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Introduction

Purpose



The **FOREST FEVER** CD-ROM offers educators of all types a teaching tool that:

- is fun and interactive
- provides the student a balanced viewpoint of the profession of forestry and the forest industry
- promotes the practice of sustainable forest management
- emphasizes the career opportunities in forest resources management

Forest Fever is designed to capture the intrigue of high school students. This is accomplished by including topic-specific information, enrichment activities that challenge students to apply science, math, language arts and critical thinking skills, and an exploration into career opportunities in forestry resources.



The *Forest Fever* CD-ROM is hosted by three dynamic young men and women, each of which represents a specific role in forestry: managing environment, economic, and social objectives. They deliver enlightening descriptions of their forest-related careers and specific examples of the types of challenges and decisions they encounter each day in their work. Finally, they discuss how each of these roles must be considered to establish and maintain a balanced, healthy, and productive forest.



Introduction

CD/Teacher's Guide Features

The *Forest Fever* CD uses video, text, interactive learning episodes, and links to the Internet to facilitate the learning process. Navigation buttons allow the user quick and easy access to the desired section. The user can replay, fast forward, and pause the videos at any time, thus allowing the instructor flexibility to lead a discussion or activity related to a specific section.



INTRODUCTORY MESSAGE

The Introductory Message primes the user with basic information about the practice of sustainable forestry, the benefits of the forest, and outlines the learning objectives set forth for the CD.



ENVIRONMENT, ECONOMIC, AND SOCIAL

These sections provide the user with topic-specific content information related to forestry. In addition to this information, the hosts describe the challenges associated with their specific job responsibilities.



MESSAGE

Videos in each section provide basic information about each host's goals and responsibilities. The Background section of this Teacher's Guide has additional information that corresponds with the video message. Background information may be used for class discussion or lecture.



Introduction

CD/Teacher's Guide Features (continued)

PRESS CONFERENCE

Included in each section is an interactive Press Conference. The virtual press asks four questions to test the user's knowledge. Then the user selects the correct multiple-choice answer. The corresponding Press Conference pages in this Teacher's Guide give the questions, answers, and explanation of each answer to help the teacher with class discussion.



GUIDELINES

Finally, the Environment, Economic, and Social hosts each offer Guidelines for their different approaches to forest management tools. In the Guidelines section, students will learn about 12 functions performed in forestry, and how each host might perform these functions differently. These Guidelines will help the students manage their own virtual forests later in the lesson plan. Teachers may use the For Example... pages of this Teacher's Guide to provide specific examples or further explanation of the Guidelines in their class discussions. Handouts of the Guidelines for each section are provided in the Additional Resources section of the Teacher's Guide. Pre-written Assessments for each section are provided in the Teacher's Guide. Enrichment Activities are also provided and are correlated to state standards.



BALANCE

The Balance Section is hosted by all three personalities. Students learn here that forest management requires cooperative interaction. The underlying message is this: to reach the desired objectives of a forest landowner, a forest manager must balance the environment, economic, and social objectives.



Introduction

CD/Teacher's Guide Features (continued)

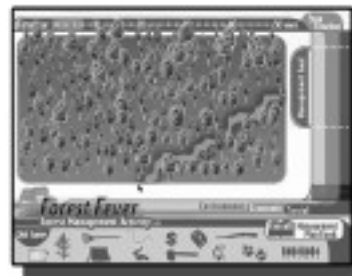
NATURAL DISASTERS

Next, the CD-ROM describes Natural Disasters or conditions such as wildfire, disease, and endangered species that are present in the forest, and how they affect the forest ecosystem. These Natural Disasters will help the students manage their own virtual forests later in the lesson plan. Teachers may use the For Example... pages of this Teacher's Guide to provide specific examples or further explanation of Natural Disasters in their class discussions. Also, a handout of the Natural Disasters is provided in the Additional Resources section of the Teacher's Guide.



FOREST MANAGEMENT ACTIVITY

The Forest Management Activity is a forest growth simulation. Students watch a forest grow before their eyes. They are expected to use their newly gained knowledge to manage and grow a forest for 50 years (5 minutes). The user develops an understanding of the complexity of managing a forest while balancing environmental, economic, and social perspectives. The final score is based on successfully balancing environmental, economic, and social objectives. Teachers may use the Forest Management Tool Kit located in the Teacher's Guide to instruct their students on how to use the Forest Management Activity effectively. A student handout of the toolkit is located in Additional Resources. Additionally, Enrichment Activities are provided for and are correlated to your state standards. All scores for the Press Conference Activities and Forest Management Activity are saved to a file on the computer's desktop, along with the student's Login information and the date and time of the disc's use.



Introduction

Presenting Forest Fever in the Classroom



The description below is a recommendation of how to present the *Forest Fever* CD-ROM and accompanying Teacher's Guide materials. The amount of time you spend on each section is at your discretion.

STAGE 1:

- Read the Introduction and CD/Teacher's Guide Features in the Teacher's Guide and install the CD-ROM on your classroom computer. Begin the CD-ROM and **show the Introductory video**.
- From the Main Menu of the CD-ROM, go to the (Environment, Economic, or Social) Section and **show the video**.
- Hold a **class discussion** using the "Background Notes" found in the Message section of this guide.
- Begin the **Press Conference Activity** on the CD-ROM, and solicit answers from the class.
- Hold a **class discussion** using the "Press Conference Questions – Further Explanation" prompts found in the Message section of this guide.
- Pass out copies of the (Environmental, Economic, or Social) **Guidelines student handout**, found in the Additional Resources section of the guide. Begin the Guidelines section of the CD-ROM.
- Use the "**For Example...**" **talking points** in the Message section of the guide to enhance class discussion, and encourage students to take notes on their handouts.
- **Repeat** this process with the two (2) remaining topics.

STAGE 2:

- From the Main Menu, go to the **Balance Section** and **show the introductory video**.
- Pass out copies of the **Natural Disaster Guidelines student handout**, found in the Additional Resources section of the guide. Begin the Natural Disasters Guidelines screen in the Balance Section of the CD-ROM. Use the "For Example..." talking points in the Message section of the guide to enhance class discussion, and encourage students to take notes on their handouts.

Introduction

Presenting Forest Fever in the Classroom



STAGE 2 (CONTINUED) :

- Before you begin the Forest Management Activity, pass out copies of the **Forest Management Tool Kit student handout**, found in the Additional Resources section of the guide. A **teacher's copy** is located in the **Balance Message** section of the guide. Discuss each of the forest management tools with the class before beginning the activity.
- As you **begin the Forest Management Activity**, encourage the students to use both their handouts and the "Management Plan Book" button on the screen to help them make good decisions.
- After completing the activity, discuss the successes and difficulties of the students' forest management plans. **Review the Guidelines handouts and the Management Tool Kit** and discuss ways to improve the plan.

STAGE 3:

- From the Main Menu, press the Exit button and **show the closing video**. Use the student assessment handouts in the Assessment section of the guide to test knowledge.
- Choose several activities from the **Enrichment Activities** section of the guide that correspond to each section of the CD-ROM (Environment, Economic, and Social). Initiate **class participation** activities or use as homework.
- Use the **Careers** section of the guide to **discuss** the areas of interest, organizations, and educational requirements associated with different careers in forestry.
- Use the **website link** from the CD-ROM to **research** more information about forestry topics, or allow students to access the website so that they can research topics of interest themselves.

Introduction

How to Read the Teacher's Guide



This guide is organized so that teachers may quickly understand the objectives, subject areas, and state standards of each page or activity. The "Message" Section incorporates the information presented in the *Forest Fever* CD-ROM into lecture materials. The "Enrichment Activities" Section provides classroom activities that relate to the *Forest Fever* materials. The "Assessment" Section provides questions about each section of *Forest Fever* to test knowledge. Finally, the "Additional Resources" Section gives the teacher more information about forestry careers, education, and more online resources as well as student handouts for the classroom.

Environment Section Objective

After completing the environment section, students will be able to discuss the process of photosynthesis, describe environmental benefits provided by a forest, and identify and explain Best Management Practices applied in forestry.

Background Objective

Use this information to enhance your lecture or class discussion before or after viewing the Environment Message video on the *Forest Fever* CD-ROM.

Subjects

Biology, Chemistry, History, Economics, Environmental Education, Government

State Standards

Biology—10, 38, 40, 41
Botany—10, 17, 19, 27, 28
Geology—7, 10, 46
Physical Science—7, 10

You will find the **objectives**, **subjects**, and the **state standards** listed in the shaded left column of each new section or in the shaded box underneath each Enrichment Activity. This means that you can choose which activities and information will best suit you and your students. Below is a brief description of each heading:

SECTION OBJECTIVE :

This area describes the specific educational goal(s) of each of the main menu sections of the *Forest Fever* CD-ROM: **Environment, Economic, Social, and Balance**. You will find the Section Objective on the first page of each section in Part I: Message of the Teacher's Guide.

BACKGROUND/PRESS CONFERENCE/ FOR EXAMPLE... OBJECTIVE :

This area describes the intended use for the information or activities listed on that page. This gives you a quick description of how to use the given information in your lesson plan.

Introduction

How to Read the Teacher's Guide (continued)

Environment Section Objective

After completing the environment section, students will be able to discuss the process of photosynthesis, describe environmental benefits provided by a forest, and identify and explain Best Management Practices applied in forestry.

Background Objective

Use this information to enhance your lecture or class discussion before or after viewing the Environment Message video on the Forest Fever CD-ROM.

Subjects

Biology, Chemistry, History, Economics, Environmental Education, Government

State Standards

Biology—10, 38,40, 41
Botany—10, 17, 19, 27,28
Geology—7, 10, 46
Physical Science—7, 10

SUBJECTS :

This area lists the specific subject areas covered through information or activities listed on that page. This lets you quickly determine which portions of each section directly apply to your class. The subjects are listed in the shaded left column in Part I: Message and in the shaded box under each activity in Part II: Enrichment Activities.

STATE STANDARDS :

This area lists the state standard correlations to the information or activities listed on the page. The state standards are listed in the shaded left column in Part I: Message and in the shaded box under each activity in Part II: Enrichment Activities.

This is how the **subjects** and **state standards** box is illustrated

Subjects/State Standards

Biology: 12,15-17, 32
Language Arts: 31-35

under each activity in Part II: Enrichment Activities.

FOREST/RECREATION FACTS :

Found in the Background subsection of the Message section, Forest Facts gives additional educational information that relates to the video in each of the three main *Forest Fever* sections: Environment, Economic, and Social.

TALKING POINTS :

Found in the Background subsection of the Message section, Talking Points provides the teacher with interesting facts or concepts meant to generate class discussion.

Introduction

How to Read the Teacher's Guide (continued)

HISTORY :

Found in the Background subsection of the Message section, History gives the background of some of the important legislative and environmental issues mentioned in the video from each section of *Forest Fever*.

DEFINITIONS :

Found in the Background subsection of the Message section, Definitions are vocabulary terms that are specific to that section and are supplemental to the glossary on the CD-ROM.

SOCIAL APPLICATION :

Found in the Background subsection of the Message section, Social Application describes how some of the information given in the videos relates to, or has an influence, on society.

FURTHER EXPLANATION :

Found in the Press Conference subsection of the Message section, Further Explanation gives a more comprehensive description of the correct answer to each of the Press Conference Questions.

FOR EXAMPLE... :

Found in the For Example... subsection of the Message section, For Example... gives additional information or specific scenarios that enhance understanding of the Guidelines for each section of *Forest Fever*.

Why would you allow hunting? Isn't it bad for biodiversity?

- a) Hunting is bad for biodiversity, but it's better to have a hunting season to regulate hunters than it is to have no regulation at all.
- b) Hunting is bad for biodiversity, and I wouldn't allow it on my land.
- c) Hunting doesn't affect biodiversity at all.
- ✓ d) **Hunting is good for biodiversity because it can control overpopulation of certain species.**



Further Explanation:

Regulating the harvest of game animals is accomplished by setting the "limit". Each year wildlife biologists carefully evaluate populations and make changes as needed.

Hunting - Allow hunting to keep population of game species in check and to prevent the spread of disease in overpopulated herds.



FOR EXAMPLE... When the population increases, it reaches a point that the habitat can no longer provide sufficient food and shelter. Animals become weak and susceptible to disease. This is a good discussion point regarding "carrying capacity".

Introduction

System Requirements/Installation Instructions



SYSTEM REQUIREMENTS :

IBM-COMPATIBLE

Pentium 233 or higher processor
64 MB of RAM
4x CD-ROM drive
16-bit sound card with external speakers
16-bit color @ 640 x 480 resolution
Windows 95 or higher

MACINTOSH

Power Mac G3 or higher
64 MB RAM
4x CD-ROM drive
Millions of colors @ 640 x 480 resolution
System 8.6 or higher

INSTALLATION INSTRUCTIONS :

Windows 95 or higher

1. Insert the disc into the CD-ROM drive. If the installer does not automatically appear on your screen within 30 seconds, begin installation by selecting the icon for the CD-ROM drive (generally "D" drive) from the "My Computer" menu. The title of the CD-ROM should appear beneath the CD-ROM icon. Next, double-click the "install.exe" application file.
2. Choose the type of installation you would like: a full installation is recommended for the best performance. Also install any necessary software included on the CD-ROM if you are prompted to do so. If you install a new version of QuickTime software, it is recommended that you reboot your machine before beginning the program.
3. When the installation is complete, you may begin the program by double-clicking the "Forest Fever" icon that is placed on the desktop during installation. The program may also be run by double-clicking on the "Forest Fever" application file in the CD-ROM drive or by going to the Start Menu, highlighting "Forest Fever," and choosing "Run Disc."

Macintosh

Insert the disc into the CD-ROM drive, and double-click the "Forest Fever" icon.

Background

Environment



Environment Section Objective

After completing the environment section, students will be able to discuss the process of photosynthesis, describe environmental benefits provided by a forest, and identify and explain Best Management Practices applied in forestry.

Background Objective

Use this information to enhance your lecture or class discussion before or after viewing the Environment Message video on the Forest Fever CD-ROM.

Subjects

Biology, Botany, Environmental Education, Geology, Physical Science

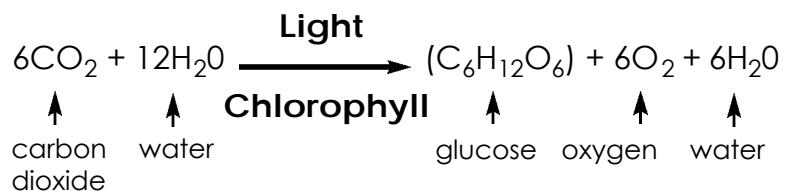
State Standards

Biology—10, 38, 40, 41
 Botany—10, 17, 19, 27, 28
 Environmental Education—1, 7, 10, 15, 17, 18, 19, 20, 24, 26, 27
 Geology—7, 10, 46
 Physical Science—7, 10

FOREST FACTS :

- Carbon dioxide (CO₂) enters the leaf through small openings called stomata. Once inside the leaf, CO₂ is broken down to carbon and oxygen. The carbon is then transformed into complex carbohydrates using light energy.

Here's the generalized equation for photosynthesis:



- Only green plant tissue undergoes the process of photosynthesis.
- Trees growing along the edge of a stream, lake, or river contribute to improved water quality. Covered with leaves or needles, trees provide shade to effectively lower water temperatures during the summer months. The lower the temperature, the greater amount of dissolved oxygen found in the water column. This means that aquatic animals have more oxygen to breathe. Also, when the leaves fall into the water, they provide a source of food for aquatic animals. The roots of trees growing along the banks of streams and shorelines of lakes provide protection and reduce the amount soil lost to erosion each year.

Background

Environment



TALKING POINTS :

- Think about other sources of energy like coal and wood, and how photosynthesis is responsible for storing energy.
- Foresters must know and understand how individual trees grow and reproduce. They must also take into consideration the influence that environmental factors like sunlight, precipitation, soil, climate, and even fire have on tree growth. The ecosystem itself must be part of the equation, and includes such things as the wildlife, plant succession, and population variations within the forest community.

HISTORY :

- Best Management Practices, commonly referred to as BMPs, are a practice or group of practices determined to be the most effective to reduce the amount of non-point source pollution generated during forest management activities, and that are voluntarily implemented. The concept of BMPs was established under the Federal Water Pollution Control Act of 1972. This act is the primary law that protects our nation's lakes, streams, rivers, aquifers, and coastal areas. The two fundamental goals behind this law are:
 - 1) eliminate the discharge of pollutants into the nation's waters, and
 - 2) achieve water quality levels that are fishable, drinkable and swimmable.

SOCIAL APPLICATION :

- The Sustainable Forestry Initiative (SFI)TM is a nationwide program adopted by the American Forest & Paper Association (AF&PA) in 1994. Implementation of the principles, objectives and performance measures is a condition of membership for AF&PA. The sole intent of the SFI program is utilize sound business practices to ensure the benefits of the forest are enjoyed by generations to come, while protecting water quality, wildlife, plants, and soil through the use of responsible environmental practices.

Press Conference

Environment



Environment Press Conference Objective

This section relates to the Environment press conference activity. Each question and its correct answer are listed.

Enrichment:

Teachers may use the "Further Explanation" tips to enrich the class discussion about the correct answers.

Another enrichment tip is to divide part of the class into press members, who have to think of questions, and another part of the class into speakers from each role: environmental, economic, and social. Hold a press conference in class, then let the two teams switch sides.

Subjects

Biology, Botany, Environmental Education,

State Standards

Biology—38, 39, 40, 41
Botany—17, 18, 19, 27, 28
Environmental Education—18, 23, 24, 26, 27, 28

ENVIRONMENT

PRESS CONFERENCE QUESTIONS :

(Correct answers are bold and checked)

Why should we be managing our forests? Don't they grow well enough on their own?

- a) Because the forest wouldn't survive without us. It's grown to depend on us because we've improved on its natural cycle so much.
- ✓ b) **Forests have a great natural life cycle. Forest management mimics these natural conditions to maintain good forest health and biodiversity while meeting the needs of people.**
- c) We don't need to manage the forest at all.



Further Explanation:

Intensive forest management activities can increase the growth rate of trees. These activities include targeted use of herbicides to control competing vegetation around the trees, application of fertilizers, and even pruning of lower limbs to produce high quality saw logs.

Why would you allow hunting? Isn't it bad for biodiversity?

- a) Hunting is bad for biodiversity, but it's better to have a hunting season to regulate hunters than it is to have no regulation at all.
- b) Hunting is bad for biodiversity, and I wouldn't allow it on my land.
- c) Hunting doesn't affect biodiversity at all.
- ✓ d) **Hunting is good for biodiversity because it can control overpopulation of certain species.**



Further Explanation:

Regulating the harvest of game animals is accomplished by setting the "limit". Each year wildlife biologists carefully evaluate populations and make changes as needed.

Press Conference

Environment



ENVIRONMENT

PRESS CONFERENCE QUESTIONS (CONTINUED) :

(Correct answers are bold and checked)

Isn't the risk involved in a prescribed burn greater than the potential good that comes from it?

- ✓ a) **Actually, properly set prescribed burns help both the environment and nearby communities by eliminating underbrush that can lead to wildfires.**
- b) Prescribed burns are neutral - they do not hurt the environment, but they do not help it, either.
- c) Prescribed burns are bad for animal habitats, and should never be used.



Further Explanation:

The risk associated with prescribed burns is minimized by requiring a thorough "burn plan." Check with your state forestry agency and ask them what is required to be submitted before issuing a burn permit.

You say that trees keep us healthy. Can you explain how?

- a) Through the process of photosynthesis, trees help hold the atmosphere to the earth.
- ✓ b) **Through the process of photosynthesis, trees take in carbon dioxide and release oxygen, which we need to breathe.**
- c) Through the process of photokinesis, trees shade us from the sun's harmful rays.
- d) Through the process of photokinesis, trees take in oxygen and release carbon dioxide, which we need to breathe.



Further Explanation:

Besides producing oxygen, trees keep us healthy in other ways. The roots of trees filter pollutants from our water. The leaves of trees provide shade and keep us cooler. Researchers have found people recover from illness quicker when they have a view of trees and the outside.

For Example...

Environment



Environment For Example... Objective

This section provides the guidelines that appear in the Environment Guidelines section. Use these guidelines and the "For Example..." information that corresponds with each guideline to enhance class discussion and provide additional information. A ready-to-copy handout of these guidelines is in the "Additional Resources" section of this guide.

Subjects

Biology, Botany, Environmental Education, Economics

State Standards

Biology—25, 38, 39, 41
Botany—17, 18, 19, 27, 28
Environmental Education—18, 19, 20, 23, 24, 26, 27
Economics—1, 3, 5, 6, 9, 16

Hunting - Allow hunting to keep population of game species in check and to prevent the spread of disease in overpopulated herds.



FOR EXAMPLE... When the population increases, it reaches a point that the habitat can no longer provide sufficient food and shelter. Animals become weak and susceptible to disease. This is a good discussion point regarding "carrying capacity."

Prescribed Burning - Use prescribed burning, which benefits the health of forests. Check for weather conditions like drought.



FOR EXAMPLE... In the southern pine forests fire is used to control hardwoods and other undesirable vegetation. The thick bark of the pine trees insulates the tree against the heat of the fire.

Wildlife Management Area - Establish a wildlife management area to protect endangered species and other wildlife that need a habitat.



FOR EXAMPLE... The different management techniques affect the species diversity of a forest. The method used to harvest trees is a good example. A clearcut system removes all the trees and opens the site to allow a diversity of pioneer species to grow. This creates a great source of forage for deer, turkey, quail, and other game species. On the other hand, the shelter wood system provides a residual tree canopy that protects young trees growing underneath. This provides habitats for birds, squirrels, and other species that live in protection of the forest.

Cutting Trees - Generally, cut no more than 20% of a harvest stand, and place buffer zones between harvest blocks.



FOR EXAMPLE... The objective of the landowner, the species of trees to be cut, and the condition of the forest will drive the selection of the most appropriate management activities to use. Foresters maximize tree growth by controlling competition for water, nutrients, light, and space.

Planting Trees - Plant trees on erodable landscapes like hills or slopes near water to protect against severe weather.



FOR EXAMPLE... Planting trees is the best method of altering the species composition of an area. Spacing of the seedlings will determine the density of the forest as it grows. The more dense the trees, the greater amount of competition for water, nutrients, light, and space.

For Example...

Environment



Fertilizing - Fertilizing is not a standard environmental practice because it doesn't help sustain ecosystems.



FOR EXAMPLE... What is fertilizer? Is it plant food? No, fertilizer is a mixture of essential nutrients like nitrogen (N), phosphorous (P), and potassium(K). Plant food is the carbohydrates produced by photosynthesis and not N, P, or K.

Building a Road - Build roads when necessary for recreation or harvesting.



FOR EXAMPLE... The placement of roads can adversely affect trees. Cutting root systems and piling dirt over root systems can, over time kill a tree.

Creating a Trail - Make sure that trails are away from wetlands to help avoid erosion.



FOR EXAMPLE... Just like roads, trail construction can be harmful to trees. Foot traffic compacts the soil. The roots of a tree must "breathe". If the soil is compacted oxygen cannot enter the soil and carbon dioxide can not escape, and this will suffocate the tree.

Raking Pine Straw - Raking pine straw has no environmental advantage.



FOR EXAMPLE... Raking pine straw can be done if proper equipment is used. The concern about equipment is that trees can be damaged (ripping bark and compacting soil).

Timber Sales - Limit the size of harvest stands to maintain wildlife habitat and decrease tree vulnerability to wind damage.



FOR EXAMPLE... Properly planned and implemented, thinning and harvest activities is beneficial to maintaining a healthy forest.

Buffer Zones - Use buffer zones to protect sensitive areas such as wetlands, bodies of water and endangered species habitat. Also, leave trees between harvest stands as travel corridors for animals.



FOR EXAMPLE... Buffer zones provide multiple environmental benefits. They also must be maintained. Trees can be "selectively" removed to maintain the health of a stand without causing damage to the environment.

Creating a Campground - Be mindful of how human activities affect the natural habitat. Build an access road or trail to the campground. Thin no more than 40% of the stand in the campground area.



FOR EXAMPLE... Campgrounds are high traffic areas like trails. The same environmental concerns apply to these sites as well. Another issue is the damage caused by campers looking for firewood. Branches are cut, or worse, broken off leaving openings for insects and disease to enter the tree.

Background

Economic



Economic Section Objective

After completing the economic section, students will be able to describe the pattern of forest land ownership in the U.S., list different wood products, and discuss the importance of a stand prescription.

Background Objective

Use this information to enhance your lecture or class discussion before or after viewing the Economic Message video.

Subjects

Biology, Botany, Environmental Education, Economics

State Standards

Biology—7, 10, 38, 39, 40, 41
 Botany—7, 10, 27, 28
 Environmental Education—7, 10, 17, 20, 24, 26
 Economics—3, 5, 6

DEFINITIONS :

- A **prescription** is a written plan developed by a professional forester to meet the objectives of the landowner. Two major elements comprise the prescription: Site data (geology/soils, climate, hydrology, vegetation, archeological features, and site quality) and Stand data (timber resources, wildlife habitat, range, protection, and recreation). Using the information gathered from the field, the professional forester can then begin to develop the prescription - matching appropriate management activities (silviculture) with projected outcomes to meet landowner objectives. A prescription also projects treatment costs and returns through an entire rotation (time from planting to final harvest).
- **Timberlands** are forests capable of growing 20 cubic feet of commercial quality wood fiber per acre per year.
- An area of land with similar characteristics is classified as a **stand**. Management prescriptions are written on a stand basis to increase treatment efficiency (reduce cost) and effectiveness (increase tree health and vigor).

Background

Economic



FOREST FACTS :

- In the year 2001-2002, about 57 percent of the timberland in the United States was owned by private forest landowners; the forest industry, about 15 percent; and public lands, which includes our national forests, 28 percent.
- About 1/3 of the US land area, or approximately 730 million acres is considered as forestland. Of this, about 483 million acres are classified as timberlands (commercial forest land).
- About 245 million acres of the total forestland area is considered "non-commercial", and is held in areas like national parks, designated wilderness, and other holdings. For example, there are over 8 million acres of old growth forest on federal lands in Washington and Oregon, of which nearly 57% is preserved in parks, wilderness areas, and other set-asides.
- See page 37 for Alabama forest facts.



2001-2002 U.S. Timberland Ownership

TALKING POINTS :

- Did you know that cellulose from a tree is used to thicken cough syrup? Cellulose powder is used to keep the tiny pieces of Parmesan cheese from sticking together. What other products come from trees?
- Trees are one of our few renewable resources from which many important and convenient products are made that are recyclable and biodegradable. What are some of these products? How does recycling work? What does "biodegradable" mean?

Background

Economic



TALKING POINTS (CONTINUED) :

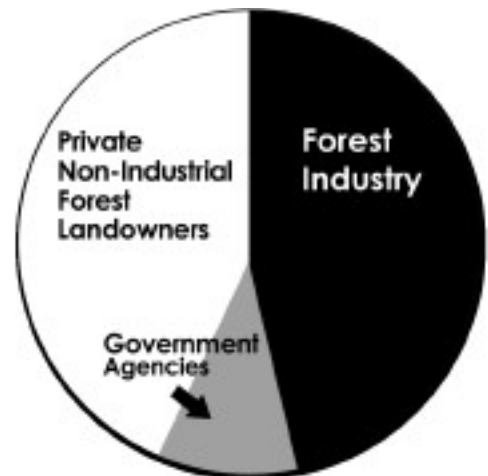
- What are Best Management Practices (BMPs)? Can you list several examples? Explain the Sustainable Forestry Initiative.

HISTORY :

- When the early European settlers arrived it was believed that a squirrel could travel from the East coast to the Mississippi River without touching the ground. This was not true. Another misconception about our forests is that we are running out of trees. We are far from it! We have more trees today than we had 70 years ago.

SOCIAL APPLICATION :

- The forest industry employs over 1.4 million people. Collectively they produce over \$200 billion worth of paper and wood products each year.
- Each year, approximately 1.6 billion seedlings are planted in the U.S. (That's 5 seedlings per person) The forest industry plants a little more than 43% of these seedlings, while private non-industrial forest landowners plant 40%, and government agencies plant around 16%.



Percentage of U.S. Seedlings Planted
Total = Approximately 1.6 billion seedlings a year

Press Conference

Economic



Economic Press Conference Objective

This section relates to the Economic press conference activity. Listed below is each question and its correct answer. Teachers may use the "Further Explanation" tips to enrich class discussion about the correct answers.

Enrichment:

Another enrichment tip is to divide part of the class into press members, who have to think of questions, and another part of the class into speakers from each role: environmental, economic, and social. Hold a press conference in class, then let the two teams switch sides.

Subjects

Biology, Botany, Environmental Education, Economics, American Government

State Standards

Biology—38, 39, 41
 Botany—27, 28
 Environmental Education—23, 24, 26, 27
 Economics—3, 5, 6, 8, 9
 American Government—13, 15

ECONOMIC

PRESS CONFERENCE QUESTIONS :

(Correct answers are bold and checked)

Why can't we just leave the forest alone?

With new technologies, why do we still need them?

- a) We need them for timber for people's houses and furniture. Everything else can be made synthetically.
- b) Really, we don't need the wood. But people like it, so I'll sell it.
- ✓ c) **Thousands of products other than wood comes from trees, like drugs, food, and the pencil you're holding.**



Further Explanation:

Trees are a renewable resource. Trees are used to make products, and the manufacturing of these products create jobs for hundreds of thousands of people around the world. Trees also are the sole source of energy for millions of people who use wood for cooking and heating.

As the trees get older, doesn't their value increase?

- ✓ a) **Up to a certain point. Then they begin to maintain or lose value.**
- b) The older the trees are, the more valuable they are because of the products they're used for.
- c) Saplings and young trees are the best because their wood is strong and vibrant.



Further Explanation:

As a tree matures, the rate of growth slows. Trees reach a peak where growth and value are maximized. Then it is time to harvest the trees.

Press Conference

Economic



ECONOMIC

PRESS CONFERENCE QUESTIONS (CONTINUED) :

(Correct answers are bold and checked)

I see that you just bought this property. Do you plan to cut down all of the trees?

- a) Yes. Since my main goal is to generate revenue, I plan on harvesting the entire landscape. Then I'll plant more.
- b) No. I'll cut down 40 to 50% of the trees, and let the rest grow naturally. This way there will always be trees.
- ✓ c) **No. My plan is to divide the land into harvest blocks and harvest each block intermittently. I'll replant after harvesting each block - this way there will always be trees.**



Further Explanation:

Staggering the harvest time for each block is good for many reasons: steady flow of income, planning can be done well in advance, and it regulates the growth of the entire forest. However, not all areas can be easily divided. It depends on many variables. What is the current condition (health and vigor) of the forest? What is the primary objective of the landowner for owning the property? Is the land area big enough to divide the property into harvest blocks? Is there sufficient diversity to divide the property into "forest stands"?

Since you want to make money, are you still planning on setting prescribed burns?

- a) No. The expense of planning and implementing a prescribed burn would severely cut down on my revenue.
- b) No. Trees grow faster with the underbrush around them, which means that I can harvest my trees faster. Prescribed burns would get rid of the underbrush.
- ✓ c) **Yes. Prescribed burns clear out underbrush, which allows more room for trees to grow faster.**
- d) Yes. Prescribed burns help clear out less costly trees, allowing more expensive ones to grow.



Further Explanation:

When properly applied, fire is a natural, inexpensive, and effective forest management practice. Hardwood trees are very susceptible to the killing affects of fire. On the other hand, fire is used in pine forests to reduce competition. Tree growth is improved with less competition for water, nutrients, light, and space.

For Example...

Economic

Economic For Example... Objective

This section provides the guidelines that appear in the Economic Guidelines section. Use these guidelines and the "For Example..." information that corresponds with each guideline to enhance the class discussion and provide additional information. A ready-to-copy hand-out of these guidelines are provided for you in the "Additional Resources" section of this guide.

Subjects

Biology, Botany, Environmental Education, Economics, Zoology

State Standards

Biology—38, 39
Botany—19, 27, 28
Environmental Education—24, 26, 27
Economics—3, 5, 16
Zoology—31, 32

Hunting - Allow hunting to provide revenue from hunters.



FOR EXAMPLE... Hunting leases are an excellent way to earn extra money from your forestland. Typically, the cost of a lease is on a "per acre" basis. Contact your local state forestry or wildlife agency for more information about what price to charge.

Prescribed Burning - Set prescribed burns to clear out undergrowth. Less competition increases the growth rate of desired trees.



FOR EXAMPLE... Prescribed burning is a very affordable forestry activity. At a cost of around \$3/acre, prescribed burning reduces fire hazard, controls disease outbreaks, reduces competition, initiates the growth of forage plants, and is often a technique used to prepare a site for planting.

Wildlife Management Area - If a wildlife management area is needed, create one in an area with less valuable timber to decrease economic loss.



FOR EXAMPLE... What species of wildlife you are interested in having populate your area will dictate your forest management decisions. Not all wildlife need full time protection of the forest. Deer and other game species are often seen in the open savannah-like conditions created by a clearcut.

Cutting Trees - Thin trees 30-35% between 15-25 years of age. Final harvest should be between 28-35 years of age. Divide your forest into harvest stands and leave buffer strips between stands.



FOR EXAMPLE... The time it takes to grow a economically mature tree depends on the species. A loblolly pine can be economically mature in 18 to 20 years, while a Douglas fir may take 60 to 80 years to mature.

Planting Trees - Replant new seedlings within 2 years of harvesting timber to ensure quick growth and less competition with other vegetation.



FOR EXAMPLE... Regeneration is either artificial or natural. Artificial regeneration is when seedlings are planted by hand or a mechanical planter, or seed may be dispersed by plane or helicopter. Natural regeneration refers to the method of letting the trees and vegetation grow, die, and reseed without human intervention. For example, when an area is cut several trees are left standing to provide seed, and after a sufficient new crop of trees is growing the seed trees are harvested.

For Example...

Economic



Fertilizing - Fertilize within 3 years of planting or thinning to help tree growth. Avoid fertilizing near water.



FOR EXAMPLE... Fertilization is not for every situation. Some soils are very fertile and do not need to be fertilized, while other soils need only one or two elements. For example, phosphorous is often a limiting nutrient in sandy soil.

Building a Road - Build a road to get to harvest areas. Build long-lasting roads to keep down maintenance costs and to protect the ecosystem.



FOR EXAMPLE... Roads provide access for recreation and add value to timber land. Roads take time to construct so planning is a critical factor - start at least one year in advance of the timber sale. Always follow the recommended BMPs. The type of road constructed will determine cost. A woods road is less expensive than an all weather road that is covered with gravel.

Creating a Trail - Create trails to provide income through fees. Create trails to avoid harvesting areas.



FOR EXAMPLE... Trails designed for occasional use by the landowner are often simple and require minimum labor to construct. However, if opening the property to the public is the objective, then more stringent guidelines must be followed such as the Americans with Disabilities Act.

Raking Pine Straw - Rake pine straw to generate additional revenue between harvests.



FOR EXAMPLE... Not all pine needles are created equal. The best species for pine straw are longleaf and slash pine because the needles are long and bale easily. The landowner can sell the bales wholesale or sell the baling rights to a pine straw producer. The wholesale price of a bale may be as much as \$1.00 per bale, and retail price may be as high as \$5.00 per bale.

Timber Sales - Trees between 20-30 years of age generate the most revenue. Trees younger than 20 are less valuable. Diseased or damaged trees can be sold after they're cut.



FOR EXAMPLE... The local market should guide the landowner in the right direction. Growing trees for a saw-timber market is not advisable if there are no saw mills nearby. Pulpwood may be the only choice.

Buffer Zones - Create buffer zones between harvest blocks.



FOR EXAMPLE... Buffer zones are part of practicing responsible forestry. The width of a buffer zone depends on the slope of the land. On land with steep slopes, the width of the buffer is wider than land with a gentle slope.

Creating a Campground - Campgrounds create revenue through fees. Build a road or trail to access the camping area, and thin no more than 40% of the area.



FOR EXAMPLE... To increase the economic gain from building a campground, advertise in specialized magazines. Inviting guests to enjoy the forest also requires the need for insurance. There are many sources of insurance. Check with your local forestry professional for help in finding an insurance provider.

Background

Social



Social Section Objective

After completing the social section, students will be able to identify the national forests and grasslands in the United States, discuss the design aspects of trail construction, and describe one of many federal cost-share programs for forest landowners.

Background Objective

Use this information to enhance your lecture or class discussion before or after viewing the Social Message video.

Subjects

Environmental Education,
Economics, American Government,
History (10th-11th)

State Standards

Environmental Education—10, 23,
24, 26, 27
Economics—5, 17, 19
American Government—4, 11, 12,
13, 14, 15
History (10th)—33
History (11th)—18, 24

DEFINITIONS :

- **Outdoor recreation** is when a person voluntarily engages in an activity from which they derive pleasure, and that is to some degree dependent on the natural setting of the area.

RECREATION FACTS :

- The USDA Forest Service is responsible for taking care of 155 national forests and 22 national grasslands, covering a total land area of 192 million acres.
- There are 403 "Wilderness Areas" covering 35.2 million acres; 20 National Recreational Areas, 9 National Scenic Areas, and 7 National Monuments, Volcanic Monuments, and National Preserves.
- There are:
 - 136 (9,126 miles) national forest scenic byways;
 - 95 (4,418 miles) wild and scenic rivers;
 - 133,087 miles of trails;
 - 4,300 campgrounds; and
 - 23,000 developed recreation sites in the U.S.
- All 50 states have passed a law that limits the liability of a landowner who makes available to the public certain areas of land for recreational purposes without charge.

Background

Social



TALKING POINTS :

- When designing a trail, important questions to ask are:
 - what is the purpose of the trail(s)?
 - how many trails will be constructed and how long will they be?
 - who and how often will the trails be used?
 - what are the potential hazards/conflicts of the trails?
 - where will parking and access be located?
 - what must be done to accommodate visitors with disabilities?

SOCIAL APPLICATIONS :

- Forest land can be provide other social opportunities like bird watching, photo safaris, and hunting.
- The Federal Government's Forest stewardship Program (FSP) encourages multiple use forestry for non-industrial private landowners. It brings professional management expertise to landowners and helps them develop plans that manage forests for timber production, wildlife habitats, watershed protection, recreational opportunities and other benefits. The Stewardship Incentives Program (SIP) is a cost share program of FSP that provides financial assistance to non-industrial private landowners who agree to maintain management plans and multiple use management strategies for their land. The program encourages the development of trails for people, bikes, horses and wheelchairs and requires certain standards for the development of those trails.

Press Conference

Social



Social Press Conference Objective

This section relates to the Social press conference activity. Listed below is each question and its correct answer.

Enrichment:

Teachers may use the "Further Explanation" tips to enrich the class discussion about the correct answers.

Another enrichment tip is to divide part of the class into press members, who have to think of questions, and another part of the class into speakers from each role: environmental, economic, and social. Hold a press conference in class, then let the two teams switch sides.

Subjects

Biology, Botany, Environmental Education, American Government

State Standards

Biology—39
Botany—27
Environmental Education—24, 26
27
American Government—11, 12,
14, 14, 15

SOCIAL

PRESS CONFERENCE QUESTIONS :

(Correct answers are bold and checked)

What would you do if you discovered that the bike trail you created ran through an endangered species habitat?

- a) I'd close down the park - I can't risk any human contact with the species.
- b) As long as people do not attempt to touch the species, I'd leave the trail open.
- c) I'd relocate the endangered species to a safer environment.
- ✓ d) **I would contact and follow the recommendations of the U.S. Fish and Wildlife Service and the state Game and Fish Commission for the specific species.**



Further Explanation:

The Endangered Species Act (ESA) has specific provisions for activities within the habitat of an endangered species. Research the ESA as a class.

Bikers and hikers are arguing over who gets to use your trail. What's your decision?

- a) Since there are more bikers than hikers, I'll designate the trail for bikers only.
- b) Since hikers are less damaging to the habitat than bikers, I'll designate the trail for hikers only.
- ✓ c) **Since I've opened the land for all of the community, I'll make accommodations for both on the trail system.**
- d) Since it's stirred up so much controversy, I'm going to close the trail down to all visitors.



Further Explanation:

There are issues of safety and liability associated with land use and recreational activities. The American Disabilities Act (ADA) is an important issue to address when building community access facilities. Research ADA regulations.

Press Conference

Social



SOCIAL

PRESS CONFERENCE QUESTIONS (CONTINUED) :

(Correct answers are bold and checked)

What do you say to community members who don't want prescribed burning near their neighborhood?

- a) Prescribed burning will increase the safety of your homes by eliminating underbrush that could cause an uncontrollable wildfire.
- b) Prescribed burning will be closely monitored by burn specialists. Their goal is to keep the fire under control.
- c) Prescribed burning might agitate those with health problems like asthma. I'll make sure to give advanced warning so that you can leave before we begin.
- ✓ d) **I'd say all of these things.**



Further Explanation:

Following the state law is the first step. Secondly, the issue of private property rights must be respected. The guidelines for burning are established for each state and take into account the issues of public concern and safety. Smoke management is very important. Dangerous situations can occur if smoke blows across highways or through neighborhoods.

I've heard that you're planning a "buffer zone" near our neighborhood. Can you explain what a buffer zone is?

- ✓ a) **A buffer zone is a wooded area surrounding your neighborhood so that you can enjoy the natural beauty of the forest.**
- b) A buffer zone is an animal wildlife management area, to keep animals safe from human contact.
- c) A buffer zone is a section of land that we can play in the safety of open spaces.
- d) A buffer zone is a protective fence to keep pesky animals away from your neighborhood.



Further Explanation:

A buffer zone is many things. A buffer zone can be a combination of trees and shrubs to block unsightly views. A buffer zone can reduce the noise of a busy roadway. A buffer zone can filter water before it enters a stream or river. A buffer zone is a "work zone for trees".

For Example...

Social



Social For Example... Objective

This section provides the guidelines that appear in the Social Guidelines section. Use these guidelines and the "For Example..." information that corresponds with each guideline to enhance the class discussion and provide additional information. A ready-to-copy handout of these guidelines are provided for you in the "Additional Resources" of this guide.

Subjects

Biology, Botany, Environmental Education, Economics, Zoology

State Standards

Biology—38, 39, 41
Botany—27
Environmental Education—24, 26, 27
Economic—3, 5, 6
Zoology—31, 32

Hunting - Allow hunting as a social pastime.



FOR EXAMPLE... Hunting leases and resorts are a popular recreational application of forest land. The landowner can realize income and the community can benefit too. Controlling the population of game animals may also be necessary. A large population of deer can cause damage to personal property - especially flower and vegetable gardens.

Prescribed Burning - Use prescribed burns to create a more attractive forest. Notify local communities of prescribed burn before setting.



FOR EXAMPLE... The key to success is proper planning. Skilled professionals evaluate the site (humidity, fuel load, wind speed and direction, and make the decision of when to burn. Fire lines are plowed to keep the fire within the target area, tactical burning techniques (i.e. back fire, head fire) are employed, and fire fighting equipment is on hand should a problem occur.

Wildlife Management Area - Create a wildlife management area to meet society's goals of protecting and enjoying wildlife.



FOR EXAMPLE... In addition to protecting wildlife, there are also educational components of wildlife management areas. Teaching the public about land use issues, private property rights, and wildlife management can increase the social value of such an area.

Cutting Trees - Cut damaged or infected trees. Thin trees according to guidelines for campgrounds, roads, and trails. Leave buffer zones near roads and houses to maintain beauty.



FOR EXAMPLE... Keep in mind that trees are a renewable resource and everybody uses products made from trees every day. We need to continue to harvest trees, while protecting our water quality and providing wildlife habitat. Professional foresters have the environments' best interest in mind every time they make decisions about cutting trees. Trees are their job.

For Example...

Social



Planting Trees - Plant trees for shade, recreation, and aesthetics.



FOR EXAMPLE... Planting the right tree in the right place is very important. Each species of tree provides a different benefit. For example, pine trees are grown for pulpwood to make paper products, oak trees are a good source of food for wildlife, and other trees are better suited for providing shade in your backyard.

Fertilizing - No fertilizing is needed when you manage the forest for enjoyment. There's no need for the trees to grow faster.



FOR EXAMPLE... Although fertilizing is unnecessary when managing a forest for enjoyment, trees will produce more fruit after fertilization, which may be important if attracting wildlife is an objective.

Building a Road - Build a road for user access to campground. Use no more than 5% of harvest stand to build a road.



FOR EXAMPLE... The type of road will be important. A dirt road would not be desired if it is the main point of entry into a heavily used area. The location of the road is also important. A professional forester can help locate the route a road should follow.

Creating a Trail - Build trails for user enjoyment. Use no more than 5% of harvest stand to build a trail.



FOR EXAMPLE... Design of a trail can influence the amount of use it receives. A trail that is a straight line is not good because it leads the user out and back along the same route. Make trails that loop and intersect to let users extend or shorten their trail experience. Incorporate learning stations along the way to add educational value.

Raking Pine Straw - Rake pine straw to lessen the potential for fire around campgrounds.



FOR EXAMPLE... Pine straw raking is not often a commercial venture in areas that are open to the public.

Timber Sales - Harvesting timber creates products society wants and needs.



FOR EXAMPLE... If timberland is located near a public use area, use it as an opportunity to educate the public about the operation. Tell them why the timber is being harvested, explain the process that is used, and most importantly, be sure the site is regenerated. Demonstrate that sustainable forestry is being practiced.

Buffer Zones - Create buffer zones around roads, trails, campgrounds, and neighborhoods to maintain natural beauty.



FOR EXAMPLE... Locate trails and educational stations within the buffer zone. Point out how the buffer zone provides habitat and protects water quality.

Creating a Campground - Build a campground for people to enjoy the forest. First, build an access road or trail. Next, thin the trees for campground space up to 40%. Finally, build the campground.



FOR EXAMPLE... Safety and enjoyment are the top priorities of a public campground. Concerns are unsightly camp areas from overflowing trash cans or campsites located too close to each other.

For Example...

Balance



Natural Disaster Guidelines For Example... Objective

This section provides the Natural Disaster Guidelines that appear in the Balance section. Use these guidelines and the "For Example..." information that corresponds with each guideline to enhance the class discussion and provide additional information. A ready-to-copy hand-out of these guidelines are provided for you in the "Additional Resources" section of this guide.

Subjects

Biology, Botany, Environmental Education, Zoology

State Standards

Biology—24, 25, 38, 39
Botany—27
Environmental Education—23
Zoology—30, 31, 32

NATURAL DISASTER GUIDELINES :

Drought - Do not plant seedlings and do not schedule a prescribed burn.



FOR EXAMPLE... Newly planted trees are more vulnerable since they are still trying to replace roots lost in the transplanting process. However, lack of moisture is not the only danger to your trees during drought. The stressed stand of trees might survive the loss of water only to be ravaged by wildfire, insects, or disease.

Wildfire - Reduce the severity of wildfire damage by scheduling prescribed burns regularly. After a wildfire is contained, damaged stands should be clearcut. Replant soon after clearcut.



FOR EXAMPLE... Without prescribed burns, fuels build up over time, increasing the risk of catastrophic fires, which are more likely to destroy human life and property--and whose intense heat can cause severe ecosystem damage. People who live in homes near a forest can protect their property by keeping tidy lawns, cutting branches away from their houses, and clearing the nearby area of any woody debris.

Insects and Disease - If invading insects or disease are discovered, harvest the entire affected area immediately, then replant.



FOR EXAMPLE... There are three main factors necessary for disease to begin and spread: the right type of environment, a pathogen (the agent that causes disease), and a host (an organism from which the pathogen derives nutrition). Insects have many different methods of attacking trees. Some are borers, some eat the leaves, and others attack the seeds, cones, or flowers. Insects also like different types of trees: some prefer pines, while others attack hardwoods.

For Example...

Balance



NATURAL DISASTER GUIDELINES (CONTINUED) :

Endangered Species - Cut damaged or infected trees. Thin healthy trees according to guidelines for campgrounds, roads, and trails. Leave buffer zones near roads and houses to maintain beauty.



FOR EXAMPLE... Mammals and birds are not the only living things to be protected as endangered species. Insects, reptiles, amphibians, fish, and plant species are also being protected from extinction. There are also different classifications for how rare the species is, including endangered, threatened, and species of special concern.

Severe Storm - After the storm is over, selectively cut the damaged trees, then replant new ones.



FOR EXAMPLE... Storms affect different types of trees differently. For instance, a hurricane or wind storm might bring down more hardwoods because their broad spreading canopies and flat leaves catch the wind. Many hardwood trees also have shallow, spreading root systems, which increase their susceptibility to tipping over. Pines have the deep roots holding them upright. The smaller canopies and aerodynamic needles of pine trees make them less susceptible to uprooting. However, tall pines are more likely to break because of their thinner trunks.

Forest Management Activity Tool Kit

Balance




Forest Management Activity Objective

After completing this activity, the student will possess a basic understanding of the complexity of forest management, increased critical thinking skills, and be able to explain the different tools used to manage a forest. The goal of the Forest Management Activity is to achieve a well-balanced forest. Students achieve this by raising the scores of all three objectives – environmental, social, and economic – into the "Management Goal" area of the bar graph by the end of the activity.

Tool Kit Objective

This toolkit explains to teachers how each of the management tools work and effect the scoring of the activity. Teachers should use this as a guide to instruct their students in the use of the Forest Management Activity. A student handout of the toolkit is available in the "Additional Resources" section.

FOREST MANAGEMENT HELPER TOOLS :

 **Check Finances** - Pressing the dollar sign-shaped icon allows the user to check his or her finances. A box will appear that lists the user's current total balance and the costs and values of each action that has been performed.



Management Plan Book - You can refer to the management guidelines discussed in earlier portions of the program at any time during the game. To do this, press the "Management Plan Book" button located in the lower-right corner of the screen. Select the management goal area you'd like to research (environment, economic, social, or natural concerns). After you've finished, press the "Close" button to return to the management activity.



Selection Tool - You must choose the selection tool to select an area of the forest you would like to manage. First, press the square-shaped icon located in the lower left corner of the screen, underneath the "Quit Game" button. Then press your mouse down and drag it across the area you would like to manage. When you've selected the area, release the mouse. You may move the selection area after you've chosen it by clicking inside the selection area and dragging it to a different location. After you've chosen the area, choose the icon for the tool you would like to use on this area, such as hunting, cutting trees, campground, etc.



Stop/Start Timeline - You can stop the progress of the activity at any time by pressing the "Stop Timeline" button located in the upper-right corner of the screen, directly to the right of the timeline bar. When you are ready to resume, press the same area, which will read "Start Timeline".

FOREST MANAGEMENT ACTION TOOLS :



Buffer Zones - Pressing the icon shaped like a row of trees allows the user to establish a buffer zone around certain areas. After the icon is pressed, the user can roll over the forest, and buffer zone possibilities highlight. When the user clicks on a highlighted area, a buffer zone is built. The user can build a buffer zone around a water

Forest Management Activity Tool Kit

Balance



FOREST MANAGEMENT ACTION TOOLS (CONTINUED) :

body, a neighborhood, a road, and endangered species. If the user does not build a buffer zone, gradual environmental points will be taken away. If the user cuts trees around a stream without a buffer zone in place, the user will lose instant environmental points. Cutting trees around a road or trail without establishing a buffer zone will subtract social points.



Build a Road - Pressing the road-shaped icon lets you build a road through the forest. First, use the selection tool to choose the placement of the road. Next, choose the icon to pave a road in that area. If the chosen area has not been cleared enough, a message will appear and the action will not be performed. Initial building funds will be taken from your finances and affect the economic score. Maintenance costs will affect the economic score. Gradual points will be added to the social score.



Create a Campground - Pressing the tent-shaped icon allows the user to build a campground. First, the user must choose the selection tool to designate the placement of the campground. Next, choose the icon to build a campground in that area. A picnic table graphic overlay will appear on the forest to indicate the campground. If the chosen area has not been cleared sufficiently, a message will appear informing the user of this and the action will not be performed. Initial building funds will be taken from the user's finances and affect the economic score. Maintenance costs will gradually affect the economic score. Gradual points will be added to the social score. The user must maintain adequate forest cover to keep the campground. If the user attempts to build another area on the campground, the new selection will take over the chosen space.



Create a Trail - Pressing the trail-shaped icon allows the user to blaze a trail through the forest. First, the user must choose the selection tool to designate the placement of the trail. Next, choose the icon to blaze a trail in that area. If the chosen area has not been cleared sufficiently, a message will appear informing the user of this and the action will not be performed. Initial building funds will be taken from the user's finances and affect the economic score. Maintenance costs will gradually affect the economic score. Gradual points will be added to the social score.



Cut Trees - Pressing the axe-shaped icon allows the user to cut trees. First, the user must choose the selection tool to designate the specific area to be harvested. Next, choose the axe-shaped icon to cut trees within that area. A slider bar will appear that allows the user to determine the age range of the trees and the percentage of that range to be cut (from 1-100%). The user can choose both a minimum and maximum age for the trees. After the user chooses the age range and percentage, he or she may press "Cut" to perform the action. The user will receive economic points for this choice. The amount of money that the user is granted depends on the number and age of trees cut.




Fertilize - Pressing the sack-shaped icon allows the user to fertilize a section of the forest. First, the user must choose the selection tool to designate the specific area to fertilize. Next, choose the icon to fertilize the soil in that area. A graphic animation will appear to indicate that this action has been performed. The fertilized trees will grow at a faster rate than unfertilized trees. Funds will be taken from the user's finances and affect the economic score. Points will also be taken from the environmental score.


Forest Management Activity Tool Kit


Balance





FOREST MANAGEMENT ACTION TOOLS (CONTINUED) :

 **Hunting** - Pressing the gun-shaped icon allows the user to create a hunting area. First, the user must choose the selection tool to designate the specific area to be used for hunting. Next, choose the icon to assign hunting grounds to that location. A graphic animation will appear to indicate that this tool has been selected. Additionally, a graphic overlay of the word "hunting" will appear on the forest to indicate the hunting grounds. The user will receive points on the social score. Initial building funds will be taken from the user's finances and affect the economic score mildly. Maintenance costs will gradually affect the economic score. The user must maintain adequate forest cover to keep the hunting grounds. If the user attempts to build another area on the hunting ground, the new selection will take over the chosen space.

 **Plant Trees** - Pressing the seedling-shaped icon allows the user to plant new trees. First, the user must choose the selection tool to designate the specific area in which to plant. Next, choose the icon to plant trees within that area. A slider bar will appear that allows the user to determine the number of trees to plant in the area. The maximum number allowed on the selection bar is calculated by the maximum number of trees that can be sustained in the selected planting area.

 **Prescribed Burning** - Pressing the flame-shaped icon allows the user to set a prescribed burn in the forest. After the icon is pressed, the prescribed burning tool calculates all of the forest that is safe for a prescribed burn and determines the score for this area. A graphic animation will appear to indicate that this tool has been selected. Initial building funds will be taken from the user's finances and affect the economic score. The main benefit of this tool is the prevention of wildfire damage. The prescribed burning tool sets the underbrush and pine straw counters back to minimal: thus if a wildfire starts in the forest, it will spread less rapidly.

 **Raking Pine Straw** - Pressing the rake-shaped icon allows the user to rake the forest for pine straw. After the icon is pressed, the raking tool calculates all of the forest that is appropriate for pine straw raking and determines the score for that area. An animation will appear to indicate that this action has been performed. Initial building funds will be taken from the user's finances and affect the economic score. Points will then be added to the economic score. The raking tool also sets the pine straw counter back to minimal: thus if a wildfire starts in the forest, it will spread less rapidly.

 **Wildlife Management Area** - Pressing the paw print-shaped icon allows the user to create a wildlife management area. First, the user must choose the selection tool to designate a wildlife management area. Next, choose the icon to assign the wildlife management area to that location. A graphic animation will appear to indicate that this action has been performed. Additionally, a paw print graphic overlay will appear on the forest to indicate the wildlife management area. The user will receive social and environmental points for this choice. Maintenance costs will gradually affect the economic score. The user must maintain adequate forest cover to keep the wildlife management area. If the user attempts to build another area on the wildlife management area, the new selection will take over the chosen space.

State Fact Sheet

Alabama Forestry Facts

Alabama's Major Forest Types



10.6 million acres **hardwood forest**
4.2 million acres **mixed forest**
8.1 million acres **pine forest**

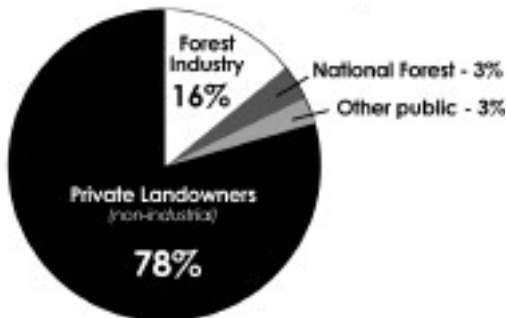
1,000,000 More Acres



2000 - 22.9 million acres
1990 - 21.9 million acres

* 71% of Alabama is covered in forest

Alabama Land Ownership



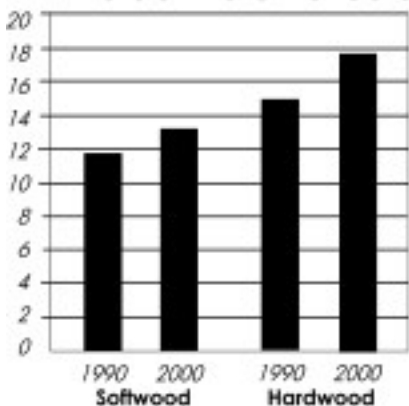
22.9 Million Acres

U.S. Land Ownership



2001-2002 U.S. Timberland Ownership

Volume of Timber in Alabama's Forests



Other Alabama Forestry Facts:

- The annual economic impact of the forest products industry (fpi) on Alabama is \$13 billion.
- 205,000 (or 11%) of jobs in Alabama are directly or indirectly dependent on fpi.
- The fpi has a \$2.1 billion payroll.

Source: 2000 Forest Inventory Survey

Enrichment Activities

Environment



Environment Enrichment Activities Objective

Incorporate these activities into your lesson plans to enrich learning by asking the students to apply knowledge to new situations. The box below each activity description is a list of subject areas, skills, and correlations to state standards that apply to the activity.

Subjects

See the gray box below each of the activities for correlating subjects that apply to that activity.

State Standards

See the gray box below each of the activities for the state standards that apply to that activity.

WHAT'S UNDERGROUND ?

Excavate 2 or 3 holes, 6"x6"x6" in size, under the canopy of a large tree. Place all the material in a large container. Using water, gently clean and separate all the roots found in the bucket. Carefully measure and record the length of each root. Sum the root lengths recorded. Now, calculate the total volume of soil sampled. Next, measure the total area under the canopy of the tree from which the samples were extracted. Using the data from the samples, determine the total length of the root system under the canopy of the tree. Discuss how a tree benefits by having an extensive root system.

Subjects/State Standards

Biology: 3–8, 24–26, 38, 41 Botany: 3–7, 18, 19, 27

ALL ABOUT BMPs

Search the world wide web for information about BMPs in your state. Who is the agency responsible for enforcing the regulations? Invite a natural resource professional who has a working knowledge of BMPs (installation and compliance), to speak to your class. If possible, take students to see BMPs in action. Ask the students to describe the impacts to the site if BMPs were not used. What are the social, economic, and environmental costs with, and without, BMP compliance?

Subjects/State Standards

Biology: 25, 39 Botany: 27 Zoology: 30, 32

Enrichment Activities

Environment



WHO LIVES HERE ?

Select several trees in a given area. Identify the species of tree. Record the height and diameter. Take pictures of the entire tree, its branches, trunk, bark, twigs, and leaves (if present). Now carefully inspect the tree and record all signs of use by wildlife. Establish an observation station. Using binoculars, observe and record what wildlife species are using the tree and how the tree was being used. Repeat this procedure for each tree selected. Observations can be taken at different times of the day, and different times throughout the year. Set a time to end the study. Compare the list of wildlife species observed and their use of the tree for each observed.

Subjects/State Standards

Biology: 3–7, 23, 24, 38, 39 Botany: 3–7, 27, 28
 Zoology: 3–7, 31, 32

LEARNING ABOUT SUSTAINABILITY

Ask students to list their ideas of what sustainable forestry means to them. Find common terms that several students mention. Research the topic of sustainable forestry: What is being done here in the United States? In other countries? Are there any differences between what is required/expected here, compared to other countries? What about the issue of private property rights? Can a private landowner be told what to do on their own land as long as they are not breaking any laws? Develop a role play and ask students to represent the various parties (landowners, professional resource managers, environmental regulatory agency, citizens, other?)

Subjects/State Standards

Biology: 10, 38, 39 Botany: 10, 27, 28 Economics: 5, 17
 Environmental Education: 10, 24, 26, 27 Zoology: 10, 32
 American Government: 11, 12, 13, 15
 Language Arts (9th)—12, 15–17, 19, 28, 29, 31, 34
 Language Arts (10th)—19–21, 26–30
 Language Arts (11th)—18, 21, 22, 24, 32
 Language Arts (12th)—18, 21–23, 26–28,

Enrichment Activities

Environment



My ECOSYSTEM

Define and discuss the forest ecosystems in your area. Invite a professional forest resource manager or ecologist to lead the discussions. Using a topographic map, delineate a watershed. What information can be determined from the map? Show Global Positioning System (GPS) and Geographic Information System (GIS) technology, aerial photos, and satellite images, and demonstrate how they are used to construct maps of various types. Contact your local state forestry agency, extension forestry specialist, or forest landowners association and ask to see a stand map. Lots of information about mapping and types of maps is available on the web. Make a map of an area. Indicate the boundary of the watershed and the different ecosystems located within the boundary.

Explore a nearby ecosystem. List the trees, wildlife, soil, and vegetation found. Discuss how human activities can disrupt the natural cycles and processes within the ecosystem. Choose an activity like building a hiking trail or harvesting trees, and list the impacts these activities would have on the site.

Subjects/State Standards

Botany: 3–7, 27, 28 Environmental Education: 3–7, 18
Zoology: 3–7, 31, 32

PLT Activities

Environment



The following activities are suggested PROJECT LEARNING TREE activities selected from *The Changing Forest: Forest Ecology*, one of the PLT Secondary Environmental Education Modules.

CAST OF THOUSANDS (Page 27, Activity #2)

Overview: Students will further explore the variety of life in their adopted forest and will discover the importance of this biological diversity. They will take measurements, in much the same way as a forester does, to draw conclusions about the overall health of their forest.

THE NATURE OF PLANTS (Page 50, Activity #3)

Overview: Through a series of experiments, students will learn the importance of photosynthesis and the elements needed for photosynthesis to take place. They will also discover the factors necessary for healthy plant growth and the detrimental effects of a variety of environmental stresses.

If you are interested in using the PLT materials in your classroom, but have not completed the PLT Educator training session, contact your state PLT office at: www.ala.plt.org. You may also obtain PLT information from the Alabama Forestry Association at:

555 Alabama Street
Montgomery, Alabama 36104-4395
Tel: (334) 265-8733
Fax: (334) 262-1258
afa@alaforestry.org

Enrichment Activities

Economic



Economic Enrichment Activities Objective

Incorporate these activities into your lesson plans to enrich learning by asking the students to apply knowledge to new situations. The box below each activity description is a list of subject areas, skills, and correlations to state standards that apply to the activity.

Subjects

See the gray box below each of the activities for correlating subjects that apply to that activity.

State Standards

See the gray box below each of the activities for the state standards that apply to that activity.

THE COST OF DOING FORESTRY

Understanding the financial aspect of forestland ownership. Ask the county tax assessor or certified land appraiser to visit with the class. Ask your visitor to explain the different taxes associated with forestland ownership. Lead a discussion about taxes: how they are calculated, what activities/costs can be charged to your tax bill, and what, if any, are the tax incentives to owning forestland?

Subjects/State Standards

Economics: 16, 18, 19

WHY DO YOU OWN FORESTLAND ?

Part 1 Invite a private forest landowner and a professional forester (consultant or state agency) to visit with your class. Inform your guests that they will be the subject of an interview process. They will be provided with the list of questions, in advance of their visit, the students will be asking. Allow at least one week for them to review and prepare for the class activity.

Part 2 At least two weeks prior to the day of the activity, divide your class into small groups (3-5). Ask each group to make a list of questions, such as: why do you own forest land? (inherited, investment, forest preserve, wildlife habitat, etc.) or what are the challenges (economic, social, environmental) of owning forestland? Other questions may be explored. Regroup, list each group's questions, eliminate duplicates, and generate a master list of questions. *(continued)*

Enrichment Activities

Economic



WHY DO YOU OWN FORESTLAND ? (CONTINUED)

duplicates, and generate a master list of questions. Inform the class that they are going to interview the visitors. Working in the same small groups, each group must assign a minimum of two recorders and only one speaker who asks questions. Give each group an equal share of questions from the master list. The recorders must take accurate notes. After the interview, allow students to work within their groups to discuss the results of the interview. Assign a writing exercise using the information from the interview and any research the group can do. They must write a position paper - either for or against the idea of owning forestland.

Subjects/State Standards

Economics: 3, 5, 9, 10, 16
Language Arts (9th): 8, 12, 15, 17, 18, 24, 26, 27, 31–34
Language Arts (10th): 10, 15, 16, 26–30
Language Arts (11th): 9, 12, 22, 24–28, 32
Language Arts (12th): 14, 17, 21, 26–28

MY FORESTLAND

Learn about the forests of your state. The best source of current information is from the Alabama Forestry Commission or cooperative extension forest resources office. If you have internet access, search the web for www.forestry.state.al.us. The amount of information you can find grows daily. For example, you can look for maps, land use statistics, research data, education programs, urban forestry. Ask students to make a map of the forestland in your state or around your school. Evaluate ownership patterns - who owns the most forestland (federal, non-federal, and private)? How many acres are held by each group? Fit map on an 8.5" x 11" piece of paper; draw areas of different ownership on 8.5" x 11" transparencies; draw major rivers, cities, and highways on another layer; now stack different layers to create a multilayered map. Are there any evident patterns of landownership? If yes, explain possible reasons.

Subjects/State Standards

Biology: 11, 38, 39 Environmental Education: 11, 24, 26
American Government: 11– 15 History (10th): 33

Enrichment Activities

Economic



WHAT IS A FOREST PRODUCT ?

To help students understand the breadth of the forest industry, have them research a product, or group of similar products made from trees. Expect the student to be able to explain the chain of events from the time the tree is harvested to final product. Suggestions of what to include in report: What are the processes involved in producing the product(s)? What species of tree(s) are used to produce the product? Where is the product produced? What is the market of the product? Are there any by-products produced during the manufacturing process of the selected product(s)? Allow students to prepare multi-faceted reports: oral, computer, visual aids, demonstration, what ever they feel comfortable with. Compile reports and publish. Be sure to keep a copy in your school library.

Provide students with a list of forest products that are used on a daily basis. Ask students to select one product from the list, write it down on a slip of paper along with their name, and hand it in. Next, inform them that they must TRY not to use the product they just selected for one day. Select the day for the "Product Challenge". Then ask each student to share with the class the product they selected and how their life was effected. After the Product Challenge day, assign the students the task of writing a short story about their experience. How would their life change if all forest products were no longer available? Are there any substitutes for the product? What do they think about cutting trees and the application of sustainable forest management activities?

Subjects/State Standards

Economics: 3, 5, 8, 9, 16
Language Arts (9th): 15–17, 31–34
Language Arts (10th): 21, 26, 29, 30
Language Arts (11th): 13, 18, 22–24, 27, 32

Enrichment Activities

Economic



DEVELOPING A FOREST MANAGEMENT PLAN

Find a piece of forestland nearby. Find out who owns the property (private, county, state, or federal). Contact your local state forestry agency. Ask them to visit your class and discuss the components of a management plan, and explain the process involved in developing a plan for a landowner. The primary point should be how to determine the landowner's objectives, what do they want from the land? Provide students with a copy of a completed management plan, and if possible, share plans that are constructed with different primary objectives. Compare and contrast the different plans. Explain the different federal cost share programs available to forest landowners. Give students a description of a fictitious forest. Include situations such as water (stream, pond, etc.), roads, adjoining landowners, pasture land, forest land, power lines, endangered species, need for income, and desire to hunt - add any real-life condition to the scenario. The best thing to do is draw a map (show major attributes like forest land, roads, pond, property boundary, etc.) and write the scenario. Allow students time to read the scenario. The students must now make a decision as to what their primary and secondary objectives are given the situation. The students must justify their response with support of sound management activities.

Subjects/State Standards

Economics: 5, 16–19 American Government: 13–15
Language Arts (11th): 26 Language Arts (12th): 20

PLT Activities

Economic



The following activities are suggested PROJECT LEARNING TREE activities selected from *Exploring Environmental Issues: Focus on Forests*, one of the PLT Secondary Environmental Education Modules.

WHO OWNS AMERICA'S FORESTS? (Page 30, Activity #4)

Overview: In this activity, students will read maps and will figure out where forested lands are located around the nation and whether they are publicly or privately owned.

WORDS TO LIVE BY (Page 42, Activity #7)

Overview: In this activity, your students can express their own views about forests, and then can explore different perspectives by reading excerpts from the writings of different authors.

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afa@alaforestry.org

Enrichment Activities

Social



Social Enrichment Activities Objective

Incorporate these activities into your lesson plans to enrich learning by asking the students to apply knowledge to new situations. The box below each activity description is a list of subject areas, skills, and correlations to state standards that apply to the activity.

Subjects

See the gray box below each of the activities for correlating subjects that apply to that activity.

State Standards

See the gray box below each of the activities for the state standards that apply to that activity.

WRITE A STEWARDSHIP PLAN

Invite a local state forestry representative to speak to your class. Ask them to describe the Forest Stewardship Program (FSP) and the Stewardship Incentive Program (SIP), and how the program works in your state. Be sure that the students are provided with brochures, etc. that describe the FSP and SIP for your state. Ask your speaker to discuss how to write a Stewardship Management Plan. Be sure students understand the importance of setting objectives and applying the principles of the FSP to managing natural resources. Give them a scenario with a description of property they just inherited and ask them to come up with a primary and secondary objective for the property and to justify their choice.

Subjects/State Standards

Botany: 10, 16, 27, 28 Economics: 9, 16–19
Environmental Education: 10, 16, 24, 26, 27 Biology: 10, 16, 38, 39
Language Arts (11th): 26 American Government: 14

DESIGN-A-TRAIL

Select a site and challenge students to design a trail system. The site can be at your school or in a public park or recreation area. Have students work in teams and help them set an educational objective for their trail. Give them a realistic budget to work with. Tell them they must incorporate local civic groups as in-kind labor to help make the trail. Invite a local state forestry agency representative to help students learn the technical aspects of trail design, and ask a volunteer agency to talk about building partnerships and managing volunteers. Have each team present their trail design ideas to the class. Have a panel evaluate and select the best plan.

Subjects/State Standards

Economics: 5, 16, 17 Language Arts (11th): 26
American Government: 11, 13, 14, 15

PLT Activities

Social



The following activities are suggested PROJECT LEARNING TREE activities selected from *Introductory Handbook for the Secondary Modules*, one of the PLT Secondary Environmental Education Modules.

400-ACRE WOOD (Page 42, Activity #5)

Overview: In this activity, students will play the roles of managers of a 400-acre (162 ha) piece of public forest. Through these roles, students will begin to understand the complex considerations that influence management decisions about forest lands

DEMOCRACY IN ACTION (Page 50, Activity #6)

Overview: This activity will help students learn about the roles and responsibilities of citizens' groups in environmental policies and decision making, and about how young people can become involved in the process.

If you are interested in using the PLT materials in your classroom, but have not completed the PLT Educator training session, contact your state PLT office at: www.ala.plt.org. You may also obtain PLT information from the Alabama Forestry Association at:

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Enrichment Activities

Forest Management Activity



Forest Management Enrichment Activities Objective

Incorporate these activities into your lesson plans to enrich learning by asking the students to apply knowledge to new situations. The box below each activity description is a list of subject areas, skills, and correlations to state standards that apply to the activity.

Subjects

See the gray box below each of the activities for correlating subjects that apply to that activity.

State Standards

See the gray box below each of the activities for the state standards that apply to that activity.

KNOW YOUR TOOL KIT

Before starting the Forest Management Activity, divide the students into 11 groups and assign one action tool to each group. Have each group explore their assigned action tool. Ask them to find out why their tool is used in managing a forest, how it is applied, and what are the expected results. Ask them to write a short (2-page) paper and present their findings to the class. They can do research on the web, interview a professional forester, or visit the public library. Combine all the reports to make a class reference tool.

Subjects/State Standards

Biology: 10, 11, 38, 39 Botany: 10, 11, 27
 Environmental Education: 10, 11, 24, 26, 27
 Language Arts (9th): 8, 12–17, 23–29, 31–33
 Language Arts (10th): 10, 11, 17–19, 20, 21, 23–26, 30
 Language Arts (11th): 11–13, 21–24, 26–28, 30
 Language Arts (12th): 11, 13, 14, 21–28

MANAGEMENT PLAN BOOK

Make copies of the chart on the next page to pass out to the class. Have each student or group chart their decisions as they do the Forest Management Activity. After completing the activity, have them discuss or write a report on their results. They can answer the following questions: Which tool impacted your score most? Which tool impacted your score least? Which tool did you like most? What activity variable did you use to make management decisions? (i.e. timeline, tree age, etc.) After the discussion, have the students use the chart to make a plan for their forest before starting the activity. What did they do differently this time? Did their score improve? Encourage them to keep a notebook of their charts.

Subjects/State Standards













Language Arts (9th): 12, 15–17, 19, 31–34
 Language Arts (10th): 21, 26, 29, 30
 Language Arts (11th): 18, 22, 24, 32
 Language Arts (12th): 18, 21, 22, 26–28

Forest Fever

Forest Management Activity Management Plan Book

Name: _____

Date: _____

		Years									
		5	10	15	20	25	30	35	40	45	50
Actions            	Create a Road										
	Create a Trail										
	Cut Trees										
	Fertilize										
	Plant Trees										
	Rake Pine Straw										
	Set a Prescribed Burn										
	Set a Buffer Zone										
	Set a Campground										
	Set Hunting Area										
	Set Wildlife Area										
Financial Balance											

Was your final score balanced? (circle one)

yes

no

Environment Assessment

Forest Fever

Name: _____

Date: _____

- 1.) A forest provides many benefits. It purifies _____ , filters _____ , is a home for _____ , and provides _____ .
- 2.) Only _____ plant tissue undergoes the process of _____ . _____ is the light-absorbing green pigment that converts light energy to chemical energy.
- 3.) What are the primary products of photosynthesis?
 - a) water and carbon dioxide
 - b) sugar and carbon dioxide
 - c) complex carbohydrate, oxygen, and water
 - d) light and chlorophyll
- 4.) What law established the concept of Best Management Practices?
 - a) Martial law
 - b) Clear Air Act
 - c) Organic Act of 1897
 - d) Federal Water Pollution Control Act of 1972
- 5.) Define forest ecology:
- 6.) Define Best Management Practices for forestry:
- 7.) What are the two fundamental goals behind the law that created the concept of Best Management Practices?
- 8.) Explain how trees growing in the riparian area benefit and protect water quality?

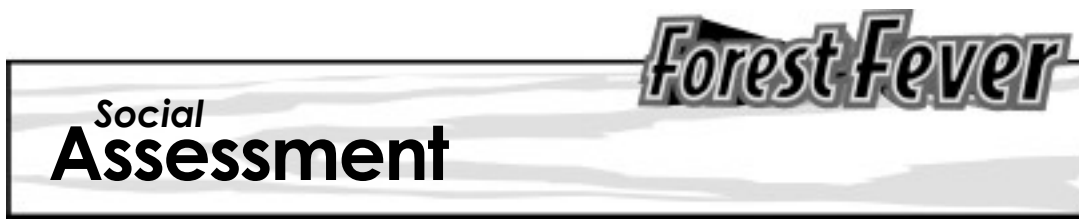
Economic Assessment

Forest Fever

Name:

Date:

- 1.) How many acres in the United States are considered to be forestland?
 - a) 7.3 million
 - b) 73 million
 - c) 730 million
 - d) 1730 million
- 2.) How many acres in the United States are classified as timberland?
 - a) 0.483 million
 - b) 4.83 million
 - c) 48.3 million
 - d) 483 million
- 3.) Who plants the most seedlings each year?
 - a) forest industry
 - b) non-industrial private forest landowners
 - c) government agencies
- 4.) Define timberlands:
- 5.) Define a prescription:
- 6.) Define a stand:



Name:

Date:

-
- 1.) What federal agency is responsible for managing our national forests and grasslands?
 - a) Bureau of Land Management
 - b) USDA Forest Service
 - c) Department of Interior
 - d) Department of Energy
 - 2.) List four national forests found in Alabama.
 - 3.) Define outdoor recreation.
 - 4.) List 4 important questions to ask when designing a trail.
 - 5.) What is the Stewardship Incentives Program?
 - 6.) Who is eligible to receive SIP money and what is the intended use of the money?

Assessment Answers

Environment, Economic, and Social



ENVIRONMENT ASSESSMENT ANSWER KEY :

- 1) air, water, wildlife, shade 2) green, photosynthesis, chlorophyll 3) c 4) d
- 5) Forest ecology is the study of forest ecosystems, and the interactions of the plant and animal communities that live within its boundaries.
- 6) BMPs apply to all processes determined to be the most effective to reduce the amount of non-point source pollution generated during forest management activities, and that are voluntarily implemented.
- 7) 1) eliminate the discharge of pollutants into the nation's waters, and 2) achieve water quality levels that are fishable, drinkable, and swimmable
- 8) – Provide shade and keep water temperatures down. The cooler the water temperature, the greater the amount of dissolved oxygen in the water.
– Leaf litter falling into the water provides a source of food for aquatic animals.
– The root systems of trees at the waters' edge fight against the erosive force of water. Keeping soil out of the water.
– Reduce flood damage, regulate, subsurface flow, trap sediments, and filter runoff.

ECONOMIC ASSESSMENT ANSWER KEY :

- 1) c 2) d 3) a
- 4) Timberlands are forests capable of growing 20 cubic feet of commercial quality wood fiber per acre per year.
- 5) A prescription is a written plan developed by a professional forester to meet the objectives of the landowner.
- 6) A stand is a area of land with similar characteristics.

SOCIAL ASSESSMENT ANSWER KEY :

- 1) b
- 2) Tuskegee, Bankhead, Talledega, and Connecuh.
- 3) Outdoor recreation is when a person voluntarily engages in an activity from which they derive pleasure, and that is to some degree dependent on the natural setting of the area.
- 4) 1. What is the purpose of the trail(s)? 2. How many trails will be constructed and how long will they be?
3. Who and how often will the trails be used? 4. What are the potential hazards/conflicts of the trails?
5. Where will parking and access be located? 6. What must be done to accommodate visitors with disabilities?
- 5) SIP is a cost-share program of the Forest Stewardship Program
- 6) Non-industrial forest landowners with an approved Forest Stewardship Program management plan are eligible to receive SIP dollars to implement forestry practices.

Internet Resources

Additional Resources



For information about forestry, contact your state forestry agency or association, local Cooperative Extension Service office, the Natural Resources Conservation Service, or your state agency office responsible for environmental protection.

RELATED WEB SITES :

Photosynthesis: To understand photosynthesis see this unique site:

<http://esg-www.mit.edu:8001/esgbio/ps/psdir.html>

Forest Ecology: A site with a list of forest ecology terminology:

<http://soilslab.cfr.washington.edu/S-7/EcolGlos.html>

Best Management Practices:

To understand the application of BMPs in the U.S. go to this web site:

<http://forestry.about.com/library/weekly/aa013000.htm>

Sustainable Forestry Initiative:

The American Forest & Paper Association site has information to learn more about the SFI program:

<http://www.afandpa.org/>

Riparian Area: For information about riparians and how to manage these areas go to this web site:

<http://www.cropinfo.net/ripiarian.htm>

Land Ownership: This site has a chart of land ownership in the U.S.:

<http://www.nwi.org/Maps/LandChart.html>

Economics of Forestry: This site compares wood with other material:

<http://www.calforests.org/economics/comparison.html>

Forest Products: This site offers information about forest products:

<http://www.forestdirectory.com/>

Internet Resources

Additional Resources



RELATED WEB SITES (CONTINUED):

Forest Management: Search for information from the USDA Forest Service information here: <http://www.fs.fed.us>

Forest Regeneration: To find out more about forest regeneration go to this web site: <http://www.rngr.fs.fed.us>

Map of the Forests of the US: This web site shows national forests, grasslands, and parks in the U.S.: <http://www.fs.fed.us/recreation/map/finder.shtml>

Recreation: This web site is a resource guide for people who are interested in outdoor recreation: <http://www4.ncsu.edu/~leung/recres.html>

Trail Design: This site provides excellent information, diagrams, and specifications to build a trail: <http://www.foothill.net/fta/work/maintnotes.html>

American with Disabilities Act: This web site offers a downloadable file containing a 92-page document describing the design standards required by law: <http://www.usdoj.gov/crt/ada/stdspdf.htm>

Forest Stewardship Program: To learn more about the Forest Stewardship Program go here: <http://www.fs.fed.us/spf/coop/fsp.htm>

Other web sites include: www.alaforestry.com, www.forestry.state.al.us, www.al.nrcs.usda.gov, and www.aces.edu.

Careers in Forestry

Additional Resources



A career in forestry, or any field of study involving natural resources, is exciting and rewarding. Depending on the type of work that interests you, the level of education you must receive and employment opportunities will vary.

EDUCATIONAL REQUIREMENTS:

A high school education alone will not advance your career in forestry. If becoming a professional forester or wildlife biologist is your goal, completing a Bachelor of Science (BS) degree is a minimum requirement. However, earning a Masters or Ph.D. degree will increase your employment opportunities and your starting salary.

If you are interested in becoming a professional forester, you must graduate from an **accredited** forestry school. The Society of American Foresters is the professional organization recognized by the Council for Higher Education Accreditation, and is responsible for granting accreditation.

For further information about accreditation, contact:

Department of Science and Education, Society of American Foresters
5400 Grosvenor Lane
Bethesda, MD 20814-2198
(301) 897-8720, ext. 122
cillayp@safnet.org.

For a complete listing of the accredited professional forestry schools go to this web site:

<http://www.safnet.org/educate/pforschools.htm>.

— or —

Contact Kent Hamby, Student Services Officer at Auburn University School of Forestry, at:
(334) 844-1007

Careers in Forestry

Additional Resources



Who hires a forester? What does a forester do?

There are lots of employment opportunities for professional foresters.

The following descriptions provide a glimpse into the opportunities for people with a forestry degree.

EMPLOYMENT OPPORTUNITIES :

Several agencies within the federal government hire forestry graduates. Working for a federal agency offers many career advancement opportunities. A person hired as a field technician can, by proving their skills and knowledge, find themselves being promoted to a management-level position. A federal agency most people recognize is the **U.S. Department of Agriculture, Forest Service**. They hire technicians who are responsible for much of the field work such as fire control, timber cruising, and wildlife management. Another government agency who hires professional foresters is the **U. S. Department of Interior**. There are two organizations within the Department of Interior that offer forestry jobs - the Fish & Wildlife Service and National Park Service. Although the number of job opportunities are not as numerous as with the Forest Service, they are just as rewarding. Foresters working for the Fish & Wildlife Service usually have an undergraduate degree in forestry and a Masters degree in wildlife biology. Positions are located on National Wildlife Refuges. The type of work would involve using forest management techniques to maintain wildlife habitat. The National Park Service hire professional foresters, forestry aides, and forestry technicians to meet special forest protection and management needs, and are classified as a Park Ranger.

A government agency that you might not think about hiring forestry graduates is the **U. S. Department of Defense, Army Corps of Engineers**. They hire foresters to manage forestland, and wildlife biologists to handle issues involved with wildlife mitigation activities. Most of the positions are located at lake sites under the jurisdiction of the Corps of Engineers.

State agencies hire foresters too. Positions can be found with the **Department of Natural Resources or the State Forestry Commission**. As a forester with a state agency, your primary responsibility is to manage the state-owned forest lands and provide assistance to private forest landowners. Duties include reforestation, fire control, pest management, and public lands management. A minimum of a Bachelor's degree is required for most state level jobs.

Careers in Forestry

Additional Resources



EMPLOYMENT OPPORTUNITIES (CONTINUED) :

Foresters also find job opportunities at a **University**. Research, teaching, and extension positions exist that require different levels of education. If you are interested in research, technician positions require a Bachelor's or Master's degree, but a research scientist must have a Ph.D.. If teaching at the college level is what you want to do, a Ph.D. is most often required. Extension specialists plan, develop and deliver educational programs for a variety of audiences and work with extension agents to address forest-related needs in communities. This type of work usually requires a Ph.D., but some positions may require only a Master's degree.

The private sector offers the greatest variety of forestry jobs. The level of education requirements ranges from a Bachelor's, to Master's, to Ph.D. The **forest industry** hires entry-level foresters to do many different jobs that include conducting land surveys, cruising timber, managing prescribed burns, monitoring water quality, plus many more. **Private consulting** is another option. Working for a private consulting firm, a forester offers professional services to private landowners. In some states, a private consultant must be a registered forester. A minimum of a Bachelor's degree and 5-10 years experience is required prior to becoming a private forestry consultant. **Utility companies** (electric, natural gas, etc.) hire foresters to maintain their right-of-ways. Controlling the vegetation is the primary responsibility, but some companies may own forest land too. **Non-profit organizations**, like the Nature Conservancy, hire foresters to oversee planning and policy issues. Educational requirements range from the Bachelor's degree to Ph.D. Other employment opportunities you might consider include golf courses to maintain the trees on the golf course, consumer product sales of wood products like doors, windows, and high quality lumber, and international organizations that work in forestry development projects overseas.

ENRICHMENT ACTIVITY :

Get a Job! --- As a group, ask students to list forestry-related jobs on the black board or flip chart. Then, break into small groups (3-5 each). Tell the students to choose one of the jobs listed. Once each group has chosen a job they are interested in, tell them they must now "Find a Job". This activity is designed to acquaint them with using the internet. Using an employment search engine like monster.com, each group should try to find employment opportunities that fit the desired job. Challenge the students to locate jobs working for different employers (state, private or government). For each job, students should take note of the educational requirements, work experience, and job responsibilities. Students will learn that a career in forest resources can take them on a wonderful adventure around the world.

Glossary

Additional Resources



Best Management Practices – (BMPs) guidelines that are designed to protect natural resources (such as forests) while allowing people to utilize those resources. They vary by state and many are voluntary.

Biodiversity – the variety and abundance of plants, animals and all other living things within an ecosystem.

Buffer Zone – an area in which forest management activities are limited or prohibited to protect special areas of the environment.

Cellulose – a chain of glucose molecules occurring mainly as long hollow fibers that make up the cell walls in woody plants.

Clearcutting – harvesting essentially all of the trees within a specific area.

Conservation – responsible use, protection, and improvement of natural resources for the present and future.

Ecosystem – a community of organisms together with its natural environment.

Endangered species – a plant or animal in danger of becoming extinct as defined by the Endangered Species Act.

Environment – all external conditions affecting the life, development, and survival of an organism.

Erosion – the wearing away of the land surface by rain, running water, wind, ice, gravity, or other agents.

Habitat – an area that provides an animal or plant with adequate food, water, shelter and living space.

Harvest – cutting down, processing, loading and transporting trees for forest products.

Harvest Block – an area of trees that has been designated for harvesting.

Forest Management – the practical application of scientific, economic, and social principles to the use and care of a forest.

Forester (Forest Manager) – a person, accredited by the Alabama Board of Registration for Foresters, who directs the management, use and enjoyment of forests.

Glossary

Additional Resources



Ladder Fuels – combustible material such as pine straw that allows fire to climb into the crowns of trees or shrubs.

Management Objectives – goals that foresters set out to achieve when managing a particular area.

Management Plan – a long-term plan developed by land managers, using detailed information and research about a specific property to fulfill management objectives.

Multiple Use Management – any practice fulfilling two or more objectives of management.

Natural Regeneration – the establishment of a plant from natural seeding or sprouting.

Natural Resources – those raw materials supplied by the Earth and its processes. Natural resources include nutrients, minerals, water, plants, animals, etc.

Public Lands – land owned by federal, state and county governments.

Photosynthesis – the process by which light energy is captured by green plants and used to produce food from carbon dioxide, taken in from the air, and water from the soil.

Prescribed Burn (Prescribed Fire) – a controlled fire set by land managers that imitates the effects of fire in nature. Prescribed fires help reduce the potential for wildfires and their destructiveness by eliminating fuels such as dead limbs, leaves and straw and thick vegetation.

Prescription – a set of management practices scheduled for application on a specific area to satisfy multiple uses or other goals and objectives.

Pulpwood – trees that are and made into pulp for making paper and other products.

Recreation – the use of forestland for human enjoyment and relaxation.

Regeneration – the renewal of a tree crop whether by natural (seedlings and stump or root sprouts) or artificial (planting) means.

Renewable Resource – a resource whose supply becomes available for use at different time intervals and in which present use does not diminish future supply.

Runoff – water from precipitation and melting ice that flows on the ground and into nearby streams, lakes and wetlands.

Glossary

Additional Resources



Sawtimber – trees yielding logs considered suitable in size and quality for producing lumber or sawn wood (logs cut into a square edged form).

Seed Beds – the soil or forest floor on which seed falls.

Seedling – a young tree grown from the seed.

Silviculture – the art and science of controlling the establishment, growth, composition, health and quality of forests to meet the diverse needs of landowners and society on a sustainable basis.

Sprout – healthy new trees growing from the tree stump or roots of a tree that has been harvested.

Stand – a group of trees similar in age distribution and species composition to be a distinguishable unit.

Stewardship – using wise management practices for many benefits and uses of forestland.

Succession – the gradual replacement of one plant community by another through natural processes over time.

Sustainable Forestry – maintaining healthy ecosystems so that future generations have the equal opportunities to use their resources.

Sustainability – use and growth of natural resources to meet present and future needs.

Thinning – harvesting some of the trees to reduce competition and improve growth.

Understory – layer formed by the leaves and branches of the smaller trees under the forest canopy.

Urban Forest – an urban area extends from town center to suburb's edge. The urban forest would include tree-lined roadways, open green spaces, undeveloped forests, parks, along with other public and private spaces within this urban area.

Veneer – a thin sheet of wood produced by rotary cutting, slicing, or sometimes sawing used to make plywood and cover other wood products.

Watershed – a region or land area drained by a single stream or river or network of streams and rivers.

Environment Guidelines

Forest Fever

Name: _____

Date: _____



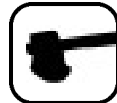
Hunting - Allow hunting to keep population of game species in check and to prevent the spread of disease in overpopulated herds.



Prescribed Burning - Use prescribed burning, which benefits the health of forests. Check for weather conditions like drought.



Wildlife Management Area - Establish a wildlife management area to protect endangered species and other wildlife that need a habitat.



Cutting Trees - Generally, cut no more than 20% of a harvest stand, and place buffer zones between harvest blocks.



Planting Trees - Plant trees on erodable landscapes like hills or slopes near water to protect against severe weather.



Fertilizing - Fertilizing is not a standard practice – don't fertilize.



Building a Road - Build roads when necessary for recreation or harvesting.



Creating a Trail - Make sure that trails are away from wetlands to help avoid erosion.



Raking Pine Straw - Raking pine straw has no environmental advantage.



Timber Sales - Limit the size of harvest stands to maintain wildlife habitat and decrease tree vulnerability to wind damage.



Buffer Zones - Use buffer zones to protect sensitive areas such as wetlands, bodies of water and endangered species habitat. Also, leave trees between harvest stands as travel corridors for animals.



Creating a Campground - Be mindful of how human activities affect the natural habitat. Build an access road or trail to the campground. Thin no more than 40% of the stand in the campground area.

Economic Guidelines

Forest Fever

Name: _____

Date: _____



Hunting - Allow hunting to provide revenue from hunters.



Prescribed Burning - Set prescribed burns to clear out undergrowth. Less competition increases the growth rate of desired trees.



Wildlife Management Area - If a wildlife management area is needed, create one in an area with less valuable timber to decrease economic loss.



Cutting Trees - Thin trees 30-35% between 15-25 years of age. Final harvest should be between 28-35 years of age. Divide your forest into harvest stands and leave buffer strips between stands.



Planting Trees - Replant new seedlings within 2 years of harvesting timber to ensure quick growth and less competition with other vegetation.



Fertilizing - Fertilize within 3 years of planting or thinning to help tree growth. Avoid fertilizing near water.



Building a Road - Build a road to get to harvest areas. Build long-lasting roads to keep down maintenance costs and to protect the ecosystem.



Creating a Trail - Create trails to provide income through fees. Create trails to avoid harvesting areas.



Raking Pine Straw - Rake pine straw to generate additional revenue between harvests.



Timber Sales - Trees between 20-30 years of age generate the most revenue. Trees younger than 20 are less valuable. Diseased or damaged trees can be sold after they're cut.



Buffer Zones - Create buffer zones between harvest blocks.



Creating a Campground - Campgrounds create revenue through fees. Build a road or trail to access the camping area, and thin no more than 40% of the area.

Social Guidelines

Forest Fever

Name: _____

Date: _____



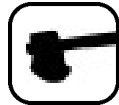
Hunting - Allow hunting as a social pastime.



Prescribed Burning - Set prescribed burns to create a more attractive forest. Notify local communities of prescribed burn before setting.



Wildlife Management Area - Create a wildlife management area to meet society's goals of protecting and enjoying wildlife.



Cutting Trees - Cut damaged or infected trees. Thin trees according to guidelines for campgrounds, roads, and trails. Leave buffer zones near roads and houses to maintain beauty.



Planting Trees - Plant trees for shade, recreation, and aesthetics.



Fertilizing - No fertilizing is needed when you're managing the forest for human enjoyment. There's no need for the trees to grow faster.



Building a Road - Build a road for user access to campground. Use no more than 5% of harvest stand to build a road.



Creating a Trail - Build trails for user enjoyment. Use no more than 5% of harvest stand to build a trail.



Raking Pine Straw - Rake pine straw to lessen the potential for fire around campgrounds.



Timber Sales - Harvesting timber creates products society wants and needs.



Buffer Zones - Create buffer zones around roads, trails, campgrounds, and neighborhoods to maintain natural beauty.



Creating a Campground - Build a campground for people to enjoy the forest. First, build an access road or trail. Next, thin the trees for campground space up to 40%. Finally, build the campground.

Natural Disaster Guidelines

Forest Fever

Name: _____

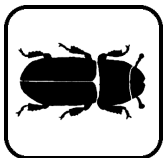
Date: _____



Drought - Do not plant seedlings and do not schedule a prescribed burn.



Wildfire - Prevent severity of wildfire damage by scheduling prescribed burns regularly. After wildfire is contained, damaged stands should be clearcut. Replant soon after clearcut.



Insects and Disease - If invading insects or disease are discovered, harvest entire affected area immediately, then replant.



Endangered Species - Cut damaged or infected trees. Thin healthy trees according to guidelines for campgrounds, roads, and trails. Leave buffer zones near roads and houses to maintain beauty.



Severe Storm - After the storm is over, selectively cut the damaged trees, then replant new ones.

Forest Management Activity Tool Kit

Forest Fever

Name: _____

Date: _____

FOREST MANAGEMENT HELPER TOOLS :



Check Finances - Pressing this icon lets you check your finances. The Finances Box will list your current total balance and the costs and values of each action you have performed.



Management Plan Book - You can refer to the management guidelines discussed in earlier portions of the program at any time during the game. To do this, press the "Management Plan Book" button. Select the management goal area you'd like to research (environment, economic, social, or natural concerns). After you have finished, press the "Close" button to return to the management activity.



Selection Tool - You must choose the selection tool to select an area of the forest that you would like to manage. First, press the square-shaped icon. Then press your mouse down and drag it across the area you would like to manage. When you've selected the area, release the mouse. You can move the selection area after you've chosen it by clicking inside the selection area and dragging it to a different location. After you've chosen the area, choose the icon for the tool you would like to use on this area, such as hunting, cutting trees, campground, etc.



Stop/Start Timeline - You can stop the progress of the activity at any time by pressing the "StopTimeline" button directly to the right of the timeline bar. When you are ready to resume, press the same area, which will read "Start Timeline".

FOREST MANAGEMENT ACTION TOOLS :

Buffer Zones



- Pressing this icon lets you establish a buffer zone around a water body, neighborhood, road and endangered species. After the icon is pressed, you can roll over the forest and buffer zone possibilities highlighted. When you click on a highlighted area, a buffer zone is built. If you do not build a buffer zone, you will lose environmental points. If you cut trees around a stream without a buffer zone in place, you will lose environmental points. If you build a road or trail without making a buffer zone, you lose social points.

Build a Road



- Pressing the road-shaped icon lets you build a road through the forest. First, use the selection tool to choose the placement of the road. Next, choose the icon to pave a road in that area. If the chosen area has not been cleared enough, a message will appear and the action will not be performed. Initial building funds will be taken from your finances and affect the economic score. Maintenance costs will affect the economic score. Gradual points will be added to the social score.

Create a Campground



- Pressing this icon lets you build a campground. First, use the selection tool to choose the placement of the campground. Next, choose the icon to build a campground in that area. A picnic table graphic overlay will appear. If the chosen area has not been cleared enough, a message will appear and the action will not be performed. Initial building funds will be taken from your finances and affect the economic score. Maintenance costs will affect the economic score. Gradual points will be added to the social score. You must maintain adequate forest cover to keep the campground.

Create a Trail



- Pressing this icon lets you blaze a trail in the forest. First, use the selection tool to choose the placement of the trail. Next, choose the icon to make the trail. If the area has not been cleared enough, a message will appear and the action will not be performed. Trail building fees and maintenance costs will be taken from your finances and affect the economic score. Gradual points will be added to the social score.

Forest Management Activity Tool Kit

Forest Fever

Name: _____

Date: _____

FOREST MANAGEMENT ACTION TOOLS (CONTINUED) :

Cut Trees - Pressing this icon lets you cut trees. First, use the selection tool to choose the area to be harvested. Next, choose the icon to cut trees in that area. A slider bar will appear that lets you to determine the age range of the trees and the percentage of that range to be cut (from 1-100%). You can choose both a minimum and maximum age for the trees. After you choose the age range and percentage, press "Cut" to perform the action. You will gain economic points for this choice. The amount of money you get depends on the number and age of trees cut.



Fertilize - Pressing this icon lets you fertilize. First, use the selection tool to choose the area to fertilize. Next, choose the icon to fertilize the soil in that area. A graphic animation will appear to show that this action has been performed. The fertilized trees will grow at a faster rate than unfertilized trees. Funds will be taken from the your finances and affect the economic score. Points will also be taken from the environmental score.



Hunting - Pressing this icon lets you create a hunting area. First, use the selection tool to choose the area to be used for hunting. Next, choose the icon to assign hunting grounds to that location. A graphic animation will appear to indicate that this tool has been selected. Additionally, a graphic overlay of the word "hunting" will appear on the area. You will receive points on the social score. Initial building funds will be taken from your finances and affect the economic score. Maintenance costs will affect the economic score. You must maintain adequate forest cover to keep the hunting grounds.



Plant Trees - Pressing this icon lets you plant new trees. First, use the selection tool to choose the area in which to plant. Next, choose the icon to plant trees in that area. A slider bar will appear that allows you to choose the number of trees to plant in the area.



Prescribed Burning - Pressing this icon lets you set a prescribed burn. The prescribed burning tool calculates all of the forest that is safe for a prescribed burn and determines the score for this area. A graphic animation will appear to indicate that this tool has been selected. A prescribed burning fee will be taken from your finances and affect the economic score. The prescribed burning tool sets the underbrush and pine straw counters back to zero so that if a wildfire starts, it will spread less rapidly.



Raking Pine Straw - Pressing this icon lets you rake the forest for pine straw. The raking tool calculates all of the forest that is appropriate for pine straw raking and determines the score for that area. A graphic animation will appear to indicate that this action has been performed. Initial building funds will be taken from your finances and affect the economic score. Points will then be added to the economic score. The raking tool also sets the pine straw counter back to zero so that if a wildfire starts in the forest, it will spread less rapidly.



Wildlife Management Area - Pressing this icon lets you create a wildlife management area. First, use the selection tool to choose a wildlife management area. Next, choose the icon to assign the wildlife management area to that location. A graphic animation will appear to indicate that this action has been performed. Additionally, a paw print graphic overlay will appear on the area. You will receive environmental and social points for this choice. Maintenance costs will affect the economic score. You have to maintain adequate forest cover to keep the wildlife management area.



Credits

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