

**DAEMEN COLLEGE THINK TANK**  
**FINAL REPORT**  
**2006 Granting Period**

**Project Ecotrail**

**Faculty Participants**

Associate Professor Brenda Young , Chair of Natural Sciences

Associate Professor Kevin Kegler, Department of Visual and Performing Arts

**Student Participants**

**ENS 201/ Environmental Science Spring 2006**

Stephanie Domroes

Lauren Faulks

Nickolas Fotia

Dawn Gibson

Kariel Kohane

Wendy Smith

Lauren Stack

Emily Strong

Kristen Szramkowski

Alicia Tucker

**Project Description**

During the Spring 2006 semester, professors Brenda Young and Kevin Kegler worked with ten students on initial designs for an interactive environmental trail as a project associated with their team-taught ENS 201/ Environmental Science course. This “Ecotrail”, proposed for the Daemen College Campus, will promote environmental literacy, investigation, and stewardship. The trail will be utilized by students and teachers on campus, as well as visitors from the larger regional community as well.

The Ecotrail is designed to pass through the natural and built environments of the campus and will provide students, faculty, and visitors with both an aesthetic and scientific connection with the natural world. While some individuals may be aware of the natural resources they gain from their environment, they may be less conscious of their spiritual and aesthetic relationships with their environment. Individuals who have limited exposure to green space and healthy outdoor environments do not form these connections with their outside world and fail to see how their activities impact these environments. Experiential learning through outdoor exercises reinforces environmental awareness more effectively than classroom training. It is our goal to expose individuals from our campus and targeted underserved urban communities to the outdoor world and to teach them to observe at multiple levels so that they will become effective environmental stewards.

Through this team-taught course in environmental science, we worked with students from a range of majors on the initial designs for the campus Ecotrail. Students were taught background material in both environmental science and design in order to complete this project. Both professors presented the unique perspectives of their disciplines in guiding the students through this design exercise. We realized that this course offered a unique way to engage non-science students in an appreciation of the environment. The students presented their designs at the 2006 Academic Festival for viewing by the college community.

**Student Activities**

Students were divided into three groups. Each group was assigned one of three areas of the Daemen campus that is considered an appropriate site to include the Ecotrail (see addendum A). The groups were chosen to combine students from various backgrounds, interests, and majors. All students had at least one student who was an art or design major.

Students in each group took on specific tasks in researching existing nature trails and their design.. The class had two field trips to local trails with different foci. The Burchfield Nature Center in West Seneca focuses on how nature inspires the human creative spirit. There is a balance of science and art in the signage and trail layout at this nature center that was founded in dedication to the artist Charles Burchfield. The trails at the Reinstein Woods are dedicated to observing the local flora and fauna in an informal setting. Both trails have mixed audiences including school groups, families, and individuals wishing to be in a natural surrounding. At Reinstein Woods, our tour was led by the naturalist who developed the trail and signage; she specifically addressed the issues related to engaging a varied audience through signage and trail design.

As a result of their research, each student group identified pathways, signage format and stations for their portion of the campus. Each group was assessed in concept development and implementation of their group designs. Their individual contributions to their groups were also assessed. Equal value was given to each of the five areas that we evaluated. Those areas included the design process/creativity, scientific content, craftsmanship in presentation, thoroughness of the entire plan, and clarity of visual and written communication.

## **Students**

Students enrolled in ENS 201- Environmental Science, Spring 2006 came from various majors. Most of the students had little to modest background or involvement in environmental science and had little understanding of their relationship to the accelerating environmental degradation of the late 20<sup>th</sup> and early 21<sup>st</sup> centuries. Students were given an introductory classroom experience in environmental science through weekly lectures by Professor Young. We used *Principles of Environmental Science, Inquiry and Applications* by William and Mary Ann Cunningham as the textbook for this course. Students' research was conducted through their text, libraries, the internet, and regional site visits. The design component of the course was led by Professor Kegler and guided with a project brief for the Ecotrail.

## **Results**

Following the course completion, we reviewed the designs and identified the logistical issues for trail construction. The student proposals were developed without a budget or timeline included. This resulted in the students not feeling restrictions which allowed them to explore all the possibilities that they believed were appropriate. This also resulted in some aspects of their designs being too challenging or unrealistic for creating. We also made decisions on how to begin implementing the designs. These included the need for permits and surveys for property boundaries as well as discussions of how this can be incorporated into the campus master plan. As these items are identified, a proposed budget for the project will be prepared.

In future semesters, we plan to work with students in building the Ecotrail. This will be done in conjunction with a team-taught service-learning course. Students will have the opportunity to create something that can be used by both the local and campus communities, while increasing their awareness of environmental issues and natural history as well as their aesthetic appreciation.

As the trail is developed, we will be identifying areas where hands-on exercises can be incorporated. We anticipate working with college students to develop teaching materials that could be used by K-12 teachers in conjunction with visits to our campus Ecotrail. The trail's objective and scientific information will be the base from which present and future teachers can develop experiential fieldwork, science students conduct field research, students practice nature journaling, and participants gain first-hand experience to develop their own informed positions on environmental issues.





Recycle your papers \_\_\_\_\_

**For the following topics, indicate what you feel your level of understanding is according to the following scale-**

**1**-don't know anything about    **2**-vaguely familiar    **3**-moderate knowledge  
**4**-significant background        **5**-extensive knowledge

- a. water pollution        \_\_\_\_\_
- b. air pollution            \_\_\_\_\_
- c. biodiversity            \_\_\_\_\_
- d. energy sources         \_\_\_\_\_
- e. energy use              \_\_\_\_\_

**For the following, answer in one to two sentences.** If you are not at all familiar with the question material, write "don't know".

1. What is the Kyoto Protocol?
  
  
  
  
  
  
  
  
  
  
2. What is the current issue related to the Arctic National Wildlife Refuge?
  
  
  
  
  
  
  
  
  
  
3. Scientists predict Global warming-what is causing the global warming?
  
  
  
  
  
  
  
  
  
  
4. What is the source for your drinking water?
  
  
  
  
  
  
  
  
  
  
5. Where does the water go when you flush the toilet?

## **Addendum B: Results of Pre- and Post-Surveys for ENS 201**

As part of the pre- and post-survey, students were asked questions about their daily behaviors and decisions regarding energy use and conservation. Student responses indicated a significant change toward environmental awareness in their daily practices (Wilcoxon Signed Rank  $Z=2.01$ ,  $n=10$ ,  $p=0.036$ ). All students indicated increased knowledge in environmental issues after the course (Wilcoxon Signed Rank  $Z=2.81$ ,  $n=10$ ,  $p=0.005$ ). We asked students specific questions related to environmental issues in the news and their ability to completely answer the questions as a result of the course improved significantly (Wilcoxon Signed Rank  $Z=2.81$ ,  $n=10$ ,  $p=0.005$ ).

## **Addendum C:**

ardwalk

### Raingarden



The location to the rear of Canavan Hall provides an ideal location for a rain garden. The run-off ditch will provide the water to support the plants which will in turn filter the water, improving it's quality before it enters the creek.

#### Rain Garden Species

- Delonix regia* (Royal Poinciana)
- Demodermis* (Sagebrush)
- Stemmadia* (New Zealand Holly)
- Alnus* (Baldern)
- Calluna* (Calluna)
- Demodermis* (Sagebrush)
- Demodermis* (Sagebrush)
- Calluna* (Calluna)
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- Calluna* (Calluna)



More than half of the rainwater that falls on a typical city block, one with 75 percent or more impervious cover — such as roads or parking lots — will leave as runoff, according to the Environmental Protection Agency. This runoff includes metals, oils, fertilizers, and other particulate matter. Properly designed rain gardens can effectively trap and retain up to 99 percent of common pollutants in urban storm runoff. Rain gardens significantly reduce concentrations of nitrates, ammonias, phosphorous and other pollutants reaching storm drains. In addition, design tweaks that allow polluted rainwater to pool at the bottom of the garden; permits bacteria in the soil to convert harmful nitrates into nitrogen gas, preventing them from entering the groundwater.

### Hands-On Activity Kits



Energy Experiment

Soil Testing

Water Testing



## Proposed Bird Feeders



Nectar and fruit feeders attract species such as Hummingbirds and Baltimore Orioles. These feeders come in many different styles and colors, attracting different types of birds. Nectar feeders are filled with a water/sugar solution that mimics nectar from flowers or fruit.



Northern Oriole



Nuthatch



Black-Capped Chickadee



Tube feeders are usually constructed of clear PVC and have a number of feeding ports. Most tube feeders come with a tray that collects discarded seed hulls. This tray helps minimize rodents feeding off of fallen seed. Chickadees, Finches, and Grosbeaks often use these feeders.



Purple Finch



Hopper feeders are box-shaped feeders that are mounted on poles placed in the ground. The seed is reached by a ledge at the bottom of the feeder. The ledge acts as a tray to hold seed as well as catch discarded shells. This feeder allows larger birds such as Bluejays, and Woodpeckers to perch and feed.



Bluejay

Bird feeders will be placed along the trail to attract local birds. These feeders will benefit both the birds and the community, allowing for people to view and learn about the different species of birds that live in our area. The varieties of feeder have been chosen for their minimal litter which would make the issue of rodent feeding from discarded seeds a very small concern. There is also potential for later developed science stations, educating people about bird migrations, mating habits, and feeding patterns.



# Nature Trail Signs



**NATURE TRAIL SIGNS**

- Wild Mustardwings
- Eastern Cottontail Rabbit
- Northern Highbush Blueberry
- Turkey (Cattails)
- White-Tailed Deer
- Wild Romance Aster
- Wild Turkey

**CAMPUS SPECIES**

**TYNIA (CATTAIL)**

...

**CAMPUS SPECIES**

**WILD MUSTARDWINGS**

...

**CAMPUS SPECIES**

**WHITE-TAILED DEER**

...

**CAMPUS SPECIES**

**EASTERN COTTONTAIL RABBIT**

...

**CAMPUS SPECIES**

**WILD ROMANCE ASTER**

...

**CAMPUS SPECIES**

**HONEYBEE SOCIETY BLUEBERRY**

...

**CAMPUS SPECIES**

**WILD TURKEY**

...

...



...for Daemen College we not  
 the science aspect that we  
 integrate the art world as  
 would like to add is something  
 or sculpture. We will include a  
 have shown below. It will be  
 all we shown below. We will  
 made the signs for the  
 will then be posted  
 for instance on a tree. We  
 sculpture such as the one  
 displayed somewhere  
 individuals to stop and enjoy the  
 community.

Franc West  
 Mounting Point 3  
 2004



## Lily Pond



Before



After



*Eleocharis acicularis*  
Needle spike-rush



*Nymphaea odorata*  
Water lily



*Zantedeschia aethiopica*  
White arum lily



## Proposed Solar Lighting

(for use around Lily Pond, the Gazebo, and on the Nature Trail)

### What is Solar Lighting?

Simply put, solar lighting is the safest and easiest kind of outdoor lighting to install. Each light fixture contains a scientifically designed solar collector panel that converts daytime sunlight into electrical energy. This energy is stored in highly efficient rechargeable batteries, used to light the fixture at night.

### No Wiring!

Each solar light operates independently from others without the need of a transformer and wiring. This makes solar lighting especially suitable for use in remote areas and locations that water.

Solar lights utilize the latest "LED" technology and provide sufficient light to mark entrances, accent walkways and steps and indicate the locations of darkened obstacles at night.

### Suggested Applications

1. Mark entrances to and along nature trail
2. Accent darkened steps and curbing
3. Outline winding walkways
4. Highlight remote garden paths
5. Indicate fish pond area

### Solar Questions and Answers

#### Q: How do solar lights store energy and how do they work?

Solar lights have a built in solar panel and charging circuit that store energy in rechargeable batteries. They operate in much the same way as rechargeable flashlight operates except, the sun provides the needed electrical energy rather than plugging the cord into an outlet.

#### Q: How long do solar lights stay on?

The length of time that the lights stay on is dependent on the amount of sunlight received during the day. Most solar lights stay on for up to 10 hours with fully charged batteries.



## Gazebo



Before



After

## Nature Trail



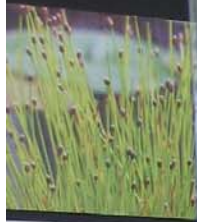
Before



## Bridge

1/6:  
N  
0  
00  
DEC 15

Pond



*Eleocharis acicularis*  
Needle spike-rush



Gazebo



# DAEMEN COLLEGE ECOTRAIL

There is a natural ecological area on the campus of Daemen College. This area is a natural area that has been preserved and is a natural area that has been preserved. This area is a natural area that has been preserved and is a natural area that has been preserved.

**CAMPUS SPECIES SIGN**  
The sign will be placed in the area of the campus species sign. The sign will be placed in the area of the campus species sign.

**GAZEBO**  
The gazebo will be placed in the area of the gazebo. The gazebo will be placed in the area of the gazebo.

**NATURE TRAIL**  
The nature trail will be placed in the area of the nature trail. The nature trail will be placed in the area of the nature trail.

**ART**  
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**BRIDGE**  
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**NATURE TRAIL SIGN**  
The nature trail sign will be placed in the area of the nature trail sign. The nature trail sign will be placed in the area of the nature trail sign.

## Nature Trail



## Sculpture

(for use around the Nature Trail)

## Bridge



As part of our Ecotrail for Daemen College we not only want to incorporate the science aspect that we have discussed but also to integrate the art world as well.

An example that we would like to add is something along the lines of poetry or sculpture. We will include a poem such as the one we have shown below. It will be shown in the same way that we made the signs for the campus species. This sign will then be posted somewhere along our trail for instance on a tree. We also had the idea of adding a sculpture such as the one shown. This will also be displayed somewhere throughout our trail for individuals to stop and enjoy the artistic aspect of the community.

**Life is Opportunity**  
Life is opportunity  
Every day,  
All seem to pass,  
Can stimulate new thought.

**Chance is not what rules the world**  
There's purpose everywhere,  
It's just for us to recognize  
The part that's waiting there.

**The opportunity for us**  
To learn and serve and grow,  
The harder that the workman toils  
The higher we can go.

**What is ours will come to us**  
So bear yourselves true,  
Just find the gift in everything  
And we'll become adult.

**Franc West**  
Maudslayi Pond 2  
2004

Signage



# Hidden Maple Trail

A self-guided Ecotrail on the Daemen College campus



Examples Of Proposed Boardwalk



Examples of brochure stop posts



Meeting Platform

The expectations we have for our nature boardwalk are both enjoyable as well as educational. We plan on building the nature boardwalk starting behind Canavan and ending behind Schenk. The boardwalk will outline the Daemen college property as well as indicate property lines for a few residences located on Getzville road. Students, as well as faculty, will be able to use this area for relaxing, studying and doing homework, while enjoying the natural weather Buffalo has to offer. The boardwalk will be built out of pressure treated wood and metal posts that will secure it into the ground. There will be open areas with benches and drawing horns for anyone to utilize. Also, the boardwalk will become a place of learning with signage identifying plant species, as well as other animals that can be found in the area. We believe the whole community will benefit from our nature boardwalk.

