UF | UNIVERSITY of FLORIDA
IFAS Extension

Florida's Fabulous Forests

4H FOM13

Florida 4-H Project Book
Forest Resources
Series Book 3

Note to the Project Helper

This project book is designed to help youth explore the amazing world of forests. It can be used with a 4-H club, classroom, family outing, or at camp. You might use this material with an entire club or class, or sponsor an individual. The ideas are here to help guide the exploration and should not limit the journey. Use the Leader Guide for the Forest Resources Series for background information and suggestions. There are other resources you might tap including experts in your community who will have other ideas of interesting projects. Groups can conduct a community service project with *Give Forests a Hand*.

Sunshine State Standards

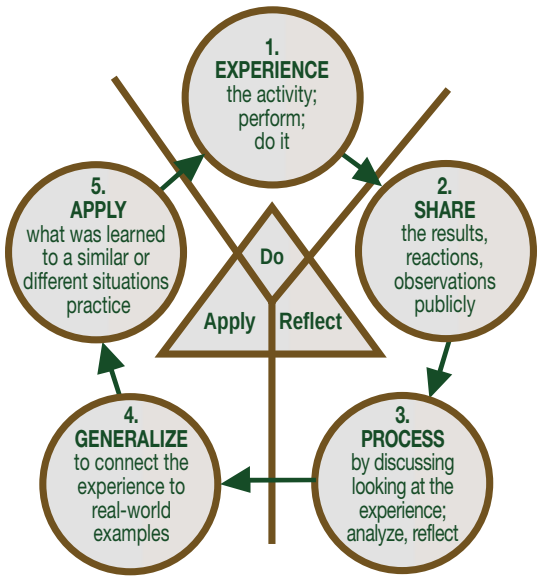
Teachers may also use these activities to enhance their work on the following Sunshine State Standards:
LA.B.2 - writes to communicate ideas and information effectively
SC.G.1 - understands the competitive, interdependent, cyclic nature of living things in the environment
SC.D.2 - understands the need for protection of the natural systems on Earth

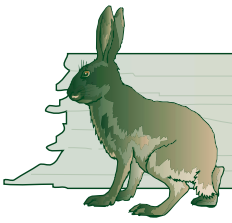
Additional activities to teach your students about trees and forests are in the national curriculum resource Project Learning Tree (PLT). A list of PLT activities for most of the exercises in this project book can be found in the Forest Resources Series Leader Guide. Contact your County Extension Office or the Florida Forestry Association (850-222-5646) for the next PLT workshop near you.

Experiential Learning

The activities in this book were designed to include the three basic steps of the Experiential Learning Model. 4-H members should 1) do an activity, 2) reflect on this experience by responding to the questions, and 3) apply this experience to a new situation.

An Experiential Model for Effective Teaching and Learning Experiences





What's Inside

Chapter 1 – Introducing Forests

Chapter 2 – Elements of Forests

Chapter 3 – Managing Forests

Welcome to Florida's Fabulous Forests

This activity guide will help you, the 4-H member, work with your project helper to explore the great variety of forests across Florida and how they are managed for various objectives. Each activity includes background information, something to do, and some questions to answer. The activities are designed to improve both life skills and specific project skills as you learn about Florida's forests. Do your best to complete each activity and don't be afraid to ask for help. You should consult additional resources such as books, magazines, encyclopedias, and field guides. You can visit your local library, use the Internet, and contact local forest agencies. Best of all, you will get to explore the outdoors!

The first step is to choose your project helper. This person will provide support as you complete this guide. Your project helper could be a family member, a friend, a teacher, or group leader. Ask someone to be your project helper and record his or her name here.

Project Helper _____

Project Plan

Good planning is key to a successful and fun project. Before you start your project, look through this activity guide and decide what you want to do. Think about the following questions and record your responses below. Discuss your project plan with your project helper.

What do I want to do and learn in this project? What are my goal(s)?

_____

_____

_____

_____

How do I plan to reach my goal(s)? _____

_____

_____

_____

_____

What activities and challenges do I plan to complete?

_____

_____

_____

_____

Signed: _____ _____

4-H member Project Helper

Date: _____

Chart Your Progress

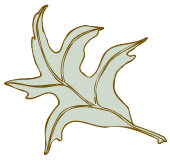
Date each activity as you complete it and have your project helper initial it.

Main Activities

Date	Helper	Activity
		1.1 A Walk in the Woods
		1.2 So What's a Forest?
		1.3 Not All the Same
		1.4 Forest in the City
		1.5 A Working Forest
		2.1 Who Call this Home?
		2.2 A Wild Life!
		2.3 In Danger
		2.4 Get your Hands Dirty
		2.5 Forests in the Rain
		2.6 It's Natural to Succeed
		3.1 It's Not So Clear Cut
		3.2 Tree Doctor
		3.3 Friendly Flames
		3.4 Be Prepared!
		3.5 Visitors from Far and Away
		3.6 Enter Humans

Your project plan may include activities found in the More Challenges section at the end of each main activity or you might create activities on your own. Use the table below to briefly name and describe those challenges and to record the date that you complete them. Have your project helper initial these too.

Date	Helper	Name and Description of Challenge



Project Evaluation

When you complete your project, it is important to review what you accomplished and what else you hope to work on in the future. The following questions will guide you through this process. Record your answers in the space provided and review these with your project helper.

What I did: _____

_____

_____

_____

_____

I feel I met (or did not meet) my goal(s) because : _____

_____

_____

_____

_____

Other things that I would like to do and learn (future goals): _____

_____

_____

_____

_____

Signed: _____ _____

4-H member Project Helper

Date: _____

Chapter 1: Introducing the Forests

The first five activities will help you become acquainted with the variety of forests in than other places in the United States. Are you ready to start exploring?

Activity 1.1: A Walk in the Woods

Life Skill: Planning and organizing
Project Skill: Assembling a hiking kit
What to Do: Determine items needed for a forest hike and make a hiking kit.

Rules of the Trail

1. Take a friend with you when you go into a forest. Tell an adult when, where you are going, and when you plan to be back.
2. Get permission of the landowner before you venture onto any forested land. Know the rules of the landowner.
3. Stay on marked trails. Walk only where you can see the ground.
4. Respect the forest including all plants and animals. Minimize your disturbance of natural areas.
5. Pack it in, pack it out. If you bring it, plan to carry it out. This includes lunch bags, twist ties, and even used toilet paper.

Exploring forests is essential to understanding forest ecology. Not only can you learn a lot but you can also have fun! The places you can explore are limitless, and so are the interesting things you can find. Many of the activities in this book will require you to take a field trip to a forested area. Before you venture out, however, you need to be prepared.

Do the Activity

Before taking a trip to the forest, assemble a hiking kit that will contain important items for forest safety as well as things that will just make your adventure more enjoyable. Once you have collected everything, put it in your knapsack!

Essential Items

- **Water -** It's important to drink lots of water even when it's not that hot out. Just hiking around causes your body to lose a lot of fluids. Be sure to replace those fluids often and make sure everyone else does, too.
- **Snacks -** Tramping around the forest will also use up lots of energy. Bring snacks that will give you energy such as a granola bar, gorp, or fruit.
- **Insect Spray -** Florida forests have insects. Most are harmless and neat to look at but mosquitoes, chiggers, and ticks can be annoying. Also watch for spiders, bees, wasps, and ants. Some people are hypersensitive to certain insects and may have an allergic reaction if bitten or stung. Using insect spray will help ward some insects off. Socks, long sleeves, and long pants will help too.
- **First Aid Kit –** Purchase a good first aid kit or make one of your own. Include bandaids, gauze bandages, tape, scissors, antiseptic, tweezers, and aspirin. Be sure to include any personal medication you might need. A first aid handbook is always helpful.

Gorp Recipe

Gorp is trail mix that you make ahead of time, place in a bag, and eat while you hike. The neat thing about gorp is that you create your own mix by combining whatever ingredients you like. Choose ingredients that provide quick energy.

Sample Gorp Ingredients

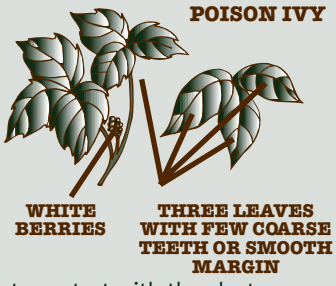
peanuts	raisins
walnuts	dates
pine nuts	prunes
Macadamia nuts	dried pears
dry cereal	oats
M&Ms	granola
sesame seeds	pretzels
roasted sunflower kernels	coconut

- **Sunscreen -** A sunburn is a surefire way to ruin a good time outdoors so prevent one by using sunscreen. Even if it's not sunny, the sun's rays can still cause damage. A hat is a good idea, too!
- **Map -** It's always helpful to know where you are, and how to get back.
- **Flashlight -** Even if you don't plan to be out after dark, take a flashlight for emergencies. Take a whistle, too, in case you get separated from your group and need to signal them.
- **Other possible items -** field guides, binoculars, sturdy shoes, camera and film, pen and paper, rain gear.

Are there any other items you can think of that you might need? Ask your family and friends or anyone who enjoys being outdoors what they think you should include in your hiking kit. Also ask them if they have any safety tips and advice. Other people's experiences are invaluable!

Leaves of Three, Leave it Be!

Poison ivy and poison oak are two similar plants that you may encounter in the forest. Look for three leaves with jagged edges. These plants contain a chemical called urushiol that causes allergic skin reactions in many people when they come into contact with it. The best way to avoid an allergic reaction is to learn to recognize the plants and avoid them. Wearing long sleeves and long pants will also help. If you do come into contact with the plants, wash your skin and clothing as soon as possible with soap and water.



Snake in the Path

Snakes are only one of the many forest animals that you might encounter on your field trips. Most forest snakes are nonvenomous. In fact, over 40 species of snakes are found in Florida and only six are venomous. What should you do if you see a snake in the woods? The best plan is to back away and observe. Most snakes are even more afraid of you and will bite people only if they have been threatened. If you plan to be outdoors, however, you should be able to identify the venomous snakes, know where they can be found, and what to do in the unlikely event that a snakebite occurs.

Talk it Over

Share with your helper

- Tell what items are in your hiking kit and why.
- Discuss how you would prepare for a trip to a forest.
- Discuss proper hiking etiquette.

Tell what's important

1. Why should you plan ahead before you explore a forest? _____

_____

_____

_____

2. How can you respect the forest when you explore? _____

_____

_____

Job Hunt

A forester manages different types of forests. Good management means considering all aspects of the forest such as trees, wildlife, water, and recreation. Foresters work in local, state, and federal agencies and for companies. They have a four-year college degree in forestry.

Explore what you learned

1. How would you react to an emergency situation while on a hiking or camping trip? _____

_____

_____

Imagine what's next

1. If other people in your hiking party are not being safe or not behaving appropriately, what could you say or do? _____

_____

_____

2. What other activities can you think of where advance preparation would be necessary? _____

_____

_____

More Challenges

1. Overnight camping allows you to experience the forest in a whole new way. Find an adult who likes to go camping and plan an overnight camping trip. Invite friends and family and keep a journal of your trip.
2. Knowing the basics of first aid will make you a better hiker and camper. Contact your local Red Cross, hospitals, or outfitter to find out about first aid classes in your area. Sign up and attend.

Activity 1.2: So What's a Forest?

Life Skill: Learning to learn
Project Skill: Observing and recording information
What to Do: Visit a forest, draw what you see, and reflect on what you learn.

The words in bold are defined in the Glossary

You probably already have a good idea about what a forest is, but providing a single definition of a forest is not easy. Many people define forests differently and that's fine. These differences are a reflection of the diversity in forests and the diversity in people's views.

Do the Activity

How would you describe a typical forest?

_____

_____

_____

How would you define the word 'forest'?

_____

_____

_____

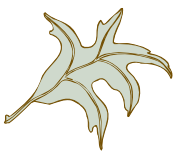
When other people define a forest they may focus on different components. For example:

- how much precipitation an area gets
- how many trees are in an area
- ability of a group of plants to mature and reproduce itself
- how an area works together as a community
- the other types of organisms (besides trees) that live in an area

Since the focus of this book is forests, it's important that you understand what is meant when the word 'forest' is used here. Our definition is in the Glossary, but don't peek until you have written your own!

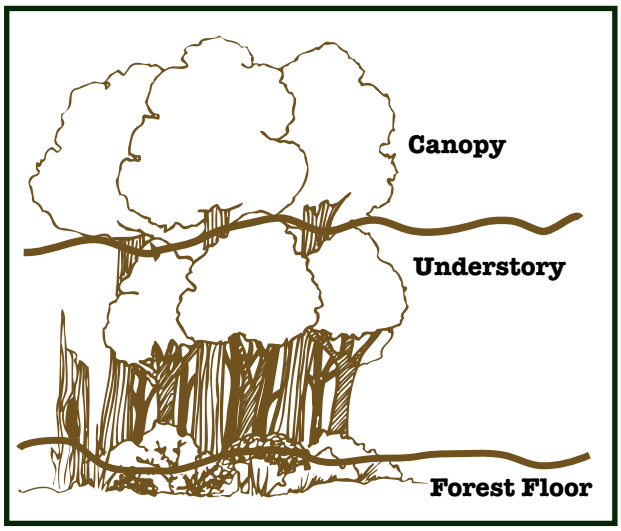
When you know what a forest is, it's time to go visit one. Choose any area with plants and animals and a lot of trees. It can be a small or large area and it can be nearby or far away. Visit your chosen forest and try to spend at least an afternoon or morning there. Draw a picture of what you see. Then, using the information provided, identify the three forest layers in your picture.

All forests are alike in one way because they all have trees.



Working Together

A forest is an **ecosystem,** an interconnected and interactive community of living things and their physical environment. There are many different parts of a forest ecosystem, some of which you can see and some you cannot see.



1. **The 3 Forest Layers**
   Canopy - top layer of the forest formed by the branches and leaves of the tallest trees.
2. **Understory -** middle layer of the forest where shorter trees and shrubs grow.
3. **Forest floor -** bottom layer of the forest that contains seedlings, grasses, ferns, and decaying materials.

Forests can be different from each other, as you will learn in the next activity, by having unique combinations of trees and other plants. Forests can also vary by their management objectives. **Objectives** are specific goals set by the landowner that guide the management decisions for that forest. As you will see throughout this project book, there can be many different objectives that determine how much and what type of human activities occur in a forest. These varying activities influence the type of forest that occurs in a given place and at a given time.

Forests can be protected areas where people do not influence the natural course of events. These lands will have minimal human activity. Examples of this type of forest are the wilderness areas set aside by the federal government.

Forests can also be managed for producing any of the many things that people desire from forests. Here the objectives are supplying one or more outputs such as wood products, water, or certain types of animals. These forests can be intensively managed to insure a good yield of the desired product(s). An example of a production forest is a plantation owned by a private company to produce trees that are harvested every 18 to 35 years to produce goods like lumber and paper.

Some forests are managed to meet many different needs. This is called **multiple-use management** and the objective is to balance the needs and values of different users. This can be challenging since some of these uses and values may conflict. Many of our state and national forests are managed for camping, hiking, swimming, wildlife habitat, harvesting of trees for firewood, and wood products.
What type of forest did you visit? Is it a preserved forest, a production forest, or a multiple-use forest? How do you know? What are the objective(s) of your forest? If it's not obvious, you should ask the forest manager.

Talk it Over

Share with your helper

- Describe the forested area you visited.
- Explain how it fits the definition of the word 'forest.'
- Describe the objective(s) of your forest.

Tell what's important

1. How are all forests alike? How do forests differ? _____

_____

_____

2. What types of human activities occur in your forest?_____

_____

_____

Explore what you learned

1. Thinking back to the three layers of a forest, which layers of the forest you visited could you see? Which layers could you not see or did you have difficulty seeing? _____

_____

_____

2. Will all forests have a canopy, understory, and forest floor? _____

_____

_____

3. What evidence helped you decide on your forest's objective(s)? _____

_____

_____

Imagine what's next

1. As you explore forests, what do you want to learn about them? _____

_____

_____

2. What types of forests do you want to explore? _____

_____

_____

3. How will the human activity in the forest alter that forest? How will managing the forest change the forest in the future? _____

_____

_____

More Challenges

3. Research, take photographs or draw pictures, and write descriptions of forests in your area. How do these forests differ? How are these forests the same?
4. Discover what forests look like across the United States and even in the rest of the world. Find pictures and descriptions of these forests. Which forests would you most like to visit? Why?
5. Identify at least two designated wilderness areas in Florida. What are people allowed to do in these areas? What are they not allowed to do?

Activity 1.3: Not All the Same

Life Skill: Learning to learn
Project Skill: Creating an imaginary forest
What to Do: Choose a Florida forest type and invent a forest that fits the characteristics of that type.

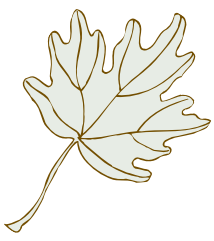
Florida is a long peninsula, stretching through several climate zones. The Florida landscape is diverse too. Sandy beaches, dense forests, and mucky swamps are just some of the different scenes that dot the Florida landscape. Oceans, rivers, lakes, and springs contribute to the varying water sources. Soils throughout Florida are also quite different, ranging from sand to hard clay. These varying conditions allow for many different types of forest ecosystems. Each ecosystem type is home to different plants and animals.

Do the Activity

Step 1: Getting to Know Florida's Forest Ecosystems

The chart on the next page names and describes the types of forest ecosystems in Florida. Study the chart and think about each type as you read. Consult additional resources for more information or to learn how to identify the dominant trees.

Ecosystem	Dominant Tree Types	Soil Descriptions	Comments
Flatwoods	Slash Pine Longleaf Pine	poorly drained, nutrient poor, sandy soils	• Most extensive ecosystem in Florida • Fire plays major role
Scrub	Sand Pine	well-drained, nutrient poor, deep, sandy soils	• Desert-like • Home to many threatened & endangered species • Needs intense fire every 20-60 years
Sandhills	Longleaf Pine Turkey Oak	well-drained, nutrient poor, dry, sandy soils	• Benefits from frequent fire • Home to some threatened & endangered species
Upland Hardwoods	Laurel oak Southern magnolia Pignut hickory Sweetgum	fairly fertile, well-drained, sandy soils	• Largest number of species of trees and shrubs per unit area in the continental United States • Are productive for agriculture and make ideal home sites for people so many of these ecosystems have been cleared and/or developed
Bottomland and Wetland Hardwoods	Live oak Red maple Water oak	poorly-drained, silt and clay soils	• Include several variations including true bottomland hardwoods found mainly in the Panhandle, swamp hardwoods, and wetland hardwood hammocks • These areas experience flooding at certain times during the year
Tropical Hammocks	Gumbo limbo Pigeon plum	alkaline, sandy soils	• Located on outcroppings of limestone • Contains tropical palms, hardwoods, and wildlife not found in other parts of the United States
Swamps	Baldcypress Pondcypress Swamp tupelo	poorly-drained, very wet, muck soils	• Near or in standing or running water • Important water recharge areas
Mangroves	Black mangrove Red mangrove White mangrove	fine mud, sand, or peat	• Salt water tidal areas • Important in coastal fishery food chains



Which forest ecosystems are found near your home? _____

_____

_____

What other forest ecosystems have you explored? Where are they located? _____

_____

_____

What other forest ecosystems would you like to explore? Where can you find these ecosystems? _____

_____

_____

_____

Step 2: Learning the Trees, Shrubs, and Herbs of Selected Ecosystems

Learn to identify all the dominant trees in each ecosystem and 10 companion plants in at least 2 of the ecosystems. The dominant trees are listed in the chart from Step 1. The boxes on the next page list plants, both trees and non-trees, that may be commonly found in these ecosystems. These plants are only a sampling of what is found in these areas. Use the 4-H Florida Forest Ecology website at www.sfrc.ufl.edu/4h, field guides, and local reference materials to help you identify the trees and plants.

Step 3: Creating your own Forest

Select one forest ecosystem that you would like to learn more about. It might be a forest type that is near where you live or it could be one you have never visited. Start with the descriptions on page 63 now and use your library, the internet, and other resources to find out more details about this forest type. Look for pictures and drawings. What plants and animals live there? What distinctive characteristics does it have? With the information you found, create a poster of this forest ecosystem. Draw or paint pictures, cut and paste images, use other materials, and really use your imagination. After all, it's your forest.

Talk it Over

Share with your helper

- Name and describe the different Florida forest ecosystems.
- Show your poster and discuss which ecosystem it is.

Tell what's important

1. Why does Florida have so many types of forest ecosystems? _____

_____

_____

Explore what you learned

1. Why did you choose the forest type that you selected? _____

_____

 _____

2. How could anyone who looks at the poster of your forest determine what type of forest ecosystem it is?

_____

_____

_____

3. How is this ecosystem different from others in Florida? _____

_____

_____

Imagine what's next

1. What other conditions would create a different ecosystem (think about forests in other states)? _____

_____

_____

More Challenges

6. Give the forest you descried in step 3 a name and decide what you would like to do with your forest. Create a forest plan that lists your objectives for your forest and that describes how you would like your forest to look in 15 years.

7. Investigate your county to find out what types of forest ecosystems are found there. Obtain a map of your county and label areas you know contain forests and indicate what type of ecosys tems those forests are. How far would you need to travel to find a different forest ecosystem?

8. Go visit at least one of the eight forest ecosystems in Florida. The list on page 63 indicates some state and national parks and forests that showcase our native forests.

Flatwoods

- Beautyberry
- Blackberry
- Blazingstar
- Bracken fern
- Cabbage palm
- Coralbean
- Deer tongue
- Deerberry
- Eastern redcedar
- Fetterbush
- Flatwoods plum
- Gallberry
- Ground blueberry
- Hawthorn
- Live oak
- Loblolly pine
- Poison ivy
- Red maple
- Saw palmetto
- Sparkleberry
- St. Johnswort
- Stinging nettle
- Sweetgum
- Tarflower
- Water oak
- Wax myrtle
- Wiregrass
- Yellow jessamine

Swamps

- Blackberry
- Buttonbush
- Cabbage palm
- Carolina willow
- Dahoon holly
- Elderberry
- Fetterbush
- Golden club
- Lizard's tail
- Loblolly bay
- Poison ivy
- Poison sumac
- Primrose willow
- Red maple
- Resurrection fern
- St. Johnswort
- Saw palmetto
- Saw-grass
- Smilax
- Spanish moss
- Sweetbay magnolia
- Titi

Bottomland Hardwoods

- Baldcypress
- Blackberry
- Cabbage palm
- Hornbeam
- Overcup oak
- Low Panicums
- Peppervine
- Poison ivy
- Poison sumac
- Resurrection fern
- River birch
- Smilax
- Spanish moss
- Sparkleberry
- St. Johnswort
- Sugarberry
- Swamp chestnut oak
- Sweetbay magnolia
- Sweetgum
- Sycamore
- Water hickory
- Wild grape
- Winged elm

Scrub

- Broomsedge
- Chapman oak
- Gopher apple
- Ground blueberry
- Lichens
- Milk peas
- Myrtle oak
- Low Panicums
- Rosemary
- Rusty lyonia
- Sand live oak
- Saw palmetto

Upland Hardwoods

- American basswood
- American beech
- American holly
- Black cherry
- Blackberry
- Bluff oak
- Bracken fern
- Cabbage palm
- Carolina laurel cherry
- Coralbean
- Deerberry
- Eastern redcedar
- Flowering dogwood
- Hophornbeam
- Live oak
- Loblolly pine
- Low Panicums
- Pecan hickory
- Poison ivy
- Resurrection fern
- Shumard oak
- Smilax
- Southern red oak
- Spanish moss
- Sparkleberry
- Spruce pine
- Stinging nettle
- Virginia creeper
- White ash
- Wild grape
- Winged elm
- Yaupon holly

Sandhills

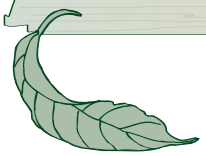
- Broomsedge
- Black cherry
- Blackberry
- Blazingstar
- Bluejack oak
- Bracken fern
- Deer tongue
- Golden aster
- Gopher apple
- Ground blueberry
- Lopsided Indian grass
- Low Panicums
- Pawpaw
- Persimmon
- Prickly pear
- Rusty lyonia
- Sand post oak
- Sassafras
- Southern red oak
- Sparkleberry
- Wiregrass

Tropical Hammocks

- Black ironwood
- Boston fern
- Cabbage palm
- Devil's claw
- Fiddlewood
- Lancewood
- Marlberry
- Mastic
- Myrsine
- Poison ivy
- Poisonwood
- Rapanea
- Resurrection fern
- Snowberry
- Strangler fig
- Torchwood
- Virginia creeper
- White stopper
- Wild coffee
- Wild grape
- Wild tamarind
- Willow bustic

Mangroves

- Buttonwood
- Fishpoison tree
- Nickerbean
- Perennial glasswort
- Saltwort
- Sea blite
- Sea daisy
- Sea purslane



Activity 1.4: Forest in the City

Life Skill: Leading self and others
Project Skill: Conducting an inventory
What to Do: Explore an urban forest and collect data.

Many people in Florida live in urban areas. Most of these people work, go to school, and play in cities. Does this mean they rarely get to visit a forest? Of course not. People who live and work in cities experience a special type of forest every day — the urban forest.

Secret Life of an Urban Forest

- A well-positioned shade tree can keep a house 20% cooler in the summer.
- Just three well-placed trees around a home can lower air conditioning bills by up to 50% and windbreak trees can reduce winter heating bills by up to 30%.
- Mature trees raise property values by up to 20%.
- Tree root systems hold soil in place, preventing erosion. Trees also absorb storm water that might otherwise result in flash flooding. A city's urban forest can reduce peak storm runoff by 10-20%.
- Areas of trees within cities can help reduce temperatures in the summer, which lowers smog production.

Do the Activity

An urban forest is a community of trees and related organisms occurring in and around areas where there are large groups of people. An urban forest can be found in parks, yards, vacant lots, streets, parking lots, cemeteries, schoolyards, and neighborhoods. Select an urban forest that you can easily visit. One way to explore your urban forest is to list and count the trees and animals you see. This process is called taking an inventory. Conduct the three inventories listed below and record your data in the boxes provided. Use separate sheets of paper if you need more room and contact a forester or wildlife biologist if you need help identifying the things you find.

Inventory 1: Tree Species

Identify the different tree types in your urban forest. Use a tree identification guide and what you have already learned about identifying trees. Ask a tree expert to help identify unfamiliar trees. Determine the total number of trees according to species. In the 'Observations' column record any general information about the tree type that you find interesting. For example, does it have leaves, needles, flowers, fruits, or cones? What does the bark look like?

Tree Name	Number of Trees	Observations

Common Urban Tree Problems

Construction damage	Poor planting	Misuse of herbicides
Improper pruning	Soil compaction	Lack of watering
Vandalism	Wrong tree for the site	Damage from automobiles

Inventory 2: Tree Damage

Urban trees are subject to a lot of stresses not found in a natural forest. Examine trees in your urban forest for any signs of damage or injury. Determine the number of trees with each type of damage and injury. In the 'Observations' column record information such as how bad the damage is and how you think the tree was damaged.

Damage or Injury	Number of Trees	Observations

Inventory 3: Wildlife

Using binoculars and field guides, if you have them, identify the different kinds of animals you see, or evidence of animals you find in the urban forest. In the 'Observations' column, record the evidence you found, what the animals were doing, or what they look like.

Animal Name	Number of Animals	Observations

Talk it Over

Share with your helper

- Describe your urban forest.
- Discuss the different tree and animal species you found in your area.
- How much tree damage or injury was in your area?

Job Hunt

Urban foresters are in charge of planning, planting, and maintaining trees in the urban forests. One of their major goals is educating the public about the urban forest. A career in urban forestry requires a four-year college degree in forestry specializing in urban forestry.

Tell what's important

1. What did the three inventories tell you about your urban forest? _____

_____

_____

_____

_____

Explore what you learned

1. What benefits do you get from urban forests? _____

_____

_____

2. What benefits do urban forests provide for the whole community? _____

_____

_____

Imagine what's next

1. Why might a community want their urban forests to be inventoried? _____

_____

_____

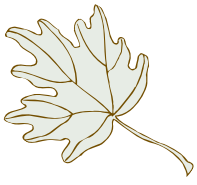
2. What else would you like to know about your urban forest? _____

_____

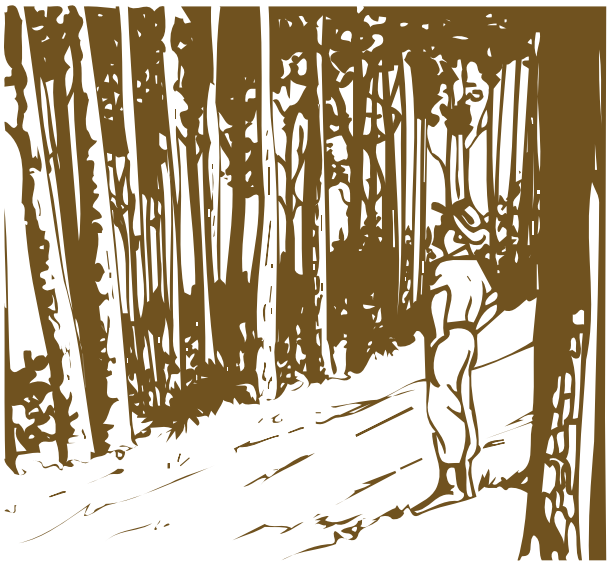
_____

More Challenges

9. Invite a friend to make the same observations as you and compare notes. What things were on both lists? What things did only one of you see?
10. Write a list of ways that you can help maintain and enhance the urban forests in your area. Talk with other members of your community to create ways that your whole community can help improve the urban forests.
11. Discover which cities near you employ urban foresters. Contact one of these urban foresters and find out what they do.



Activity 1.5: A Working Forest



Life Skill: Relating to others
Project Skill: Understanding what a plantation is
What to Do: Visit and tour a plantation.

Florida is home to many **plantations**, planted forests primarily grown to produce the raw materials needed for the manufacture of wood products. Some plantations are managed by public agencies like the Florida Division of Forestry but most are privately owned either by forestry corporations, investors, or private citizens. If you live near forest plantations, your forest-owning neighbors might welcome 4-H clubs and other youths to visit their lands.

Do the Activity

Arrange with a landowner or forestry professional to visit a plantation. Discuss with your tour guide the management plan and objectives for the plantation. Based on your observations made during the tour and with the help of your tour guide, complete the chart below.

Objectives What are the landowner's objectives? How will these be met? Are the objectives the same for all parts of the forest? Are there areas of special concern?	
Tree Species Which species of trees are in the forest? Does one species dominate or is there a mix?	
Size and Age of Trees How big are the trees? Are all the trees the same age or is there a wide range? What is the average age? Were the trees planted?	

Spatial Arrangement Are the trees in rows? Are the trees close together or far apart?	
Understory What plant species are present in the understory? What is their density and height? How do wildlife use the area? Are herbicides or fertilizers used? If so, why?	
Harvest When was the last harvest? When is the next harvest? How are the trees harvested? (Activity 3.1 gives information on harvesting.) What are the harvested trees used for?	
Miscellaneous Record any other observations or comments.	

Talk it Over

Share with your helper

- Describe your visit to a forest plantation.
- Tell who owns and manages the forest you visited and what their objectives are.

Tell what's important

1. How did visiting the forest plantation help you understand what a plantation is? What aspects of the management plan could you see in action? _____

_____

_____

2. What observations on your tour did you find interesting? Did you learn anything about plantations that surprised you? _____

_____

_____

Explore what you learned

1. What do plantations provide for your local community? What do they provide for the State of Florida?

_____

_____

_____

Imagine what's next

1. Why is it important to have a management plan? Do you think management plans are flexible and can change throughout the life of a forest? Why or why not? _____

_____

_____

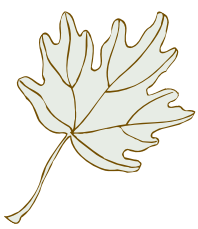
2. Besides plantations, what other types of forests should have management plans? What other natural resources should have management plans? _____

_____

_____

More Challenges

12. Research some of the private corporations in your area that manage plantations. Design a fact sheet about at least one private industrial landowner that informs the public about their mission and contribution to the local community.
13. *Trees and Me,* Book 2 of this Forest Resources Series, provides information on the many products that come from trees. Using this and other resources, gather an assortment of tree products and create a display for a 4-H fair or contest.



Chapter 2: Elements of Forests

In the next five activities, you'll learn more about the ingredients that, with trees, help create a forest community.

Activity 2.1: Who Calls this Home?

Life Skill: Applying science process skills
Project Skill: Gathering and recording data
What to Do: Examine a fallen, rotting log and record data about what you see.

A forest is home to many, many creatures. You can often see deer, squirrels, birds, and other animals. Beneath a rotting log, however, is another whole community of organisms that you have to look closely to see.

What's Going On?

As trees grow, they take nutrients from the air and soil around them and use these nutrients to make bark, twigs, leaves, and branches. When a tree dies and when leaves fall, these nutrients become available for other organisms to use. Termites, fungi, bacteria, and other organisms colonize fallen logs and begin breaking down the logs into smaller parts. This process is called **decomposition**. All these small organisms work together to break down dead trees and other matter to make **humus**, a rich layer of soil.

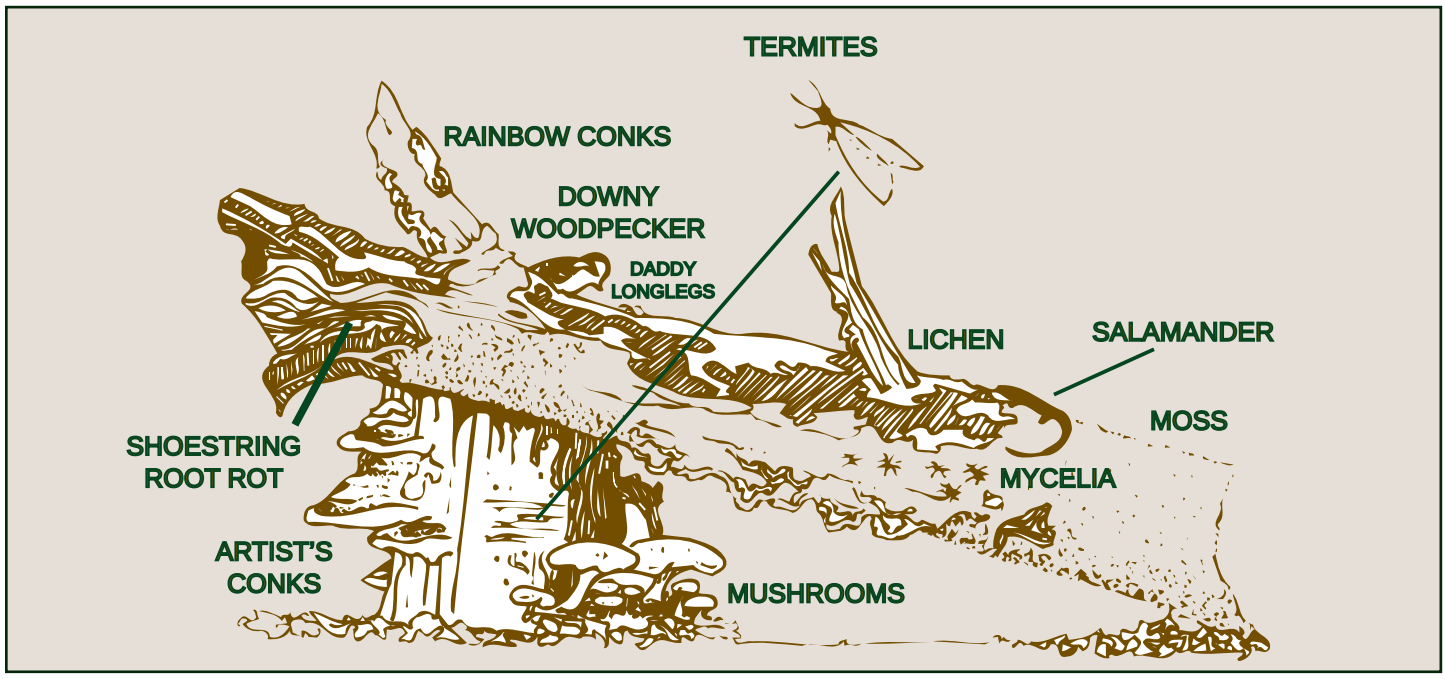
Do the Activity

Fallen logs can be found almost anywhere there are trees. Find a rotting log in an area where you have permission to move a fallen log. Turn the log over and examine it closely. Use a stick rather than your hands and be cautious in case you stumble upon a scorpion or snake.

It's a good idea to use a magnifying glass to view the really small organisms. In the chart below, record what you see. Your list might include spiders, centipedes, worms, moss, fungi, and other small plants and bugs. Describe the insects and plants you see. What do they look like? What are they doing? Where are they located on the log? When you are done recording your data, try to put the log back the way it was. After all, that log is home to many things!

Data Chart

Description of what you see	Observations (What is it doing? Where?)



Talk it Over

Share with your helper

- Using your data chart, describe what you observed when you examined the log.
- Discuss what the organisms you observed were doing.

Tell what's important

1. What does observing a single log tell you about the whole forest? _____

_____

_____

_____

Information is the Key!

Bits of information gathered from observation and experimentation are called data. In this activity, your data are what you see on the log. It is important to carefully record your data so the information can be used later, when you can no longer observe the log or by someone who never saw the log. The word 'data' is confusing because it is plural. One bit of information is called datum.

2. When can you use this technique of observing and recording to help you report and share what you have learned? _____

_____

_____

Explore what you learned

1. Are the animals on the sunny side of the log the same as those on the shady side? Why or why not?

_____

_____

_____

2. Where else in the forest might you find the same type of small organisms? _____

_____

_____

3. A community is a group of organisms living in the same place that are connected through food chains and other relationships. Are the rotting log and its inhabitants a community? Why or why not? _____

_____

_____

Imagine what's next

1. What type of activities (natural and human) might damage the part of the forest ecosystem you observed? _____

_____

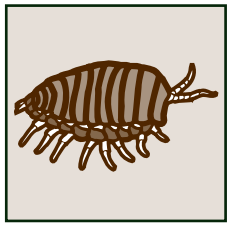
_____

More Challenges

14. Using the data you recorded, write a short story about what is happening on your rotting log. Use your imagination and create a whole cast of characters!

15. Draw a close-up picture of the log you examined and all the creatures you observed. Imagine what that log will look like in the future and draw a second picture to illustrate what you imagine.

Beetle Grub



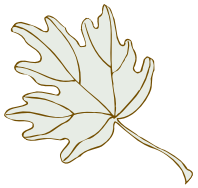
Pillbug

Long-Horned Borer

Land Snail

Centipede

Activity 2.2: A Wild Life!



Life Skill: Planning and organizing
Project Skill: Creating an animal-friendly habitat
What to Do: Research a local animal and enhance its habitat.

Animals have different preferences for their **habitat**, the place that provides an animal with all its basic needs for survival. A forest can provide habitats for many animals. Each type of animal has unique habitat needs. These habitat needs might include a certain type of food, nesting material, or shelter.

Do the Activity

Select an area that you can easily access and that you have permission to change a little bit. It could be your backyard or a neighborhood park. It can be a big or small area with a little or a lot of vegetation. Research your area to learn about which animals live there. Contact your county extension agent or ask friends and neighbors. Select an animal common to your region that you would like to see more of. Research your selected animal to find out its habitat needs, including what it eats and where it lives. Figure out how you can make your selected area more attractive to that animal. It may be as simple as placing a bird feeder or planting a certain type of plant.

Animal Name:

Habitat Needs:

What does the animal eat?

Where does it like to live?

Does it have special needs?

How will you change the habitat to benefit this animal?

Talk it Over

Share with your helper

- What type of animal did you choose to research and why?
- What are the habitat needs of your selected animal?
- What did you do for your animal?

Tell what's important

1. How did the change or addition to your area meet the habitat needs of your animal? _____

_____

_____

_____

Job Hunt

Wildlife biologists study different types of animals and their habitat needs. They help improve habitats and monitor populations. These positions require at least a four-year degree in wildlife biology as well as a great love of the outdoors!

Explore what you learned

1. How could you improve your selected area to meet even more of your animal's habitat needs? _____

_____

_____

2. Are there any conditions that might drive away your animal, rather than attracting it? _____

_____

_____

Imagine what's next

1. Can you imagine any habitat needs of an animal that would require your community to work together to create an animal-friendly environment? _____

_____

_____

2. Can you imagine any negative consequences of these habitat improvements? _____

_____

_____

3. Imagine a situation in your home or school where you might have to change your surroundings to meet the needs of a new person. Examples might include if an elderly grandparent or someone in a wheelchair came to visit. _____

_____

_____

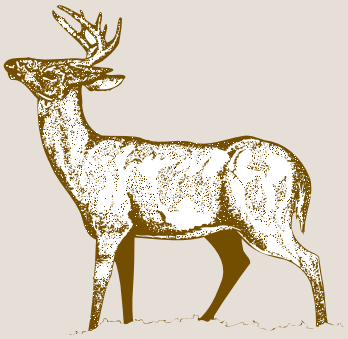
More Challenges

16. Observe your altered area for a week and record any sightings or signs of your species. In some cases, you may have to wait longer than a week to see any sign.

17. Learn how to identify animals by their tracks. Look for animal tracks in your neighborhood or a local park and forest. Create drawings of these tracks or find out to make plaster casts of animal tracks.

Introducing...Florida Forest Friends

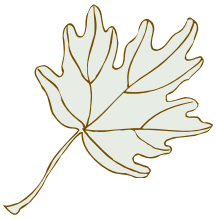
You might not be able to attract these animals to your area, but they are common in Florida's forests so you might see them when visiting a forest.



White-tailed Deer: When startled, these deer flick their tail up like a flag, exposing the white underside. In the summer these deer have red-brown fur that turns a gray-brown in the winter. Although these deer are a popular target for hunters, strict laws regulate hunting. White-tailed deer can be found in great numbers in Florida in wilderness areas and around small communities.

Wild Turkey: Although most people associate turkeys with Thanksgiving, wild turkeys can be found throughout the year in Florida forests. They build their nests on the ground and lay 9-18 eggs at a time. In the early 1900s, wild turkeys were declining due to hunting and habitat loss. With management, these birds have made a comeback and in Florida today, wild turkeys thrive.

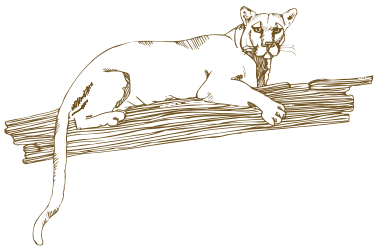
Eastern Box Turtle: The box turtle has a hinged lower shell which can be brought up to meet the upper shell creating a "box" for the turtle to hide in. The box turtle eats insects, berries, and leaves. These turtles usually live 40 years or so but have been known to live for as many as 100 years!



Activity 2.3: In Danger

Life Skill: Communicating with others
Project Skill: Researching and presenting a topic
What to Do: Select an endangered species and create an information campaign.

A **species** is a group of organisms that have similar, specific characteristics and generally interbreed only among themselves. For example, the alligators found in Florida are all the same species. They look alike and behave similarly. They can breed with other alligators but cannot breed with crocodiles, which are members of a different species.



A species becomes **extinct** when there are no living members of that plant or animal. Dinosaurs became extinct a long time ago. The passenger pigeon and Carolina parakeet disappeared more recently. An endangered species, according to the Federal Endangered Species Act, is any species which is in danger of extinction throughout all or a significant portion of its range. The U.S. Fish and Wildlife Service has designated over 900 native plants and animal species as endangered in the United States. In Florida today, 77 species are close to becoming extinct. Endangered animals include the red-cockaded woodpecker, Florida panther, and American crocodile. Examples of endangered plants are the four-petal paw-paw, Florida golden aster, and pygmy fringetree. Species that are likely to become endangered within the near future are called **threatened species.** Over 200 native species of plants and animals are threatened in the United States today. Florida is home to 25 threatened species including the Eastern indigo snake, Florida scrub-jay, and scrub buckwheat.

One of the major threats to endangered species is habitat destruction. Many endangered plants and animals have very specific habitat needs. These species cannot just move into any available area. If their habitat is significantly changed or completely destroyed, they have no place to go.

What species did you choose?

Who is your audience?

What should people know?

Do the Activity

Select an endangered species in Florida that lives in a forest ecosystem and imagine that your job is to educate the public about that species. The first step is to research that species to discover important information that you would want the public to know. Secondly, decide who your target audience is. Pick an audience that can make a difference. Record that information in the appropriate box.

What is your audience?

How will you get your message across?

Next, armed with that knowledge, design a public information campaign to inform your audience about that endangered species. Describe that campaign in the appropriate box. Focus your message on what that audience should do.

Sample Tools for a Public Information Campaign

News release – Short article for the newspaper (see Activity 3.2)
Public service announcement (PSAs) – Short spots for radio or TV
Paid advertisement – Designed for print, TV, or radi.
Direct mailing – Letters and flyers mailed to a segment of the publi
License plates/bumper stickers – Statements to increase awareness
Brochure and flyer – Informational materials attractively designed
Press conference – To attract media coverage and provide information

Talk it Over

Share with your helper

- Discuss the endangered species you selected. Share any interesting facts you discovered.
- Tell why you chose that plant or animal.
- Describe the efforts being made to protect your species.

Tell what's important

1. What role does your endangered species play in the ecosystem?

_____

_____

_____

_____

2. What might happen if your species became extinct? _____

_____

_____

_____

3. Why should we care about this endangered species? _____

_____

_____

_____

Explore what you learned

1. What can be done to make the public more aware of Florida's endangered species? _____

_____

_____

_____

2. What will help the public take action concerning Florida's endangered species? _____

_____

_____

_____

Job Hunt

Communication specialists work in most natural resource agencies and organizations to coordinate outreach and education programs. These jobs usually require a four-year degree in natural resources with a specialization in education, journalism, or communication.

Imagine what's next

1. What specific actions can you or the public take to help protect this species? _____

_____

_____

2. What organizations and agencies protect endangered species in Florida? _____

_____

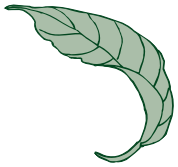
_____

More Challenges

18. Create an exhibit based on your campaign and display it at a public place or conduct a presentation or illustrated talk for your club on this topic.
19. Learn more about organizations, such as the American Forest and Paper Association, American Forestry Association, Audubon Society, National Wildlife Federation, and Society of American Foresters, that are concerned about endangered species. Find out what they do to help endangered species and how you can become involved.
20. Explore existing campaigns to help people turn out lights for sea turtles or motor slowly around manatees.

Activity 2.4: Get Your Hands Dirty

Life Skill: Applying science process skills
Project Skill: Observational and experimental skills
What to Do: Dig a hole to examine the soil and test for soil drainage.



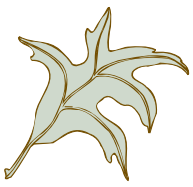
An essential component of a forest ecosystem is soil. Soil provides water, physical support, and nutrients for plants. It is important to know about soils because the type of soil in a forest helps determine what types of plants, including trees, grow there. Foresters also use their knowledge of soils to guide decisions about forest management including what type of fertilizers, if any, should be added to increase a plantation's health and growth.

Do the Activity

Part I: Dig In!

For the first part of this activity, you will need to locate a patch of land where you have permission to dig a hole. Using a shovel, dig a hole that is 3 feet deep and 2-3 feet wide. Keep one side of the hole very flat and smooth. Make the hole big enough to be able to see the color of the soil 3 feet down and the different soil layers. Draw a diagram in the box provided of the flat, smooth side of your hole.

A **soil profile** describes the different layers of soil. These layers are called horizons. The top layer, or topsoil, is called the A Horizon. This layer is covered by litter deposited from vegetation that decomposes to add organic matter to the topsoil. This makes the topsoil loose and crumbly and usually darker in color than the layer below. Beneath the topsoil is the subsoil, called the B Horizon. The subsoil usually has less organic matter than the topsoil and more clay or sand. The bottom layer is the C Horizon and is made up of the parent material. It is called the parent material since the A and B Horizons come from this layer of soil or weathered rock. The C Horizon can be loose or dense because it may be made of many materials ranging from soft sand to hard rock.



Identify the horizons you can see in your hole (you may not be able to see all of them). Describe the different layers you see and how these layers change:

_____

_____

_____

_____

Soils have different characteristics, such as texture and color that can help identify the soil type.

Soil texture describes the amount and type of particles in the soil. Soils with a fine texture have mostly small, clay particles. They feel slick when wet and firm when dry. Medium-textured soils are made of silt particles that feel like talcum or baby powder. Soils that contain big, sand particles are coarse-textured and feel gritty. These are the soil types common to Florida.

Description	Particle Type	Particle Size	How It Feels
Fine texture	Clay	Very small	Slick when wet, form when dry
Medium texture	Silt	Small	Similar to talcum or baby powder
Coarse texture	Sand	Large	Similar to table salt

Take a small amount of soil from the B Horizon of your hole. Rub that sample between your thumb and finger. What does it feel like? What texture does it have? Do soils from the different layers have different textures?

_____

_____

_____

_____

Soils can be all types of colors depending on what layer it is and where it came from. Soils can be black, brown, gray, red, yellow, white, and many shades in between. Usually a darker color indicates there is more rich, organic matter than in a lighter color soil.

What colors do you see in your hole? _____

Are there different colors of soil in the different layers?_____

_____

_____

_____

_____

Part II: Down the Drain

Another important soil characteristic is drainage. To examine this aspect of soil, you will conduct an experiment to see how long it takes for a quart of water to be absorbed into soil. First, choose a patch of soil near your hole that is free of large roots and debris and examine it. Do you think it is well-drained or poorly-drained soil?

How long do you think it will take a quart of water to drain into this soil? _____

Write your prediction here: _____ seconds _____ minutes _____ hours

Materials:

1. Large (46 oz.) tin can such as the ones that contain tomato or pineapple juice
2. Can-opener
3. Water
4. Plastic ruler
5. Watch

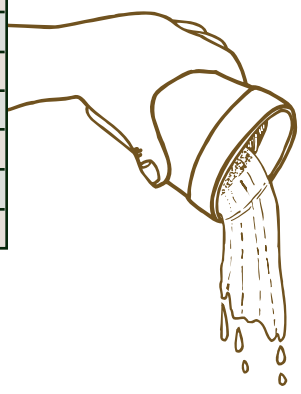
Method:

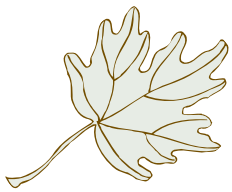
With your project helper, carefully use a can-opener to remove both ends of the juice can. Then mark a line 2 inches from the bottom of the can. Using a piece of wood or a rock, pound the can into the soil of the area you selected above, so that the mark near the bottom of the can is at the surface of the soil. Pour a quart of water into the can and use a ruler to immediately measure the depth of the water in the can and again 30 seconds later and 60 seconds later. Then, for the next ten minutes, measure the water depth every minute. After that, measure the depth every ten minutes until all the water is gone. Record your information in the chart below. Move to another spot and do this again.

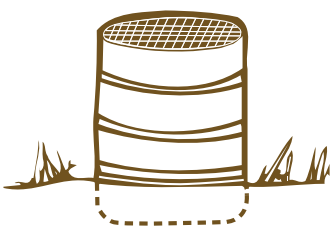
Time after water poured in can	# of inches of water in the can – Trial 1	# of inches of water in the can – Trial 2
0		
30 seconds		
1 minutes		
2 minutes		
3 minutes		
4 minutes		
5 minutes		
6 minutes		
7 minutes		
8 minutes		
9 minutes		
10 minutes		
20 minutes		
30 minutes		

Time for water to disappear	Soil drainage
2 minutes or less	well-drained
Between 2 to 8 minutes	fairly-drained
8 minutes or more	poorly-drained

Based on the provided chart, what type of drainage does your soil have? _____



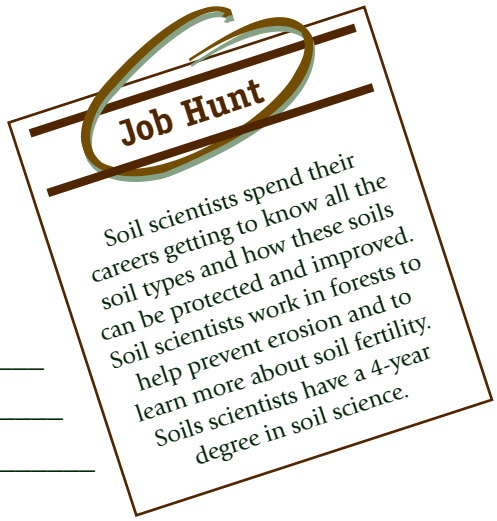




Talk it Over

Share with your helper

- Describe the three soil horizons.
- Show the hole that you dug and discuss its soil properties.
- Define soil drainage and tell how you measured it.



Tell what's important

1. What is the role of soil in the forest ecosystem? _____

_____

_____

_____

_____

2. Why do foresters need to know about the properties of soil? _____

_____

_____

Explore what you learned

1. Under what conditions might the soil profile of an area be changed? _____

_____

_____

2. How do you think adding fertilizer to a forest will alter that ecosystem? _____

_____

_____

3. How did your results for the two different drainage tests differ? What does this say about the two soil sites? Why might these results be different? _____

_____

_____

Imagine what's next

1. Soil drainage determines the types of plants and trees that grow in an area. Examine the ecosystem chart on page 13. Find the soil description(s) that match the description of the soil you examined in this activity. What ecosystem type might your soil support? What type of trees and plants might grow there?

_____

_____

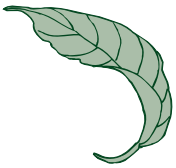
_____

More Challenges

21. Find out more about the soil type(s) in your county. This type of information can be found in your county's soil survey document. Contact your county extension agent for more information.

22. Visit a garden center and examine the different types of fertilizers they sell. How do the fertilizers differ? Fertilizers are labeled with a number such as 20-15-8. What do these numbers indicate?

Activity 2.5: Forests in the Rain



Life Skill: Applying science process skills
Project Skill: Conducting experiments
What to Do: Explore how forests and soil interact with water.

The first national forest reserves in the United States were protected not because they had trees but because the trees protected important watersheds. In some cases the trees had to be replaced to protect the watersheds and prevent soil loss and erosion. Forests play an important role in our water cycle and help provide us with clean water.

Do the Activity

Materials:

1. Large watering can
2. 2 aluminum pie plates or similar containers
3. Soil
4. Leaf litter
5. 2 large bowls

In a typical Florida forest, the ground is not bare soil, but it is covered with fallen leaves, pine needles, and dead branches. Does this ground cover affect runoff from heavy rains? In this experiment you will compare runoff from bare soil to runoff from soil with leaf litter. What do you think will happen? Record your predictions here: _____

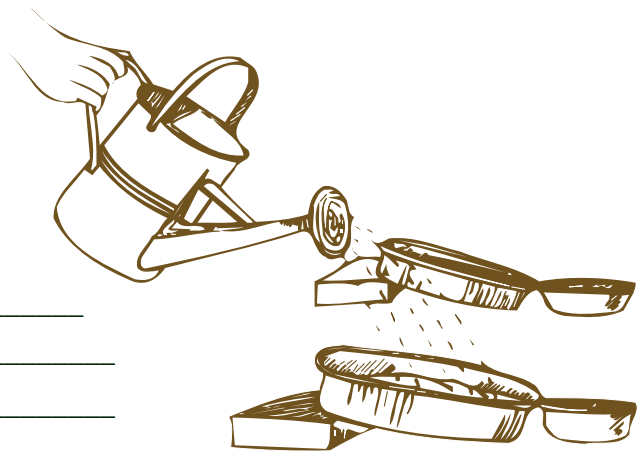
_____

_____

_____

Method:

Go outside to do this experiment. Fill the two aluminum pie plates halfway with soil. Place forest leaf litter over the layer of soil in one of the pie plates. Prop the pie plates up so that "rain" water will run off the soil. Set one of the bowls below each pie plate to catch the runoff. Use the watering can to pour an equal amount of water on both containers to simulate rain. Try to keep the force of the "rain" the same on both pie plates. It's okay if some of the water splashes out of the bowls. When you see water running out of the trays, compare the water that is captured in the bowls. Are there equal amounts? Do they look the same? How do your results compare to what you predicted? Describe your results here: _____



_____

_____

_____

Talk it Over

Share with your helper

- Discuss the experiment you conducted.
- Explain the question you were attempting to answer.
- Describe any trouble you had in doing the experiment.

Tell what's important

1. What is one of the roles forests play in our water cycle? _____

_____

_____

Explore what you learned

1. This experiment looked at the roles of ground cover during rainfall. What role might tree roots play in the water cycle? _____

_____

_____

Imagine what's next

1. Trees help protect water quality by keeping soil in place. Are there places in your community where soil erosion is a problem? Could you help enhance the ground cover with bushes or trees? _____

_____

_____

2. Forest fires burn up the leaf litter in a forest. If it rains soon after a fire, what could happen to the forest soils and waterways? _____

_____

_____

3. What organizations and agencies protect water quality in Florida? _____

_____

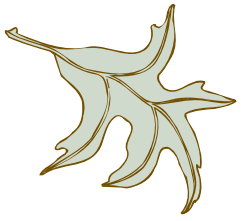
_____

More Challenges

23. Visit your Water Management District and ask about the watershed that provides your community with water. Is part of your watershed forested? Draw a map of your watershed.

24. Leaves help slow the force of falling rain. How do leaves affect soil erosion? Design another experiment to investigate the role of leaf cover and forest canopy in the water cycle.

25. Identify an area in your community that has soil erosion. Work towards controlling that area's erosion.



Activity 2.6: It's Natural to Succeed

Life Skill: Communicating with others
Project Skill: Interviewing people
What to Do: Research and share the history of nearby forests.

A forest constantly changes. These changes can be big or small, sudden or slow. Over time a forest goes through different stages or phases. These occur in a more or less predictable pattern as sun-loving plants give way to shade-tolerant plants in a process called **forest succession.** Succession refers to the changes in both the plant and animal communities in the forest. For example, an abandoned field can be quickly filled with grasses and broadleaved plants. Small trees and shrubs that grow well in full sun will move in. As more trees pop up, a young, shady forest will be formed. Over the years, these trees will dominate the area. Eventually, trees that grow well in the shade will replace the trees that require lots of sunlight. With each new stage, the types and numbers of animals and plants changes. Although succession is a natural process, people may slow, reverse, or speed up the pattern of succession with silvicultural techniques that you will learn about in the next chapter.

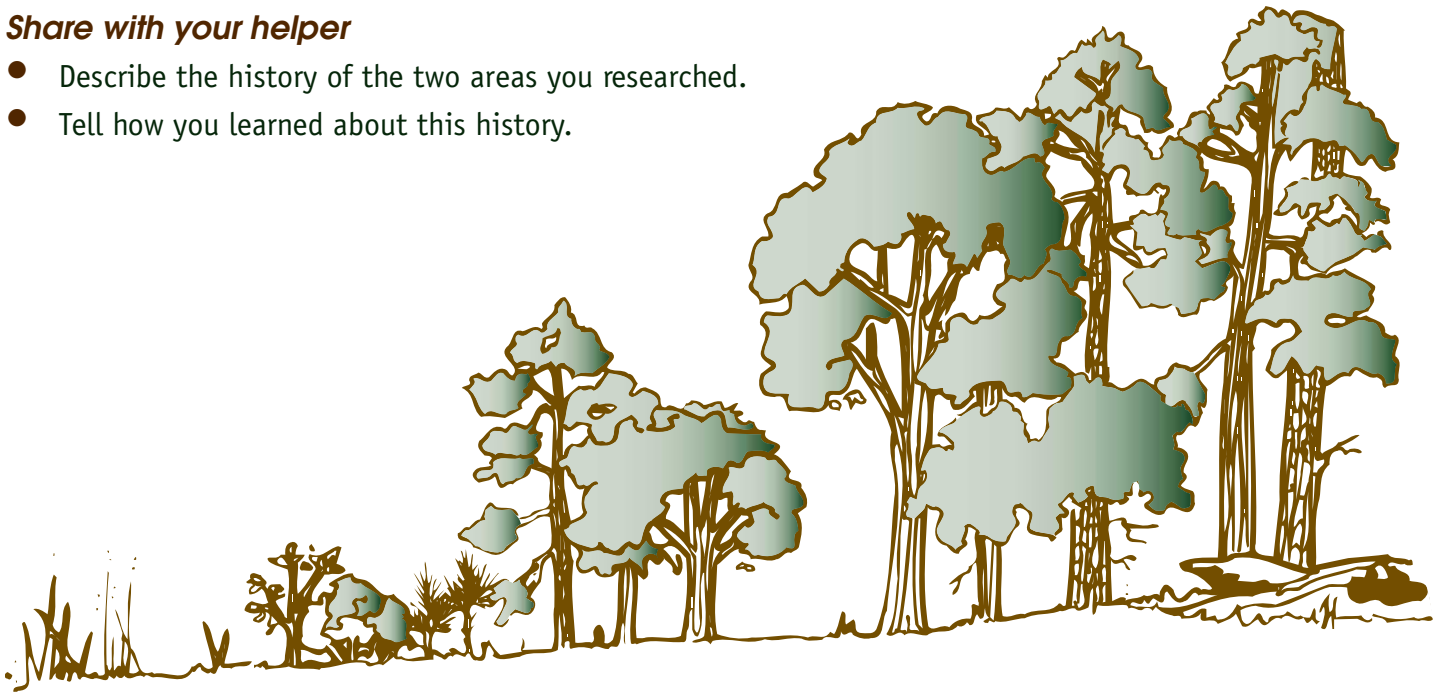
Do the Activity

Select two forests in your area – one with young trees and one with large, old trees. Research the history of the areas by visiting the library, contacting government officials, and using the internet. Meet with the forest landowners and with people who live in and around the areas. Interview people who have lived near both areas for at least 10 years to find out what they remember about the changes in those areas. When you have gathered enough information to tell a story, share it with others by creating a booklet, video, or website.

Talk it Over

Share with your helper

- Describe the history of the two areas you researched.
- Tell how you learned about this history.



Stages of a Forest

Tell what's important

1. What can be learned from studying the history of forests? _____

2. What unique information can personal interviews provide? _____

Explore what you learned

1. What information about the history of each forest surprised you? _____

2. Although succession is often described as a one-way set of changes from sun-loving to shade-tolerant plants, some natural events can "set back" succession. What events might change the composition of plants and animals in Florida forests? _____

3. Imagine that the citizens of a town in Florida identified a beautiful patch of pine trees for their public park. They want to keep the forest the same for their grandchildren. If they don't do anything to the land, will the pine forest remain as it is? How could they manage the area to keep the forest growing new pine trees? _____

Imagine what's next

1. What will both of the forests you selected look like in 5 years? 10 years? 50 years? _____

2. Interviews are good tools to find out all sorts of information such as your family history. Interview older family members about a part of their life history. _____

More Challenges

26. Draw pictures and describe how each of your forests might look in 15 years if people do not interfere with succession.
27. Imagine different scenarios in which humans play a role in the life of one of your forests. Your forest could be managed as a plantation, as a park, or as a preserve. Draw pictures and describe the scenarios if your forest were managed like that for 10 years.
28. Sometimes, even a single tree can have a big influence on a person's life. Is there a special tree that you have or that you remember? Interview several people to discover the significant trees in their lives.

Chapter 3: Managing Forests

In previous chapters, you have been introduced to the different types of forests, the wide range of management objectives, and some of the many components of a forest. In this last chapter you will see how all of this comes together through the use of the different tools and skills used to manage forests.

Activity 3.1: It's Not So Clear Cut

Life Skill: Relating to others
Project Skill: Conduct an opinion poll
What to Do: Learn about timber harvest and what others know.

Silviculture is the art, science, and practice of managing the establishment, composition, and growth of forests to achieve a desired set of objectives. These practices include planting trees, spacing trees, thinning trees, controlling pests, using prescribed fire, and harvesting trees. Silviculturalists manage a forest in smaller stands. A **stand** is a group of trees, managed as a single unit, that are similar in species composition, size, age, structure, spatial arrangement, and/or condition.

One of the most important silvicultural decisions that forest managers make is how to harvest trees — which trees will be cut and which will remain. When harvesting, forest managers must also think about the regeneration of the stand. **Regeneration** is the replacement or renewal of a forest stand by natural or artificial means. Some of the more common harvesting practices and regeneration plans are described below.

In a **clearcutting system,** nearly every marketable tree growing in a stand is harvested in a single operation. This creates an opening that allows lots of sunlight to reach the forest floor encouraging sun-loving plants of all types to grow quickly. Clearcutting disturbs the soil, which also produces a favorable environment for many young plants to grow. Artificial regeneration involves planting fast-growing seedlings in the cleared area. Alternatively, clearcuts mimic a natural opening allowing the forest to regenerate from natural seed fall or from stump or root sproutings.

In a **seed tree system,** all except a few trees are harvested. Usually ten to fifteen high quality trees are left on each acre. These trees are left to provide seeds to establish the next stand.

In a **shelterwood system,** a stand is harvested through a series of two or more cuts spaced several years apart. Like the seed tree system, high quality seed trees are always left to reseed the stand. Unlike the seed tree system, more seed trees are left to provide shade and protection for the young seedlings as they develop in the understory.

Selective cutting is the harvesting of single trees or a small group of trees, being careful not to harm the remaining trees. New trees grow in the space formerly occupied by the selected trees. The new trees come from seeds of surrounding trees or from stump or root sproutings. Unlike the harvesting-regeneration systems mentioned above, this approach is not well-suited to trees and other plants that require a lot of sunlight or disturbance to the forest floor to allow their seeds to develop.

Thinning is the harvest of some trees to provide growing space for better quality trees, or to remove dead or dying trees to reduce pest problems.

Do the Activity

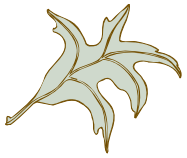
An opinion poll is a series of questions used to find out what people know and how they feel about an issue. Conduct an opinion poll to learn how a few people feel about one harvesting method – clearcutting. First review the information above about silviculture and in the box called "Clearcut Facts" so you are familiar with clearcutting.

Now find five people who are familiar with clearcutting and ask them the following questions. Record their responses.

Question	Yes	No	Maybe or Not Sure
Is clearcutting the same as clearing for development?			
After a forest is clearcut, do trees grow back?			
Does clearcutting cause the loss of wildlife habitat?			
Does clearcutting a forest create wildlife habitat?			
Is clearcutting the only method for harvesting trees?			
Does clearcutting in Florida pose a major threat of soil erosion?			
Do you support clearcutting as a forestry practice?			

Talk it Over

Share with your helper



- Discuss silviculture and some of the harvesting methods.
- Explain how you conducted your opinion poll. Who did you ask to participate? Did you ask strangers or people you knew?
- Describe your experiences conducting the opinion poll. Did everyone cooperate? Did anyone refuse to participate? Did anyone want to add information rather than merely answering yes or no?

Tell what's important

1. With which questions were the respondents in agreement? On which questions did they disagree with each other? What does this tell you? _____

_____

_____

2. Do you think the way you ask a question can influence how people respond? Explain. _____

_____

_____

Explore what you learned

1. Do you think yes/no questions were effective in learning what people know about clearcutting? How else could you ask people what they know about clearcutting? _____

_____

_____

2. Did people feel strongly about clearcutting? How might their feelings make it difficult to learn new information? _____

_____

_____

Imagine what's next

1. Did you discuss clearcutting with people if they had questions after completing your survey? Did you offer them any feedback about what they said and what you have learned about clearcutting?

_____

_____

_____

2. Why are some forests clearcut? _____

_____

_____

More Challenges

29. Research at least one other silvicultural tool such as fertilization, prescribed fire, herbicide use, or salvage cuts. How is that tool used? Why is it used?
30. Choose a forest issue and create and conduct an opinion poll.
31. Opinion polls can be found throughout the media such as newspapers, television, and radio. Examine these media sources for the use of opinion polls about a current issue.
32. Conduct more research on clearcutting systems in Florida. What would you want the general public to know about clearcutting?

Clearcut Facts

- Clearcutting only refers to situations where a forest is allowed to regrow on the site. When trees are cut to convert land to agriculture or development, that process of land clearing is called deforestation and the end-use (crops or buildings) actually prevents forest regrowth.
- Clearcutting creates habitat for many wildlife species that get part or all of their food, water, and shelter from low plants and brush found in open areas with bright sunlight. Many people believe that clearcutting destroys wildlife habitat; this is true for the species that require mature forest habitat.
- Much of Florida is flat ground so clearcutting does not pose the major threat of soil erosion as it does in hilly areas.

Activity 3.2: Tree Doctor

Life Skill: Learning to learn
Project Skill: Recognizing forest insect and disease damage
What to Do: Look for signs of damage on trees and build models of insects.

Most people enjoy good health, but from time to time, they suffer sicknesses. Some of these health problems are caused by microorganisms such as bacteria, viruses, and fungi, while some are linked to the foods we eat (or don't eat) and the environments where we live, work, and play.

The Right Tree for the Right Place

Perhaps the best way to protect a tree from unwanted insects and pathogens is to carefully select what tree to plant in a given area. Many trees are naturally resistant to certain insects and pathogens. When planting a tree, be sure to know what undesired insects and pathogens exist in your area and select a tree that is able to fend off these problems on its own.

In many ways, trees are like people. Most trees are healthy, but from time to time most trees suffer from attacks by **plant pathogens** (fungi, bacteria, viruses, etc.) that cause disease, or from insects or other animals that feed on the living tissue of trees. Some of these problems are minor and cause little harm but others can be quite serious, often killing the tree. Thankfully, most of the microorganisms and insects we find in the forest do not cause major harm to tree, in fact, most of these organisms are beneficial to forest ecosystems. Fungi and bacteria help decompose dead plants, releasing nutrients to support new plant and animal growth. Some insects serve as pollinators for plants while others are predators, attacking insects that harm trees.

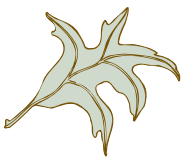
Some harmful insects and pathogens attack healthy trees. Others prefer to attack very old trees, very young trees, or those weakened or damaged by things like drought, floods, lightning, fire, or wounds.

People who study forest insects are known as forest entomologists. People who study pathogens and environmental factors affecting tree health are known as forest pathologists. Foresters manage forest ecosystems in ways to help avoid or minimize the effects from unwanted insects and pathogens. They regularly monitor the health of the trees to find out if unwanted insects and diseases are present and the extent of these problems.

Do the Activity

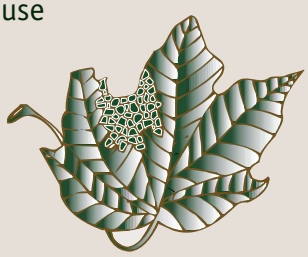
Part I

Just as forest managers are on the constant lookout for insect and disease problems, you can examine trees in your area for similar damage. Select an area where you can closely examine many different types of trees. Using the list below, look for signs of damage. Although the information provided here does not allow you to diagnose the problem, you can contact a tree expert, such as your county forester, if you think you have found a serious problem.



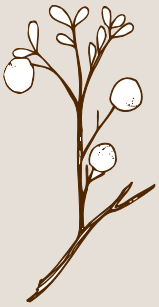
10 Possible Signs of Tree Insects and Diseases

1. Leaves with holes or missing large parts – Leaf holes may be caused by insects chewing and feeding on leaves.
2. Swollen or abnormal areas on leaves – These bumps are called **galls** and are an abnormal growth caused by insects, mites, and fungi.
3. Spots on leaves – A spot is a dead area of a leaf that is well distinguished from healthy areas. Insects and pathogens can cause spots.



4. Blotches on leaves – A blotch is a dead area on a leaf that is larger than a spot and is usually irregular in its shape. Blotches are often caused by a pathogen.
5. Leaf curling, twisting, or rolling – Insects and pathogens can cause leaf distortion.

6. Holes in bark – Insects such as borers and bark beetles create small holes in the bark of host trees. Insects use these holes to access the phloem and xylem.
7. Galls on trunk or branches – Like the leaf galls, galls on other parts of the tree are swollen areas of abnormal growth. Insects and pathogens such as fungi, bacteria, and viruses, can cause these galls.



8. Bark peeling off – This can be a sign of insects such as borers and bark beetles, of birds or other animals, or it could be caused by a pathogen.
9. Lesions on bark – **Cankers** are areas of dead tissue caused by a pathogen invading the tree. The bark of an infected area may shrink, crack, and peel off.

10. Mushroom-like growth attached to trees – These growths are called **conks** if they are hard and woody, or they are called mushrooms if they are soft and fleshy. These structures are the reproductive bodies of wood decay fungi.

Keep a record of what you see. Visit another area and check for signs of insects or diseases. How do the two places compare?

Part II

One way to learn about a few of the insects, and have some fun at the same time, is to create clay models of the insects. Buy modeling clay from an art or craft supply store. With your clay, make models of five forest insects found in Florida: eastern tent caterpillar, fall webworm, Ips beetle, pine tip moth, and southern pine beetle. You can color your insects by painting them or using the appropriate colors of clay. You might add bristles, hairs, wings, antenna, eyes, and other insect parts with things around the house: an old toothbrush, buttons, and beads. Make these models as big as you dare!

Florida Forest Insects

Eastern tent caterpillar: This 2-2 1/2 inch caterpillar has a black head. Its long body is covered with light brown hairs. On its back is a light stripe surrounded by yellowish-brown and black wavy lines. The sides of the caterpillar have blue and black spots.

Fall webworm: This 1-1 1/4 inch caterpillar is covered with white, silky hairs. Its body color can vary from pale yellow to green. On its back is a black stripe. A yellow stripe runs across its body on each side.

Ips beetle: The adult beetle is 1/8 – 1/5 inch long. It can range in color from reddish brown to black. The backside of the beetle is scooped out and has 4 to 6 spines on each side.

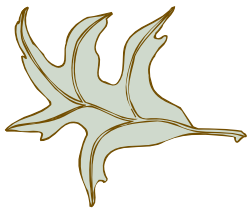
Pine tip moth: The adult moth has a 1/4 inch body with a wingspan of 1/2 an inch. The moth is covered in gray scales except for the wings that are a shiny copper color.

Southern pine beetle: The 1/8 inch long adult is reddish brown to black in color. It has short legs and a notched head. The back part of is body is rounded.

Further descriptive information and pictures of these insects can be found in field guides and on the internet at www.sfrc.ufl.edu/4h. As you look for more descriptions, also read about the habits and damage that these insects can cause. Once you have constructed your models, show them to your friends and families. Be able to talk about each insect as you show off your models.

Talk it Over

Share with your helper



- Explain what forest entomology and forest pathology are.
- Describe some of the signs of insects and diseases that you looked for.
- Name the five insects you made and describe the damage they can cause.

Tell what's important

1. What characteristics of a tree or forest can make it easier for an insect or disease to attack?

_____

_____

_____

2. How can forest managers keep insect and disease damage to a minimum? _____

_____

_____

Explore what you learned

1. What damage to trees or forests have you seen when visiting forests? What could have caused the damage?

_____

_____

_____

Imagine what's next

1. How does an insect or disease outbreak in a forest affect the rest of the forest community?

_____

_____

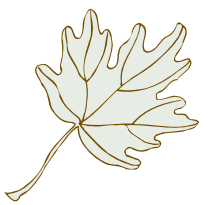
_____

More Challenges

33. Contact a local forest manager and ask what the most damaging forest insects and diseases are in your area. Find out what is being done to deal with these problems.

34. Scientists are using some trees' natural resistance to insects and diseases to genetically alter desired tree species. Find out more about biotech trees and present this information to your club or class.

35. Find out more about the Forest Health section of the 4-H Forest Ecology Contest. Prepare and participate in the next contest.



Activity 3.3: Friendly Flames

Life Skill: Communicating with others
Project Skill: Writing a newspaper article
What to Do: Research prescribed fire and write a newspaper article.

In the past, fires started by lightning and early inhabitants burned across much of Florida. Many of the plants and animals that live in Florida forests are adapted to frequent fire. Some plants in Florida actually flourish with a low-intensity fire and some animals benefit from the nourishing new growth of shoots and grasses after such a fire.

Fire-Adapted Florida Ecosystems

Pine Sandhills – Low-level fires burn the grasses and wildflowers every 2 to 5 years.
Pine Flatwoods – Slightly hotter fires burn the palmettos and shrubs every 3 to 7 years.
Sand Pine and Oak Scrub – Very hot fires burn everything every 10 to 50 years.

Possible Benefits of Prescribed Fire

- prevents wildfire
- mimics natural fire
- improves soil fertility
- reduces weeds
- improves habitat for wildlife

However, in the last 100 years, the situation has changed. The population of Florida has grown enormously and fire cannot sweep across the region without threatening people and towns. The policy has been to put out all wildfires. Over time, this policy resulted in lots of overgrown vegetation – the perfect fuel for wildfires. Now, Florida is threatened by more intense and damaging wildfires.

What can be done to prevent these huge wildfires? One tool is prescribed fire. **Prescribed fires** are small, controlled fires set by land managers to achieve some of the benefits of natural fires. These controlled burns are called "prescribed" because the Florida Division of Forestry issues a permit for burning under prescribed and specific, safe conditions.

Do the Activity

Imagine you are a reporter for your local newspaper. You have been asked to write an article on the use of prescribed fire in your area. Research the topic of prescribed fire and contact a local park manager or county forester to ask about the use of prescribed fire in your local parks and forests. Find out when the next prescribed fire is scheduled and ask to attend. If there are no prescribed fires planned for the near future or if you cannot attend a prescribed fire in your area, interview several people who have experience with prescribed fires. You could interview park and forest officials, members of the local fire department, and even homeowners that live near an area that recently has been burned under controlled conditions. Use what you learn from these interviews, your own experience, plus any other research you do to write an informative newspaper article on prescribed fire.

Newspaper Writing The 5 Ws and an H

Start your article with these basic facts and then add more details in the paragraphs that follow. Stay focused on what makes this story newsworthy.

Who – who is involved, who said it
What – what's going on, what occurred
Where – where did this occur
When – when did it occur
Why – why did it occur, why should the reader care
How – how did it happen

Talk it Over

Share with your helper

- Discuss the history of fire in Florida.
- Explain what prescribed fire is and how it can be good for the forest.

Tell what's important

1. What should Florida residents know about prescribed fire?

_____

_____

_____

_____

_____

_____

2. What can be done to inform people about prescribed fire?

_____

_____

_____

Explore what you learned

1. How did this activity change how you feel about fire in the forest?

_____

_____

_____

Imagine what's next

1. In recent years, fires have been put out to protect people and developments but this has not been good for Florida's native forest ecosystems. What other situations can you think of where the ecosystem suffers for the benefit of people?

2. What can be done about conflicts between helping people and hurting the ecosystem?

More Challenges

36. Visit a forest over a period of several months after it has undergone a prescribed burn. Record what you observe and how you feel about the effects of the fire.

Activity 3.4: Be Prepared!

Life Skill: Making decisions
Project Skill: Conveying important information
What to Do: Create a model or drawing that shows how to landscape with fire in mind.

There are several kinds of fire in Florida that affect forests. One type is prescribed fire, which you learned about it in the last activity. The other type is wildfire, which can burn out of control, threaten homes, and damage forests.

Florida has warm weather most of the year, plentiful rain in wet seasons, and mild winters. These conditions enable plants to grow abundantly, providing lots of vegetation that can feed fires in dry times. If dry, windy weather combines with all this vegetation and a spark, the result can be an intensely hot wildfire that rages out of control. Serious wildfires burned across Florida in 1998, 1999, and 2000. Human carelessness or lightning strikes started most of these wildfires. Florida residents are not powerless against these wildfires. People who live in high-risk areas can take steps to prepare for wildfires. In this activity you will learn how to determine an area's risk for wildfire and what residents in high-risk areas can do to reduce this threat.

Florida in Flames! Summer of 1998

- 500,000 acres burned
- 330 homes and businesses damaged or destroyed
- 204 people injured
- $400 million in damages
- More than $800 million to pay for fire-fighting costs
- Over 100,000 people evacuated, including all of Flagler County
- Wildfires reported in 66 of Florida's 67 counties

Do the Activity

Step 1: Walk around outside of your home and look at the nearby land. Using the information below determine your home's risk for wildfire.

You are at little risk if you see:

- densely populated, urban area.
- subdivision with no surrounding undeveloped land.
- water hydrants at the roadside.

You are at low risk if you see:

- bare ground, improved pasture, or widely spaced grassy clumps or plants.
- moist forest, mostly leafy trees, or mostly large trees.
- few plants growing low to the ground.
- oak leaves or other broad leaves covering the ground.

You are at medium risk if you see:

- thick, continuous grasses, weeds, or shrubs.
- thin layer of pine needles on the ground and scattered pine trees.
- scattered palmettos or shrubs up to 3 feet tall separated by patches of grass or sand.
- a clear view into or across the undeveloped area.

You are at high risk if you see:

- a thick bed of pine needles on the ground and lots of pine trees.
- continuous palmettos, shrubs, or sawgrass more than 3 feet tall.
- vines and small-to-medium trees or palms beneath taller pine trees.
- impenetrable shrubs or young pines.
- no clear view into the undeveloped area because of dense growth.

Step 2: One way people who live in medium or high risk areas can help minimize the effects of wildfire is by landscaping around their home with fire in mind. By following the guidelines below, residents help create an area around their home called **defensible space**. Defensible space is a 30-foot-wide (or wider) space around a home that allows fire trucks to maneuver and is landscaped to discourage the spread of wildfire. Create a detailed model or drawing that illustrates the following guidelines. Your model and drawing can educate people in medium and high-risk areas about the idea of defensible space.

Landscaping Guidelines for Medium and High Risk Areas

1. Trim lower branches to 10 feet on tall trees.
2. Remove vines from trees.
3. Keep shrubbery away from pine trees.
4. Use shrub islands or patches of perennials rather than continuous beds of plantings.
5. Thin trees so the branches do not touch each other.
6. Keep combustible items like wood piles and propane tanks at least 30 feet away from the home.
7. Clear away dead vegetation, pine needles, and branches.
8. Use mowed grass, gravel walkways, and mulched plantings near the home. Do not pile thick, combustible mulch near the foundation.
9. Keep large, leafy, hardwood trees in your yard, particularly on the east and west sides of your home for shade.
10. Remove flammable plants like saw palmetto, wax myrtle, yaupon holly, redcedar, and gallberry within 30 feet of your home.
11. Clearly label the street name and house number.
12. Create a 16-foot clearance of vegetation along the driveway.

Talk it Over

Share with your helper

- Discuss your home's level of risk for wildfire and how you determined this risk level.
- Explain the idea of defensible space, when it is appropriate to use, and how it can be created.

Tell what's important

1. Why should Florida residents determine their risk for wildfire?

_____

_____

_____

_____

_____

2. Why should all Florida residents not landscape their yards according to the guidelines for defensible space? _____

_____

_____

Explore what you learned

1. Who do you know who lives in a medium or high-risk area for wildfire? _____

_____

_____

2. What can they do to reduce their risk for wildfire? _____

_____

_____

Imagine what's next

1. What other types of natural disasters can threaten Florida homes? _____

_____

_____

2. Why is it challenging to convince people that they need to prepare for natural disasters? _____

_____

_____

Job Hunt

In Florida, the Division of Forestry is responsible for controlling wildland fire. Rangers do much of the fire fighting, and must have a high school diploma and additional fire fighting training. Most foresters are trained in using prescribed fire and in fire control. Many four-year forestry degrees include a course in fire ecology and management.

More Challenges

37. Imagine that your house was threatened by a wildfire. Devise an emergency plan for your family to follow that would insure you and your family's safety.

38. Look through old issues of your local newspaper to find out how the 1998 wildfires in Florida were covered by your media. Examine how other newspapers across the state and even across the nation covered these same wildfires.

39. Examine the media coverage of the 1998, 1999, and 2000 wildfires to discover which different organizations worked together to combat the fires. How did these agencies cooperate? Write a brief story that tells about the combined effort to fight the fires.

Activity 3.5: Visitors from Far and Away

Life Skill: Problem solving
Project Skill: Identifying and removing invasive non-native plants
What to Do: Visit a local natural area and identify invasive non-native plants.

Look around any landscape. Some of the plants and animals you see are **native**, which means those species are originally from that area. Other plants and animals that you might see are **exotic.** They did not always live in the area and have been brought to the area from somewhere else. Exotic species can be introduced to a region intentionally because they are beautiful or tasty. Other plants and animals may be accidentally introduced. Some exotics live in a new area without causing any problems but others become **invasive.** Invasive exotics often reproduce quickly and, without predators, can disrupt the natural ecosystem and squeeze native plants and animals out of their habitat.

Florida's subtropical environment makes it an easy place for exotic plants to flourish. Many of the most troublesome plants were actually thought to be beneficial and were brought here on purpose: Melalueca was planted to dry out the Everglades and increase the area available for farming, Brazilian pepper was a pretty ornamental, and Australian pine was intended to block wind and control beach erosion. Whether an accident or by intent, many plants are causing trouble in natural ecosystems.

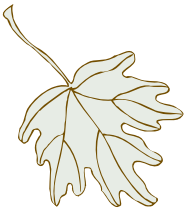
Do the Activity

Contact a local natural area manager. Consider visiting a state park, state forest, water management district wellfield, county park, or nature center. Interview the land manager and find out if they have problems with non-native plants invading their property. Which ones?

Learn to identify the plants that are causing problems in this natural area. You may find materials on the web and in your county extension office library helpful, particularly *Identification and biology of non-native plants in Florida's natural areas* edited by Langeland and Burks and published by The University of Florida in 1998.

Find out what strategies are being used to remove these plants. Are there ways you can help? The removal tools are very dependent upon the plant and location. Some 4-H'ers are raising beetles to control the spread of some invasive plants; others are picking up air potatoes.

Finally, explore how these plants get to this natural area. Do the seeds blow in with the wind? Do they come down a drainage ditch? Can the plant reproduce from plant parts other than seeds such as branches or tubers? Where is the seed source? Do nearby homeowners grow these plants in their yards? Where do these plants come from? What can you do to remove the source of these invaders?



Talk it Over

Share with your helper

- Explain the terms native, exotic, and invasive and provide examples of each.
- Discuss the results of your interview at the natural area.

Tell what's important

1. What damage can invasive exotics cause? _____

_____

_____

2. How do invasive plants get to natural areas? _____

_____

_____

3. Are there non-native plants in Florida that are not invasive? _____

_____

_____

4. Why are some plants invasive and others not? _____

_____

_____

Explore what you learned

1. Why do you think people sometimes plant non-native invasive plants in their yards? _____

_____

_____

2. Should people be able to grow anything they want in their yards? _____

_____

_____

3. Who is ultimately responsible for restricting the spread of invasive plants – the federal government, the state government, the nurseries, or the citizens? _____

_____

_____

Imagine what's next

1. Should something be done to encourage Florida residents to rid the state's natural areas of non-native invasive species? If so, who should pay for it? _____

_____

More Challenges

40. Create a flyer or brochure that encourages the use of non-invasive plants in landscaping.

41. Identify an area in your community that is experiencing trouble with an invasive exotic. Create a Club Community Service Project to control the invasive exotic. Ask your 4-H agent about Chevron Community Pride Grants that can provide funding for supplies and materials that you will need.

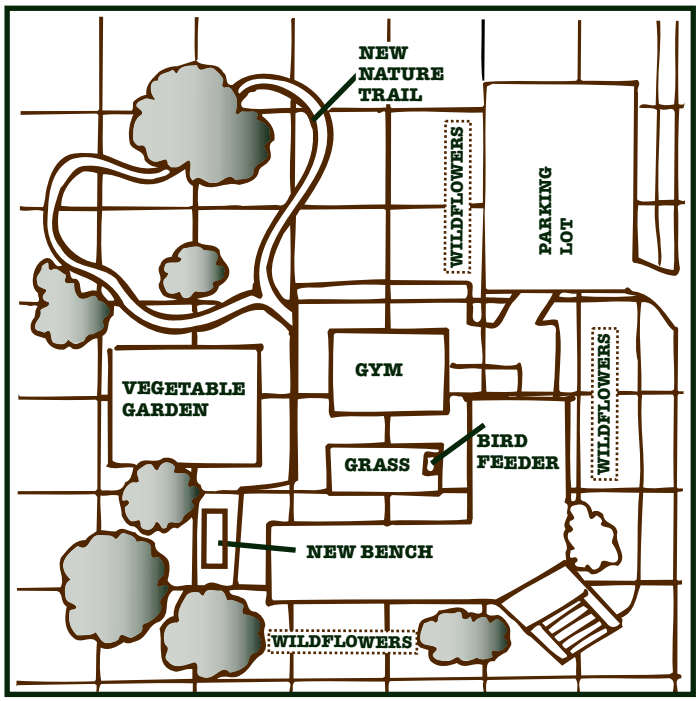
42. Work with Integrated Pest Management researchers to test new strategies for reducing non-native plant populations.

43. If you identified how a species was dispersing to a natural area, see if you can develop a plan for controlling or stopping that dispersal.

Activity 3.6: Enter Humans

Life Skill: Planning and organizing
Project Skill: Creating and carrying out a plan
What to Do: Create and implement a plan to improve a park or forest.

Humans affect forest communities in many ways. Different forests are managed with different objectives and consequently have different levels of human use. Urban forests show various impacts of humans, pollution, and cars. Plantations are carefully managed for wood production. Some forests are managed to protect wellheads and watersheds. National, state, and local forests and parks are often used for recreational areas. But people are not only users of the forest, they are also **stewards,** responsible for taking care of the forests for present and future generations.



Do the Activity

Contact a local park or forest manager. Discuss the impacts that humans have created at that area. Working with the land manager, create a plan to improve the park or forest. Try to devise a project that will lessen the negative human impacts. Examples of possible projects could be picking up litter, repairing hiking trails, or establishing a butterfly garden. Carry out your plan and maintain the work you do.

My Forest Improvement Worksheet

Describe your selected area:

What does your area need?

How will you improve your area?

How will you maintain your area?

Talk it Over

Share with your helper

- Describe why and how you selected your area.
- Explain how your improvements will benefit the area.

Tell what's important

1. How can you make your improvements long-lasting? _____

_____

_____

Explore what you learned

1. When you visit a forest, how do your actions impact that area? _____

_____

_____

2. How can you minimize any negative impacts you have on a forest when you visit it? _____

_____

_____

Imagine what's next

1. How can you become a better steward of all Florida forests? _____

_____

_____

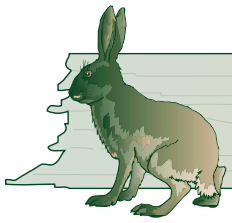
More Challenges

44. Learn more about organizations in Florida that are interested in the management of Florida's forests. These groups include Audubon Society, Florida Forestry Association, Florida Trails Association, The Nature Conservancy, Sierra Club, and Society of American Foresters.

45. Contact the Florida Forest Stewardship Program to find out what that organization does to protect and care for Florida's privately owned forests.

46. Convert your forest management plan into a Club Community Service Project. You can even apply for funding to purchase materials or supplies. Ask your 4-H agent about Chevron Community Pride Grants.

47. Explore other service project ideas through the project guide *Give Forests a Hand*.



Congratulations!

You have completed *Florida's Fabulous Forests*. You have increased your knowledge about forest ecology, forest ecosystems, and forest management. You have explored the urban forest, natural areas, plantations, and ecosystems across Florida.

Florida is an exciting place to learn about forests because it has so much diversity. To continue the learning process, be sure to check out *Give Forests a Hand*. There is still a lot to learn about forests!

Certificate of Achievement

I certify that _____ has completed a project using the *Florida's Fabulous Forests* project activity guide.

_____ _____

Project Helper's Signature Date

Tree Talk - Glossary

Canker – area of dead tissue on a tree or other plant

Canopy – top layer of the forest formed by the branches and leaves of the tallest trees

Clearcutting system – harvesting, in a single operation, of nearly every marketable tree growing on a site

Conk – hard, woody, mushroom-like growth on a tree that is the reproductive body of a wood decay fungi

Data – bits of information gathered from observation and experimentation

Decomposition –process of breaking down organic matter into smaller parts to release the nutrients

Defensible space – 30-foot-wide (or wider) space around a home that allows fire trucks to maneuver and is landscaped to discourage the spread of wildfire

Ecosystem – interconnected, interactive community of living things and their physical environment

Endangered species – any species which is in danger of extinction throughout all or a significant portion of its range

Exotic species – plant or animal that did not always live in an area and has been brought to the area from somewhere else

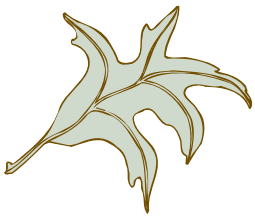
Extinct species – any species which has no living members

Forest – a tree-dominated ecosystem, made up of plants and animals, that undergoes constant change

Forest floor – bottom layer of the forest that contains seedlings, grasses, ferns, and decaying materials

Forest succession – process of change as a forest goes through a predictable pattern where sun-loving plants are eventually replaced by shade-tolerant plants

Gall – swollen area of abnormal growth on trees and other plants



Habitat – place that provides a plant or animal with all its basic needs for survival

Horizons – different layers of soil

Humus – nutrient-rich, top layer of soil

Invasive species – species that disrupts the natural ecosystem and squeezes native plants and animals out of their habitat

Multiple-use management – forest is managed to meet many different needs

Native species – plants and animals originally from an area

Objectives – specific goals set by the landowner that guide the management decisions for that forest

Plant pathogen – organisms such as fungi, bacteria, viruses, etc, that cause disease in plants

Plantation – planted forest primarily grown to produce the raw materials needed for the manufacture of wood products

Prescribed fire – small, controlled fires set by land managers to achieve some of the benefits of natural fire

Regeneration – replacement or renewal of a forest stand by natural or artificial means

Seed tree system – system where nearly all trees are harvested except for ten to fifteen high quality trees on each acre that are left to provide seeds to establish the next stand

Selective cutting – harvesting of single trees or a small group of trees, being careful not to harm the remaining trees

Shelterwood system – stand is harvested through a series of two or more cuts spaced several years apart, leaving high quality seed trees to reseed the stand and provide shade and protection for the young seedlings

Silviculture – art, science, and practice of managing the establishment, composition, and growth of forests to achieve a desired set of objectives

Soil profile – description of the different layers of soil

Species – group of organisms that have similar, specific characteristics and generally interbreed only among themselves

Stand – group of trees, managed as a single unit, that are similar in species composition, size, age, structure, spatial arrangement, and/or condition

Stewards – people responsible for taking care of the forests for present and future generations

Thinning – harvest of some trees to provide growing space for better quality trees, and/or to remove dead or dying trees to reduce pest problems

Threatened species – species that are likely to become endangered within the near future

Understory – middle layer of the forest where shorter trees and shrubs grow

Urban forest – community of trees and related organisms occurring in and around areas where there are large groups of people

Tree Resources

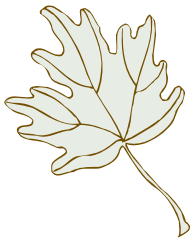
A variety of resources can be found in your library, at your county extension office, and on the internet to help you explore Florida's forests.

Field Guides

Field guides are essential to identifying plants, trees, insects, and animals. Here a few good field guides you can use:

- *Eastern Trees* (Peterson Field Guides), by George A. Petrides, Janet Wehr, and Roger Tory Peterson, revised in 1998
- *Familiar Trees of North America: Eastern Region* (The Audubon Society Pocket Guides), by Jane Friedman and Jerry F. Franklin, 1987
- *Forest Trees of Florida,* by the Florida Division of Forestry, 1997 (This small pocket guide is available free from your local Florida Division of Forestry office.)
- *Forest Trees of the United States and Canada and How to Identify Them,* by Elbert L. Little, 1980
- *Golden Field Guide to Trees of North America,* by C. Frank Brockman, 1968
- *The National Audubon Society Field Guide to North American Trees: Eastern Region* (Eastern), by Elbert L. Little, 1980
- *Peterson First Guides:* Trees, by George A. Petrides, Olivia Petrides, Janet Wehr, 1998
- *Tree Finder: A Manual for the Identification of Trees by Their Leaves* (Nature Study Guide Series), by May T. Watts, 1991

Websites



4-H Florida Forest Ecology — http://www.sfrc.ufl.edu/4h/

American Forest and Paper Association — http://www.afandpa.org

Backyard Conservation — http://www.nhq.nrcs.usda.gov/CCS/Backyard.html

Extension Wildland Fire Materials — http://www.sfrc.ufl.edu/Extension/ExtInfo.htm

Florida Division of Forestry — http://www.fl-dof.com/

Florida Exotic Pest Plant Council — http://www.fleppc.org/

Florida Forestry Information —http://www.sfrc.ufl.edu/Extension/ffes/ffwshome.htm

Florida Museum of Natural History — http://www.flmnh.ufl.edu/

Florida National Forests — http://www.fs.fed.us/recreation/forest_descr/fl_r8_florida.html

Florida State Forests — http://www.fl-dof.com/Fm/stforest/index.html

Florida State Parks — http://www.dep.state.fl.us/parks/

Florida Trails — http://www.state.fl.us/fwc/ — use 'Florida Trails' button on the left

Forest Trees of Florida — http://www.fl-dof.com/Pubs/trees/

Forestry in Florida's Counties — http://www.sfrc.ufl.edu/Extension/county/county.htm

List of Endangered Species in Florida — http://endangered.fws.gov/statl-fl.html#LnkFL

National Firewise Project — http://www.firewise.org/

Panthers in Florida — http://www.panther.state.fl.us/

Virginia Forestry Outreach Site — http://www.cnr.vt.edu/dendro/forsite/welcome.htm

Wildfire in Florida— http://flame.doacs.state.fl.us/

Wildlife in Florida — http://www.wec.ufl.edu/extension/ and http://www.state.fl.us/fwc/

Books

Here are a few library books that include information about forests. Look for more interesting reading books in your library.

- *The Cay,* by Theodore Taylor, 1969
- *The Fire Bug Connection,* by Jean Craighead George, 1993
- *The Moon of the Bears,* by Jean Craighead George, 1993
- *My Side of the Mountain,* by Jean Craighead George, 1959
- *On the Far Side of the Mountain,* by Jean Craighead George, 1990
- *Save My Rainforest,* by Monica Zak, by 1992

Where to visit our fabulous forest ecosystems in Florida:

Swamps: Swamps are forested wetlands. They may border a river with moving water, or occupy a pond of still water. They may even be dry in some parts of the year. The plants that live in swamps have special adaptations that enable them to tolerate high water levels. Approximately 10% of the land area in Florida is covered by forested wetlands. Visit cypress swamps at Highlands Hammock State Park, Blue Cypress Water Management Area, Tosohatchee State Reserve, Fakahatchee Strand State Preserve, Collier-Seminole State Park, and Big Cypress National Preserve.

Scrub: The scrub ecosystem is usually dominated by shrubby oak trees and sand pine. It usually is found on well-drained, nutrient-poor, sandy soils. This community is adapted to and maintained by huge, infrequent fires. Because they are not susceptible to flooding, these areas are often converted to citrus orchards, golf courses, and housing developments. Visit the scrub forest at Ocala National Forest, Jonathan Dickinson State Park, Merritt Island National Wildlife Refuge, Silver River State Park, St. Joseph Peninsula State Park and Oscar Scherer State Park.

Flatwoods: The flatwood forest covers the flat, sandy areas of southern, central, and northern Florida. Much of this area is now used for pine plantations or grazing. Although the soil is sandy, patches of clay below the surface holds water in cypress ponds. The soil tends to be low in nutrients. This is the most extensive forest ecosystem in Florida. The appearance of this ecosystem today is strongly influenced by fire. The Apalachicola, Ocala, and Osceola National Forests are just three possible sites to explore. Others include Tosohatchee State Reserve, and Oscar Scherer State Park. Everglades National Park, Fakahatchee Strand State Preserve, and Big Cypress National Preserve harbor the state's only remaining expanses of pine rockland, a southern variation of this community.

Sandhills: The sandhill system is a forest ecosystem noted for dry, sandy soils that do not flood. These soils are well-drained, unlike the flatwoods. This forest experiences fire very frequently (1-15 years) and therefore does not have the dense shrubs typical of the scrub forest. Instead, grasses usually cover the ground. This forest once extended from Virginia to Florida and Texas. Excellent longleaf forests on sandhills can be seen at Blackwater River State Forest, Apalachicola National Forest, Wekiwa Spring State Park, Silver River State Park, Dead Lakes State Recreation Area, and Riverside Island in the Ocala National Forest. These have good places to hike, bike, or ride horseback through well-maintained examples of the high pine community.

Upland Hardwoods: This forest is one of the most diverse in the state, because it covers a variety of climates, soils, and moisture conditions. The forest will vary in tree species from north to south Florida, eventually blending into the Tropical Hammock forest. They even extend into the Appalachian mountains. These forests are usually found in patches, surrounded by flatwoods and sandhill forests. These soils have more clay and soil nutrients than other forests, and therefore retain more soil moisture. Because many different tree and plant species prefer these forests, there is no one dominant tree that covers this ecosystem. Excellent trails through hardwood forests and hammocks are available in: Florida Caverns State Park, Dead Lakes State Recreation Area, Mike Roess Gold Head Branch State Park, Torreya State Park, Tosohatchee State Reserve, Faver-Dykes State Park, Silver River State Park, San Felasco Hammock State Preserve, Falling Waters State Recreation Area, Wakulla Springs State Park, and Highlands Hammock State Park.

Bottomland Hardwoods: This forest is an extension of the upland hardwood forest into the river floodplains and wetlands. The plants in this ecosystem cannot tolerate long periods of flooding (as in a swamp) but they do get flooded periodically when the rivers rise. Tour bottomland hardwoods along rivers in Ichetucknee Springs State Park, O'Leno State Park, Apalachicola National Forest, Suwannee River State Park, Dead Lakes State Recreation Area, Wakulla Springs State Park, St. Marys National Wildlife Refuge, Faver-Dykes State Park, Silver River State Park, and the Myakka River State Park.

Tropical Hammocks: Hardwood forests with broad-leaved evergreens are called hammocks. The tropical hammock ecosystem is restricted to South Florida, below the frost line, and contains plants and animals that live no other place in the United States. The soils are well-drained and therefore many forests have been converted into housing developments and towns. Visit the tropical hammocks at Everglades National Park, Lignumvitae Key State Botanical Site, John Pennekamp Coral Reef State Park, and Collier-Seminole State Park.

Mangrove: Along Florida's south coast and halfway up the peninsula, mangrove swamps hug the shoreline. These dense forests grow at the high tide line and help stabilize the shoreline, filter pollution, and provide nesting and nursery areas for many aquatic organisms. They are particularly threatened by shoreline development and pollution. This ecosystem now has legal protection. Trails in Everglades National Park, John Pennekamp Coral Reef State Park, Collier Seminole State Park, and Ding Darling National Wildlife Refuge are just a few places to view this fascinating natural community.

Acknowledgments

We thank George Blakeslee, Marcus Boston, Chris Demers, Mary Duryea, Lydia Flewelling, Ken Gioeli, Doria Gordon, Art Hornsby, Joy Jordan, Ken Langeland, Alan Long, Sue Munyan, Stan Rosenthal, and Wayne Smith for their thoughtful and helpful comments on this material. Two separate series of 4-H forestry books prepared by the University of Tennessee Agricultural Extension Service and the Minnesota Extension Service, University of Minnesota provided ideas and inspiration. We are grateful for the comments of the teachers at the 2000 League of Environmental Educators of Florida (LEEF) conference and 4-H youth across Florida who pilot tested these activities. We deeply appreciate the donation of design and printing by the Florida Department of Agriculture and Consumer Services to the University of Florida 4-H Foundation, Inc.

Florida's Fabulous Forests

Florida 4-H Project Book
Forest Resources Series Book 3

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Produced by the School of Forest Resources and Conservation, in cooperation with the 4-H Youth Development Program, University of Florida Cooperative Extension, Institute of Food and Agricultural Sciences, May 2001. The 4-H emblem is protected under 18 U.S.C. 707.

COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF FLORIDA, INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES, Christine Taylor Waddill, Director, in cooperation with the United States Department of Agriculture, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and is authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, age, sex, handicap or national origin. The information in this publication is available in alternate formats. Single copies of extension publications (excluding 4-H and youth publications) are available free to Florida residents from county extension offices. Information on copies for out-of-state purchase is available from Publications Distribution Center, University of Florida, PO Box 110011, Gainesville, FL 32611-0011. Information about alternate formats is available from IFAS Communication Services, University of Florida, PO Box 110810, Gainesville, FL 32611-0810. This information was published May 2001 as 4H FOM13, Florida Cooperative Extension Service.
Reviewed July 2006.