Fostering Engagement in Natural Resources Through Research

A case study of a high school summer employment program

Amy Grotta
March 15, 2008
What this presentation will cover

- Summer Youth Forestry Institute – overview
- First year outcomes
- Where we are going from here
- Ideas for learning assessment
Summer Youth Forestry Institute -- Goals

- Engage high school students in natural resources study
- Introduce students to natural resource field skills and tools
- Provide King County with forest inventory data
Long-term objectives

Increase the number of young people who choose environmental or NR careers and/or fields of study

- Hager et al. (Clemson, 2007):
  - teens’ interest in environmental issues is increasing
  - but lack of knowledge about NR careers is contributing to declining enrollment in NR academic programs

- Kathy Wolf (UW, 2007):
  - nature-based, achievement-oriented learning experiences in adolescence influenced career choice for current NR professionals
Our hopes for the students

- Gain science/research skills
- Understand/appreciate forests and forestry
- Summer job out of the ordinary
SYFI – an overview

- 10 students
- 4 weeks – Monday thru Friday
- Informal curriculum
- Fixed plot forest inventory
- Mentors/guest speakers
- Field trips
- Reporting to County
- $500 stipend + SL credit ($800 in 2008)
Our study site

Taylor Mountain Forest
King County-owned working forest property (1,800 acres)
**Pacing**

When measuring distances walked along a road, trail, or through the forest, it is easiest to use the pacing method rather than measuring with a tape.

One “pace” equals two steps using a natural walking stride. To find your pace, you will use a 100-foot pacing course.

1. Start at the beginning of the course and walk naturally to the end, counting every time you step with your left foot.
2. Repeat three times.
3. Take the average of the three numbers and that is the number of paces it takes you to walk 100 feet.
4. Do this on a road, through a flat forest and on steep terrain, because your pace will vary in each setting.
5. To find out the length of your pace, divide 100 feet by the average number of paces.

<table>
<thead>
<tr>
<th>Flat Road</th>
<th>Uphill Road</th>
<th>Flat Off-road</th>
<th>Uphill Off-road</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st try</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd try</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd try</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Clinometer**

1. The clinometer has two scales. Use the scale on the RIGHT.
2. Walk far enough away from the tree so that you can see its top. Convenient distances: 50, 100, or 200 feet. Walk on as flat ground as possible, i.e., try not to go too far uphill or downhill from the tree.
3. Use one of the charts below, depending on whether you are uphill, downhill, or on flat ground from the tree.
4. Record your distance from the tree under (A).
5. Keeping both eyes open, look at the top of the tree with one eye while looking through the clinometer with the other. Record the number on the right-hand scale that corresponds with the top of the tree in column (B).
6. Do the same for the tree base (if needed)
7. Use a calculator to complete the calculation. The tree height is the figure in the final column.

**If you are uphill from the tree:**

<table>
<thead>
<tr>
<th>Distance to tree</th>
<th>% to tree top</th>
<th>% to tree base</th>
<th>B + C</th>
<th>D * A / 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
</tbody>
</table>

**If you are downhill from the tree:**

<table>
<thead>
<tr>
<th>Distance to tree</th>
<th>% to tree top</th>
<th>% to tree base</th>
<th>B - C</th>
<th>D * A / 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
</tbody>
</table>

**If you are on flat ground:**

<table>
<thead>
<tr>
<th>Distance to tree</th>
<th>% to tree top</th>
<th>your eye height (ft)</th>
<th>(B * A / 100) + C</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
</tbody>
</table>

See pictures on the back!
Permanent Study Plot Installation

- tree species/diameter/height
- understory vegetation
- snags/coarse woody debris
- monument trees
- photo points
Collecting inventory data
Diagram #1 and #2 are from stand 3 in 2007 after clear-cut and replanting of 300 DF and RC, with untouched natural growth to 2057.

Diagram #3 should look like this with less tree competition.

Diagram #3 is same stand but with 50% thinning of trees in 2037. Diagram is #4 up to 2057.

Ben and Stephan's stand
Culminating Presentation
What worked?

✓ We imparted field skills

Ten years from now, when you look back on your experience in the SYFI, what do you think will stand out in your mind the most?

“The hard core field work our team pulled off even though none of us have had experience.”

“I think I will not be able to believe that I was so skilled with all the instruments. By the end of the program, I knew how to do everything, and in my opinion, worked efficiently.”
What worked?

✓ We helped them **explore** career options

How has this program affected your ideas about what field you want to work in or study?

“I want to work with wildlife for sure, not just with trees.”

“I still want to do some kind of biology, but Julie (guest speaker) was cool because she talked about how that can relate to forestry.”

“I know this is a field that I don’t want to work in/study when I get older.”
What worked?

✔ We got them thinking critically about forestry

How did participating in this program change your perceptions about forestry?

“I didn’t know that people actually did all of this and now I think it’s great and important.”

“It turned my whole view around. I always thought that timber companies were bad even when they were necessary. After seeing the mills and stands where it’s necessary to cut down forests, my view has changed.”
What worked?

✓ **We built teamwork skills**

What did you like best about SYFI and your experience?

“*I liked most of my crew members. We were able to help each other while laughing and having fun.*”

“I liked meeting all of the other people, we really bonded!”
We reached a diverse audience

- Stipend
- Transportation
Areas for improvement

• **Assessment of learning**
  – Post-test but no pre-test

<table>
<thead>
<tr>
<th></th>
<th>Before the summer, I knew…</th>
<th>Now, I know…</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>none</td>
<td>a little</td>
</tr>
<tr>
<td>Tree/Plant Identification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How forests grow and change with time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How forests are related to climate change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How forests are related to our water supply</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to measure how fast a tree is growing over time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What kinds of features in a forest make good wildlife habitat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What the term “riparian area” means</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Post-test results (selected)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Before this summer, I knew…</th>
<th>Now, I know…</th>
</tr>
</thead>
<tbody>
<tr>
<td>How forests grow and change with time</td>
<td>none (4)</td>
<td>a little (3)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (1)</td>
</tr>
<tr>
<td></td>
<td>none (0)</td>
<td>a little (3)</td>
</tr>
<tr>
<td></td>
<td>a little (3)</td>
<td>a lot (6)</td>
</tr>
<tr>
<td>How forests are related to climate change</td>
<td>none (3)</td>
<td>a little (3)</td>
</tr>
<tr>
<td></td>
<td>a little (3)</td>
<td>a lot (3)</td>
</tr>
<tr>
<td></td>
<td>none (0)</td>
<td>a little (4)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (5)</td>
</tr>
<tr>
<td>How forests are related to our water supply</td>
<td>none (4)</td>
<td>a little (4)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (1)</td>
</tr>
<tr>
<td></td>
<td>none (1)</td>
<td>a little (4)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (4)</td>
</tr>
<tr>
<td>What kinds of features in a forest make good wildlife habitat</td>
<td>none (4)</td>
<td>a little (4)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (1)</td>
</tr>
<tr>
<td></td>
<td>none (0)</td>
<td>a little (4)</td>
</tr>
<tr>
<td></td>
<td>a little (4)</td>
<td>a lot (5)</td>
</tr>
<tr>
<td>What a forester’s job is like</td>
<td>none (6)</td>
<td>a little (2)</td>
</tr>
<tr>
<td></td>
<td>a little (2)</td>
<td>a lot (1)</td>
</tr>
<tr>
<td></td>
<td>none (0)</td>
<td>a little (1)</td>
</tr>
<tr>
<td></td>
<td>a little (1)</td>
<td>a lot (8)</td>
</tr>
</tbody>
</table>
Areas for improvement

• Assessment of learning
  – Written reflections – how to use them?

Reflection #2 – Tuesday, July 10th
Yesterday and today you spent a lot of time looking at plants and learning their names. List the plants that you now feel comfortable identifying without having to look them up. What are some tricks that you have figured out to distinguish different plants from one another?

Reflection #6 – Monday, July 16th
This job requires a lot of teamwork and division of labor to get all the data collected. Reflect on how your team has worked together to get things done. Are there ways that your team could do things better or more efficiently?
Service Learning

- Relevant service
- Academic material
- Critical reflection

Community, Students, Staff
Areas for improvement

- Consistent daily routine and staff
- Plan funding accordingly!
Challenges

• Funding
  – $2,300/student
  – Many funding sources reward breadth, not depth

• Staff time and seasonality

• Assessment/Documentation
  – Especially long-term impacts
Thank you

- King County Natural Resource Stewardship Network (funding)
- Ara Erickson, University of Washington
- American Forest Resource Council (donation)
- Many area forestry professionals (donations and/or volunteer time)
Thank you!