

# 4-H & Forestry Afterschool Clubs: A Collaboration to Foster Stewardship Attitudes and Behaviors in Youth



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## Background

- United States has been an international leader in scientific fields but decreasing numbers of science, engineering, and technology graduates may jeopardize that position.
- Only 18% of high school seniors are considered proficient in the sciences (National Center for Education Statistics, 2005).
- 4-H's Science, Engineering, and Technology initiative addresses these issues.
- The Society of American Foresters also identified engaging youth in forestry as a concern because of the decreasing number of forestry graduates and increasing forestry retirements.

### Partnering to create the 4-H & Forestry Afterschool Program:

Forestry and 4-H Extension Educators partnered to address the common concerns by creating the 4-H & Forestry Afterschool program to engage youth in an outdoor, forestry education program. Strong evidence suggests that out-of-school-time programming can support improvements in participants' grades, attitudes towards science, specific science knowledge, and interest in science careers, even producing interest in science that is sustained long after participation (National Research Council, 2009). Additionally, adults who choose actions that benefit the environment, such as choosing an environmentally-related career, tend to have had direct experience in nature in their youth and were likely mentored by an adult in their interest in nature (Chawla & Cushing, 2007). Thus, an outdoor 4-H & Forestry program is believed to be an appropriate method for building interest in natural resource careers.

## Methods

Beginning in 2007, 4-H clubs focused exclusively on forestry activities engaged youth in the topic through hands-on, experiential learning and sustained participation.

- Program objectives: cultivating interest in natural resource careers and serving underserved audiences.
- Participants: 3 clubs, 50 3rd-5th grade participants over 54 program sessions in Itasca, Winona and Olmsted counties. The program targets underserved audiences with few natural resource and 4-H programming opportunities. This audience likely includes low-income and geographically isolated communities.
- Instruction: paid contractors and high school 4-H and Woodland Advisor volunteers trained by Extension in forestry and forest management.

To determine if youth engaged with the topic of forestry, a team of educators developed an evaluation to measure content knowledge and changes in environmental attitudes and behavior during the program. In addition to routine evaluation questions, the evaluation included indicators of knowledge, attitudes, and behavior, adapted from other peer-reviewed tools (Mayer & Franz, 2004; Vadala, 2004). The knowledge indicators included multiple choice questions (e.g. "How can you tell how old a tree is?"). The attitude and behavior indicators both used a retrospective pretest in a five point Likert-type scale response format.

## Analysis

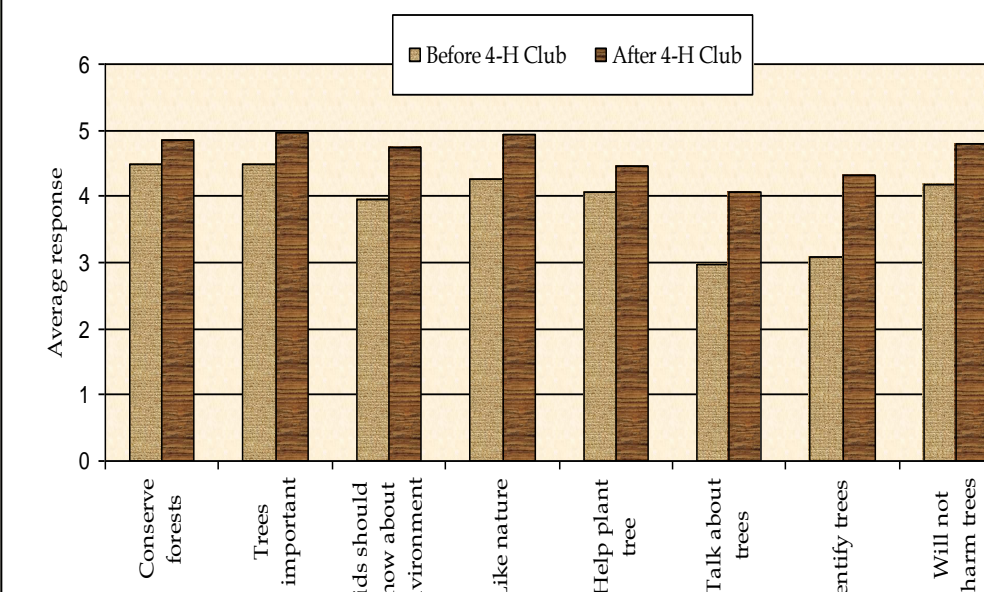
### Descriptive Statistics & t Values for Stewardship Dimensions

|   | BEFORE |      |         | AFTER |      |         | t      |
|---|--------|------|---------|-------|------|---------|--------|
|   | Mean   | SD   | Range   | Mean  | SD   | Range   |        |
| I think it's good to conserve forests.                          | 4.48   | .64  | 3.0-5.0 | 4.85  | .36  | 4.0-5.0 | -3.08* |
| I think trees are important.                                    | 4.48   | .75  | 3.0-5.0 | 4.96  | .19  | 4.0-5.0 | -3.61* |
| I think all kids should know about the environment.             | 3.96   | .90  | 2.0-5.0 | 4.74  | .53  | 3.0-5.0 | -5.5*  |
| I like nature.  | 4.26   | .86  | 2.0-5.0 | 4.93  | 2.67 | 4.0-5.0 | -4.22* |
| I would like to help plant a tree.                              | 4.07   | 1.17 | 1.0-5.0 | 4.46  | 1.07 | 1.0-5.0 | -3.12* |
| I talked to my family or friends about the importance of trees. | 2.96   | 1.26 | 1.0-5.0 | 4.07  | 1.2  | 2.0-5.0 | -5.14* |
| I can identify different types of trees.                        | 3.08   | 1.22 | 1.0-5.0 | 4.31  | .88  | 2.0-5.0 | -6.13* |
| I try not to harm trees.  | 4.19   | .96  | 1.0-5.0 | 4.8   | .8   | 1.0-5.0 | -4.65* |

N=28, \* = p < .01

### Pre and Post Test Results

Participants reported increases in stewardship attitudes, beliefs and behaviors.



### Correlations

Significant correlations were found between youth reports of interest in joining again and feeling welcomed, included, and learning something new about the environment.

|                             | New Friends | Learned | Group Work | Welcomed | Included | Know More | Interested Again | Recommend |
|-----------------------------|-------------|---------|------------|----------|----------|-----------|------------------|-----------|
| Met New Friends             | 1           |         |            |          |          |           |                  |           |
| Learned Something New       | 0.12        | 1       |            |          |          |           |                  |           |
| Group Work                  | 0.21        | 0.26    | 1          |          |          |           |                  |           |
| Welcomed                    | 0.18        | 0.11    | 0.06       | 1        |          |           |                  |           |
| Included                    | .4*         | 0.31    | 0.1        | .6**     | 1        |           |                  |           |
| Know More about Environment | 0.11        | .81**   | 0.28       | 0.31     | 0.25     | 1         |                  |           |
| Interested Again            | 0.3         | .5**    | 0.16       | .43*     | .56**    | .53**     | 1                |           |
| Recommend                   | 0.11        | .58**   | 0.32       | 0.31     | 0.1      | .69**     | .53**            | 1         |

N=28, \* = p < .05, \*\* = p < .01

## Results

Evaluation results revealed statistically significant changes in all measures of environmental attitudes and behavior using a retrospective pretest (N= 28, p<.01). Results also demonstrated increases in youth's general knowledge acquisition about forestry items.

Correlation analysis showed support for building high quality youth development environments, with an emphasis on inclusive and welcoming environments. Future efforts should continue to concentrate on building both strong scientific content and strong relationships between youth and adults.

## Conclusion

The 4-H & Forestry program demonstrated that an outdoor forestry education program can build environmental knowledge, improve attitudes towards the environment, and foster aspirations to participate in environmentally beneficial behaviors, such as planting trees. Evidence suggests that positive experiences outdoors with an adult mentor also have a long term correlation with choosing to take actions later in life that will benefit the environment. Such actions could include choosing a natural-resource career such as forestry. This project serves as a model for engaging youth in natural resource activities in order to foster their interest in and preparation for natural resource careers.



What was your favorite part of 4-H "going outside and doing activities" - 4H & Forestry Participant

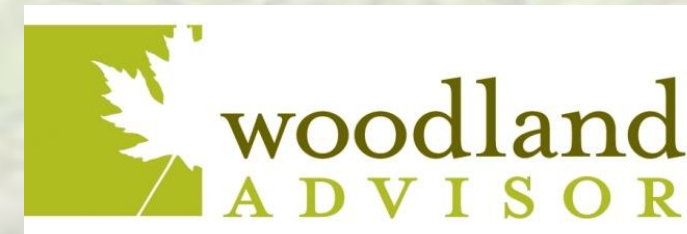
What is one thing you learned? "knowledge about trees and the environment" - 4H & Forestry Participant

"In Forestry club I learned you can tell how old trees are by counting their rings." - 4-H & Forestry Participant



## Acknowledgements

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