group 3 - Fairly Tolerant	Group 4 - Very Tolerant
<input type="checkbox"/> Stonefly Nymph	<input type="checkbox"/> Damselfly Nymph	<input type="checkbox"/> Leech	<input type="checkbox"/> Aquatic Worms
<input type="checkbox"/> Mayfly Nymph	<input type="checkbox"/> Dragonfly Nymph	<input type="checkbox"/> Midge Larva	<input type="checkbox"/> Blood Midge Larva (red)
<input type="checkbox"/> Caddis Fly Larva	<input type="checkbox"/> Scud	<input type="checkbox"/> Planaria/Flatworm	<input type="checkbox"/> Rat-tailed Maggot
<input type="checkbox"/> Riffle Beetle	<input type="checkbox"/> Sowbug	<input type="checkbox"/> Black Fly Larvae	<input type="checkbox"/> Left - Handed or Pouch Snail
<input type="checkbox"/> Dobsonfly Larva	<input type="checkbox"/> Crane Fly Larva		
<input type="checkbox"/> Right-Handed Snail	<input type="checkbox"/> Clam/Mussels		
<input type="checkbox"/> Water Penny	<input type="checkbox"/> Crayfish		
<input type="checkbox"/> # of TAXA	<input type="checkbox"/> # of TAXA	<input type="checkbox"/> # of TAXA	<input type="checkbox"/> # of TAXA
<input type="checkbox"/> Weighting Factor (x4)	<input type="checkbox"/> Weighting Factor (x3)	<input type="checkbox"/> Weighting Factor (x2)	<input type="checkbox"/> Weighting Factor (x1)

Pollution Tolerance Index Rating
(Add the final index values for each group)

PTI Ratings	
Excellent	23 or More
Good	17 - 22
Fair	11 - 16
Bad	10 or Less

Please check other Biological Indicators you observed:

Native Mussels Zebra Mussels Rusty Crayfish Aquatic Plants _____% Algae Cover _____ Diversity Index

Assessment

After discovering how to use a dichotomous key, participants will put their skills to the test and try identifying invertebrates on their own in the first activity. They will be given a general key and an invertebrate will be provided. The second activity allows participants to use the identification skills from the first activity and their knowledge accumulated throughout the program to determine the health of the aquatic system.

Differentiation

The first activity will not hinder any participants with physical disabilities. The second activity may cause issue due to the act of using the nets to collect invertebrates.

Participants will be assisted if needed or may rely on other group members. For those that may have visual impairments, the educators will be using large images as aids. If there are visitors with hearing impairments, the educators should speak clearly and ask clarifying questions.

Resources

Animal Life. (n.d.). Retrieved June 30, 2016, from

[http://www.uvm.edu/~jbartlet/nr260/animal life/animallifefinal.html](http://www.uvm.edu/~jbartlet/nr260/animal%20life/animallifefinal.html)

Covich, A. P., Palmer, M. A., & Crowl, T. A. (n.d.). BioScience. Retrieved July 1, 2016, from <http://bioscience.oxfordjournals.org/content/49/2/119.full>

Madison, S., & Paly, M. *A World in Our Backyard: A Wetlands Education and Stewardship Program*. Chapel Hill, NC: Environmental Media Center.

UW-Extension ERC Natural Resources Education Publications. (n.d.). Retrieved July 1, 2016, from <http://clean-water.uwex.edu/pubs/clipart/critters.riv.htm>

Wetlands. (n.d.). Retrieved July 1, 2016, from <http://www.worldwildlife.org/habitats/wetlands>

Wetlands Classification and Types. (n.d.). Retrieved June 30, 2016, from <https://www.epa.gov/wetlands/wetlands-classification-and-types#marshes>

Habitat Adventures: Woodlands

Essential Questions

- What makes up a woodland?
- What types of habits and adaptations allow plants and animals to live in woodland?
- What generally unseen processes take place for the woodlands to thrive?

Learning Outcomes

- Visitors will be able to describe what a woodland habitat is and types of organisms that live there.
- Visitors will be able to explain the process of composting and how this process is important to woodland habitats.

Materials and Resources

- Laminated cards that show different woodland habitats.
- Laminated cards with various species that help in composting.
- Printed logs and pencils for visitors to record observations during exploration.
- Hand wipes
- Bin, ingredients, worms, etc.
- Dichotomous key of forest floor inhabitants

Age Level: intergenerational (4-10 yr. old content)

Duration: one two-and-a-half-hour session

Group Size: 20-25

Background

What is a forest and how is it structured?

According to the Illinois State Museum, “a forest is best defined as an ecosystem dominated by trees and other woody vegetation.” Areas with more trees may have certain descriptors based on the amount of canopy cover. It may be a regular forest mainly covered with trees, a woodland with less percentage of tree cover or a savanna that has little tree cover. People may only see these systems as a large area with trees, but there is much more than meets the eye. The forest is like a booming city. We just don’t always see the business of it. There are many types of animals and plants that have adapted to living in the various parts of the forest. The forest is divided into sections from top to bottom. You may see birds in the canopy, deer and squirrel in the understory, and salamanders and worms on the forest floor. Each of these levels play a very important role to the ecosystem as a whole. (Forest)

Look at the different parts of the forest through the eyes of a fairy. Explain how they may see and describe the different levels.

The Canopy

The forest canopy is the highest part of the forest. It is warmer and drier than the forest floor. It is also home to many organisms. Birds and small mammals may nest in the canopy. Bugs may eat the leaves that are produced.

The Understory

This section is somewhat enclosed by the canopy making this layer more humid. This humidity makes for a perfect habitat for mosses and ferns. Having such a unique climate

allows this section to house a large diversity of plants and animals because of the shelter and food sources provided. This portion of the forest also helps move nutrients through the system. Adding nutrients allows for increased fertility. (Gilliam, 2007)

The Forest Floor

When the canopy and understory lose leaves, twigs, dead animals, and other matter, it collects on the bottom. This may sound like the dumpsite of the forest, but really it is a hub of activity and amazing life. Amphibians are eating invertebrates and taking shelter under decaying logs and leaves. Centipedes are crawling below the forest litter to find insects and worms to prey upon while millipedes look for decaying matter to consume. Not only do many small organisms live in this layer, but decomposition of all the forest dead matter takes place here.

Activity 1

Name that forest floor critter!

1. Opening/Pow

Many organisms go unnoticed on the forest floor. See if you can determine who is living under the rocks and leaf litter!

2. Activity

- a. Give groups dichotomous keys and images of forest floor critters.
- b. Give time for groups to identify organism.

3. Closure

Discuss the various organisms that groups found.

What is decomposition?

For nutrients to go full cycle the forest system, decomposition must occur.

Decomposition is “the breakdown of raw organic materials to finished compost (The Decomposition Process).” This breakdown produces rich materials that add to the health of the forest. This process doesn’t just happen by magic. There are organisms that aid in the breakdown of materials. These organisms may include beetles, fungi, bacteria, slugs, snails, millipedes, springtails, and earthworms.

Those that eat dead material

Millipedes, snails and slugs, springtails, and beetles can all eat dead material and are only some organisms that help with the decomposition process. Snails and slugs are not typically consumers of dead material. However, they will eat freshly dead plant matter. Springtails, tiny invertebrates that one can find “bouncing” around, will eat many types of decomposing materials. Beetles will eat decomposing matter in their juvenile and adult stages. Not all beetles will eat dead matter, but some may be predators or have additional food sources. Millipedes help with decomposition by feeding on plant matter. (The Decomposition Process).”

Worms

Earthworms are considered an all-star in the world of decomposition. These little animals consume plants and soils. These materials are broken down and release nutrients that

could benefit the forest ecosystem. Worms don't only help clean-up the environment, but unintentionally make it a rich, healthy place. (Earthworms' role in the ecosystem)

Fungi

Unlike other plants, fungi do not have the chlorophyll to produce their food. This means they rely on an outside source to help sustain them. Fungi will feed on dead matter to receive this energy. (The Decomposition Process) They break down this matter into a form that other organisms can consume as well.

Bacteria

Bacteria help break down the fresh litter on the forest floor. There isn't just one type of this tiny organism working to decompose materials. The bacteria found during decomposition depend on factors such as the temperature of the pile, how much moisture is in the pile, the amount of air, and even what organic materials make up the pile that is decomposing. (The Decomposition Process)

Activity 2

Find that decomposer!

1. Opening/Pow

Many decomposers are not obvious to people enjoying nature. You sometimes need to look a little more closely to find these hidden wonders.

2. Activity

a. Give families charts with the decomposers they may see and a log to record findings.

b. Let families explore areas of prime decomposition; under a log, in the leaf litter.

3. Closure

Discuss the various organisms that groups found.

Why People Would Compost and How

Just as decomposers help tidy up the forest floor and increase nutrients to the system, humans can create a healthy material to add to their gardens. It all starts with a need to get rid of waste that humans produce. Trees and animals may add leaves or dead organisms on the forest floor. Humans add things such as egg shells, coffee filters, fruit peels, yard waste and more to landfills every year. With all the waste produced, any way to reduce the amount of organic materials would be beneficial.

According to the Wisconsin Department of Natural Resources (2005), the state of Wisconsin has helped the amount by “banning leaves, grass clippings, garden debris, and twigs, brush and branches from going to disposal sites.” So what can you do with these materials? Residents can have the city they live in collect the materials, they can burn the yard waste, or compost the materials. Composting gives the added benefit of making your own fertilizer. The perfect habitat the forest floor provides for decomposition needs to be replicated. The composting process can occur in two ways; hot and cold.

Hot Composting

If you are hoping for quick fertilizer turn around, hot composting is for you. To create a hot composting pile, you need a shovel to turn the pile, sticks for the bottom, brown material (dead leaves, etc.), and green or nitrogen material (grass clippings, manure, etc.).

You layer the green and brown materials on the base. Make sure there is plenty of moisture in your pile. Turn every one or two weeks. It can take 2-6 months for this process to be complete. You can add food scraps by digging a hole 8 inches into the pile and burying the food debris. Just make sure the pile has plenty of green and brown material along with water to make sure you have a hot center and happy microbes!

Cold Composting

Cool composting allows a person to still break down materials and not put too much effort into it. It may take 1-2 years for this process to be completed. This process does not require adding moisture or making sure there is a large amount of green materials. Green materials should be mixed with those brown leaves or other brown items. Food scraps need to be buried 8 inches.

Foods to Compost

You cannot just throw any food scraps into your pile. You can put fruits, vegetables, egg shells, coffee filters, or plant leaves. You should not put meats, oils, fats or dairy products into your pile.

Activity 3

How can I compost?

Procedure

1. Opening/Pow

So not that we have met the composters and looked at the composting process, let's see how we can compost at home.

2. Activity

- Let families walk around different pile options in the composting area.
- Give each family composting kit supplies and instructions.

3. Closure

Recap the composting processes and how this process occurs in nature.

Assessment

After discussing the different forest levels, families will use this knowledge in the first activity to determine where you may see certain animals. During the second activity, families will get hands-on experience looking for organisms that help in the decomposition process after gaining knowledge from the educators.

Differentiation

There may be difficulty during the second activity for those with physical disabilities. The educators will have trays to scoop materials in for those that cannot get low to the ground. For those that may have visual impairments, the educators will be using large images as aids. If there are visitors with hearing impairments, the educators should speak clearly and ask clarifying questions.

Resources

Definition of a Forest. (n.d.). Retrieved July 1, 2016, from

http://www.museum.state.il.us/muslink/forest/htmls/intro_def.html

Earthworms' role in the ecosystem. (n.d.). Retrieved July 1, 2016, from

<http://sciencelearn.org.nz/Science-Stories/Earthworms/Earthworms-role-in-the-ecosystem>

Forest. (n.d.). Retrieved June 30, 2016, from

<http://www.fcps.edu/islandcreekes/ecology/forest.htm>

Gilliam, F. S. (2007). The Ecological Significance of the Herbaceous Layer in Temperate Forest Ecosystems. *BioScience*, 57(10), 845-858. doi:10.1641/b571007

The Decomposition Process | Earth-Kind® Landscaping. (n.d.). Retrieved June 30, 2016, from <http://aggie-horticulture.tamu.edu/earthkind/landscape/dont-bag-it/chapter-1-the-decomposition-process/>

Wisconsin Department of Natural Resources. (2005). *Home Composting The Complete Composter* [Brochure].

Maybe: <http://www.scientificamerican.com/article/bring-science-home-leaf-litter-biodiversity/>

<http://www.caryinstitute.org/sites/default/files/public/downloads/curriculum-project/Invertebrate%20Guide.pdf>

APPENDIX C: THEME SHEETS

Interpretive Program Theme Planning Worksheet

Presenter Name: Jessica Doerr, Cate Lucas

Presentation Location: Schmeckle Reserve **Day and Time:** July 30 & August 2, 2016, 10 a.m.-12:30 p.m.

Program Topic: Prairies

Narrow your topic through research/brainstorming and write a theme.

1. List specific resources used for research (*primary & secondary sources*):

See Lesson Plan

2. List the tangible resources and intangible meanings of your focused topic:

Tangibles

Animal and Plant Residents
Animals leave traces
Diversity
Adaptations

Intangibles

Beauty
Relationships with prairies (animals, humans)
Home to diverse group of organisms
Restoration

3. Program Theme (*complete sentence, specific & focused, links tangibles to intangibles, organizational tool*):

While some only see grass, prairies are diverse systems that have unique relationships with the many unnoticed plants and animals call home as well as humans.

Describe how your program will address the Three Pillars of Interpretation.

4. How will this program meet the goals of your agency or organization?

Schmeckle Reserve's mission includes being a Refuge for all things found in the Reserve, being an outdoor classroom as well as other education and research related to natural resources, and lastly providing recreation opportunities to the residents and visitors of Stevens Point, WI. This program will allow for visitors to recreate through a hands-on nature-based program that will look at various habitats around the Reserve and hopefully get families motivated to explore and appreciate the outdoors more.

5. What audience(s) do you expect will attend? (*ages, background, interests and expectations*)

The expected audience includes intergenerational groups from the surrounding communities. These could include families or guardians and youth (Big Brother, Big Sister). They will hopefully have

various backgrounds and interests in the outdoors. I would expect they would want to learn a few fun things about the outdoors while enjoying a program as a group.

How will you serve diverse audiences? (*people with disabilities, minorities, older adults, families*)

The program will include many multisensory components that will allow for various ages and different learners to understand the content and make connections with the material. The activities provided will allow for all ages to enjoy the program and participate. The paths that will be used and areas for programming should be accessible to all visitors. If problems with mobility do arise, different routes will be planned.

6. What specific site-based resource(s) will you interpret?

The Zimmerman Prairie and its residents will be interpreted. This will include plants and animals that call this habitat home. All signs of life (tracks, scat, holes, etc.) will also be interpreted to visitors.

Develop the organization, structure, and techniques for your program.

7. List the subthemes of your program (2-4 “chunks” of the theme):

- A. Prairie habitats are made up of diverse communities.
- B. The plants and animals that call prairies home have special adaptations and behaviors to be successful residents.
- C. To discover who lives in prairies, one may have to look for signs of life if the actual animals are not seen.

8. Brainstorm creative interpretive techniques you can use (*presentation style, props, involvement*):

Visitors will use props to dress up as and act out different plant and animal species. Photos will be used to show species that may not be seen during programming or to assist in explaining a concept. Presenters will use a detective theme to get participants involved in activities.

9. Outline the four main parts of your program. Be as specific as possible.

POW (*attention-grabbing introduction*):

Ms. Holmes and Dr. Watson are on the hunt to determine just who has been living in their backyard!

BRIDGE (*transition from POW to Body: introduce self, establish credibility, incorporate theme*):

See Lesson Plan

BODY & TRANSITIONS (*List the order of main points. For each, provide a short description of what you’ll talk about, techniques to interpret it, and transitions between the points*):

See Lesson Plan

CONCLUSION (*creative and inspiring take-home message*):

See Lesson Plan

Interpretive Program Theme Planning Worksheet

Presenter Name: Cate Lucas, Jessica Doerr

Presentation Location: Schmeeckle Reserve **Day and Time:** August 6 & 9, 2016, 10 a.m.-12:30 p.m.

Program Topic: Wetlands

Narrow your topic through research/brainstorming and write a theme.

1. List specific resources used for research (*primary & secondary sources*):

See lesson plan.

2. List the tangible resources and intangible meanings of your focused topic:

Tangibles

Animal Residents
Diversity
Adaptations – feeding, breathing

Intangibles

Home to diverse group of organisms
Wetland Restoration

3. Program Theme (*complete sentence, specific & focused, links tangibles to intangibles, organizational tool*):

Humans can look at the unique adaptations of flora and fauna of wetlands to identify species, determine the health of the ecosystem, and contribute to ongoing research regarding specific wetland areas.

Describe how your program will address the Three Pillars of Interpretation.

4. How will this program meet the goals of your agency or organization?

Schmeeckle Reserve’s mission includes being a Refuge for all things found in the Reserve, being an outdoor classroom as well as other education and research related to natural resources, and lastly providing recreation opportunities to the residents and visitors of Stevens Point, WI. This program will allow for visitors to recreate through a hands-on nature-based program that will look at various habitats around the Reserve and hopefully get families motivated to explore and appreciate the outdoors more.

5. What audience(s) do you expect will attend? (*ages, background, interests and expectations*)

The expected audience includes intergenerational groups from the surrounding communities. These could include families or guardians and youth (Big Brother, Big Sister). They will hopefully have various backgrounds and interests in the outdoors. I would expect they would want to learn a few fun things about the outdoors while enjoying a program as a group.

How will you serve diverse audiences? (*people with disabilities, minorities, older adults, families*)

The program will include many multisensory components that will allow for various ages and different learners to understand the content and make connections with the material. The activities provided will allow for all ages to enjoy the program and participate. The paths that will be used and areas for programming should be accessible to all visitors. If problems with mobility do arise, different routes will be planned.

6. What specific site-based resource(s) will you interpret?

The Reflection Pond and freshwater invertebrates found there will be interpreted.

Develop the organization, structure, and techniques for your program.

7. List the subthemes of your program (2-4 “chunks” of the theme):

- A. Wetlands are complex systems with residents that are specially adapted to live in the environment.
- B. Aquatic invertebrate residents have unique adaptations that allow them to fill various niches.
- C. Simple identification and record of invertebrates found in a wetland habitat can help assess the health of the system.

8. Brainstorm creative interpretive techniques you can use (*presentation style, props, involvement*):

Visitors will be introduced to simple invertebrate identification using a dichotomous key chart. Visitors will dipnet in a selected wetland habitat. Visitors will use charts to record what invertebrates are found. Preserved specimens will be used to show participants different types of organisms that can be found. Movements for participants to do will be developed to help represent how different invertebrates move.

9. Outline the four main parts of your program. Be as specific as possible.

POW (*attention-grabbing introduction*):

See lesson plan.

BRIDGE (*transition from POW to Body: introduce self, establish credibility, incorporate theme*):

See lesson plan.

BODY & TRANSITIONS (*List the order of main points. For each, provide a short description of what you’ll talk about, techniques to interpret it, and transitions between the points*):

See lesson plan.

CONCLUSION (*creative and inspiring take-home message*):

See lesson plan.

Interpretive Program Theme Planning Worksheet

Presenter Name: Cate Lucas, Jessica Doerr

Presentation Location: Schmeeckle Reserve **Day and Time:** August 13 & 16, 2016, 10 a.m.-12:30 p.m.

Program Topic: Forests

Narrow your topic through research/brainstorming and write a theme.

1. List specific resources used for research (*primary & secondary sources*):

See lesson plan.

2. List the tangible resources and intangible meanings of your focused topic:

Tangibles

Animal Residents – general & decomposers
Different forest levels
Decomposition in the woods

Intangibles

Home to diverse group of organisms
Misunderstood animals

3. Program Theme (*complete sentence, specific & focused, links tangibles to intangibles, organizational tool*):

Woodlands are home to misunderstood and underappreciated plants, animals, and fungi that help tidy up the forest floor in ways humans can adapt to reduce waste in their own environment.

Describe how your program will address the Three Pillars of Interpretation.

4. How will this program meet the goals of your agency or organization?

Schmeeckle Reserve's mission includes being a Refuge for all things found in the Reserve, being an outdoor classroom as well as other education and research related to natural resources, and lastly providing recreation opportunities to the residents and visitors of Stevens Point, WI. This program will allow for visitors to recreate through a hands-on nature-based program that will look at various habitats around the Reserve and hopefully get families motivated to explore and appreciate the outdoors more.

5. What audience(s) do you expect will attend? (*ages, background, interests and expectations*)

The expected audience includes intergenerational groups from the surrounding communities. These could include families or guardians and youth (Big Brother, Big Sister). They will hopefully have various backgrounds and interests in the outdoors. I would expect they would want to learn a few fun things about the outdoors while enjoying a program as a group.

How will you serve diverse audiences? (*people with disabilities, minorities, older adults, families*)

The program will include many multisensory components that will allow for various ages and different learners to understand the content and make connections with the material. The activities provided will allow for all ages to enjoy the program and participate. The paths that will be used and areas for programming should be accessible to all visitors. If problems with mobility do arise, different routes will be planned.

6. What specific site-based resource(s) will you interpret?

The different forest levels will be interpreted. The animals that help decompose organic materials will be interpreted.

Develop the organization, structure, and techniques for your program.

7. List the subthemes of your program (2-4 “chunks” of the theme):

- A. Woodlands are divided into different levels that serve as homes for different types of organisms.
- B. While most people are looking up, the forest floor is home to animals adapted to be the cleanup crew of the forest.
- C. Humans can use the skills of woodland animals to help break down wastes at home.

8. Brainstorm creative interpretive techniques you can use (*presentation style, props, involvement*):

Diagrams and images will be used to discuss the various woodland levels and the residents of this habitat. Visitors will get to explore the forest floor. Dichotomous keys will be used to identify those organisms living on the forest floor. Participants will look at the forest through the eyes of a fairy. Participants will help construct a small compost bin that could be used in a home.

9. Outline the four main parts of your program. Be as specific as possible.

POW (*attention-grabbing introduction*):

See lesson plan.

BRIDGE (*transition from POW to Body: introduce self, establish credibility, incorporate theme*):

See lesson plan.

BODY & TRANSITIONS (*List the order of main points. For each, provide a short description of what you’ll talk about, techniques to interpret it, and transitions between the points*):

See lesson plan.

CONCLUSION (*creative and inspiring take-home message*):

See lesson plan.

APPENDIX D: REGISTRATION SPREAD SHEET

Habitat Adventures: Prairies								30-Jul-16
Name	Phone	E-mail Address	#Adults	#Children	Ages of Participants	Relationship to Group Members	How did you hear about this program?	Have you been to any programs at Schmeckle in the past?

APPENDIX E: INFORMED CONSENT

Informed Consent to Participate in Human Subject Research

You are being asked to participate in a research study conducted by Melissa Alexander, a graduate student in the College of Natural Resources at the University of Wisconsin – Stevens Point. The purpose of this study is to determine the best methods for developing and implementing nature-based programs for family-like groups while looking at the social and learning aspects of adults and youth in a group format. If you decide to participate in this study, you will be asked to allow the researcher to observe you and your youth during the program. You and your youth will be asked questions in a group following the program about your experience. You will also be contacted in October with follow-up questions. These answers will be recorded for research purposes.

The researcher anticipates minimal risk to you as a result of your participation in this study. This includes exposure to outdoor elements during programming, engaging in outdoor activities (walking, standing, etc.), and possible mental discomfort due to sharing opinions in a group setting.

Potential benefits from participation in this study include information gained during this programming and the potential for Schmeckle Reserve to continue this programming at a later date.

The observations taken and answers you give to questions asked will be recorded in anonymous form. No information that could identify you will be released.

If you want to withdraw you and/or your youth from the study at any time you may do so without consequence.

Once the study is complete, you can obtain the results of the study. If you are interested in the results or have questions, please contact:

Melissa Alexander
Schmeckle Reserve
2419 North Point Drive
Stevens Point, WI 54491
(715)346-4992

If you have any complaints about your treatment as participant in this study, please call or write:

Dr. Debbie Palmer, Chair
Institutional Review Board for the Protection of Human

Subjects

Department of Psychology
Science Building, D240
University of Wisconsin-Stevens Point
Stevens Point, WI 54481
(715) 346-3953
dpalmer@uwsp.edu

Although Dr. Palmer will ask your name, all complaints are kept in confidence.

I have received a complete explanation of the study, my role in the study, and I agree to participate.

Name _____
(Signature of subject)

I have received a complete explanation of the study, my youth's role in the study, and I agree to allow them to participate.

Name _____
(Printed name of youth)

Name _____
(Signature of parent/guardian)

Date _____

This research project has been approved by the UWSP Institutional Review Board for the Protection of Human Subjects.

APPENDIX F: YOUTH CONSENT SCRIPT

Hi, I'm Melissa and I work here at Schmeckle Reserve. I also go to school at the University. I would like for you to be a part of my school project about family groups, just like yours, going to nature programs. If you say yes, I would like to

- 1. Ask you questions about the program when we are done.*
- 2. Walk around with everybody and take notes on what everyone does for my school project.*

Is this okay with you?

Modified from Guidelines for Obtaining Assent from Minors.

APPENDIX G: INSTITUTIONAL REVIEW BOARD APPROVAL

Protocol #: 15-16.095
Principal Investigator(s): Melissa Alexander and Brenda Lackey
To be completed by the IRB Staff

Institutional Review Board Action:

- Project is exempt from IRB review under category _____ Exemption holds for 5 years.
- Project is exempt from IRB review under category _____ *provided minor modifications are completed.* Exemption holds for 5 years.
- Project is approved through expedited review.
- Project is approved through expedited review *provided minor modifications are completed.*
- Project is approved through the full board review process; date of meeting: 5-5-16
- Project is approved through the full board review process, *provided minor modifications are completed;* date of meeting: _____
- Additional information is requested. Please see attached instructions and resubmit.
- Project is not approved at this time.
- Project does not include human subjects.
- Project is not defined as research.

Signature: *Delcie Palmer* 6-15-16

Institutional Review Board Chair or Designee

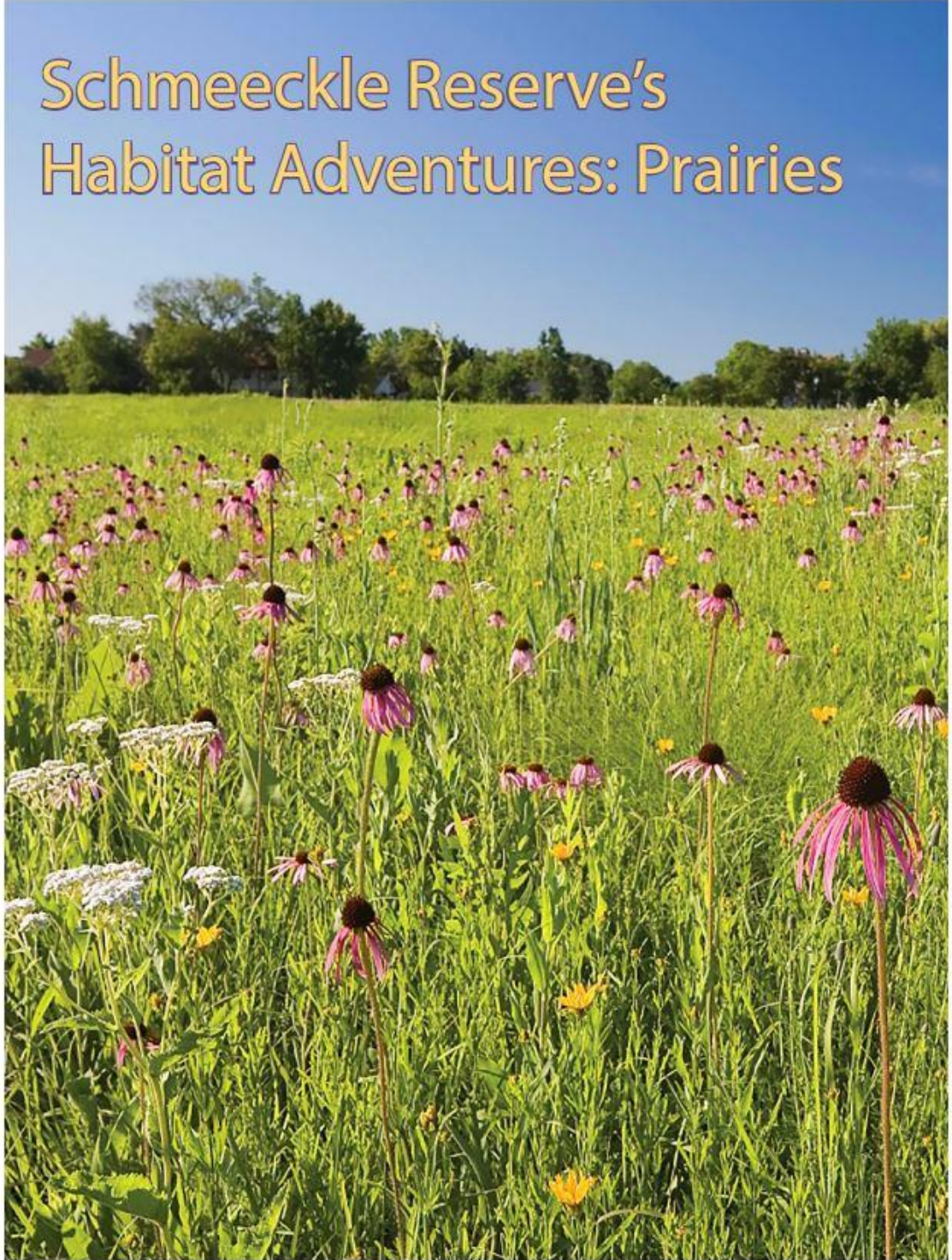
Date

APPENDIX H: MURAL INTRODUCTION TO YOUTH

Draw a picture of a _____ habitat. You can use all of the supplies given. Draw as best you can – you can use labels and words if needed. Include things that live in these habitats. Show me why this habitat is important.

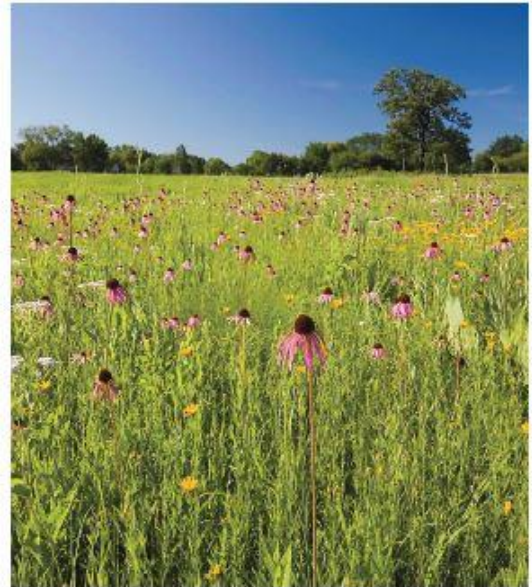
APPENDIX I: EXAMPLE PROGRAM BOOKLET

Schmeeckle Reserve's Habitat Adventures: Prairies



What is a prairie?

Prairies are habitats that consist of grasses, sedges, flowering plants, and sometimes have trees.



Who lives in prairies?





Milkweed



Monarch Butterfly



13-lined Ground Squirrel



Big Bluestem

Garter Snake



Black-eye Susan














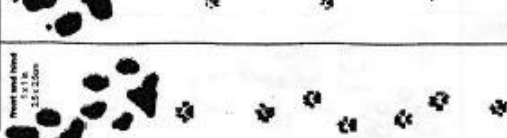




Whitetailed Deer

Signs of Life

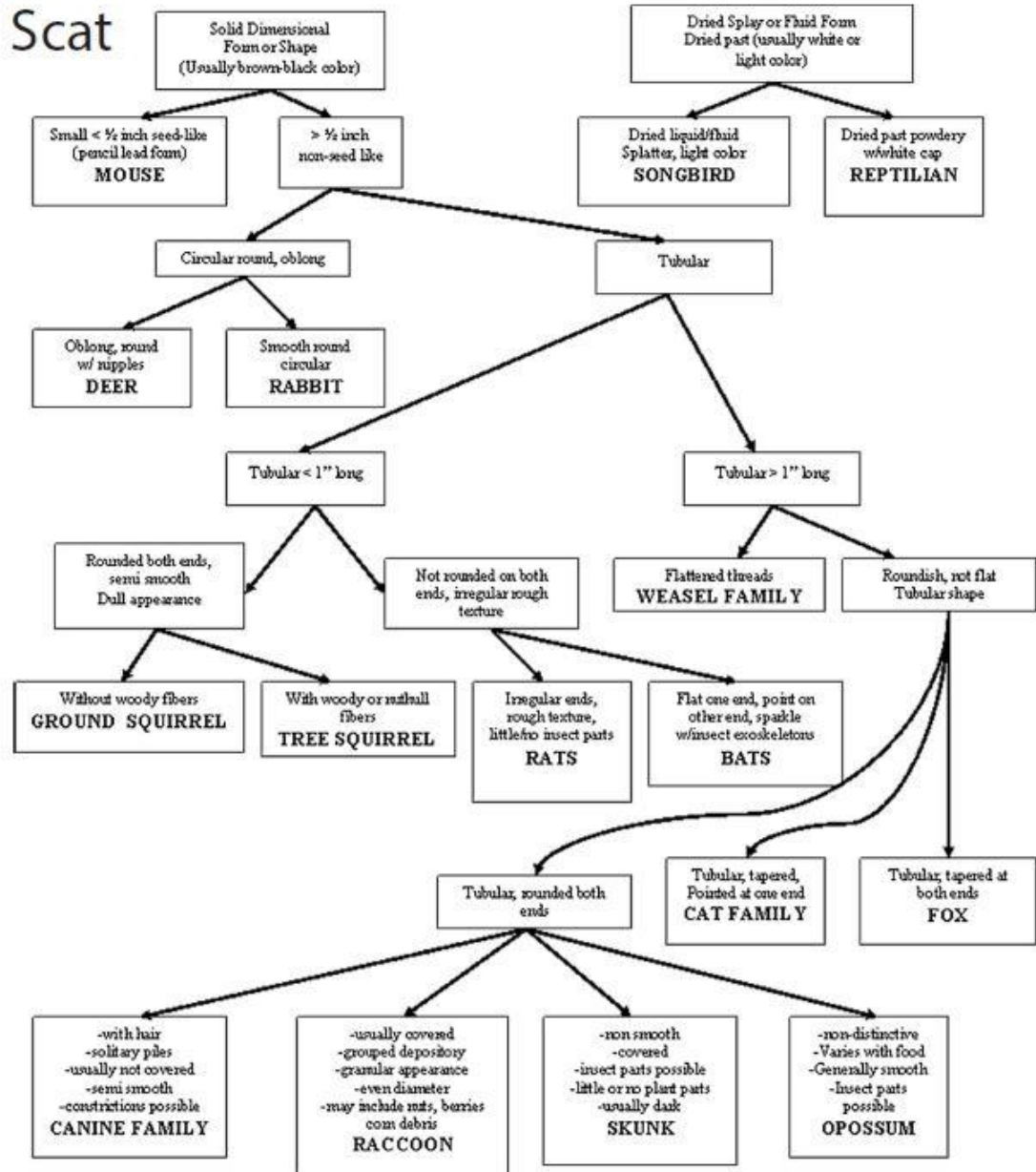


Tracks

Mouse	Vole	Squirrel	Rabbit	Fox	Deer	Cat	Dog
 	 	 	 	 	 	 	 
Tracks	Tracks	Tracks	Tracks	Tracks	Tracks	Tracks	Tracks
Food Source	Food Source	Food Source	Food Source	Food Source	Food Source	Food Source	Food Source
Shelter	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter	Shelter
Scat	Scat	Scat	Scat	Scat	Scat	Scat	Scat

Tracks and illustrations are from Scats and Tracks of the Northeast (Halfpenny, Bruchac and Teland, The Globe Pequot Press, 2001) and <http://www.naturenorth.com>, a Manitoba online magazine.

Scat



Become a Detective

	WHAT DO YOU SEE?	WHO LEFT THE HINT?	WHY DO THEY WANT THE PRIZE?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

APPENDIX J: PROGRAM ADVERTISEMENT

Schmeckle Reserve's Habitat Adventures

A Family Program Series
Summer 2016

Walk among the trees, smell the wildflowers, and listen to wetland birds. Discover the wonders of Schmeckle's diverse habitats during a summer family program series.

Parents and guardians, bring your youth out for hands-on activities to explore the habitats of Schmeckle Reserve. Programs are geared toward youth ages 4-10, with a maximum group of four children and two adults.



Program Line-up

Prairies, July 30 or August 2, 10 a.m.-12:30 p.m.

Wetlands, August 6 or 9, 10 a.m.-12:30 p.m.

Forests, August 13 or 16, 10 a.m.-12:30 p.m.

Programs are free but registration is required. Register by contacting Melissa Alexander at...



Schmeckle Reserve
College of Natural Resources
University of Wisconsin - Stevens Point

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(715) 346-4992

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Schmeckle Reserve
Habitat Adventures Program
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Public · Family · Hosted by Schmeeckle Reserve

★ Interested + Going Invite Edit ...

🕒 Saturday, July 30 at 10 AM - 12:30 PM
about 2 months ago

📍 2419 North Point Drive, Stevens Point, WI [Show Map](#)

About

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Details

Join Schmeeckle interpreters and discover the beautiful, busy world of prairies. Explore the diverse world of plants and animals that live in this habitat. Become a detective and search for signs of those animals that may not be seen but leave behind traces of their existence.

Program attendees can help shape future programming at Schmeeckle Reserve by participating in a family study. After hands-on activities and exploration of the prairie, Schmeeckle staff would like to ask you a few questions about your experience.

Parents and guardians, bring your youth out for an exciting look at this amazing habitat. The program is for kids 4-10 years old with a maximum group of four kids and two adults. Snacks will be provided.

This program will be given twice, July 30 and August 2. This is a free program and registration is required. Register for programs by contacting Melissa Alexander at malexand@uwsp.edu or (715)346-4992.

About Schmeeckle Reserve



Schmeeckle Reserve
University · Stevens Point, Wisconsin
Natural area on the University of Wisconsin-Stevens Point campus.

EVENT TIPS [Next Tip](#)

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Have another event by Schmeeckle Reserve coming up? Create an event to let people know about it.

[Create](#)



Allison, Meghan and Robbie were interested

27 interested 0 went 1 shared with

INSIGHTS

1K Reached 
+0 this week

91 Viewed 
+0 this week

32 Responded 
+0 this week

Since 06/30/2016

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Sat Oct 15 at Schmeeckle Rese...
Workshop · 1 friend is going
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'Habitat Adventures' summer family programs at Schmeeckle Reserve

7/5/2016

Explore the prairies, wetlands and woodlands of University of Wisconsin-Stevens Point's Schmeeckle Reserve this summer as part of a series of free, family summer programs.

Each session is limited to 20-25 people. Families with youth ages 4-10 may attend, with family groups no larger than two adults and four children. Programs will begin at the Schmeeckle Reserve Visitors Center, 2419 North Point Drive, Stevens Point, and will be taught by student naturalists from the College of Natural Resources. Each program is from 10 a.m. to 12:30 p.m., including:

- Prairies, Saturday, July 30, or Tuesday, Aug. 2
- Wetlands, Saturday, Aug. 6, or Tuesday, Aug. 9
- Forests, Saturday, Aug. 13, or Tuesday, Aug. 16

All programs are free but registration is required. Contact Melissa Alexander at malexand@uwsp.edu or 715-346-4992. For more information, go to www.uwsp.edu/cnr-ap/schmeeckle/Pages/programs/calendar.aspx.

Article Tags

CNR; Healthy; Sustainable

[UW-Stevens Point University Relations and Communications](#)

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Comments or questions: urc@uwsp.edu

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APPENDIX K: EXAMPLE OF COMPLETED OBSERVATION SHEET

		Group Snails									
		Adult Male	Youth Female	Adult Female	Youth Male	Adult Male	Youth Female				
August 6, 2016 Wetlands	During Lecture	Interest & Attentiveness	Group Beeties	Adult Male	Adult Female	Youth Male	Youth Female	Adult Male	Adult Female	Youth Male	Youth Female
			paid attention throughout, seemed interested in all information given, eyes were always up front when listening and made comments about things being taught.	seemed interested throughout, paid attention	loves telling stories, thought tree frogs and some toads lived in wetlands, knows other critters that live there	very interested in all info being given, watched educators	not sure on interest level, but did look forward and pay attention throughout program	listened throughout	so excited throughout, very excited about pictures	listened throughout	listened throughout
			Understand & Approval	would nod and laugh, knew some species of aquatic insects because of book reading, liked the additional info we had to offer, shared info from book with daughter previously	so excited!	knew mosquito larva, smiled	talked about their aquarium at home and how that is where their son got his ideas of wetlands from and stories, smiled and joked with other mother	knew caterpillars changed to butterflies, smiled and laughed	smiled		
			Resistance or Disapproval		Frogs and blue gills don't live together.. Haha						
			Confusion		goofy, but excited, wanted to asked questions from time to time						
			Boredom								
			Tool Suggester	X		X, excited by net!!!					
			Teacher	Dad and daughter led, but whole family worked together							
			Exploration Ender	suggested using net to find critters, dad showed family the small things you can find in the plants	mom really liked the worksheet	excited by net!	showed youth how to use net	mom and daughter would use the key to id all animals found	ended up a bit distracted and talked, heat may have been a component		excited about net
			Exploration Ender	shared info w/daughter about the ecosystem, shared feelings about movie epic and the connections that can be made to the wetlands	shared findings, mom shared knowing water spider	daughter would suggest using direct key					daughter was excited about showing all of the animals found
Activity 2 Explore Based	Sharing Experiences	innovator (encourages imagination)	continuously looking for things and dipnetting	excited about bird that was seen in trees behind stage, "wetlands stay where they are", excited about pictures being passed around, do crayfish pinch? "Oh yeah", excited about id-ing, inquisitive	able to deduce and great recall skills, shared experience about squirrel	quizzed kids on things they should know, ex. What a group of fish is called?, talked with kids about june bug, lava after looking at and hearing about other larvae, mom continued netting throughout 2nd activity	talked about turtles using catails as swords (anal), "Snarks eat fish"				
		Notes									
Overall program notes		this family was so excited about exploring together, they were all very interested in the information presented and already had a background in getting outdoors together heat may have been a component when looking at exploration ending, all kids ending up holding dragonflies, both families enjoyed critter aerobics Awesome program! The heat was a little intimidating at the pond. Educators did a great job getting involved in the group discoveries.									