



Forestry

HANDBOOK UPDATE:

Policies and Guidelines

Added Cucumber Tree, Serviceberry

Added volume chart to reflect 1" DBH

Purpose

The Tennessee FFA Forestry Career Development Event is designed to stimulate student interest and to promote the forestry industry as a career choice. It also provides recognition for those who have demonstrated skills and competencies resulting from forestry instruction in the agricultural education classroom.

Objectives

Students will be able to

- Understand and use forestry terms.
- Promote an understanding of the economic impact of the forest environment and the forest industry to the American economy.
- Recognize sustainability (multiple use) opportunities in the forests.
- Recognize environmental and social factors affecting the management of forests.
- Identify major species of trees of economic importance to the United States and internationally.
- Identify and properly use hand tools and equipment in forestry management.
- Recognize and understand approved silvicultural practices in the United States.
- Identify forest disorders.
- Take a forest inventory.
- Utilize marketing management strategies.
- Recognize safety practices in forest management.

Event Rules

- The team will consist of four individuals, and all four scores will count toward the team score.
- The team score is comprised of the combined scores of each individual and the team activity in which all team members will participate.
- Participants must come to the event prepared to work in adverse weather conditions. **The event will be conducted regardless of weather.** Participants should have rain gear, warm clothes and closed toed shoes. Each participant must provide the following safety equipment, and it must be worn while in the woods or the participant will be disqualified:
- Participants should provide the following: clean clipboard, compass, tree stick, calculator, pencils, and/or clinometer.
- Participants must follow instructions from event staff for handling materials during the event. Any infraction of this rule will be sufficient to eliminate the team from the event.
- Observers will not be permitted in the event area while the event is in progress.
- Participants will be assigned to group leaders who will escort them to various event-staging sites. Each participant is to stay with his or her assigned group leader throughout the event or until told to change leaders by the event superintendent.
- All participants will be given an identification number by which they will be designated throughout the event.
- All written materials will be furnished for the event. No written materials such as tests, problems and worksheets shall be removed from the event site.

- Any participant in possession of an electronic device in the event area is subject to disqualification.

Event Format

INDIVIDUAL ACTIVITIES

Written Exam (100 points)

- Fifty multiple-choice questions will be selected from areas of the forestry industry reflected in the event objectives. This phase of the event will test the participant's knowledge and understanding of basic principles of forestry. The test will be comprised of questions from the last five years of National FFA forestry exams.
- The test will come from the last five years of National FFA forestry CDE exams (2019-2024)

Tree Identification (100 points)

- Twenty live specimens, pressed samples, fresh leaf samples and/or standing trees, from the tree identification specimen list will be displayed for participants to identify by common names. A number will designate each specimen.
- Each participant will be allowed 30 minutes to complete this phase.

Equipment Identification Practicum (100 points)

- Twenty-five pieces of equipment from the equipment identification list will be displayed for participants to identify by technical names. Each piece of equipment will be designated by number.
- The equipment will be presented in one or more of the following forms:
- Actual samples.
- Pictures or slides.
- Written description.

Map Interpretation Practicum (100 points)

Participants will answer questions using a furnished United States Geological Survey topographic map. The participant should know legal description, recognize topographic map symbols, and understand the meaning of map symbols, size and location of 40 acres or more in a parcel.

Examples:

- What is the legal description of the boxed area?
- What is the item located at this point?
- What is the acreage of the area enclosed?
- In what section is the city of Marshall located?
- What is the elevation at this point?

Legal descriptions will be written or described according to the public land survey system.

- **Example:** SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Section 3, T3N, R1E

Tree Measurement — Timber Cruising for Board Volume (100 points)

- Each participant will measure ten pre-numbered trees on a plot for board foot volume. The participant must record the DBH (Diameter Breast Height) to the nearest one-inch class and the merchantable height of each tree height rounded down to the nearest ½ log.
- Volume tables will be provided at the event.
- The following minimum diameters and log length will be:

Minimum Saw Timber	
DBH	10 inches
Top diameter	10 inches DIB
Height	16 feet

- Merchantable height stops are estimated to the upper point on a tree where it becomes 10 inches in diameter or where a major fork in a tree stem occurs or where a limb has a diameter equal to ½ of the diameter of the tree at that point.
- Each participant will be allowed 30 minutes to complete this phase.
- Thirty points will be given for the correct DBH and thirty points for the correct height. Forty points will be given for the correct volume per acre. Five points will be deducted for each five percent deviation (plus or minus) from the correct measured volume.
- Members can use a tree stick and/or clinometer to complete this activity.

Compass Practicum (100 points)

The participant will use a hand compass and pacing to the nearest full foot to simulate the determination of the property lines on a tract of timber. The participant will start at any point and record the compass reading and distance to the next point. Azimuth readings shall be recorded. Participants will record data for 10 points.

Partial credit will be given with a deduction of one point for each two degrees or two feet the participant is off the correct answer.

Chainsaw Parts Identification, Troubleshooting and Safety Practicum (100 points)

This practicum will consist of one or more of the parts listed below. Parts may utilize photos, video, demonstration, actual parts, written situations and/or problems. This is not an all-inclusive list.

- Chainsaw parts identification:** Each participant will identify parts of a chainsaw (does not include internal engine components).
- Troubleshooting:** The participant will identify chainsaw problems or troubles.
- Safety:** The participant will identify safety hazards, unsafe practices and/or proper safety equipment.

Tree/Forest Disorders Practicum (100 points)

Symptoms of at least 10, but not more than 20, disorders from the Tree Disorders Identification List will be displayed for participants to identify by common names. The symptoms will be presented in one or more of the following forms:

- Actual sample.
- Pictures/slides.
- Written description.
- Written case history.

A number will designate each set of symptoms representing a disorder.

TEAM ACTIVITIES

Forest Industry Scenario Team Activity (100 points)

Each team will be provided with a forest industry scenario. The scenario will utilize components from the individual forestry CDE practicums. Teams must work together using forestry skills and tools to complete the team activity. Ninety minutes will be allowed to plan and complete the activity. All supplies and materials needed to complete the task will be provided.

Example(s) 10 questions for 100 points..

1. Station 1
 - a. Identify this tree (2 pts) _____
 - b. What is the diameter of this tree? (2pts) _____
 - c. What is the merchantable height? (2pts) _____
 - d. What is the board foot volume? (2 pts) _____
 - e. What is the merchantable board foot value of this tree? (2 pts) _____

Species	Price per bd ft
Yellow Poplar	\$0.30
White Oak	\$0.70
Red Oak	\$0.50
Walnut	\$0.90

2. Station 2
 - a. Identify this piece of equipment flagged E1 (5 pts) _____
 - b. Identify the piece of equipment flagged E2 (5 pts) _____
3. Station 3
 - a. Identify this tree (5 pts) _____
 - b. What is the diameter of this tree (5 pts) _____
4. Station 4. Refer to the line marked by two stakes.
 - a. Along what azimuth does the marked boundary line extend?
 - b. How many feet is this leg of the boundary?
5. Use the provided USGS topography map to answer the following questions:
 - a. What is the scale of this USGS topography map?
 - b. What is the contour interval of the USGS topography map?
6. Station 6
 - a. Identify this tree.
 - b. What disorder does the tree possess?

Scoring

Activities	Individual Points	Team Points
General knowledge exam	100	400
Tree identification	100	400
Tree measurements — timber cruising	100	400
Equipment Identification	100	400
Map Interpretation	100	400
Compass	100	400
Tree/Forest Disorders & Insects	100	400
Chainsaw Part Identification, troubleshooting and Safety	100	400
Forest industry scenario team activity		100
TOTAL	800	3,300

TIEBREAKERS

Team

Tiebreakers for teams will be determined by adding together the individual ranking of team members. The team with the lowest score will earn the tiebreak.

Individuals

1. Timber cruising
2. Tree identification
3. Total Individual Practicum Score
4. Knowledge exam

References

This list of references is not intended to be all-inclusive. Other sources may be utilized, and teachers are encouraged to make use of the very best instructional materials available. Use discretion when selecting website references by only using reputable, proven sites. The following list contains references that may prove helpful during event preparation. The most current edition of resources will be used. Past CDE materials and other resources are available by navigating to FFA.org.

GENERAL KNOWLEDGE EXAM

- Introduction to Forestry Science. Burton, Delmar Publications.
- Science of Forestry Management. Kris Irwin. University of Georgia, AAVIM. Please call 706-742-5355 or email sales@aaavim.com. Request Item #400. Cost is ~ \$25 plus \$10.50 shipping. Please leave your name, Item, number of copies, shipping and billing address, and phone number. They will respond to secure payment information.

TREE IDENTIFICATION

- Dendrology at Virginia Tech, <http://dendro.cnre.vt.edu/dendrology/main.htm>
- "FFA Georgia State and National Tree Lists," available from www.amazon.com
- W. H. Harlow, E. S. Harrar, and F. M. White. Textbook of Dendrology, current edition. New York, NY: McGraw-Hill Book Company.
- Silvics of North America, Handbook #654, volume one and two, U.S. Forest Service, P. O. Box 2417, 12th and Independence Avenue SW, Washington, DC 20013.

TREE MEASUREMENT

- https://www.americanforests.org/wp-content/uploads/2014/12/AF-Tree-Measuring-Guidelines_LR.pdf

FOREST MANAGEMENT

- Introduction to Forestry Science. Burton, Delmar Publications.
- Science of Forestry Management. Kris Irwin. University of Georgia, AAVIM. . Please call 706-742-5355 or email sales@aaavim.com. Request Item #400. Cost is ~ \$25 plus \$10.50 shipping. Please leave your name, Item, number of copies, shipping and billing address, and phone number. They will respond to secure payment information.

EQUIPMENT IDENTIFICATION

- Current Catalog of Forestry Suppliers, Inc., 205 West Rankin Street, Jackson, MS 39204-039.
- <http://www.husqvarna.com/us/accessories/>
- www.deere.com/en_US/industry/forestry/forestry.page?
- www.treestuff.com

MAP INTERPRETATION

- The U.S. Department of Interior Geological Survey Topographic Map Information and Symbols Key, Map Distribution, U. S. Geological Survey, Box 25286, Federal Center, Denver CO.
<https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf>
- Map Interpretation: <https://www.norfolk.gov.uk/-/media/norfolk/downloads/jobs-training-volunteering/volunteering/map-reading-guide.pdf>
Map Interpretation: https://d28rz98at9flks.cloudfront.net/102240/Map_reading_guide_v4.pdf
- Reading and Interpreting Topographic Maps: paste the following url into your browser
ftp://ftp.bpcrc.osu.edu/downloads/outreach/Watersheds/01_Exercise3.5v1.pdf

COMPASS

https://georgia4h.org/wp-content/uploads/2018/05/manual_compassranger.pdf

CHAINSAW PARTS AND IDENTIFICATION

Husqvarna How to and safety training videos, Training videos include stance, safety gear, maintenance and how to execute a tree felling plan. <https://www.youtube.com/playlist?list=PL0VcazyXHqErUd8ib-OKs6sZkfGFO5shu>

Tree Identification Specimen List

1. Ash (*Fraxinus* sp.)
2. Baldcypress (*Taxodium distichum*)
3. Basswood (*Tilia americana*)
4. Beech, American (*Fagus americana*)
5. Birch, Black (*Betula lenta*)
6. Birch, River (*Betula nigra*)
7. Birch, White (*Betula papyrifera*)
8. Blackgum (*Nyssa sylvatica*)
9. Boxelder (*Acer negundo*)
10. Buckeye (*Aesculus glabra*)
11. Cherry, Black (*Prunus serotina*)
12. Cottonwood, Eastern (*Populus deltoides*)
13. Cucumber Tree (*Magnolia acuminata*)
14. Dogwood, Flowering (*Cornus florida*)
15. Elm (*Ulmus* sp.)
16. Hackberry (*Celtis occidentalis*)
17. Hemlock, Eastern (*Tsuga canadensis*)
18. Hickory (*Carya* sp.)
19. Locust, Black (*Robinia, pseudoacacia*)
20. Maple, Red (*Acer rubrum*)
21. Maple, Silver (*Acer saccharinum*)
22. Mulberry (*Morus rubra*)
23. Maple, Sugar (*Acer saccharum*)
24. Oak, Blackjack (*Quercus marilandica*)
25. Oak, Black (*Quercus velutina*)
26. Oak, Chestnut (*Quercus montana*)
27. Oak, Chinkapin (*Quercus muehlenbergii*)
28. Oak, Northern Red (*Quercus rubra*)
29. Oak, Post (*Quercus stellata*)
30. Oak, Scarlet (*Quercus coccinea*)
31. Oak, Southern Red (*Quercus falcata*)
32. Oak, White (*Quercus alba*)
33. Oak, Willow (*Quercus phellos*)
34. Osage Orange (*Maclura pomifera*)
35. Pawpaw (*Asimina triloba*)
36. Pecan (*Carya illinoensis*)
37. Persimmon (*Diospyros virginiana*)
38. Pine, Eastern White (*Pinus strobus*)
39. Pine, Loblolly (*Pinus taeda*)
40. Pine, Shortleaf (*Pinus echinata*)
41. Pine, Virginia (*Pinus virginiana*)
42. Poplar, Yellow (*Liriodendron tulipifera*)
43. Red Bud (*Cercis canadensis*)
44. Redcedar, Eastern (*Juniperus virginiana*)
45. Sassafras (*Sassafras albidum*)
46. Serviceberry
47. Sourwood (*Oxydendrum arboreum*)
48. Sweetgum (*Liquidambar styraciflua*)
49. Sycamore (*Platanus* sp.)
50. Walnut, Black (*Juglans nigra*)
51. Willow, Black (*Salix nigra*)

Equipment Identification List

1. Abney Level
2. Altimeter
3. Angle Gauge
4. Ascender
5. Axe
6. Backpack Fire Pump
7. Bark Gauge
8. Bulldozer
9. Canthook
10. Carabiner
11. Chainsaw
12. Chainsaw Chaps
13. Chipper
14. Climbing Harness
15. Clinometer
16. Cruising Vest
17. Data Recorder
18. Densimeter
19. Delimber
20. Diameter Tape
21. Dot Grid
22. Drip Torch
23. Ear Protection
24. Endloader
25. Feller Buncher
26. Felling Wedge
27. Fiberglass Measuring Tape
28. Fire Rake
29. Fire Shelter
30. Fire Weather Kit
31. Fire-Swatter
32. First Aid Kit
33. Flow/current Meter
34. Foot Ascender
35. Gas Tank
36. GPS Receiver
37. Hand Compass
38. Hand Lens
39. Harvester
40. Hip Chain
41. Hypo-Hatchet
42. Increment Borer
43. Jacob Staff
44. Log Rule
45. Logger's Tape
46. Lopper
47. Maul
48. Peavy
49. pH Meter
50. Planimeter
51. Plant Press
52. Plastic Flagging
53. Pole Saw
54. Pruning Saw
55. Pulley
56. Relaskop
57. Safety Glasses
58. Safety Hard Hat
59. Scale Stick
60. Skidder
61. Staff Compass
62. Stereoscope
63. Stump Grinder
64. Tally Book
65. Tally Meter
66. Timber Tongs
67. Tree Caliper
68. Tree Climbers
69. Tree Marking Gun
70. Tree Planting Hoe or Bar
71. Wedge Prism
72. Yarder

Tree Disorders Identification List

1. Aphid
2. Asian Longhorn Beetle
3. Black Knot
4. Butt or Heart Rot
5. Canker
6. Chemical Damage
7. Cicada
8. Climatic Injury (snow, wind, frost, drought, hail)
9. Damping Off
10. Douglas Fir Beetle
11. Dutch Elm Disease
12. Eastern Larch Beetle
13. Emerald Ash Borer
14. Fir Engraver Beetle
15. Fir Tussock Moth
16. Fire Damage
17. Hemlock Woolly Adelgid
18. Ips Engraver Beetle
19. Lightning Damage
20. Mechanical Damage
21. Mistletoe
22. Mountain Pine Beetle
23. Needle Cast
24. Nematode
25. Rust
26. Sawfly
27. Scale
28. Spongy Moth
29. Spruce Beetle
30. Spruce Budworm
31. Sudden Oak Death
32. Sunscald
33. Tent Caterpillar
34. Western Pine Beetle
35. Wetwood or Slime Flux
36. Wildlife/Livestock Damage

Doyle Log Rule

FORM CLASS 80

Volume (Board Feet) by Number of 16 Foot Logs									
DBH Inches	1	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5
10	16	20	23	24	26				
11	24	30	35	38	42				
12	31	39	47	52	57	60	62		
13	42	53	64	72	80	84	88		
14	52	67	82	93	104	109	114		
15	64	84	104	118	132	141	150		
16	77	101	125	143	161	174	186		
17	92	122	152	175	198	214	230		
18	108	144	179	206	234	254	273		
19	126	168	210	244	278	301	324		
20	144	193	242	282	321	348	374	396	417
21	164	221	278	324	370	403	436	462	489
22	185	250	315	368	420	458	497	529	561
23	208	282	356	417	478	521	564	604	643
24	231	314	397	466	536	583	630	678	725
25	256	350	443	522	600	655	710	764	818
26	282	386	489	576	663	727	791	852	912
27	310	425	540	638	735	806	877	946	1015
28	339	466	592	700	807	885	963	1040	1118
29	370	509	648	766	884	970	1056	1144	1232
30	400	552	703	832	961	1055	1149	1248	1346

Board Foot Volume Estimation Worksheet

Tree Number	DBH	Number of Logs	Volume
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10			
TOTAL VOLUME			