

# **An undergraduate experiential learning activity to improve communication skills and engage public school students in forest ecological principles**

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# Background

Began with a small U.S. Fish and Wildlife Foundation Grant – Goal was to **increase engagement of public school students with Wild Refuge system**, visited Mason Neck National Wildlife Refuge



Continued work at Mason Neck National Wildlife refuge with an EPA grant

Expanded with a USDA Challenge ***Ambassadors for Conservation Education (ACE) Program***

ACE Program involved students from **Virginia Tech and University of Georgia**



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Encourage public school student use of public forested areas (e.g. National Wildlife Refuge, State Parks)

Recruit students into natural resource based careers



# Plot and data bases

0.02-ha area permanent plots established

Accurate tree diameter (>10 cm)


Tree species identified and tagged





# Plot and data bases

Plot/Tree data, along with the exercise objectives, field trip preparation material (e.g., data sheets), were placed on the internet for use by teachers

**DBH** How to determine the diameter of a tree




A diameter tape (D-tape) is used by foresters to measure the diameter of a tree. Since trees are swelled at the base, measurements are made **4.5 feet above the ground** in order to give an average diameter estimate. The D-tape is wrapped around a tree and is specially designed to convert the tree circumference to tree diameter.

This black oak is 21.6 inches in diameter.

Of course, there are rules for measuring DBH.

- Foresters always measure on the uphill side of a tree.
- If the tree forks below 4.5 feet, the trunks count as separate trees.
- If the fork is **AT** 4.5 feet, measure the diameter just below any swelling caused by the fork.
- If there is a swelling at 4.5 feet, measure just above the swelling.



The beech to the right is a problem for Ranger Nick. Assume the red line is at 4.5 feet. Can you help him?

BTW... Diameter can be measured with a cloth ruler. You will need to convert each measurement after you record it, because the cloth ruler actually measures tree circumference. To convert to diameter, just divide circumference by 3.14.

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**HOME**

**The Mission**

**The Refuge**

**Field Prep**

**Analysis**

**Data**

**The Crew**

*Environmental and Cultural History at Mason Neck National Wildlife Refuge*

What is the USDA Species code? You can find this 4-6 character code in your twig or leaf key, or you can find them [here](#).

Why do I have to enter my data? As part of your [mission](#), you will help the Refuge collect many years of data so future researchers can examine long-term forest trends.

HINT - you can "Tab" between data entry fields. Click "Submit" at the bottom after you have entered ALL your data.

Date:

Plot Number:

School:

Teacher:

Stand Age (tree core):

Soil Data:

Horizon	Depth (cm.tenths)	Color	Texture
Example	10.6	7.5R7/2	sandy clay
O	<input type="text"/>	<input type="text"/>	<input type="text"/>
A	<input type="text"/>	<input type="text"/>	<input type="text"/>
B	<input type="text"/>	<input type="text"/>	<input type="text"/>

Tree Data:

Tag Number	USDA Species Code	Diameter (cm.tenths)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
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Welcome to the Environmental and Cultural History at Mason Neck Project... a collaborative relationship between high school students, teachers, Wildlife Refuge personnel and university researchers! Students involved in this project will collect, analyze, and present data on Mason Neck soils, tree rings, and forest diversity.



This part of the Wildlife Refuge was once an agricultural field. Students will be able to determine how long ago these Virginia pines seeded into the field, and the impact of agriculture on the soil beneath their feet.



# Plot and data bases

School classes then visit and re-measure the plots

Two public areas (Mason Neck, Virginia and Indian Springs State Park, Georgia)

Six high schools with forests within walking distance (Virginia only)



# Why we added the schools with nearby forests

Anecdotal comments from teachers indicated they would not revisit off site plots if grants didn't pay for buses.

Results from a southern Piedmont teacher survey confirmed this.



# Survey results: What limits teachers from participating in field trips (n=302)

1 strongly disagree – 5 strongly agree

Money limits me from taking forestry related field trips	4.17
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Time constraints limit me from taking forestry related field trips	4.14
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# Survey results: What limits teachers from participating in field trips

55.6% of teachers have a forest within walking distance

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Frequency of Field Trips	No forest	Forest nearby
1	110 (85%)	57 (35%)
2	16 (12%)	41 (25%)
3	2 (2%)	43 (27%)
4	1 (1%)	20 (13%)

# Survey results: What limits teachers from participating in field trips

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Factors **most mentioned** in comments  
as **limiting** to field trips

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School curriculum	63%
Lack of time	67%
Lack of money	61%

# Survey results: What limits teachers from participating in field trips

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Factors **rarely mentioned** in comments as limiting to field trips

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Lack of training	5%
Living in the City	1%
Bad Student behavior	2%
Large Class Size	2%
No bus	1%

# Undergraduate teacher training

Undergraduate students (both in Virginia and Georgia) enrolled in a communication class where they were taught principles of effective communication and leadership.

The class emphasized outdoor environmental teaching with numerous outdoor practice sessions where students improved their skills at teaching outdoors in informal settings.





# Teaching Days

Undergraduates then led high school field trips where students and their teachers visited the plots and collected the same information in the pre-established plots.



High school students learned principle of tree identification, use of diameter tapes, increment borers and soil augers.



# Results/Observations

Data collection by students and their teacher is very inaccurate unless plots are clearly identified and they are closely supervised by an instructor

55% when with teacher from school

98% when with university faculty

85% when with undergraduate instructor

This inaccuracy was despite very intensive teacher training both indoors and outdoors.



# Results/Observations

Significantly more public school students are reached by sending undergraduate instructors to individual schools

Individual school visits -- 6 schools, 19 classes and 274 students

Field trips to public area --2 schools, 2 classes and 48 students (2011), 36 students (2010)

# Results/Observations

In the absence of outside money, schools are very unlikely to visit distant areas



# Questions/Discussion



[www.savestadiumwoods.com](http://www.savestadiumwoods.com)

