

Course	Agricultural Science II
Unit	Forestry
Lesson	The Importance of Forest Resources
Estimated Time	Four 50-minute blocks

Student Outcome

Identify the important benefits from the Missouri forest industry and available careers in forestry.

Learning Objectives

1. Identify the benefits from Missouri forests.
2. Identify the career opportunities related to forestry in Missouri.
3. Describe what forestry assistance is available from agencies in Missouri.
4. Describe how the programs of the Forestry Division of the Missouri Department of Conservation help in the utilization of Missouri forest lands.
5. Identify the responsibilities and benefits of classifying land as Forest Crop Land.

Grade Level Expectations

SC/ES/3/A/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. *Forestry* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1986.
2. *Forestry Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2008.

Supplemental Information

1. Internet Sites
 - ☐ Flooding has Occurred Across the Forest. US Forest Service, Mark Twain National Forest. Accessed February 29, 2008, from <http://www.fs.fed.us/r9/forests/marktwain/>.
 - ☐ Forest Management Assistance for Missouri Landowners. Missouri Department of Conservation. Accessed May 28, 2008, from <http://www.mdc.mo.gov/forest/products/mgmtasst.htm>.
 - ☐ Missouri Forest Facts. Conservation Commission, Missouri Department of Conservation. Accessed February 29, 2008, from <http://mdc.mo.gov/forest/landE/forfacts.htm>.
 - ☐ Missouri Forests – Their History, Values, and Management: Missouri Forests in the Past. Missouri Department of Conservation. Accessed May 28, 2008, from <http://mdc.mo.gov/forest/landE/forests/forest.htm>.
 - ☐ Private Land Programs. Missouri Department of Conservation. Accessed May 28, 2008, from <http://www.mdc.mo.gov/forest/products/private.htm>.

2. Print

- ❑ Holland, I.I., G.L. Rolfe, and D.A. Anderson (ed.). *Forests and Forestry*. 5th ed. Danville, IL: Interstate Publishers, 1997.
 - ❑ Stelzer, H.E. *Forestry Assistance for Landowners* (Guide G5999). Columbia: University of Missouri Extension, revised 2007. Accessed May 28, 2008, from <http://extension.missouri.edu/explore/agguides/forestry/g05999.htm>.
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Interest Approach

Forests cover approximately 12.4 million acres out of Missouri's total of 44 million acres. Forest resources provide a highly diverse range of benefits ranging from recreation to providing jobs to a significant portion of the work force.

Communicate the Learning Objectives

1. Identify the benefits from Missouri forests.
2. Identify the career opportunities related to forestry in Missouri.
3. Describe what forestry assistance is available from agencies in Missouri.
4. Describe how the programs of the Forestry Division of the Missouri Department of Conservation help in the utilization of Missouri forest lands.
5. Identify the responsibilities and benefits of classifying land as Forest Crop Land.

Instructor Directions	Content Outline
Objective 1 <i>Ask students how they benefit personally from Missouri's forest lands. List their ideas on the board and discuss how these and other factors benefit the quality of life in Missouri.</i>	Identify the benefits from Missouri forests. Water and soil – Forests affect the quality and availability of water. <ol style="list-style-type: none">1. Forest canopy reduces speed of raindrops.2. Decayed organic matter from forests protects soil from raindrops.3. Runoff is reduced and more water is allowed to filter into the ground.4. Water gradually finds its way into ground water and streams.5. This also reduces sediment which can be carried off. Recreation – Forest lands provide recreational areas. <ol style="list-style-type: none">1. Much of the state's tourism and recreational activities occur in the forested areas of Missouri.2. Recreation areas are often near attractive bodies of water. (Watersheds help keep water clean and provide aesthetic backdrops.) Wildlife habitat – Forests are complex communities of plants and animals. <ol style="list-style-type: none">1. Food and cover are provided for wildlife.2. Important to the ecological balance of associated plants Other non-marketable benefits <ol style="list-style-type: none">1. Erosion control2. Shade3. Windbreaks

Instructor Directions	Content Outline
	<p>Timber products – Missouri produces a variety of forest products.</p> <ol style="list-style-type: none"> 1. Fine hardwoods <ol style="list-style-type: none"> a. Missouri leads the nation in the production of black walnuts – fine wood for veneer, cabinets, and gunstocks b. Many oak products <ul style="list-style-type: none"> – Flooring – Barrel staves – Railroad ties – Lumber – Furniture – Posts c. Other hardwood products <ul style="list-style-type: none"> – Hickory for most tool handles – Boxes and pallets – Pulpwood – Firewood: 1.7 million cords (enough to make a stack 4 feet by 3 feet wide from Kansas City to St. Louis) – Charcoal 2. Shortleaf pine <ol style="list-style-type: none"> a. Poles, piling, posts b. Lumber c. Log buildings d. Pulpwood f. Furniture 3. Red cedar <ol style="list-style-type: none"> a. Novelties b. Closet lining c. Animal bedding d. Posts e. Furniture
<p>Objective 2</p> <p><i>Discuss with the students all of the careers they can think of which are related to forestry. List them on the board.</i></p>	<p>Identify the career opportunities related to forestry in Missouri.</p> <p>Forestry occupations – occupations concerned with developing, maintaining, cultivating, and protecting forests, forest tracts, and woodlands, as well as with harvesting their products</p> <ol style="list-style-type: none"> 1. Professional forester 2. Forest nursery person

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	<ol style="list-style-type: none"> 3. Christmas tree farmer 4. Christmas tree grader 5. Seedling puller 6. Seedling sorter <p>Forests conservation occupations – concerned with planting tree seedlings; pruning and thinning trees to improve quality of stand; locating and combating fires, insects, pests, and diseases harmful to trees; controlling erosion and leaching of forest soil</p> <ol style="list-style-type: none"> 1. Fire warden 2. Forester aide 3. Smoke jumper 4. Fire lookout 5. Fire ranger 6. Forest worker 7. Forest firefighter 8. Tree planter <p>Logging and related occupations – concerned with felling trees and cutting them into logs or products such as cordwood, shakes, firewood, and posts using chain saws, axes, wedges, and related tools</p> <ol style="list-style-type: none"> 1. Felling-bucking supervisor (power saw supervisor, saw boss, timber supervisor) 2. Faller 3. Tree-shear operator 4. Bucker 5. Logger 6. Tree cutter 7. Chain saw operator 8. Log marker <p>Log grading, scaling, sorting, rafting and related occupations</p> <ol style="list-style-type: none"> 1. Log grader 2. Log scaler 3. Log sorter 4. Log marker <p>Other forestry occupations</p> <ol style="list-style-type: none"> 1. Logging supervisor 2. Woods boss

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	<ol style="list-style-type: none"> 3. Cruiser 4. Timber Stand Improvement Contractor 5. Forest surveyor <p>Forest related occupations – based on using, processing, and/or marketing forest products</p> <ol style="list-style-type: none"> 1. Wood machining occupations – concerned with shaping wooden parts or products by removing excess material from stock or objects, primarily by such means as cutting, boring, abrading, milling, and planning 2. Processing wood and wood products – concerned with producing wood particles (such as chips, sawdust, and powder) and conglomerates (such as plywood, particle board, and compressed-sawdust fuel logs), removing moisture from wood, and treating wood with preservatives 3. Woodlot owner 4. Sawmill owner or operator 5. Logging contractor 6. Lumber yard or store worker
<p>Objective 3</p> <p><i>Discuss with students the agencies in your area which give assistance to land owners. List their suggestions on the board.</i></p>	<p>Describe what forestry assistance is available from agencies in Missouri.</p> <p>County University Extension Center</p> <p>State Forester's Office – Missouri Department of Conservation</p> <ol style="list-style-type: none"> 1. Forestry Division <ol style="list-style-type: none"> a. Tree planting b. Species selection c. Woodland management d. Fuelwood cutting e. Timber stand improvement f. Timber sales and tax treatment of these sales g. Harvesting and marketing h. Insect and disease detection i. Woodland wildlife management j. Utilization of timber products k. Marketing timber products l. Management plans m. Advice on cost-share payments for specific forestry practices such as T.S.I. and tree planting

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	<ol style="list-style-type: none"> 2. Forest Crop Land Program <ol style="list-style-type: none"> a. Landowners receive significant reduction in property taxes if they agree to follow an approved management plan for 25 years. b. Counties are reimbursed to offset revenue lost through this program. c. Timber tracts must be at least 20 acres in size. 3. George O. White State Forest Nursery – sells tree and shrub seedlings at a minimal cost 4. Wildlife Division – helps locate areas for food plots, brush cover, or ponds 5. Fisheries Division <ol style="list-style-type: none"> a. Advises on pond establishment and management b. Stocks farm ponds with fish <p>Missouri Department of Natural Resources</p> <ol style="list-style-type: none"> 1. Regulates standards for air, water, minerals, and energy 2. Administers state park system of Missouri 3. Restores original public land survey corners to ensure accurate location of property boundaries 4. Soil and water conservation programs 5. Forms soil and water conservation districts for watershed protection and proper land management <p>Missouri Department of Agriculture</p> <ol style="list-style-type: none"> 1. Licenses and regulates applicators of pesticides 2. Conducts surveys with assistance of other state and local agencies to locate and control spread of insect pests and plant diseases 3. Establishes preservative retention standards for treated timber products 4. Aids pecan and other nut growers, fish farmers, and produce growers in marketing their products <p>School of Natural Resources – University of Missouri</p> <ol style="list-style-type: none"> 1. Offers 4 year and graduate programs in fisheries and wildlife sciences; forestry; and parks, recreation, and tourism 2. Extension staff transfers information from faculty research programs to potential users

Instructor Directions	Content Outline
	<p>3. Educational programs about renewable natural resources for landowners, industry, professionals, FFA, 4-H, and other youth organizations</p> <p>United States Department of Agriculture – U.S. Forest Service</p> <ol style="list-style-type: none"> 1. Manages federal lands of the Mark Twain National Forest to promote timber, recreation, watershed protection, grazing, and wildlife 2. Research carried on at North Central Forest Experiment Station <p>Missouri Soil and Water Districts Commission (SWDC)</p> <ol style="list-style-type: none"> 1. Develops statewide programs of resource conservation 2. Offers cost-share incentives to owners of agricultural land to install erosion control projects and practices 3. Developing a soil and water conservation loan interest-share program <p>Missouri Christmas Tree Producers Association</p> <ol style="list-style-type: none"> 1. Non-profit organization of Christmas tree growers and technical persons to promote the Christmas tree industry in Missouri 2. Promotes production of high-quality Christmas trees 3. Encourages research related to Christmas tree production 4. Informs members regarding current research 5. Conducts educational meetings and tours of successful Christmas tree plantations <p>Walnut Council International Office and Missouri Chapter of the Walnut Council – provides information regarding planting, growing, and tending of black walnut trees for nut, lumber, and veneer crops</p> <p>American Tree Farm System of the American Forest Foundation, and the Missouri Tree Farm Program of the Missouri Forest Products Association</p> <ol style="list-style-type: none"> 1. Free woodland inspection to help develop a management plan 2. Provides woodland management information

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	<p>3. To qualify, woodlands must be privately owned, 10 or more acres; protected from fire, insects, disease, and grazing; and managed for production of timber and forest products.</p> <p>Missouri Forest Products Association</p> <ol style="list-style-type: none"> 1. Provides services to sawmill owners, loggers, wood products manufacturers, and forest landowners 2. Provides information about markets, insurance, waste utilization, and legislation 3. Co-sponsors of the Missouri Tree Farm Program <p>Missouri Consulting Foresters Association</p> <ol style="list-style-type: none"> 1. Provides consultation on a fee basis 2. Woodland management plans 3. Timber appraisals 4. Forest and shade tree damage appraisals 5. Marketing timber 6. Reforestation 7. Marketing and sale supervision 8. Surveying and mapping
<p>Objective 4</p> <p><i>Discuss with students the ways in which the programs of the Forestry Division of the Missouri Department of Conservation help Missourians fully utilize the benefits of Missouri forest lands.</i></p>	<p>Describe how the programs of the Forestry Division of the Missouri Department of Conservation help in the utilization of Missouri forest lands.</p> <p>Fire control – The Forestry Division provides direct fire protection to 16,000,000 acres and, on the average, suppresses 3,500 fires annually.</p> <ol style="list-style-type: none"> 1. Must maintain necessary manpower, equipment, and facilities 2. Significant responsibility in heavily timbered Ozarks <p>Fire prevention</p> <ol style="list-style-type: none"> 1. 99 percent of fires are man-made, either intentional or accidental. 2. Prevention activities <ol style="list-style-type: none"> a. Publicity (radio and television ads) b. Information and education <ol style="list-style-type: none"> – During high danger periods, telling public about fire precautionary measures – Publications about fire prevention 3. Law enforcement to capture and punish forest arsonists

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	<p>Insect and disease control</p> <ol style="list-style-type: none"> 1. Damage to forests from insects and diseases is greater than from fire. 2. The Forestry Division employs entomologists (insect specialists) and pathologists (disease specialists) to train field foresters about the diagnosis and treatment of pest problems. <p>State land management</p> <ol style="list-style-type: none"> 1. Direct management <ol style="list-style-type: none"> a. 285,000 of state-owned Forestry Division land b. 100,000 acres of land of the Fisheries Division and Wildlife Division 2. Managed under multiple use concept <ol style="list-style-type: none"> a. To produce wood products b. To improve wildlife and fish habitats c. To provide recreation and high quality watersheds d. To preserve unique areas <p>Urban and Community Forestry Program</p> <ol style="list-style-type: none"> 1. Three major components <ol style="list-style-type: none"> a. Urban state forests b. Urban forest technical assistance c. Community forestry assistance 2. During an average year, about 100 community forest projects are planned around the state. <p>George O. White State Forest Nursery</p> <ol style="list-style-type: none"> 1. Located at Licking, Missouri 2. Objective – to provide tree seedlings for Missouri’s private and public lands 3. Over 14,000 total seedling orders processed each year, with 11 million trees distributed (enough so every person living in the state could plant two trees) 4. Special bundles of trees for <ol style="list-style-type: none"> a. Wildlife cover b. Windbreaks c. Conservation 5. Large part of the nursery devoted to shortleaf pine plantings 6. Yearly seedlings distributed to all fourth grade students for Arbor Day plantings

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	<p>Tree Improvement Program</p> <ol style="list-style-type: none"> 1. Objective – selection and development in initial survival, growth, and production characteristics 2. Highest priority species – black walnuts and shortleaf pines 3. Pecans and cottonwoods next priority <p>Forest products utilization</p> <ol style="list-style-type: none"> 1. Direct assistance from the Forestry Division given to loggers, manufactures, and consumers 2. Provides assistance on utilizing wood residues <ol style="list-style-type: none"> a. Extends forest resources b. Helps reduce potential pollution sources <p>Research and planning</p> <ol style="list-style-type: none"> 1. Often conducted in cooperation with the University of Missouri School of Natural Resources 2. Oriented to solve specific problems and needs facing forestry statewide <p>Information activities</p> <ol style="list-style-type: none"> 1. Presentations to group 2. Written articles 3. Use of media 4. Distribution of pamphlets and brochures 5. Exhibits at fairs 6. Working with schools <p>Private land management assistance</p> <ol style="list-style-type: none"> 1. 85 percent of Missouri’s forested acreage is owned by private individuals. 2. How foresters can help <ol style="list-style-type: none"> a. Recommend number and types of trees to plant b. Inventory of standing timber c. Develop management plans for cutting and forest improvements d. Give advice for woodland wildlife management e. Help select trees to harvest f. Advise owners about timber sales and assistance programs g. In an average year, foresters accomplish the following <ul style="list-style-type: none"> – Give assistance on thousands of acres

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	<ul style="list-style-type: none"> - Make wildlife recommendations - Help to sell about 30 million board feet of timber (enough to make crossties to build a railroad from Kansas City to St. Louis)
<p>Objective 5</p> <p><i>Discuss with students the benefits and responsibilities from becoming involved in the Forest Crop Land Program. List these benefits and responsibilities on the board.</i></p>	<p>Identify the responsibilities and benefits of classifying timber land as Forest Crop Land.</p> <p>Benefits</p> <ol style="list-style-type: none"> 1. Partial tax relief for 25 years 2. Intensified fire control through the aid of the Forestry Division 3. Continuing free forest management 4. Timber trespass assistance <p>Responsibilities of landowners</p> <ol style="list-style-type: none"> 1. Marked ownership boundaries 2. Reasonable efforts to prevent and extinguish wildfires 3. Land must be designated and devoted primarily to growing trees <ol style="list-style-type: none"> a. Lands cannot be grazed b. Buildings cannot be erected c. Must file for inspection to qualify
<p>Application</p>	<p>Other activities:</p> <ol style="list-style-type: none"> 1. Have a Farm Forester or a member of the Forestry Division come and speak to students about their programs. 2. Have a local tree farmer who is involved in the Forest Crop Land Program speak to the class. The local forester should be able to recommend an individual who belongs to this program.
<p>Closure/Summary</p>	<p>Missouri has many acres of valuable timber providing income and jobs from timber and tourist industries as well as providing beauty to all. The Forestry Division of the Missouri Department of Conservation aids in developing the potential of this natural resource through its numerous programs.</p>
<p>Evaluation: Quiz</p>	<p>Answers:</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. Water and soil conservation and improvement b. Recreation c. Firewood d. Shade

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> e. Windbreaks f. Timber products g. Wildlife habitat <ol style="list-style-type: none"> 2. 99 percent 3. Multiple use 4. Black walnuts, shortleaf pines 5. 85 percent 6. <ul style="list-style-type: none"> a. Partial tax relief for 25 years b. Intensified fire control through aid from the Forestry Division c. Continuing free forest management d. Timber trespass assistance