

CREATING AN OUTDOOR CLASSROOM



A comprehensive guide to establishing and maintaining an outdoor classroom for educational and recreational purposes

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plants to include and their benefits, maintenance tips, and possible extension projects for the university.

West Chester University is dedicated to environmental stewardship and a sustainable future, and enhancing the campus with more green spaces is just one of the ways to attain that goal.

Why an Outdoor Classroom?

In every walk with nature one receives far more than he seeks – John Muir

What better way to learn biodiversity, to learn nature, than through actually experiencing it? Textbooks and classrooms are of course excellent supplements to learning about the natural world, but direct experience grants a more thorough and satisfying understanding of nature.

With the abundance of technology, it is easy to imagine that computer programs could adequately simulate a habitat, but why not go outside and use the real deal?

In “College Campuses: Patches of Insect Diversity, Opportunities for Entomological Discovery, and Means for Enhancing Ecological Literacy”, author Alfred G. Wheeler illustrates the vision of utilizing natural areas on university campuses for environmental studies as outdoor classrooms and treating them as “patches of biodiversity”, opening the door for conservation and stewardship. Biology Departments, such as Binghamton University’s,



list natural areas as facilities (24).

Such natural areas and preserves offer potential for learning opportunities because of their incredible capacity to harbor insect, plant, and animal species. In an outdoor classroom, for

example, insects can be observed to learn about species richness and interactions (25), and larger preserves like the Gordon Natural Area can be used to study invasive species and has been used to study deer populations, among many other things. In addition, “Natural and manmade elements convey a sense of place” and community (Wheeler 22). Features such as trees, buildings, open space, and natural areas and preserves add to a university’s aesthetic value and feeling of community.

In essence, outdoor classrooms and spaces all contribute to ecological literacy, understanding and appreciating the natural world (19). “Ecological literacy can be regarded as basic to ‘living fully and wisely’ (Uhl and Anderson 2001) as is the ability to read and write” (Wheeler 27). Experiencing nature firsthand is necessary to achieve ecologically literacy and “seems critical to the development of well-rounded or true intelligence” (Wheeler 29). What easier way to experience nature and gain ecological literacy on campus than through an outdoor classroom or natural preserve?

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Goals of an Outdoor Classroom

1. A take home educational opportunity for students, parents, faculty, staff and visitors
2. A place to relax & enjoy on campus
3. For classroom use-
 - a. one class can use the space in coordination with the Cornell Bird Feeder Watch Survey
 - b. potential for monitoring birds and insects by other classes
4. Reduce the amount of lawn to be treated by grounds, effectively reducing manpower, equipment and pesticides



Planning and Approving the Space

Whether a few square feet or an entire acre, any outdoor space can improve the campus!

Here is a step-by step on approving and planning the space

- A new outdoor space on campus can be established anywhere on campus with approval. The first contact should be the Associate Registrar for Course and Event Management (currently Barbara Winicur). This is the initial approval; suggestions or adjustments to the space are usually made here, and then the request is sent forward.
- The Grounds department must approve the request, after which the President's Council will review the request. The council meets weekly, and usually if the request is reasonable (i.e., hundreds of acres are not required) the Council will be more than happy to proceed.
- The space will be added to the University database of outdoor spaces, called R25, by the Associate Registrar for Course and Event Management or by the Space Management Office. This database includes athletic fields, the Gordon Natural Area, and the academic quad. Some distinguishable features should be added to describe the area. Once in the database, adding the ability to book the outdoor space for specific events is optional. A number will be assigned to the space (for example, the Gordon Natural Area is 325).
- Once the area has been officially dedicated, maintenance will move from grounds to whoever dedicated or has adopted the area.
- **Funding:** Watch for scholarships that may be available to students. West Chester University also holds the Student Research and Creative Activities awards each year; winners earn a monetary prize. With the help of faculty, grants can be written on an as needed basis. Local organizations can also be contacted as sponsors.

What is needed for a proposal? Just an idea! In order for a student to propose a



new outdoor space, however, he or she must have departmental advocacy and a faculty member to work with. In other words, if a student wished to create a garden outside of the Schmucker Science Center, the Biology Department or a faculty member of that department would most

likely team with the student. Collaborating with other students or faculty is a great way to have some help with planting and constructing the space.

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How to Choose Plant Species and Where to Get Them

- ❖ Five local native plant nurseries and a brief selection of plants to choose from based on a few possible environmental conditions

Once funds are in place, there are plenty of native plant nurseries in the area from which to purchase plants! Two have already worked with WCU; Yellow Springs Farm Native Plant Nursery, located in Chester Springs, Pennsylvania, provided us with the plants for the first outdoor classroom. Redbud Native Plant Nursery worked with a WCU student on her Capstone graduation project. Nurseries and locations include:

Yellow Springs Farm Native Plant Nursery (Chester Springs, PA)

Redbud Native Plant Nursery (Glen Mills, PA)

Octoraro Native Plant Nursery (Kirkwood, PA)

Natural Landscapes Nursery (West Grove, PA)

North Creek Nurseries Inc. (Landenberg, PA)

Plants to Use

Before deciding which plants to use, a basic site assessment should be done to analyze how much sunlight the site receives, how moist the soil is, and how much seasonal rainfall the site receives. Also, consider what type of habitat you want to create. A grassland or meadow would reduce or eliminate lawn maintenance and attract numerous butterflies and other insects. A dense, shrubby area with lots of groundcover and perhaps some trees would provide food and shelter for birds and small mammals.

The list of plants native to the eastern United States is expansive, so here is a brief selection to get ideas going. Many of these have been planted in the Outdoor Classroom outside of Merion Hall. Flowers are grouped by genus and were referenced from William Cullina's *Growing and Propagating Wildflowers in the United States and Canada*. Trees, shrubs, and grasses are grouped by species and were referenced from Pennsylvania's Department of Conservation and Natural Resources website.

Native Flowers

Habitat

| Plant Species | Sunny, Dry | Sunny, Wet | Shade Tolerant | Woodland Wildflowers | Meadow & Prairie | Groundcover |
|---|------------|------------|----------------|----------------------|------------------|-------------|
| <i>Agastache</i> – Hyssop | | | | | X | |
| <i>Allium</i> – Nodding Onion | X | X | | | | |
| <i>Amsonia tomentosa</i> – Woolly Bluestar | | | | | | X |
| <i>Arisaema triphyllum</i> – Jack in the Pulpit | | | | X | | |
| <i>Asclepias</i> – Milkweed | X | X | | | X | |
| <i>Aster laevis</i> – Smooth Aster | | | | | X | X |
| <i>Baptisia australis</i> – False Blue Indigo | | | | | X | |

| | | | | | | |
|---|---|---|---|---|---|---|
| <i>Callirhoe</i> – Poppy-Mallow | | | | X | | |
| <i>Caltha palustris</i> – Marsh Marigold | | | X | | | |
| <i>Clematis</i> | | | | | | X |
| <i>Coreopsis</i> - Tickseed | | | | | | X |
| <i>Echinacea</i> <i>purpurea</i> – Purple Coneflower | X | | | | | |
| <i>Erythronium</i> – Trout Lilly | | | | X | | |
| <i>Eupatorium</i> – Joe Pye Weed | | X | X | | X | |
| <i>Helianthus</i> - Sunflower | | | | | X | |
| <i>Iris versicolor</i> – Northern Blue Flag | | X | | | | |
| <i>Pachysandra</i> | | | | X | | X |
| <i>Phlox</i> | | | | | | X |
| <i>Podophyllum</i> <i>peltatum</i> – Mayapple | | | | X | | |
| <i>Polygonatum</i> – Solomon’s Seal | | | | X | | |
| <i>Pycnanthemum</i> – Mountain Mint | X | | | | X | |
| <i>Rudbeckia</i> – Coneflower, Black-Eyed- Susan | X | | | | X | |
| <i>Solidago</i> – Goldenrod | | | | | | |
| <i>Tiarella</i> – Foamflower | | | | | | |
| <i>Vernonia</i> – Ironweed | | | | | X | |
| <i>Uvularia</i> - Bellwort | | | | | | X |
| <i>Zizia aurea</i> – Golden Alexanders | | | | | X | |

Native Flowers Continued

Wildlife Value

| Plant Species | Food – Butterflies & Insects | Food – Birds & Mammals | Distasteful to Deer | Especially Bold Foliage |
|---|------------------------------|------------------------|---------------------|-------------------------|
| <i>Agastache</i> – Hyssop | X | | | |
| <i>Allium</i> – Nodding Onion | X | | X | X |
| <i>Amsonia tomentosa</i> – Woolly Bluestar | X | | X | |
| <i>Arisaema triphyllum</i> – Jack in the Pulpit | | | X | X |
| <i>Asclepias</i> – Milkweed | X | | X | X |
| <i>Aster laevis</i> – Smooth Aster | | | X | |
| <i>Baptisia australis</i> – False Blue Indigo | X | | X | |
| <i>Callirhoe</i> – Poppy-Mallow | X | | | |
| <i>Caltha palustris</i> – Marsh Marigold | | | | X |
| <i>Echinacea purpurea</i> – Purple Coneflower | X | X | X | X |
| <i>Erythronium</i> – Trout Lilly | | | | |
| <i>Eupatorium</i> – Joe Pye Weed | X | X | X | |
| <i>Guara</i> | X | | | |
| <i>Helianthus</i> – Sunflower | X | X | | X |
| <i>Iris versicolor</i> – Northern Blue Flag | | | | X |
| <i>Liatris</i> – Blazing Star | | X | | |
| <i>Lobelia</i> - Cardinal flower | X | | X | |
| <i>Mondarda</i> – Bee Balm | | | | X |
| <i>Pachysandra</i> | | | | X |
| <i>Phlox</i> | X | | | |
| <i>Podophyllum peltatum</i> – Mayapple | | X | X | |
| <i>Pycnanthemum</i> – Mountain Mint | X | | | |

| | | | | |
|---|---|---|---|---|
| <i>Rudbeckia</i> – Coneflower, Black-Eyed-Susan | X | X | | X |
| <i>Sedum</i> – Stone Crop | X | | | |
| <i>Solidago</i> – Goldenrod | X | X | X | |
| <i>Tiarella</i> – Foamflower | X | | | |
| <i>Vernonia</i> – Ironweed | X | | | |

Native Tree Species

| <i>Scientific Name</i> | <i>Common Name</i> |
|--------------------------------|--------------------|
| <i>Acer rubrum</i> | Red Maple |
| <i>Cornus florida</i> | Flowering Dogwood |
| <i>Liriodendron tulipifera</i> | Tulip Poplar |
| <i>Quercus alba</i> | White Oak |
| <i>Sassafras albidum</i> | Sassafras |

Native Shrub Species

| <i>Scientific Name</i> | <i>Common Name</i> |
|-----------------------------|--------------------|
| <i>Amelanchier arborea</i> | Serviceberry |
| <i>Aronia melanocarpa</i> | Black Chokeberry |
| <i>Ilex verticillata</i> | Winterberry |
| <i>Lindera benzoin</i> | Spicebush |
| <i>Vaccinium corymbosum</i> | Highbush Blueberry |

*These particular tree and shrub species are recognized to have very high to intermediate wildlife value by the Pennsylvania Department of Conservation and Natural Resources

Native Grass Species

| <i>Scientific Name</i> | <i>Common Name</i> |
|--------------------------------|--------------------|
| <i>Andropogon gerardii</i> | Big Bluestem |
| <i>Eragrostis spectabilis</i> | Purple Lovegrass |
| <i>Schizachyrium scoparium</i> | Little Bluestem |
| <i>Sorghastrum nutans</i> | Indiangrass |
| <i>Sporobolus heterolepis</i> | Prairie Dropseed |

What makes an outdoor space certifiably sustainable? Gardening for Wildlife – National Wildlife Federation Certified Natural Habitats



The first WCU Outdoor Classroom has been certified as a Natural Habitat site by the NWF. Having the habitat certified indicates environmental sustainability and that it benefits the ecosystem. The NWF has a few simple elements required for certification, which are easy to incorporate when planning your space.

Remove Invasive, Restore Native – Integrating native plants is the most important aspect of establishing any outdoor space. They are better for the environment and require very little care, requiring little to no fertilizer and effectively balancing soil nutrients. Sometimes native plants are stereotyped as boring and

common, but many actually have quite colorful and diverse foliage.

Food – To feed wildlife, the NWF’s website offers a Top Ten List of Native Plants for any state. A list of plants from the Pennsylvania Department of Conservation considered valuable to wildlife appears later in the handbook. Native plants are more effective and appealing than bird feeders as a food source; they offer a constant source of food and can be more attractive than round, metal feeders.

Water – Bird baths or small ponds are an excellent source of water. Bird bath-water should be changed at least every other day to maintain cleanliness.

Shelter – Wildlife greatly appreciate brush piles for nests and birdhouses. Shrubs and trees offer safe places to hide, in addition to tall grasses and flowers like Indiangrass or clusters of Joe Pye Weed and Mountain Mint.

Sustainable Gardening – Conservation is key. Mulch, for example, prevents evaporation by allowing soil to retain moisture, allowing more water to be reserved for plants; consider it the “icing on the cake”. Be careful to use mulch from a sustainable company. In addition, water in the evenings or early mornings, if necessary.

The certification application is available online at <http://www.nwf.org/gardenforwildlife/certify.cfm>. Remember, you can certify habitats at your home or workplace, too!

Maintenance – Sustainable Gardening Practices



Mulching helps reduce the need to water plants because it helps to prevent excessive evaporation. In addition, decomposing mulch provides plants with nutrients, reducing the need to fertilize. Try to find mulch that uses sustainable forestry practices.

Conserving Water – Avoid sprinklers and use a garden hose instead. Water is better directed to the plant and overwatering can be avoided. Including plants that are

drought-tolerant or use little water is an easy way to conserve.

Use Friendly Fertilizer – Most fertilizers on the market contain ammonia, which is toxic to soil in the long run, making it more acidic. Nutrients are depleted and healthy soil bacteria are killed. Organic and natural fertilizers which do not contain ammonia are available at a variety of locations, from native plant nurseries to Lowe's. Compost is also an excellent fertilizer.

Weeds – These can be sprayed with white vinegar on a sunny days to burn them; the method is effective on controlling roots as well. A layer of leaf compost or mulch also prevents weed growth. (Catherine Renzi, Yellow Springs Farm Native Plant Nursery)

Care is otherwise simple. If coneflowers are planted, the dead growth should be trimmed back in late October. General weeding and watering will help keep the space healthy. Non-native grass (lawn) between plants can be mowed every week or two beginning in April and ending in late October.



What others Schools Have Done

“Americans must address the growing need for bonds between nature and children to improve the health and well-being of both.” – Richard Louv, author of *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*

The Flatirons Outdoor Classroom ~ A K-12 integrated outdoor space, the Flatirons Elementary Outdoor Classroom project is aimed at combining elements of science, art, social studies, and the humanities in an outdoor environment. The space includes a 135 foot length of river, a mural representing Colorado’s geographical history, a Zen garden and performance art area, and exposed strata. The Boulder Valley School District has teamed up with the Denver Museum of Nature and Science and the University of Colorado. http://sciencepolicy.colorado.edu/about_us/archives/projects/flatirons/

Humboldt State University Outdoor Classroom ~ This University in northern California makes use of its nearby Redwood forest. The linked document is the proposal for the classroom, and includes a list of classes that could benefit from an outdoor space, ideas for site evaluation, and more. Beneficial for the design of a larger outdoor space compared to WCU’s Outdoor Classroom outside of Merion Hall. <http://www.humboldt.edu/~mastplan/pdf/OutdoorClassroom.pdf>

Swarthmore’s Crum Woods ~ The 220 acres of forest, most of which lies along Pennsylvania’s Swarthmore College campus includes walking paths and opportunities for recreation and research. Specifically Crum Woods has been used for research in deer overpopulation, much like West Chester University’s Gordon Natural Area. Similar goals include ways to manage the population and restore the ecosystem. Thirty-five courses in 12 different departments utilize the forest.



<http://www.swarthmore.edu/crumwoods.xml>

Future Ideas for West Chester University

As of January 2010, an outdoor garden area has been designated just to the west of the Outdoor Classroom outside of Merion Hall. Students from the Honors course “Technology and the Environment” will design and install raised beds. A composter is already in place. Some additional features to the campus and Outdoor Classroom for future consideration include:

- ❖ Rain barrel – to catch excess rainwater runoff to be used to water gardens, for example
- ❖ Green Roof and Green Walls – to add greenery while reducing our ecological footprint. An area of green roof or green wall can make up the area used for a patch of sidewalk for example. They also help absorb rainfall
- ❖ Outdoor art – Nature has always been an inspiration to artists. Yet another way to beautify that concrete wall behind the garden!
- ❖ Additional areas of warm season grass species – to reduce upkeep of grassy areas and lawn. No trimming and little water needed!

