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

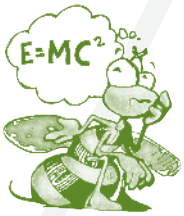
My favorite science experience was helping cross-country skiers and snowmobile users work together to make decisions. They both wanted to use the same area for outdoor recreation. Snowmobiling and cross-country skiing, however, are very different activities that may not always be compatible. The outcome 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** lä jists) study individuals and sociologists (**sə** sə **ä** lə jists) study groups of people. Social scientists also include archeologists (**ar** kə **ä** lə jists), anthropologists (**an(t)** thrə **pä** 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 (**lək** ərt) 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

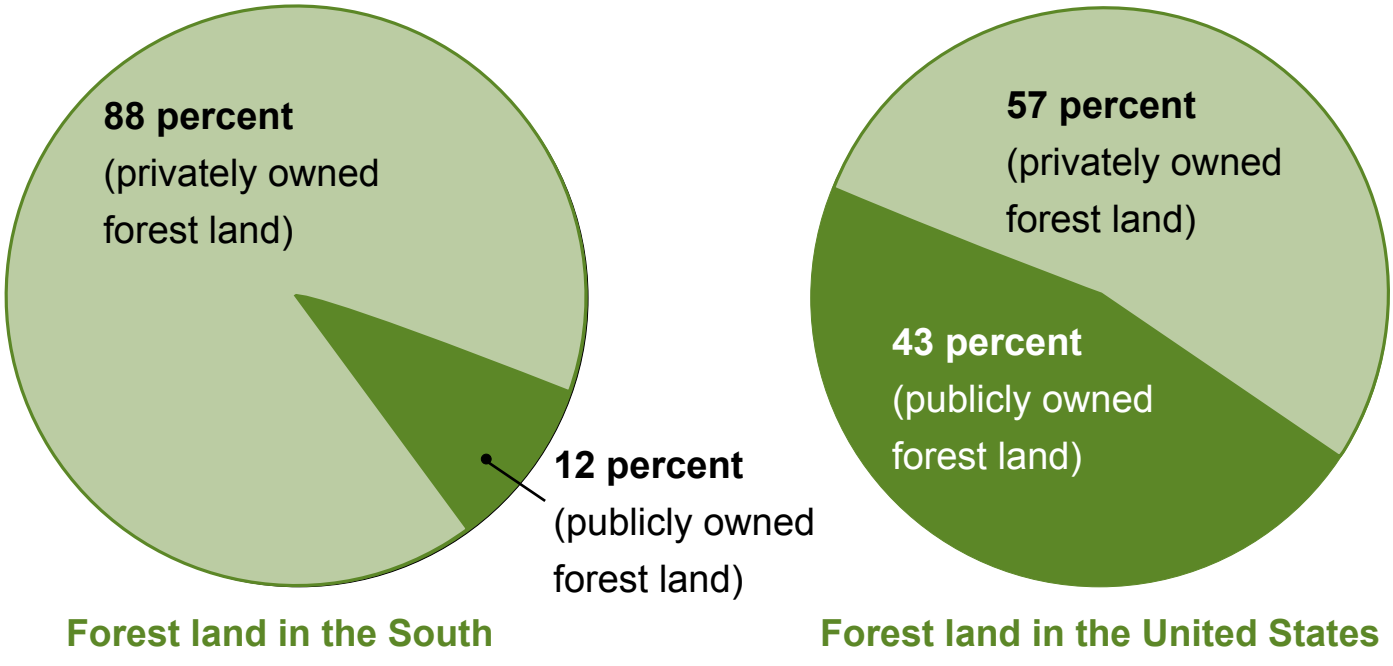
Over the past 40 years, Federal and State governments have provided **financial incentives** to private forest landowners. In the early years, the incentives encouraged landowners to grow and cut trees for timber or for paper production. For the past 25 years, the incentives have encouraged private landowners 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.

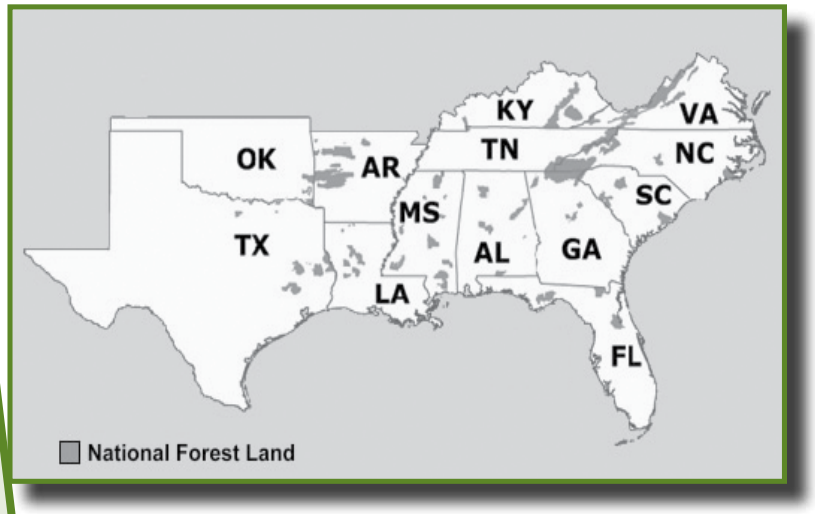


Figure 4. The scientists studied programs in 13 Southern States.

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?

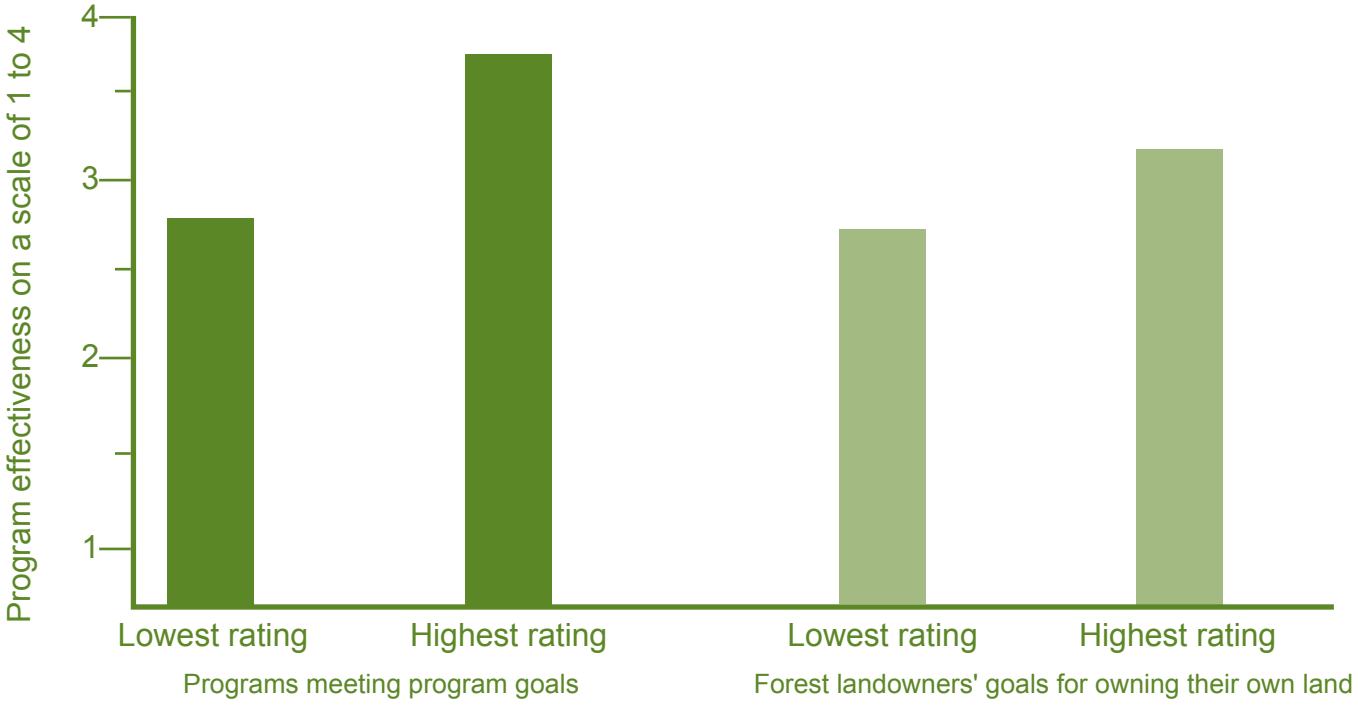
Findings

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	ŋ	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 **vərt** ed): Changed from one form or function to another.

economic (**e** kə **nä** 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 (**pä** 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_____