I describe the experience of a seven month internship at Aullwood Audubon Center and Farm. Aullwood is located in Southwest Ohio outside the city of Dayton. It was established in 1957 when Marie S. Aull gave the land to the National Audubon Society to open a nature center for people to enjoy the beauty of the land. The 120 acre farm was added in 1962 and is a working organic farm. My internship focused on teaching natural history and organic/sustainable agriculture programs to school groups. I was also involved in teaching education programs for adults, teaching Summer Earth Adventures classes, leading the Girl Scout overnight program, planning the Educational Farm Symposium, presenting a volunteer workshop, developing two education activities, caring for farm animals, visiting other nature centers, and assisting with special events. The internship was a professionally enriching experience and has strengthened my abilities for a career in environmental education.
AN ENVIRONMENTAL EDUCATION INTERNSHIP AT AULLWOOD 
AUDUBON CENTER AND FARM IN DAYTON, OHIO

An Internship

Submitted to the

Faculty of Miami University

in fulfillment of the requirements for the degree of

Master of Environmental Science

Institute of Environmental Sciences

by

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2003

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TABLE OF CONTENTS

LIST OF FIGURES iv

ACKNOWLEDGMENTS v

Chapter 1: INTRODUCTION 1
National Audubon Society 1
Aullwood Audubon Center and Farm 3
Internship Duties 6
Internship Goals and Objectives 6

Chapter 2: INTERNSHIP RESPONSIBILITIES 8
Education 8
Animal Care 8
Farm Chores 9
Girl Scout Overnight Programs 11
Volunteer Workshops 12
Ozone Monitoring Program 12
Reporting Schedule 13

Chapter 3: EDUCATION PROGRAMS 14
School Programs 14
Aullwood Adventures Program 19
Lifelong Learning Opportunities 19
Audubon Naturalist and Audubon Home Ecologist Certification 21
Adult Classes and Workshops 22
Public Programs 24
Summer Earth Adventures 27
Aullwood Resources for Earth and Agriculture Discovered and Shared 30

Chapter 4: PROJECTS 33
Educational Farm Symposium 33
Biodiversity in Organic Farming: Sustainability in Agroecosystems 36
Education Materials 37

Chapter 5: NATURAL HISTORY 39
Aquatic Field Study 39
Stillwater River Fish Seining 39
Long Term Butterfly Monitoring 40
Morning Discovery Walks 41
<table>
<thead>
<tr>
<th>Chapter 6: NATURE CENTER VISITS</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glen Helen Outdoor Education Center</td>
<td>42</td>
</tr>
<tr>
<td>Darke County Parks Nature Center</td>
<td>43</td>
</tr>
<tr>
<td>Brukner Nature Center</td>
<td>44</td>
</tr>
<tr>
<td>Cedar Bog</td>
<td>44</td>
</tr>
<tr>
<td>Chapter 7: SPECIAL EVENTS</td>
<td>46</td>
</tr>
<tr>
<td>Englewood Fine Arts Festival</td>
<td>46</td>
</tr>
<tr>
<td>Apple Fest</td>
<td>46</td>
</tr>
<tr>
<td>Enchanted Forest</td>
<td>47</td>
</tr>
<tr>
<td>Ice Cream Social</td>
<td>48</td>
</tr>
<tr>
<td>Chapter 8: CONCLUSION</td>
<td>49</td>
</tr>
<tr>
<td>Farms and Natural History</td>
<td>49</td>
</tr>
<tr>
<td>Environmental Education and Natural History</td>
<td>52</td>
</tr>
<tr>
<td>Conclusion</td>
<td>55</td>
</tr>
<tr>
<td>Graduate Course Work</td>
<td>57</td>
</tr>
<tr>
<td>Career Preparation</td>
<td>58</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>60</td>
</tr>
<tr>
<td>Appendix A: GIRL SCOUT OVERNIGHT PROGRAM</td>
<td>62</td>
</tr>
<tr>
<td>Appendix B: FULL MOON WALK</td>
<td>63</td>
</tr>
<tr>
<td>Appendix C: WEEKEND PROGRAMS</td>
<td>65</td>
</tr>
<tr>
<td>Appendix D: SUMMER EARTH ADVENTURES</td>
<td>71</td>
</tr>
<tr>
<td>Appendix E: EDUCATIONAL FARM SYMPOSIUM</td>
<td>79</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

FIGURE 1:  Map of Dayton, Ohio 3
FIGURE 2:  Trail Map of Aullwood Audubon Center and Farm 4
FIGURE 3: Aullwood Operational Structure 5
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CHAPTER 1

INTRODUCTION

The Institute of Environmental Sciences (IES), Master of Environmental Science program internship option, is an opportunity to complete the program at an organization involved in interdisciplinary environmental activities. The six month internship is a valuable way to gain experience in a particular field of work. One of the internship requirements is to be involved in a project that plays a significant role in the organization. A written agreement between IES and the sponsoring organization, monthly progress reports, a final report, and a final public defense are also required. I chose the internship option because I wanted to work with children and be involved in environmental education. I chose Aullwood Audubon Center and Farm (Aullwood), a National Audubon Society (NAS) education center, because of the opportunity to gain experience in environmental education and organic farming.

My field of concentration in IES was Biological Conservation, and I chose to do an internship in environmental education because I wanted to work in an outreach capacity with children and adults. Aullwood offers education internships with an added opportunity of working on and teaching about the organic farm. I am very passionate about fostering children in experiences that connect them to the land and all of the creatures with which they share the planet.

National Audubon Society

The National Audubon Society was founded in 1905 and is named for John James Audubon, a naturalist, ornithologist, and wildlife artist. Throughout the late 1800s, Audubon Societies were forming focusing on the protection of wild birds and animals.
Since no wildlife laws had yet been established, birds and other animals were being exploited for meat, decorative feathers, and eggs. Audubon societies fought to protect birds and other animals. In 1940, the name was shortened from the National Association of Audubon Societies for the Protection of Wild Birds and Animals to the National Audubon Society (National 2002).

Public Outreach and Education campaigns began in 1910 with the Junior Audubon Club. Children in the group were taught about birds and their protection through distributed leaflets. Today, Audubon sponsors environmental education programs through Audubon Adventures and the network of thirteen Audubon centers. Audubon’s educational focus is on hands-on learning, involving problem solving and linking students to the world around them, to study nature, birds, and appreciate the complexity of the world they inherit (National 2002).

Today, Audubon centers and sanctuaries exist throughout the United States and NAS has over 600,000 members, state offices in twenty-seven states and 500 chapters. The mission of the National Audubon Society is “to conserve and restore natural ecosystems, focusing on birds and other wildlife for the benefit of humanity and the earth’s biological diversity” (National 2002). The organization has conservation, education, and advocacy programs at the local, state, and national levels (National 2002).
**Aullwood Audubon Center and Farm**

Aullwood Audubon Center and Farm is located on 350 acres of land in the Miami Valley near Dayton, Ohio (Figure 1). The education center includes many exhibits, live animals, and six miles of trails through prairie, marsh, pond, stream, and forest habitats (Figure 2). The certified organic farm operates as a working farm with livestock, vegetable and herb gardens, pastures, crop fields, and beech-maple forest (Figure 2). The land where the education center stands was given to NAS by Marie S. Aull in 1957. An adjacent farm was bought by Mrs. Aull to deter development and was given to NAS in 1962. In 1978, the center and farm were combined and renamed Aullwood Audubon Center and Farm (Aullwood 2002).

Aullwood’s mission statement is: “Aullwood Audubon Center and Farm, an Audubon Center of the National Audubon Society for environmental education and organic agriculture, provides activities that increase understanding and preservation of the planet by children and adults through education, research, and recreation” (Aullwood 2002).

Aullwood staff members have offices at the nature center, but are involved with both the nature center and the farm. Two staff members are located at the farm office. There are fourteen full-time staff and four part-time staff, plus interns and volunteers. The Friends of Aullwood Trustees oversee the operations of the nature center and farm. Figure 3 shows the Operational Structure of Aullwood.

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![Figure 1: Map of Ohio showing the location of Aullwood Audubon Center](image)
Figure 2: Trail Map of Aullwood Audubon Center and Farm
Figure 3: Aullwood Operational Structure
Internship Duties

As with all internships, interns are assigned specific duties at the beginning of the internship that are part of the internship contract. Along with these duties, the program is individualized to each intern. The intern objectives as written in the Internship Program Syllabus are as follows:

- Teach students from pre-school through high school in an outdoor setting (primary responsibility)
- Develop weekly lesson plans for Summer Earth Adventures
- Plan and conduct programs for the general public (including weekend programs and Center for Lifelong Learning programs)
- Learn to answer the public’s natural history questions
- Complete an approved project for Aullwood
- Understand and effectively teach basic ecological concepts
- Develop or modify Aullwood school program curricula
- Assist with special events and off-site exhibits
- Care for animals at the center and farm and other farm chores as needed
- Write articles for newsletter
- Attend weekly volunteer workshops
- Serve in all other capacities as needed including operating cash register, telephones, greeting guests, etc.

Internship Goals and Objectives

In order to make the most of my internship at Aullwood, I formulated goals and objectives based on my professional interests and Aullwood’s intern program. I reviewed my objectives often and was able to accomplish many of them during the seven month internship.
**Education** - To teach children and adults about the interconnections between themselves and the natural world.
- Gain more experience working with children and adults in a natural history/environmental setting
- Learn more hands-on activities and ways to engage children in hands-on learning
- Learn innovative teaching methods from other educators
- Prepare and present public programs
- Assist in planning the sustainable living series of workshops
- Learn about other nature or farm centers’ education programs by site visits
- Prepare and implement lesson plans for Summer Earth Adventures classes
- Attend workshops to further knowledge and training
- Volunteer for the Resources for Earth and Agriculture Discovered and Shared (R.E.A.D.S.) program

**Natural History** - To gain a better understanding of the natural and cultural history of Aullwood, the region, and the state.
- Improve natural history skills by learning the ecology, and natural history of native plants, shrubs, vines, trees, birds, fungi, geology, streams, butterflies, fish, etc.
- Learn about the cultural history of Aullwood and the surrounding area
- Obtain certification in the Center for Life Long Learning naturalist program
- Learn more about edible wild plants

**Agriculture** – To gain experience in organic agriculture techniques.
- Learn the operations of the farm
- Be involved in organic gardening and help make the garden educational as well as aesthetically pleasing to the public
- Learn more about beekeeping
- Obtain more knowledge on sustainable agriculture and small farm operations
- Research ways to reach a larger audience with farm programs

**Animal Care** – Learn more about the animals at the nature center and farm.
- Care for, observe, and research animals at the nature center and farm

**Research** – Gain a better understanding of the ecology of Aullwood through established on-going research.
- Be involved in research at Aullwood (butterflies, birds)
- Learn more about land management at the nature center and farm

**Other** – To become familiar with the operations of the organization.
- Contribute to Aullwood in all capacities as needed
- Help at special events
- Learn the operations of the center
- Be in charge of the nature center on the weekends
- Become part of Audubon’s activism campaign
CHAPTER 2

INTERNSHIP RESPONSIBILITIES

Education

The primary responsibility of environmental education interns at Aullwood is to teach school groups. Around 1,000 local students visit Aullwood each week and the education staff is joined by interns and volunteers to make education programs at this large scale possible. Teaching and working with children was my favorite part of the internship and the primary reason that I came to Aullwood. The education programs at Aullwood are designed to build awareness, teach the basics of natural history and organic agriculture, and encourage a sense of wonder about the natural world. By giving children hands-on outdoor exploration experiences and the opportunity to visit a working organic farm, it is hoped that their lives will be enriched and they will form a connection to the land and their communities.

Animal Care

Aullwood has native Ohio animals to provide educational experiences for visitors. Although the most important things to discover at Aullwood are outside, it is rare for visitors to get to interact closely with live animals. Most animals are very secretive and afraid of people, so visitors usually do not see many animals other than birds and squirrels at Aullwood. The animals are cared for by interns and staff. I cared for the following animals during my internship:

- Snakes: black rat snakes, milk snake, garter snake, timber rattlesnake, Northern copperhead, and Eastern massasauga rattlesnake
- Water turtles: snapping turtle, map turtle, Eastern spiny softshell turtle, painted turtle, and red-eared slider
- Land turtle: Eastern box turtles
Keep the bird feeders around the building filled with seeds was also included in animal care. Animal feeding, watering, and cage cleaning was split equally among the interns. The best part about animal care was learning about each animal through this close contact. The hawk is used educationally for programs about birds and ecology and is effective to use to demonstrate the ecological role of a bird through a food web.

While at Aullwood I tried to understand the need for education and the realization that animals were being kept in an environment that did not resemble their natural habitats. Some animals originated in the pet trade, while some were caught in their natural habitats and brought to Aullwood. They slept and lived in one place, could not interact with other animals or catch their own food, and lived under artificial lighting. Their life habits and seasonal cycles were completely altered for educational purposes. Having animals for the sake of education does not justify keeping them in cages at Aullwood, but more natural living environments could be designed and alternatives to keeping living creatures in artificial environments could be researched and explored.

Farm Chores

Aullwood Farm is a 120 acre organic farm certified by the Ohio Ecological Food and Farm Association. Some crop fields and animals have been certified organic for three years. The farm is a wonderful teaching resource and a great place to discuss human uses of the land. Hay and spelt are grown for food and bedding for the animals which include horses, sheep, pigs, cows, rabbits, goats, chickens, and turkeys.
All interns were assigned morning and afternoon farm chores once or twice a week, which entailed feeding and watering all of the animals and checking them to make sure that they were not sick or injured. Cleaning animal stalls and milking a goat were also included in daily chores.

The farmer planted a mixture of grasses and legumes for the hay crop including a mix of alfalfa and other plants. Once the hay was tall enough and the weather conditions were right for cutting (sunny, no precipitation), the hay was cut and raked in windrows to aid in air circulation and drying. The hay fields were usually cut two to three times during the summer depending on the amount of precipitation. Intern labor was needed to bring hay bales from the fields to the barn and since there were several cuts of each field, we helped bale hay several times.

One of the farmer’s long-term goals was to have more fenced pastures for rotational grazing of animals. Rotational grazing is a method that allows animals to be moved through a series of pastures to provide fresh forage for the animals and to rest the soil and plants between grazing times. This process is beneficial for the farm in many ways. The animals are healthier because they are outside getting sunshine and eating grass and field plants. Less hay has to be baled and manure does not have to be spread on the fields because the animals are distributing it around the pasture. Also, in this way Aullwood can be a local resource for farmers and the community for education about and a demonstration of rotational grazing and sustainable farming practices.

The vegetable garden was maintained by the farm educator and interns. Vegetables and flowers were planted in raised beds which facilitate in water drainage and weed control. When I began my internship in June, there was no work in the garden
because it had already been planted and was not yet ready for harvesting. Asparagus, Jerusalem artichokes, tomatoes, peppers, squash, zucchini, cucumbers, corn, lettuce, gourds, and sunflowers were growing and began to be harvested in July. There were not enough vegetables for a market garden but the staff and summer camp students enjoyed learning about and tasting the vegetables. Expanding the garden to sell vegetables in the summer as a farm product would be a great idea for the farm staff to pursue because it could provide people with fresh local produce along with the meat and eggs that are already sold. This is a way to further expand the educational and sustainability goals of the farm because people could buy local, fresh produce and support Aullwood’s programs and philosophy. Also, by learning how vegetables are grown at Aullwood, people could be encouraged to turn some of their lawn into a vegetable garden.

**Girl Scout Overnight Programs**

The Girl Scout Overnight Program was designed for Brownies and Girl Scouts to experience the farm or the nature center in an in-depth program designed by an Aullwood staff member and scout group leader. I was given the program to manage during my internship and was in charge of all aspects of the program, including scheduling, planning, and the overnight event. Working toward a badge was included, which helped to focus the program and made it more fun and educational.

I planned and led one Girl Scout overnight program during my internship. There were ten girls and four adults and they stayed at the nature center and worked on six activities for a Wildlife Badge. We hiked to Bluegill Pond, saw the red-tailed hawk, discussed birds and their songs, discussed reptiles and observed a snake, and observed and held the box turtles. An outline of the program is in Appendix A. Overall, it was an
educational experience for the Girl Scouts and the troop leaders. The girls received their Wildlife badges before they left and said that they enjoyed learning about ecology and wildlife at Aullwood.

Volunteer Workshops

Volunteer workshops occurred weekly throughout the school year to provide training for all volunteers. Interns were expected to attend all workshops and field trips which ranged in topic seasonally. Workshops I attended during my internship were a field trip to a Five Rivers MetroPark, a field trip to the Columbus Zoo, a Farm 101 workshop, an Enchanted Forest workshop, a Candle Dipping workshop, an Owls workshop, and an Animal Behavior workshop. These 2.5 hour workshops were valuable in learning about the education programs at Aullwood, learning natural history, and visiting other sites to see their operations. They are also valuable in training volunteers to be more knowledgeable with Aullwood visitors.

Ozone Monitoring Program

Aullwood was part of the Miami Valley Ozone Monitoring Program run by Ohio Citizen Action and Environmental Defense. This citizen monitoring program was part of a larger project taking place in Cleveland, Dayton, Buffalo, Baltimore, Atlanta, Washington, and Cincinnati. There were nine sites in the Miami Valley that participated by documenting the levels of low level ozone at their sites. The sponsoring groups paid for all of the equipment and each site was responsible for measuring and recording the ozone levels five days a week. The program lasted from June through September and the interns rotated the weekly responsibility of recording and reporting the results. All of the air quality data for the Miami Valley sites were compiled into a national database. In
cooperation with the Miami Valley Regional Planning Commission, Aullwood also offered free gas cap testing and replacement in July as part of the program. In this partnership with other organizations, Aullwood was able to educate people on a local issue and provide a way for people to actively participate in making a difference in the air quality of their community.

**Reporting Schedule**

Seven monthly reports formatted by weeks were sent to committee members. All reports had an introduction or brief overview of the month, weekly summaries, progress on goals set for the month, goals for the next month, and a conclusion. The reports documented in as much detail as possible what had taken place during the month and included lesson plans for classes or programs from that month and reflection.
CHAPTER 3

EDUCATION PROGRAMS

School Programs

Guided Field Experiences

There are nine guided programs for school groups that are taught throughout the year by education staff, interns, and volunteers. The programs are Nature Explorations, Farmyard Adventures, Comparing Communities, Ohio Visions of the Past, Birds of Prey, Special Focus On Birds, Special Focus On The Farm, Scales and Cold-Blooded Tails, Feathers and Flight, and Geology Explorations. These natural history and organic agriculture programs are designed to provide students with hands-on outdoor experiences that will stimulate their sense of wonder for the natural environment. A major part of my internship was teaching school groups. Below is a brief summary of each of the programs. All programs are ninety minutes long unless otherwise stated.

Nature Explorations is a program for students in pre-kindergarten through grade three. This program is designed to facilitate discovery by encouraging the use of all senses in a rich and natural environment. Visitors walk the trails and explore the hands-on exhibits in Aullwood’s Discovery Room. Visitors experience the diversity of plants and animals to build awareness of Ohio ecosystems.

Farmyard Adventures is a program for students in pre-kindergarten through grade six. This program at Aullwood’s organic farm is designed to make the connection between people and food. Students walk the farmyard, vegetable garden, herb garden, and pastures to discover the diversity of a traditional Ohio family farm. Students learn about the energy and nutrient cycles that characterize the farm ecosystem. Students also
learn about the importance of Aullwood’s team of Belgian draft horses, pigs, cows, goats, chickens, rabbits, turkeys, and sheep in the ecology of the farm.

*Comparing Communities: A Study of Ecology* is a program for students in grades three through twelve and lasts four hours. This in-depth study of ecology allows students to explore Aullwood’s ecosystem communities including prairie, stream, forest, pond, and farm. The program is designed to show how these communities are made up of producers, consumers, and decomposers. As students explore various habitats, they encounter living and nonliving components of ecosystems. This program builds awareness and the use of all senses is stressed as the students explore Aullwood’s unique ecological communities. At the farm, the connection of people to the land and the farm ecological community are discussed while exploring the pastures, gardens, and barns.

*Ohio Visions of the Past* is a program for students in grades three through seven. This two hour program explores the landscape and ecosystems that existed throughout Ohio’s geologic history. By taking an imaginary journey through time, students learn about changes to Ohio’s landscape and cultures including the ancient ocean, ice age, Native Americans, and early Ohio settlers.

*Birds of Prey* is a program for students in kindergarten through grade twelve. This program is designed for students to become familiar with Ohio’s hawks and owls. Students learn about predator adaptations, ecosystem roles, and threats to the existence of birds of prey with slides and real specimens. Students have the opportunity to view Aullwood’s live red-tailed hawk and to learn about an owl’s digestive system and prey by dissecting owl pellets.
Scales and Cold-Blooded Tails is a program for students in grades three through six. This program is designed to teach students about the life characteristics, ecology, and diversity of reptiles. A short introduction program classifies reptiles with all other living creatures and shows specimens relating to reptiles. Students have a chance to observe several Ohio reptiles and explore habitats where reptiles live. Reptile adaptations are stressed as well as their importance in ecosystems.

Feathers and Flight is a program for students in grades three through six. This program explores the life characteristics, ecology, and diversity of birds. The red-tailed hawk is a highlight of the program in which adaptations of birds of prey are discussed. A short introduction with slides and specimens relating to bird ecology illustrates the unique characteristics and complex vocalizations of birds. Field identification and ecology are stressed during a hike on the trails.

Geology Explorations is a program for students in grades four through six. This two hour program involves a short introduction to the geologic history of Ohio and the forces that shaped the landscape into how it looks today. Students walk the geology trail to explore parts of the Stillwater River watershed and look for evidence of ancient oceans, continental glaciers, and running water. The Stillwater River’s fossil beds are explored for fossils of organisms that lived millions of years ago.

Special Focus On Birds is a four hour program for students in grades six through twelve. This special program is designed to take up to eighty students through a full day of exploration of the beauty, ecology, and diversity of birds. Classroom-sized groups have four sessions that address important ecological topics: Identification and Flight
Songs, Adaptations, Habitats and Ecology, and Science and Birds. One session takes place as a hike on the trails to discover bird habitats.

Special Focus On The Farm is a program for students in grades six through twelve. This special program is designed to take up to eighty students through a full day of exploration of the production of food on farms and the importance of sustainable agriculture. Classroom-sized groups go through four sessions that address exciting farm topics of which the teacher can pick four: Farm Scavenger Hunt, How Sweet It Is (honeybees), It’s None of Your Beeswax, Draft Horse Power (wagon ride), and Farm Tour. This program is four hours.

Seasonal Guided Field Experiences

There are several programs that are based on the seasons of the year. These special programs are Maple Syrup, Candle Dipping, Udder Delight, and Enchanted Forest. They vary in length from one to two hours based on the age of the group and the focus of the program.

Maple Syrup is offered in February and March for students in kindergarten through grade twelve. This program is designed to highlight the process of maple syrup making, the importance of green plants in turning sunlight into food, and the exploration of the forest in winter. Students explore the Sugar Bush, where buckets hang on sugar maple trees and the Sugar House where sap is boiled down into maple syrup. They have the opportunity to taste maple syrup and take a small sample of syrup home after their visit. The history of maple syrup making and uses, as well as a discussion of the anatomy of trees and diversity of maple trees, is part of the indoor portion of this program.
Candle Dipping is offered in November and December to students in pre-kindergarten through grade twelve. This program takes place completely inside where beeswax candles are made by dipping candles into large tanks of wax. This program is designed to describe the history of lighting and energy use, the relationship between bees and beekeeping, and the use and understanding of renewable and nonrenewable resources.

Udder Delight is offered in October and April to students in pre-kindergarten through grade twelve. This program is designed to show the connection between food and farms, and students are involved in collecting milk from a milk goat, exploring a farm ecosystem where milk is produced, and churning milk into butter. The students also trace the energy of sunlight through the farm ecosystem to the food on their dinner tables.

Enchanted Forest is offered in late October to students in pre-kindergarten through grade two. In this fun and educational program, students venture through the trails and encounter costumed animals that tell stories about their lives. Students walk the trails through wetland, prairie, and forest ecosystems to learn about animals that are often misunderstood by humans such as raccoons, beavers, bats, and turtles.

Self-Guided Programs

There are three self-guided programs that groups can schedule to visit Aullwood without a naturalist guide. Groups can choose a Nature Center Visit, a Farm Visit, or Geology Explorations. Each group is greeted by a naturalist who discusses the history of the National Audubon Society and Aullwood. They are told about the educational resources in the center, the farm, and on the trails. On their visit to the center, they may have the experience with a naturalist of touching a snake or turtle to feel its scales or
shell. During this time the rules for the center, trails, and farm are explained to the group and then they explore at their own pace.

Aullwood Adventures Program

Currently Aullwood is affiliated with four elementary schools in a special program called Aullwood Adventures. These Dayton suburb schools, Demmitt Elementary, Englewood Elementary, Helke Elementary, and Loos Elementary commit to visiting Aullwood two to three times a year and have a school assembly presented by Aullwood naturalists. This is a beneficial educational program because the students have an opportunity to experience Aullwood in more than one season and can build on their experiences each year. The education coordinator is working to expand this program to more schools.

A school assembly at the beginning of the school year introduces the programs that each grade will be coming for during the year. I helped plan and took part in two school assemblies during my internship. The first assembly was at Englewood Elementary School and was for kindergarten through grade six students. The second school assembly was at Demmitt Elementary School and was for kindergarten through grade four students. In the program we showed slides, performed skits, and dressed up as animals. These programs helped to build the children’s interest in coming to Aullwood later in the school year.

Lifelong Learning Opportunities

Aullwood’s Center For Lifelong Learning satisfies the need for education programs for individuals that are not currently in formal school programs. Pre-school children and people of any age may enroll in Center For Lifelong Learning classes and
workshops. Classes and workshops are scheduled throughout the year and are based on a wide variety of topics including natural history, cooking, gardening, birds, and field trips to various sites.

Preschool Classes

The Preschool program was started three years ago to expand Aullwood’s teaching audience to young children. These classes include Baby Steps In Nature for children ages two-months-old to two-years-old accompanied by an adult, Tots Enjoying Nature (T.E.N.) for children ages two-years-old accompanied by an adult, and T.E.N. for children ages three- to five-years-old with adult accompaniment optional.

Baby Steps In Nature meets once a month and is an opportunity for young children and an adult to enjoy the beauty of Aullwood in all seasons. Children spend time exploring natural objects and doing a group activity, and then venture outside for a sensory experience involving seeing, hearing, feeling and smelling. This program is one hour.

T.E.N. for two-year-olds is offered once a month and meets for ninety minutes. In these classes children explore Aullwood with an adult, beginning with free play with natural objects, toys, and books. Group time follows and the children enjoy songs, stories, finger plays, or a visit from a live animal. Finally, on a walk to explore the many special and secret places of Aullwood, children are encouraged to discover anything from a spotted salamander under a log to a 400-year-old sycamore tree.

T.E.N. for three- to five-year-olds is offered once a week in sessions of seven weeks. Classes are held at the center or the farm and involve a fun-filled two hours of inside and outside exploration. Free play time, songs, stories, finger plays, crafts, seeing
live animals, hikes, and other activities encourage exploration and fascination of the natural world and diversity of Aullwood.

**Audubon Naturalist and Audubon Home Ecologist Certification**

Aullwood offers adult workshops and classes taught by Aullwood staff and a variety of people in the community. The Audubon Naturalist Certification program is designed to inspire individuals to become skilled naturalists and stewards of the earth. There are three levels of certification in the program each with specific requirements. The three levels of certification are *Outdoors Observer*, *Nature Explorer*, and *Audubon Naturalist*. To become an *Outdoors Observer*, the requirements are any combination of four classes and workshops that span at least two areas of study. The requirements for *Nature Explorer* are to complete the first level, and four additional classes and workshops that span at least three different areas of study. A three-day trip and keeping a nature journal for three months are also required. Level Three or *Audubon Naturalist* requirements include completing the *Nature Explorer* level plus four classes and workshops, two three-day trips, maintaining a nature journal for six months, and any two of the following: (1) complete a natural history project with a presentation to others in the certification program, (2) mentor another person in the program, (3) teach a Center For Lifelong Learning class, (4) lead a nature hike at Aullwood, (5) become involved in environmental advocacy, or (6) participate in a land management project at Aullwood. The education coordinator is available to work with participants on any of these projects. Awards such as a certificate, a book on a natural history topic, and recognition in the newsletter are given for the different categories of certification.
Along with the Audubon Naturalist Certification, a new certification program involving sustainable living skills has begun, Audubon Home Ecologist Certification. The requirements are the same and involve classes and workshops that focus on sustainable living topics. The three levels of certification are *Earth Steward, Backyard Farmer*, and *Audubon Home Ecologist*. *Earth Steward* has the same requirements as Level One of the Audubon Naturalist certification. *Backyard Farmer* has the same requirements as *Nature Explorer*, but the participant must go on two day-long farm field trips. To achieve *Audubon Home Ecologist* Certification, a participant must complete the *Backyard Farmer* level plus four classes and workshops, two day-long farm field trips, maintenance of a natural living journal for six months, and any two of the following: (1) complete a project relating to homesteading with a presentation to others in the certification program, (2) mentor another person in the program, (3) teach a Center For Lifelong Learning class, (4) lead a nature hike at Aullwood, (5) become involved in a community agricultural project or program, or (6) participate in a land management project at Aullwood Farm. Awards such as a certificate, a book on farming or homesteading, and recognition in the newsletter are given for the different categories of certification.

**Adult Classes and Workshops**

During my internship, I attended workshops and classes toward fulfilling the requirements of the Naturalist Certification program. The classes that I attended as an intern were *Moth Families of Ohio, Trees of the Miami Valley, Fish of the Stillwater River, Audubon Issues and Advocacy*, and *Animal Behavior*. 
Moth Families of Ohio was a class offered by a lepidopterist who specialized in moths and worked for the Montgomery County Park District. He showed slides, discussed how to make collections, and we went out late to look at moths that were feeding on bait sponges. The class met three times: two lectures were given and one evening was dedicated to seeing moths on the trails at Aullwood. The class was very interesting I learned about the large diversity of moths in Ohio.

The class, Trees of the Miami Valley, was taught in the summer by the Education Coordinator at Aullwood. This class met five times and there were two field trips to Woodland Cemetery in Dayton, and to the Englewood MetroPark. The class covered tree identification based on leaf and bark characteristics and information on common trees of Ohio. Although I had some knowledge of trees before the class, I learned more about identifying trees from bark and leaf characteristics, and I enjoyed learning more information about common trees of this region.

The Fish of the Stillwater River class was also taught by the Education Coordinator at Aullwood. This class met five times with many field trips to different parts of the Great Miami River watershed. We used a seining net at several sites and found twenty-eight species of fish. Added to the beauty in seeing a diverse assemblage of fish, I have become better trained for taking children to the stream to seine fish. It was a great way to see the diversity of fish living in the Stillwater River.

Audubon Issues and Advocacy was a special program offered by the Communications Coordinator at Aullwood. This program was designed to discuss issues that are central to the work of Audubon. This group of advocates met to discuss issues and write letters or electronic mail, or telephone elected officials to take action.
Background materials were distributed in advance so that group members could research prior to discussion. Examples of past campaigns include: Everglades restoration, Arctic National Wildlife Refuge oil drilling, and a proposed oil pipeline in Ohio. This program was designed to meet six times but was cancelled after two meetings due to low enrollment. I believe that the fact that people had to pay for this program caused the low enrollment.

*Animal Behavior* was a workshop held by one of the Environmental Education interns at Aullwood. The workshop covered a wide range of animal behavior learned through experimental and observational research and included a walk outside to discuss and analyze the behavior of animals at Aullwood. I gained a greater appreciation of the activities and behavior of animals such as the barred owl that flew over us as we walked on the trail. We discussed why the presence of the owl during the day was abnormal behavior and concluded that it was disturbed from a resting place by our noise on the trail. Overall, from these classes and workshops I gained a greater appreciation and expanded my background knowledge of natural history in Ohio.

**Public Programs**

*Full Moon Walks*

Every month there was a walk on the night of the full moon. The walk was a way for people to experience Aullwood at night and to enjoy and learn more about the moon. I led the August Full Moon Walk which started with a short introduction and then a hike to a hilltop to observe the moon. There were twenty people and a view of the bright orange moon led to a discussion of why the August full moon was called the Prairie Moon and some general things about the moon and the earth. We also discussed other
names for the August full moon and that many native people around the world named the full moons based on the cycles of their lives. It was my first adult program at Aullwood and I enjoyed leading the program.

I also led the October Full Moon Walk and there were forty people for the program (Appendix B). We walked to the farm from the nature center along the moonlit trail and had a beautiful view of the moon at the top of the hill in a pasture. We discussed the topography of the moon, compared the size of the moon to the earth, and the importance of the cycles of the moon to animals as well as humans.

Weekend Programs

Every Saturday and Sunday there was a staff led walk or special program. As part of the intern program, we were encouraged to design programs on topics of our choice. I led three special programs that included a hike at either the center or the farm. I also led two of the seasonal weekend programs, a Tallgrass Prairie Walk and Candle Dipping. The weekend programs I designed were titled Farm Ecology, Water-where did it come from and where is it going, and Fall Colors Walk. Program outlines are in Appendix C.

Farm Ecology was the first weekend program that I designed and led in July. The program was planned to discuss the farm as an ecosystem including farm animals, wild animals, bacteria, plants, and soil. We visited the organic vegetable garden, the compost pile, and the farm animals, and discussed the flow of energy through the farm ecosystem.

Water- Where did it come from and where is it going, was an introduction to the hydrologic cycle and the local watershed. We explored the creek that runs through Aullwood downstream to the confluence with the Stillwater River. We also discussed the importance of water quality and the impacts of some human interactions with streams.
The *Fall Colors Walk* was held in mid-October when the leaves were changing colors and beginning to fall from the trees. Leaves were still bright green with a mix of deep browns, warm yellows, and vivid reds. The walk was designed to focus on the beautiful colors of autumn, but also to discuss the physiognomic reasons for leaf color change and senescence. As with many parts of my internship, I learned more about leaf fall than I had known previously and was able to share this interesting information with the people who attended the program.

*Tallgrass Prairie Walks* were held in August which is the time of year when the prairie flowers and grasses are in bloom or have already bloomed. We hiked the trails and discovered the diversity of plants and animals that make up the prairie ecosystem. We discussed the biology and ecology of the prairie as well as the history of Aullwood’s prairie and Ohio’s changing landscape.

*Candle Dipping* was another seasonal program that was offered each year in November and December. The program started with an introduction about the history of lighting and discussed renewable and nonrenewable resources and resource use. Since the candles were made from a mixture of beeswax and paraffin, bee keeping and bee biology was also discussed as well as petroleum and oil extraction. At the end of the program, people made candles with more of an appreciation about the materials and process used in candle making.
Summer Earth Adventures

Summer Earth Adventures is a weekly summer program that offers special hands-on experiences to children two-months to fourteen years old. Classes focused on different topics but followed the theme of building a sense of wonder and excitement about the beauty of the natural world. All classes had a lead teacher and an assistant who were Aullwood staff and volunteers, and children spent a week at Aullwood in small classes of ten or less. Classes met five times and on the final day children showed a special project that they worked on during their week-long adventures. Each teacher wrote the lesson plan of activities for the week.

During my internship I taught or assisted six weeks of classes and was involved in the Teacher Training Workshop. I wrote goals and learning objectives for each class based on the age of the children and the education mission of Aullwood. Overall goals were the same for all of the classes with a specific goal based on the theme of each class. The goals were to: (1) discuss basic principles of ecology, (2) promote a sense of awe and respect for the living and nonliving world, (3) provide a positive and caring environment for each child to experience the natural world, and (4) provide a fun and enriching experience for each child.

Hands-on positive experiences are an important part of helping children to learn natural history and gain an appreciation of the natural environment. Environmental education is certainly a major goal in my classes as well. The classes that I taught or assisted were: Young Caterpillars, Busy Beavers, Spiders Snakes and Bees, Farmer for a Week, Nature Memory Books, and Fish of the Stillwater Lesson plans are in Appendix D. Young Caterpillars
My first class was Young Caterpillars with seven, four- and five-year-old children. The main goal of the class was to teach basic principles of ecology through a beautiful and interesting creature: the butterfly. The activities were designed around the class goals and for each day there were specific objectives that related to the overall goals. Another intern and I taught the class together, but I wrote the lesson plan for the week. Overall, the children seemed to enjoy the class and they loved discovering things during our time outside. In evaluating the class, I should have planned more time outside exploring, so for my other classes I planned more time on the trails.

Busy Beavers

For this class I assisted a volunteer who had taught this class for several years. The children spent the week learning about beavers and constructing a beaver lodge and dam in the small creek that runs through Aullwood. They also watched a short video on the natural history of beavers and made their own beaver tails out of sugar cookie dough for a snack. I learned so much from assisting with this class because the volunteer was a retired classroom teacher with many years of experience working with children and Summer Earth Adventures classes.

Spiders, Snakes and Bees

I taught the class Spiders, Snakes, and Bees with ten children from three- to six-years-old. The main goal of this class was to teach a basic understanding of organisms that children may fear, or as I found out, that they love. The activities were designed around this goal and for each day, there were specific objectives. It was a difficult week because they were a high energy group and I felt that I had to spend much of the time keeping the class together. The children’s behavior made me realize that I needed to
learn creative ways for dealing with or preventing problems. One of the best moments was when we went looking for water snakes and one of the children found a Northern water snake in the creek.

Farmer for a Week

The Farmer for a Week class for second graders was my first summer class held at the farm. The farm educator and I planned and taught the class. The main goal of this class was to teach the children about Aullwood’s organic farm and farming. We spent the week seeing the animals, collecting eggs from chickens, moving spelt from the granary to the feed bins, planting seeds, harvesting and eating vegetables and herbs from the garden, and milking a goat. Overall, it was a week full of activities and the children really enjoyed spending time at the farm and learning about the farm community. I learned much more about the farm from being there all week and from teaching with the farm educator.

Nature Memory Books

Nature Memory Books was a class with ten, four- and five-year-old children that focused on making a book of memories of their discoveries. We spent the week doing activities such as going on a scavenger hunt, making bark and leaf rubbings, collecting fallen leaves, coloring our favorite insects, looking for animal tracks, making rock rubbings, and making handprints with mud from the creek. In my assessment, it was a great week and the children really loved exploring in the creek and getting wet. The only thing that I would change if I taught the class again would be to spend more time exploring the creek.
Fish of the Stillwater

I assisted the Education Coordinator with the Fish of the Stillwater River class which had thirteen, ten- to thirteen-year-old children. The focus of this class was to use a seining net in the river to catch and release fish in order to learn to identify and survey the species of fish. The class was interesting and I learned to identify about twenty-eight of the seventy species of fish that live in the Stillwater River. On the last day of class, the children fished with poles in Bluegill Pond at Aullwood and cooked two of the fish to eat. This class was very helpful for training me to take children seining for fish so that they can discover the diversity of fish living in the Stillwater River.

Overall, teaching Summer Earth Adventures classes was my favorite part of the internship. I enjoyed making my own lesson plans for the week and the informal atmosphere of the summer. I learned many creative ways of teaching and working with children and an important skill in education, writing lesson plans. One effective skill I learned was to give the children opportunities to discover small processes happening everyday, such as a mushroom growing on a log and relate it to the larger scheme of nutrient cycling in ecosystems.

Aullwood Resources for Earth and Agriculture Discovered and Shared

Resources for Earth and Agriculture Discovered and Shared (R.E.A.D.S.) is a program in which Aullwood is partnered with a local school to work one-on-one with students, reading and exploring nature. Aullwood recruits volunteers (staff, interns, and volunteers) to work with individual students to improve their reading skills, provide a positive relationship, and provide hands-on activities that will strengthen the overall experience. The role of the mentor is to help the child read by encouragement rather than
teaching. The mentors take turns reading with the child, discussing the book and illustrations, and helping the child summarize the experience at the end.

The Fall/Winter 2002-2003 program had twenty students and twenty mentors. The program lasted eleven weeks in which time the children came one day a week for ninety minutes. Helke Elementary School third and fourth grade students participated in this program and enjoyed different themes each week such as Insects, Birds, Wetlands, Farm Animals, and Maple Sugaring. Each program started with a song that introduced the day’s theme followed by an introduction by an Aullwood Naturalist. The group was then split into two for a hike at the nature center or farm for hands-on experiences. After the hike, each child sat down with their mentor to read a book and to write or draw about their experience.

I also provided introductions and led hikes for two programs: Farm Animals and Farming. For the introduction to Farm Animals, I had the children name animals that are found on farms and what food and fiber products people get from these animals. The walk around the farm included visiting and discussing all of the animals. The book we read, Farm Animals, told a story of the livestock encountered on most farms and showed a large variety of animal breeds.

For the theme Farming, my introduction discussed the importance of farms, if humans could live without farms, and the meaning of organic farming. Many of the children knew that an organic farm did not use chemicals and that it used animal manure as fertilizer. We explored parts of the farm, the pastures, barn, vegetable garden, and visited the animals to discuss their importance on the organic farm. Manure was the main topic of discussion because most of the children had never been to a farm and seen
animals in pastures. The book we read, *Farming*, was a story about the seasonal cycles of life on a farm.

R.E.A.D.S. was one of my favorite programs at Aullwood. The one-on-one interaction with the children was invaluable because I believe that all children should be learning about where food comes from and exploring the place where they live. I also am an advocate for reading and I believe that people’s lives can be enriched through reading. I would like to use this program as a model for starting similar programs in the future.
CHAPTER 4
PROJECTS

As part of the internship program at Aullwood and the IES degree requirements, I completed three projects. I had two major projects and one minor project that I accomplished during my internship.

Educational Farm Symposium

At the beginning of my internship, I discovered that there was an opportunity to be involved in planning a conference focused on educational farms in the region. This idea came from the farmer who envisioned a regional conference where ideas could be shared that would improve operations and programming at educational farms. The audience grew to include any environmental center in the United States, but the focus and purpose were still the same. As my intern project, I was on the conference planning committee and helped with planning and preparation, and also attended and worked at the conference held at the end of January 2003. I had interest in the farm as an educational resource and experience with farm-focused conferences. I did not have prior experience planning and implementing a conference and so it was a great project for me to learn and grow professionally. Materials created for the symposium are in Appendix E.

Planning Committee Responsibilities

The planning committee consisted of the executive director, the farm manager, the farm educator, the communications coordinator, and me. We began meeting in August and started by brainstorming keynote speakers, discussion topics, and possible field trips. We also decided on the official title to be the Educational Farm Symposium. We planned to have keynote speakers, field trips, workshops, and facilitated discussions.
The tasks I was given were to: research contact names, addresses, and descriptions of farms that were potential field trip sites, contact three possible keynote speakers, plan and lead a field trip to the Stratford Ecological Center in Delaware, Ohio, contact facilitated discussion presenters, and create the packet and folder to be given out at the symposium.

The last month before the symposium was spent creating the participant folder. This was an on-going process because I had to add information as I received it from the presenters. The folders included a symposium brochure, schedule, Ohio Ecological Food and Farm Association brochures, and Aullwood brochures.

Symposium Responsibilities

The symposium took place after my internship ended, but since I was hired as a part-time naturalist I had a key role in the symposium weekend. I was in charge of checking in participants, coordinating drivers and shuttle vans, setting up presenters, and other things that were needed during the symposium. Aullwood staff attended most of the conference and helped when needed. The interns were vitally important to symposium success as they did many small tasks.

The symposium had seventy-five participants from all over the United States. It was an enriching experience for attendees and Aullwood. The atmosphere caused by the participants was friendly and enriching. Keeping with the philosophy of the symposium, meat from Aullwood Farm was served at meals and participants could visit the farm to learn about livestock management. The presenters spoke on a wide range of subjects and the sessions were well attended. The keynote address was given by Dr. John Ikerd, a retired professor from the University of Missouri, who spoke about reconnecting
consumers to the food chain and the role of educational farms in doing this in the present and future.

Being involved in planning the Educational Farm Symposium was an interesting project and was one of the most beneficial tasks that I undertook during my internship. It was educational for all participants and Aullwood staff members got many ideas for the future direction of the farm. Since Aullwood is currently planning a farm expansion, the symposium was beneficial for learning about programs from other educational farms and nature centers. There were also related problems and challenges that many other facilities were experiencing such as lack of funding, low event attendance, difficulties of reaching a wide audience with programs, and difficulty in connecting to the local community. After the symposium, I provided suggestions for farm improvements to the director.

Some suggestions from the field trip to Stratford Ecological Center, were to expand the learning potential of Aullwood Farm by adding a small greenhouse onto the main building as an educational investment. Seeds for the garden could be started there by some children, planted in the garden by other children, and harvested and eaten by other children. The vegetable garden could also be enlarged and improved by adding benches for people to sit and enjoy, making it more inviting to visitors. As for the farm animals, mixed species groups in the barn and pasture complement each other ecologically and make it easier to rotate the animals through pastures. From the people that attended, I learned of the extreme need for education programs for high school students focusing on sustainable agriculture. Programs that are already in place at other educational farms could be researched to get ideas for implementation at Aullwood. Staff
members of the Allan Savory Center for Holistic Management described the benefit of holistic management for organizations, especially farms. The decision making process in these practices is intense and could further the sustainable goals of Aullwood and would improve daily management. Finally, based on the keynote address given by John Ikerd, it is evident that Aullwood could be a model of sustainable agriculture for the community and a place for educating children and adults about small diversified farms. Improved programming for children and adults as well as community outreach programs could be a step toward reaching these goals.

Aullwood will be working on incorporating ideas from the symposium into plans for the farm capital campaign. The experience was extremely educational and I enjoyed meeting people from many places that are involved in similar work. This experience was personally as well as professionally enriching, as I got to meet many people in the fields of environmental education and sustainable agriculture and I feel confident about planning conferences in the future.

**Biodiversity in Organic Farming: Sustainability in Agroecosystems**

As one of my intern projects, I presented a Volunteer Workshop at Aullwood called *Biodiversity in Organic Farming: Sustainability in Agroecosystems*. I gave a PowerPoint presentation at the farm. Fourteen people including education staff, interns, and volunteers attended the 2.5 hour workshop. The presentation started with an activity about the origin of last night’s dinner. Partners discussed the contents of last night’s dinner and tried to unravel its travel from farms to their plates. We discussed how most food molecules travel 2,000 miles to a person’s digestive system. After this introduction activity, I discussed the loss of small farms throughout the United States and Ohio. The
overall goal of the workshop was to make the volunteers and staff more aware of our industrial food system so they can change their own behaviors and teach others about the importance of small diversified and organic farms.

After the presentation, there was thoughtful discussion and we walked the farm fields discussing farming practices, habitats, and biodiversity. Most of the volunteers had never walked the land outside of the farmyard, so it was a learning experience for everyone. The farm manager said that he learned a great deal from the presentation, and that the walk made him more aware of the farm as an ecosystem. Overall, I think that my goal of raising awareness about this topic was accomplished and I enjoyed discussing with people and evaluating the farm from an ecological viewpoint. I also learned a great deal synthesizing information and preparing the presentation.

**Education Materials**

As a minor project, I designed two educational activities about habitats and animals to use at the nature center and farm. These activities were planned to be easy ways to engage students in learning as part of their Aullwood experience.

*Habitat Activity*

The Habitat Activity was used to discuss the communities in which animals live. I laminated four photographs of Aullwood habitats: pond, stream, prairie, and forest. I also found photographs from magazines of animals that live in these habitats. This can be used for multiple activities but it was designed to be used as an animal-to-habitat matching game. Each of the four habitats were put with a tray and the players put an animal card in the tray of the animal’s habitat. It was a great starting activity to get a group excited about their visit or as an ending review activity.
Animal Picture Activity

The Animal Picture Activity was used to get students to look more closely at the anatomy of farm and wild animals. The wild animal close-up photographs have an answer key that can be shown to the children at the end of the activity. The farm animal close-up photographs were taken of animals at Aullwood Farm so they can be easily identified because the children have already seen the animals. These pictures can also be used for other activities such as:

1. describe characteristics of the animal
2. discuss adaptations for survival of the animal
3. discuss the animal’s niche or place in the food chain
4. discuss what the animal is doing to get ready for winter or a change in seasons
5. discuss how the animal raises young
6. describe the animal’s habitat
7. discuss the impacts of certain human activities on the animal

These two activities were a way to actively involve the learners in the learning process. Children will not remember as much of what they are told as what they learn or experience themselves. I feel that it is very important to involve the students in hands-on activities so they are actively involved in the learning, and these two activities were a way to accomplish this goal.
CHAPTER 5
NATURAL HISTORY

One of the things that I hoped to accomplish during my internship was to learn about the natural history of the area. I am interested in all aspects of ecology and hoped to learn more by observation and research during my internship. Along with my own field studies, I participated in four organized natural history learning opportunities. I learned an immense amount about the butterflies, dragonflies, fish, amphibians, and birds that inhabit Aullwood and Ohio.

Aquatic Field Study

Wetlands are an important part of the Aullwood landscape and include streams, ponds, marshes, wet woods, wet meadows, springs, seeps, and vernal pools. Children love to explore these diverse habitats to find living things. The interns spent one afternoon with the Intern Coordinator catching insects in various life stages in the pond and stream. This field study was great training for teaching children about what is living in the water and sediments of these habitats. I also learned more about the common aquatic insects in the wetlands at Aullwood.

Stillwater River Fish Seining

The Stillwater River is a State Scenic River and is an educational resource for Aullwood because it is adjacent to Aullwood’s boundaries. All of the water draining from Aullwood goes to the Stillwater River. Seventy species of fish have been found in the river and thus it is a great place to learn about fish diversity and discuss water quality. One afternoon was spent seining with the Education Coordinator to catch and identify
fish. We found many different species mostly in the families Cyprinidae, Catostomidae, and Centrarchidae.

**Long Term Butterfly Monitoring**

**Weekly Monitoring**

Aullwood participates in the Long Term Butterfly Monitoring Program run by Ohio Lepidoperists and the Cleveland Museum of Natural History. Aullwood has participated in the program since April 2000. A transect that runs through areas that are likely to support butterflies was established and the trail is walked once a week from April through October. All butterflies or skippers that pass through or are found in a fifteen foot box around the transect are recorded. The transect is made up of several sections and data from all sections are recorded during the census. Data are compiled in the fall and are sent to the Cleveland Museum of Natural History to be compiled for all of Ohio. To date, 57 species of butterflies and skippers have been recorded for Aullwood’s Long Term Butterfly Monitoring Program. I participated in most of the surveys, either identifying or recording data along the transect.

**Annual Monitoring**

In addition to the weekly monitoring, Aullwood has held an annual Fourth of July Butterfly Count since 1985 in order to learn more about butterflies at Aullwood. Groups of people walk four different areas of Aullwood and the neighboring metropark to find butterflies present in July. Data are compiled at Aullwood and to date there are seventeen years of data that is used for education and land management purposes. I participated in the Fourth of July Butterfly Count on July 20, 2003 and worked with the team on Aullwood’s trails and farm. In all we found 41 species of butterflies and skippers. With
the combination of these programs I have learned to identify the seventeen most common butterflies in Ohio that comprise ninety percent of the Long Term Butterfly Monitoring observations.

**Morning Discovery Walks**

Every Thursday morning there was a walk led by the education coordinator for members, volunteers, interns, and visitors. The walk focused on natural history and seasonal changes at Aullwood including birds, wildflowers, trees, habitats, weather, butterflies, animals, and any other natural history topics of interest.

I learned an immense amount about natural history from these walks because I was out hiking the trails at least once a week to see seasonal changes and make observations that I could later talk about with students and visitors. My knowledge of birds, trees, butterflies and general ecology greatly improved during my internship at Aullwood. I now have a greater expertise in identifying breeding and migratory birds by sight and vocalizations. I also learned to identify woodland and prairie wildflowers that are common in Ohio and about their life cycles. I feel that I have gained a better sense of place from all that I have learned and can use this for teaching others to also know the place where they live.
As part of the internship learning experience, I visited other nature centers in the area to learn about their education programs and operations. I visited Glen Helen Outdoor Education Center, Darke County Parks Nature Center, Brukner Nature Center, and Cedar Bog.

**Glen Helen Outdoor Education Center**

I visited Glen Helen Outdoor Education Center to learn about the education programs and met with staff to tour the center and trails. The residential facility had education programs for sixth graders who stayed for a week to experience camp life. The director of the outdoor education programs gave me a brief overview of Glen Helen and I joined an educator’s group for the Birds of Prey program at the raptor rehabilitation center.

I also met with the raptor rehabilitation center assistant who showed me around the facility. There were twenty-four permanent resident birds (can never be released due to injuries) and others that were brought in to be rehabilitated and released. The raptor cages were similar to the red-tailed hawk’s cage at Aullwood except that there were wood chips on the cement floor of the cages to make them more natural. There were also flight cages for the birds to practice flying before they were released. The raptor center received about 200 injured birds in 2002 and they were able to release about 50 percent of these birds with nine dying from West Nile virus.

I enjoyed some of the beautiful landscape by hiking trails that are part of the education programs. I observed Birch Creek flowing through the “glen” or ravine and
drank from the yellow spring where students learn the history of the area. Overall, it was interesting to learn about Glen Helen’s education programs and how they interpret their site.

I also visited the Trailside Museum, an education center which is open to the public, and learned that they were renovating many of the facilities, including the museum, at Glen Helen. Overall, the visit was informative and I took back educational ideas that could be implemented at Aullwood. One idea that came from the raptor center visit was an activity to teach children to identify common Ohio birds. Another idea is to build a larger cage or flight cage if Aullwood were to continue to keep birds of prey for education. Aullwood will probably never become a residential facility, but there seemed to be merit in working with children daily for a continuous period of time. In the future, Aullwood could design a week long residential summer camp for students to provide a similar experience.

Darke County Parks Nature Center

I also visited the Darke County Parks only nature center, Shawnee Prairie Preserve. The interesting educational displays at the nature center included an informative weather station, and an exhibit about Ohio’s natural treasures such as the state bird and the state flower. In the window space was a Kids’ Play Corner, designed for small children, with books and hands-on activities. There were salamanders and toads together in a terrarium about twice as large as Aullwood’s. These are ideas that could be models for Aullwood if changes were to occur in animal enclosures in the future. Increases in cage sizes and more natural habitats would greatly improve education about the native animals at Aullwood.
The landscape at Shawnee Prairie Preserve was very different from Aullwood as I discovered from hiking through prairie, forest, stream, and wetland habitats with a naturalist. Along Mud Creek, which is part of the Great Miami River watershed, beavers had dammed and flooded a large area and built a beaver lodge. Muskrats had also taken advantage of this area and built a lodge. On the walk back to the nature center, I had the wonderful opportunity to see a Cooper’s hawk in a nearby tree. I also learned some of the geology of the area and about the shaping of Darke County by glaciers.

**Brukner Nature Center**

Brukner Nature Center in Troy, Ohio is located in neighboring Miami County. Brukner is a 165 acre nature preserve with over six miles of trails through forest, wetland, and prairie communities. There is also a wildlife rehabilitation center and forty native Ohio wildlife ambassadors or animals that cannot be released that are used for education. I met with Debbie Brill, the Administrative Director, who was a graduate of the IES program. Brukner offers school and adult programs and is open to the public. After visiting the center, hearing about the programs, and hiking the trails, I found Brukner to be a wonderful resource for Miami County and the region. I learned more about the nature center than the education programs and so I was not able to bring back specific ideas that could be implemented at Aullwood.

**Cedar Bog**

The intern field trip to Cedar Bog Nature Preserve in Urbana, Ohio was interesting and there was too much to learn about the unique landscape in a single visit. Cedar Bog is a nature preserve operated by the Ohio Historical Society with a site manager in charge of the education programs and land management. Northern white
cedars which usually do not grow this far south (it is the southern-most white cedar bog),
grow there because of the glacial history of the landscape. The site manager took us on a
hike through the bog and described some of the fascinating natural as well as cultural
history of the bog. The number of plant species (they have catalogued 500 species) is
incredible and this diversity is due to landscape heterogeneity. It was an important
resource for learning about the natural history of the area and the bog is an ecological
resource for Ohio and the Midwest. Since this site is just beginning to build a nature
center, there were not specific ideas that could be implemented at Aullwood.

Overall, my visits to other nature centers in the area made me more aware of
Aullwood’s teaching resources as each of the places I visited had minimal staff compared
to Aullwood. Glen Helen relies mostly on interns for teaching, Shawnee Prairie Preserve
has a five member staff, Brukner Nature Center has some full-time staff but all of the
educators are part-time, and Cedar Bog has only one employee. Aullwood staff,
volunteers, and interns make it possible to reach so many school children and adults. The
visits also helped me network in the community and gain resources for future
employment.
CHAPTER 7

SPECIAL EVENTS

Part of the internship responsibilities included planning, setting up, and working at special events. For the two large events, Apple Fest and Enchanted Forest, all staff members were required to participate. For the Englewood Fine Arts Festival and the Ice Cream Social, a few staff and interns worked.

Englewood Fine Arts Festival

Aullwood has participated in the Englewood Fine Arts Festival for ten years. Every year a staff member takes a sign board with photographs, brochures, and an animal to attract visitors. Most of the vendors at the festival sold arts and crafts, but it was a good opportunity for advertisement of Aullwood programs. Volunteers sat at the booth during the day and I was responsible for setting up the display and bringing an animal on both days of the festival.

Apple Fest

Apple Fest is the largest fund raising festival that Aullwood hosts each year. Everything from food and entertainment to seeing the farm animals is part of this festival held at the farm in September. All staff members prepare for the festival by advertising at local businesses and libraries, and setting up the apple butter booth, tents, tables, trash cans, and chairs. Other tasks included transporting the children’s activities, posting signs, setting up the bank barn for dancing, and cleaning the barns and kitchen.

The festival was held on Saturday and Sunday and was successful with about 2,000 visitors during the two days. All staff members worked both days and cleaned up the following week. I spent half of Saturday and Sunday doing small tasks to keep the
festival running smoothly and checking on the animals, and half of both days working at the nature center. This experience contributed to my knowledge about festivals and will be useful for planning and implementing large festivals in the future.

**Enchanted Forest**

The Enchanted Forest program draws school groups and the public to Aullwood to learn about native Ohio animals from people dressed in animal costumes on the trails. The week of the event was spent setting up fire rings for storytelling, tables in the building for popcorn and cider, and a tent and tables on the trail at the nature center. Enchanted Forest took place at the nature center on Tuesday, Wednesday, and Thursday for school groups and was held on Thursday, Friday, and Saturday evenings for the public at the farm. My role was to dress up as characters and speak to visitors about the life history of each animal for the day and evening programs. One afternoon I was the naturalist and had a table on the trail with natural objects such as pinecones, buckeyes, and deer antlers. The children could touch everything on the table and we discussed the things that were unfamiliar. Another afternoon I was the trail master and made sure that groups were not backed up on the trails. The last afternoon I was a beaver and explained some life history characteristics and conservation activities to increase their populations in Ohio.

One evening program at the farm I was a flying squirrel on the sugarbush trail and had only four groups because the event closed early due to heavy rain. Another evening I was a pileated woodpecker with three other characters to talk to the visitors as they arrived. Enchanted Forest was another event that drew a lot of people and children
seemed to love it. It was a fun and creative way to teach about Ohio animals and it was a
great alternative to traditional Halloween activities.

Ice Cream Social

The Old Fashioned Ice Cream Sundae Social was a new special event sponsored
by local businesses and nonprofits to raise money for Aullwood’s education programs.
Staff members were working to give visitors a chance to see and touch some of the
animals. I held the black rat snake and the red-tailed hawk and discussed some of their
life history characteristics with the visitors.

The special events are excellent ways to get people to Aullwood that might not
come otherwise and to fundraise for education programs. Overall, they seem to be
successful at bringing in the community and are fun for volunteers to work at and
members to attend. However, I was disappointed at the lack of education at these events.
The events are wonderful opportunities for education because people have paid and want
to be involved with all activities. Thus, natural history or education based activities could
be a part of the events instead of just entertainment and food. Examples of educational
activities include: teaching about recycling, leading hourly nature hikes, interpreting the
farm animals, and educating about farm meats and local community issues. These are
just a few general activities and could be made more specific to fit each festival. This
would further Aullwood’s mission which is foremost education, and would not greatly
increase planning efforts.
CHAPTER 8

CONCLUSION

Farms and Natural History

American society is disconnected from the land that supports it. Most people know little about how their food was grown, where their jeans came from, or how their suburban yards affect wildlife. In *The Fatal Harvest Reader: The Tragedy of Industrial Agriculture*, Kimbrell writes, “Our highly urbanized society is far removed from the sources and origins of its daily bread” (2002, xi). The dominant ideology is that “nature” and “culture” occur separately and people typically want to experience nature at a park or other protected area. As America becomes more of a “suburban nation,” (Nassauer 2002, 50) with about 90% of the population living in urban/suburban areas (Rosset 1994), this disconnection between “nature” and “culture” increases. The industrial revolution brought people from the countryside to cities to work and people’s direct interaction with the land, such as in farming, has disintegrated. According to Laura Jackson, “the number of farms in the United States has decreased by 60 percent since 1964,” (2002, 45) while ecological destruction has increased. This is a call for conservation education that emphasizes a closer connection between people and the land.

Aullwood nature center and farm and similar organizations across the state and US are working to demonstrate the connection between people, the land, and other species by building a sense of wonder and strengthening people’s connection with nature. Through the organic farm and natural history education programs, Aullwood is providing the opportunity for people to learn about local communities, organisms, and ecosystems with which they share the planet. As John Ikerd stated in his keynote address at the
Educational Farm Symposium, “An educational farm, with its roots in the soil, provides an ideal environment to teach and demonstrate the critical linkages between the sustainability of the land, the sustainability of agriculture and the sustainability of humanity” (2003). I believe that conservationists, environmental educators, farmers, and naturalists can show people ways to interact with the earth in a more sustainable manner. Farmscapes that include productive land and natural areas provide a perfect place for people to learn about their role as part of ecosystems.

In the article “The Naturalist,” Barry Lopez describes a modern naturalist as someone who “knows a local flora and fauna as pieces of an inscrutable mystery, increasingly deep, a unity of organisms Western culture has been trying to elevate itself above” (40). He describes how the modern naturalist “has now become a kind of emissary, working to establish good relations with all the biological components humanity has excluded from its moral universe” (2001, 40). In this article, Lopez is advocating the importance of the connection between human and biological communities. This “land ethic” treats people as a part of nature, not as separate from it, and promotes a respect and care for the world outside of oneself. I believe that all nature centers that are “rooted in the land” could better serve in this capacity by teaching about the interconnections between people and the places where they live. Farmscapes are the perfect places for teaching about these interconnections.

In the future, I have hope for the further ideological breakdown between nature and culture which has already been appearing in some social movements. Aldo Leopold observed that “conservation efforts on certain parts of the land would fail if other parts were ruthlessly exploited” (Jackson, D. 2002, 17). There is currently a growing
movement of people wanting to not only protect and conserve landscapes in parks and preserves, but in their own backyards. The National Wildlife Federation has a Backyard Wildlife Habitat program that certifies backyards, schoolyards, and communities that want to have “wild” space for many creatures (NWF 2003). This program and others can be used as tools for private land owners that want to lessen the gap between themselves and the natural world.

The organic/sustainable agriculture movement is growing and the purchase of organic food is on the rise (Jackson, D. 2002). Educational farms can be demonstration sites for agriculture that integrates biodiversity with agricultural production, and “organic agriculture is the beginning of the evolution of a food system that respects farmers, communities, the land, biodiversity, animals, and the wild (Fatal Harvest 2002, 264). Through educational farms that teach about the wildlife and plant diversity associated with organic farms, children and adults can learn the values of healthy landscapes that are both productive and tied to the values of the local community. This new agrarianism is a way to connect more people to the land and provide healthy landscapes for people to live and work. As Dana Jackson reminds us in “The Farm as Natural Habitat,” “Aldo Leopold, the Midwest’s conservationist, disapproved of the separation of natural areas from farming. To him it didn’t make sense to protect forests in a special area and accept the absence of trees on agricultural land, when the farm was then left without the conservation benefit of erosion control and wind breaks” (Jackson, D. 2002, 17). The hope is that teaching about natural areas and agriculture together will influence people to care about the health of the land, their communities, and future generations. Aullwood has a perfect base for moving more in this direction with its education programs.
Agricultural education outreach could also be an integral part of Aullwood’s role in the community and environmental education field. In Montgomery County, Ohio, the amount of farmland is steadily decreasing with the increase of specialized industrial farms and the decrease of diversified family farms, a phenomenon currently facing most communities in the US. With the increase in industrial agriculture, agricultural diversity and rural communities as well as biodiversity and ecosystem health are eroded. Aullwood could provide a new opportunity for farmers and consumers to connect and provide an example of small scale family farm management and marketing.

Environmental Education and Natural History

Environmental education was defined in the 1978 report prepared by the United Nations Environmental, Scientific, and Cultural Organization as: “a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action” (PCEE 2003). Environmental education is a lifelong process that involves multiple experiences and repeated opportunities to build environmental literacy. Although environmental education has its roots in natural history, conservation education, and outdoor education, it is different from these earlier movements (PCEE 2003). Natural history focuses on the study of natural systems, discovery, and first-hand observation. Conservation education was designed to raise the awareness of environmental problems and the importance of conserving natural resources. Outdoor education is more of an educational method which can include residential camping, natural history, and group cooperation (PCEE 2003). Environmental education, today, is
a process that teaches about the “interconnection between humans and the environments that surround them” and embodies many earlier movements and academic disciplines (NAAEE 2003).

Natural history study and field experiences may be one part of a broad environmental education that is the starting point for making a child into an environmentally literate and caring adult. Natural history as a field of science has largely been forgotten because of the rise of technology in science, but it has started to make a comeback. An environmental magazine, *Orion*, focused the entire Autumn 2001 issue on natural history. In one article, “The Rise and Fall of Natural History,” Robert Michael Pyle states that people without a connection or understanding of the natural world will make choices solely based on themselves. He writes:

> A populace less familiar with its nonhuman neighbors is one whose own impacts are unlikely to be noticed and moderated by choice. Ecological ignorance breeds indifference, throttling up the cycle I call the extinction of experience: as common elements of diversity disappear from our nearby environs, we grow increasingly alienated, less caring, more apathetic. What we know, we may choose to care for. What we fail to recognize, we certainly won’t. (Pyle 2001, 18)

At Aullwood, the school group programs and the nature center building were designed for teaching about the natural history of Ohio through exhibits, native animals, and themed classrooms dedicated to plants, mammals, arthropods, reptiles, amphibians, and birds. Aullwood’s natural history assets are the diverse habitats for teaching – forest, pond, prairie, stream, and farm. In these places children learn about the natural world and the place where they live through observation and exploration. Aullwood has always taught natural history programs with a focus on the nature center and this immersion in the natural world is a part of the environmental education program. To meet the
challenges of environmental education, nature centers could better integrate natural history with sustainability and conservation education on a local level.

Nature centers and educational farms should not be expected by society to produce an ecologically literate society without the availability of various environmental education experiences throughout a person’s lifetime. Based on the length of time schools may have for off-site programs, the role of nature centers may be currently restricted to teaching natural history. In the book, *Earth Education: A New Beginning* (1990), Steve Van Matre writes about building a sense of wonder and the importance of short programs because these places are “oases where the overall systems of life, along with many of the other passengers who share the earth with us, can still be experienced” (255). For the constraints of day programs, he still finds them extremely important to “hook the kids on…places filled with wild and weird and wonderful things that share the earth with us” (255). A program that can stimulate the imaginations of children and entice them to learn more about the world around them has a significant place as part of environmental education.

Environmental education programs can show ways that people use the land without diminishing ecosystem processes and health. The organic farm at Aullwood is a great resource for teaching about connections and the interrelatedness of all species. Steve Van Matre writes about this as using a “whole systems approach” rather than a “picking and naming approach” which will get across the importance of the big environmental picture (1990). Environmental education and natural history programs can encourage young people to learn about the world around them, their environment, and also natural science.
Conclusion

Overall, my internship at Aullwood was very interesting and always challenging. I was surprised at the degree to which I relied on my previous teaching experience at the Cincinnati Nature Center as well as my ecological knowledge from graduate course work.

There are a few suggestions that could improve Aullwood’s capacity to serve the public. The overall school education program could be improved by unifying the classes in a sequential manner. This program would provide classes in a sequence from kindergarten through grade six, with students coming for a class that builds on and is linked to the previous year. The classes would also be linked to the state science standards and the current classes could be modified to fit this program. A cumulative instructional program would benefit Aullwood, the teachers, and students as they build on their experiences each year. Younger students could focus on a sense of wonder and identifying the categories of life, and older students could build on this introduction with ecological and environmental concepts. This would bring more students above elementary school to Aullwood and facilitate the Aullwood Adventures program which aims to bring students twice a year during elementary school. This is a challenge to Aullwood to further expand the educational programming.

Also, to further enhance Aullwood’s mission, I believe Aullwood could use many tactics to educate and connect people to the natural world. I think that being an active community member would help Aullwood better reach its goals and mission. Aullwood could use the current “environmental issues” board, which provides information about global environmental problems, for posting information and ways to be active in local
issues. Awareness and activism in local issues does not need to become the focus of education efforts, but posting information for visitors to read would enhance community education.

Aullwood’s staff members could be more open to change and new ideas brought by interns. The amount of new ideas that interns could potentially contribute is enormous if ideas were better received by the education staff and director. During my internship, I did not feel that my potential as a student in environmental science and conservation was fully used. The staff could better capitalize on the possible contributions of interns from all backgrounds and experience levels by lessening the work load of activities and stressing a creative project that educates and interests the interns along with benefiting Aullwood.

The special events significantly increased the workload and working hours for interns. I was disappointed with the lack of education done at the special events. Apple Fest, which is Aullwood’s largest fundraising event, successfully brought people to Aullwood and raised money, but missed an educational opportunity. Aullwood could take advantage of the amount of people that come to the festival and make it more educational and farm focused. Ways to do this are by only selling Aullwood meats and educating about organic foods, and having more farm-focused activities such as wool spinning, animal husbandry demonstrations, and chicken egg collecting.

Due to a physical separation and staff time, a disconnection exists between the nature center and the farm. A better integration could make community education more effective. Many staff members at the nature center seemed to not understand the importance of organic agriculture and did not see the nature center and farm as part of the
same landscape. Most of Aullwood’s resources (financial, staff time) were used for
development of the nature center. Aullwood’s mission could be better accomplished by
offering more education programs that teach about the landscape as a whole by
integrating the farm and surrounding habitats in programs.

Recommendations that I would like to make to Aullwood to improve the quality
of service to the community and the field of environmental education are to:

- Improve the farm-center connection
- Use the farm as a natural history resource
- Increase the length of school programs to accommodate both nature center and
  farm exploration
- Build a cumulative instructional school program
- Add more education to special events
- Improve some animal cages with a more ‘natural’ environment
- Be an example of the philosophy and mission of the organization (i.e. recycling,
sustainability)

The internship program is a wonderful building experience for young people that
are interested in environmental education or organic agriculture. I think the program is
better suited for college students after their junior and senior years as they are deciding a
career path than for graduate students. It was still a tremendous learning experience from
which I have grown professionally and personally. I am better prepared for a career in
environmental education or for an education position at a nonprofit organization. I know
that my passion for teaching and commitment to the environment have grown stronger
since the beginning of the internship. I will continue to use my graduate school and past
experiences as a resource for future work.

Graduate Course Work

IES core courses and courses in other departments such as botany, zoology,
anthropology, geography, and geology, provided a background in the natural sciences and
raised my awareness on environmental issues. Principles and Applications in Environmental Science and Anthropology courses provided a social sciences background that I did not receive in my undergraduate biological sciences training and helped to better articulate the scope of environmental issues. I do not believe that an environmental debate can take place isolated from social, political, or economic issues, because they are interrelated. The public service project was the most beneficial part of the course work in IES because it provided a professional situation in which to use academic knowledge and provided the experience of working in groups, attending meetings, preparing a budget, keeping a schedule, and working with a client on a local issue. All of the reading and writing in the courses provided a refinement of these skills and the public speaking events helped to improve my speaking skills.

Career Preparation

Overall, the experience better prepared me for a career in environmental education or a related field and I learned more then I had known about budgets and nature center operations. This experience helped me to better understand some of my strengths and weaknesses and work toward what I want to do in the future. The teaching experience was excellent and I have learned many teaching methods and activities. Aullwood is a great resource for discovery based learning because visitors can be actively engaged and explore. I followed this idea when I was with a school group because I believe that being lead to learn is very rewarding and the great joys for the students are in their own discoveries.

I have found that I have many strengths related to this type of work and hope to continue to work with children in the future. I plan to work at a nonprofit education
facility where I can be a part of environmental learning for people of all ages. I would like to work in the future in planning high school programs, programs for underserved audiences, adult conservation and education classes, and programs linking land use and conservation issues. I would like to expand the vision of nature centers to the idea of sustainability and have the center be an experiment and demonstration of people using the land in an ecological manner. This could include having the center be as self-sustaining as possible. Local resources would be used and small-scale diversified farming or gardening with crops and animals would take place. Networks within the community could provide resources for information or goods that were not part of the farmscape. Educational programs would immerse students in the ecological functioning of the forests as well as the farm. Students would help with growing their food as well as learn about the biodiversity of plants within the farmscape that benefit from this type of ecoagriculture. This use of the landscape in an ecologically healthy and sustainable way could be an educational example and lessen the gap between human and biological communities.
REFERENCES

Aullwood Audubon Center and Farm, July 2001-June 2002, A Report to our Friends.


APPENDIX A: Girl Scout Overnight

Aullwood Audubon Center and Farm
September 13-14, 2002

Schedule

FRIDAY

5:00 pm Arrive at center
     Put sleeping bags in bird classroom and food in kitchen
5:30 pm Introduction to Aullwood and rules for visit
     Hike to Bluegill pond and back to nature center
6:30 pm Dinner
7:30 pm Girls observe Red-tailed hawk and discuss
Activities for wildlife badge:
     Take A Closer Look (bird watching room and trails)
     • discuss why people use tools to study nature
     • use binoculars to look at birds
     • use magnifying lens to look at plants
     Animal Watcher (bird watching room)
     • discuss field markings, songs, and life histories of common birds at feeders
     • help them to identify 3 birds
     It’s All In The Details (bird watching room)
     • discuss sketching and drawing wildlife
     • sketch a bird or plant seen on the trail
     How Was Your Day? (bird watching room)
     • girls observe birds and record 3 characteristics
       • food, habitat, locomotion, communication, young
     We Are Family (discovery room)
     • discuss taxonomy and grouping
     • use snakes and plants to describe characteristics that are part of each group
     Touch-Me-Not! (discovery room and trails)
     • discuss how plants protect themselves
     • observe venomous snakes and discuss
     • look for poison ivy and pokeweed on trails
10:00 pm Sky search and storytelling on back porch
11:00 pm Sleep

SATURDAY

7:00 am Explore building, animal care at the nature center
8:00 am Breakfast
9:00 am Departure
APPENDIX B: Full Moon Walk

Aullwood Audubon Center and Farm
Colored Leaf Moon
October 21, 2002
8:00-9:30 pm

Native American Names for October Full Moons:

Leaf Falling Moon
White Frost on Grass and Ground Moon
Striped Gopher Looks Back Moon
Harvest Moon
Deer Rutting Moon
The Moon The Birds Fly South
Hunter’s Moon

Moon Data for October 21, 2002:
Moonrise 6:54 pm preceding day
Moon transit 1:23 am
Moonset 8:02 pm
Moonrise 7:17 pm
Moonset 9:01 am following day
Sunset 6:49 pm

Interesting Moon Facts:
• Moon had been a natural time piece
• Babylonians based calendar on cycles of the moon
• Moon and earth gravitationally coupled (causes tides and effects not only on surface water but also on deep water)
• Sun much more massive than moon but much further away from earth so it has less tidal capacity
• Phases of the moon are based on the alignment of the sun, earth, and moon
  • shape of the moon is based on the fact that the moon is a dark spherical object illuminated on one side by the sun
  • we can only see the illuminated portion of the moon
  • shape of the moon is determined by how much of the illuminated hemisphere is turned towards the earth which depends further on the apparent angle between the sun and moon in the sky
• Apollo astronauts footprints will be visible on the moon for 10 million years (there are no eroding forces on the moon like on earth such as wind and water)
• Craters are caused by meteorites slamming into the moon
• “Hot moon” versus “Cold moon” Theory
  • earth is a “hot” planet because of its hot core and new rocks are constantly being made so young rocks are burying older ones
• if the moon is a cold planet which it was thought to be, old rocks would not be buried and would be at the surface
• before landing on the moon it was thought to be a hot planet like earth
• Apollo mission would tell the age of the rocks brought back
• “hot” and “cold” moon scientists eagerly awaited testing and dating of rocks
• some rocks were found to be 4.6 billion years old or the age of the solar system
• the moon was thought to have been once hot and since it is a small planet, it lost heat more quickly
• it could have also had water but it is now believed to be an airless and waterless planet
• evidence of the moon going from hot to cold is the “man in the moon”
  • this is the “lunar maria” or oceans as named by Galileo where the dark areas are younger rock called basalt (congealed lava) meaning that once the moon could have been volcanically active
• a new “planet” was discovered October 2002 beyond Pluto, named Quaoar
• it is a ball of ice and rock about 800 miles in diameter (half the size of Pluto) and 4 billion miles from earth in the Kuiper Belt where comets originate
APPENDIX C: Weekend Programs

Aullwood Audubon Center and Farm
Farm Ecology Walk
Saturday, July 27, 2002

Soil
- the most important thing at the farm because it is the basis for all life
- soil is a living thing because it contains rock particles as well as decaying matter and soil organisms
- soil nutrients must be replenished after growing plants, crops, and vegetables

Compost/Manure
- is it a waste product? NO…it is Brown Gold!
- it is “brown gold” to the farmer because it replaces lost nutrients in the soil
- manure (horse nuggets, cow patties, etc.) is used at the farm to fertilize crops such as hay and spelt, and vegetables in the garden
- food scraps (fruit peels, apple cores, egg shells) are composted at the farm in compost piles and used in the garden
- the compost pile is alive with decomposer organisms which are the “work horses” of the pile
- all of these friends process dead organic material into a form that releases nutrients

Animals
- they are used on the farm for teaching, working, and manure
- the farm is integrated because there are livestock and crops
- they turn plants into protein for us in the form of meat, milk, and eggs, and also give us manure
- grazing or grass-fed animals are healthy animals

Garden
- plants are grown for eating and to feed some animals
- companion planting is used for pest control
- raised beds are constructed for drainage, holding organic material, and weed control
- multicropping is done for pest control and to increase species richness which means healthier plants
- growing your own food is a great way to be a part of an ecosystem
Crops
- hay and spelt are grown at the farm to feed to livestock through the winter
- other crops for livestock such as corn and soybeans could also be grown at the farm to keep the energy loop closed on the farm
- the animals eat the food that is grown on site and their manure (nutrients) are returned to the same site

Woods and Wildlife
- the sugarbush woods supports many kinds of plant and animals species and can be used by people to collect sap and make maple syrup
- other trees on and surrounding the farm are good homes for wildlife (which are part of the farm ecosystem)
- diverse habitats support diverse species

Organic/Sustainable Agriculture
- methods used include: building soil fertility, rotating crops, using green manure, using compost/manure, using multicrop planting techniques, and integrating animals and crops on the same farm
- farming of the past can be linked to farming of the future to improve farm ecosystems
Water—Where did it come from and where is it going?
Aullwood Audubon Center and Farm
Saturday, August 24, 2002

1. Introduce myself and ask people in the group questions to find out:
   - Where do you live?
   - Do you know what watershed you live in or can you name a local stream?
   - Do you like to go fishing?
   - What streams or rivers have you been to?

2. Discuss the importance of water and why it should be considered a gift from nature.

3. Discuss the hydrologic cycle and show a stylized picture of it. Show a map of the average annual precipitation for the US and discuss the effects of rainfall patterns on plants and animals.

4. Discuss large river systems in Ohio and show a map of the principal drainages of Ohio. Discuss the Stillwater River watershed and show a smaller map with the Stillwater River watershed outlined. Briefly discuss fish of the Stillwater River.

5. Discuss Wiles Creek and start the hike by going to the stream crossing closest to the building. Discuss where Wiles Creek starts, where it flows to ultimately (the Gulf of Mexico/Atlantic Ocean), and how it might have been named.

6. Hike along the geology trail adjacent to the stream, through Mrs. Aull’s garden, across Aullwood Road, and down to the Stillwater River to the mouth of Wiles Creek.

7. Hike back to the nature center and offer resources to people who are interested.

Interesting topics for discussion during the hike:
   - Where does our drinking water come from? Is it from surface water or groundwater?
   - How do streams get their names?
   - Riparian areas support a diversity of plants and animals because of the land/water connection
   - What are some threats to our streams?
   - Scenic Rivers Program of Ohio Department of Natural Resources is one of the most comprehensive programs in the US. There is a ten member advisory council that works to maintain water quality and habitat for stream organisms in 20 streams (679 miles).
   - Water issues such as water shortages especially in the western states and with the Colorado River. In an April 2001 issue of the New York Times there was an article about water, not oil being liquid gold in Texas.
Vocabulary and Definitions:

**Erosion**-the removal or wearing away of soil or other material by water, wind, glacier, or other forces

**Habitat**-the natural environment or home of a plant or animal including chemical, physical, and biological components

**Hydrologic cycle (water cycle)**-the continuous recycling of water between the earth and the atmosphere through evaporation, transpiration, and precipitation

**Riparian**-the land bordering a stream

**Nonpoint source pollution**-sediment and other pollutants that enter a stream through surface runoff, spills, groundwater, or in any other diffuse way

**Point source pollution**-pollution that enters a stream from a pipe or other distinct location

**Watershed**-the land that discharges surface and groundwater to a stream, also referred to as a stream’s drainage area

Resources:


Ohio Department of Natural Resources, Division of Natural Areas and Preserves. 1998. *Ohio’s Scenic River Program*. Columbus, Ohio.

Ohio Department of Natural Resources, Division of Natural Areas and Preserves. 1998. *Ohio’s Streamside Forests: The Vital, Beneficial Resource*. Columbus, Ohio.


Fall Colors Walk
Aullwood Audubon Center and Farm
Sunday, October 13, 2002

Introduction/Questions:
Where do you live?
Have you noticed tree leaves changing colors or falling off the trees this year?
Is autumn your favorite season and why?

Interesting topics for discussion during the hike:
Leaf Senescence: Why do deciduous trees lose leaves?
• cold temperatures in winter would cause ice crystals to form in leaves and these would rip open cell membranes
• there is less evaporative surface for losing water in winter when ground water is frozen and not available to plants (evergreen trees have waxy coating to reduce evaporation and prevent leaf stress from cold temperatures)

Leaf Abscission: How do leaves fall?
• abscission-leaf falls from plant
• triggered by photoperiod-length of daylight, moisture, temperature, chemicals, hormones
• photosynthesis slows and stops
• nutrients in the leaves are transported back to the branches in vascular bundles (leaf veins) to conserve nutrients (nothing is wasted!)
• a barrier forms at the end of the leaf (hormones trigger this response)
• the stem side hardens with wax-like compounds to seal the scar
• wind, rain, or frost causes leaves to fall

Leaf Colors: How do leaves change color?
• pigments-leaves make chlorophyll (green)
• leaves slow production of chlorophyll as the days get shorter and cooler
• other pigments (carotenoids and anthocyanins) that are naturally produced in the leaves are masked by the green chlorophyll until chlorophyll production slows
• carotenoids are yellow, orange, or brown pigments and are present in leaves throughout the year
• anthocyanins are red pigments and are only produced in autumn
• these pigments are what produces the beautiful fall colors
• different trees produce different pigments in their leaves and thus an array of beautiful colors: Oaks-red and brown, Hickories-yellow, Tulip tree-yellow, Maples-many colors, Sugar maple-orange-red, Black maple-bright yellow, Red maple-bright scarlet
Leaf recycling: What happens to all of the dead leaves?
- fallen leaves are broken down by bacteria, fungi, earthworms and many other decomposer organisms
- decomposing leaves become part of the humus layer and provide recycled nutrients for more plant growth
- spring ephemerals are the earliest wildflowers to bloom in the spring because they take advantage of these newly added nutrients in the soil

Winter weather: How do other organisms prepare for winter?
- birds migrate to places where food is available (further south in the US or as far as central and south America)
- deer grow winter coats and scavenge for available food all winter
- plants store living material underground or seeds in the soil that will be ready to germinate in the spring
- rodents such as chipmunks and squirrels store food (acorns, walnuts, other nuts) underground
Goals
The goals of this class are to (1) teach basic principles of ecology through a beautiful and interesting creature: the caterpillar and butterfly, (2) promote a sense of awe and respect for the living and nonliving world, (3) provide a positive and caring environment for each child to experience the natural world, and (4) provide a fun and enriching experience for each child.

Background Information
All caterpillars go through a process of metamorphosis as they grow into adults. A butterfly will lay eggs, the eggs will hatch into caterpillars (larvae), the larva will spin a chrysalis (pupa), and the butterfly will emerge. Butterflies are very important as pollinators and are vital as predators and prey in food webs. Caterpillars and butterflies also provide beauty in the landscape and inspire a sense of awe with their magnificent transformation.

Vocabulary and Definitions
Butterfly, Caterpillar, Moth
Food Web-interrelationship of organisms as they are connected by consumption (eating)
Larva (caterpillar)-a stage of development in the life cycle of some organisms after the eggs hatch
Pupa (chrysalis)-a stage of development in the life cycle of some organisms after the larval stage
Metamorphosis-gradual transformation of an organism as it grows and matures
Pollination-carrying of pollen from male part to female part of flower by agents such as insects, wind, water, and animals
Predator-organism that consumes (eats) another
Prey-organism that is consumed (eaten) by another
Monday
Theme: Animals at Aullwood
Objectives: Make children comfortable in their new surroundings by letting them play games or activities on their own. Introduce and explore the center's many creatures.
Materials: Games, puzzles, books, name tags
Introduction: Discuss the discovery room and rules for the week. Introduce the topic of the week: caterpillars!
Activities: matching games-butterfly cards, insect cards, animal cards (children match similar creatures), puzzles (turtle, life cycle), books (Peterson First Guides to Caterpillars, Common Butterflies and Skippers of Ohio), design name tags, explore discovery room, hike trails.

Tuesday
Theme: Metamorphosis
Objectives: Teach children about respecting each other and all creatures with baby picture activity. Teach children about life cycle changes of organisms by baby picture activity, reading a story, coloring, and hiking to look for and identify butterflies and caterpillars as well as any other organisms with life cycles.
Materials: Book-From Caterpillar to Butterfly, copies of caterpillar, pupa, and butterfly for coloring, crayons, butterfly nets, collection bottles
Introduction: Discuss how animals, plants, and even humans change over time as they grow and mature. Read a story about metamorphosis and ask children ways that they have changed since they were babies.
Activities: Each child brings a baby picture and tells a story about when they were a baby (children are praised for sharing story with the group and for being good listeners); read a story; color a caterpillar, pupa, and butterfly; try to catch butterflies and other flying insects with nets in meadow.

Wednesday
Theme: What do I look like?
Objectives: Teach the children to more closely examine characteristics of caterpillars and butterflies by comparing them to insects and other animals.
Materials: Book- The Very Hungry Caterpillar, paper, crayons, glue, stream book bag with nets, vials, identification book, etc.
Introduction: Discuss the characteristics of caterpillars, butterflies, and moths and how they look different than other animals. Discuss some characteristics of animals that the children are familiar with (e.g. their cat/dog, pet fish, deer) and describe some animals that they are not familiar with.
Activities: Read The Very Hungry Caterpillar, do craft-color and assemble a caterpillar pal to take home (see Wild and Crafty p. 16), and explore the stream and pond by netting organisms and identifying/comparing to each other and to caterpillars and butterflies.
Thursday
Theme: Pollination
Objectives: Teach the children about pollination and the interrelationships between plants and animals. Teach the children the importance of pollination by looking for insects pollinating flowers.
Introduction: Discuss what pollination is and look at pictures of pollinators, describe the importance of pollination for all animals (including humans). Discuss the adaptations of flowers and insects to helping each other
Activities: color butterfly wings to wear, do pollination activity (see Bugs to Bunnies p. 33), look for pollinators at the prairie, look at flowers being pollinated by insects.

Friday
Theme: Food Chains
Objectives: To teach children about the interrelationships of living and nonliving organisms and provide a review of the week.
Materials: Baby picture of child enlarged by scanner, paper, crayons, glue, life cycle puzzle, game signs, safety pins
Introduction: Discuss the interrelationships between living and nonliving organisms. Discuss how animals (caterpillars) depend on plants and later plants depend on animals (pollination). Discuss some food chains that may be found on the hike.
Activities: make frame for baby picture by coloring and pasting picture of caterpillars (made by intern), as a group do life cycle puzzle (found in Arthropod Room), do food chain game (each child gets a card with the name of an animal that they try to pretend to be and they must figure out who to eat), hike and talk about who would eat who in a food chain.

References
Parshall, David, Horace Davidson, and John Watts. 2001. Common Butterflies and Skippers of Ohio. Ohio Department of Natural Resources: Columbus, OH.
Spiders, Snakes, and Bees
Aullwood Audubon Center and Farm
4-5 years old
July 15-19, 2002

Goals
The goals of this class are to (1) teach a basic understanding of organisms that children may fear: spiders, snakes, and bees; (2) promote a sense of awe and respect for the living and nonliving world; (3) provide a positive and caring environment for each child to experience the natural world; and (4) provide a fun and enriching experience for each child.

Background Information
Spiders, snakes, and bees are organisms that children usually fear or dislike because they are taught this behavior without an understanding of the organisms. Snakes are reptiles and can go for long periods of time without food. Snakes use various techniques for catching prey. Poisonous snakes use their venom to catch prey. Some snakes do not have poison, and constrict their prey until they swallow them whole. Snakes use their forked tongues to collect odor molecules which they use to “smell”. Snakes are interesting creatures and should be respected as they have an important place in ecosystems and food chains.

Spiders have eight legs and are not insects (six legs), they are arachnids. Some species build webs to catch food such as insects. Spiders have spinnerets that hold silk for webs and draglines.

Bees are insects (six legs) and have distinctive body parts: head, thorax, and abdomen. Not all bees sting and they are efficient pollinators of flowers. Bees pollinate many of the flowering plants and trees as well as food crops that we all enjoy. All three of these organisms have a special place in food webs and ecosystems and should be respected for their role in the natural world.

Vocabulary and Definitions
Insect-organism with six legs and an exoskeleton
Pollination-carrying of pollen from male part to female part of flower by agents such as insects, wind, water, and animals
Predator-organism that consumes (eats) another
Prey-organism that is consumed (eaten) by another
Spinnerets-spider organs that contain silk for draglines or webs
Venom-poisonous fluid that some snakes use to kill their prey
Web-prey catching structure made by spiders using silk
Monday
Theme: Animals at Aullwood
Objectives: Make children feel comfortable with their new surroundings by letting them play activities or look at books. Introduce and explore the nature center’s many creatures.
Materials: snake puppet, bee puppet, books in classroom, name tags (pictures of spiders, snakes, and bees), crayons, markers, two large pieces of paper
Introduction: Name sharing. Discuss the discovery room and rules for the week.
Activities: pick and color name tag, make a list of where they have seen spiders, snakes or bees, explore discovery room, hike trails, make list of things that we saw or heard on the trails each day.

Tuesday
Theme: Smooth Slithering Snakes
Objectives: Learn about life history characteristics of snakes and become more comfortable around snakes.
Materials: camera film cases, dried beans, snake stories (“Rattles” in Bugs to Bunnies p.86, Baby Rattlesnake)
Introduction: Let children share what they know about snakes. Read snake story. Discuss life history characteristics (food, home, movement, smell) of snakes. Discuss differences between poisonous and nonpoisonous snakes.
Activities: Read snake stories. Do a snake slither (flick your tongue in and out and hiss like a snake, slither, curl up as tight as you can), observe Aullwood’s snakes, make a rattle using beans in a camera film case, hike on trails to look for snakes or snake homes.

Wednesday
Theme: Creeping Crawling Spiders
Objectives: Learn about spiders by comparing them to insects and other animals.
Materials: Book-Spiders, spray bottle, yarn, duct tape, spider pictures for giant web
Introduction: Discuss the characteristics of spiders and how they look different than other animals. Discuss how spiders make webs and how they are used to catch food.
Activities: Read Spiders, do “a spider’s breakfast activity” (Bugs to Bunnies p.42), make a child size web using yarn and tape (Bugs to Bunnies p.38), look for different spider webs outside and bring water spray bottle to mist unoccupied webs to see them easier.
Thursday
Theme: Busy Buzzing Bees
Objectives: Learn about the many different kinds of bees. Learn about the life cycle and life history characteristics of a bee. Learn about bee keeping and honey.
Materials: Books-Creepy, Crawly, Baby Bugs and Bees, “anatomy of an insect” bee picture, crayons, bee hive, bee keeping outfit, nets
Introduction: Introduce bee life cycles with book and by looking at hive. Show pictures of different kinds of bees and talk about which ones sting. Discuss pollination of flowers by bees and other insects.
Activities: Read books, color a bee and talk about bee anatomy (Bugs to Bunnies p.17), look at bee hive in classroom, play “buzz, buzz, bee” instead of “duck, duck, goose”, hike to prairie to look for bees on flowers, buzz like a bee.

Friday
Theme: Spiders, Snakes and Bees Review
Objectives: Review what we learned during the week about spiders, snakes, and bees.
Materials: cards with questions about spiders, snakes, and bees
Introduction: Spiders, snakes, and bees are interesting creatures if you get to learn more about them. Discuss what happens when people do not like these animals.
Activities: review list of things we saw during the week on the trails, ask questions about spiders, snakes, and bees, hike trails to look for them.

References
Nature Memory Books
Aullwood Audubon Center and Farm
4-5 years old
August 5-9, 2002

Goals
The goals of this class are to (1) create a nature memory book of experiences, (2) promote a sense of awe and respect for the living and nonliving world, (3) provide a positive and caring environment for each child to experience the natural world, and (4) provide a fun and enriching experience for each child.

Background Information
Besides writing and drawing, experiences with the natural world can be remembered by making rubbings of tree bark, leaves, and rocks and collecting wildflowers, leaves, and seeds from trees. The things that can be saved in a nature memory book are only limited to the imaginations of the children. At the 4-5 age level most children are explorers so they will explore and collect some things for their memory books. They can also draw pictures about their experiences.

Monday
Theme: Nature Explorations
Objectives: Prepare a nature memory book cover. Explore trails by doing a scavenger hunt.
Materials: book covers with 3 holes punched, color pictures of animals and children’s names from computer (ClipArt program), scavenger hunt paper with pictures of things found outdoors, crayons, glue sticks
Introduction: Earth ball activity. Discuss things in nature that we like and that we might put in our nature memory books.
Activities: record weather on weather chart, pass around earth ball and share favorite animal, glue name and pictures on cover of nature memory book, hike trails with a scavenger hunt paper and circle what we saw on the trails.

Tuesday
Theme: Leaves and Insects
Objectives: Give children a greater appreciation for trees and leaf diversity. Give children a greater appreciation for the insects that live at Aullwood.
Materials: weather chart, paper for tree bark and leaf rubbings, paper with pictures of different types of leaves, crayons, glue sticks
Introduction: Discuss diversity of trees, leaves, and insects. Discuss our favorite insects and why we like them so much.
Activities: record weather on weather chart, make bark and rock rubbings and collect three leaves to do leaf rubbings back in class, circle favorite leaves on leaf chart, color insect pictures and glue onto favorite insects page.
**Wednesday**

**Theme:** Water and geology  
**Objectives:** Make children more familiar with the stream and its importance to plants and animals. Make children aware of Ohio’s exciting glacial history.  
**Materials:** paper, glue sticks, tape, crayons, container for mud  
**Introduction:** Discuss Wiles Creek and the importance of the water to plants and animals. Discuss the glacial rocks, where they came from, and how they are made of different materials (how they feel and look different).  
**Activities:** record weather on weather chart, collect three leaves for favorite leaves page, make rock rubbings, look for animal tracks along the stream bank, collect mud from the stream to make hand prints (our own tracks), and explore section of Wiles Creek by walking in the water.

**Thursday**

**Theme:** Birds and Animals  
**Objectives:** Make children more familiar with birds and animals that live at Aullwood and in the surrounding area.  
**Materials:** bird pictures to color (chickadee, cardinal, great blue heron, great horned owl), feathers, paper, crayons, glue sticks  
**Introduction:** Discuss bird behavior and some common birds that children may know. Discuss other animals that might make their homes at Aullwood.  
**Activities:** record weather on weather chart, color bird pictures, decorate robin picture with feathers, hike to look for birds, feathers, tracks, or other animals on the trails.

**Friday**

**Theme:** Wildflowers  
**Objectives:** Give children a better appreciation for wildflowers and their lifecycles.  
**Materials:** paper, seeds, glue, yarn (3 small pieces for each child for tying nature memory books together)  
**Introduction:** Discuss seeds and flowers. Discuss where flowering plants grow and why they are important.  
**Activities:** record weather on weather chart, make seed picture, walk to prairie to look at wildflowers, finish nature memory book, receive certificate for finishing nature memory book.

**Reference**

APPENDIX E: Educational Farm Symposium

National Audubon Society
Educational Farm Symposium
January 30 - February 2, 2003
Aullwood Audubon Center and Farm

Audubon

Presented by the National Audubon Society with support from the Association of Nature Center Administrators

Welcome to the Educational Farm Symposium!
We are very excited that you are part of this First National Symposium for the leaders of non-profit educational farms! It will be a time for sharing and learning from our successes and mistakes as we teach by example healthy and viable agricultural practices. This Symposium includes concurrent tracks so that you will experience best practices from around the country in farm management techniques, educational programming, and leadership development. We are grateful to the National Audubon Society for sponsoring the Symposium as well as for the support of the Association of Nature Center Administrators.

Symposium Guiding Principles
The Symposium will model sustainable resource conservation practices when possible. Examples include:
- Aullwood’s china and flatware for most meals.
- Reused folders for welcome packets.
- Refillable hot/cold beverage mugs provided.
- Bandanas provided to use as napkins.
- Use of recycled and reused materials.
- Aullwood Farm’s organic meats used for many dinners.
- Minimal use of individually packaged food.
- Group transportation to and from Symposium programs.

Ways that you can make the Symposium more eco-friendly:
- Bring your refillable mug and bandana to all programs and meals.
- Put recyclables in labeled containers.
- Use the shuttles or carpool to Symposium programs.
- Busing your china plates and silverware to the kitchen after each meal.

THANKS from the Symposium Planning Team!
Jason Beale        Chris Norman
Larry Brown        Cherie Wagner
Charity Krueger

79
Name Badge Required For Entry
For security, a name badge is required for entry to all Symposium events and meals. Remember to wear it!

What Does Your Registration Fee Include?
$ Your name badge indicates which Symposium meals you purchased.
$ The fee paid for the registration package you selected includes lunch, dinner, snacks, beverages, programs, social events and transportation for the dates of the package you purchased.
$ While staying at the Hampton Inn-Dayton Northwest, breakfast at the hotel is included in your room fee. For information about other hotel amenities, please ask hotel desk staff.

Transportation Notes
Shuttles to and from Aullwood and the Hampton Inn-Dayton Northwest reduce parking pressure, pollution and fuel use. Please see the shuttle schedule for trip planning.

Notable Regulations
Please stay on trails and areas designated for use.

Services For Your Convenience And Safety
The following services are available to Symposium participants. If you need other assistance, please ask an Aullwood staff member.

Need a phone? You may use the pay phone in the center entrance or the staff office phone at the farm.
Have something to copy or fax? You may use the fax machine and photocopier at Aullwood. Our staff is happy to assist you.
Need Supplies? Aullwood has tape, markers, scissors, paper, etc. Our staff will help you find what you need.
Room capacities: If you arrive at a session and it is full, please join another session in a different space.

Program Variety
Welcome! Here’s the different programs offered at the Symposium.
Field Trips: Site visits to local farms of historical or agricultural interest will provide examples of educational farms and their programs.
Workshops: Experts will present in-depth sessions on select topics. Pre-registration is required.
Facilitated Discussions: Leaders with diverse backgrounds and experience will facilitate discussions on specific topics. Leaders will provide an overview and facilitate group discussions to tap into the collective knowledge and experience of participants.
Breaks and Meals: Informal discussions with colleagues are a great way to share and solve problems. Open Space discussions will occur during lunch on Saturday.
Tell Us What You Think - Symposium Evaluations
Please take time to thoughtfully complete and return a Symposium evaluation form. Include examples of what worked well and specific suggestions for future Symposia.
THANKS!

Thursday Symposium Activities
Shuttles from Hotel, 8:00 a.m. and 8:15 a.m.

Field Trips, 9:00 a.m. - 4:00 p.m.
Meet at Marie S. Aull Education Center.
Box lunches will be provided.

Stratford Ecological Center
Join us for a trip to Stratford Ecological Center in Delaware, Ohio. We will spend the day at this 236-acre farm and state nature preserve. Their staff will share with us how this “living laboratory” is used to teach people of all ages about the relationship between natural ecosystems and agricultural ecosystems. We will also explore their involvement in on-going research to find better, healthier ways to grow our food. Throughout the day they will discuss how to provide hands-on learning whether it be by harvesting produce from the education garden, discussing the food chain within the compost pile, or learning about the interconnections of all living things.

Gorman Heritage Farm and Long Branch Farm
Journey south to explore Cincinnati Nature Center’s two educational farms, Gorman Heritage Farm and Long Branch Farm. We’ll start our day at Gorman Heritage Farm and discover their market vegetable garden. Their staff will describe field crop production and the husbandry of sheep, chickens, goats, and rabbits. In the afternoon we will visit Long Branch Farm, a 600-acre livestock operation featuring Angus cattle, pigs, sheep, chicken, turkeys, and horses. Throughout the day, Cincinnati Nature Center’s experienced staff will discuss their successes in interpreting their farms to varied audiences and the local agricultural community.

Aullwood Audubon Farm and Carriage Hill Farm
Come learn about the exciting farm interpretive techniques of Aullwood and Carriage Hill Farms with Aullwood Education Coordinator Tom Hissong and Farm Manager Chris Norman. Hike Aullwood’s organic farm and the patchwork of fields and ecosystems that compose our outdoor classroom. We will explore the role that small scale organic agriculture plays in today’s farm education. At historic Carriage Hill, we will rendezvous with Rick Musselman, Carriage Hill Education Supervisor, and experience farming through a different set of eyes. The tour will feature historical farming techniques that Carriage Hill uses to preserve their unique agricultural heritage. We will also play period games to enrich the 1880s experience. Program development will be discussed throughout the tour.

Shuttles to Hotel, 4:00 p.m. and 4:15 p.m.
Thursday Evening Program
(Marie S. Aull Education Center)
Shuttles from Hotel, 4:45 p.m. and 5:00 p.m.

5:00 – 5:30 p.m. Mingle with other participants
5:30 – 6:30 p.m. Dinner
6:30 – 8:30 p.m. Slideshow with each participant sharing 3-5 slides of their facility

Shuttles to Hotel, 7:30 p.m., 8:30 p.m., and 9:30 p.m.

Friday Symposium Activities
Shuttles from Hotel, 6:45 a.m., 8:00 a.m., and 8:15 a.m.

7:00 – 8:00 a.m., Bird Walk
(Meet at Aullwood Farm)
Join an Aullwood Naturalist for an early morning walk along Aullwood’s beautiful trails. We will focus on birds and the wonders of winter.

7:00 – 8:00 a.m., Farm Chores
(Meet at Aullwood Farm)
Join Aullwood’s Farm Manager for an early morning look at how the farm and the animals are cared for.

8:30 – 9:00 a.m., Welcome and Comments by David Catlin from National Audubon Society (Marie S. Aull Education Center)
David will discuss the role of farms and centers in Audubon’s vision for 2020.

9:00 – 10:00 a.m., Keynote Address by John Ikerd, Professor Emeritus of Agricultural Economics
John Ikerd was raised on a small dairy farm in southwest Missouri and received his Ph.D. degree from the University of Missouri. He worked in private industry and spent thirty years in various professorial positions at four major land grant universities before retiring from the University of Missouri. He spends his time writing and speaking on issues related to the sustainability of agriculture.

Keynote Address:
“Linking the Future of Farming With The Past, Through Educational Farms”
American agriculture is in crisis. The industrialization of agriculture, reflected in ever larger and fewer farms, is reaching its climax with increasing corporate control of the whole food system - including farming. Farming as we have known it for the past half-century, with independent family farms supporting viable rural communities, is coming to an end. Farming is being transformed into agribusiness.

However, an agriculture composed of agribusinesses rather than farms, an industrial agriculture, is not sustainable. The industrialization of agriculture is degrading the natural environment, destroying economic opportunities for farmers, and promoting the
economic and social decay of rural communities. If there is to be a future in farming in America, it will be with a fundamentally new and different kind of agriculture - an agriculture that puts the "culture" back in agriculture and respects the principles of true "farming." For agriculture to be sustainable, farms of the future must be ecologically sound and socially responsible as well as economically viable.

Educational farms provide an ideal setting to inform the general public of the growing negative consequences of an industrial agriculture and of the opportunities to create a new and better, sustainable agriculture for the future. The purpose of sustainable agriculture is the same as that of farming in the past, before agricultural industrialization - to support a desirable quality of life for farm families, rural residents, and society as a whole. The principles of a sustainable agriculture are the same as those of "real farming" – to take care of the land, be a good neighbor, and earn a decent living by producing good food. Educational farms can attract people through public interest in farms of the past, but they can then educate people about the problems of the present, the opportunities for the future, and their responsibilities for helping create sustainable food and farming systems.

10:00 – 10:30 a.m., Snacks and Break (Snacks are located in the Volunteer Room)

10:30 a.m. – 4:30 p.m., Facilitated Discussions, 3 Sections

Session #1, 10:30 a.m. - 12:00 p.m., Choose ONE

FARMS Leadership Program: High School Studies - Auditorium A
Mary Kimball, FARMS Leadership, Inc.
Join us to discuss the experience of implementing high school-aged, hands-on education programs based on agriculture and natural resource conservation. For most nature centers, this is an untapped audience since many concentrate on programs for K-6. High schoolers are an important future resource; not only will they soon be voting and making decisions regarding agriculture, land use and environmental issues, but they will also be making post-secondary and career decisions. Engaging high school students in hands-on programs based on agriculture is important for these reasons and can build leadership, critical thinking, and life skills. Creating civic and community awareness, teaching critical social and environmental equity issues, and preparing them for life beyond high school are also outcomes.

Attracting Audiences and School Groups - Auditorium B
Michele Wales, Delaware Nature Society
Do you have a wonderful farm but want a greater audience to enjoy it? Join us for a discussion on attracting audiences to your site. Learn to creatively and pragmatically design educational opportunities for multiple audiences. Share experiences in assessing program participants, focusing on your farm’s programmatic strengths, and tailoring instruction for niche audiences. We will also share clever educational ideas.
Maintenance and Safety Issues on the Farm - Arthropod Classroom
Jim Butcher, Five Rivers MetroParks, Carriage Hill Farm
Maintaining farm equipment and being aware of safety issues with visitors is a large task. Join this discussion about ways to manage and maintain a successful and safe environment for visitors.

Working with your Farm Community - Bird Classroom
Sandra Murphy, Cincinnati Nature Center, Gorman Heritage Farm
This discussion will focus on connections with local (rural, suburban, and urban) communities and organizations, how to best use farm production to educate visitors, and sources of non-production income from the farm.

Personnel and Staffing Issues - Mammal Classroom
Connie Brockman, Cincinnati Nature Center, Rowe Woods
Join us to discuss recruitment, supervision, evaluation, motivation, and discipline solutions with your peers. We’ll begin by generating a list of topics the group would like to discuss within this theme, and then work together to share our experiences.

12:00 – 1:00 p.m., Lunch (Auditorium A)

Session #2, 1:00 – 2:30 p.m., Choose ONE

Farm Edges - Arthropod Classroom
John Anderson, Hedgerow Farms
The edges of farmland consist of field borders, roadsides, odd corners, drainage ditches and swales, irrigation canal banks, riparian zones, tail water wetlands, and essentially any area that is not cropped. Current agricultural practices, especially on large industrialized farms, tend to maintain non-cropped areas devoid of vegetation or at the most planted to a cover crop of exotic grasses. Farm edges can be planted with local native species which will provide corridors of habitat for a wide variety of wildlife now absent from many farms. Additional benefits include control of weeds, buffering for nonpoint source pollution, erosion control, habitat for beneficial insects, and aesthetics. This session will explore implementation of such practices and include technical assistance, cost share programs, and volunteer activities.

Linking Farm Education with State Proficiencies - Auditorium B
Tom Hissong, Aullwood Audubon Center and Farm
Michele Wales, Delaware Nature Society
Scheduling a field trip and buses, raising funds to support the trip, and recruiting chaperones are just a few of the things the classroom teacher must do to bring children to your site. Reward the process by providing the visiting class with a fun, educational experience that extends back into the classroom. Linking field experiences to state proficiencies supports the efforts in the classroom and streamlines the development of school programs at your site. Share in a discussion on how to “wade through” classroom proficiencies gleaning those that connect to your farm, then translating them into effective lesson plans and programs.
Volunteers – Integral to Your Organization - Bird Classroom
Nina Lapitan, Aullwood Audubon Center and Farm
Do you want to expand your volunteer program and wonder what it takes to recruit and retain volunteers in the 21st century? What does it take to have a successful volunteer program? What are the trends in volunteerism today and how can you take advantage of them? Find the answers to these questions and more as you and your peers discuss and problem-solve the challenges of integrating volunteers into your organization.

Children’s Gardens - Mammal Classroom
Laurel Crotty, Cincinnati Nature Center, Gorman Heritage Farm
Kristie Fisher, Rush Creek Gardens and Farm Camp
Sandra Murphy, Cincinnati Nature Center, Gorman Heritage Farm
Please join us for a lively discussion on challenges and successes of gardening with children. We will share some innovative programming ideas and hands-on methods to help you include teaching children in your own gardens and on your farms.

Keynote Address Topics - Auditorium A
John Ikerd, University of Missouri
Join us for a follow-up discussion of issues raised in the keynote address.

2:30 p.m. – 3:00 p.m., Snacks and Break (Snacks are located in the Volunteer Room)

Session #3, 3:00 – 4:30 p.m., Choose ONE

Organic Farming - Arthropod Classroom
Derric Pennington, Ohio Ecological Food and Farm Association
Harv Roehling, Locust Run Farm
Educational farms are a perfect place to demonstrate organic farming practices that are based on preserving ecological functions, building habitat, and sustaining communities. Join us for a discussion on organic farming and organic certification opportunities.

Life-long Learning Opportunities - Auditorium B
Jason Beale, Aullwood Audubon Center and Farm
Tom Hissong, Aullwood Audubon Center and Farm
Join us for an in-depth discussion about developing new education programs for adult and preschool audiences. This discussion will utilize Aullwood’s Center for Lifelong Learning as a model and investigate the opportunities and challenges of starting your own life-long learning program.

Special Events - Auditorium A
Charity Krueger, Aullwood Audubon Center and Farm
Special events are fund-raisers and friend-raisers. Events are a perfect way to bring lots of new visitors to your farm and gain publicity with the news media. First we’ll share some of Aullwood’s successful events and then share participants’ successes and failures.
Marketing Your Products - Bird Classroom
John Ellerman, Ohio State University Extension Direct Marketing Program
Need help marketing your farm products? Join us for a discussion on trends, opportunities, niche markets, and barriers to entry into markets.

Shuttles to Hotel, 4:30 p.m. and 4:45 p.m.

Friday Evening Program
(Aullwood Audubon Farm)
Shuttles from Hotel, 5:15 p.m. and 5:45 p.m.

5:30 – 6:30 p.m. Mingle with other participants

6:30 – 7:30 p.m. Dinner

7:30 – 8:30 p.m. Roping demonstration and foot stompin’ fiddle music with Doug Smith and Barbara Kuhns. Doug Smith recently retired from Five Rivers MetroPark’s Carriage Hill Farm. His specialty is historic restoration. Doug has been roping professionally for years and is ranked as the fourth best roper in Ohio. He teaches a roping class for Aullwood’s Center for Lifelong Learning. Doug and Barb also perform with the nationally recognized Corndrinkers. Bring your instruments to join in with homemade music!

Shuttles to Hotel, 8:30 p.m., 9:00 p.m., and 9:30 p.m.

Saturday Symposium Activities
Shuttles from Hotel, 6:45 a.m., 8:00 a.m., and 8:15 a.m.

7:00 – 8:00 a.m., Bird Walk (Meet at Aullwood Farm)
Join an Aullwood Naturalist for an early morning walk along Aullwood’s beautiful trails. We will focus on birds and the wonders of winter.

7:00 – 8:00 a.m., Farm Chores (Meet at Aullwood Farm)
Join Aullwood’s Farm Manager for an early morning look at how the farm and the animals are cared for.

8:30 – 9:00 a.m., Announcements and Generation of Open Space Topics to be offered during lunch (Marie S. Aull Education Center)

9:00 a.m. – 4:30 p.m., Facilitated Discussions, 4 Sections
Session #4, 9:00 – 10:30 a.m., Choose ONE

Accounting Procedures - Arthropod Classroom
Julie Fox, Ohio State University South Centers
This session provides an overview of resources for bookkeeping and record keeping, budgeting and cash flow, understanding financial statements, analyzing profitability, and making the most of your money.

Interpreting the Farm - Bird Classroom
Tom Hissong, Aullwood Audubon Center and Farm
Join us for a discussion on ways to make farm education fun for all ages. We will discuss interpretive techniques as well as school, public, and life-long learning education opportunities for your farm.

Whole Farm Planning - Auditorium B
Mary Child, Allan Savory Center for Holistic Management
Communities throughout rural America are experiencing a decline in small farms and farming culture. When we look more closely, we might see sub-optimum planning, failures due to unclear definition of the deepest held values of family members, difficulty in obtaining the resources necessary to sustain an economically viable enterprise and examples of land use that fall short of community, environmental, and neighborly norms. Whole farm planning can bring these and other key variables into one plan that views the farm as a whole system. Please bring your experience to share in this discussion.

Global Classroom - Auditorium A
Jason Neumann, Cincinnati Nature Center, Long Branch Farm and Trails
This interactive presentation will show you how an educational farm site is used as a jumping off point to explore issues such as global resource use and distribution and human consumption of resources. Using activities and hands-on demonstrations, this program helps participants to: 1) identify differences and similarities between their lives and the lives of young people in other cultures, 2) understand human connections to natural systems and resources, and 3) develop empathy, appreciation and understanding of diversity.

10:30 – 11:00 a.m., Snacks and Break (Snacks are located in the Volunteer Room)

Session #5, 11:00 a.m. – 12:30 p.m., Choose ONE

Aullwood Farm Tour – Aullwood Audubon Farm
Chris Norman, Aullwood Audubon Center and Farm
Come get the dirt on Aullwood Farm! Visit with Chris Norman and cultivate a discussion on farm topics. These could include Aullwood’s organic operation, direct marketing, holistic management, crop rotation, year-round events, and our up-coming farm capital campaign. Discussion will take place inside accompanied by a brief hike around the farm. Shuttle from Marie S. Aull Education Center to Aullwood Audubon Farm and back, 10:50 a.m.
Starting an Educational Farm - Auditorium B
Dave Catlin, National Audubon Society
Come discuss essential elements to successfully plan an educational farm. We will discuss the issues, questions, and experiences that are of interest to participants.

Early Childhood Education - Aullwood Audubon Farm
Julie Kline, Cincinnati Nature Center, Gorman Heritage Farm
Do your palms sweat when you think about taking a group of preschoolers on a tour of your farm? The short attention spans, the blank stares when you begin to inform them of unique farm facts. During this session we will learn about the youngest farm visitors. Participants will be led in a discussion about the 3-5 year old’s developmental characteristics and how to best use this knowledge to plan a successful, easy and developmentally appropriate program. **Shuttle from Marie S. Aull Education Center to Aullwood Audubon Farm and back, 10:50 a.m.**

New Information Technology: What is its Role on the Farm? - Auditorium A
Dave Imbrogno, Bernheim Arboretum and Research Forest
Claude Stephens, Bernheim Arboretum and Research Forest
Tom Kimmerer, Athenic Systems
Explore the possibilities of hand-held computers and other technology to enhance the visitor experience. Bernheim Forest and Athenic Systems are developing an exciting new information delivery system which includes hand-held computers linked to web based resources and on-site kiosks to deliver information, out in the field, that is custom tailored to the visitor’s interests and easily updated in-house with a few keystrokes. A companion system will address in-house management needs in the field, including such things as data gathering, animal and plant management schedules, database access, etc.

**12:30 – 1:30 p.m., Lunch (Auditorium A)**

**1:30 – 4:30 p.m., Workshops and Facilitated Discussions**

**Saturday Symposium Workshops**
1:30 – 4:30 p.m.

Green Building for Educational Farms (Aullwood Farm)
Shuttle from Marie S. Aull Education Center to Aullwood Audubon Farm, 1:20 p.m.

Steve Loken is the “green” architect for the National Audubon Society.
Historically farm architecture in North America evolved from the very ground that the farmers worked. Timber from land being cleared for crops was used for construction. Coal, charcoal, and wood from the farm was used for heating; straw from grain crops could be used for insulation, or even structural walls, and roof assemblies. This soil based architecture is the basis for the sustainability, or green building, movement of today. Farms are more important than ever before, not just for feeding us, but for compelling us to learn of lessons past and future, involving efficiency, economy and sufficiency, and
how this relates to buildings and farming in years to come. Join Steve Loken to explore the topic of sustainable design for educational farms. Site selection and design anchor the workshop as we discuss the needs for and of the building. Find out how to plan for possible future expansion. Salvage and re-use techniques will be presented along with ideas for energy, water and materials conservation. Steve will also discuss landscape ecology by presenting ideas for the capture and diversion of storm water, water interception, and use of native grasses. To round out the workshop, long-term maintenance and operation will be covered.

**Holistic Management (Marie S. Aull Education Center - Auditorium A)**

Mary Child coordinates and develops the Certified Educators Program and Case Study Research throughout the United States with the Allan Savory Center for Holistic Management. She is serving as Program Mentor for the Holistic Management Certified Educators Program in the Northeast United States. One focus of the Northeast program is to use Holistic Management to develop whole farm plans. Mary has a Bachelors degree in Social Ecology from Goddard College. Mary was raised on a small farm in Southern Delaware. In 1975 she moved to West Virginia and lives in the highlands near the headwaters of both the Potomac and James Rivers. She co-founded a land-based non-profit organization there in 1985 and has designed and co-directed projects, conferences, and residential programs focused on stewardship of natural and human resources; local food systems; organic farming; forest, streambank, and wetland restoration and experiential education curriculum.

Phillip Metzger is a Resource Conservation and Development Coordinator with the USDA Natural Resources Conservation Service in the Central New York RC&D office in Norwich, New York. He is currently enrolled in the Northeast Holistic Management Certified Educator Training Program scheduled for graduation in January 2004. He has a Bachelors Degree in Agriculture from West Virginia University and is a certified Customer Service Trainer. Phil has 23 years of service with NRCS and has also worked in the states of Ohio and West Virginia as a District Conservationist and Soil Conservationist, which involved him in farm planning and conservation practice planning and installation.

Holistic Management enables you to make decisions that consider economic, social and environmental outcomes for present and future generations while taking you towards what you truly value in life. The centerpiece is the holistic goal which includes: what you value deeply, what you need to produce, and what your resources must be far into the future in terms of people, the environment and the community. All decisions are made towards achieving what you have carefully described in your holistic goal.

**1:30 – 4:30 p.m., Facilitated Discussions**
(Concurrent with Workshops)
Session #6, 1:30 – 3:00 p.m.

**Issue Advocacy - Bird Classroom**
Emily Byrum, National Audubon Society
This discussion will focus on the issues facing sustainable agriculture today and the role of educational farms in issue advocacy.

Session #7, 3:00 – 4:30 p.m.

**Historic Farming - Bird Classroom**
Jim Butcher, Five Rivers MetroParks, Carriage Hill Farm
Join us for a discussion on using educational farms as a way to teach history and demonstrate farming techniques of different time periods.

Shuttles to Hotel, 4:30 p.m. and 4:45 p.m.

**Saturday Evening Program (Aullwood Audubon Farm)**
Shuttles from Hotel, 5:15 p.m. and 5:45 p.m.

5:30 – 6:30 p.m. Mingle with other participants

6:30 – 7:30 p.m. Dinner

7:30 – 8:30 p.m. Parlor Games
Enjoy old-fashioned fun playing parlor games! Larry and Julia Marple from Carriage Hill MetroPark Farm will lead participants in 19th century games and amusements including conundrums and parlor tricks.

8:30 – 9:30 p.m., Night Hike
Join an Aullwood Naturalist for a hike around the farm to enjoy the cool night air and look for anything that might be stirring.

Shuttles to Hotel, 8:30 p.m., 9:00 p.m., and 9:30 p.m.

**Sunday Symposium Activities**
Shuttles from Hotel, 8:00 a.m. and 8:15 a.m.

**Sunday Optional Workshop,**
9:00 a.m. – 3:30 p.m. (Box lunch provided)
Food, Land, & People (Aullwood Farm)
Jason Beale is the Farm Naturalist Teacher at Aullwood Audubon Farm. He began teaching at Aullwood in June 2002 following employment with Audubon and Wildwood Lake Sanctuary in Harrisburg, Pennsylvania. He loves sharing his enthusiasm for sustainable agriculture and the natural systems that support all life on Earth.

The mission of Project Food, Land, and People is to provide educational materials and promote approaches to learning that help educators and students in grades pre K – 12 to better understand the interrelationships among agriculture, the environment, and people of the world. This 6 1/2 hour workshop will provide an interdisciplinary, hands-on training focusing on the Project Food, Land, and People curriculum. Important issues such as adapting lessons to various audiences and using local resources will be covered. Educators will receive the new edition of the Project Food, Land, and People curriculum, a certificate of completion, and a variety of educational resources.

Shuttles to Hotel, 3:30 p.m. and 3:45 p.m.

Sunday Aullwood Winter Speaker Series, 2:30 p.m.
If your flight doesn’t leave until late Sunday afternoon, please join us at the Marie S. Aull Education Center at 2:30 p.m.

Steve Newman, known to many as the “Worldwalker” is the only person in history documented to have walked solo around the world. From 1983 to 1987 the journalist trekked across 21 nations on five continents, all the time sharing his adventures with his one million newspaper readers.

Labeled as a fool by nearly everyone, on April 1, 1983, Steve set out from his boyhood home in the village of Bethel, Ohio to live his dream of walking around the world. Across Europe, Africa, Asia, Australia, and North America Steve walked alone, sleeping in fields, under bridges, in abandoned buildings, or in the homes of people who invited him in. Plan to join Steve Newman when he recounts his exciting experience.
2003 Educational Farm Symposium Evaluation

Please share with us your thoughts on the various parts of the Educational Farm Symposium. Your thoughtful, specific examples and suggestions are most helpful! Thanks!

Workshops: Please circle a rating for the workshop you attended and comment on it.

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Comments ____________________________________________________________
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Facilitated Discussions: Please name each discussion you attended and comment.

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Meals, Snacks, Beverages:
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Registration Materials and Process:  
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Poor Excellent

Did this Symposium help you to grow professionally:  
1 2 3 4 5  
Poor Excellent

How often should the Educational Farm Symposium be held?  
_______ Annually _______ Every other year  
_______ Every three years

What month should the Symposium be held? Please rank preferences (1 - highest, 5 - lowest).  
_______ January _______ May _______ September  
_______ February _______ June _______ October  
_______ March _______ July _______ November  
_______ April _______ August _______ December

What improvements would you make if we hosted a Symposium next year?  
________________________________________________________________________

________________________________________________________________________

Where could future Symposia be held?  
________________________________________________________________________

My organization would be interested in sponsoring an Educational Farm Symposium next year:  
Name and organization ____________________________

Overall Comments ____________________________

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Name and Organization  
(Optional) ____________________________
Things are not going well in farming today. In fact, American agriculture is in crisis. People will continue to eat, and someone will continue to produce their food. But farming, at least as we have known it for the past fifty years, is coming to an end. As agricultural production has become increasingly specialized and standardized, control has been consolidated among a handful of large agribusiness corporations – mostly through comprehensive contractual arrangements. As farms continue to become larger in size, fewer in number, and increasingly under the control of these large corporations, at some point farming is no longer farming, but instead becomes agribusiness management. Farming is associated with agriculture, not agribusiness. If farming is to survive, we must somehow “rediscover agriculture.”

Prior to the past half-century, farming had been about working with nature – about finding harmony with the unchangeable, uncontrollable order of nature. Harmony was a means of ensuring productivity – of allowing nature to be more productive. But, farmers also benefited directly from living and working in harmony with nature. Historically farmers valued stewardship because they felt a moral and ethical responsibility to take care of the earth – “to leave the land as good as they found it.” They cared for the land even if they never expected to live to see the return on their investment. They practiced stewardship because it gave purpose and meaning to their lives – not because it was profitable to do so. And, this kind of farming made sense, because it was the “right” way to farm.

Prior to the past half-century, farming had been about working with other people – in families, communities, and nations. On a family farm, the farm and the family were inseparable parts of the same whole. The farming operations were designed to build character and self-esteem in children as they grew up. Farm work kept the family together, not simply because employing the whole family improved the bottom line, but because building a strong family was a valued purpose for farming. Farm families valued the sharing of equipment and labor with neighbors beyond just getting the work done quicker and at less cost. Farmers also knew the people who bought their products and the people who provided them with supplies. There was value in being a member of a farming community. States and nations also had strong agricultural identities. People realized that changing occupations and shifting production among regions and nations do not occur without large costs in terms of social well-being. Historically, agriculture placed a high value on human relationships. This kind of farming made sense, because it was the “right” way to farm.

Many speak of the farm of the future as a high-tech, bottom-line agribusiness. In reality, there is less reason to place our faith for the future in agribusiness than in the future of agriculture. Agriculture has been around for centuries, while agribusiness is less than
sixty years old. Only in the past half century or so have we allowed the economics of individual self interest to dominate, degrade, and ultimately destroy the ethical and social values arising from farming. Farmers have been coerced, bribed, and brainwashed into believing that the only thing that really matters, or at least the thing that matters more than anything else, is the economic bottom line. But, farmers at last are beginning to realize that their blind pursuit of profits is the root cause of their financial failure. American agriculture has never been more productive or efficient than it is today, and farmers have never been confronted with more financial difficulties. The two are not coincidental.

So what’s the real difference between a farm and an agribusiness, and why does it matter? First, farmers historically have attempted to tip the ecological balance to favor humans over other species, but they still worked with nature. Farmers recognized that the laws of nature must prevail over the laws of “man.” Farmers were dependent on unpredictable weather and worked with living systems that they could manage but never expected to control. Farming always was as much a way of life as a way to make a living. A farm was a good place to raise a family and farming was a good way to be a part of a community. The benefits of farming were never solely, or even predominantly, economic in nature. Farming always carried with it a set of beliefs, behaviors, and customs that distinguished it from any other occupation – a culture of agriculture. This “culture” of agriculture defines what it meant to be a farm, and culturally, a farm quite simply is not just agricultural business.

Certainly most farmers have had times when they wished they could control the weather and longed to be more independent. If they could gain more control they could reduce risks, improve production, and make the farm more profitable. It always seemed easier to achieve the social and ethical rewards of farming than to keep pace with other occupations in terms of income and return on investment. Down deep, most probably knew that if they were to succeed in achieving independence and control, they would lose some of the things they valued most about farming. But little did they realize that they would lose the ability to continue being “farmers.”

As new technologies gave producers more control over production – commercial fertilizers, pesticides, livestock confinement, and now biotechnology – they took the physical culture out of agriculture as they abandoned the natural production principles of the past. As new farming methods made farmers more independent – mechanization, hired labor, and financial leverage – they took the social culture out of agriculture as they abandoned their personal connectedness with others. As farmers gained control over nature, they took the spiritual culture out of farming as they abandoned their respect for the higher natural order of things. As farmers took the culture out of farming, they transformed agriculture into agribusiness.

As new technologies and methods succeeded in freeing farming from the constraints of nature, community, and morality, agricultural production became attractive to corporate investors. Corporations place no value on working in harmony with nature – instead they must control nature to reduce risks and to ensure profitability and growth. Corporations
place no value on relationship within families, communities, or nations – instead they must separate people to ensure that each produces to their full economic potential. A corporation is not human – it has no heart, it has no soul. When management becomes separated from ownership, the corporation takes on a life of its own. The people who choose to work for corporations are powerless to change their fundamental nature. The corporation has no sense of ethics or morality. The only thing it can possibly value is profit and growth.

If there is to be a future of farming in America, farmers must rediscover agriculture. This does not mean that farmers should go back to technologies and methods of the past, although some may have merit for the future. Instead, they must choose technologies and methods that respect the fundamental principles of farming, the culture of agriculture, regardless of whether they are old or new. Certainly, farming in the future must yield an acceptable economic return to the farmer’s resources – land, labor, capital, and management. But an acceptable economic return does not mean the same thing as maximum profits and growth. Farmers of the future must regain the realization that there is value in relationships among people – within families, communities, and nations. Farmers of the future must regain the realization that there is value in living an ethical and moral life – in being good stewards or caretakers of nature and of human culture. These things still make sense, because they are the “right things” to do.

Thankfully, the growing crisis in American agriculture has given rise to the rediscovery of agriculture, through the development of a post-industrial paradigm for farming – sustainable agriculture. In its most basic sense, a sustainable agriculture is an agriculture that will last – an agriculture that can maintain its value to society, indefinitely. A sustainable agriculture must meet the needs of people of the present, while leaving equal or better opportunities for those of the future. To meet the needs of both the present and future, a sustainable agriculture must be ecologically sound, economically viable, and socially responsible.

If a system of agriculture destroys the productivity of its natural resource base - water, air, or soil - it eventually will lose its ability to produce, it can’t last, and thus, is not sustainable. If a system of agriculture can’t survive financially, the farm business can’t last, and thus, it is not sustainable, no matter how ecologically sound it may be. And, if a system of agriculture doesn't meet the needs of society, as consumers, producers, and citizens, it will not be supported by society, and it is not sustainable. All three dimensions of sustainability are necessary - like the three dimensions of a box. A box without height, width, and length, is not a box, and a farm that is not ecologically sound, economically viable, and socially responsible is not sustainable – it can’t last.

Sustainability is rooted in a philosophy fundamentally different from that of industrialization. Industrialization views the earth as a set of natural, economic, and human resources to be extracted and exploited for the benefit of humanity. Industrialization recognizes no limits to growth, and thus, doesn’t address long run resource issues of conservation, regeneration, or renewal. Industrialization relies on the
“invisible hand” of the “market economy” to allocate natural and human resources among alternative uses and to allocate goods and services to meet the needs of consumers.

Sustainability, on the other hand, recognizes an appropriate role for a “competitive” free market economy in meeting the needs of people as individuals. But, sustainability views the earth as a living system that must be nurtured and cared for, not exploited, if it is to sustain human life. Sustainability recognizes that humans must limit their claims to the resources of the earth, and that its limited resources must be continually conserved, renewed, and restored. Sustainability recognizes that families, communities, and societies are more than just a collection of individuals – that social relationships among people matter. And, sustainability recognizes that each human life has purpose and meaning that transcends self, that we, in fact, are connected with those of past and future generations through some higher order of things – that ethics and morality matter.

In essence, the pursuit of sustainability requires that we apply the Golden Rule both within and across generations. We should take care of ourselves, if we are able, but also must care for others, as we would have them care for us were we not able to care for ourselves. And, we should care for those of future generations, as we would have them care for us, if we were of their generation and they were of ours. As Ben Franklin once said, philosophical and religious "commandments" such as the Golden Rule "are not good for us because they have been commanded of us, but are commanded of us because they are good for us."

To farm, work, or live sustainably, we must recognize that caring for others is not a sacrifice, but instead, is a privilege. The positive relationships that result from mutual concern are valuable, even essential, to a desirable quality of life. To farm, work, or live sustainably, we must recognize that stewardship of nature, for the benefit of future generations, is not a sacrifice, but instead, is a privilege. Stewardship of the earth enhances our quality of life because it adds purpose and meaning. To farm, work, or live sustainably, we must pursue a more enlightened self-interest, which recognizes and values the individual, interpersonal and spiritual dimensions of our lives. Sustainability, ultimately, is about sustaining a desirable quality of life.

Thankfully, a new breed of American farmer has emerged to lead the way in transforming the philosophy of sustainability into a practical, tangible reality. Literally thousands of these new farmers, scattered across the continent and around the world, are creating new and better ways to farm. They may label themselves organic, biodynamic, ecological, natural, holistic, practical, innovative, or nothing at all; but they are all pursuing the same basic purpose. They are on the frontier of a new and different kind of agriculture, an agriculture capable of meeting the needs of the present while leaving equal or better opportunities for those of the future – a sustainable agriculture. These farmers face struggles and hardships and there are failures along the way. Life is rarely easy on any new frontier. But, a growing number are finding ways to succeed. And, while there
are no “blueprints” for the New American Farm, some basic characteristics are emerging. First, these farmers see themselves as stewards of the earth. They are committed to caring for the land and protecting the natural environment. They have a deep sense of respect for things of the earth. They work with nature rather than try to control or conquer nature. They fit the farm to their land and climate rather than try to bend nature to fit the way they might prefer to farm. Their farming operations tend to be more diversified than are conventional farms because nature is diverse. Diversity may mean a variety of crop and animal enterprises, crop rotations and cover crops, or managed livestock grazing systems, depending on the type of farm. By managing diversity, these new farmers are able to reduce their dependence on pesticides, fertilizers, and other commercial inputs that squeeze farm profits and threaten the environment. Their farms are more economically viable, as well as more ecologically sound, because they farm in harmony with nature.

Second, these new farmers build relationships. They tend to have more direct contact with their customers than do conventional farmers. Most either market their products direct to customers or market through agents who represent them with their customers. They realize that as consumers each of us value things differently because we have different needs and different tastes and preferences. They produce the things that their customers value most. They have a strong sense of respect for people. They are not trying to take advantage of their customers to make quick profits; they are trying to create long-term relationships. They market to people who care where their food comes from and how it is produced – locally grown, organic, natural, humanely raised, hormone and antibiotic free, etc. – and, they receive premium prices by producing foods their customers value. Their farms are more profitable as well as more ecologically sound and socially responsible.

These new farmers challenge the stereotype of the farmer as a fiercely independent competitor. They freely share information and encouragement. They form partnerships and cooperatives to buy equipment, to process and market their products, to do together the things that they can’t do as well alone. They are not trying to drive each other out of business, so the survivors can farm more land; they are trying to help each other succeed. They refuse to exploit each other for short run gain; they are trying to build long term relationships. They buy locally and market locally because they value community. They bring people together in positive, productive relationships that contribute to their economic, ecological, and societal well-being. They value people, for personal as well as economic reasons, and want to build and maintain good human relationships.

Third, to these new farmers, farming is as much a way of life as a way to make a living. They are “quality of life” farmers. To them, the farm is a good place to live – a healthy environment, a good place to raise a family, and a good way to become a part of a caring community. Many of these farms create economic benefits worth tens of thousands of dollars, in addition to any reported net farm income. Their “quality of life” objectives are

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1 For 50 real life examples, see “The New American Farmer – Profiles in Agricultural Innovation,” the SARE Program, USDA, Washington DC. ($10 US – call: 802-656-0484 or e-mail: sanpubs@uvm.edu, also available free on line at http://www.sare.org/newfarmer)
at least as important as the economic objectives in carrying out their farming operations. Their farming operations reflect the things they like to do, the things they believe in, and the things they have a passion for, as much as the things that might yield profits. They are connected spiritually through a strong sense of purpose and meaning for their lives. However, for many, their products are better and their costs are less because by following their passion they end up doing what they do best. Most new American farmers are able to earn a decent income, but more important, they have a higher quality of life because they are living a life that they love.

The purpose and principles of sustainable agriculture are completely consistent with the historic culture of agriculture. This is no coincidence. The industrialization of agriculture over the past half-decade was but an aberration in the historical development of agriculture – an aberration in that it was a sharp break with the past, but which has no future. The industrial paradigm of development, quite simply, is not sustainable. The fundamental purpose of agriculture is to support a more desirable quality of life for people – farmers, rural residents, and society as a whole. The exploitation of natural and human resources to maximize profits by producing quick, convenient, and cheap food has not enhanced the quality of life of farmers, rural residents, or society; and it is not sustainable. The fundamental principles of long run sustainability are those of ecological integrity, economic viability, and social responsibility. An industrial agriculture clearly violates all three. Sustainable farming, i.e. a real farming, must take care of the land, be a good neighbor, and earn a decent living by producing good food. An agribusiness does none of these things. The purpose and principles of sustainability link the future of farming with its cultural past. The culture of agriculture is being rediscovered through sustainable farming.

Educational farms, farms that serve as education centers, would seem to provide the ideal setting in which Americans can rediscover agriculture, and in the process, can discover a better way of life. People are no less dependent upon the land today than in the days when we were all hunters and gathers, or farmers; our dependence is simply less obvious. All of life depends on the soil. Life requires air and water, but nothing can live with air and water alone. Things that are not directly rooted in the soil – that live in the sea, on rocks, or on trees, for example – still require minerals from the earth. Living things other than plants get their food from plants or from other living things that feed on plants, and plants feed on the soil. By one means or another, all life is rooted in the soil. And, farmers are the people who nurture the life in the soil and bring life from the land that ultimately supports all human life. So, the seeds for a sustainable agriculture must be sown in the earth. An educational farm, with its roots in the soil, provides an ideal environment in which to teach and demonstrate the critical linkages between the sustainability of the land, the sustainability of agriculture and the sustainability of humanity.

The purpose and principles of sustainable farming also can be demonstrated on educational farms. Educational farms can be developed to demonstrate how ecologically, economically, and socially sustainable systems of farming can enhance the quality of life of farmers, rural residents, and society as a whole. Such demonstrations can show how
principles of good farming from the past – such as, diversification, relationship marketing, and cooperation – can be used in developing sustainable farming systems for the future. The farming practices and methods of the future – and the associated farm machinery, equipment, buildings, etc. – may be very different from those of the past, but the fundamental principles must remain the same if farming is to be sustainable.

A good demonstration farm need not have chickens, hogs, dairy cows, beef cows, and a half-dozen different crops, but it must be sufficiently diverse so as to function in harmony with nature. A good demonstration farm need not market all of its products to its neighbors, but it must depend on personal relationships with customers, rather than convenience and price, to sustain the farm economically. A good demonstration farm need not completely support a farm family, but it must demonstrate that it can enhance the quality of life for a family – economically, socially, and spiritually. The farm enterprises, methods, and practices may be different, but the purpose and principles of farming in the future must be the same as those of the past.

The new American farms and farmers, as mentioned previously, are scattered all across the country. Such farms can provide real world, local examples of the types of sustainable farming operations that are feasible in a given location. Managers of educational farms should visit as many such farms as is practical and visit with as many such farmers as possible, to gain as much insight as possible into how to develop an effective sustainable educational farm. The new vision for the future of farming is not being developed in the universities or government agencies, but instead, on real farms by real farmers. These new farmers will be the most valuable advisors in creating effective educational farms.

It is difficult to imagine an effective educational farm that is not operated, day-to-day, by an individual or family who has a long-term commitment to the farm. In real farming, sustainable farming, a meaningful, personal bond must exist between the farmer and the land. It would be difficult, if not impossible, to demonstrate the principles of sustainability without this bond.

It is also difficult to imagine an effective educational farm that does not produce products for sale to customers who have a personal relationship with those who operate the farm. Obviously, educational farms incur costs that are not incurred on actual farms, but a sufficient amount of income should be generated by the farm to demonstrate the economic viability of the concepts. And, direct marketing to customers who care about sustainability, and about sustainable farmers, are the only logical source of such income. The marketing demonstration should be appropriate for the location and farming situation, and might involve a roadside stand or a community supported agriculture (CSA) organization, or sales to farmers markets, local restaurants, or independent food retailers. Farms should attempt to maintain contact and build long term relationships with their customers, regardless of whether they visit frequently, living nearby, or only visit once, coming from halfway around the world.
It is difficult also to imagine an effective educational farm that doesn’t demonstrate the value of personal relationships, stewardship, and ethical behavior, not only in the operation of the farm, but in all aspects of its educational programming. An effective educational farm must exist for the purpose and function by the principles that it is attempting to demonstrate.

Educational farms can attract people through public interest in farms of the past. Most people today still at least have a curiosity about farming, although most no longer have any personal connections with farmers. Most consumers realize that their food comes from a farm somewhere, somehow, although know little about anything beyond the supermarket or restaurant. Few people will make the effort or take the time to tour local food processing and distribution centers to learn more about the industrial food system – and such tours are increasingly less available to the general public. And, most industrial farming operations are too dangerous to accommodate visitors – liability insurance costs are a consideration for those who might choose to do so. But, educational farms, specifically farms that farm by the principles of sustainability, are rapidly growing as tourist and educational destinations. Many people are curious about “real farms,” which they perceive to be farms of the past, and many will be willing to learn how these “real farms” can be, and should be, the farms of the future.

If they are to be effective, educational farm programs must convey the reality of agriculture today. Most information regarding today’s agriculture is little more than propaganda designed to support the continued industrialization of agriculture. Educational farms must convey the truth about the ecological degradation, social decay, demise of family farms, and growing insecurity of our national food system – obvious consequences of relentless agricultural industrialization.

To be effective, educational farms must make people aware of the opportunities for the future and their responsibilities for helping create sustainable food and farming systems. While the initial interest of many visitors may be in farms of the past, effective educational programs must convey the logical linkage of the future of farming and with its past. Visitors should leave an educational farm with a clear concept of why our industrial food system of today is not sustainable and why farming must return to its historic purpose and principles to ensure its long run sustainability. They should also leave with a clear understanding that human life on earth is only as sustainable as are our systems of food and farming.

Those who learn from their experiences at educational farms quite likely will begin seeking out more local sources of sustainably produced foods – once they return to their homes. They will frequent local farmers markets or roadside stands where they can buy fresh, local produce. They may join a CSA, where they contract for a share of “their farmer’s” produce for a season. They may seek out local restaurants or shop at independent food stores that buy from local farmers. They may or may not start buying organic foods, but they will most certainly care more about how their food is grown, who grew it, and how the earth and people were treated in the process of production. As
people become more conscious of issues affecting the sustainability of agriculture, they will become more concerned about the sustainability of human society in general.

Things are not going well in American agriculture today, and will not go well, until farmers rediscover the culture of agriculture. The industrialization of agriculture was but an aberration, an abrupt break with the past, which has no future, because it is not sustainable. An new vision for the future of agriculture is emerging from growing concerns for the sustainability of agriculture. Thousands of new American farmers are finding ways to translate the purposes and principles of sustainability into reality. Although the enterprises, methods, and practices may be different, the purpose and principles of farming sustainably are the same as those of the past – before industrialization. The sustainability of agriculture depends on our understanding this linkage of farms of the future with farms of the past.

Educational farms provide unique opportunities to provide a conceptual bridge between sustainable farms of the future and farms of the past. People may be drawn to educational farms by their curiosity about the history of farming, but once there, may be willing to learn about the present and future of agriculture, and its implications for the future. Effective educational farms can demonstrate, and not just teach, the purpose and principles of sustainable farming and of sustainable living. The educational experiences of farm visitors can be life changing, and ultimately, world changing. Lessons of a farm are lessons of life. As people rediscover the culture of agriculture, they will learn life’s lessons of sustainability. As we reconnect with the past, and with sustainable farming, we will discover our future.