

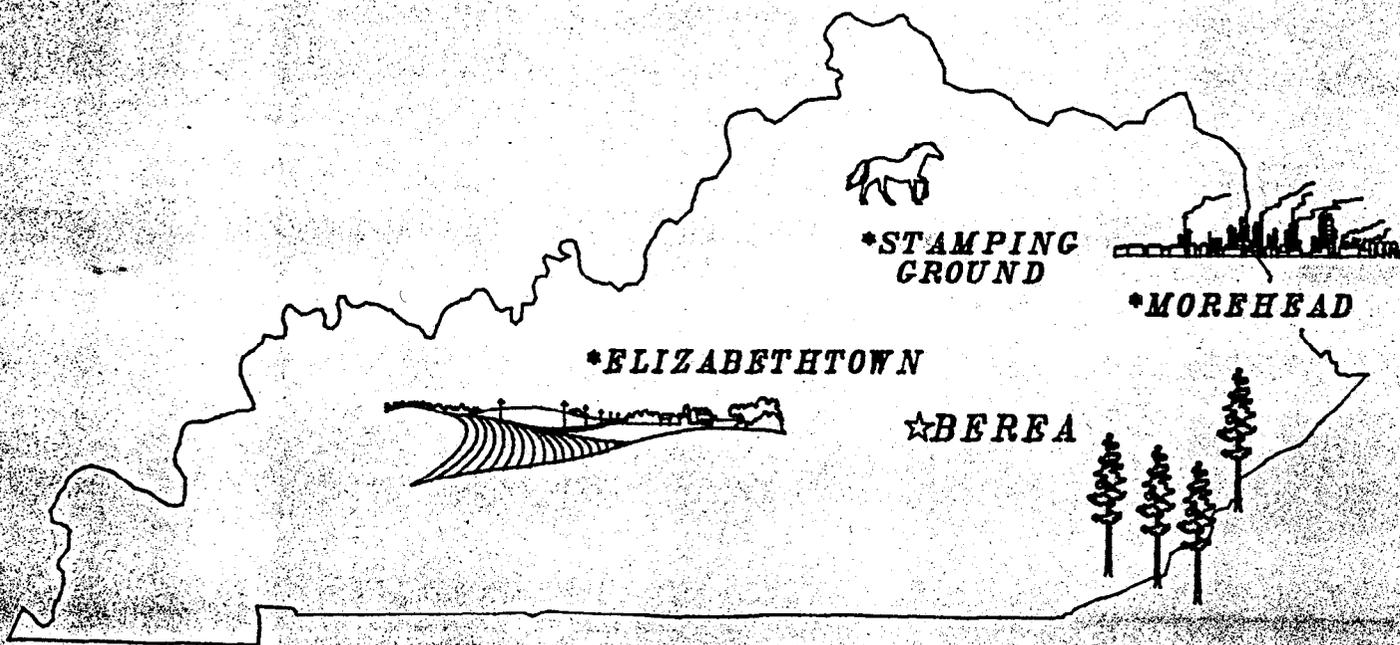
This Portable Document File (PDF) is a subset of the Kentucky field manual published by the Forest Inventory Analysis and Economics Unit of what was formerly the Northeastern Forest Experiment Station, now named the Northeastern Research Station. The full original manual is entitled:

Field Instructions for the Fourth Inventory of Kentucky 1986-1987

This document only includes pages that directly relate to the variables included in the plot-level dataset ky88ewex.csv on the Southern Forest Resource Assessment's Data Center:

<http://www.srs.fs.fed.us/sustain/data/>

**FIELD INSTRUCTIONS
FOR
THE FOURTH INVENTORY
OF
KENTUCKY
1986 - 1987**



**FOREST INVENTORY ANALYSIS & ECONOMICS UNIT
NORTHEASTERN FOREST EXPERIMENT STATION
FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE**

State, Item 1.

The code for the State of Kentucky is **21**.

Unit, Item 3.. and County, Item 3. UNIT, cm

The 120 counties of Kentucky **are** grouped into seven units within the state. Listed below are the **counties, by** their respective units. **Each** unit has been assigned a one digit code. Each county has a three **digit** code.

UNIT 1 Eastern

071 Floyd
095 Harlan
119 Knott
131 Leslie
133 Letoher
159 Martin
193 Perry
195 Pike

UNIT 2 Northern Cumberland

019 Boyd
043 Carter
063 Elliott
089 **Greenup**
115 'Johnson
127 Lawrence
135 Lewis
153 **Magoffin**
165 Menifee
175 Morgan
197 Powell
205 **Rowan**
237 Wolfe

UNIT 3 Southern Cumberland

013 Bell
025 Breathitt
051 Clay
065 Estill
109 Jackson
121 Knox
125 Laurel
129 Lee
147 **McCreary**
189 Owsley
203 Rockcastle
235 **Whitley**

UNIT 4 Bluegrass

005 Anderson
011 **Bath**
015 **Boone**
017 Bourbon
021 Boyle
023 Bracken
037 Campbell
041 Carroll
049 Clark
067 Fayette
069 Fleming
073 Franklin
077 **Gallatin**
079 Garrard
081 Grant
097 Harrison
103 Henry
111 Jefferson
113 **Jessamine**
117 Kenton
137 Lincoln
151 Madison
161 Mason
167 **Mercer**
173 Montgomery
181 Nicholas
185 **Oldham**
187 Gwen
191 Pendleton
201 Robertson
209 Scott
211 Shelby
215 Spencer
223 Trimble
229 Washington
239 **Woodford**

UNIT 5 Pennyroyal

001 Adair
 027 Breckenridge
 029 Bullitt
 045 Casey
 053 Clinton
 057 Cumberland
 085 Grayson
 087 Green
 091 Hancock
 093 Hardin
 099 Hart
 123 Larue
 155 Marion
 163 Meade
 169 Metcalfe
 179 Nelson
 799 Pulaski
 207 Russell
 217 Taylor
 231 Wayne

UNIT 6 Western Coalfield

003 Allen
 009 Barren
 031 Butler
 033 Caldwell
 047 Christian
 055 Crittenden

UNIT 6 Western Coalfield (Con't)

059 Daviess
 061 Edmonson
 101 Henderson
 107 Hopkins
 141 Logan
 149 McLean
 771 Monroe
 177 Muhlenberg
 183 Ohio
 213 Simpson
 219 Todd
 225 Union
 227 Warren
 233 Webster

UNIT 7 Western

007 Ballard
 035 Calloway
 039 Carlisle
 075 Fulton
 083 Graves
 105 Hickman
 139 Livingston
 143 Lyon
 145 McCracken
 157 Marshall
 221 Trigg

Plot Number, Item 4. PLOT

This is a three digit, number that permanently identifies each field plot. These numbers range from 007 to 999.

Sample Kind, Item 5. SKIND

This code identifies the design of the sample plot being established (See Figure 1). The codes used are:

<u>Code</u>	<u>Definition</u>
1	new 5 point cluster
2	remeasured 10 point cluster
8	replacement 5 point cluster (new 5 point cluster used as a replacement for a remeasured plot that can't be established)

PI Class. Item 6. PI . . .

A code which identifies a photo interpreted category of land use and forest volume for each ground plot. These codes should never be changed in the field, even if they do not agree with conditions found on the ground. For this inventory the PI class codes are:

I. Forest Land	Photo Class Code
A. Timberland	
0 - 100 cubic feet gross volume per acre	21
101 - 600 cubic feet gross volume per acre	22
601 - 1300 cubic feet gross volume per acre	23
1301 - 2000 cubic feet gross volume per acre	24
2001 - 2800 cubic feet gross volume per acre	25
2801 - 3500 cubic feet gross volume per acre	26
3501 + cubic feet gross volume per acre	27
B. Unproductive	40
II. Nonforest Land	
A. Nonforest land without cubic foot volume	60
B. Nonforest land with some cubic foot volume	61
III. Indeterminate Land Use'	99
IV. Water	
Census water	91
Noncensus water ²	92

¹ Indeterminate - Includes all questionable forest and nonforest areas and is primarily intended for use in classifying idle land that is in the process of reverting to forest.

² Noncensus water Includes bodies of water less than **40** acres in size and water courses from 720 feet to **1/8** mile in width.

Land Use Class. Item 7. LU

One of the following land use codes will be assigned to every field plot.'

<u>Code</u>	<u>Land Use</u>
<u>Forest Land</u>	
20	timberland
21	pastured timberland
22	urban timberland
23	reclaimed timberland
40	unproductive forest land
41	unproductive reserved forest land
50	productive reserved forest land
51	Christmas tree-plantation

Nonforest Land

<u>Without trees</u>	<u>With trees</u>	
61	62	cropland
63	64	improved pasture
65	66	idle farm land
67	68	other farm land
69	--	bog
70		marsh
71	--	salt marsh
72	--	swamp
73	74	maintained rights-of-way, regardless of width.
75	7 6	mining and waste land
77	78	maintained recreation site
79	80	industrial and commercial land
81	82	tract and/or multiple family housing
83	84	single family custom housing
85	86	other (specify the exact use in general notes on tally page 4)

Water

91	census water
92	noncensus water

Land use is determined by the predominant use at plot center (point 1). The point must fall within the area of at least one acre (strips must be at least 120 feet wide) in size, on which the predominant land use is the same. Inclusions of less than one acre, with two exceptions, are considered to be the same land use. The exceptions are (1) **maintained** rights-of-way, which are considered to be nonforest land (codes 73 or 74), regardless of their width, and (2) any permanent man made features such as buildings.

The following special applications must be considered **in assigning land use** codes:

1. For sample kind **1** (new 5 point cluster plots), the *entire* sawtimber growth plot at point 1 must fall within the same land use. If it does not, it is moved as described in **Figure 2**. Once this is done, points 2 thru 5 must be located in that same land use. Note however, that this applies only to their point centers. Should any such point center fall on another land use, or any maintained rights-of-way, they are rotated, as described in **Figure 3**, so that they fall on the same land use as point 1 .

NOTE: **ALL POINT ROTATIONS MUST BE CLEARLY EXPLAINED IN THE SPACE PROVIDED FOR GENERAL NOTES AND DIAGRAMMED IN ITEM 83 (P L O T DIAGRAMS) .**

2. For sample kind 2 (**remeasured** 10 point clusters), land use is determined at point 1. The one acre minimum still applies. Point 1 is not moved. If the land use has changed for this point the land use for the other points, and thus the entire plot, changes accordingly. All trees that may have been present on the last occasion are reconciled, but no new trees are tallied.

If the land use at point one is the same as previously recorded, but one or more of the other points now fall in a different land use, these points will be reconciled and rotated points will be established. The reconciliation of all **points that** have changed land use will include a full tally of the point for current information, as well as an accounting of all trees that were previously tallied and are no longer present. A substitute point will be established for each point that has changed land use. Point 1 must fall in a stand of at least one acre, and there must be ten points in the same land use when the plot is completed.

The procedure for identifying rotated points when using the tally sheet, or the data recorder, will be to add **10** to the original point number. For example, if point **3** has changed land use the rotated point that would **serve** as its substitute would be numbered **13**. On the tally sheet, Item **14** (Point Number) is set up to be a one digit code. When a rotation point is set up it will be necessary to squeeze two digits into the block. (See **Figure 4**)

NOTE: ALL POINTS THAT **HAVE** CHANGED LAND USE MUST BE **CLEARLY** EXPLAINED IN THE SPACE PROVIDED FOR **GENERAL NOTES AND DIAGRAMMED** IN ITEM **83 (PLOT DIAGRAMS)** .

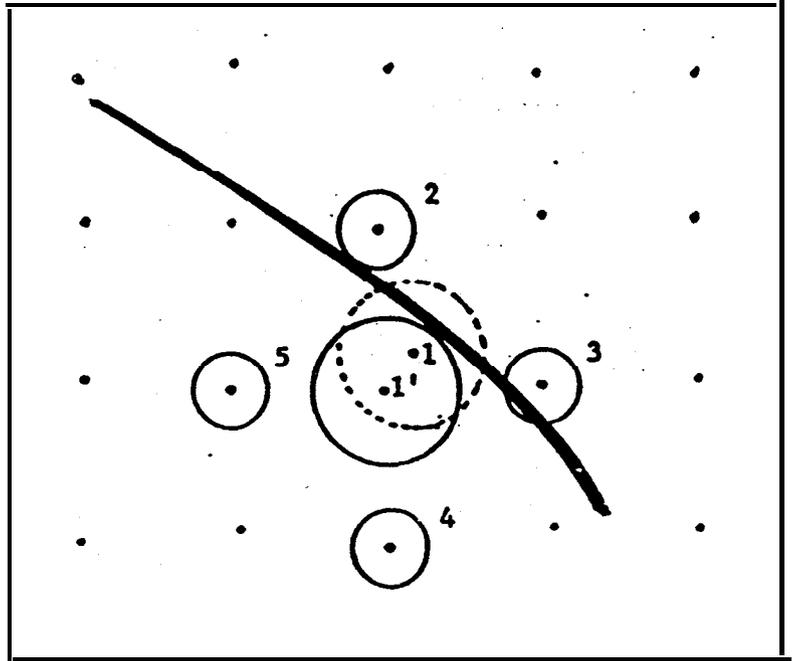
<u>Reconciled Point Number</u>	<u>Corresponding Substitute Point Number</u>
2	12
3	13
4	14
5	15
6	16
7	17
8	18
9	19
10	20

Figure 2. Moving plot center

A permanently maintained **right-of-way** passed thru a part of the growth plot centered at point 1. The plot center was **set** back, perpendicular to the right-of-way, to point one **prime(1')** so that the entire growth plot is now in the same land use class. The other points (**2-5**) were then established from the new plot center.

Point number **3** did not have to be rotated even though a part of the vegetation plot falls within the right-of-way.

Plot center could also be moved, regardless of land use class (**but** never more than 52.7 feet), when an obstacle, such as a cliff, would prevent the accurate tree tally measurements on the entire growth plot.



Record the movement of plot center as you would a turning point and make note of it in the space provided in the General Notes.

Figure 3. Rotating points 2-5

Points 2 and 3 fell on **cropland** and had to be rotated. Starting at the highest numbered point that did not require rotating (pt. 5), a clockwise sweep was made to find the first eligible alternate location for point 2. This new location is shown as point 2 prime (**2'**). Following the same procedure, point **3'** was located. If it had been necessary to rotate point 4, the search for an **alternate** cardinal location would have started at point **3'**.

Points 2 - 5 are rotated only when a point center falls in a land use class different from that at plot center, or when the establishment/measurements at the normal location would be unsafe.

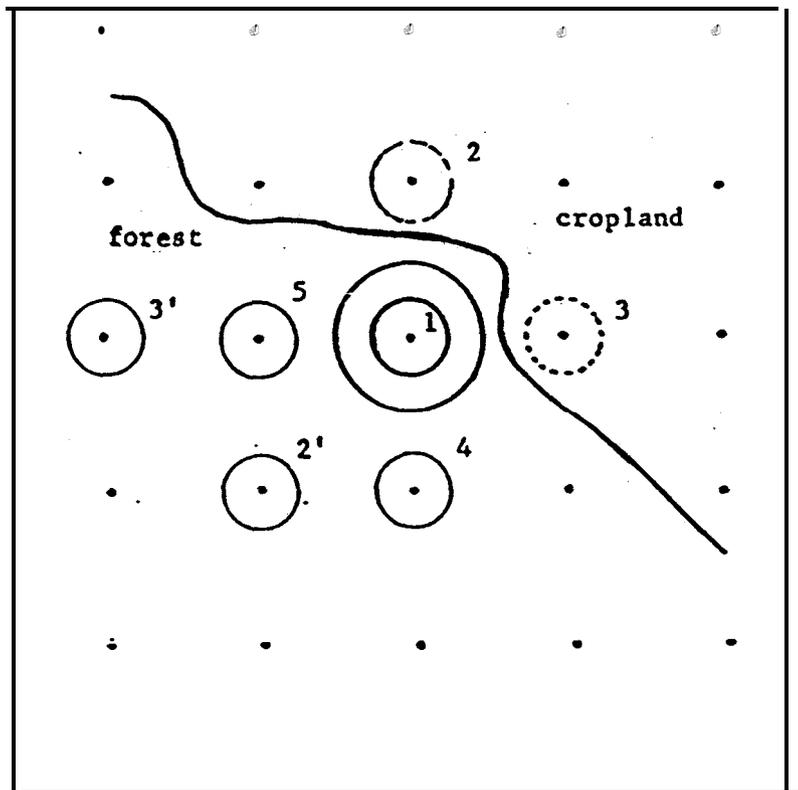
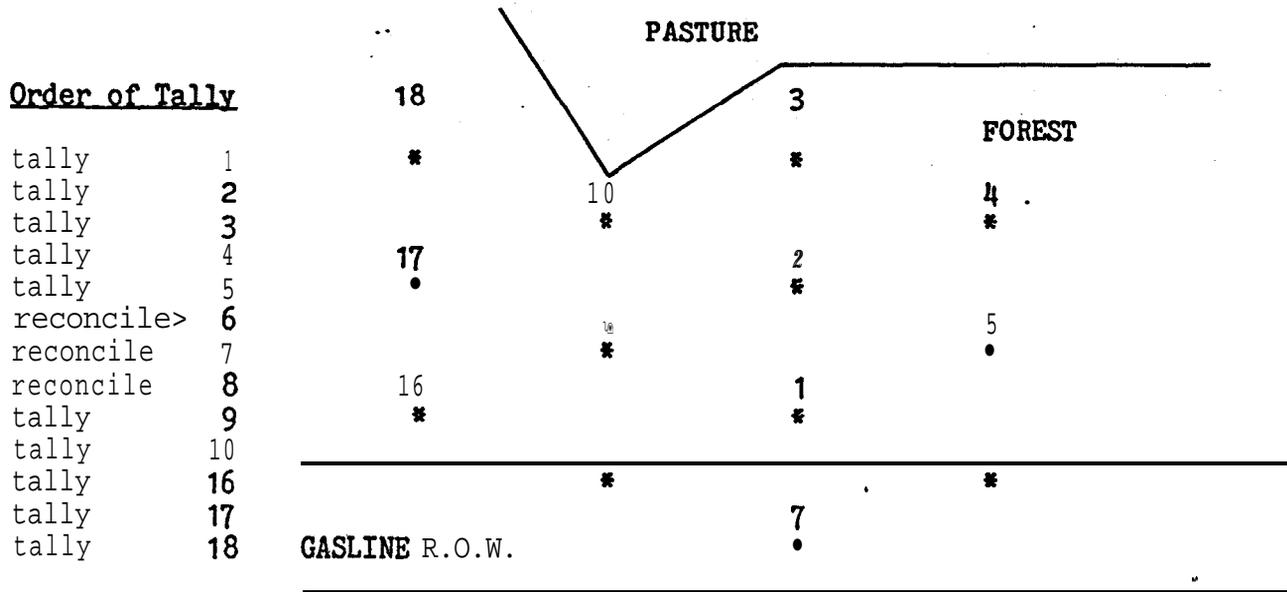
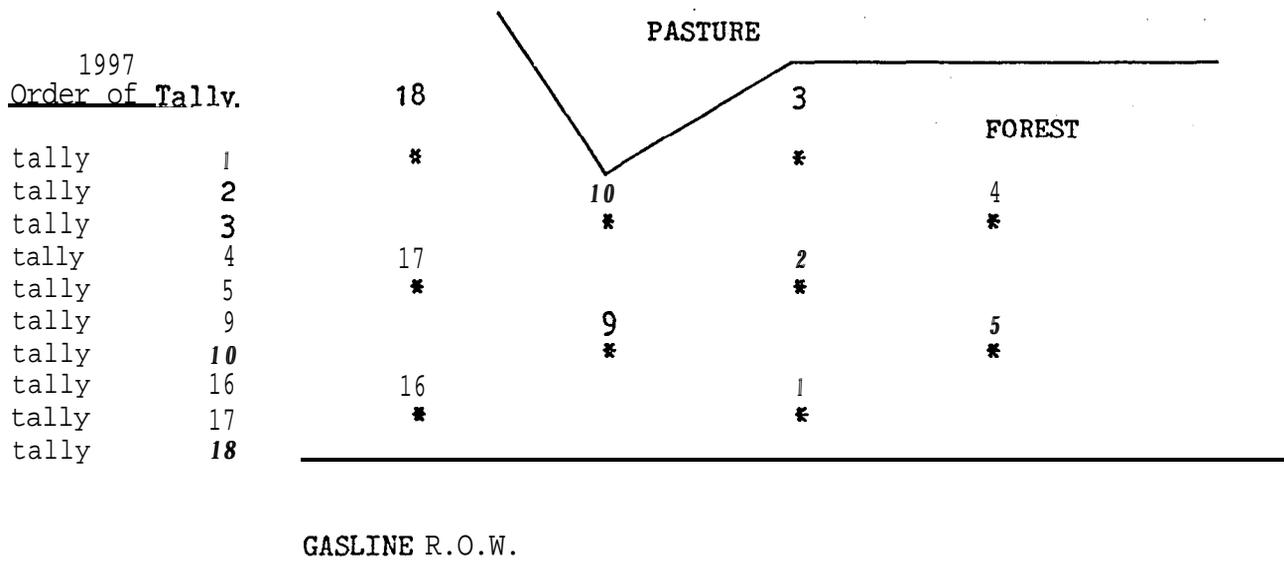


Figure 4. Point placement on a ten point remeasure that has had three points change land use.

In this example, points 6,7 and 8 of the plot now fall in a gasoline right-of-way. A complete tally of this plot would show the tally of points 1 through 5; the reconciliation of points 6,7 and 8; the tally of points 9 and 10; and the tally of rotated substitute, points 16, 17 and 18.



Looking ahead 10 years, the crew that remeasures this plot in 1997 would find a pattern of points as depicted below, assuming that there were no more changes in land use.. The plot would include ten points on forested land of at least one acre.



STOCKING LEVELS

Because of the different types (fixed radius and variable radius) and the different sizes (**milacre, 1/10 acre, 1/5 acre**) of samples that we use; determining the level of **stocking** for a plot can be very **confusing**. Fortunately we only have **to be** concerned with two specific levels of stocking; a minimum of 10 % stocking for forest land, and a minimum-of 25 % stocking for the unique category of pastured timberland.

In situations where **it is** questionable as to whether. the plot **area** is sufficiently stocked there are some relatively easy tests that can be done to verify whether the stand meets the **minimum** stocking requirements.

When checking for 10 % stocking on a new five point cluster, starting at point 1, use the **prism** to check for any trees (**5" D.B.H.** or greater) that may be "in". One tree "in" is sufficient to meet the minimum 10 % stocking requirement. If there are no trees, check the reproduction plot for saplings and seedlings. One **of** either, sapling or seedling, is also sufficient to achieve **10 %** stocking. If there is no tally, of any kind, at point 1 proceed to point 2, and point 3, and so on. As soon as something is tallied you know that the plot does meet minimum stocking requirements and you can return to point 1 and start the normal tally procedures.

If there is nothing encountered after a check of all five points do not assume that this is not forest land., This only means that the stocking level does not exceed minimum requirements. Refer to the land **use definitions** before making a full determination.

For 10 point remeasures, at 10 % stocking, the **procedure** is similar except that the prism check is made at all ten points, if necessary, while the reproduction check is done only on the odd-numbered points. The requirements are now two trees (**5"D.B.H.** or greater), or one sapling, or one seedling anywhere within the check.

The procedures for checking either type plot at the 25 % stocking level are the same as when checking at the 10 % level. The required number of trees increases though, to **3** for a five point cluster, and 5 for a 10 point remeasure. In all cases just one sapling or seedling tallied on any of the reproduction plots will be enough to raise the stocking above 25 %.

Remember, when there is very light stocking don't spend time running a regular tally until you have completed a check to verify that the plot meets minimum stocking requirements. Once you know that it does, return to point one and proceed as normal. If the plot doesn't meet minimum stocking, refer to the land use definitions to make your determination.

Plot;	Minimum <u>Stocking</u>	Minimum # of Trees	Minimum Saps or Seeds
		<u>On All Points</u>	<u>On All Points</u>
5 point	10 %	1	1
10 point	10 %	2	1
5 point	25 %	3	1
10 point	25 %	5	1

Select the appropriate land use class *from* the following list:

FOREST LAND

Land at least 10 percent stocked by forest trees of any size, or land that formerly had such tree cover and is not currently developed for nonforest use. See definition of nonforest land. The minimum area for classification as forest land is one acre. Roadside, streamside, and shelterbelt strips of timber must **have a** crown width at least 120 feet wide to qualify as forest land. Unimproved roads and trails, streams and other bodies of **water, or** natural clearings in forested areas shall be classed as forest, if less than **120** feet in width. Note: 10 percent stocking is present if, after 5 milacre plots **are** examined, at least one tree (established seedling or larger) has been tallied.

Grazed woodlands, reverting fields, and pastures that are not actively **maintained are** included if the above qualifications are satisfied. See definition of idle farmland and **improved/maintained** pasture.

TIMBERLAND - Land Use Code **20.**

Forest land that is producing or capable of producing crops of industrial wood and that is not withdrawn from timber utilization either by law, public agency, or exclusive use for Christmas tree production. (Note: Areas qualifying as commercial timberland have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for the production of industrial wood in the foreseeable future.

Timberland may be nonstocked provided that neither any -natural condition, nor any activity by man prevents or inhibits the establishment of tree seedlings.

PASTURED TIMBERLAND - Land Use Code **21.**

Land that is partially developed, maintained **or** managed for pasture and grazing, but which continues to meet the definition of timberland in other respects, ie. is suitable for and has adequate stocking for the production of industrial wood products.

Land must be at least **25%** stocked with trees at least **1"** dbh. Because cedar and hawthorn (*Juniperus virginiana* and *Crataegus* sp.) are non-palatable species, and for that reason, they are frequently found on pasture land, they are not to be considered in determining the 25% stocking requirement. They will however, be tallied if there is 25 % , or more, stocking of other tree species.

Ten point clusters require five, or more, trees to be tallied for the plot to be considered **25%** stocked. At least three trees must be tallied on new five point clusters for the plot to be considered 25% stocked.

URBAN FOREST LAND-LOCATIONALLY RESERVED - Land Use Code 22.

Land that except for its **location**, would ordinarily be classified as timberland. This land is either completely surrounded by or nearly surrounded by urban development, whether commercial, industrial, or residential. This land meets all the criteria for commercial timberland, i.e. at least one acre; will produce 20 cubic feet per acre per year of industrial wood; is not developed for some use other than timber production; not reserved by a public agency, It is extremely unlikely that such land would be used for timber products on a continuing basis. Such land may be held **for** future development or scheduled for development. (Timber present may be utilized only at the time of development.) The lands may be undeveloped due to periodic flooding, low wet sites, steep slopes, or their proximity **to** industrial facilities that are unfavorable to residential development.

RECLAIMED TIMBERLAND - Land Use Code 23.

Forest land sufficiently productive to qualify as timber land that shows signs of being land that was mined and reclaimed;

RESERVED BY STATUTE OR ADMINISTRATIVE DECISION - Land Use Code IQ.

Forest land sufficiently productive **to** qualify as timber land, but withdrawn from timber utilization by a public agency or by law.

CHRISTMAS TREE PLANTATIONS - Land Use Code 51.

Forest land sufficiently productive to qualify as timber land, but withdrawn from timber utilization for **exclusive** use in **Christmas-tree** production. There must be evidence of annual shearing, or other management practices that indicate the exclusive use.

Note that city parks are always nonforest land. .

UNPRODUCTIVE FOREST LAND - Land Use Code 40.

Forest land which is incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions, because of adverse site conditions. Note: Adverse conditions include sterile soils, dry climate, poor drainage, high elevation, steepness, and rockiness. **Vegetation,if** present, is widely spaced and scrubby, or tree growth cannot be established.

UNPRODUCTIVE RESERVED FOREST LAND - Land Use Code 41.

Forest land **which is** incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions, because of adverse site conditions, and is withdrawn from timber utilization by a public agency or by law. Note: Adverse conditions include sterile soils, dry climate, poor drainage, high elevation, steepness, and rockiness.. Vegetation,if present, is widely spaced and scrubby, or tree growth cannot be established.

NONFOREST LAND

Land that does not support or has never supported forests and lands **formerly** forested where use for timber-management **is** precluded by development. for other uses. (Note: Includes areas used for **crops**, maintained/improved pasture, residential areas, city parks, improved roads of any width and adjoining rights-of-way, powerline clearings of any width, and noncensus water. If intermingled in forest **areas**, **unimproved** roads and **nonforest** strips must be more than 120 feet wide, and clearings, etc., **more than** one acre in size, to qualify as nonforest land.). Although there may be some **stocking**, the critical **classification** factor is the predominant use being made of the land. Do not confuse with urban forest land.

NONFOREST LAND WITH TREES

These represent nonforest plots on which **trees 5" DBH and larger** are within the visual acre about P.C. The visual acre must be in the same Land Use.

Following are the legal nonforest definitions and codes. The odd numbered codes are for nonforest conditions and the even numbered codes are to be used when the requirements for nonforest with trees are met.

CROPLAND - Without trees Code **61**. With trees Code **62**.

Land **that currently** supports agricultural crops including silage and feed grains, bare farm **fields** resulting from cultivation of **harvest, and** maintained orchards.

IMPROVED/MAINTAINED PASTURE - Without trees Code **63**. With trees Code **64**.

Land that is currently used and maintained for grazing (not including grazed cropland). Evidence of maintenance besides the degree of grazing includes condition of fencing, presence of stock ponds, periodic brush removal, seeding, or mowing; land that generally has less than 10.0 percent stocking in live trees (established seedlings or larger trees), except that occasional large trees with the obvious function of providing shade for livestock and small single trees or clusters of hawthorn and/or eastern **redcedar** should be ignored when determining stocking; grazing should be intense enough so that forest reproduction (except for hawthorn and eastern redcedar) **could** not occur naturally--this would be evident if all other vegetation were closely browsed.

IDLE FARMLAND - Without trees Code **65**. With trees Code **66**.

Former **cropland** or pasture that has not been tended within the last 2 years and that has less than 10.0 percent stocking with live trees, (established seedlings or larger trees) regardless of species.

OTHER FARMLAND - Without trees Code **67**. With trees Code **68**.

All nonforest land on a farm excluding cropland, pasture, and idle farmland; includes farm lanes, stock pens, and farmsteads--specify the exact land use of the plot center on the tally sheet.

BOG (nonforest) - Land Use Code **69**.

Wet, spongy land **characteristically** having a thick layer of peat. **It** is rich in plant residues, usually acidic in reaction and frequently surrounding a body of open water. Characteristic flora are sedges, heaths, and sphagnum.

NOTE: Bogs are not always nonforest. Some tree species such as black spruce can adapt to the bog conditions. If the stocking requirement is met; the land is considered forest land. The decision of **whether** the land is productive or nonproductive will be made by the field crews. (LU 20 or 40).

MARSH - Land Use Code **70**.

Tract of soft, wet land, often periodically inundated and always treeless. Usually characterized by grasses, cattails or other **monocotyledons (i.e.** lilies, lady slippers, sedges).

SALT MARSH - Land Use Code **71**.

Flat land that is subject to intermittent or occasional overflow by salt water, containing water that is brackish to strongly saline. Supports a vegetation of saltwater adapted plants usually consisting chiefly of grasses.

SWAMP (nonforest) - Land Use Code **72**.

Wet, spongy land saturated and sometimes partially or intermittently covered with water. Such land supports natural vegetation predominantly of shrubs, and/or trees.

NOTE: Swamps are not always nonforest. Some tree species readily adapt to the swamp conditions. If the stocking requirement is met, the land is considered forest land. The decision of whether the land is productive or nonproductive will be made by the **field crews. (L.U. -20 or 40)**.

RIGHTS-of-WAY - Without trees Code 73. With trees Code **74**.

Highways, railroads, pipelines, powerlines, canals.

MINING AND WASTE LAND - Without trees Code **75**. With trees Code **76**.

Surface mining, gravel pits, dumps.

DEVELOPED RECREATION SITE - Without trees Code **77**. With trees Code **78**.

Parks, campgrounds, playing fields, athletic and sports tracks.

INDUSTRIAL AND COMMERCIAL LAND - Without **trees** Code **79**. With trees Code **80**.

Supply yards, parking lots, shopping **centers, factories**, waste disposal, etc.

MULTIPLE FAMILY HOUSING - Without trees Code **81**. With trees Code **82**.

More than one family household per structure.

SINGLE FAMILY HOUSING - Without trees Code **83**. With trees Code **84**.

One family or person per structure.

OTHER- Without trees Code **85**. With trees Code **86**.

Includes any category not mentioned previously. **Specify** each situation on the tally sheet.

CENSUS WATER - Land Use Code **91**.

Rivers more than **1/8** mile wide; bodies of water more than **40** acres in size (includes lakes, the ocean, reservoirs). This category is never intentionally sampled. If a new plot falls in census water, it should be turned in and an alternate plot should be selected. If a remeasure plot now falls in census water, record L.U. **91**, **reconcile** the trees, and turn in **the** plot.

NONCENSUS WATER - Land Use Code **92**.

Streams/streams between 120 feet and **1/8** mile in width, and bodies of water between 1 and **40** acres in size. The Bureau of Census classifies such water as land and therefore it will be sampled. It should **be treated** as any other nonforest land use.

*****THIS IS IMPORTANT*****

NOTE: Field **crews** are required to **notify** the Field Supervisor of all plots that are assigned a Land Use Class that differs from the P.I. Class or, in the case of remeasured plots, a Land **Use** Class that differs from the Previous Land Use Class, within one week of the date that the plot was completed.

*****THIS IS IMPORTANT*****

Time of Current Tally, Item 8. MONTH, DAY, YEAR

Enter a six digit code for the month, day and year on which the plot is completed.

Previous PI Class, Item 9. **PREPI**

Applies only to remeasured plots. Enter the PI code that appears in Item **7** of the previous inventory record.

Previous Land Use. Item 10. PRELU

Applies only to remeasured plots. Enter the land use code appearing in Item 8 of the previous inventory record.

The following codes were those used at the last occasion and are listed here only for explanation purposes.

Code

20	Commercial forest land
21	Pastured commercial forest land
40	Unproductive forest land
50	Productive forest land withdrawn from commercial use
51	Productive forest land withdrawn for Christmas tree production
61	Cropland
62	Improved pasture
64	Idle farmland (not tended within the last 2 years and less than 16.7% stocked with all trees)
65	Marsh
66	Other farmland, including farmsteads
67	Urban and other
68	Nonforest reclaimed strip mine
90	Water
97	Census water
92	Roncensus water

Previous Date. Item 11. PREMO, PREYR

Applies only to remeasure plots. Enter two digit codes for the month and the year that were recorded in Item 77 on the previous tally record. January will be coded as 01, December as 12.

Cruiser. Item 12. CRUSR

Enter the three digit numeric code of the person that cruised the plot.

Tallyperson. Item 13. TALLY

Enter the three digit numeric code of the person that tallied the plot.

Point Number. Item 14. PTNUM

Point numbers have been pre-printed on page 1. When the substitute points have been installed their locations should be clearly documented in Item 83. Do not alter the pre-printed point numbers on page one.

On page 2 of the tally sheet, enter the appropriate number for each point.

Slope Correction. Item 15. SLCOR

For points 2 - 5 of new five point clusters, record the slope correction, to the nearest .1 (1/10) foot, between points. Record as a three digit code.

Point History, Item 16. PTHST

Record one of the following:

<u>Code</u>	<u>Definition</u>
0	new point, normal location
1	new point, rotated
2	remeasured point, old pin found
3	remeasured point, old pin not found

On points 6 through 10 of remeasured clusters make note of whether the old pin was found in the space provided for point notes.

Percent Slope, Item 17. SLOPE

Record the percent slope of the terrain at the point. In order to avoid microsite conditions, the slope should be taken over a span of at least 100 feet. The slope measurement should be taken in the same direction as the aspect for the point.

Record actual percent slope as a two digit code except:

Code QQ = less than 5% slope

Code 99 = more than 99% slope

Aspect, Item 18. ASPCT

Aspect is the **exposure** for land surfaces that are not horizontal. It is the direction toward **which** the slope faces. Determine and record the aspect of the terrain at each sample point. To avoid microsite conditions, a distance of 100 feet is the minimum span over which aspect should be determined. The compass sighting should be downhill in the same direction as the slope of the terrain.

Use a three digit code to record aspect to the nearest degree except:

Record **000** when there is no aspect. (slope of terrain is less than 5%)

Record **360** for a north aspect.

Terrain Position, Item 19. TERRN

Terrain position is the **location** of the sample point along the slope profile. Select the terrain position that best relates the sample point to the slope profile. To avoid microsite conditions, a distance of 100 feet is the minimum span to consider. (See Figure 5.)

<u>Code</u>	<u>Terrain Position</u>	<u>Code</u>	<u>Terrain Position</u>
1	top of slope (convex)	5	lower slope (concave)
2	upper slope (convex)	6	bottomland (horizontal)
3	midslope (uniform angle)	7	flatland (areas not part of or related to slope)
4	bench (slope deviation)		

NOTE: Codes 4 (bench), 6 (bottomland) and 7 (**flatland**) are the only valid codes for points with an aspect of **000** (slope less than 5%). Bottomlands-are- generally associated with a drainage, flatlands are not..

Disturbance Since Time of Photo Item 53. DSTRB

. After 'ground examination of the visual plot acre, enter the appropriate code.'

<u>Code</u>	<u>Definition</u>
0	<u>No evidence</u> is present to indicate that more than minor disturbances have occurred on the plot since the photo was taken. Minor disturbances are those which could not be detected on a photo.
1	<u>Trees</u> have died as a result of fire which occurred since the time of the photo.
2	<u>Beaver activity</u> . Trees that have died as a result of the flood of a dam or by the cutting and chewing of a beaver.
3	<u>Weather</u> . Trees that have died as a result of blowdowns, flooding (other than directly by beaver), ice storms, etc.
4	All <u>harvest</u> related.
5	<u>Constructi</u> by man. Includes road and building construction or all disturbances directly caused by man.
6	<u>Dis rbances not listed</u> . A description of the disturbance must be entered in the general notes section.

Owner class Item 54. OWNER

If the category of landowner is known, enter the appropriate 'code.' If the landowner category cannot be determined, enter zeros.

On private lauds (categories 20, 30, 40, 50, 60) it is **important to** correctly **identify** forest **industry** and farmer owned prop'ties if possible.

<u>Code</u>	<u>Owner Class</u>
11	N a t i o n a l f o r e s t
12	other federal
13	state forest
14	other state
15	Indian tribal lands
16	county and municipal
17	inter-governmental (co-ownership between federal, state, or local govt's)
20	forest industry
30	farmer
40	misc. private individual/joint owner (other than forest industry or farmer)
50	misc. private corporate (other than forest industry or corporate farms)
60	other misc. private group (trusts, clubs, partnerships other than forest industry or farmer)

If the owner is other than public and if information reporting the amount of Forest Land acreage can be obtained; record the-second digit of codes 20, 30, 40, 50, and 60, as follows:

<u>Code</u>	<u>A c r e s</u>	<u>Code</u>	<u>Acres owned</u>
1	1 - 9 acres	6	200 - 499
2	10 - 19	7	500 - 999
3	20 - 49	8	1000 - 4999
4	50 - 99	9	5000 or more acres
5	100 - 199		

Stand Area Class Item 55. C

This is an indicator of management feasibility. On the appropriate aerial photo, measure and classify the area, contiguous to the plot, that is of the same overall stand size and major type group (hardwood, softwood, or uniform mixture of both). Record one of the following area class codes:

<u>Code</u>	<u>Acres</u>
1	1 - 9
2	10 - 19
3	20 - 49
4	50 - 99
5	100 - 499
6	500 or more acres

Distance to Nearest Road, Item 56: ROAD

Determine from a map, photograph, or ground observation, the distance from plot center to the nearest permanently maintained road. To qualify as permanently maintained, a road does not have to be a paved or public road. Road width and evidence of ditching, grading and graveling should be considered. A road may be permanently maintained and not be in use, or the use may be seasonal. Local residents, workers, landowners-, fire wardens and game-protectors are good sources of information.

Record the appropriate code from the following:

<u>Code</u>	<u>Distance(Miles)</u>	<u>Distance(Ft.)</u>	<u>Code</u>	<u>Distance(Miles)</u>	<u>Distance(Ft.)</u>
1	0 - .25	0-1,320	6	2.0 - 2.5	10,561-13,200
2	.25 - .50	1,321-2,640	7	2.5 - 3.0	13,201-15,840
3	.50 - 1.0	2,641-5,280	8	3.0 - 4.0	15,841-21,120
4	1.0 - 1.5	5,281-7,920	9	4+	21,121+
5	1.5 - 2.0	7,921-10,560			

Recreation Opportunity Class. Item 57. RECOP

The field crew will assign a recreational opportunity class to all plots (both forest and nonforest), using the criteria provided below. The crew should assume that the plot is representative of the area in general and should assess the area's general potential for outdoor recreation.

CRITERIA FOR DETERMINING RECREATIONAL OPPORTUNITY CLASS

NAME	PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
CODE	1	2	3	4	5	6
GENERAL RECREATIONAL SETTING DESCRIPTION	Area is characterized by an essentially unmodified natural environment of fairly large size. There is no motorized use of the area.	Area is characterized by a predominantly natural or naturally appearing environment of moderate to large size. There is no motorized use of the area.	Area is characterized by a predominantly natural or naturally appearing environment of moderate to large size. There may be motorized use of the area.	Area is characterized by a predominantly natural appearing environment with moderate evidence of the sights and sounds of man. Conventional motorized use is common with roads provided.	Area is characterized by a substantially modified natural environment. Sights and sounds of man are readily identifiable. Intensified motorized use is common.	Area is characterized by a substantially urbanized environment, although the background may have naturally appearing features. Vegetative cover is often mowed and manicured. Sights and sounds of man, on-site, are predominant. Intensified motorized use, including mass transportation, is common.
SIZE OF AREA (ACRES)	5,000 minimum	2,500 minimum if standing alone, but could include an area as small as 1,000 if adjacent to a primitive area	2,000 minimum	No size criteria	No size criteria	No size criteria
REMOTENESS CRITERIA; DISTANCE FROM TRANSPORTATION CORRIDORS	3 miles from roads, railroads, or trails with motorized use, but could be as close as 1 1/2 miles if vegetation and topography give a sense of isolation.	1/2 to 3 miles from roads, railroads, or trails with motorized use.	0 to 1/2 mile from primitive roads or trails used by motor vehicles, but greater than 1/2 mile from conventional roads, railroads and trails.	0 to 1/2 mile from conventional roads, railroads, and trails with motorized use.	No distance criteria	No distance criteria
DEGREE OF DEVELOPMENT OR CUTTING ACTIVITY	Based on what can be seen from the photos or along route to the plot, any changes that have been made to the natural landscape are not readily apparent. Structures are extremely rare.	Based on what can be seen from the photos or along the route to plot, changes to the landscape are noticeable but do not attract attention. Cutover areas have regenerated into at least pole timber stands. Structures are rare and isolated.	Based on what can be seen from the photos or along route to the plot, changes to the landscape are easily noticed, but do not dominate the landscape. Cutting may be recent, but is scattered. Structures are generally scattered and not dominant.	Based on what can be seen from the photos or along route to plot, there is constantly aware of changes to the landscape, which may include pastoral or agricultural landscapes, frequent and large-scale cutting operations, and utility corridors. Structures may range from scattered to small dominant clusters, such as second home development.	Based on what can be seen from photos or along route to plot, the landscape is strongly dominated by structures and the natural appearing landscape is subordinate. Examples include major recreational resorts, industrial sites, and residential/commercial areas.	

To use the chart **on the** opposing page, **first read** the general recreation & setting description to get a feeling of what each class represents. Then look at each of the **criteria** that follow the general description, and apply these standards to the area represented by **the** plot. If all of the criteria meet the standards **for** a certain class, it becomes the class of the plot. If the criteria for the area fall into more than one class, use the class which is closest to the urban end of the spectrum. For **example, assume** that the area meets all of the criteria for the primitive classification except that there is a **frequently** used jeep trail in the plot area. This jeep trail will **attract** attention, **therefore,** the plot should be classed as semi-primitive motorized. (using code **3**) since that is the class closest to the urban end of the chart. In other words, the most limiting factor will be the one used to assign a code for this class. In the Northeast, **distance** to transportation corridors (remoteness) and size of area will probably be the most common limiting factors.

The field crew is allowed some discretion in applying the criteria. For example, **if** the crew feels that the plot area meets the general description for primitive, but there is a road $1\frac{1}{2}$ miles away over rugged terrain, then the **crew** is allowed to classify the plot primitive despite not meeting the strictest interpretation for remoteness. The field crew should place the greatest emphasis on the general recreational setting description* and use the **other criteria** as general guidelines.

Forest Type, Item 58. FTYPE

This item must be completed for all plots. **Use** the instructions below to . . . determine the correct forest type, and, to select the appropriate code **from** the list that follows these instructions.

The forest type should be selected on the basis of plurality (that is, most common, not necessarily more than half) of stocking of the species listed in the same type names. Where more than one species are in **the name,** the type may be assigned when any combination of the named species makes up the plurality of stocking. It is not necessary that the stand include all of the named species. For example, if the site **is wet** to very wet and red maple predominates, the type is Black ash/American elm/Red maple (code **71**) even though black ash and American elm may be absent. In addition, in areas where hardwoods (usually white, northern red, black, scarlet, or chestnut oaks) comprise a plurality of stocking but where pines **or eastern redcedar** comprise **25 to 49** percent of stocking, the plot will be given one of the oak-pine type-codes.

In typing a plot, give most consideration to the species composition of the overstory, especially the dominant and codominant trees. In certain cases this will not be possible. Then saplings and seedlings must be used. Do not base your decision on tallied trees alone, but consider all live trees on the acre. If you feel that the trees within the plot boundaries are not representative of the stand in general, then you may consider trees surrounding the plot only if they are on the same type of site as the plot. On regenerating clear-cuts, type the plot on what is there after a cut. With recent clear-cuts, type what the area is **most likely** to become when it regenerates.

NOTE- IN CASES WHERE THE TALLIED TREES ALONE DO NOT DESCRIBE THE FOREST TYPE ACCURATELY, ATTACH A NOTE TO THE TALLY SHEET DESCRIBING THE SITUATION AND HOW YOU SELECTED THE TYPE CODE YOU DID.

Try to choose the best specific type code first. If for some reason this cannot be done, but you know which type group the plot is, use one of the codes ending in Q. Only as a last resort, when you cannot use one of the specific or group codes, should you use INDETERMINATE code 98. This might also be used if there was a strange stocking situation on the plot, such as 6 large wolf trees surrounded by seedlings and saplings in a reverting field. The 6 large trees dominate the "overstory" but the seedlings and saplings dominate the plot.

NOTE: WHENEVER YOU USE A TYPE GROUP CODE (ENDING IN Q) OR THE INDETERMINATE CODE 98, INCLUDE A NOTE, IN THE 'GENERAL NOTES SECTION, EXPLAINING WHY YOU COULD NOT USE ONE OF THE SPECIFIC TYPE CODES.

FOR ALL PLOT TYPES THAT HAVE BEEN DETERMINED TO BE NON-FOREST, RECORD CODE 99.

Forest Types for the Northeast.

<u>Code</u>	<u>Forest Type</u>
10	WHITE/RED/JACK PINE GROUP
01	Jack pine: <u>Associates</u> --red pine, northern pin oak, quaking and bigtooth aspen, paper birch, black spruce, and white spruce; <u>Sites</u> --generally driest, most porous sands but also on more moist, sandy soils near swamps and on rocky hills and lodges.
02	Red pine: <u>Associates</u> --white, jack, or pitch pine; northern pin oak; white oak; red maple; paper birch; quaking and bigtooth aspen, chestnut oak, northern red oak, and hemlock. <u>Sites</u> --spotty distribution in Northeast and sandy and gravelly locations or dry sandy loam soils; often in plantations.
03	White pine: <u>Associates</u> --pitch pine, gray birch, aspen, red maple, pin cherry, white oak, paper birch, sweet birch, yellow birch, black cherry, white ash, northern red oak, sugar maple, basswood, hemlock, northern white-cedar, yellow-poplar, white oak, chestnut oak, scarlet oak, and shortleaf pine. <u>Sites</u> --wide variety, but best development on well drained sands and sandy loams.
04	White pine/hemlock: <u>Associates</u> --beech, sugar maple, basswood, red maple, yellow birch, black cherry, white ash, paper birch, sweet birch, northern red oak, white oak, chestnut oak, yellow-poplar, and cucumbertree. <u>Sites</u> --wide variety but favors cool locations, moist ravines, and north slopes.
05	Hemlock: <u>Associates</u> --beech, sugar maple, yellow birch , basswood, red maple, black cherry, white ash, white pine, paper birch, sweet birch; northern red oak, and white oak. <u>Sites</u> --prefers cool locations, moist ravines, and north slopes.
06	Scotch pine: plantation type, not naturally occurring.

20 **SPRUCE/FIR GROUP**

- 11 Balsam fir: **Associates--black**, white, or red spruce; paper or yellow birch; quaking or **bigtooth** aspen, beech; red maple; hemlock; tamarack; black ash; or northern white-cedar. e--upland sites on low lying moist flats and in swamps.
- 12 Black spruce: **Associates--white** spruce, balsam fir, jack pine, quaking aspen, paper birch, tamarack, northern white-cedar, black ash, or red maple. **Sites--acid** peat swamps but also on moist flats and uplands.
- 13 Red spruce/balsam fir: **Associates--red** maple, paper birch, white pine, hemlock, white spruce, and northern white-cedar.' W--moderately drained to poorly drained flats, or on thin-soiled upper slopes.
- 14 Northern white-cedar: **Associates--tamarack**, yellow birch, paper birch, black ash, red maple, white pine, and hemlock. **Sites--slow** drainage (not stagnant bogs) areas that are not strongly acid..
- 15 Tamarack (eastern larch): **Associates--northern** white cedar, red maple, black ash, and quaking aspen. **Sites--wet** swamps.
- 16 White spruce: **Associates--black** spruce, balsam. fir, quaking aspen, paper paper birch, jack pine, red spruce, sugar-maple, beech, and yellow birch. **Sites--moist**, sandy loam or alluvial soils-found on many different sites but especially typical of stream banks, lake shores, and adjacent slopes.
- 17 Norway spruce: plantation type, not naturally occurring.
- 18 Larch (introduced): plantation type, usually **Japanese** larch, European larch, or a hybrid of the two (**Dunkeld** larch) - not naturally occurring. **Sites--well-drained uplands**; heavy plantation in New York.
- 19 Red Spruce: **Associates--vary** widely and may include red maple, yellow birch, eastern hemlock, **eastern white pine, white** spruce, northern **white-cedar, paper** birch, pin cherry, gray birch, mountain ash, beech, striped maple, sugar maple, northern red oak, red pine, and aspen. **Sites--include** moderately **well** drained to poorly drained flats and thin-slopes and on varying acidic soils in abandoned fields and pastures. This code should be used where red spruce comprises a plurality or majority of the stand's stocking but where balsam fir is either nonexistent or has very little stocking. Otherwise the plot would be coded **13**, red spruce/balsam fir.

30 LOBLOLLY AND **SHORTLEAF** PINE GROUP

- 31 Loblolly pine: **Associates--sweetgum**, southern red oak, post oak, blackjack oak, blackgum, yellow-poplar, and pond pine. **Sites--in** Delaware and Maryland both on **upland** soils with abundant moisture but good drainage and on poorly drained depressions.

- 32 Shortleaf pine: Associates--white oak, **southern red oak, scarlet oak,** black oak, hickory, post oak, **blackjack** oak, blackgum, red maple, pitch pine, and **Virginia pine.** Sites--low, well drained ridges to rocky, dry, south slopes and the better drained spur ridges on north slopes and also on old fields.
- 33 Virginia pine: Associates--shortleaf pine, white oak, chestnut oak, southern red oak, black oak, sweetgum, red maple, blackgum, and pitch pine. Sites--dry sites, often abandoned fields.
- 35 Eastern redcedar: Associates--gray birch, red maple, sweet birch, Virginia Pine, shortleaf pine, oak. Sites--usually dry uplands and abandoned fields on limestone outcrops and other shallow soils but can. grow well on good sites,.
- 36 Pond pine: Associates--loblolly pine, sweetgum, baldcypress, and Atlantic white-cedar. Sites--rare, but found in southern New Jersey, Delaware and Maryland in low, poorly drained acres, swamps, and marshes.
- 38 Pitch pine: Associates--chestnut oak, **scarlet** oak, table-mountain pine, **black** oak, and blackgum. Sites--relatively infertile ridges, dry flats and slopes.
- 39 Table-mountain pine: Associates--chestnut oak, scarlet oak, pitch pine, pine, and black oak. Sites--poor, dry, often rocky slopes.
- 40 OAK/PINE GROUP
- 41 White pine/northern red oak/white ash: Associate+red maple, basswood, yellow birch, **bigtooth** aspen, sugar maple, beech, paper birch, black cherry, hemlock, and sweet birch. Sites--deep, fertile, well drained soil.
- 42 Eastern redcedar/hardwood: Associates--oak, hickory, walnut, ash, locust dogwood, blackgum, hackberry, winged elm, shortleaf pine, and Virginia pine. Sites--usually dry uplands and abandoned fields.
- 44 Shortleaf pine/oak: Associates--(oaks generally include white, scarlet, blackjack, black, post, and southern red) hickory, blackgum, sweetgum, Virginia pine, and pitch pine. m--generally on dry, low ridges, flats, and south slopes.
- 45 Virginia pine/southern red oak: Associates--black oak, scarlet oak, white oak, post oak, blackjack oak, shortleaf pine, blackgum, hickory, pitch pine, table-mountain pine, chestnut oak. Sites--dry slopes and ridges.
- 46 Loblolly pine/hardwood: Associates--wide variety of moist and wet site hardwoods including blackgum, sweetgum, yellow-poplar, red maple, white and green ash, and American elm; on drier sites associates include southern and northern red oak, white oak, post oak, scarlet oak, persimmon, and hickory. m--usually moist to very moist though not wet all. year, but also on drier sites.
- 49 Other oak/pine: catchall type for other unnamed pine-hardwood combinations that meet the stocking requirements for oak-pine.

50 **OAK/HICKORY GROUP**

- 51 Post, black, *or* bear oak: W--blackjack oak, hickory, southern. red oak, white oak, scarlet oak, shingle oak, live oak, shortleaf **pine**, Virginia pine, blackgum, sourwood, red maple, winged elm, hackberry, chinkapin oak, shumard oak, dogwood, and eastern redcedar. Sites--dry uplands and ridges.
- 52 Chestnut oak: Associates--scarlet oak, white oak, black oak, post oak, pitch pine, blackgum, sweetgum, red maple, red oak, shortleaf pine, Virginia pine. Sites--**rocky** outcrops with thin **soil, ridge** tops.
- 53 White oak/red oak/hickory: Associates --scarlet oak, bur oak, pin oak, white ash, sugar maple, red maple, walnut, basswood, locust, beech, sweetgum, blackgum, yellow-poplar, and dogwood. Sites-- wide variety of well drained upland soils.
- 54 White oak: Associates--**black** oak, northern red oak, bur oak, hickory, white ash, yellow-poplar. Sites--scattered patches on upland, loamy soils but on drier sites than type 53.
- 55 Northern red oak: Associates--black oak, scarlet oak, chestnut oak, and yellow-poplar., Sites--spotty distribution on ridge crests and north slopes in mountains but also found on rolling land, slopes, and benches on loamy soil.
- 56 Yellow-poplar/white oak/northern red oak: Associates--black oak, hemlock, blackgum, and hickory. Sites--northern slopes, coves, and moist flats.
- 57 Black locust: Associates--many species of hardwoods and hard pines may occur with it in mixture, either having been planted *or* from natural seeding. Sites--**may** occur on any **well drained** soil but best on dry sites, often in old fields.
- 58 **Sweetgum/yellow-poplar:** Associates--red maple, white ash, green ash, and other moist site hardwoods. Sites--generally occupies moist, lower slopes.
- 83 Black walnut: Associates--yellow-poplar, white ash, black cherry, basswood, beech, sugar maple: oaks: and hickory. Sites--coves and well drained bottoms.
- 94 Yellow-poplar: Associates--black locust, red maple, sweet birch, cucumbertree, and other moist-site hardwoods (except **sweetgum** (see type 58) and white oak and northern red oak (see type 56)). Sites--lower slopes, northerly slopes, moist coves, flats, and old fields.
- 95 Central hardwood reverting field: Associates--any commercial or noncom- mercial pioneer species commonly found in the oak/hickory region except black locust (see type 57), yellow-poplar (see type 94), sassafras or persimmon (see type 97), *or* eastern **redcedar** (see type 35). Sites--abandoned farmlands and old fields.

- 96 **Scarlet oak:** Associates--black oak, southern red oak, chestnut oak, white oak, post oak, hickory, pitch pine, blackgum, sweetgum, black locust, sourwood, dogwood, shortleaf pine, and Virginia pine. Sites--dry ridges, south- or west- facing slopes and flats, but often moister situations probably as a result of logging or fire.
- 97 Sassafras/persimmon: Associates--elm, eastern redcedar, hickory, ash, sugar maple, yellow-poplar, and oaks. Sites--abandoned farmlands and old fields.
- 29 **Red maple/central hardwoods:** Associates--the type is dominated by red maple and some of the wide variety of central hardwood associates include upland oak, hickory, yellow-poplar, black locust, sassafras as well as some central softwoods like Virginia and shortleaf pines. Sites--uplands (see type 84).
- 59 Mixed central hardwoods: Associates--Any mixture of hardwoods of species typical of the upland central hardwood region, should include "at least some oak. m--wide variety of upland sites.
- 60 **OAK/GUM/CYPRESS GROUP**
- 61 Swamp chestnut oak/cherrybark oak: Associates--white ash, hickory, white oak, shumard oak, blackgum, sweetgum, southern red oak, post oak, American elm, winged elm, yellow-poplar, and beech. W--within alluvial flood plains of major rivers on all ridges in the terraces, and on the best fine sandy loam soils on the highest first bottom ridges.
- 62 **Sweetgum/Nuttall oak/willow oak:** Associates--green ash, American elm, pecan, cottonwood, red maple, honeylocust, and persimmon. Sites--very wet (**physiographic** class 7)
- 65 **Overcup oak/water hickory:** Associates--willow oak, American elm, green ash, hackberry, persimmon, and red maple. Sites--in South within alluvial flood plains in low, poorly drained flats with clay soils; also in sloughs and lowest backwater basins and low ridges with heavy soils that are subject to late spring inundation.
- 66 Atlantic white-cedar: Associates--North includes gray birch, pitch pine, hemlock, blackgum, and red maple: South includes pond pine, baldcypress, and red maple. Sites--usually confined to sandy-bottomed, peaty, interior, and river swamps, wet depressions, and stream banks.
- 67 Baldcypress/water tupelo: Associates--willow, red maple, American elm persimmon, overcup oak, and sweetgum. Sites--very low, poorly drained flats, deep sloughs, and swamps wet most all the year.
- 68 Sweetbay/swamp tupelo/red maple: Associates--blackgum, loblolly and pond pines, American elm, and other moist-site hardwoods. Sites--very moist but seldom wet all year--shallow ponds, muck swamps, along smaller creeks in Coastal Plain (**rare in Northeast**).

70 ELM/ASH/RED MAPLE GROUP

- 71 Black ash/American elm/red maple: Associates--silver maple, swamp white oak, sycamore, pin oak, blackgum, white ash, and cottonwood. Sites--moist to wet areas, swamps, gullies, and poorly drained flats.
- 72 River birch/sycamore: Associates--red maple, black willow, and other moist-site hardwoods. Sites--moist soils at edges of creeks and rivers.
- 73 Cottonwood: Associates--willow, white ash, green ash, and sycamore. Sites--streambanks where bare, moist soil is available.
- 74 Willow: m--cottonwood, green ash, sycamore, pecan, American elm, red maple, and boxelder. Sites--streambanks where bare, moist soil is available.
- 75 Sycamore/pecan/American elm: Associates--boxelder, green ash, hackberry, silver maple, cottonwood, willow, sweetgum, and river birch. Sites--bottomlands, alluvial flood plains of major rivers.
- 63 Sugarberry/American elm/green ash: Associates--pecan, blackgum, persimmon, honeylocust, red maple, hackberry, and boxelder. Sites--low ridges and flats in flood plains.

80 MAPLE/BEECH/BIRCHGROUP

- 81 Sugar maple/beech/yellow birch: Associates--basswood, red maple, hemlock, northern red oak, white ash, white pine, black cherry, sweet birch, American elm, rock elm, and eastern hophornbeam. Sites--fertile, moist, well drained sites.
- 82 Black cherry: Associates--sugar maple, northern red oak, red maple, white ash, basswood, sweet birch, butternut, American elm, and hemlock. m--fertile, moist, well drained sites.
- 84 Red maple/northern hardwoods: Associates--the type is dominated by red maple and some of the wide variety of northern hardwood associates include sugar maple, beech, birch, aspen, as well as some northern softwoods like white pine, red pine, and hemlock; this type is often man-made and may be the result of repeated cuttings. Sites--uplands. (See Type 29 under oak/hickory group)
- 88 Northern hardwood reverting field: Associates--any commercial or noncommercial pioneer species commonly found in the northern hardwood region except aspen (see type 91) and gray birch (see type 93). Sites--abandoned farmlands and old fields.
- 89 Mixed northern hardwoods: Associates--wide variety of upland hardwoods typical of northern hardwood or cover hardwood types where the sugar maple-beech-yellow-birch combination or black cherry alone do not comprise a plurality of stocking. Sites--upland, well drained, fertile.

90 **ASPEN/BIRCH GROUP**

91 Aspen: **Associates--paper** birch, pin cherry, bur oak, green ash, American elm, **balsam** poplar, and **boxelder**. **Sites--all kinds** of soils except very driest sands and wettest swamps; found on burns, clearcuts, and abandoned land.

92 Paper* birch: **Associates--aspens**, white pine, yellow birch, hemlock, red maple, northern red oak, and basswood. **Sites--wide** range of upland site, **common** on burns or clearcuts.

93 Gray birch: **Associates--oaks**, red maple, white pine, and others. **Sites--** poor soils of abandoned farms and burns.

98 **INDETERMINATE--to be** used only as a last resort.

99 **NONFOREST**

Plot Origin, Item 59. ORIGIN

Based on the percent of the visual acre occupied, classify the trees on the visual acre as to their origin. Record a **1-digit** code.

<u>Code</u>	<u>Origin</u> f Trees
1	100% natural
2	majority natural (over 50% plurality)
3	100% artificial
4	majority artificial (over 50% plurality)

Stand Age, Item 60. STAGE

This item will usually be determined from the ages of the site index trees. Since the site index cores are being read in the lab it will only be necessary for the crew to enter the code 0 (zero) in most cases.

In situations where site index cores cannot be taken, or where the crew feels that the **site index** cores will not indicate the true stand age class (as in the case of two-storied stands), it will be necessary to assign a stand age class in the field. In such cases describe the situation, and explain why you chose the stand age class that you did, in the general notes section.

An **even-aged stand** is composed of trees that are the same age or at least of the same age class; a stand is considered even-aged if the difference in the age between the oldest **and youngest** trees does not differ more than 20 years in age. Most of the tree **crowns** within these stands occur at approximately the same level of the crown profile.

An **uneven-aged stand is one** which consists of three or more age classes intermingled on the same area. There may be small clumps of trees within the stand with crown profiles resembling even-aged stands, but in general the crown profile consists of crowns in all positions and there is a wide range of ages represented by the trees within the stand.

Two-storied stands are two even-aged stands growing on the **same site**. The crown profile consists of two different and distinct levels. The average age of each level should differ significantly (by more than **20** years) from each other..

<u>Code</u>	<u>Age class</u>	<u>Code</u>	<u>Age class</u>
0	determined from lab readings	5	71 - 90
1	1 - 10 years	6	91 - 110
2	11 - 30	7	111 + years
3	31 - 50	8	two-storied
4	51 - 70	9	uneven-aged

✓ **Timber Management Class. Item 61 MGTCCL**

Assign a timber management class to each forested plot (timberland, pastured timberland, urban, productive-reserved, Christmas tree plantations, and unproductive forest land uses). This class should be the **most** appropriate one for the **stand**. The stand is that group of trees, represented by the plot, of the same forest type and generally the same size of timber.

Assume the management objective is to grow full yields of the highest value **sawtimber** the site can produce in the shortest reasonable time. Most of the production will be high quality sawtimber and veneer, but pulpwood, firewood, and other small products may result from intermediate treatments. Also assume that the treatment which is recommended can be economically justified, that is, will show a return on the investment.

While recognizing that virtually all stands in the Northeast could use some sort of **treatment**, prescribe a practical treatment (codes 1 thru 9) only if you believe it will really pay for itself. If you feel that the owner could not make money from the treatment either now or in a reasonable amount of time, then consider the stand impractical to manage (code 0).

Use the flow chart on Figure 16 and the detailed timber management class description to select the proper code.

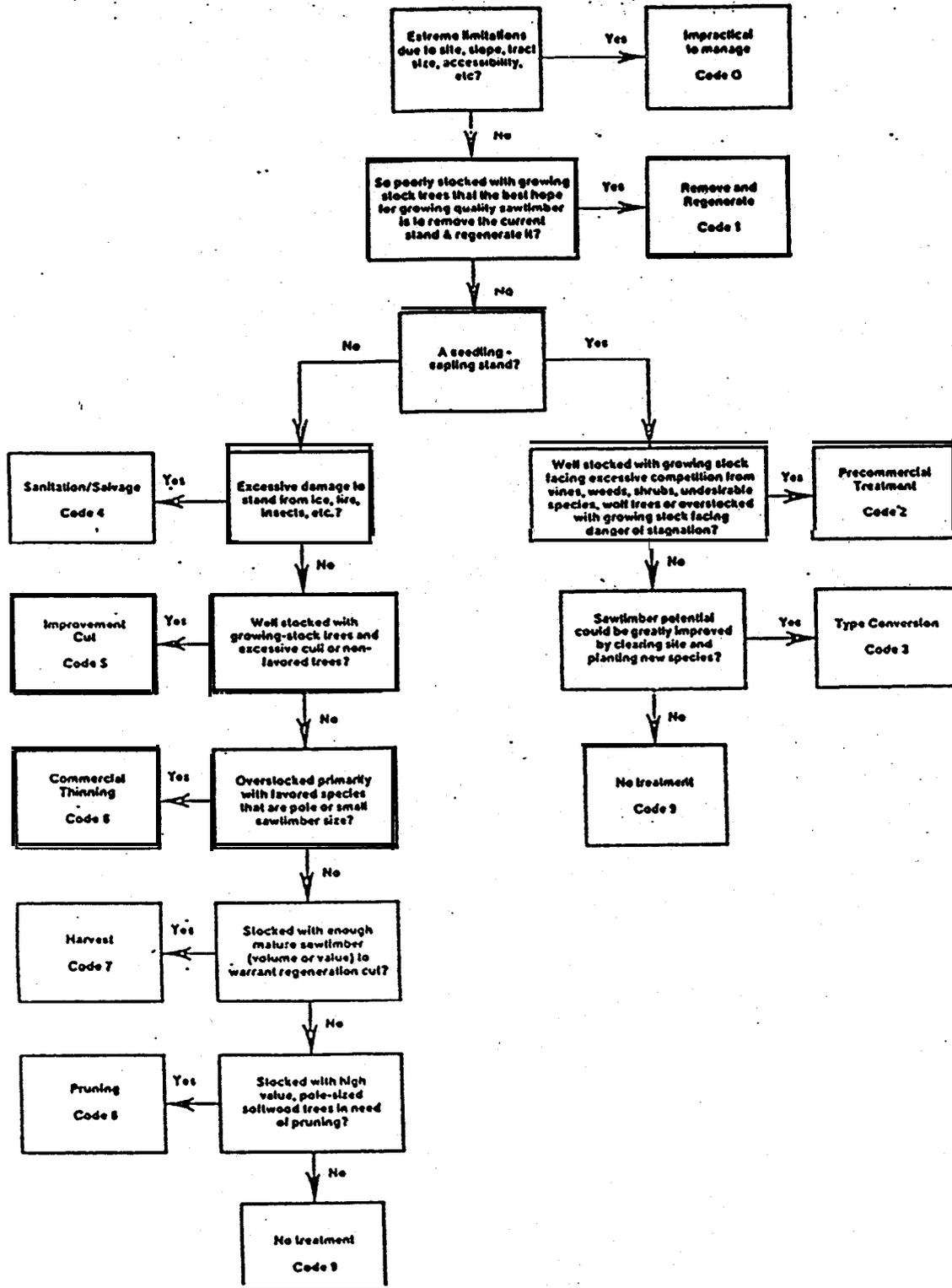
Timber Management Class Codes and Descriptions

Code

- 0 **Impractical to manage** - the stand is impractical to manage **in its** current condition due to very limiting economic, physical, or social factors. Some examples are: very poor site quality, unstable soil, excessive slope, proximity to stream or river, high recreation use area or scenic area where logging wouldn't be permitted, and very **small** stands. All unproductive **forest plots and Christmas tree** plantations must be given this code. For other plots, be conservative in using this code, but also remember that you should be able to justify economically any other treatment classes should you pick one of them.

Figure 16

FLOW CHART FOR DETERMINING TIMBER MANAGEMENT CLASS



- 1 **Remove and Regenerate** - the stand has-so little stocking in growing stock trees (but may be well stocked or overstocked with cull or noncommercial trees) that the best treatment for growing high quality **sawtimber is** to remove the current stand (usually by **clearcutting**) and to start all over. The new stand should be regenerated to the same forest type, either naturally or artificially. If the current stand **is** immature and a different forest type is warranted, see "Type Conversion".
- 2 **Precommercial Treatment** - to qualify for **this treatment**, the stand must be in the seedling-sapling stage. It must be well stocked with growing stock on a good site as these investments often are expensive and take a relatively long time to pay **off**. The **treatment may** be cleaning (**release of desirable** species the influence of undesirable species), weeding (release of desirable species from weeds, vines, or shrubs), liberation cut (release of desirable **species** from wolf or large residual trees), or a precommercial thinning (removal of desirable species in a stand overstocked with growing stock **trees** to encourage the remaining stems and to prevent stagnation).
- 3 **Type Conversion** - this treatment should rarely be prescribed. The stand must be a seedling-sapling stand on a site with good potential as this treatment is costly. **The stand** has a history of extreme disturbance **which** has resulted in off-site or undesirable species dominating the site. This requires removal and artificial regeneration. **Examples** of sites that might require this treatment are coal spoil banks which might be planted to hybrid poplar and areas that have been logged and burned repeatedly. (Also see "Remove and Regenerate").
- 4 **Sanitation and/or Salvage** - this treatment removes diseased or damaged stems from a pole or sawtimber stand. The stand should be threatened with excessive damage or else be extensively damaged at **present in** order to warrant this treatment. The treatment may or may not pay off immediately depending on how recent the damage is and what the size of the timber is. The health of the remaining **stand** or nearby stands will be improved by this treatment.
- 5 **Improvement Cut** - this treatment should be done **in** stands that are well stocked with pole timber or sawtimber growing-stock **trees**. The operation generally provides a dollar return, though more cull and undesirable species are removed than growing stock (in contrast to "Commercial Thinning" which removes mostly merchantable material). The purpose is to release trees in order to improve the composition, form, and/or growth of the residual stand. This is often the initial treatment in a previously unmanaged stand and is used to bring the stand into a better condition for management.
- 6 **Comm hinning** - this treatment involves the cutting of favored species in even-aged stands or even-aged groups in uneven-aged stands in order to redistribute growth and/or improve the quality of the **residual** stand. The stand must be overstocked with primarily favored species that are pole or small sawtimber size. Crown closure indicates the trees are receiving considerable competition from one another and future growth is likely to be lost to suppression mortality. The residual stand must contain enough preferred stems to yield an adequate harvest at maturity.

- 7 **Harvest -- this is a regeneration treatment. The stand must be stocked with** mature sawtimber of sufficient volume or value to justify a harvest. Radial growth of these trees has slowed down based on cores extracted from determining stand age and age of site trees. The appropriate regeneration system may be clearcutting, seed tree, shelterwood, selection, or coppice. (Contrast with "Commercial Thinning" which applies to immature pole and small sawtimber stands, "Type Conversion" which applies to seedling-sapling stands that would do better as another forest type, and **"Remove and Regenerate"** which applies to stands with insufficient volume in merchantable sawtimber trees and need to be cleared to make the stand productive).
- 8 **Pruning** - this treatment removes the branches from the bole of the tree in order to **increase the** production of knot-free wood. The **aim** is to improve log quality and thus the value of the timber. This treatment should be applied only to pole sized, high value white pine, red pine, or spruce stands that do not need improvement cutting, **commercial** thinning, or other intermediate treatments.
- 9 **No Treatment** - this recommendation is appropriate for seedling-sapling pole timber, and sawtimber stands if the stand appears to be adequately stocked with growing stock trees and is in reasonably good condition for **future** timber production. Indications are, at this time, that nature will correct any minor deficiencies in the stand without substantial losses in growth.

Stand History. Item 62. STHST

Based on conditions **within**, the visual acre, record the code that best describes past harvesting activities.

<u>Code</u>	<u>Stand History</u>
0	no evidence of harvesting on the visual acre since the last inventory - for local areas, check remeasured tally sheets.
1	Clearcut - commercial/noncommercial clearcutting in blocks, patches, or strips (must have involved the entire visual acre).
2	Partial cut - It may include any harvesting situation where scattered individual trees or very small groups of trees were cut. Selection, diameter limit cutting, seed tree and shelterwood cuts should also be included.

Time Since Harvest. Item 63. HRVST

Based on evidence in the area and on the aerial photo, estimate when the last harvesting activity took place on the visual acre.

For very recent cut- appearance of stump and logging slash, will obviously be the best indicators. For **older** cuttings, sprout development on hardwood stumps and damaged trees should provide clues. Other criteria should be considered together rather than singly.

Characteristics **useful for estimating** time of cutting include:

1. Sprouts - age of sprouts on stumps-or damaged trees.
2. Cut face of stump and top - color or condition of resin if present; stage of decay.
3. Bark - tightness.
4. On felled trees **left behind** - color or condition of leaves, needles, and twigs.
5. Occurrence of decay, conks, borers, etc., and extent of their development.

In sprout development, consider the time of the year the cutting occurred'. For example, sprouts on stumps or on trees that were damaged in the spring will likely show full growth for the first year; late summer cuttings may exhibit small or winter-killed sprouts; and fall or winter cuttings will be followed by no sprouting until the **next** growing season.

Record the appropriate code for the time since harvest.

<u>Code</u>	<u>Harvest</u>
0	No harvest in last 10 years
1	Harvest was within last 3 years
2	Harvest was between 3 and 10 years ago (reproduction may be established).

✓ Equipment Limitations, Item 64. EQUIP

This is a measure of the physical operability within the visual acre. Ignore overall slope, water, and boulders, **since these** are recorded in other items. Consider cliffs, ledges, rock outcrops and **local** topography (abrupt changes in slope within less than 100 feet).

Record one of the following:

<u>Code</u>	<u>Limitations</u>	<u>Limitations</u>
0	none	2 moderate
1	slight	3 severe

Surface Stone Class. Item 65. STONE

Estimate the percent of the visual acre that is covered with stones or boulders that are larger than 10" in diameter. This does not include rock outcrops. Any flat rocks, such as slate or shale, which are large enough, should be included. This data will help soil scientists in assessing the soil properties of the plot.

<u>Code</u>	<u>Percent acre covered</u>
0	0 to 3
1	4 to 15
2	16 to 50
3	51 or more

✓ **Water on Plot, Item 66. WATER**

Record the type of water present on the visual plot acre, that will **cause** the greatest impact in the area. Example: Water present only in the spring may not have as much influence as a lake.

<u>Code</u>	<u>Category of water</u>
0	none
1	spring/seep
2	stream/river/creek
3	bog/marsh/salt marsh/swamp
4	pond/lake
5	seasonal flooding/intermittent water

Any of the categories of water may occupy a portion of the visual acre, but if large enough to qualify as a nonforest land use, they **must** not be present within the sawtimber growth plot, or at point centers. If that should happen, the **entire** plot may need to be reclassified.

If the presence of water on the plot causes a break in the continuous canopy, an edge is created and should be recorded in Item 80.

Physiographic Class Item 67, PHYSI

Record a physiographic class for the location based upon the following specified soil and water conditions that determine forest **cover type** and site.

<u>Code</u>	<u>Class Description</u>
1	Xer sites. Very dry droughty sites where excessive drainage seriously limits both growth and species occurrence. Examples are the sandhills of the southeastern pine forest, the thin soiled ridge tops of the Appalachian, and the jack pine plains of the northeastern coniferous forests.
-2	Xeromesic sites. Moderately dry sites where excessive drainage limits growth and species occurrence to some extent. These include the flatwoods in southeastern forests, the drier oak ridges in the Ozark-Piedmont forests, and the red pine - jack pine associations on the sandy and gravelly soils in the northeastern coniferous forests.
3	Mesic sites. Soil-water relationships are favorable to tree growth, with growth and species occurrence limited only by climate. These are the deep, well drained soils, usually well suited to agriculture , in all regions. These sites offer the most favorable management opportunities.
4	Hydromesic sites. Poor drainage or frequent flooding limits species occurrence on these sites. These include the better drained bottomland hardwood sites; the heavy, poorly drained, truncated soils of the Ozark-Piedmont forest; and the hardpan soils of the northeastern coniferous forests.

Hydric sites. Growth and **species occurrence are severely limited** by excess **water**. These are the **pocosins**, swamps, and bays of the southeastern pine forests; **wet**, frequently flooded river bottoms; and the spruce bogs of the northeastern **coniferous** forests.

Forest Openings, Item OPENG

These are **openings greater than 1 acre**, in the continuous forest canopy over the visual acre plot. Such openings **result** from the death or removal of overstory trees and a failure of tree regeneration to develop because of competition from shrubs, grasses, and other vegetation. They also include natural features such as rock outcrops and wet areas where normal tree cover cannot become established because of adverse conditions. **not consider** reverting fields or a cut area **greater** than 1 acre as an opening.

Record the appropriate code for forest openings:

Code

Status

0 no openings present
1 openings present

Browse Line, Item 6A BROWS

A browse line is a **distinct** condition that results from excessive utilization, by foraging animals, of understory woody stems. The **understory is** virtually removed and any low occurring overstory has a "shaven off" appearance. Actual understory heights may fluctuate, as with a receding hare line.

In reverting fields and pastures, grazing **from** livestock primarily affects herbaceous vegetation. For these areas, only woody stem browse should be attributed to wildlife.

Record whether or not a discernible browse line is present within the visual plot.

Code

Condition

0 absent - no browse line
1 present - browse line due to wildlife
2 present - browse line due to livestock

Edge on Plot, Item 70. EDGE1, EDGE2

Edge is important to wildlife as it provides diverse habitats within short cruising distances. Edge occurs when different land **classes**, vegetation types, or ground conditions are juxtaposed.

Record the two most predominant edge juxtapositions that occur on the visual acre, and which can also be identified on the plot photo. Each edge is recorded as a 2-digit code. The specific edge codes and definitions are as follows:

<u>Code</u>	<u>Edge Juxtapositions</u>	<u>Code</u>	<u>Edge Juxtapositions</u>
00	None	07	Ag/Herb-Cultural
01	Forest-Forest	08	Hedgerow
02	Forest-Shrub	09	Transportation
03	Forest-Ag/Herb		Right-of-Way
04	Forest-Cultural	10	Utility Right-of-Way
05	Shrub-Ag/Herb	11	Aquatic
06	Shrub-Cultural		

Forest-- Generally as defined by Forest Inventory (see Land Use Definitions), but with the following restrictions. The stand usually averages over **25 feet** canopy height or over 70 percent crown closure for stands less than 25 feet in height (see shrubs). The dominant overstory must be **tree species**. Examples of stands qualifying in the Forest-Forest edge category are a conifer stand juxtaposed to a deciduous stand, a mixed (deciduous and **conifer**) stand to a deciduous stand, a sawtimber stand to a poletimber stand, a partially cut stand to an uncut stand, etc.

Shrub - The dominant vegetation will be **shrub** and/or tree species, with an obvious herbaceous understory. The area must be at least one acre in size, and greater than 120 feet wide if in strips. Average canopy height will usually be less than 25 feet, and **crown** closure will be less than 70 percent.

Agricultural/Herbaceous - Dominant vegetation is herbaceous (grasses and **forbs**) and includes all active agricultural lands, pasture, and natural grasslands. The area must be at least one acre in size, and greater than 120 feet wide.

Cultural - Lands with human development as the major land cover. **Includes** urban/suburban lands and rural residential lands. **Any land** use change completely within an urban/suburban area will not be tallied in the edge inventory, only those changes occurring at the periphery of the urban/suburban area.

Hedgerow - Areas with dominantly tree and/or shrub cover, either natural or planted. Crown width is less than 120 feet and usually limited to a width of one crown. If bordering land classes are different, tally the edge created by these classes.

Transportation RoW - Includes improved or maintained roads and railroads. For edge item 97, two-lane roads are tallied as a single edge, four-lane divided highways are tallied twice. For two-lane roads, if the bordering land classes differ, tally the edge created. Do not tally driveways, farm access roads, skid trails, etc.

Utility RoW - This class includes both pipelines and electric transmission lines. For this edge item 97 tally this edge class only if the vegetative cover is different from the adjacent land classes. Tally the edge class-twice if the **RoW** is over 120 feet wide, once if **less than 120** feet. If less than 120 feet, also tally any edge created if the bordering land classes differ.

Aquatic - This involves the unique vegetative communities bordering a body of water.

1. Streams and Rivers - For edge item 97 tally once if the waterway is less than 120 feet wide, twice if over **120** feet wide. If less than **120** feet wide and the bordering land classes differ tally the edge class created.

2. Lakes and Ponds - For edge item 97 tally aquatic edge for lakes and ponds of one acre **in size** or greater. Each time a transect intersects the shore of a lake or pond is one edge hit.

Elevation - Item 71. ELEV

Leave this blank unless the elevation of the plot is known or is easily obtained. The information can be obtained from topographic maps at a later date.

<u>Code</u>	<u>Elevation</u>	<u>Code</u>	<u>Elevation</u>
00	Sea level to 99 ft.	07	700 - 799
01	100 - 199	08	800 - 899
02	300 - 399	09	900 - 999
03	400	10	1000 - 1099
04	- 499	11	1100 - 1099
05	500 - 599		...continue to ...
06	600 - 699	50	5 0 0 0 - 5999

Site Index Information. Items 72 - 74. SPP(1-4), DBH(1-4), THT(1-4),
Site Index information will be recorded for:

- .all forested, new 5 point plots
- .all forested, remeasured plots

Every effort should be made to select on, or near each field location, four trees to be cored. Species, d.b.h., and total height will be recorded in items 91, 92 and 93 respectively. Borings must reach the pith and the trees **must** be relatively free from rot in order to achieve accurate ring counts. The increment cores will be sealed in labeled cardboard tubes. Labels will identify the plot and the tree number (1 - 4). The tubes will be placed in a protective container and stored securely. Supervisors will periodically collect the tubes.

Site index trees must be:

- .at least 20 years old and vigorous
- .dominant or codominant within the stand most of their lives
- .free growing and not those that were suppressed during early years, then released,
- .all of the same species judged to determine the forest type representative of the sample area. In mixed species stands where the forest type is not evident, select a minimum of two trees from each species likely to determine the site.
- .selected on the basis of stems that are 5.0 inches d.b.h. or greater.

represent the site potential rather than stand condition. Do not select trees on the basis of their size. Select on the basis of dominance and apparent history of dominance.

Site index **trees may** be selected **from areas near** the plot **if:**

.the site of the surrounding area appears to be the same (soil, drainage, landform, species; **etc.**)

.doing so would allow the trees to be of the **same species.**

.the trees on the plot are severely damaged as the result of the activities **of people/machines/nature.**

.the trees on the plot have been subjected to a natural catastrophe which would prevent evaluating the site potential on terms of natural undisturbed conditions.

The following steps should be followed to produce accurate tree height data when measuring tree height with a clinometer.

1. Always take tree height measurements from a horizontal distance when possible. Take measurements on a plane approximately even with the base of the tree or standing on a plane above the base of the tree.
2. It is recommended that the distance at which tree height is measured is at least 1 chain (66 feet).
3. If the tree is leaning, stand perpendicular to the lean of the tree and then measure the tree height.

Photo Plot Edge Information, Item 76.

The work for **this** item will be done in the office. Do **not** make entries while in the field.

For each new ground plot (sample kind **1**), land use edge will be recorded. Edge is inventoried from a pattern of circular transects marked on a transparent overlay.

The first and second digits - edge hits - When the transparency is overlain on the photo and entered on P.C., "**edge hits**" along the transects will be tallied according to the appropriate edge classes. An "**edge hit**" is defined as the intersection of different land classes, vegetation types or ground conditions along the transect. A control line has been provided as a starting point for each count., Begin at the control line and total the number of hits for each of the **11** land classes on all four circles. Record this number in the first block of the tally section for edge. If there are no hits for a particular class, leave the block blank.

Refer to Item 70, Edge On Plot, for specific edge definitions, and to figures **18** and **19** for examples of photo edge tally.

The third digit - distance - Information is needed on the average distance from the plot center to a contrasting land use. The four circles on the template represent the distances, **(1)** 1/8 mile, **(2)** 1/4 mile, **(3)** 3/8 mile, and **(4)** 1/2 mile. Record the first circle (closest to P.C.) in which a land use condition change occurs:

APPENDIX

AID TO DETERMINE PRODUCTIVITY OF FOREST LAND

The table below may be used by field crews to assist in the determination of unproductive forest land; that is, land on which the potential productivity is less than 20 cubic feet of industrial wood per acre, per year.

From an increment boring, determine the age class of a tree that is **located** on the site in question. For **example**, a **27** year old black spruce in the **20** year age class must be at least 8 feet tall if the site **is** to be considered as being productive. But sample trees must be representative of the site. The factors of drainage, soils, elevation, and exposure must also be considered.

Total height **in feet** at upper limit of the unproductive site class

Age Class	Black Spruce Height	Black Ash Height	Red Maple Height	Chestnut Oak Height
20	8	12	10	12
30	13	21	17	21
40	19	29	24	29
50	25	34	32	34
60	30	39	37	39
70	33	45	43	45
80	39	50	49	50
90	41	53	53	52
100	43	57	57	56
110	47	60	60	57
120	50	60	61	58
130	51	61	61	59
140	52	62	62	60
150	53	63	62	--
160	--	64	63	--
170	--	65	63	--
180	--	65	63	--