

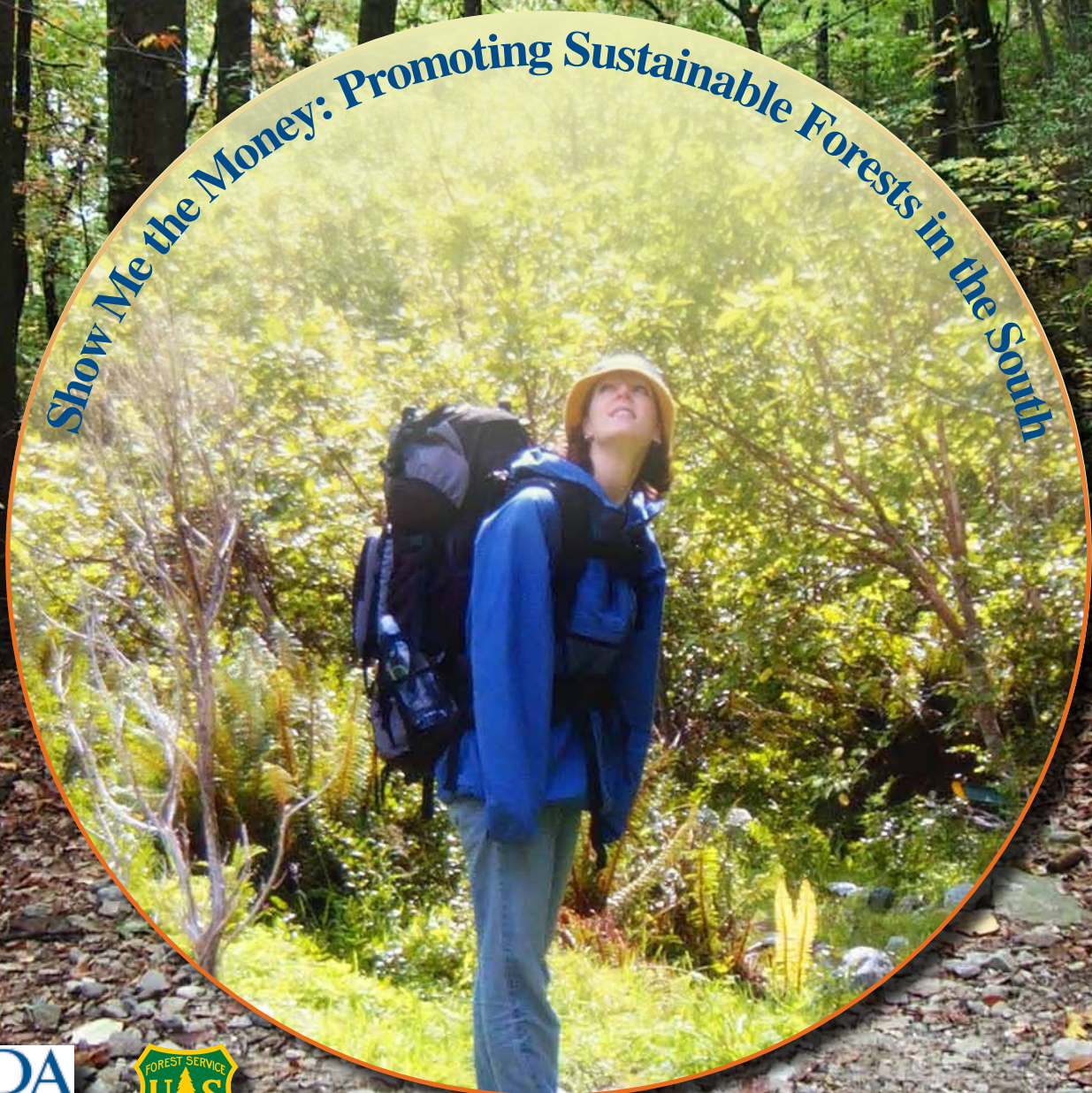
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Natural Inquirer

The Natural Inquirer Monograph Series



Show Me the Money: Promoting Sustainable Forests in the South





The
Natural Inquirer

Monograph Series

Research in the South
Show Me the Money: Promoting Sustainable Forests in the South

Produced by

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Cradle of Forestry in America Interpretive Association

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Contents

8

FEATURE:

Show Me the Money:

Promoting Sustainable Forests in the South



- 4 Who Are Scientists?
- 5 Welcome to the *Natural Inquirer* Monograph Series!
- 6 Editorial Review Board at Work
- 7 What Are Private Nonindustrial Forest Lands?
- 21 FACTivity
- 23 Landowner Assistance Flier
- 25 Web Site Resources
- 26 Figure it Out! Photo Challenge
- 27 Show Me the Money—Create a Phrase
- 28 Note to Educators
- 29 Lesson Plan for Show Me the Money



- 32 Possible Answers to Questions in the Reflection Sections
- 33 Which National Education Standards Can Be Addressed Using This Monograph?
- 34 Graphic Organizer
- Inside back cover**
 - What Is the Forest Service?
 - What Is the Cradle of Forestry Interpretive Association?
 - What Is the Southern Research Station?

Who Are Scientists?

Scientists are people who collect and evaluate information about a wide range of topics. Some scientists study the natural environment.

To be a successful scientist, you must:

Be curious:

You must be interested in learning.



Be careful:

You must be accurate in everything you do.

Be open-minded:

You must be willing to listen to new ideas.



Be enthusiastic:

You must be interested in a particular topic.

Question everything:

You must think about what you read and observe.



Welcome to the *Natural Inquirer* Monographs!



Scientists report their research in a variety of special books. These books enable scientists to share information with one another. A monograph is a book about research that focuses on a single science project. This monograph of a *Natural Inquirer* article was created to give scientists the opportunity to share their research with you and other middle school students.



The monograph presents scientific research conducted by scientists in the Forest Service, U.S. Department of Agriculture. If you want to learn more about the Forest Service, you can read

about it on the inside back cover of this monograph, or you can visit the *Natural Inquirer* Web site at <http://www.naturalinquirer.org>.

All of the research in this *Natural Inquirer* monograph is concerned with the natural environment, such as trees, forests, animals, insects, outdoor activities, and water. First, you will “meet the scientists” who conducted the research. Then you will read about one of the many interesting aspects



of science and about the natural environment. You will also read about a specific research project. The research article is written in the format that scientists use when they publish research in scientific journals. Then YOU become the scientist as you go through the FACTivity associated with the article. Don't forget to look at the glossary and the special sections highlighted in the article. These sections give you extra information that is educational and interesting.

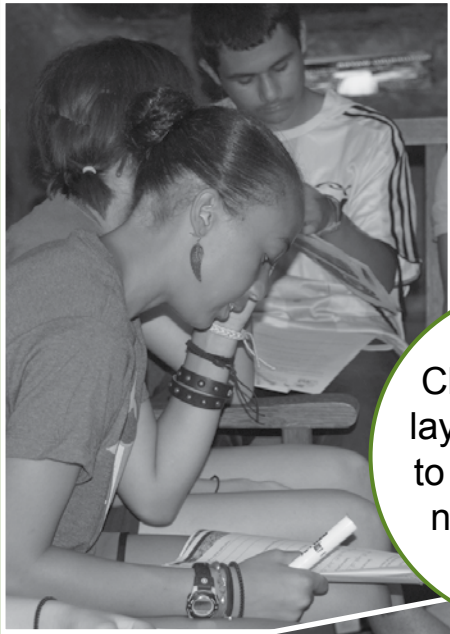
At the end of each section of the article, you will find a few questions to help you think about what you have read. These questions will help you think like a scientist. They will help you think about how research is conducted. Your teacher may use these questions in a class discussion, or you may discuss these questions in a small group.

Each *Natural Inquirer* monograph will help you explore the exciting world of science and prepare you to become a young scientist. You will learn about the scientific process, how to conduct scientific research, and how to share your own research with others.

Visit <http://www.naturalinquirer.org> for more information, articles, and resources.

Editorial Review Board

Sandy Creek Nature Center Teen Day Camp,
Athens-Clarke County, Georgia.
Tim Kinnard, Camp Director



Charts and text layout are easier to read than just normal layout.

I really like the design elements you used. It made the article real easy to read. I enjoyed reading it!

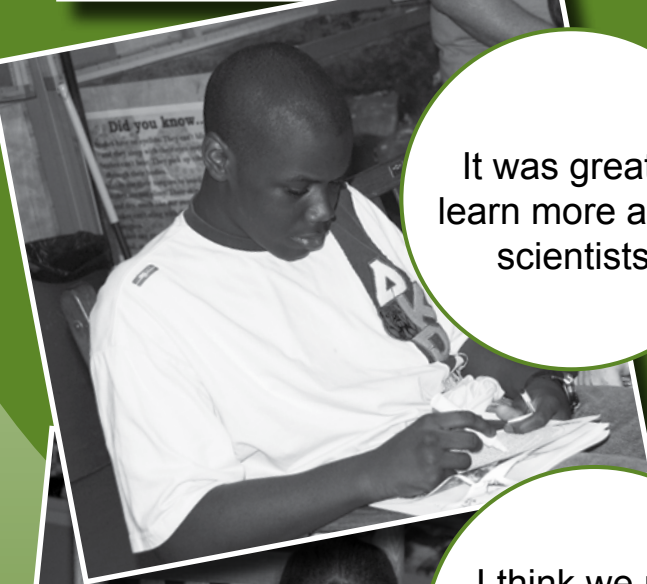


Put the Glossary near the Introduction.

It was great to learn more about scientists.

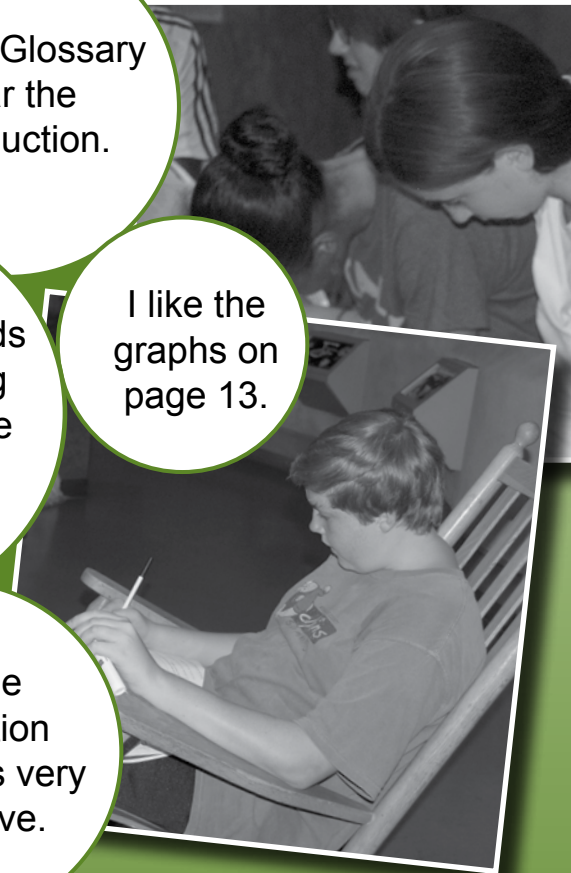
If possible, get pictures of kids and adults doing things to help the forest, not just cartoons.

I like the graphs on page 13.

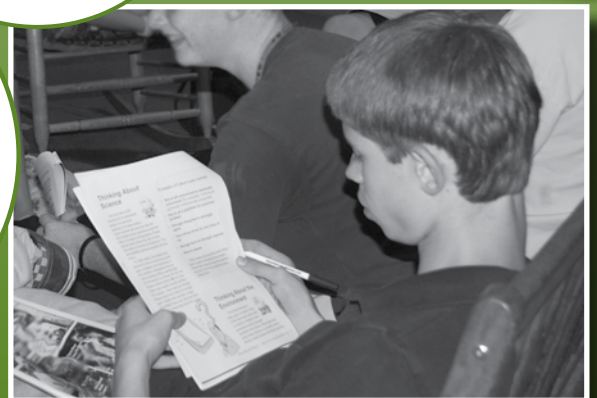
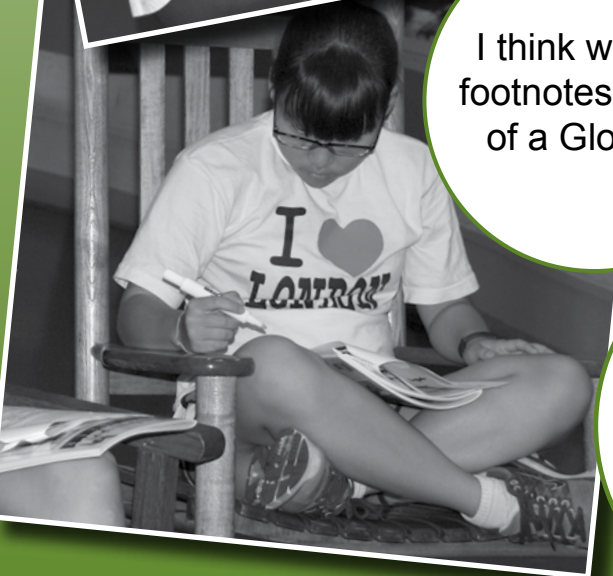


I think we need footnotes instead of a Glossary.

I like the Introduction section. It's very descriptive.



Graphs and charts were disrupting the flow and are too large and disorganized.



What Are Nonindustrial Private Forests?

Forest lands can be owned by different types of owners. For example, national forests are owned by all citizens. These forests are managed on behalf of the citizens by the Federal Government. State forests are owned by all citizens of a particular State. These forests are managed by the State government on behalf of its citizens. National and State forests are called public lands because they are owned by the public.

Forests can also be owned by businesses. Sometimes these forests are owned for their future monetary value. In many cases, these forests are managed by a business for the products or services that can be sold. These products include timber; food, such as fruits or nuts; or camping, fishing, and other recreation activities. When a business owns forest land, the forest is called an industrial forest. Industrial forests are called private lands because they are not owned by the public.

Forest lands can also be owned by individuals or groups of individuals. Examples include individual citizens such as your grandparents, your parents, or friends of your parents. Groups of individuals can also own forest land. Examples include a hunting club or an organization hoping to protect a piece of forest land. These types of forest lands are called nonindustrial private forests. This is a long name and it describes these lands very well.

Nonindustrial means that the land is not owned by a business. Private means

that the land is not owned by the public. Nonindustrial private forests can be just a few acres to thousands of acres in size. In the Eastern United States, most of the forest land is nonindustrial private forest land.



Nonindustrial private forests are managed by the people or groups who own them. They can be managed for many purposes. Whatever the reasons for owning forest lands, the best idea is to manage them so that they are healthy now and into the future. Through special programs, nonindustrial forest landowners can receive assistance managing their land. This article is about those special programs and southern landowners who may or may not take advantage of the programs.

At the end of the article and following the puzzles, you will find a flier that can be removed from the *Natural Inquirer*. This flier can be taken home to your parents or guardians. If they or someone they know owns forest land, this flier can be shared. It has information about how landowners can take advantage of the programs to help them manage their forest land.





Show me the moneys



Promoting Sustainable Forests in the South



Meet the Scientists!



**Dr. John Greene,
Forest Economist**

My favorite science experience is sharing the things I find out with people who can use them. In this photo, I am discussing forest plans with Ms. Patricia Black.

**Dr. Michael Kilgore,
Economist**

My favorite science experience is when I get to travel to other places around the world to study how people use forests.



Dr. Thomas Straka,
Forest Economist

My favorite science experience is evaluating large government programs and policies to see if they make financial sense. For example, should the State forestry agency hire more foresters to advise forest owners on how to manage their forests? Or, should the forestry agency use that money to pay for part of the tree planting? By doing this, they could grow more acres of forest. Because money is always limited, forest economists often figure out how to best use the money.

The photograph is of me making charcoal at Hopewell Furnace National Historic Site in Pennsylvania. Charcoal is made from wood and was the fuel used more than 100 years ago to make iron and melt metals. Charcoal is still used for fuel and cooking in developing countries. Because I am interested in the historic use of charcoal, I am writing an article about how charcoal production resulted in much forest land being cut in the 1800s. To better understand the charcoal making process, I went to Hopewell to learn how to make it myself. It was fun to see how it was done. I learned to make charcoal myself so I would know what I was writing about! For more information, you can visit <http://www.nps.gov/hofu/>.



Dr. Steven Daniels,

Interdisciplinary (in tər di sə plə ner ə)

Social Scientist

My favorite science experience was helping cross-country skiers and snowmobile users work together to make decisions. They both wanted to use the same area for outdoor recreation. Snowmobiling and cross-country skiing, however, are very different activities that may not always be compatible. The outcome allowed them to both enjoy an area of great beauty and unique recreational opportunity.



What kind of scientists worked on this research?

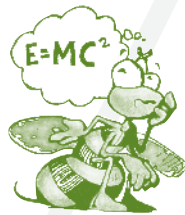
Economists are social scientists who study the value people place on experiences or things. Economists study how people make decisions about things they want to consume or produce. A natural resource economist examines and measures the values people place on a variety of natural resources, including timber, water, wildlife, outdoor recreation, clean air, clean water, the scenery, and other environmental resources. A forest economist is like a natural resource economist, except that the resources being studied are found within forests.

Social scientists study what groups of people do, value, and believe. Social scientists may study individuals or groups of people. Psychologists (*sə kə lə jists*) study individuals and sociologists (*sə sə ə lə jists*) study groups of people. Social scientists also include archeologists (*ər kə ə lə jists*), anthropologists (*an(t) θrə pə lə jists*), and historians. An interdisciplinary social scientist uses ideas from different kinds of social sciences to guide his or her work.



Thinking About Science

One way that social scientists try to understand people is to ask them questions. For some studies, social scientists ask questions that are like multiple choice questions except that there is no right or wrong answer. People answer based on how they feel or what they believe to be true for themselves. You have probably answered questions like this before.



For other studies, the scientists ask questions to find out how much people agree or disagree with a statement or how satisfied or dissatisfied they are with something. When a **survey** asks for information in a format like this, the format is called a Likert (**lɪk ɔrt**) scale. Likert scales usually include numbers. For example, 1 may mean you strongly disagree and 4 may mean you strongly agree. Likert scales can have a range of numbers. Some may only have three numbers; others may have five or more numbers.

In this research, the scientists used Likert scales to gather information from people. When Likert scales are used, the numbers are used to show how people feel about certain topics.

Examples of Likert scales include:

- **Not at all concerned to extremely concerned** (For example, 1=Not at all concerned; 4=Extremely concerned)
- **Not at all a problem to a serious problem**
- **Strongly disagree to strongly agree**
- **Very untrue of me to very true of me**
- **Strongly favor to strongly oppose**
- **Never to always**

The first instance of glossary words are given in **bold** and the words are defined on page 20.

Thinking About the Environment

Forest land belongs to many types of owners. Some of the forest land in the South is owned by Federal or State governments and is managed on behalf of the citizens.

Most forest land in the South, however, is privately owned. Private owners include individuals, families, organizations, and businesses. Regardless of who owns forest



land, it is a good idea to take care of it so that it can stay healthy into the future. This is the goal of sustainable forestry. Sustainable forestry means that forests are managed so that the environmental, economic, and social needs of today can be met without hurting these needs for future generations.

Federal and State governments have developed programs to encourage private forest landowners to practice sustainable forestry. They have done this because sometimes it is more difficult or it may cost more to practice sustainable forestry. These programs often provide landowners with free advice, information, and assistance. They may also provide payments to cover some of the costs of practicing sustainable forestry. Sometimes the programs help private landowners by reducing the amount of property taxes owed if the landowner practices sustainable forestry. The goal of these programs is to encourage private landowners to take care of their land today so that it will continue to be healthy into the future.

Introduction

Over the past 40 years, Federal and State governments have provided **financial incentives** to private forest landowners. In the early years, the incentives encouraged landowners to grow and cut trees for timber or for paper production. For the past 25 years, the incentives have encouraged private landowners to practice sustainable forestry. In some cases, these financial incentives include providing free assistance, information, and advice. In other cases, landowners may receive money to help them manage their land, or they may pay lower taxes.

Some scientists wondered what kind of impact these programs are having. This question is of particular importance in the Southern United States. Of all of the regions of the United States, the South has the most privately owned forest land (**figures 1 and 2**). If the programs are effective, then a large amount of forest land is being managed so that it will be healthy into the future. If the programs are not effective, then there is a chance that forest land in the future may not be as healthy as it could have been.

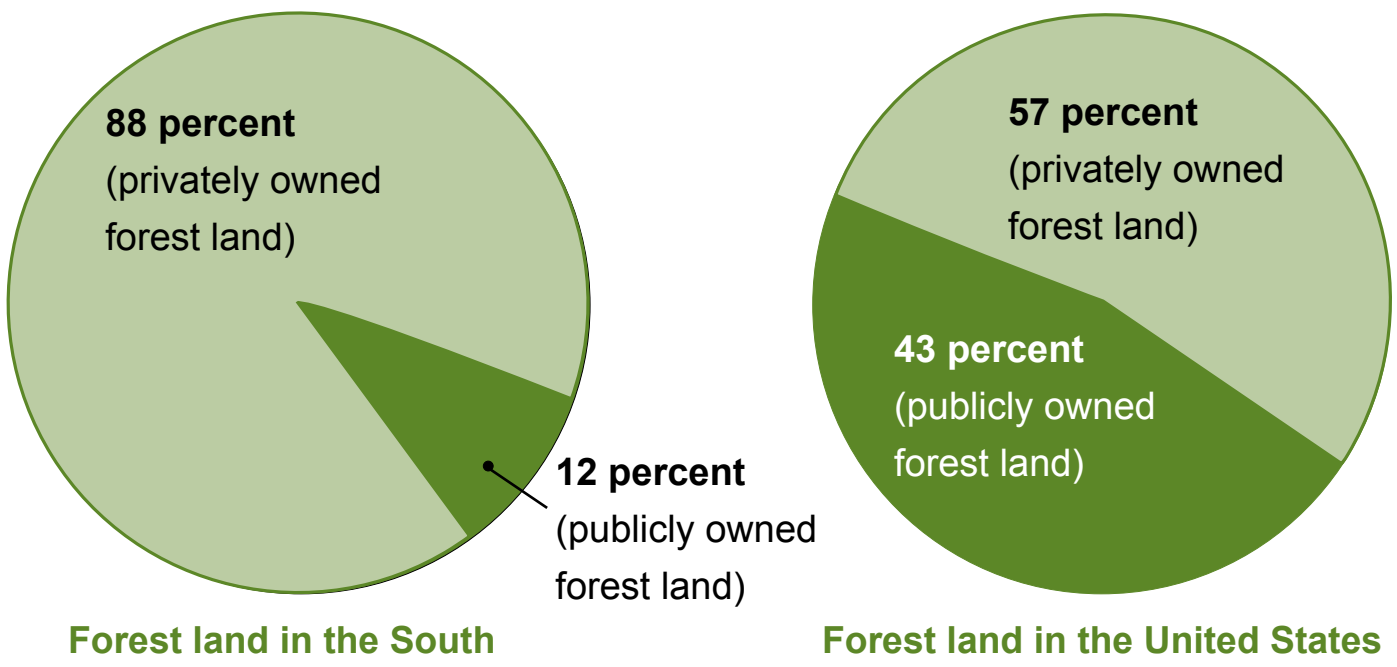
The scientists in this study wanted to know how effective the programs are that provide financial incentives to private forest landowners in the South. Specifically, they wanted to know whether the programs are meeting the goal of keeping southern forests healthy into the future.





Figure 1. Private forest land in Georgia.

Figure 2. Privately owned forest land in the South compared with the rest of the United States.





Reflection Section



Many people benefit from healthy forest land, even if they do not own it. Benefits include clean water and air, pretty scenery, homes for wildlife, and lower amounts of carbon dioxide in the atmosphere. Do you think it is fair to use taxpayer money to help nonindustrial private forest landowners practice sustainable forestry? Why or why not?

Why is it important to know if a program is achieving its goals?

Methods

The scientists decided to evaluate nine different programs offered by the Federal government (**figure 3**). They did not have enough money to collect information from the 4,300,000 private forest landowners in the South, so they needed a different way to collect their information. They thought about the people in each State who manage the federal programs. These people usually work for the State forestry agency that helps private forest landowners. The scientists decided that these people could answer the survey on behalf of the forest landowners in their State.

Figure 3. The scientists studied nine Federal financial assistance programs.

Program Name	Acronym	Date Created	Program Goal	Method of Assistance
Conservation Reserve Program	CRP	1985	Convert erodible farmland to less erodible land	Yearly payments to landowners for 10 to 15 years; provide up to 50 percent of the cost of planting new vegetation.
Wetlands Reserve Program	WRP	1985	Conserve wetlands	Payments to landowners to convert former wetlands back to wetlands or to keep wetlands as wetlands.
Forest Stewardship Program	FSP	1990	Keep forests in healthy condition	Advice and assistance to landowners to develop a written plan to keep their forests in healthy condition.
Forest Legacy Program	FLP	1990	Keep forest land from being converted to nonforest uses	Payments to landowners to provide permanent conservation easements on their private forest land.
Wildlife Habitat Incentives Program	WHIP	1996	Encourage the development and protection of wildlife habitat	Advice and assistance provided to develop a written wildlife management plan. Payments are made to landowners to help implement the plan.
Environmental Quality Incentives Program	EQIP	1996	Protect soil and water	Assistance, advice, and payments to farm and ranch owners to protect soil and water.
Forest Land Enhancement Program	FLEP	2002	Promote sustainable forest management	Advice and limited payments provided to landowners to support sustainable management practices.
Landowner Incentive Program	LIP	2003	Protect and restore habitat for plants and animals that are at risk	Advice and payments provided to landowners to develop and implement habitat management plans for plants and animals.
Southern Pine Beetle Prevention and Restoration Program	SPBPR	2003	Reduce the chance of Southern Pine Beetle attack, restore affected areas, and fund research about the Southern Pine Beetle	Advice and assistance, as well as limited payments, provided to landowners to implement practices that reduce the chance of Southern Pine Beetle attack. The Southern Pine Beetle is a beetle that attacks and kills southern pine trees.

For more information about the Conservation Reserve Program and the Wetlands Reserve Program, see “Fill Those Potholes” in the *Natural Inquirer* Ecosystem Services edition at <http://www.naturalinquirer.org>.

For more information on another type of pine beetle, see “Beetles Are Supercool!” in the *Natural Inquirer* Olympic Winter Games edition at <http://www.naturalinquirer.org> (electronic copy only).



What is a proxy?

Sometimes social scientists cannot get answers directly from the individuals in whom they are interested. For example, Federal scientists cannot ask personal questions of individuals younger than age 18. If these scientists want to get information about young people, they must ask parents, teachers, or older siblings. A person acting on behalf of another is called a proxy. In this study, State forestry employees were used as proxies for all of the private forest landowners in their State. Think of a time when you acted as a proxy for another person. Why did you have to act as a proxy? Share your experience with your class. What is one advantage of having a proxy? What is one disadvantage?

The scientists created a survey that used Likert scales to collect information about each program (see “Thinking About Science”). Most of the Likert scales had four ratings, with the number 4 meaning that the program was very effective. The scientists mailed their **survey** through the post office to a State forestry employee in each of the 13 Southern States (**figure 4**). The scientists followed up with phone calls and emails to get additional information. The scientists received answers from every one of the people they contacted.

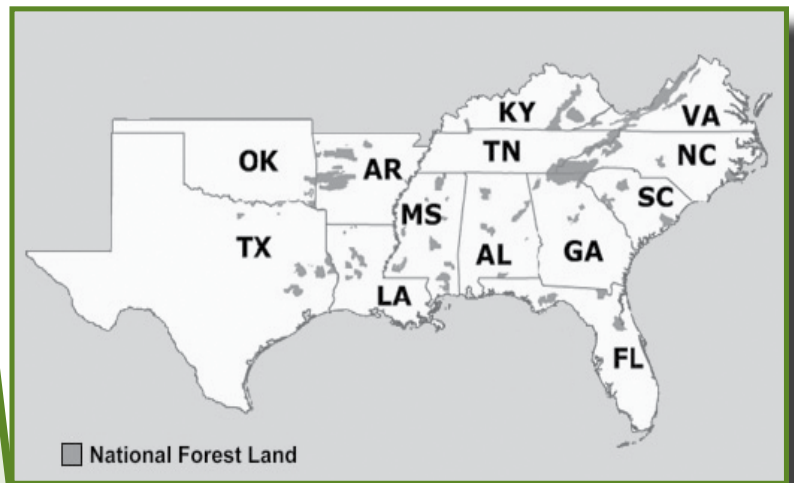


Figure 4. The scientists studied programs in 13 Southern States.

Remember that each State forestry employee was asked to answer the survey on behalf of the nonindustrial private forest landowners in his or her State. The scientists wanted to learn whether landowners were aware of the programs and whether they were interested in participating. The scientists wanted to know whether the programs were achieving program goals (**see figure 3**). They also wanted to know if the programs helped forest landowners to achieve their own goals for owning their land.



Figure 5. Some people own forest land so they can enjoy camping on their land.

People own forest land for many reasons. Some people own forest land to grow trees to sell for timber or to make paper. Other people own forest land so they can use it for recreation, such as hiking and camping (**figure 5**). People also own forest land to provide habitat for wildlife or to protect the soil and water. Some people own forest land because they enjoy looking at it. Usually, nonindustrial private forest landowners have many reasons for owning forest land. If you owned forest land, what would be your reasons?

Reflection Section



In the Likert scales used by the scientists, the number 4 meant that the program was very effective. What did the number 1 mean?

Look at figure 3. What makes the SPBPR different than the other financial assistance programs?



Findings



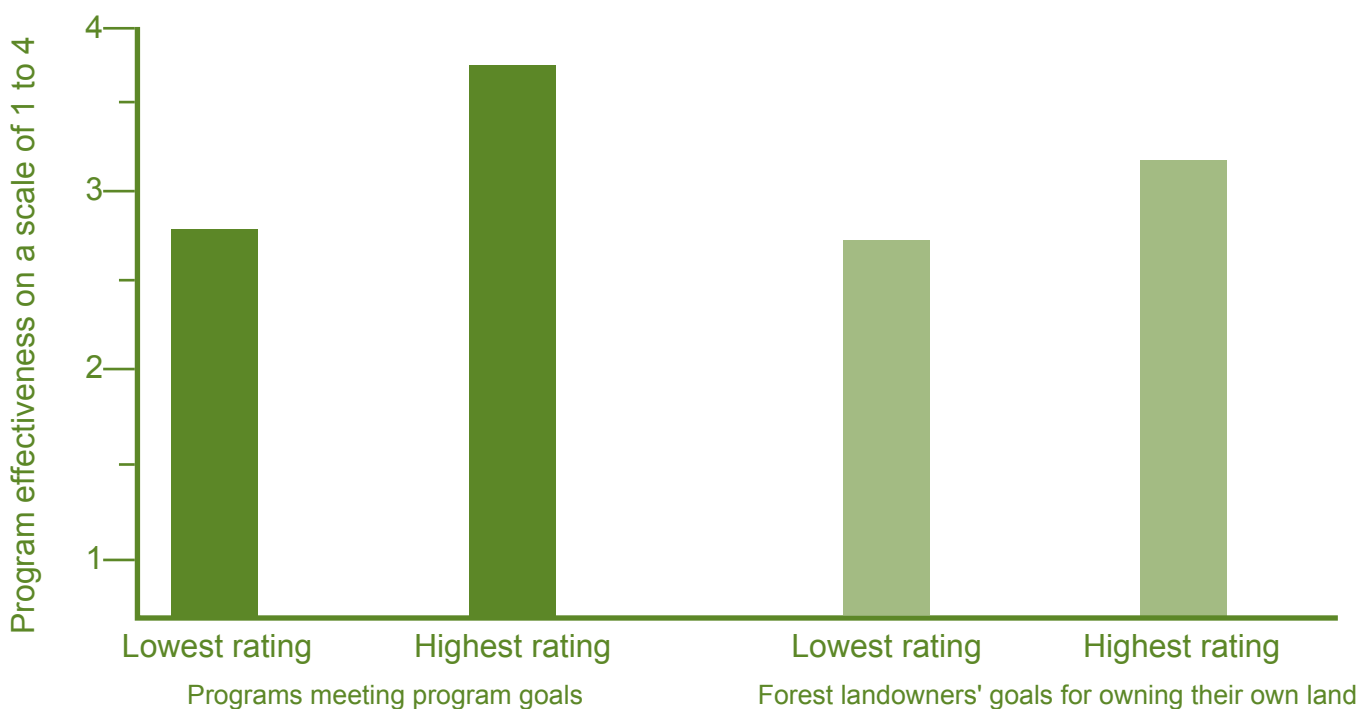
Remember that most of the Likert scales had four ratings. When the scientists calculated the average response from all 13 State forestry employees, the closer the average was to the number 4, the more favorable the result. It did not appear that landowners were very aware of the programs. This is because the average

ratings for the programs were between 1.75 and 2.69. The landowners that were aware of the programs, however, expressed some interest in participating in the programs with ratings between 2.50 and 3.38. The ratings for whether the programs were meeting program goals (see figure 3) and how well the programs help the landowners achieve their own goals for owning land are shown in figures 6 and 7.

Figure 6. Effectiveness of the Federal financial incentive programs (in table form).

	Lowest rating, based on a scale from 1 to 4	Highest rating, based on a scale from 1 to 4
Program effectiveness based on program goals	2.82	3.74
Program effectiveness based on forest landowners' goals for owning their own land	2.70	3.36

Figure 7. Effectiveness of the Federal financial incentive programs (in bar chart form).



Reflection Section



If you were one of the scientists in this study, what is one recommendation you would make about these Federal financial incentive programs based on these findings?

Do you think these programs are achieving their goals for forest sustainability? Why or why not?

Look at figures 6 and 7. They present the same information in different formats. Which is easier for you to understand? Why do you think it is easier to understand?

Are the programs more effective at reaching program goals or helping landowners achieve their own goals for owning land? How do you know?

Discussion



The scientists concluded that the programs are doing a better job of meeting program goals for forest sustainability than they are of meeting landowner goals for owning their land. The differences between them, however, are not that great. The scientists also concluded that more effort should be made to increase the awareness of these programs among southern forest landowners. Only 26 percent of southern forest landowners participated in any of the programs. The scientists concluded that this low rate of participation is limiting the overall effectiveness of the programs, including the achievement of forest sustainability.



Reflection Section



Go back to the end of the “Introduction” section and review the scientists’ questions. Based on the findings and discussion, how would you answer their questions?

Do you think the Government should work to increase awareness of and participation in these programs? Why or why not?

Do you think you could be affected by the effectiveness of these programs? Why or why not?

Pronunciation Guide

ā	as in ape	ū	as in use
a	as in car	u	as in fur
ē	as in me	ü	as in tool
ī	as in ice	ɪ	as in sing
ō	as in go	ə	as in about (both a and u)
oi	as in for		

Accented syllables are in **bold**. Marks are from the Merriam-Webster Pronunciation Guide.

Glossary

acronym (a krə nim): An abbreviation formed from the first letter or letters of each word in a phrase or name, such as USDA (United States Department of Agriculture).

conservation (kän(t) sər vā shən): Planned management of a natural resource to prevent exploitation, destruction, or neglect.

conservation easement (kän(t) sər vā shən ēz mənt): A legal agreement between a landowner and a government for the purposes of preserving or protecting a piece of land.

converted (kən vɔrt ed): Changed from one form or function to another.

economic (e kə nă mik): Relating to the production, distribution, or consumption of goods and services.

erodible (i rōd ə bəl): Able to wear away or deteriorate.

financial incentive (fə nan(t) shəl in sen tiv): The use of money to encourage action.

legacy (le gə sə): Something received from the past or from a person from the past.

policies (pă lə səz): Plans involving the goals and procedures of a government body.

stewardship (stü ərd ship): The careful management of something entrusted to one’s care.

survey (sər və): Spoken or written words used to ask questions. To ask in order to collect information for an analysis of some aspect of a group or area.

wetlands (wet landz): Lands or areas that are covered or sometimes covered with shallow water.

Adapted from Jacobson, M.G.; Greene, J.L.; Straka, T.J.; Daniels, S.E.; and Kilgore, M.A. 2009. Influence and effectiveness of financial incentive programs in promoting sustainable forestry in the south. *Southern Journal of Applied Forestry*. 33(1): 35-41. http://www.srs.fs.usda.gov/pubs/ja/ja_jacobson002.pdf.

FACTivity

Time needed:



Day 1: 15 minutes

Students will participate informally on days 2, 3, and 4 and keep a log of their activities.

Day 5: 25 minutes

Materials needed for each student:

Three copies of the log sheet on page 22.
A blank piece of paper and pencil.

In this FACTivity, you will receive an incentive to practice conservation at home and at school. At the end of the FACTivity, you will discuss your experience. The questions you will answer in this FACTivity are: What makes incentives work? What makes incentives fail?

Day 1:

After reading “Show Me the Money,” examine figure 3 and make a list of the types of incentives offered by the Federal programs. In a class discussion, identify and list other types of incentives. Think about the incentives offered by stores and other retail establishments to encourage a particular behavior, including free products, rebates, and coupons. Next, consider incentives that could be offered in your classroom to encourage a particular behavior. This might include special recognition over the loudspeaker, extra time in the media center, or an extra

dessert at lunch. Your class, along with your teacher, should agree on a particular incentive that would be of interest and value to most students.

Then, examine the log sheet on page 22 with other students and your teacher. Determine how much of the incentive you will receive for completing each conservation practice (or all conservation practices combined). This should be recorded in the last column of the log sheet.

For the next 3 days, voluntarily complete whatever conservation practices you choose. Check off each practice at its conclusion. You should certify that you have completed your sheets accurately by signing the log sheet.

Day 5:

Your teacher will collect the log sheets and distribute the incentives. In small groups, discuss your experience. In particular, answer the following questions:

- Did the incentive encourage you to complete the conservation practices? Why or why not?
- Would you have done these practices without the incentive? Why or why not?
- How is this incentive like the ones described in the article? How is it different?

Your teacher will then hold a class discussion to answer the questions posed at the beginning of this FACTivity.

Daily Log Sheet

Date: _____

Practice	Done sometimes	Done every time	Incentive
I turned off all appliances when not in use			
I turned off all lights when not in use			
I unplugged all electronics when not in use			
I turned off the water spigot when not in use			
I used every piece of paper at least twice if possible			
I recycled every piece of paper after I was finished			
I recycled all plastic and aluminum			
I cleaned up all litter that I saw			
I adjusted the thermostat at least 1 degree further than I normally would have (warmer in summer, cooler in winter)			
I shortened my shower by at least 1 minute			
I reused at least one thing that I would have normally thrown away			
If one incentive is used for all practices, describe:			

Student signature _____ Date _____

cut along dotted line



Landowner Assistance Flier

Students: Remove this two-sided flier from the *Natural Inquirer* monograph and take it home to your parents or guardians.

Why is the 2008 Farm Bill important?

If you are the owner of forested property or woodlands, you may qualify for landowner assistance under the 2008 Farm Bill program.

If the future plans or goals for your forested or woodland property include:

- Conserving soil and water resources
- Establishing wildlife habitat
- Sustaining your woodlands
- Implementing your forest management plan
- Restoring wetlands

If you are not the owner of forested property or woodlands but know someone who is, the owner may qualify for assistance under the 2008 Farm Bill program. Please pass this information to the owner.

...then the Farm Bill may support your plans. This Farm Bill has opportunities for those interested in technical and financial assistance for applying conservation activities in their woodlands.

What are the benefits for woodland owners?

The U.S. Department of Agriculture (USDA) offers a variety of financial incentives to woodland owners who are engaged in conservation activities. Some programs offer annual payments for a conservation use, others offer one-time, up-front payments for long-term easements conservation, and most include Government funds to share the cost of implementing your forest management plan.

To qualify for assistance, you must develop a forest management plan for your property.

A forest management plan is a document that you develop and write with a professional forester. The plan

outlines the values and goals you have for your property and how you will manage the woodlands for long-term sustainability. Examples include wildlife, recreation, aesthetics, timber, watershed protection, carbon sequestration, or any other value you deem important.

Why is a forest management plan important?

A forest management plan, if developed by a professional forester and put into practice, can ensure the long-term sustainability of the multiple benefits that are important to you. It is also a requirement before accessing financial assistance with some Farm Bill programs.

How do I develop a forest management plan?

To develop your plan, you will need to work with a professional forester. Contact your State forester for planning assistance opportunities. Contact information for your State forester can be found at <http://www.stateforesters.org>.

How do I apply?

Before you can complete a program application, you will need to sign up with the USDA. Here is an introduction to the basics steps:

1. Locate your nearest USDA Service Center by visiting <http://offices.usda.gov>. Your local USDA Service Center can answer questions and provide the necessary forms and applications.
2. Get your information together in advance. To ensure the application process goes smoothly, gather your information before going to your local USDA Service Center. Contact your local USDA Service Center if you have any questions. You will need:
 - a. The deed for your property.
 - b. A forest management plan.
 - c. Form CCC-926, Average Adjusted Gross Income (AGI) Statement. You will need to complete this form for the previous 3 years of tax returns.

3. Register at your USDA Service Center. Your local USDA Service Center employee will assist you in registering. You will need:

- a. Name, address, and property information.
- b. Completed AGI form: This self-report form is used to determine if you meet the AGI limitation for program participation. AGI form location: http://www.fsa.usda.gov/Internet/FSA_File/ccc_926.pdf
- c. Completed Highly Erodible Land and Wetland Determination form. HEL and Wetland Determination Form location: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044278.pdf

4. Complete your program application. Once you have registered, the next step is to complete a program application for the Farm Bill programs that are of interest to you.

Where can I learn more?

To find out more information and receive technical assistance, contact one or more of the following organizations.

Your local USDA Service Center (<http://offices.usda.gov>) for:

- Technical assistance
- Information on program applications, due dates, and eligible practices
- Assistance in development, and, if approved, implementation of conservation program application

The USDA Natural Resources Conservation Service (NRCS) (<http://www.nrcs.usda.gov>) for:

- Technical assistance
- Information on program applications, due dates, and eligible practices
- Assistance in development, and if approved, implementation of conservation program application

- Information on specific programs: Environmental Quality Incentives Program (EQIP), Conservation Stewardship Program (CSP), Farm and Ranch Lands Protection Program (FRPP), Healthy Forests Reserve Program (HFRP), Wildlife Habitat Incentive Program (WHIP), and Wetlands Reserve Program (WRP)

The USDA Farm Service Agency (FSA) (<http://www.fsa.usda.gov>) for:

- Information on program applications, due dates, eligible practices, and more
- Assistance in the development, and if approved, implementation of conservation program application
- Information about specific programs: Conservation Reserve Program (CRP), Biomass Crop Assistance Program (BCAP), and Emergency Forest Restoration Program

The USDA Forest Service

(<http://www.fs.fed.us/cooperativeforestry/>) for:

- Technical assistance
- Information on the Forest Stewardship Program
- Information on the Forest Legacy Program

Your State forestry agency for:

- Technical assistance
- Assistance in developing the forest management plan development through the Forest Stewardship Program
- Information about other opportunities for woodland owners to participate in cost-share programs
- To find your State forester and your State forestry agency, visit http://www.stateforesters.org/about_nasf or <http://www.treefarm.system.org/stateforesters>

For more information, visit the following Web sites.

The 2008 Farm Bill and assistance programs:

http://www.forestfoundation.org/pdfs/AFFFarmBillBrochure_web_lo.pdf

Forest Landowner Financial Incentive Programs:

<http://www.srs.fs.usda.gov/econ/data/forestincentives/>

Forest Landowner-related publications:

<http://www.affoundation.org/publications.html> and www.treefarmssystem.org

This information was adapted from http://www.forestfoundation.org/pdfs/AFFFarmBillBrochure_web_lo.pdf.

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Teachers

If you are a trained Project WILD educator, you may use
“Sustainability: Then, Now, Later.”

If you are a trained Project Learning Tree educator, you may use Activity #50:
“400-Acre Wood.”

Web Site Resources

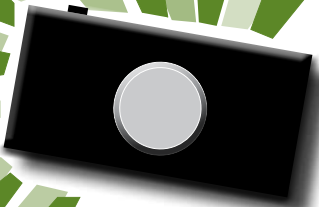
Forestry financial incentive programs by State:
<http://www.srs.fs.usda.gov/econ/data/forestincentives/>

Resources about southern forests for teachers:
<http://www.seesouthernforests.org/teachers>

Discover southern forests:
<http://www.seesouthernforests.org/discover-southern-forests/welcome>

Nature-Oriented Parenting Newsletter:
<http://www.cfaia.org>

Show Me the Money Figure it Out!



Explain what each of these illustrations represent.



Students may do this activity as a class discussion or write their explanations on a piece of paper. Be sure to add a class discussion if students write their explanations.

57 percent

43 percent

88 percent

12 percent

Show Me the Money

Create a Phrase

Draw a line from one list to the other to create a phrase from the article. Use words in each column only once.

Forest

recreation

Federal

program

Cross-country

landowner

Outdoor

government

Likert

sustainability

Strongly

social scientist

Forest Legacy

agree

Pine

scale

Forest

tree

Interdisciplinary

skiing

On a separate piece of paper, write what each phrase means in the article.

Note to Educators

The Forest Service’s mission is to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations. For more than 100 years, our motto has been caring for the land and serving people. The Forest Service, U.S. Department of Agriculture (USDA), recognizes its responsibility to be engaged in efforts to connect youth to nature and to promote the development of science-based conservation education programs and materials nationwide.

The *Natural Inquirer* is a science education resource journal to be used by students in grade 5 and up. The *Natural Inquirer* contains articles describing environmental and natural resource research conducted by Forest Service scientists and their cooperators. These are scientific journal articles that have been reformatted to meet the needs of middle-school students. The articles are easy to understand, are aesthetically pleasing to the eye, contain glossaries, and include hands-on activities. The goal of the *Natural Inquirer* is to stimulate critical reading and thinking about scientific inquiry and investigation while teaching about ecology, the natural environment, and natural resources.

The Format of a *Natural Inquirer* Article

Each *Natural Inquirer* article follows the same format. This monograph contains only one article that was written directly from a published science article and was reviewed by the scientists for accuracy. The article contains the following sections, which you may introduce to your students as they read:

Meet the Scientists: Introduces students to the scientists who did the research. This section may be used in a discussion about careers in science.

What Kind of Scientist?: Describes the work of each kind of scientist.

Thinking About Science: Introduces something new about the scientific process, such as a scientific habit of mind or procedures used in scientific studies.

Thinking About the Environment: Introduces the environmental topic being addressed in the research.

Introduction: Introduces the problem or question being addressed by the research.

Method: Describes the method used by the scientists to collect and analyze their data.

Findings: Describes the results of the analysis.

Discussion: Discusses the findings and places them into the context of the original problem or question.

Reflection Section: Presents questions aimed at stimulating critical thinking about what has been read or predicting what might be presented in the next section. These are placed at the end of each of the main article sections.

Number Crunches: Presents an easy math problem related to the research.

Glossary: Defines potentially new scientific or other terms to students. The first occurrence of a glossary word is **bold** in the text.

Citation: Gives the original article citation with a Web link to the original article.

FACTivity: Presents a hands-on activity that emphasizes something presented in the article.

Puzzles: These puzzles provide an extra challenge for students to test their comprehension (pages 26 and 27).
A lesson plan is provided on page 29.

Education Standards and Evaluations

In the back of the journal, you will find a matrix that enables you to identify articles by the national education standards that they address. Both National Science Education Standards and National Curriculum Standards for Social Studies are addressed. Evaluation forms for both educators and students are available on our Web site. We welcome any feedback so please visit <http://www.naturalinquirer.org> and complete the online evaluation forms. In addition, you may contact Dr. Barbara McDonald at the address below with any comments you have.

Dr. Barbara (Babs) McDonald

Forest Service

320 Green St.

Athens, GA 30602-2044

706.559.4224

bmcdonald@fs.fed.us

(Please put “Educator Feedback” in the subject line)

Educator Resources

For upper elementary students, check out the *Investigator* at <http://www.scienceinvestigator.org>.

Visit the *Natural Inquirer* Web site at <http://www.naturalinquirer.org>.

From this site, you can order more editions; and read and download lesson plans, word games, and other resources to help you use the *Natural Inquirer* in your classroom. You can also view and download a yearlong lesson plan aimed at helping your students learn about the scientific process.

Visit the *Natural Inquirer* Web site at
<http://www.naturalinquirer.org>.



Lesson Plan

The “6-W” Questions

Note: This is a generic lesson plan that can be used with any *Natural Inquirer* or *Investi-gator* article. For more generic lesson plans covering a variety of reading science strategies, see <http://www.naturalinquirer.org>. Generic lesson plans can be found by clicking on “Education Resources.”

In this lesson plan, students will read a *Natural Inquirer* article and write short summary notes from each section. Students will then create “6-W Poems” that reflect their understanding of the article.

Time Needed: 2 class periods

Supplies needed for each student:

A *Natural Inquirer* article.

A copy of the graphic organizer on page 31.

A blank lined piece of paper.

A pen or pencil.

Period 1:

Background:

If students are not already familiar with the following questions, introduce students to the “5-W” and “1-H” questions used by investigators from many fields. These are also called the “6-W questions.”

The “6-W questions” provide a formula used in investigative reporting, police investigations, and all kinds of research. These questions are regarded as basic to inquiry and information gathering. They provide a way to get the “full” story on something. Each of the questions is an interrogative question.



The six W questions are:

Who is it about?

What happened?

When did it happen?

Where did it happen?

Why did it happen?

HoW did it happen?

The “6-Ws” were memorialized by Rudyard Kipling in his *Just So Stories* (1902), in which a poem accompanying the tale of “The Elephant’s Child” opens with:

I keep six honest serving-men

(They taught me all I knew);

Their names are What and Why and When

And How and Where and Who.

(The background information above was adapted from http://en.wikipedia.org/wiki/Five_Ws.)

Give each student a copy of the graphic organizer. As students read the *Natural Inquirer* article, have them complete the graphic organizer for each section. Students should answer as many questions as possible for each section, but may find that some questions cannot be answered for a section.

Students may also find that there is more than one answer to some of the questions. They can include as many answers as they want, or they may focus on one or two. If they need help to get started, complete the “Introduction” as a class exercise.

Assessment Rubrics for the graphic organizer and the poem are given at the end of the lesson plan. You may use either or both rubrics.

Period 2:

Students will review their graphic organizers and if needed, may scan parts of the *Natural Inquirer* article that they read in the previous period.

Introduce “the 6-Ws Poem” form to students. This is a form of non-rhyming poetry in which all 6 of the W questions are answered. Students will use their graphic organizer (and the *Natural Inquirer* article if needed) to write their poem.

Line 1—Who or what is the poem about?

Line 2—What action is happening?

Line 3—When does the action take place?

Line 4—Where does the action take place?

Line 5—Why does this action happen?

Line 6—How does the action take place?

Here is an example of a “6-Ws Poem” from the *Natural Inquirer* article from the “Woolly Bully” monograph. Note that the questions may be answered in any order, and a question may require up to two lines:

Scientists interested in water and trees (Who)

Put meters in trees and streams (How)

They measure the flow of water (What)

In Western North Carolina (Where)

While the trees still live. (When)

How much will flow in streams (What)

When a tiny insect kills? (Why)

Note that an almost infinite number of poems could be written from one article, depending on the focus taken by the poet.

After students have written their poems, they should share them with the class. Other students can provide interpretations of what each line means and which “W” question is being addressed. Poems may be posted on the wall and electronic copies can be shared with the *Natural Inquirer* by sending to Jessica@naturalinquirer.org.

Assessment Rubric for Graphic Organizer

Each section is worth 25 points (100 points for the entire organizer). Score each section in this manner:

- 1 question answered correctly: 10 points
- 2 questions answered correctly: 12 points
- 3 questions answered correctly: 15 points
- 4 questions answered correctly: 18 points
- 5 questions answered correctly: 22 points
- 6 questions answered correctly: 25 points

Assessment Rubric for 6-W Poem

1. Number of lines written (0-6 points, 6 is the maximum score for this item)
2. Number of lines answering a unique “W” question (0-6 points)
3. Evidence of correct comprehension for each “W” question answered (0-6 points)

Scoring on a 100-point scale:

- 0: 0
- 1-5: 25
- 6-10: 50
- 11-15: 75
- 16-17: 85
- 18: 100

This lesson plan was created with ideas from http://www.mnelsonhome.com/Poetry%20ex/15_forms_of_poetry.htm.

Graphic Organizer

Name: _____

The Six W Questions

Introduction

Who?	Where?
What?	Why?
When?	HoW?

Methods

Who?	Where?
What?	Why?
When?	HoW?

Findings

Who?	Where?
What?	Why?
When?	HoW?

Discussion

Who?	Where?
What?	Why?
When?	HoW?

Possible Answers to Questions in the Reflection Sections

INTRODUCTION

Many people benefit from healthy forest land, even if they do not own it. Benefits include clean water and air, pretty scenery, homes for wildlife, and lower amounts of carbon dioxide in the atmosphere. Do you think it is fair to use taxpayer money to help nonindustrial private forest landowners practice sustainable forestry? Why or why not? *Students will have individual answers to this question. They should, however, be able to back up their answer using logic and reason.*

Why is it important to know if a program is achieving its goals? *If you do not know if a program is achieving its goals, you may be spending time and money without having the effect you desire.*

METHODS

In the Likert scales used by the scientists, the number 4 meant that the program was very effective. What did the number 1 mean? *The program was very ineffective.*

Look at figure 3. What makes the SPBPR different than the other financial assistance programs? *Students may have many answers to this question. The most obvious difference is that the program is focused on a particular forest pest. The other programs were much more general in their intent.*

FINDINGS

If you were one of the scientists in this study, what is one recommendation you would make about these Federal financial incentive programs based on these findings? *The programs need to be better advertised to forest landowners because not many knew about the programs. Students may have a variety of answers, but they should be able to say why they would make their recommendation based on the study's findings.*

Do you think these programs are achieving their goals for forest sustainability? Why or why not? *Students will have individual answers to this question. Help students explore whether they can answer this question based on the information in this article.*

Look at figures 6 and 7. They present the same information in different formats. Which is easier for you to understand? Why do you think it is easier to understand? *Students will have individual answers to these questions. Hold a class discussion about the advantages and disadvantages of tables and charts for presenting findings.*

Are the programs more effective at reaching program goals or helping landowners achieve their own goals for owning land? How do you know? *The programs were slightly more effective at reaching program goals. Figures 6 and 7 show that the ratings for program goals were slightly higher than for landowner goals.*



DISCUSSION

Go back to the end of the “Introduction” section and review the scientists’ questions. Based on the findings and discussion, how would you answer their questions? *Students will have individual answers to this question. Students should, however, realize that with only 26 percent of the landowners participating in any of the programs, the programs’ effectiveness is limited.*

Do you think the Government should work to increase awareness of and participation in these programs? Why or why not? *Students will have individual answers to these questions. They should, however, back up their answers with logic and reason.*

Do you think you could be affected by the effectiveness of these programs? Why or why not? *Students should realize that regardless of where they live, they could be affected by healthy or unhealthy southern forests. For students living in or near the South, the effect could be even greater. If forests are not as healthy in the future as they could have been, the air and water may not be as clean, outdoor recreation opportunities may be reduced, less carbon will be kept on Earth, and fewer forest products may be available.*

Class Discussion Threads

You may want to challenge your students to use this article to reflect on “big questions.” These are questions that have no definitive answers, but stimulate critical thinking and reflection. This article provides a gateway for students to think more broadly about the role of government in private affairs. Small group or whole-class discussions may be used to explore these big questions. Students may also be asked to write an essay to address this big question.

The role of government in private affairs: This article describes governmental programs aimed at encouraging private landowners to manage their land in an environmentally-sound manner. When the actions of private citizens can benefit society as a whole, should governments use taxpayer money to encourage these beneficial actions? Why or why not? Related issues that address the same big question are: providing tax breaks for solar heating systems or for purchasing hybrid automobiles; providing low-interest loans for small business owners; providing tax credits for first-time home buyers; and providing flu shots and vaccinations at no or low-cost. Encourage your students to consider this big question by comparing and contrasting these different situations.

Which National Education Standards Can Be Addressed Using this Monograph?

National Science Education Standards

Science as Inquiry

Abilities Necessary To Do Scientific Inquiry: p. 4: Who Are Scientists?; pp. 8-9: Meet the Scientists; p. 11: Thinking About Science; Methods, p.14: Making an adjustment in methods because of financial constraints; p. 16: Using a proxy

Understandings About Scientific Inquiry: p. 10: What Kind of Scientist?; p. 16: What is a proxy? The use of Likert scales and the importance of following up when collecting data; p. 17: Method Reflection Section, Question 1; Findings Reflection Section, Questions 3 and 4; p. 20: Discussion Reflection Section, Questions 1-3: These questions require students to think critically about the findings.

Life Science

Populations and Ecosystems: Figure 3, p. 15: A critical review of the different programs will allow exploration of this standard.

Science in Personal and Social Perspectives

Science and Technology in Society: p. 8: Meet the Scientists explores how science benefits society; p. 10: What Kind of Scientist explores the ways different scientists study things of importance to society; p. 12: Introduction and p. 18: Findings: How science helps to determine the impact of social programs; p. 19: Discussion: Explores how the findings can be applied to social problems; p. 20, Discussion Reflection Section, Question 3: Requires students to apply the findings to their own lives.

History and Nature of Science

Science as a Human Endeavor: p. 4: Who Are Scientists?; p. 8: Meet the Scientists; p. 10: What Kind of Scientist?

National Curriculum Standards for Social Studies

People, Places, and Environments

p. 7: What Are Nonindustrial Private Forests?; p. 9: Meet the Scientists: Both Straka and Daniels describe the relationship of people to the land; p. 11: Thinking About the Environment: The large number of private nonindustrial forest landowners in the South; The responsibility to manage one's own land in a sustainable fashion; p. 13, figure 2: Compare the amount of private forest land in the South with the rest of the United States; p. 17, sidebar: Landowner reasons for owning forest land

Individuals, Groups, and Institutions:

p. 7: Government and private ownership of forest land; p. 15, figure 3: This table enables students to examine government programs and how they benefit individual land owners. This also allows students to reflect on whether society also benefits from these programs; Findings, particularly figures 6 and 7: Are individuals or society benefitting more from these programs? p. 19, Findings Reflection Section, Question 4: Are individuals or society benefitting more from these programs?; p. 19, Discussion: Who is benefitting from these programs?

Power, Authority, and Governance:

General discussion: Should governments provide these programs to landowners? Why or why not?

Production, Distribution, and Consumption:

General discussion: If healthy forest land is important to the Nation's future, what should be government's role in encouraging it by providing incentives?

Civic Ideals and Practices:

General discussion: Is responsible and sustainable forest land ownership a civic duty? Why or why not?



What Is the Forest Service?

The Forest Service is a part of the United States Department of Agriculture (USDA). It is made up of thousands of people who care for the Nation’s forest land. The USDA Forest Service manages over 150 national forests and almost 20 national grasslands. These are large areas of trees, streams, and grasslands. National forests are similar in some ways to national parks. Both are public lands, meaning that they are owned by the public and managed for the public’s use and benefit. Both national forests and national parks provide clean water, homes for the animals that live in the wild, and places for people to do fun things in the outdoors. National forests also provide resources for people to use, such as trees for lumber, minerals, and plants used for medicines. Some people in the USDA Forest Service are scientists, whose work is presented in the journal. USDA Forest Service scientists work to solve problems and provide new information about natural resources so that we can make sure our natural environment is healthy, now and into the future.

For more information, visit <http://www.fs.fed.us>.



What is the Cradle of Forestry in America Interpretive Association?

The Cradle of Forestry in America Interpretive Association (CFAIA) is a 501(c)3 nonprofit organization based out of Brevard, NC. The Interpretive Association strives to help people better understand ecology through recreation and education opportunities. Their projects include:

- Campground and recreation area management.
- Educational programs and services, including the *Natural Inquirer*.
- Sales of forest-related gifts and educational materials.
- Workshops, newsletters and publications.
- Partnership with the Forest Service to provide programming at the Cradle of Forestry Historic Site.

Learn more about the CFAIA by visiting <http://www.cfaia.org>



What Is the Southern Research Station?

The Southern Research Station’s mission is to create the science and technology needed to sustain and enhance southern forest ecosystems and the benefits they provide. The station is part of USDA Forest Service Research and Development. Headquartered in Asheville, NC, the station serves 13 Southern States and beyond. Since the beginning of the 20th Century, the Southern Research Station’s 130 researchers have excelled in studies on temperate and tropical forests, forest resources, and forest products. These studies provide a wealth of long-term information on the dynamics of tree plantations and natural stands, watersheds, and wildlife habitats.

For more information, visit <http://www.srs.fs.usda.gov/>

Student Editorial Review Board

Sandy Creek Nature Center Teen Day Camp,
Athens-Clarke County, Georgia.
Tim Kinnard, Camp Director



Visit these Web sites for more information:

Natural Inquirer

<http://www.naturalinquirer.org>

Forest Service Conservation Education

<http://www.fs.usda.gov/conservationeducation>

(Click on Conservation Education)

Discover the Forest

<http://discovertheforest.org>

Earth and Sky radio series

<http://www.earthsky.org/about/radio-affiliates>

Project Learning Tree

<http://www.plt.org>

The Investi-gator

<http://www.scienceinvestigator.org>

