# VIRGINIA 4-H

18 U.S.C. 707

# Forestry Judging Project Book

Name _____

County _____

Date _____

Virginia Tech
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Virginia Cooperative Extension
*Knowledge for the CommonWealth*

VIRGINIA STATE UNIVERSITY

# 4-H Forestry Judging Project Book

*By Jeff Kirwan, Extension Specialist, Forestry, and Jonathan Rockett,*
*Area Extension Agent, Mine Land Reclamation and Development*

This project book is designed to help senior level 4-H members learn and practice the skills necessary to compete in district, state, and national 4-H forestry judging contests. Forestry judging consists of the following:

- Tree identification
- Tree measurements
- Compass traverse
- Topographic map reading
- Forestry quiz bowl
- Forest evaluation
- Insect identification
- Forestry written exam
- Disease identification

To complete this project book, complete the score sheet provided in each section and participate in a forestry bowl or written exam.

## Contests

Most Extension districts have a qualifying contest before the state contest. The location and date of these contests vary from year to year, but they are usually held in April and May. The state contest is usually held in May or June.

## Eligibility

Forestry judging teams consist of 3 or 4 members. Senior members must be age 14-19 on January 1 of the contest year. Juniors must be age 9-13 on Jan. 1. Contact the 4-H Extension agent in your county before forming a team.

## National Contest

The national contest is held at the West Virginia State 4-H Camp near Weston, West Virginia, the last week of July. The winning team at the state contest represents Virginia at this contest.

## For More Information

Virginia Forestry Judging: http://www.ext.vt.edu/resources/4h/environment/forjudging/

National Forestry Judging: http://www.aces.edu/N4HFI/

## Other Competitive Programs in Natural Resources

Envirothon: http://www.ext.vt.edu/resources/4h/environment/envirothon/

Soils Judging: http://www.ext.vt.edu/resources/4h/plantsoil.html

Wildlife Habitat Evaluation: http://www.ext.vt.edu/resources/4h/environment/wildjudging/

# OFFICIAL TREE IDENTIFICATION LIST

Contestants need to identify trees in their natural setting or from specimens. All trees will be taken from the official list.

## Monocotyledons

cabbage palmetto

## Dicotyledons

### Gymnosperms

***(Conifers or Softwoods)***

balsam fir

white fir

noble fir

incense-cedar

Rocky Mountain juniper

eastern redcedar

tamarack

white spruce

blue spruce

red spruce

Sitka spruce

lodgepole pine

shortleaf pine

pinyon pine

sugar pine

longleaf pine

ponderosa pine

red pine

pitch pine

eastern white pine

loblolly pine

Virginia pine

Douglas-fir

giant sequoia

redwood

baldcypress

Pacific yew

northern white-cedar or arborvitae

western redcedar

eastern hemlock

western hemlock

### Angiosperms

***(Broadleaf Trees or Hardwoods)***

boxelder

red maple

silver maple

sugar maple

Ohio buckeye

red alder

yellow birch

sweet birch

paper birch

river birch

pignut hickory

pecan

shagbark hickory

mockernut hickory

hackberry

flowering dogwood

common persimmon

American beech

white ash

honeylocust

American holly

butternut or white walnut

black walnut

sweetgum

yellow-poplar or tuliptree or tulip-poplar

cucumbertree

southern magnolia

red mulberry

black tupelo or blackgum

sycamore

eastern cottonwood

quaking aspen

black cherry

white oak

scarlet oak

southern red oak

water oak

bur oak

northern red oak

black oak

live oak

black locust

black willow

sassafras

American basswood

American elm

## Notes

# Tree Identification Score Sheet

| Team | Group No. | Contestant's Name |
|---|---|---|
| | | |

| No. | Common Name | Correct + 5 | Misspell - 1 | Score |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| | | | Contestant's Score | |

# OFFICIAL LIST OF INSECTS AND DISEASES

## Leaf Feeders

European pine sawfly

redheaded pine sawfly

hemlock woolly adelgid

pine needle scale

locust leafminer

eastern tent caterpillar

fall webworm

forest tent caterpillar

gypsy moth

Japanese beetle

Douglas-fir tussock moth

whitemarked tussock moth

## Meristem Feeders

white pine weevil

Nantucket pine tip moth

## Bark Feeders

Ips engraver beetles

southern pine beetle

mountain pine beetle

Asian longhorned beetle

bronze birch borer

emerald ash borer

locust borer

red oak borer

smaller European elm bark beetle

twolined chestnut borer

## Other Feeders

balsam woolly adelgid

beech scale

pales weevil

periodical cicada

## Beneficial Insects

caterpillar hunter beetle

checkered beetle

## Diseases of the trunk and stems

beech bark disease

black knot

chestnut blight

fusiform rust

Hypoxylon canker

Nectria canker

white pine blister rust

white trunk rot of birch

## Diseases that appear on leaves

brown spot needle blight

dogwood anthracnose

Dutch elm disease

oak wilt

## Diseases that appear as mushrooms

annosus root rot

artist conk

red heart

## Other special growths

cedar-apple rust

dwarf mistletoe

lichens

## Notes

# Insect and Disease Identification Score Sheet

| Team | Contestant's Name |
|---|---|
| | |

| No. | Common Name | Correct + 5 | Misspell - 1 | Score |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| | | | **Contestant's Score** | |

# COMPASS TRAVERSE

For this part of the contest you will need to pace off distances and determine your line of travel. A course will be set out for you at the contest.

## Materials needed

- Compass (azimuth, 360-degree type is recommended)
- Calculator

## Determine the length of one pace

Walk a 100-foot line. How many paces did it take you? _____

How many feet are in one pace? (Divide by 100) _____

## Compass Traverse Score Sheet

| Team | Contestant's Name |
|---|---|
| | |

| Line | Azimuth or Bearing | Points (0-10) | Distance | Points (0-10) | Score |
|---|---|---|---|---|---|
| A-B | | | | | |
| B-C | | | | | |
| C-D | | | | | |
| D-E | | | | | |
| E-F | | | | | |
| | | | | **Total Score** | |

Ten points are awarded for each correct answer, or 100 points total. Deduct 1/2 point for each degree error in azimuth or bearing, up to 10 points per line. Deduct 1/2 point for each foot of error up to 10 points per line.

# TOPOGRAPHIC MAP CONTEST

For this part of the contest, you will be using a 7.5 Minute Series topographic map. You will 1) identify natural and man-made features, 2) determine the length of a line established between two points, 3) determine the true bearing between those points, using your compass, and 4) adjust or "correct" that bearing so you know the line of travel to take with a compass that does not adjust for declination.

## Topographic Map Score Sheet

| Team | Contestant's Name |
|---|---|
| | |

| | Map Symbol or Feature | Possible Points | Score |
|---|---|---|---|
| A | | 2 | |
| B | | 2 | |
| C | | 2 | |
| D | | 2 | |
| E | | 2 | |
| F | | 2 | |
| G | | 2 | |
| H | | 2 | |
| I | | 2 | |
| J | | 2 | |
| K | | 2 | |
| L | | 2 | |
| M | | 2 | |
| Distance | | 8 | |
| Map Direction | | 8 | |
| Compass Direction | | 8 | |
| | | **Contestant's Score** | |

Note: Answer distance to the nearest 100 ft. Points are awarded only for correct answers.

# Forest Evaluation Score Sheet

| Team | Total Score (400 possible) |
|---|---|
| | |

**I. Site Evaluation. Circle applicable items for A, B, C, and D below. Stay in the same column as you progress through the table. Correct answers are worth 15 points each.**

| **A. Depth of Soil** | **Deep - 24 inches or more** | | | | | | **Shallow - less than 24 inches** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **B. Slope Percent** | **Rolling 0-20%** | | **Steep 21-40%** | | **Very Steep 41%+** | | **Rolling 0-20%** | | **Steep 21-40%** | | **Very Steep 41%+** | |
| **C. Aspect** | **NE** | **SW** | **NE** | **SW-** | **NE** | **SW** | **NE** | **SW** | **NE** | **SW** | **NE** | **SW** |
| **D. Slope Position** | | | | | | | | | | | | |
| Bottom | I | II | I | II | I | II | I | II | I | III | II | III |
| Lower 1/3 | I | II | I | II | I | III | I | III | II | III | III | IV |
| Middle 1/3 | I | II | II | III | II | III | II | III | III | IV | IV | IV |
| Upper 1/3 | II | III | III | III | IV | IV | III | IV | III | IV | IV | IV |

E. Forest Land Capability Class (Circle one of the following):

I = Excellent  II = Good  III = Fair  IV = Poor

Part I Score (75 possible): _____

**II. Stand Evaluation. Check all that apply. A - E are worth 10 points each. F is worth 20 points.**

**A. Grazing Damage?**

Grazed _____

Ungrazed _____

**B. Fire Damage?**

Unburned _____

Wildfire _____

Prescribed burn _____

**C. Size Distribution**
(may be more than one answer)

Reproduction _____

Sapling _____

Pole _____

Sawtimber _____

**D. Forest Type**

Hard Pine _____

Oak-Hickory _____

White pine-hemlock____

Cove Hardwoods _____

Oak-Gum-Cypress ____

Northern Hardwoods ___

**E. Stand Origin**

Seedling _____

Sprout_____

Mixed _____

Plantation _____

**F. Stocking**

Under Stocked _____

Well Stocked _____

Over Stocked _____

Part II Score (70 possible): _____

**III. Forest Inventory: 1/10 acre plot (37.3-foot radius). Each column is worth a maximum of 30 points.**

| Tree # | Species | Crown Class* | DBH (2" class) | # Logs** | Bd.-Ft Vol.*** | Tree Value |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 8 | | | | | | |
| 9 | | | | | | |
| 10 | | | | | | |
| 11 | | | | | | |
| 12 | | | | | | |
| | | | | **Plot Values** | | |
| | | | | **Per-acre Values** (30pts ±5%; 25pts ±10%; 20pts ±15%) | | |

**Crown Class: D = dominant; C = co-dominant; I = intermediate; and S = suppressed*

*** Minimum 1 log; measure to the nearest 1/2 log; minimum top = 8".*

**** Use volume table provided by your leader.*

Part III Score (180 possible): _____

**IV. Practices Recommended for Landowner's Objectives: Fill in the blank or check all that apply.**

Which species would you favor on this site? _____

_____ Protect the area from wildfire. Report any fire by calling 911

_____ Clear-cut the stand and plant with a desirable species

_____ Conduct a shelterwood or seed-tree harvest

_____ Use Best Management Practices and Sustainable Forestry Guidelines

_____ Manage stand for nontimber products

_____ Conduct a selection harvest

_____ Manage stand for wildlife habitat improvement

_____ Stand is not yet merchantable, leave alone to grow

_____ Conduct a prescribed burn

_____ Clear-cut the stand and allow for natural regeneration

_____ Manage stand for recreational opportunities

_____ Conduct a salvage or sanitation cutting

_____ Fence the area from livestock

_____ Conduct a thinning

Part IV Score (75 possible): _____

# FORESTRY WRITTEN EXAM AND BOWL CONTEST

These two events require knowledge and understanding of forestry. The most important facts, laws and definitions are listed below. You should also study the 4-H Forest Program Guide, Unit A (Trees) and Unit B (Forests), both available from your Extension agent.

## Forestry Facts

1. Trees depend upon water, soil nutrients, sunlight, and air for growth.

2. Climate, soil, and topography influence the natural range and distribution of forest communities.

3. America's forests cover about 737 million acres, or 32% of the nation's land area.

4. Private individuals own about 59% of the U.S. forest land base; local, state, and federal governments own about 27%; and the forest products industry owns about 14%.

5. Growth rates exceed harvest rates in American's forests by a wide margin. In 1992, net growth was 21.6 billion cubic feet vs. harvest of 16.3 billion cubic feet.

6. About 33% of America's forests are preserved in wilderness areas, national parks, wildlife refuges, and other parks where no commercial activity is permitted.

7. The United States is a net importer of wood and wood products.

## Forestry Laws

1. Multiple Use - Sustained Yield Act of 1960 - Established a policy of multiple use, sustained-yield management for the renewable resources of the National Forest System.

2. Clean Air Act of 1963 - Gave the federal government enforcement powers over air pollution.

3. Wilderness Act of 1964 - Established the National Wilderness Preservation System by setting aside sections of federal forest land as wilderness.

4. National Environmental Policy Act of 1969 - Required federal agencies to prepare environmental impact statements for any actions significantly affecting the environment.

5. Endangered Species Act of 1973 - Provided for the protection and conservation of threatened and endangered fish, wildlife, and plant species.

## Glossary

**Aspect** - A compass reading taken facing down a slope in the direction water would run.

**Clinometer** - Height measuring device.

**Conservation** - Gifford Pinchot, a forester closely associated with Teddy Roosevelt, applied this word to describe a natural resource philosophy. It means "wise use."

**Crown Classes** -

- **Dominant** - Trees with crowns that extend above the average of the tree crowns and receive light from directly above and some from the sides.

- **Co-dominant** - Trees with crowns that form the general level of the crown cover and receive full light from the top, but very little from the sides.

- **Intermediate** - Trees that are shorter than the two preceding classes but with some branches extending into the general crown cover. Receive little light from above and none from the sides.

- **Suppressed** - Trees with crowns entirely below the general crown level. Receive no direct light either from above or below.

**Cull** - Tree or log of merchantable size, but no market value.

**DBH** - Diameter of a tree at breast height or 4-1/2 feet above ground.

**Duff** - Freshly fallen leaves, twigs, and slightly decomposed organic matter, leaf litter.

**Germination** -When a viable seed meets favorable conditions and begins to grow.

**Girdle** - To chop or remove a strip of bark or a section of wood containing the food-carrying tissue of a tree in an even strip from the perimeter of the tree or twig.

**Multiple Land Use** - A term used to indicate the management of timber, wildlife, and recreation in an integrated, consolidated program.

**National Forests** - National lands that are managed for multiple uses and sustained yield. Timber, water, wildlife, recreation, and grazing are compatible uses.

**National Parks** - National lands that are managed primarily for recreation and preservation.

*Glossary (continued)*

**Pole Timber** - A young tree that is 3" to 12" in DBH.

**Reproduction** - A natural establishment of seedlings or sprouts 0 to 1" DBH.

**Sanitation Cutting** - The removal of dead, damaged or susceptible trees; essentially to prevent the spread of pests or pathogens and so promote forest hygiene.

**Sapling** - A young tree 1" to < 3" DBH.

**Seedling** - A tree grown from seeds.

**Silviculture** -The establishment, development, care, and reproduction of forests.

**Sprout** - A tree originating from a root or stump.

**Stocking** - A measure of the proportion of the area actually occupied by trees.

**Streamside Management Zone (SMZ)** - A buffer of land adjacent to a water body or stream where soils, organic matter, and vegetation are managed to protect water quality.

**Sustained Yield** - Forest management for a constant supply of timber and revenue.

**Timber Stand Improvements (TSI)** - A practice designed to improve a stand of timber by removal of vines, culls, and undesirable species.

**Wildfire** - Fires burning out of control regardless of how or why they were started.

**Wolf Tree** - A tree that occupies more than its fair share of growing space.

## Indicate the date(s) of forestry bowls, written exams, field days, or contests you have participated in:

**2004** **420-125**



VT/643/0404/3M/241974/420125