“To the young mind everything is individual, stands by itself...later remote things cohere and flower out from one stem.”
Ralph Waldo Emerson

The OWLS name and program are used with permission from the Kansas Department of Wildlife and Parks Chickadee Checkoff. The authors have graciously allowed the West Virginia Diversity Program to modify the OWLS program for West Virginia.

Revised September 1993.
Adapted for West Virginia by J. Scott Butterworth, Kathleen C. Leo and Carmen Blumberg

In Cooperation with

Project Learning Tree
Project WILD

(All parts of this book may be duplicated for non-profit educational purposes.)

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INTRODUCTION

The West Virginia Wildlife Resources Section is responsible for stewardship of the state's wildlife resources and an important part of its mission is to enhance the public's appreciation for wildlife. Effective education is central to this effort. Each generation of our youth, in due time, assumes responsibility for our natural resources. This responsibility includes the conservation of wildlife and their habitats. In order to prepare our youth to become responsible citizens who practice responsible conservation of our natural resources, it is necessary to emphasize educational programs that teach school-age children the principles of ecology. Relating the needs of wildlife with human needs instills the interconnectedness between humans and their natural environment. One of the best ways to accomplish this is to bring the students into contact with wildlife and their habitats.

Schools are in charge of educating our youth about science, math, English, language arts and social skills. The best way to teach and learn about nature is to provide the students with natural outdoor settings. It is well established that "hands on" activities greatly enhance a student's ability to understand and remember concepts and facts.

Many instructors are limited because of time constraints, or other reasons, from transporting classes to distant natural areas for biological study. However, many schools have property available right outside their doors that could be used to develop outdoor learning laboratories. Some schools have demonstrated how this can be accomplished on their immediate school grounds and how successful it is in educating students and giving them more insight and appreciation of nature. These outdoor classrooms provide interdisciplinary education across many different subjects.

Nongame wildlife are animals which are not typically taken for sport, fur or food. Rare and endangered species, such as our nation's symbol, the bald eagle, are nongame species, but so are the many fascinating creatures that enhance our lives with sounds and sights on a daily basis. These include the birds singing near our homes, a chorus of frogs, flashes of colorful butterflies on a summer's day and the delicately colored wildflowers carpeting meadows in early fall. There are over 500 vertebrate nongame wildlife species in the state, thousands of invertebrates and 2300 vascular plants. As well as enriching the lives of all West Virginia citizens, nongame wildlife and plants serve as an integral part in mother nature's scheme to maintain the unique beauty and environmental integrity of our state. To ensure the continued existence of wildlife and botanical resources is just one of the many responsibilities of the West Virginia Division of Natural Resources' Wildlife Resources Section, Wildlife Diversity Program (WDP). The DNR's effectiveness in meeting these responsibilities is directly related to the involvement and support of the citizens of West Virginia. The WDP’s Outdoor Wildlife Learning Sites Program is one such way to involve local conservation clubs, businesses and community members in projects.
that will aid in the conservation of West Virginia's nongame wildlife and botanical resources.

In addressing the nongame needs of the state, WDP has initiated the Outdoor Wildlife Learning Sites (OWLS) program to help increase student exposure to native wildlife and plant communities. The WDP, with the guidance of the West Virginia Wildlife Diversity Citizens Advisory Council, comprised of experts and interested citizens appointed by the Governor, has committed funds each year to establish OWLS on school grounds throughout West Virginia. OWLS grants provide up to $2,000 for any school desiring to create this type of outdoor learning laboratory after meeting standards established in this application booklet.

**Benefits of Developing Wildlife Habitat at Schools**

**Student Benefits**
- Enlivens school subjects; knowledge is applicable to the real world
- Promotes creative learning by students; student can choose to do projects
- Interdisciplinary: math, science, literature, social skills
- Unlimited learning opportunities all year

**Teacher Benefits**
- Expands teaching strategies for each subject
- Livens and improves interaction between students and teacher
- Increases satisfaction in teaching (applied knowledge reinforces learning)
- Accessible: no need to use a bus or prepare for a trip
- Teaching is brought to life by being outdoors
- Teachers learn along with students

**Wildlife Benefits**
- Creates habitat for wildlife
- Wildlife is an environmental barometer; if wildlife declines, the environmental quality of human life also declines

**Society Benefits**
- Creates responsible citizenship based on ecological literacy
- Sets a positive example for the community; improves school grounds
- Promotes responsible action
THE DETAILS

Initial Questions

What is an OWLS?

OWLS is an acronym for Outdoor Wildlife Learning Sites. OWLS are outdoor environmental/wildlife laboratories, at or near schools, consisting of one or more native habitat features. These areas are developed to attract and provide homes for a variety of native wildlife species and to facilitate multi-disciplinary learning opportunities for students. The program involves numerous organizations, agencies and community members, all with the purpose of fostering a better understanding and appreciation of our wildlife and the natural world in our youth.

Who is eligible to receive OWLS funding?

Any grade school, intermediate school, high school, or special education school, whether public or private, may apply for OWLS funding. The purpose of the OWLS program is to facilitate the development of outdoor learning laboratories on as many school grounds as possible. OWLS is a long-term effort that will involve many different groups and types of educational facilities.

How much money can be provided from the WDP for OWLS funding?

The WDP will make up to $2,000 available per school. Schools are encouraged to seek additional funding from other agencies, organizations and benefactors.

When should one apply for OWLS funding?

The closing date for applications is November 1. Funding for projects will be awarded on a competitive basis. Judging will be done by WDP staff. Because of limited funds, unsuccessful applicants are encouraged to resubmit new proposals in the following years. Each school has 2 years to complete their OWLS project after receiving their OWLS funds.

How are proposals rated?

The most important aspect of any OWLS project is that it benefit native nongame wildlife and/or botanical resources in West Virginia and that it be utilized for environmental education. Proposals must also include the following:

- use of native plants
- clear site drawings
- 8 or more committee members
- resource personnel
- long-term commitment to the project
- teachers trained in Project WILD or Project Learning Tree

Other important aspects include:

- other funding sources
- publicity plans
- site available to the public
- community involvement
- clear and reasonable budget
- education objectives
How to Apply

Submit a proposal to the address below before November 1. See pg. 8 for proposal format. To receive additional booklets write to:

OWLS Coordinator
WDP
P.O. Box 67
Elkins, WV 26241
(304) 637-0245.

Steps for Participation in the OWLS Program

~ School requests information about OWLS
~ Guidelines and application sent to school
~ School forms an OWLS committee and selects an OWLS project director
~ Assess environmental attributes of the site
~ Determine potential projects based on assessment
~ Involve students in all aspects of the process
~ School OWLS committee prepares proposal
~ Proposal submitted to WDP OWLS program coordinator by November 1
~ West Virginia WDP staff evaluate proposal for funding
~ Funding contract paperwork is initiated with approved schools
~ Funding is provided in spring
~ WDP OWLS coordinator visits school OWLS site
~ Site preparation and planting begins
~ Follow up visit by OWLS program coordinator
~ Final Report with pictures, description of accomplishments, and receipts submitted to OWLS program coordinator
Tips from previous program years

Since the program’s inception, nearly 100 schools in 40 counties have been awarded OWLS grants. Competition for funding has been keen and attention to proposal detail is important.

Some of the more common problems we have had with past proposals are as follows:

*Habitat Improvement vs. Construction*: OWLS funds should be used for wildlife habitat improvement and enhancement (ex. plantings, nest boxes, water sources, etc.) rather than for construction projects (ex. pavilions, bridges, boardwalks).

*Lack of Educational Objectives*

*Exotic vs. Native*: It is very important to plant native vegetation not only for the benefit of native wildlife and plant communities, but also to instill a responsible land use ethic in the students. For more information on native vegetation, see pages 33-41.

*Removal of Invasive Species*

*Lack of Information:*

/ Species of plants chosen (use both common and scientific names; use both genus and species in the scientific names)
/ Size of OWLS area
/ Current conditions and features of OWLS area before development occurs (ie. any vegetation, fixtures, soils, habitat types present, etc.)
/ Location of specific habitats (existing and planned) on site maps
/ Types of land-use in surrounding landscape (ex. agricultural, forested, suburban, urban, etc.)
/ Complete budget indicating exactly who will be paying for or donating each item
The Details

OWLS Overview

The following list is designed to help you obtain a basic understanding of the OWLS program and to assist you in developing your OWLS funding proposal. Use this booklet to help you with the following questions and directives.

1. What is an OWLS? (page 5)
2. Who is eligible to receive an OWLS grant? (page 5)
3. How much money can be provided from the WV Wildlife Diversity Program for an OWLS project? (page 5). List 5 other possible sources of funding for OWLS in your community.
4. When should one apply for OWLS funding? (page 5)
5. Where should you write to receive an application for OWLS funding? (page 6)
6. List 5 site features that you would like to develop at your school. (pages 31, 32-43) List the title of one educational activity for each of your 5 features. (Appendix A, page 52-55). Sketch your proposed OWLS area showing the location of your site features. (Figure 7b, page 13)
7. Who should be responsible for planning, implementing and maintaining your OWLS? (page 30)
8. Who should be on your OWLS committee? (page 30) Name the people from your school who should be on the OWLS committee.
9. List of agencies that can provide printed materials and resource people to help you develop your OWLS. (page 46). Visit those agencies, talk to their personnel about your OWLS and pick up materials that will be helpful in developing your OWLS.
10. Where should you write to receive Project WILD (PW) and Project Learning Tree (PLT) workshop information? (Appendix A, page 52)
11. Name a room in your school where you can establish your Wildlife Resource Center (WRC). (page 44) List 5 curricular materials, 5 pieces of equipment and 5 references that you would like to have in your WRC.
12. The date when grant paperwork must be sent back to the WDP (page 9).
13. What is involved in writing the final report (page 45).
How to Use this Booklet

The Proposal Application (beginning on page 8) should be copied for your use. All of the features described in the application can be found in the remaining pages of this booklet. Not only will this booklet help you to fill out the application, but it gives valuable advice and ideas for developing your outdoor classroom.

If you have difficulty filling out sections of the application, refer to the Sample Application (beginning on page 20).

Submission of Proposals

All applications for OWLS areas must be mailed and postmarked by November 1. Mail to OWLS Coordinator, WVDNR, P.O. Box 67, Elkins, WV 26241.

If you wish to receive additional copies of the Application Booklet, or know of another school interested in the program, please write to the above address.

If there are any questions about the application process, or if you need help with the development of your project, you can write or phone the OWLS Coordinator at the Elkins Office (304/637-0245, FAX 304/637-0250). Your suggestions and/or comments on the Application Booklet will be appreciated. Thank you and good luck.

Requirements

OWLS sites must use primarily plants native to West Virginia. Any exotic species used cannot be invasive or pose a threat to natural areas in the state.

Any printed materials or signs for your OWLS site must include the Wildlife Diversity Program as a sponsor.

All paperwork must be returned to the WDP within two (2) weeks of receipt or you will loose your grant.

Your final report must be returned to WPD by July 1st of the third year of the OWLS project (approximately 2 years after receiving funds). For example, if the application is submitted on November 1, 2005 the final report is due July 1, 2008. For information about the final report please see page 45.

PLEASE COPY THE PROPOSAL APPLICATION ON THE FOLLOWING PAGES FOR YOUR USE
West Virginia Division of Natural Resources Wildlife Diversity Program  
Application for the  
OUTDOOR WILDLIFE LEARNING SITES (OWLS) PROGRAM

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>(1) Provide the title of your area. The name does not have to be OWLS; be creative!</td>
<td></td>
</tr>
<tr>
<td>(2) Give the school’s address and phone number.</td>
<td></td>
</tr>
<tr>
<td>(3) Supply the name of the contact person (project director) along with his/her address, phone number, occupation, and the best time to be reached (REQUIRED!).</td>
<td></td>
</tr>
<tr>
<td>(4) List the committee members and their titles (e.g. 4th grade teacher, parent, etc.). This group must include at least 2 teachers, an administrator, a maintenance person, 2 students and 2 parents.</td>
<td></td>
</tr>
</tbody>
</table>
(5) List the **resource personnel** in your area who will help you develop and implement your site. You must have at least 1 biologist in this group.

(6) Specify the **goals** you plan on achieving including the features to be developed, activities to be implemented and the expected student outcome.

(7) Describe your **site location** and its **current features**, as well as the placement of the **OWLS features** you will be developing.
(7a) Provide a **diagram** of your **current site** and all of its features (e.g. faucet, trees, buildings, etc.) and its size. You may use a separate sheet if necessary.
(7b) Provide a **diagram** of your **site** with the **proposed OWLS features** (e.g. bird houses, butterfly and hummingbird gardens, pond, etc.) including the size of the area. You may use a separate sheet if necessary.
(8) Provide the **location(s)** of your **Wildlife Resources Center** where curriculum materials, equipment and references will be kept.

(9) **Site Use**: Provide a short narrative as to **who**, **how** and **when** the **site will be used**. Please include use by the community, clubs and organizations.

(9b) Describe some of the **activities** to be conducted on the site by the school including multi-disciplinary use by the classes.

(10) **In-service Training**.

(a) Number of people trained in Project WILD  
   Have they used this training in the classroom?

(b) Number of people trained in Project Learning Tree  
   Have they used this training in the classroom?

(c) Plans for **future training**:
(11) **Site Development:** List the start and completion dates for each feature to be developed on your site in the calendar provided. Also list any publicity events, continuing work on alternate funding, in-service training and maintenance of the area.

<table>
<thead>
<tr>
<th>Period</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall of Year 1</strong></td>
<td>Apply for OWLS grant</td>
</tr>
<tr>
<td>Winter of Year 1</td>
<td></td>
</tr>
<tr>
<td>Spring of Year 1</td>
<td></td>
</tr>
<tr>
<td>Summer of Year 1</td>
<td></td>
</tr>
<tr>
<td>Fall of Year 2</td>
<td></td>
</tr>
<tr>
<td>Winter of Year 2</td>
<td></td>
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<tr>
<td>Spring of Year 2</td>
<td></td>
</tr>
<tr>
<td>Summer of Year 2</td>
<td></td>
</tr>
<tr>
<td>Fall of Year 3</td>
<td></td>
</tr>
<tr>
<td>Winter of Year 3</td>
<td></td>
</tr>
<tr>
<td><strong>Spring of Year 3</strong></td>
<td>Turn in final report to the WVDNR by July 1</td>
</tr>
</tbody>
</table>
(12) **Budget**: Provide detailed budget worksheets indicating **current and/or pending support, in-kind services and local resources** from the OWLS program.

### (12a) Current/Pending Support

<table>
<thead>
<tr>
<th>Source</th>
<th>Support</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### (12b) In-kind Services and Local Resources

<table>
<thead>
<tr>
<th>Source</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(12c) **Requested OWLS Funds** (use additional pages, if necessary).

<table>
<thead>
<tr>
<th>Feature</th>
<th>Supplies</th>
<th>#</th>
<th>Price/Item</th>
<th>Total</th>
</tr>
</thead>
</table>

(13) Describe how the group plans on:

(a) **Involving** the **community**.

(b) Gathering **publicity** for the area.
(14) List the vegetation to be planted in each area. Please include both common and scientific names. The OWLS program requires the use of primarily native plants. Use additional pages if necessary.
(15) Provide examples of how the group will measure success (e.g. student projects, use of the area by groups other than the school, number of nestlings hatched in bird boxes, etc.). A final report, including an evaluation of success and a financial accounting, is required by July 1, of the third year of the program (See pg. 45 for details).

Please mail completed application by November 1 to:

OWLS
Wildlife Diversity Program
WV DNR Wildlife Resources Section
P.O. Box 67
Elkins, WV 26241
West Virginia Division of Natural Resources Wildlife Diversity Program
Application for the
OUTDOOR WILDLIFE LEARNING SITES (OWLS) PROGRAM

(1) Provide the title of your area. The name does not have to be OWLS; be creative!

Mountain Valley Outdoor Wildlife Learning Site

(2) Give the school's address and phone number.

Mountain Valley Elementary School
1 Watery Way
Bumperton, WV 55555
(304) 555-1112

(3) Supply the name of the contact person (project director) along with his/her address, phone number, occupation, and the best time to be reached.

Robin Fox
4th Grade Teacher
Box 321
Bumperton, WV 55555
(304) 234-7654 (Home)
Planning Period:
11:15 a.m. - 12:30 p.m.

(4) List the committee members and their titles (e.g. 4th grade teacher, parent, etc). This group must include at least 2 teachers, an administrator, a maintenance person, 2 students and 2 parents.

Robin Fox, Chairperson
Barbara Deer, Principal
Sandra Plum, Librarian
John Eagle, 5th grade science teacher
Stan Spade, maintenance supervisor
Susan Snail, 4th grade student
Arthur Bunting, 5th grade student
Alice Monarch, parent
Cheryl Crowing, parent
(5) List the **resource personnel** in your area who will help you develop and implement your site. You must have at least 1 biologist in this group.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alan Chenoweth</td>
<td>Mountain County Soil Conservationist, USDA</td>
</tr>
<tr>
<td>Janice Wheat</td>
<td>WV DNR Biologist</td>
</tr>
<tr>
<td>Sally Pamor</td>
<td>Mountain County Extension Service</td>
</tr>
<tr>
<td>Paul Ply</td>
<td>Mountain Valley Recreation Department</td>
</tr>
<tr>
<td>John Barry</td>
<td>Mountain Valley Garden Club</td>
</tr>
<tr>
<td>Ralph Knall</td>
<td>local naturalist</td>
</tr>
</tbody>
</table>

(6) Specify the **goals** you plan on achieving including the features to be developed, activities to be implemented and the expected student outcome.

Our goal is to develop features on the Mountain Valley OWLS which will attract wildlife for study by our students and members of our community to increase their appreciation for wildlife, develop an understanding of the dependency of wildlife on specific habitats, and comprehend the necessity to protect and/or restore habitats in order to increase wildlife diversity and numbers.

(7) Describe our **site location** and its **current features**, as well as the placement of the **OWLS features** you will be developing.

The Mountain Valley Outdoor Wildlife Learning Site is located on the north west corner of the Mountain Valley School grounds (See Figures 1 and 2). It is rectangular in shape and occupies nearly 0.7 acres. The site presently is covered with a thick stand of fescue grass and contains a water faucet with 100 feet of hose. Features will include a pond, a wooded area, hummingbird garden with pool, a park area, shrubland, butterfly garden with pool. All features will be connected by paths. Students, teachers, parents, and community volunteers will construct the features.
(7a) Provide a **diagram** of your **current site** and all of its features (e.g. faucet, trees, buildings, etc.) and its size. You may use a separate sheet if necessary.
(7b) Provide a **diagram** of your site with the **proposed OWLS features** (e.g. bird houses, butterfly and hummingbird gardens, pond, etc.) including the size of the area. You may use a separate sheet if necessary.
(8) **Provide the location(s) of your Wildlife Resources Center where curriculum materials, equipment and references will be kept.**

<table>
<thead>
<tr>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library (Room 111)</td>
</tr>
<tr>
<td>7th grade science lab (Room 275)</td>
</tr>
</tbody>
</table>

(9) **Site Use:** Provide a short narrative as to **who, how and when** the **site will be used.** Please include use by the community, clubs and organizations.

The Mountain Valley Outdoor Wildlife Learning Site will be used by Mountain Valley School students K-8 during the school day, and by community children and adults on weekends and summers on their own and in activities conducted by the Mountain Valley Recreation Department. Activities will be taken from Project WILD, Project WILD Aquatic, Project Learning Tree, and other hands-on curricular programs. Each K-8 student will participate in a minimum of two activities per semester.

(9b) Describe some of the **activities** to be conducted on the site by the school including multi-disciplinary use by the classes.

The Math sections will be measuring the DBH’s of the trees in the area; the English sections will be reading Thoreau’s works in the outdoor classroom; and the history sections will be re-enacting early pioneer life.

(10) **In-service Training.**

(a) **Number of people trained in Project WILD**: 2  
    Have they used this training in the classroom? Yes

(b) **Number of people trained in Project Learning Tree**: 3  
    Have they used this training in the classroom? No

(c) **Plans for future training:**  
    Project WILD training will be offered to all teachers as well as parents and other community members.
### Site Development

List the start and completion dates for each feature to be developed on your site in the calendar provided. Also list any publicity events, continuing work on alternate funding, in-service training and maintenance of the area.

<table>
<thead>
<tr>
<th>Fall of Year 1</th>
<th>Apply for OWLS grant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formed OWLS Committee</td>
</tr>
<tr>
<td></td>
<td>Contacted other community resource people</td>
</tr>
<tr>
<td></td>
<td>Assess site and involve students in planning</td>
</tr>
<tr>
<td>Winter of Year 1</td>
<td>Sent 5 people to PW workshops</td>
</tr>
<tr>
<td></td>
<td>Contacted possible community funding sources</td>
</tr>
<tr>
<td></td>
<td>Worked on draft of site plan</td>
</tr>
<tr>
<td>Spring of Year 1</td>
<td>OWLS areas laid out and marked off</td>
</tr>
<tr>
<td></td>
<td>Students have candy sale to buy songbird bundles</td>
</tr>
<tr>
<td></td>
<td>Songbird bundles planted in wooded area</td>
</tr>
<tr>
<td>Summer of Year 1</td>
<td>Receive OWLS and other funding</td>
</tr>
<tr>
<td></td>
<td>Erect bird feeders</td>
</tr>
<tr>
<td>Fall of Year 2</td>
<td>Attend PW &amp; PLT workshops</td>
</tr>
<tr>
<td></td>
<td>Construct pond</td>
</tr>
<tr>
<td>Winter of Year 2</td>
<td>Learn about native vegetation</td>
</tr>
<tr>
<td></td>
<td>Have local naturalist give talk</td>
</tr>
<tr>
<td>Spring of Year 2</td>
<td>Plant flowers and shrubs</td>
</tr>
<tr>
<td></td>
<td>Arrange boulders, plant butterfly &amp; hummingbird gardens</td>
</tr>
<tr>
<td>Summer of Year 2</td>
<td>Maintain areas already planted</td>
</tr>
<tr>
<td>Fall of Year 3</td>
<td>Plant park area trees</td>
</tr>
<tr>
<td>Winter of Year 3</td>
<td>Keep bird feeders full</td>
</tr>
<tr>
<td>Spring of Year 3</td>
<td>Turn in final report to the WVDNR by July 1</td>
</tr>
</tbody>
</table>
Sample Proposal

(12) **Budget**: Provide detailed budget worksheets indicating **current and/or pending support, in-kind services and local resources** from the OWLS program.

<table>
<thead>
<tr>
<th>(12a) <strong>Current/Pending Support</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
</tr>
<tr>
<td>Candy Sales</td>
</tr>
<tr>
<td>Mountain Valley Jaycees</td>
</tr>
<tr>
<td>PTA</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>(12b) <strong>In-kind Services and Local Resources</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Source</strong></td>
</tr>
<tr>
<td>Students Teachers Parents &amp; Community Volunteers</td>
</tr>
</tbody>
</table>
(12c) Requested OWLS Funds (use additional pages, if necessary).

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<tr>
<th>Feature</th>
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<th>Price/Item</th>
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<tbody>
<tr>
<td>Pond</td>
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<td>1</td>
<td>$479.00</td>
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<td></td>
<td>Sandstone waterfall &amp; pond border</td>
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<td></td>
<td>Pump (Little Giant 4E 34N)</td>
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<tr>
<td></td>
<td>Cattail, bulrush, sedge</td>
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<td>N/C</td>
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<tr>
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<td>Limestone boulders</td>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Trumpet vine</td>
<td>6</td>
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<tr>
<td></td>
<td>Bee balm</td>
<td>5</td>
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<td>Cardinal flower</td>
<td>5</td>
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<tr>
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<td>Pink spirea</td>
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<td></td>
<td></td>
<td><strong>$1,914.97</strong></td>
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</tbody>
</table>

(13) Describe how the group plans on:

(a) **Involving the community.**

We will have work days open to parents and community volunteers.

(b) Gathering **publicity** for the area.

Any event on the site (work days, summer activities) will be advertised in our local newspaper and we will invite the media and community leaders to work days.
List the vegetation to be planted in each area. Please include both common and scientific names. The OWLS program requires the use of primarily native plants. Use additional pages if necessary.

**Pond**
- Cattail (*Typha latifolia*)
- Bulrush (*Scirpus spp.*)
- Sedge (*Carex spp.*)

**Hummingbird Garden**
- Trumpet vine (*Campus radicans*)
- Bee balm (*Monarda didyma*)
- Butterfly weed (*Asclepias tuberosa*)
- Cardinal flower (*Lobelia cardinalis*)
- Azalea (*Rhododendron spp.*)
- Seed packets: Wild columbine (*Aquilegia canadensis*), Larkspur (*Delphinium spp.*), Phlox (*Phlox spp.*), Petunia (*Ruellia spp.*)

**Park Area**
- White pine (*Pinus strobus*)
- Sycamore (*Plantanus occidentalis*)
- Paw paw (*Asimina triloba*)
- Black walnut (*Juglans nigra*)
- Sugar maple (*Acer saccharum*)
- Red oak (*Quercus rubra*)

**Butterfly Garden**
- Redbud (*Cercis canadensis*)
- Lilac (*Syringa vulgaris*)
- Pink spirea (*Spirea spp.*)
- Seed packets: Aster (*Aster spp.*), Butterfly weed (*Asclepias tuberosa*), Goldenrod (*Solidago spp.*), perennial daisies (*Chrysanthemum spp.*)

**Meadow Planting**
- Little bluestem (*Andropogon gerardii*)
- Indian grass (*Sorghastrum nutans*)
- Wildflower seed mix: Aster (*Aster spp.*), Oswego tea or bee balm (*Monarda didyma*), Black-eyed susan (*Rudbeckia hirta*), Goldenrod (*Solidago spp.*), Shooting star (*Dodecatheon meadia*).
Sample Proposal

(15) Provide examples of how the group will measure success (e.g. student projects, use of the area by groups other than the school, number of nestlings hatched in bird boxes, etc.). A final report, including an evaluation of success and a financial accounting, is required by July 1, of year three of the project (See pg. 45 for details).

Each class, on a rotating schedule, will be required to put up a month long display on something they have learned about from our site. We hope to teach principles of general ecology and conservation through our area and these concepts will be reflected in the children’s displays. Since this project needs to have a lot of school and community support, success will also be measured in the number of volunteers and participants willing to help on work days and throughout the year. As our area grows, we hope to see donations from the community as well as increased interest in our area making it available to other groups and schools in the area.

Please mail completed application by November 1 to:

OWLS
Wildlife Diversity Program
WV DNR Wildlife Resources Section
P.O. Box 67
Elkins, WV 26241
DEVELOPING AN OWLS PLAN

When starting a project such as this, it’s often hard to know what questions to ask. Here are some additional and common questions about OWLS:

Who should be responsible for planning, implementing, and maintaining the OWLS?

The OWLS Committee

Who should be on the OWLS Committee?

- a school administrator
- at least two teachers
- at least two students
- at least one person from the school maintenance staff
- at least two parents

A WDP biologist can provide ideas and guidance along with other area resource specialists, cooperators and prospective funding partners; however, the members of the OWLS Committee will do the majority of the work. The more local people you involve, the more likely your project will succeed, not only in the short term, but also in the long run. Experience has shown that projects developed by one or two people expire when those people leave. However, long-term committee involvement should take into consideration workable numbers in order to expedite business. Normally, committees should number more than eight but less than fifteen.

What are the responsibilities of the OWLS Committee?

- inventory teacher interest (involve all interested teachers)
- inventory the potential site(s)
- decide what features exist and should be maintained on the site
- decide what new features are feasible for the site (see the Wild Yards information on the WVDNR web page)
- decide where the features will be located
- make a map of the site with desired features (see Figure 7b, p. 23)
- determine the cost of development and maintenance
- prepare a budget (see budget, p. 26)
- publicize the project (to get community support and involvement)
- obtain funding (involve other prospective funders in the OWLS)
- decide who will be responsible for developing each of the features
- decide what equipment is needed for feature development
- decide who will be responsible for the maintenance of each of the features
- decide what equipment is needed for maintenance
- decide who will be selecting learning activities for each feature
- decide who will be responsible for the school Wildlife Resource Center (WRC)
Developing an OWLS Plan

YW decide where the WRC will be located

**OWLS Committee Responsibilities continued...**
YW decide what the WRC will contain
YW decide what kind of in-service training is necessary for teachers
YW decide that teachers should participate in training at least once per year
YW decide how the in-service training is going to be funded
YW re-evaluate the use of the site every year
YW update programs, educational activities, and habitat improvements every year
YW prepare and submit final report on time

**What will be helpful for the inventory and site mapping?**

- aerial map & soil map [contact your local Natural Resources Conservation Service (NRCS) (formerly SCS) listed in the telephone book under U.S. Govt., USDA]
- topographic map - U.S. Geological Survey (304) 594-2331
  (Local bookstores and sporting goods stores sometimes carry topographic maps.)
- plant identification book - local bookstore, nature centers, see references (page 44)
- site map
  a 100-foot tape measure

**What should we include in our inventory?**

- topographic and geologic features (rocks, outcrops, boulders, slopes, streams, lakes, ponds, wetlands, etc.)
- soil types (see your county soil survey book and ask your county NRCS District Conservationist to help with this)
- soil profiles (stream cuts, road cuts, slopes, etc.)
- plants (grasses, shrubs, trees, vines, flowers, harmful plants, old field vegetation for plant succession studies, etc.)
- animal habitats (forests, forest openings, fields, wetlands, streams, riparian areas, spring seeps, brushy/shrubby areas, evergreens, brush piles, food plants, old stumps, fallen logs, snags (dead standing trees) and cavity trees (den trees), etc.)
- historical remnants (fences, foundations, orchards, outbuildings, etc.)
- surrounding landscape (agricultural, forested, suburban, urban, etc.)
SITE FEATURES

OWLS will vary in size and character as each will be tailored to the school grounds or area being considered. Each site should contain at least a planting of small trees and shrubs, a butterfly/hummingbird garden or a wet area as small as a frog pool up to a segment of a creek or even a larger marsh or pond. Each site may be customized to the available landscape and designed to achieve specific learning objectives. OWLS areas may range from a small plot of native shrubs with a small pool in a corner of the school yard to sites that feature several of the following possibilities:

- feeding stations for birds, squirrels, etc.
- shrubs that represent woody songbird plantings
- food plots for wildlife (grains left unharvested)
- butterfly and/or hummingbird gardens
- nesting structures for songbirds and small mammals
- water - a lined pond or developed wetland,
- incorporating wetland plant species
- woody plantings that include trees and shrubs
- to be used as nesting cover, food and perching sites
- a meadow
- unmown area
- perching wire
- managed grassland
- rock garden
- brush piles - shelter
- dead or fallen trees - homes
- interpretive trails

Additional Considerations and Options:

- use native plants whenever possible
- incorporate feeding stations to bring wildlife into view where they can be identified, observed, counted and recorded; consider wildlife viewing blinds
- use bird and small mammal nesting boxes to observe behavior and reproductive activities
- utilize brush or rock piles to provide cover and nesting sites for wildlife
- use weather stations to help correlate weather to habitat conditions and animal behavior
- construct an area with animal tracks pressed into clay or cement to help students learn to find and identify tracks in the wild
- incorporate trails and interpretive signs to offer students a chance to learn about wildlife by preparing material (any printed material or signs must recognize the WDP as a funding source)
- consider time capsules to relate current wildlife issues to future students
- include teachers, administrators, maintenance staff, students, parents and community resource people in the planning, implementation and maintenance of the site and development of learning activities
- apply learning activities that are site-specific and encompass many disciplines, such as science, math, art, writing and social sciences
- incorporate concepts to reduce demands on water, soil, and other natural resources (ie recycling or composting) to help foster a strong conservation ethic
- utilize or modify site activities from programs such as PLT, PW, and Project Wet
- establish a Wildlife Resource Center (WRC) in the school to house other curricular
Developing Site Features

materials, field and lab equipments, texts, references, field guides, etc.
Developing Site Features

DEVELOPING SITE FEATURES

There are a number of site features that can be included in your OWLS area. This section discusses the following list of features:

Native Species
Meadow Plantings
Woodland Plantings
Butterfly Gardens
Hummingbird Gardens
Wetlands, Ponds & Pools
Bird & Squirrel Feeding Stations
Nesting Boxes
Trails & Signs
Time Capsules
Natural Succession Areas
Student Involvement in Planting

Native Species

Native species refer to wild animals and plants that have evolved to a particular region and environment. Non-native (exotic) species are introduced from other regions or countries, accidentally, intentionally or through habitat change induced by humans or nature. Often these exotic species have no natural predators in the area where they are released allowing their population to increase rapidly. Exotic species often out-compete native species for food, shelter or space. Many times the exotic species have become pests and have taken over 25% of the native plants in West Virginia.

Some Examples of Exotic Plants That Occur in West Virginia and should be avoided:

| Johnson grass | multiflora rose | dandelions | white mulberry |
| ragweed       | hawkweeds      | sourgrass  | winged euonymus |
| bedstraws     | Japanese barberry | Japanese honeysuckle | |
| garlic mustard | paper mulberry | oriental bittersweet | crown vetch |
| leafy spurge  | chickweeds     | tree of heaven | stinging nettle |
| knapweed      | English ivy    | love grasses | bull thistle |
| mugwort       | mimosa         | spotted knapweed | Canada thistle |
| crabgrass     | Siberian elm   | purple loosestrife | chickory |
| kudzu         | Fescue 31      | Japanese knotweed | yellow bedstraw |
| Japanese smartweed | privet | autumn olive | |

For a more detailed list of invasive and exotic plants that threaten West Virginia’s natural areas, contact the OWLS Coordinator or P.J. Harmon, botanist [P.O. Box 67, Elkins, WV 26241, or (304) 637-0245].
Native Plants continued

Should you dig native plants if they are not available? OWLS recommends that you refrain from digging entire plants, but you can collect their seeds and plant them in your garden. However, if you really want a whole plant, try to find areas planned for development such as new road construction, housing developments or a proposed parking lot. Talk to the people in charge and get permission to dig plants before the area is bulldozed. Ask the highway department for information. This is an excellent way to obtain free native species.

Meadow Plantings

Often overlooked as wildlife habitat are open, grassy meadows. Grasses and forbs (wildflowers) provide food and nesting cover for many species of wildlife. Large meadows should include native forbs found within the local plant communities. Extremely small plots may only have room to accommodate grass species.

Ground Preparation -- The site should be tilled in the fall to kill cool season grasses, overwintered, tilled again in March and seeded shortly thereafter. Cover crop is an alternative to clean till seedbed preparation. Mulch spread after seeding and pressed into the soil will aid in establishment by increasing soil moisture and enhancing germination and plant survival.

Planting -- In addition to drilling, students may broadcast seed by hand. On large plots, this can be accomplished by assigning the students a grid or a line to walk. The surface can be dragged with a chain or raked to cover seeds. Uneven seeding may result, but this is an acceptable method and useful for showing succession and colonization. For comparison, a combination of drilling and hand seeding can be done. The choice to drill or hand seed will depend upon the size of the area and the speed at which the school wants the area covered. For small plantings, hand gathered seed may be more than adequate. In rural areas, parents, school board members, or others may be interested in being involved with site preparation by supplying and operating tilling equipment.

Seeding Mixture for Grasses

Big bluestem \((Andropogon gerardii)\)  
Indian grass \((Sorghastrum nutans)\)  
Little bluestem \((Andropogon scoparius)\)  
Sideoats grama \((Bouteloua curtipendula)\)  
Switch grass \((Panicum virgatum)\)
Forbs -- Many of these are commercially available, especially if large meadows are to be planted. There are also "native wildflower" mixes available through nurseries and seed catalogs, however, be aware that many of the "native" species are not native to West Virginia.

More nurseries are specializing in native plants every year. Below are some nurseries that propagate and sell native plants, and some even offer installation services. The nurseries located in West Virginia are listed first. Out-of-state suppliers were selected for this list based on these criteria: located within about 100 miles of WV, offer mail order or installation service, and have a high percentage of native plants in their stock. A percentage of native plant stock for each nursery is given at the end of each listing when known. This list is not meant to be inclusive nor is it an endorsement by the WV Division of Natural Resources of any individuals or businesses.

West Virginia Native Plant Suppliers

Use the following keys to choose the type of nursery plant materials, and services that you are looking for.
H=Herbaceous (may include annuals, perennials, ferns, grasses)
I= Offers installation services
MO=Mail Order
S=Seeds
SH=Shrubs
T=Trees
W=Wetland plants or aquatics

Enchanter’s Garden
HC 77 Box 108
Hinton WV 25951
(304) 466-3154
MO, H, S, SH, T, W 99%

Native Garden Design
Josh Meadows or Trey Flemming
Rt. 2 Box 484
Salt Rock WV 25559
Day (304) 541-0184 Eves (304) 736-6219
I, SH 100%

Spaulding Landscaping and Homeview Farm
Rt. 1 Box 39
Sheperdstown, WV 25443
(304) 876-2096
Email: homeviewfarm@aol.com
H, I, SH, T 15%

Sunshine Farm & Gardens
HC 67 Box 539B
Renick, WV 24966
(304) 497-2208
www.gardenweb.com/sunshine
H, SH, T, W 50%

Virginia Provenzano
Landscape Design & Garden
420 Dam # 4 Rd.
Sheperdstown, WV 25443
(304) 267-6924
Email: provenzano4@earthlink.net
MO, SH, T 100%

West Virginia Division of Forestry
Clements State Tree Nursery
PO Box 8
West Columbia, WV 25287
(304) 675-1820
## Out-of-State Suppliers

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<tr>
<th>Supplier</th>
<th>Address</th>
<th>Phone Numbers</th>
<th>Fax Numbers</th>
<th>Percentage</th>
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<tr>
<td>Atlantic Star</td>
<td>620 Pyle Rd., Forest Hill, MD 27050</td>
<td>(470) 838-7950</td>
<td><a href="mailto:atlantic@iximd.com">atlantic@iximd.com</a></td>
<td></td>
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<tr>
<td>Appalachian Nurseries, Inc</td>
<td>PO Box 87, Waynesboro, PA 17268</td>
<td>(717) 762-4733, FAX (717) 762-7532</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowman’s Hill Wildflower Preserve</td>
<td>PO Box 685, New Hope, PA 18938</td>
<td>(215) 862-2924, FAX (215) 862-1846</td>
<td><a href="http://www.bhwp.org/native">www.bhwp.org/native</a></td>
<td>MO, S 100%</td>
</tr>
<tr>
<td>Doyle Farm Nursery</td>
<td>158 Norris Road, Delta, PA 17314</td>
<td>(717) 862-3134</td>
<td></td>
<td>MO, H, 75%</td>
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<tr>
<td>England’s Herb Farm</td>
<td>33 Todd Rd., Honey Brook, PA</td>
<td>(610) 273-2863, FAX (610) 273-2556</td>
<td></td>
<td>I, MO, H, W 80%</td>
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<tr>
<td>Environmental Concern</td>
<td>PO Box P, St. Michaels, MD 21663</td>
<td>(410) 745-9620, FAX (410) 745-3517</td>
<td><a href="http://www.wetland.org">www.wetland.org</a></td>
<td>SH, T, W 100%</td>
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<tr>
<td>Flickinger’s Nursery</td>
<td>PO Box 245, Sagamore, PA 16250</td>
<td>(800) 368-7381, FAX (724) 783-6528</td>
<td>MO, T, SH, H</td>
<td></td>
</tr>
<tr>
<td>Gary’s Perennials</td>
<td>1122 E. Welsh Road, Maple Glen, PA 19002</td>
<td>(800) 898-6653, FAX (215) 628-0216</td>
<td>MO, H, W 20%</td>
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<tr>
<td>Heirloom Seeds</td>
<td>PO Box 245, W. Elizabeth, PA 15088</td>
<td>(412) 384-0852, FAX (412) 384-0852</td>
<td><a href="http://www.heirloomseeds.com">www.heirloomseeds.com</a></td>
<td>MO, S, 80%</td>
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<tr>
<td>Lower Marlboro Nursery</td>
<td>PO Box 1013, Dunkirk, MD 20754</td>
<td>(301) 812-0808, Email: <a href="mailto:mssd@erols.com">mssd@erols.com</a></td>
<td></td>
<td>MO, T, SH, H, W 80%</td>
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<tr>
<td>Land Reforms Nursery &amp; Landscape</td>
<td>35703 Loop Rd., Rutland, OH 45775</td>
<td>(740) 742-3478</td>
<td></td>
<td>I, MO, H, T, S, SH, W 90%</td>
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<tr>
<td>Maryland Natives Nursery</td>
<td>9120 Hines Rd., Baltimore, MD 21234</td>
<td>(410) 529-0552 FAX (410) 529-3883</td>
<td></td>
<td>I, H, SH, W 95%</td>
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<tr>
<td>Mary’s Plant Farm and Landscape</td>
<td>2410 Lanes Mill Road, Hamilton, OH 45013</td>
<td>(513) 894-0022 FAX (513) 892-2053</td>
<td></td>
<td>MO, T, SH, H 25%</td>
</tr>
</tbody>
</table>
The School Wildlife Resource Center

Shooting Star Nursery
444 Bates Rd.
Frankfort, KY
(502) 223-1679, FAX (502) 875-2231
MO, H, S, SH, T, W 100%

Wetland Supply Co./Native Plant Nursery
1633 Gilmar Rd.
Apollo, PA 15613
(724) 327-1830, FAX: (724) 733-3527
I, MO, H, SH, S, T, W 99%

Virginia Natives
PO Box D
Hume, VA 22639
(540) 364-1665 Phone & FAX
Email: vanatvs@erols.com
MO, H, SH, T, W 50%

Other Information:
West Virginia Native Plant Society – Information
Bill Grafton
345 West Virginia Avenue
Morgantown, WV 26501
(304) 293-4797 X2493

There are two great sources of native plant information including, photographs of plants native to your area and suppliers nationwide are the Lady Bird Johnson Wildflower Center website at www.wildflower.org and U.S. Department of Agriculture at http://plants.usda.gov/

Native or Adventive Species of Plants for Moist/Shaded Areas

- Jack-in-the-pulpit (Arisaema triphyllum)
- Wild ginger (Asarum canadense)
- Blue false indigo (Baptisia australis)
- Buttonbush (Cephalanthus occidentalis)
- Wild geranium (Geranium maculatum)
- Winterberry (Ilex verticillata)
- Cardinal flower (Lobelia cardinalis)
- Great blue lobelia (Lobelia siphilitica)
- Smooth azalea (Rhododendron arborescens)
- Flame azalea (Rhododendron calendulaceum)
- Purple laurel (Rhododendron catawbiense)
- Pinxter flower (Rhododendron niduflorum)
- Rhododendron (Rhododendron maximum)
- Ward's willow (Salix caroliniana)
- Glaucous willow (Salix discolor)
- Sandbar willow (Salix interior)
- Shining willow (Salix lucida)
- Heartleaf willow (Salix rigida)
- Silky willow (Salix sericea)
- Virginia saxifrage (Saxifraga virginiensis)
- Spiraea (Spiraea alba)
- Foamflower (Tiarella cordifolia)
- Oswego tea (Monarda didyma)

Native or Adventive Species of Plants for Dryer Sites

- Yarrow (Achillea millefolium)
- Milkweed (Asclepias spp.)
- Butterfly weed (Asclepias tuberosa)
- New England aster (Aster novae-angliae)
- Partridge pea (Cassia fasciculata)
- Climbing bittersweet (Celastrus scandens)
- Shooting star (Dodecatheon meadia)
- Dragon head (Dracocephalum virginianum)
- Western sunflower (Helianthus occidentalis)
- Rough blazing star (Liatris aspera)
- Spiked lobelia (Lobelia spicata)
- Wild bergamont (Monarda fistulosa)
- Evening primrose (Oenothera argillicola)
- Black-eyed susan (Rudbeckia hirta)
- Three-lobed coneflower (Rudbeckia triloba)
- Fire pink (Silene virginica)
- Oldfield goldenrod (Solidago nemoralis)
Woodland Plantings

NATIVE trees are part of the West Virginia natural heritage. They should be used whenever possible to illustrate the kinds of species adapted to the woodland biomes found within the State. Tree and shrub plantings should include those native to West Virginia that have adapted to the soils and climates of the habitat site. They enhance sites by providing habitat, nesting cover and food for wildlife, both vertebrates and invertebrates.

Ground Preparation -- If large stands or rows of trees are planned, the ground should be tilled in September or October, overwintered, and tilled again in the spring.

Planting -- In many cases, except as required by boundaries and property fences, straight rows should be avoided and curved rows used instead. More importantly, random arrangements should be encouraged. Flags where holes will be dug can be placed by walking a straight line, but randomly setting flags on either side at varying distances. Straight lines are further avoided if students dig the holes! Clumping vegetation works well, especially for shrubs, and allows succession to occur and expand in open areas.

<table>
<thead>
<tr>
<th>Trees Species</th>
<th>Height</th>
<th>Wildlife Value</th>
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<tbody>
<tr>
<td>Red maple (Acer rubrum)</td>
<td>50-70'</td>
<td>squirrels, chipmunk, evening grosbeak</td>
</tr>
<tr>
<td>Sugar maple (Acer saccharum)</td>
<td>60-100'</td>
<td>same as above</td>
</tr>
<tr>
<td>Ashleaf maple (Acer negundo)</td>
<td>75'</td>
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<tr>
<td>Pawpaw (Asimina triloba)</td>
<td>30'</td>
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<tr>
<td>Shagbark hickory (Carya ovata)</td>
<td>70-100'</td>
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<tr>
<td>Hackberry (Celtis occidentalis)</td>
<td>50-90'</td>
<td></td>
</tr>
<tr>
<td>Common persimmon (Diospyros virginiana)</td>
<td>20-70'</td>
<td></td>
</tr>
<tr>
<td>American beech (Fagus grandifolia)</td>
<td>60-80'</td>
<td></td>
</tr>
<tr>
<td>White ash (Fraxinus americana)</td>
<td>70-80'</td>
<td></td>
</tr>
<tr>
<td>Butternut (white walnut) (Juglans cinera)</td>
<td>40-70'</td>
<td></td>
</tr>
<tr>
<td>Black walnut (Juglans nigra)</td>
<td>70-90'</td>
<td></td>
</tr>
<tr>
<td>Eastern red cedar (Juniperus virginiana)</td>
<td>10-25'</td>
<td></td>
</tr>
<tr>
<td>Mt. Laurel (Kalmia latifolia)</td>
<td>20'</td>
<td></td>
</tr>
<tr>
<td>Red spruce (Picea rubens)</td>
<td>60-70'</td>
<td></td>
</tr>
<tr>
<td>White pine (Pinus strobus)</td>
<td>70-100'</td>
<td>great importance: especially favored by nuthatches, jays: also fur and game mammals, hoofed browsers; also used for nesting and roosting cover</td>
</tr>
<tr>
<td>Pin Oak (Quercus palustris)</td>
<td>70-90'</td>
<td>great importance: especially favored by gamebirds and songbirds; also used by many mammals and hoofed browsers</td>
</tr>
<tr>
<td>White oak (Quercus alba)</td>
<td>80-100'</td>
<td>same as above</td>
</tr>
<tr>
<td>Sycamore (Plantanus occidentalis)</td>
<td>60-100'</td>
<td></td>
</tr>
<tr>
<td>Black cherry (Prunus serotina)</td>
<td>60-80'</td>
<td>numerous songbirds and gamebirds, small and large mammals</td>
</tr>
</tbody>
</table>
Scarlet oak (*Quercus coccinea*) 60-80'  
Red oak (*Quercus rubra*) 60-90'  
Black willow (*Salix nigra*) 30-60'  
Eastern hemlock (*Tsuga canadensis*) 60-70'

Scarlet oak (*Quercus coccinea*) 60-80'  
Red oak (*Quercus rubra*) 60-90'  
Black willow (*Salix nigra*) 30-60'  
Eastern hemlock (*Tsuga canadensis*) 60-70' favored by pine siskin, chickadees, grouse, squirrels, used for winter cover by ruffed grouse, wild turkey, deer, used for nesting by various warblers, junco.

Blackhaw (*Viburnum prunifolium*) 20'

### Shrubs and Small Trees

<table>
<thead>
<tr>
<th>Height</th>
<th>Wildlife Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common serviceberry</strong> (<em>Amelanchier arborea</em>) 25'</td>
<td>Favored by songbirds and gamebirds; used for browse by large and small mammals</td>
</tr>
<tr>
<td><strong>American redbud</strong> (<em>Cercis canadensis</em>) 10-20'</td>
<td>songbirds</td>
</tr>
<tr>
<td><strong>Alternate-leaf dogwood</strong> (<em>Cornus alternifolia</em>) 25'</td>
<td></td>
</tr>
<tr>
<td><strong>Flowering dogwood</strong> (<em>Cornus florida</em>) 30'</td>
<td></td>
</tr>
<tr>
<td><strong>American hazelnut</strong> (<em>Corylus americana</em>) 3-6'</td>
<td></td>
</tr>
<tr>
<td><strong>Witch hazel</strong> (<em>Hamamelis virginiana</em>) 20-30'</td>
<td></td>
</tr>
<tr>
<td><strong>American holly</strong> (<em>Ilex opaca</em>) 40-70'</td>
<td></td>
</tr>
<tr>
<td><strong>American plum</strong> (<em>Prunus americana</em>) 6-12'</td>
<td></td>
</tr>
<tr>
<td><strong>Choke cherry</strong> (<em>Prunus virginiana</em>) 6-10'</td>
<td></td>
</tr>
<tr>
<td><strong>Rhododendron</strong> (<em>Rhododendron maximum</em>) 20'</td>
<td></td>
</tr>
<tr>
<td><strong>Blackhaw</strong> (<em>Viburnum prunifolium</em>) 20'</td>
<td></td>
</tr>
<tr>
<td><strong>Pipevine</strong> (<em>Aristolochia macrophylla</em>)</td>
<td>Black elderberry (<em>Sambucus canadensis</em>)</td>
</tr>
<tr>
<td><strong>Scarlet trumpet vine</strong> (<em>Campsis radicans</em>)</td>
<td>Red elderberry (<em>Sambucus pubens</em>)</td>
</tr>
<tr>
<td><strong>Climbing bittersweet</strong> (<em>Celastrus scandens</em>)</td>
<td>Greenbrier (<em>Smilax rotundifolia</em>)</td>
</tr>
<tr>
<td><strong>Virgin's Bower clematis</strong> (<em>Clematis virginiana</em>)</td>
<td>Bittersweet (<em>Solanum dulcamara</em>)</td>
</tr>
</tbody>
</table>

### Additional Shrubs and Vines:

<table>
<thead>
<tr>
<th>Height</th>
<th>Wildlife Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Virginia creeper</strong> (<em>Parthenocissus quinquefolia</em>)</td>
<td>Blueberry (<em>Vaccinium spp.</em>)</td>
</tr>
<tr>
<td><strong>Wild crabapple</strong> (<em>Pyrus coronaria</em>)</td>
<td>American grape (<em>Vitis spp.</em>)</td>
</tr>
<tr>
<td><strong>Wild black currant</strong> (<em>Ribes americanum</em>)</td>
<td>Summer grape (<em>Vitis aestivalis</em>)</td>
</tr>
</tbody>
</table>

**Butterfly Gardens**

Butterflies are attracted to flowers either as nectar sources or because they are host plants for egg laying and food. Certain wildflowers, cultivated flowers, trees, shrubs and vines are particularly attractive nectar sources and should make up most of the butterfly feature planting. A drinking source can be made by using a shallow pool of water with sloping sides or a series of partially submerged flat rocks for perches.
The School Wildlife Resource Center

Shrubs, Trees and Vines that Attract Butterflies

- Ohio or Fetid buckeye (*Aesculus glabas*)
- Paw Paw (*Asimina triloba*)
- New Jersey tea (*Ceanothus americanus*)
- Buttonbush (*Cephalanthus occidentalis*)
- Redbud (*Cercis canadensis*)
- Clematis (*Clematis* spp.)
- Hawthorn (*Crataegus* spp.)
- Huckleberry (*Gaylussacia* spp.)
- Privet (*Ligustrum* spp.)
- Spicebush (*Lindera benzoin*)
- Wild plum (*Prunus americana*)
- Yarrow (*Achillea millefolium*)
- Dogbane (*Apocynum* spp.)
- Butterfly weed (*Asclepias tuberosa*)
- Aster (*Aster* spp.)
- New Jersey tea (*Ceanothus americanus*)
- Wild Bergamot (*Monarda fistulosa*)
- Ironweed (*Veronica noveboracensis*)
- Goldenrod (*Solidago* spp.)
- Joe-pye weed (*Eupatorium maculatum*)
- Blazing star (*Liatris* spp.)
- Milkweeds (*Asclepias* spp.)
- Cardinal flower (*Lobelia cardinalis*)
- Marigolds (*Tagetes* spp.)
- Red clover (*Trifolium pratense*)
- Zinnia (*Zinnia elegans*)

**Forbs that Attract Butterflies**

- Yarrow (*Achillea millefolium*)
- Dogbane (*Apocynum* spp.)
- Butterfly weed (*Asclepias tuberosa*)
- Aster (*Aster* spp.)
- New Jersey tea (*Ceanothus americanus*)
- Wild Bergamot (*Monarda fistulosa*)
- Ironweed (*Veronica noveboracensis*)
- Goldenrod (*Solidago* spp.)

**Hummingbird Gardens**

Hummingbirds can be attracted to your area by planting red, tubular flowers. Over 160 native North American plants depend exclusively on hummingbirds for pollination. Here is a list of plants most attractive to hummingbirds.

**Forbs, Vines, Shrubs and Trees that Attract Hummingbirds**

- Buckeye (*Aesculus* spp.)
- Columbine (*Aquilegia canadensis*)
- Milkweed (*Asclepias* spp.)
- Cross Vine (*Bignonia capreolata*)
- Trumpet creeper (*Campsis radicans*)
- New Jersey tea (*Ceanothus americanus*)
- Redbud (*Cercis canadensis*)
- Thistle (*Cirsium* spp.)
- Clematis (*Clematis* spp.)
- Canada Lily (*Lilium canadense*)
- Yellow poplar (*Liriodendron tulipifera*)
- Cardinal flower (*Lobelia cardinalis*)
- Mallow (*Malva* spp.)
- Bee balm (*Monarda didyma*)
- Bergamot (*Monarda fistulosa*)
- Evening primrose (*Oenothera* spp.)
- Phlox (*Phlox* spp.)
- Morning glory (*Ipomoea coccinea*)
### The School Wildlife Resource Center

| Larkspur (Delphinium spp.) | Azalea (Rhododendron spp.) |
| Geraniums (Geranium spp.) | Black locust (Robinia pseudo-acacia) |
| Touch-Me-Not (Impatiens capensis) | Fire pink (Silene virginica) |
| Pale Touch-Me-Not (Impatiens pallida) | Coralberry (Symphoricarpos orbiculatus) |
| Blazing stars (Liatris spp.) | Old-Fashioned Weigela (Weigela florida) |

**Hummingbird Feeders** -- As a supplementary source of food, hummingbird feeders can be hung in your OWLS area. Select feeders that can be taken apart and cleaned thoroughly to prevent fungus molds and bacteria. Fill your feeders with a boiled solution of **4 parts water to 1 part white refined sugar** or a commercial "nectar" mix. Any sweeter and the birds may develop kidney or liver damage. To blend the solution sufficiently, bring water to a full boil, add sugar, stir to dissolve and remove promptly from heat. Do not overboil and allow the solution to cool, storing unused portions in the refrigerator. Do not use honey solutions in feeders as they may produce a fungal disease fatal to hummingbirds. Sugar water feeders should be cleaned every 3 to 5 days using hot water and a little vinegar, not soap.

Since the safety of "food colorings" is in question, particularly red dyes, do not use red food coloring in your solution. Avoid commercial solutions with red coloring also. It is not necessary to use red food coloring because most feeders already have red flowers or some form of red color decoration that will attract hummingbirds.

### Wetlands, Ponds and Pools

Watering areas will enhance wildlife visitation to any size site. Water sources may range from small submerged basins and large tanks associated with feeding stations, to a pond or wetland on a large site. In addition to providing drinking water, a large tank may attract dragonflies and amphibians. Aquatic sites may be used by waterfowl and shorebirds. Goose nesting structures and wood duck nesting boxes can be installed in many sites. However, be aware that geese become aggressive when the young hatch and the droppings may be a problem.

Activities for artificial ponds may include introductions of frogs, salamanders, insect larvae, plants or fish. Given the opportunity, students can be relied upon to collect many animals for the pond themselves. Be sure they are from local sources. Amphibian and insect metamorphosis may be observed from stocked tadpoles and dragonfly larvae. Energy flow and nutrient (fertilization) effects can be compared among ponds or tanks if several have been included.

### Aquatic & Marsh Plants

| Sedges (Carex spp.) | Smartweed (Polygonum pensylvanicum) |
| Barnyard grass (Echinochloa crusgalli) | Tearthumb (Polygonum sagittatum) |
| Spikerush (Eleocharis spp.) | Pondweed (Potamogeton spp.) |
| Rushes (Juncus or Scirpus spp.) | Duckweed (Lemna spp.) |
Bird and Squirrel Feeding Stations

Even school yards with severely limited space have areas where feeding stations can be integrated. Feeders are an excellent way to bring birds and squirrels into view and involve students with wildlife by visual contact. Feeding stations can be incorporated into new learning sites on the school grounds or into existing shrubs and trees near the building.

An effective way to maintain a feeder is to have it adopted by a classroom or a grade. Depending on the number of feeders, a classroom may maintain the entire station or a single feeder, or feeder filling may be rotated among grades or classrooms.

Nesting Boxes

Numerous bird house designs are available to accommodate many different species. Above and below ground nesting boxes can also be made for native mice.

When possible, students should be involved in building feeders and nest boxes. Schools and teachers may wish to have industrial arts classes make these materials in order to add to the educational value of the entire project. Bird house plans are available from the WPD.

Trails and Signs

Trails should be designed in large or dense sites. Trails through tall grass can be made by regularly mowing a single path. If interpretive signs are used for the site, students should be given a chance to research the signs. Signs would not have to be permanent, but could be an annual writing project for one or more grades. Either numbered posts with a brochure or laminated paper signs work fine.

Project ideas can range from older students writing a trail for younger students to younger students writing a trail for volunteer grandparents. Signs can simply be a title or a title with two sentences to two paragraphs, depending on the grade of the authors. Permanent signs are also an option, depending on the desires of the school and the expected use of the site by non-students. Any signs, interpretive stations, or printed materials should acknowledge the WDP as a funding source.

Time Capsules

A time capsule can add a dimension to an OWLS site. Considerations for inclusion include students' names who helped develop the site, newspaper articles covering wildlife and environmental issues at the time the OWLS was developed, and articles or materials found in the original area. Hand-recorded tapes of site sounds, photographs, and anything environmentally and student related are candidates. To improve the chances that a buried time capsule will not be forgotten or lost, it may be placed beneath the OWLS area designation sign or other fairly permanent marker. Time capsule recovery dates may be in periods of tens of years or every five years for grade schools. There could be as many as five buried capsules, which would allow for sixth grade classes to recover a capsule they buried as first graders. In the same hole, a new capsule of yet another first grade class is placed.
Natural Succession Areas

Both demonstration plots and large areas can be disturbed and left to be recolonized by surrounding species to show which kinds take hold first. This is a dynamic way to examine why windborne seed species are the first to colonize an area, to be followed by slower species relying on animal ingestion, body adhesion and gravity. The interplay of soil shading, changing Ph, modes of reproduction and minimum annual precipitation in determining the climax community of a disturbed area are also illustrated here. Since the process requires a period of years, teachers should periodically photograph the site from a standard position and record changes.

Student Involvement in Planting

In all cases, students and teachers should be involved in the planting process. Trees and shrubs lend themselves to this well. Without question, students from fifth grade on up can dig, plant and fill bare root stock and ball and burlap trees. First graders can do everything after the hole is dug for bare root stock, but need more supervision with ball and burlap and its deeper holes. In all cases, teams and the buddy system work best for trading off on digging, filling, tamping and carrying water.

Discussion beforehand should inform students 1) where trees grow and why; 2) how wildlife use trees for food and shelter and the importance of using native and non-invasive plants; 3) the species being planted; 4) how to plant these trees; 5) why it is important to tamp soil to remove air pockets and other reasons for procedures being used; and 6) what the trees will look like in the future.

Students can grow forbs in milk cartons or used styrofoam cups and transplant the species in grassy plots or special areas such as butterfly or hummingbird gardens. Other possibilities include hand scattering of forb seed in the grassy site or selecting an edge to be predominantly forbs. In such an edge, forb species can be easily found for identification. Such a concentration of flowers and seeds available for birds, small mammals and insects will attract attention as species come into bloom. Flower planting is an activity that can be done annually. As discussed previously for grass planting, students may be involved in ground preparation and seeding. Uneven seeding is acceptable and useful for showing succession and colonization. For comparison, a combination of drilling and hand seeding in different areas can be used. The choice will depend in part upon the speed at which the school wants the area covered. In rural areas, parents and board members may be interested in being involved with site preparation by supplying tilling equipment.

For more ideas on site development please see the West Virginia Wild Yards booklet available from the WDP. To obtain a free copy of the booklet please contact:

OWLS Grant Coordinator, West Virginia Division of Natural Resources
Wildlife Diversity Program, P.O. Box 67
Elkins, WV 26241
Or call (304)637-0245
THE SCHOOL WILDLIFE RESOURCE CENTER

A Wildlife Resource Center (WRC) should be established somewhere in the school. This should house curricular materials, field equipment, lab equipment, texts, references, etc. The following is a list of books and materials that might be included in your WRC. In order to acquire Project Wild (PW) and Project Learning Tree (PLT) curricular materials you must participate in their workshops. These, in fact, are outstanding experiences and we highly recommend that you participate in them. See page 46 of this manual for names of program contact persons. The Wildlife Resources Section has a collection of audiovisual materials that may be checked out. For a brochure write:

Wildlife Resources Section  
Capitol Complex, Building 3  
1900 Kanawha Blvd., East  
Charleston, WV 25305  
or call (304) 558-2771

Curricular Materials

Project WILD, see Appendix A, p. 52  
Project Learning Tree, see Appendix A, p. 52  
Project Underground, National Speleological Society  
Hands on Nature, Vermont Institute of Natural Science  
The Young Naturalist, Usborne Guide, Andrew W. Mitchell  
The Berenstein Bears Nature Guide, Stan and Jan Berenstein  
The Backyard Naturalist, National Wildlife Federation, Craig Tufts  
Naturescope, National Wildlife Federation  
Tips & Tricks in Outdoor Education, Malcom Swan  
Sharing Nature with Children, Joseph Cornell  
Eyewitness Books, Alfred A. Knopf  
Field Guides

Equipment

- Magnifying glasses
- Butterfly nets
- Sweep nets
- Binoculars
- Dip nets
- Soil analysis kits
- Microscopes
- Water analysis kits
- String & stakes for transects
- Cameras
Final Report Contents

(1) Report text:
   Items to include in report —
   Title of Project

   Details:
   ⇒ Name, address and phone number of school and project director

   Goals as stated in proposal
   ⇒ Did you meet your initial goals?

   Body of report (examples of information to include):
   ⇒ What did you do?
   ⇒ Who helped with the work?
   ⇒ Who donated supplies, equipment, etc.?
   ⇒ How did you interest students, teachers, parents?
   ⇒ Any problems with work days, vandalism, lack of interest?
   ⇒ What did you learn?
   ⇒ What would you have done differently?
   ⇒ Did you have to adjust your original plan much and why?
   ⇒ What are your future plans?
   ⇒ How will you keep the enthusiasm high?

   Any suggestions for improvement in the OWLS program as a whole:
   ⇒ Was there any confusion associated with the OWLS booklet?
   ⇒ Did you require more help than was provided by DNR staff?
   ⇒ Any suggestions to improve the OWLS program would be appreciated.

(2) Pictures and Publicity:
   A pictorial account, such as a scrapbook, is very helpful and important for the continuation of this program.
   Please provide pictures or slides of:
   - the various features of your site
   - any workdays you had
   - reproductions of media events such as newspaper clippings, spots on your local radio or TV station etc.
   - any activities conducted on site
   - a copy of any written material you generated such as booklets, trail guides, or pamphlets. Any published material must acknowledge the WDP as a sponsor.

(3) Financial information:
   1) Documentation of accounts payable in the form of receipts, invoices and checks;
   2) Financial statement listing actual expenditures with zero balance or unspent monies to be refunded to the WV DNR.
   These accounting practices are necessary because all projects funded by the Wildlife Diversity Program are subject to a state audit.

Questions with Final Report? Contact the OWLS Grant Coordinator
   office (304) 637-0245   fax (304) 637-0250
Resource personnel and printed materials are available to help in the planning and development of Outdoor Wildlife Learning Sites. Trained resource persons can be contacted at the WDP, your local Natural Resources Conservation Service office (formerly known as Soil Conservation Service), County Conservation District, Division of Forestry, Division of Environmental Protection, NRCS, US Forest Service, US Fish and Wildlife Service, US Geologic Survey, National Park Service, State Park Naturalists and/or County Cooperative Extension Office depending which agencies might be available in your area. Other places to find resource personnel are University faculty, local Garden Clubs, and Master Gardeners.

District biologists may also be available to help. Districts 1, 2 and 4 have Nongame District Biologists especially suited to assisting schools with their OWLS projects.

District 1-- Fairmont (304) 367-2720 District 4 -- Beckley (304) 256-6947
District 2 -- Romney (304) 822-3551 District 5 -- Pt. Pleasant (304) 675-0871
District 3 -- French Creek (304) 924-6211 District 6 -- Parkersburg (304) 420-4550

The WDP also produces a free quarterly full color magazine which is available online at [www.WVDNR.gov](http://www.WVDNR.gov) or by contacting the WV DNR at PO Box 67, Elkins WV, 26241 and requesting to be placed on the mailing list for *West Virginia Wildlife Magazine*. 
**Printed Materials & References**


*A free copy was sent to middle, junior, high schools and local libraries. If your school does not have a copy, contact the WDP.*

Audubon Field Guide Series.

*A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP.*


*A free copy was sent to middle, junior, high school and local libraries. If your school does not have a copy, contact the WDP.*


Gertz, L.N. 1993. Let Nature be the Teacher; Seasonal Natural History Activities for Parents and Other Educators to Share with Young Children. Habitat Institute for the Environment. Belmont, Mass.

Golden Field Guide Series.

_A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP._

Guidelines and features for outdoor classrooms. Indiana Department of Natural Resources, Division of Forestry, Indianapolis, IN (317) 232-4105 (about $2).


_A free copy was sent to middle, junior and high school libraries. If your school does not have a copy, contact the WDP._


Minnesota Department of Natural Resources, Nongame Wildlife Program, Section of Wildlife, St. Paul, MN 55155: (highly recommended publications)
- Landscaping for wildlife (about $10)
- Wild About Birds; the DNR Bird Feeding Guide (about $20)
- Woodworking for Wildlife (about $10)

Natural Resources Conservation Service/County Conservation District:
- Invite Birds to Your Home
- Ponds: Planning, Design, Construction

Peterson Field Guide Series.


So You Want to Start an Outdoor Classroom? The Oklahoma Department of Wildlife Conservation, Oklahoma City, OK (405) 521-4633 (about $2).


WV Wildlife Diversity Program, Elkins, WV:
- Attracting Cavity Nesting Birds to Your Backyard
- Bats of West Virginia
- Bluebird Box Construction and Placement
- Butterfly Gardening in West Virginia
- For the Birds ... Feeding Birds in Your Backyard
- Get Started Birdwatching
Resources & References

- Invasive Plants in West Virginia
- Mushrooms & Other Fungi of West Virginia
- Strictly for the Feathered
- WV Bird Checklist
- WV Butterfly Checklist
- WV Toads & Frogs
- WV Turtles & Lizards
- WV Mammal Checklist
- WV Neotropical Migratory Birds
- WV Reptile and Amphibian Checklist

West Virginia University Extension Wildlife Program, WVU, Morgantown, WV
(304) 293-3391:
- Aquatic and Wetland Plants of West Virginia
- Guide to Common Birds of West Virginia
- Guide to Winter Botany
- Introduction to Dragonflies and Damselflies of West Virginia
- Introduction to Ferns of West Virginia
- Owls
- West Virginia Hawks
- West Virginia Wildlife
- Winter Birds of West Virginia

Web Resources

Exotics-both have links to other good pages
www.nbii.gov/invasive/
http://invasives.fws.gov

Curricula, Ideas, and Programs- many have links so look around.
www.usgs.gov/education
www.kn.pacbell.com/cgi-bin/listApps.pl?science&Tutorial
www.nwf.org/kids
www.nwf.org/nwf/education
www.nwf.org/wildlifework
http://www.sciencenetlinks.com/matrix.cfm
www.suite101.com
www.globe.gov.fsl/html
www.kidsgardening.com
www.enature.com
http://hprtec.org
www.nbii.gov/education
www.birds.cornell.edu/programs/education/index.html
http://eelink.net/ee-linkintroduction.html
Ideas of where to find other funding

- [www.epa.gov/enviroed/grants.html](http://www.epa.gov/enviroed/grants.html)
- [http://eelink.net/grants-generalinformation.html](http://eelink.net/grants-generalinformation.html)
- [www.kidsgardening.com/grants.asp](http://www.kidsgardening.com/grants.asp)

Landscaping Resources on the web

- [www.dnr.state.oh.us/publications/wildflowers3.htm](http://www.dnr.state.oh.us/publications/wildflowers3.htm)
- [http://plants.usda.gov/](http://plants.usda.gov/)
- [www.kidsgardening.com/](http://www.kidsgardening.com/)
- [www.for-wild.org/](http://www.for-wild.org/)
- [http://aggie-horticulture.tamu.edu/kindergarden/Child/Cgintro.htm](http://aggie-horticulture.tamu.edu/kindergarden/Child/Cgintro.htm)
- [www.wildflower.org](http://www.wildflower.org)

**Videos**

*Planning Outdoor Classrooms, Trails and Recreation Areas* -- Computer simulated plans for two outdoor classrooms, a fitness/nature trail, and a landscape plan for a community park pond. A good resource in helping schools plan and develop Outdoor Wildlife Learning Sites (OWLS). Produced by the USDA Soil Conservation Service, Salina, KS. 25:30 minutes long.

To check out a copy of this video, write:
Reference Center
Kansas Department of Wildlife and Parks
512 SE 25th Ave.
Pratt, KS  67124
(316) 672-5911 ext. 209

*School Yard Habitat Video* -- Another video that shows school sites already in existence is a video available from the WDP. The video is 16:00 minutes long. To check out a copy of the video, write:

School Yard Habitat Video
WDP WVDNR
P.O. Box 67
Elkins, WV  26241
(304) 637-0245
APPENDIX A

LEARNING ACTIVITIES AND READINGS RELATED TO OWLS

In-service training is the most effective way to help teachers utilize Outdoor Wildlife Learning Sites. In-services can be conducted by Project WILD (PW) facilitators or Project Learning Tree (PLT) facilitators and through workshops offered by colleges and universities throughout the state. This training provides increased communication and cooperation among these various groups, which have common goals.

The following are activities (A) and enrichment readings (R) that elementary and secondary teachers can use to involve students in their school OWLS. These activities and readings come from Project WILD (PW) and Project Learning Tree (PLT).

For more information on PW training contact: Project WILD, Wildlife Resources Section, Building 3, Capitol Complex, 1900 Kanawha Blvd., East, Charleston, WV 25305; phone 304/558-2771.

For more information on PLT training, contact: Leslie Fitzwater, or WV Forestry Assoc., P.O. Box 488, Ravenswood, WV 26164; phone (304) 558-2788.

<table>
<thead>
<tr>
<th>Elementary</th>
<th>PW/A</th>
<th>PW - Project Wild</th>
<th>A - Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW/A</td>
<td>The Hunter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PW/A</td>
<td>Wildlife in National Symbols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PW/A</td>
<td>What's That, Habitat?</td>
<td>PW</td>
<td>A</td>
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<tr>
<td>PW/A</td>
<td>Beautiful Basics</td>
<td>PLT</td>
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<tr>
<td>PW/A</td>
<td>Animal Charades</td>
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<td>PW/A</td>
<td>Adaptation Artistry</td>
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<tr>
<td>PW/A</td>
<td>Shrinking Habitat</td>
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<tr>
<td>PW/A</td>
<td>Improving Wildlife Habitat in the Community</td>
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Woodland Activities

<table>
<thead>
<tr>
<th>PW/A</th>
<th>My Kingdom for a Shelter</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW/A</td>
<td>Thicket Game</td>
</tr>
<tr>
<td>PW/A</td>
<td>Forest in a Jar</td>
</tr>
<tr>
<td>PW/A</td>
<td>Everybody Needs a Home</td>
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<tr>
<td>PW/A</td>
<td>Some Forest Investigations</td>
</tr>
<tr>
<td>PW/A</td>
<td>Adopt a Tree</td>
</tr>
<tr>
<td>PLT/A</td>
<td>Tree Shapes, Natural and Unnatural</td>
</tr>
<tr>
<td>PLT/A</td>
<td>Did You See That Dogwood Bark?</td>
</tr>
<tr>
<td>PLT/A</td>
<td>Trees as Habitats</td>
</tr>
<tr>
<td>PLT/A</td>
<td>Forest Consequences</td>
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Appendix B - Activities

woodland activities continued

<table>
<thead>
<tr>
<th>PLT/A</th>
<th>Fire</th>
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<tbody>
<tr>
<td>PLT/A</td>
<td>Woodwork</td>
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<tr>
<td>PLT/A</td>
<td>Shades of Green</td>
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<td>PLT/A</td>
<td>Signs of Fall</td>
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<td>PLT/A</td>
<td>Rainfall &amp; the Forest</td>
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Soils Activities

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<thead>
<tr>
<th>PW/A</th>
<th>Ecoenrichers</th>
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<tr>
<td>PW/A</td>
<td>What’s for Dinner?</td>
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<td>PLT/A</td>
<td>Soil Investigations</td>
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<td>PLT/A</td>
<td>What’s in Soil?</td>
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<td>PLT/A</td>
<td>The Touchy Feely Box</td>
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Wetland, Pond and Pool Activities

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<tr>
<th>PW/A</th>
<th>Water’s Going On?</th>
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<tr>
<td>PW/A</td>
<td>Pond Succession</td>
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<tr>
<td>PLT/A</td>
<td>A Field, A Forest and A Stream</td>
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<tr>
<td>PLT/A</td>
<td>Sand, Silt and Clay</td>
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<td>PLT/A</td>
<td>Water You Know</td>
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Nesting Structure Activities

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<th>PW/A</th>
<th>My Kingdom For a Shelter</th>
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<tbody>
<tr>
<td>PW/A</td>
<td>What’s That Habitat?</td>
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<tr>
<td>PW/A</td>
<td>Beautiful Basics</td>
</tr>
<tr>
<td>PW/A</td>
<td>Everybody Needs a Home</td>
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Animal Track Activities

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<thead>
<tr>
<th>PW/A</th>
<th>Wildlife is Everywhere</th>
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<tr>
<td>PW/A</td>
<td>Habittracks</td>
</tr>
<tr>
<td>PW/A</td>
<td>Urban Nature Search</td>
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<tr>
<td>PW/A</td>
<td>Microtek Scavenger Hunt</td>
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<td>PLT/A</td>
<td>Perception</td>
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<td>PLT/A</td>
<td>Schoolyard Safari</td>
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<tr>
<td>PLT/A</td>
<td>Web of Life</td>
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<td>PLT/A</td>
<td>Schoolyard Diversity</td>
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### Secondary

#### General Activities and Readings

<table>
<thead>
<tr>
<th>PW/A</th>
<th>Improving Wildlife Habitat in the Community</th>
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<tbody>
<tr>
<td>PW/A</td>
<td>Planning for People &amp; Wildlife</td>
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<tr>
<td>PW/A</td>
<td>What Did Your Lunch Cost Wildlife?</td>
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<tr>
<td>PW/A</td>
<td>History of Wildlife Management</td>
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<tr>
<td>PW/A</td>
<td>The Hunter</td>
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<td>PW/A</td>
<td>Wildlife in National Symbols</td>
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<tr>
<td>PW/A</td>
<td>Animal Charades</td>
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<td>PW/A</td>
<td>Adaptation Artistry</td>
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<td>PW/A</td>
<td>Deer Crossing</td>
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<td>PW/A</td>
<td>Shrinking Habitat</td>
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<td>PW/A</td>
<td>What's That Habitat?</td>
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<td>PLT/A</td>
<td>Wildlife Habitat</td>
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<tr>
<td>PLT/A</td>
<td>Snow Use</td>
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<td>PLT/A</td>
<td>The Value of Wildlife</td>
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<td>PLT/A</td>
<td>Indian Summer, Winter, Spring and Fall</td>
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<tr>
<td>PLT/A</td>
<td>Native American Web of Life</td>
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<td>PLT/A</td>
<td>Pioneers in the Wilderness</td>
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<td>PLT/A</td>
<td>Build an Ecosystem</td>
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#### Meadow Activities and Readings

<table>
<thead>
<tr>
<th>PW/A</th>
<th>Wild Edible Plants</th>
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<tbody>
<tr>
<td>PW/A</td>
<td>Fire Ecologies</td>
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<tr>
<td>PW/A</td>
<td>Spider Web Geometry</td>
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<tr>
<td>PW/A</td>
<td>Grasshopper Gravity</td>
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<td>PW/A</td>
<td>Succession Transect</td>
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<td>PLT/A</td>
<td>Succession on the School Ground</td>
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#### Woodland Activities and Readings

<table>
<thead>
<tr>
<th>PW/A</th>
<th>My Kingdom for a Shelter</th>
</tr>
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<tbody>
<tr>
<td>PW/A</td>
<td>Rainfall &amp; the Forest</td>
</tr>
<tr>
<td>PW/A</td>
<td>Succession Transect</td>
</tr>
<tr>
<td>PLT/A</td>
<td>A Cassette Tour of Neighborhood Trees</td>
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<tr>
<td>PLT/A</td>
<td>Design with Nature</td>
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<tr>
<td>PLT/A</td>
<td>Green Mufflers</td>
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<tr>
<td>PLT/A</td>
<td>The Value of 100 Acres of Forestland</td>
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<tr>
<td>PLT/A</td>
<td>Careers in Forestry</td>
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<td>PLT/A</td>
<td>The Influence of the Forest on your Regions History</td>
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<tr>
<td>PLT/A</td>
<td>Why do Trees Grow There?</td>
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<td>PLT/A</td>
<td>Native Americans &amp; the Forest</td>
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woodland activities and readings continued

<table>
<thead>
<tr>
<th>PLT/A</th>
<th>Climax Forest</th>
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<tbody>
<tr>
<td>PLT/A</td>
<td>Christmas &amp; the Environment</td>
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<tr>
<td>PLT/A</td>
<td>Forest Products All Around Us</td>
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<tr>
<td>PLT/A</td>
<td>Nature Air Conditioners</td>
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<tr>
<td>PLT/A</td>
<td>The Changing Forest</td>
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</tbody>
</table>

Soil Activities
- PW/A  I'm Thirsty
- PW/A  What's for Dinner?
- PLT/A  Where are the Cedars of Lebanon?
- PLT/A  How You Bury a Dirt Pile

Wetland, Pond and Pool Activities and Readings
- PW/A  I'm Thirsty
- PW/A  Water's Going On
- PW/A  Riparian Zone
- PW/A  Pond Succession
- PLT/A  Water We Doing?
- PLT/A  We Can Work It Out
- PLT/A  How Clean Is Clean?
- PLT/A  Food Mobile

Nesting Structures Activities and Readings
- PW/A  My Kingdom for a Shelter
- PW/A  Bird Song Survey
- PLT/A  Building for the Birds
- PLT/A  Artisans in Wood
- PLT/A  What Shall I Use To Build It?
- PLT/A  What Wood Waste?

Animal Tracks
- PW/A  Tracks!
- PW/A  Habitrekkking
- PW/A  Urban Nature Search
APPENDIX B

COOPERATIVE SCIENCE PROJECTS FOR STUDENTS: AMPHIBIANS

What: Help amphibians in West Virginia by getting your students involved in research. There are two projects from which to choose: One on common terrestrial and creek salamanders and the other on frogs and toads. Your chosen study will take at least a half-day in the field to collect the data and another half-day in the classroom to analyze the data and discuss the results. Teachers are then required to return and release all amphibians at their original collection site. The findings are sent to Dr. Tom Pauley, West Virginia’s leading herpetologist and coauthor of Amphibians and Reptiles in West Virginia.

Why: To find out distribution status of West Virginia salamanders, frogs or toads, and to provide an outstanding, fun and exciting project for students.

When: Projects are to be conducted in the spring months (March, April and May).

Who: The project is designed for students from grades 1-12.

How: Teachers will be provided with a lesson plan that includes background information, step-by-step procedures, questions for students, a checklist of amphibians, a key to identify the animals, and a field worksheet. Equipment will include a thermometer, pH paper, sling psychrometer and compass for the salamander study; and a dip net, pH paper and thermometer for the study on frogs and toads.

Application Procedure: Contact the WDP to request an application form. Submit your application which includes the number of students involved, why you would like to be involved in the study, teacher qualifications, and a signature from the principal acknowledging support for the project. Deadline for applications is February 1.
APPENDIX C

NEOTROPICAL MIGRATORY BIRD RESOURCE TRUNK

The Neotropical Migratory Bird Resource Trunk is an interdisciplinary, literature-based unit that provides a hands-on experience for grades K-5 that will foster awareness, tolerance, and appreciation of neotropical migratory songbirds. The resource trunk contains a Teacher’s Guide, Books, Posters, Felt Storyboard, Badges, Student Research Kits, Cassette Tapes, Puppets, and much more! The Resource Trunk is available for loan to educators statewide. A $25.00 deposit and application are required to reserve the trunk and return postage from your location is paid by the borrower (Approximately $8.00-$10.00). Funding for this program is provided by the West Virginia Division of Natural Resources’ Wildlife Diversity Program.

For more information contact:
West Virginia Division of Natural Resources
Wildlife Diversity Program
(304) 637-0245

APPENDIX D

BAT RESOURCE TRUNK

The Bat Resource Trunk is an interdisciplinary, literature-based unit which provides a holistic, hands-on experience that will foster awareness, tolerance, and appreciation for misunderstood bats. The materials are appropriate for grades K-6. The Resource Trunk includes classroom sets (25) of 3 books, teacher’s manuals, rubber stamps, videos, audio tapes, reproducibles, posters, transparencies, games, read aloud books, puppets, and much more. A manual describing the materials found in the trunk is sent prior to receiving the resource trunk, along with free materials. The trunk also contains materials and ideas for a school-wide unit. The resource trunk is available for loan to educators statewide. A $25.00 deposit and application is required to reserve the trunk and return postage from your location must be paid for by the borrower (Approximately $10-$15). Funding for this program is provided by the West Virginia Division of Natural Resources’ Wildlife Diversity Program.

For more information contact:
West Virginia Division of Natural Resources
Wildlife Diversity Program
(304) 637-0245