

# **WESTERN SOUTH DAKOTA FOREST SURVEY FIELD PROCEDURES**

**1983**



*Appendixes 1-7*

**INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION  
U.S. Department of Agriculture      Forest Service  
Ogden, Utah 84401**

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APPENDIX I

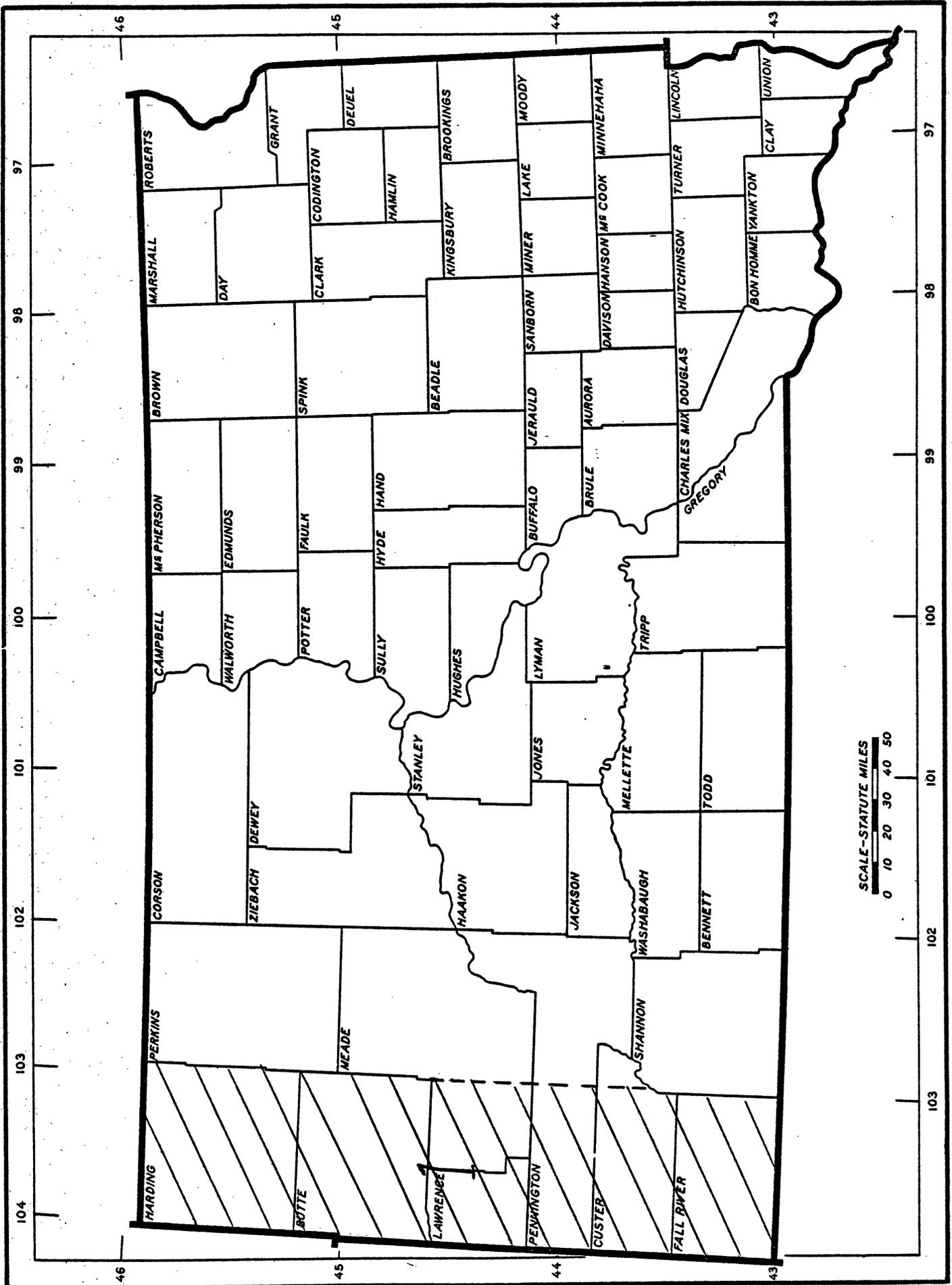
Code Lists

Sample Area Codes

All of South Dakota west to the 103d meridian  
is in Sample Area 1.  
Exclude National Forest Land from establishing and  
measuring field plots.

Code 01

# SOUTH DAKOTA SAMPLE AREAS



WESTERN SOUTH DAKOTA COUNTY CODES

<u>County</u>	<u>Code</u>
Butte	019
Custer	033
Fall River	047
Harding	063
Lawrence	081
Meade	093
Pennington	103



REGION, FOREST, WORKING CIRCLE

Forest Service (Ownership 11)

<u>Region</u>	<u>Code</u>	<u>Forest</u>	<u>Code</u>	<u>Working Circle</u>
Northern	1	Custer	8	Always coded 1 for National Forest
Rocky Mountain	2	Black Hills	3	

Bureau of Land Management (Ownership 12)

<u>Region (Resource Area)</u>	<u>Code</u>	<u>Forest (District)</u>	<u>Code</u>	<u>Working Circle (SYU)</u>	<u>Code</u>
South Dakota	8	Miles City	2	No SYU	1

Indian Trust Land

There is no Indian trust land within the sampled area.

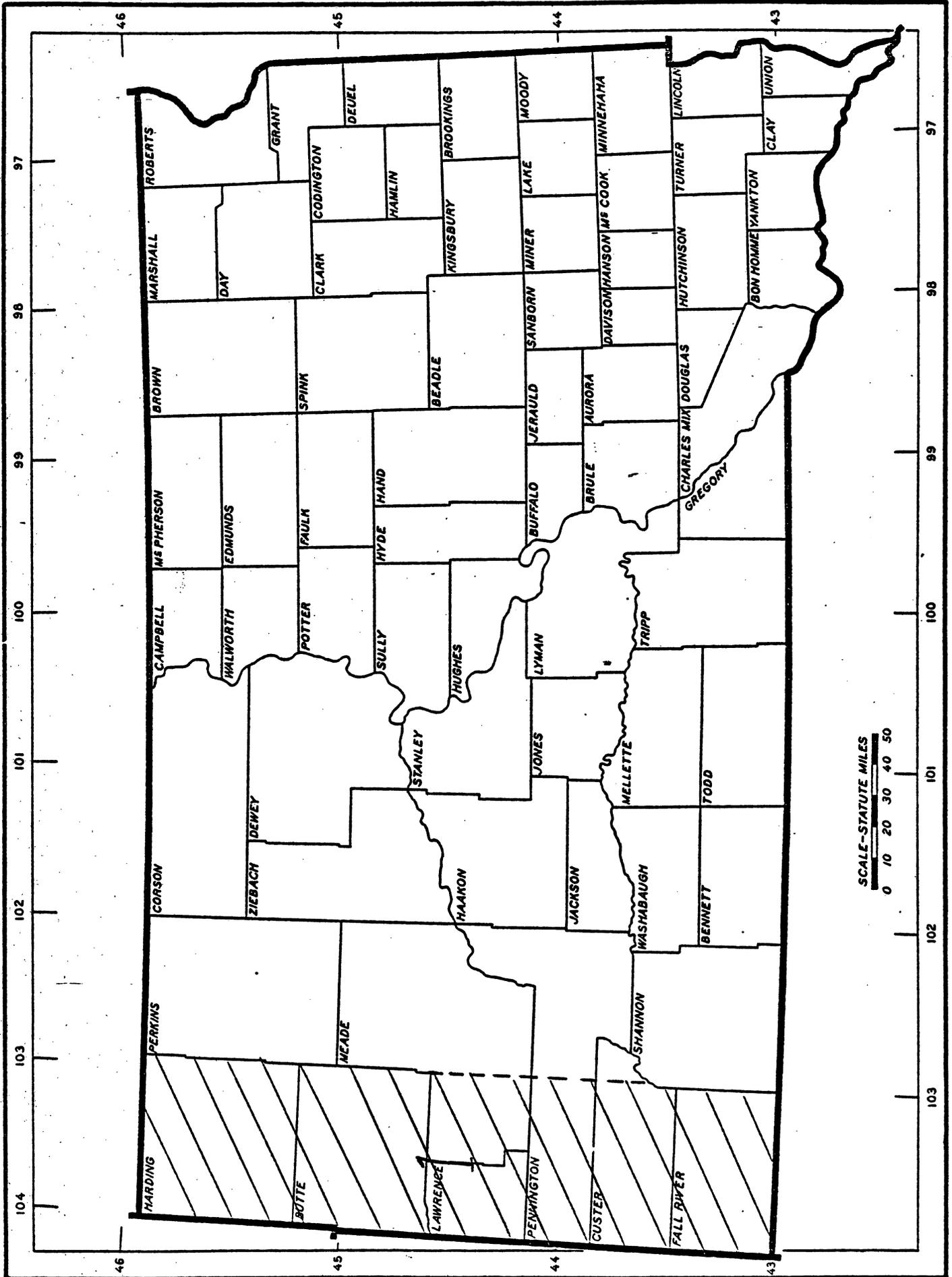
State, Private, and Other  
Ownership Codes other than 11 or 12

<u>Region Code</u>	<u>Forest Code</u>	<u>Working Circle Code</u>
0	99	1

# SOUTH DAKOTA

|

WORKING CIRCLES



State	1	P.O. No.	2	P.O. No.	3	Card Type	4	Region	5	Forest	6	Working Circle	7	Sample Area	8	County	9	Location Number	10
	12		34		5		11		12		134		1516		1710		1920		2234

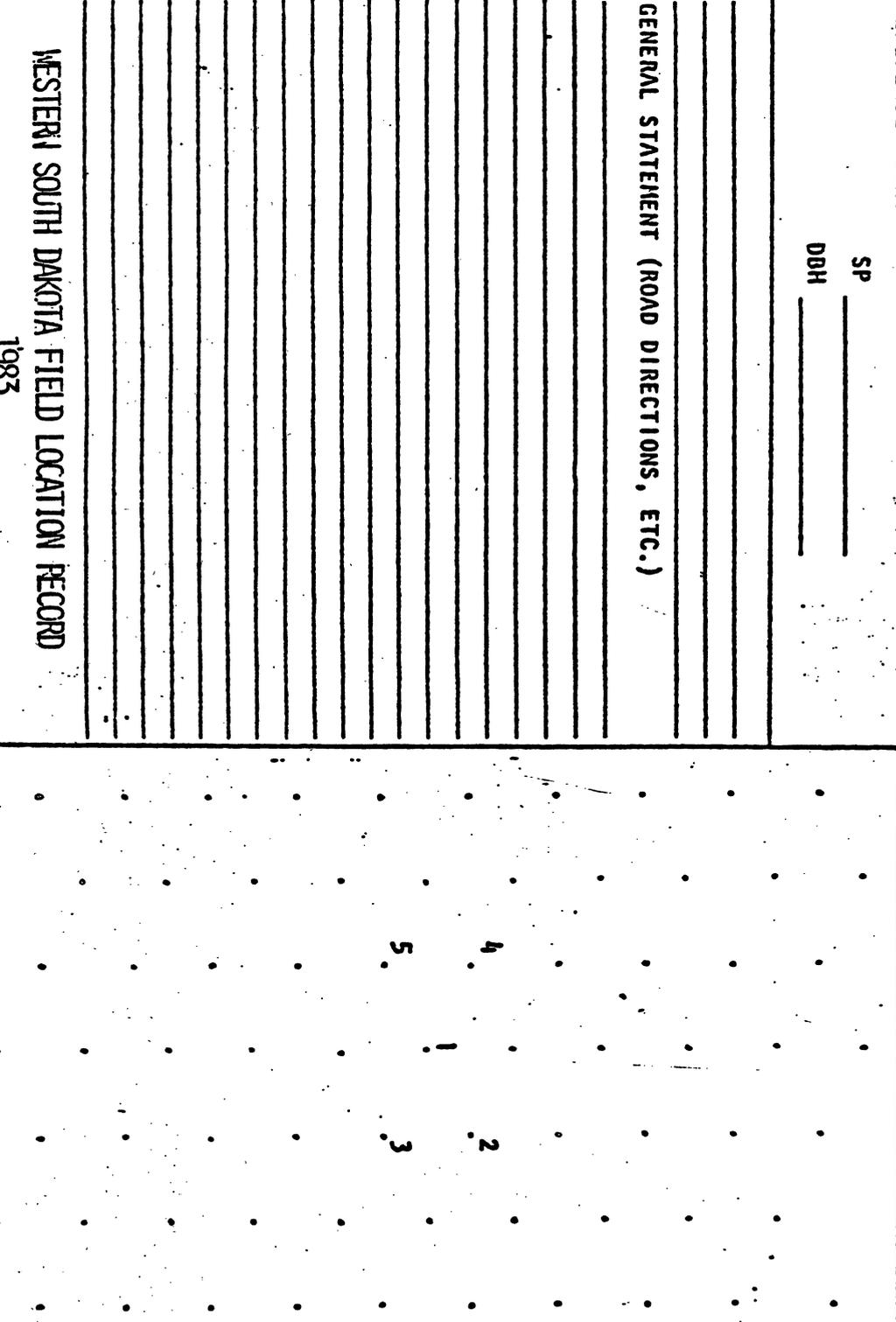
AREA CLASS		AREA DESCRIPTION										OPTIONS																																							
DATE OF SURVEY	11	CREW NUMBER	12	SAMPLING FACTOR	13	SAMPLE KIND	14	SAMPLING STRATUM	15	GROUND LAND USE	16	USE TREND	17	OWNEPSHIP	18	STAND ORIGIN	19	STAND CLASS	20	SEED SOURCE	21	FOREST TYPE	22	STAND SIZE CLASS	23	% CROWN COVER	24	ELEVATION	25	ASPECT/SLOPE/CURV CLASS	26	PHYSIOGRAPHIC CLASS	27	PRIMARY HABITAT TYPE	28	SECONDARY HABITAT TYPE	29	NUMBER OF POINTS	30	NUMBER OF RECORDS	31	PAST TREATMENT	32	NUMBER OF SAPLING PLOTS	33	SAPLING PLOT SIZE	34	35	36		
26272829	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

REFERENCE POINT

SP \_\_\_\_\_  
DBH \_\_\_\_\_

GENERAL STATEMENT (ROAD DIRECTIONS, ETC.)

SAMPLE POINT LOCATION MAP



COURSE TO SAMPLE LOCATION

AZ \_\_\_\_\_ DIST \_\_\_\_\_  
WITNESS TREES  
X SP \_\_\_\_\_ DBH \_\_\_\_\_ AZ \_\_\_\_\_ DIST \_\_\_\_\_  
Y SP \_\_\_\_\_ DBH \_\_\_\_\_ AZ \_\_\_\_\_ DIST \_\_\_\_\_

FIELD CREW ESTIMATOR \_\_\_\_\_  
RECORDER \_\_\_\_\_  
PHOTOS PROJECT \_\_\_\_\_ ROLL \_\_\_\_\_  
PHOTO-NOS. \_\_\_\_\_  
FIELD EDIT NAME \_\_\_\_\_ DATE \_\_\_\_\_  
OFFICE EDIT NAME \_\_\_\_\_ DATE \_\_\_\_\_  
DECLINATION 0° B.A.F. 40  
TOWNSHIP \_\_\_\_\_ RANGE \_\_\_\_\_ SECTION \_\_\_\_\_  
MAPS: NAME \_\_\_\_\_

WESTERN SOUTH DAKOTA FIELD LOCATION RECORD  
1985

TREE IDENTIFICATION				TREE MEASUREMENT				TREE CLASSIFICATION										ONLY OTHER SPECIES																	
TREE NUMBER	AZIMUTH	DISTANCE	TREE HISTORY	SITE TREE CODE	SPECIES	DBH/DRC	HEIGHT	RADIAL GROWTH	TREE AGE	CROWN FORM	RELATIVE CROWN POSITION	CR RATIO UNCOMP	CR RATIO COMP	BROWN CLASS	SURFACE DEFECT	INT DEFECT-CE	TOTAL VOL LOSS-CE	DAMAGE/COD	TREE/COVER CLASS	1ST 1ed INCIDENCE	2ND 1ed INCIDENCE	MISTLETOE CLASS	Percent Tree Crown Cover	MAX CROWN WIDTH	MIN CROWN WIDTH	NUMBER OF STEMS	POSTS-LINE	POSTS-CORNER	X-MAS TREE GRADE	OTHER SPECIES	EQUIV DIAMETER				
55					61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	
12	161	119	212	242	52	72	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57
13	151	161	202	242	262	202	303	323	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57

LOCATION DATA  
TO BE CODED

GROUND LAND USE CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	35	36
	State	P.I. Map Number	P.I. Point Number	Card Type	Region	Forest	Working Circle	Sample Area	County	Location Number	Date of Survey	Crew Number	Sampling Factor	Sample Kind	Sampling Stratum	Ground Land Use	Use Trend	Ownership	Stand Origin	Stand Class	Seed Source	Forest Type	Stand Size Class	Percent Crown Cover	Elevation	Aspect/Slope/Curvature	Physiographic Class	Primary Plant Association	Secondary Plant Association	Number of Points	Number of Records	Past Treatment	Number of Sapling Plots	Sapling Plot Size Code
20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
41	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
42	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
43	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
44	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
45	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
46	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
50	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
71-61	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
72-62	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
73-63	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
74-64	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
75-65	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
76-66	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
77-67	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
81	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
82	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
83	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	NS	x	x	x	x	x	x	x	x	x	x	x	x
84	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
91	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
92	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

NS - Nonstocked

For ACCESS DENIED, INACCESSIBLE, and OUTSIDE SAMPLE AREA, record the same items as for GIU 44-50.

4/19/83





**Recreation Use**

Code 0 None  
 1 Hiking  
 2 Hunting  
 3 Camping  
 4 Fishing  
 5 Trail bikes  
 6 Horse trails  
 7 Jeep trails  
 8 Boating  
 9 Other

**Trails or Roads**

Code 0 None  
 1 Paved highway  
 2 Gravel road  
 3 Dirt road  
 4 Unimproved road/powerlines, etc.  
 5 Jeep road  
 6 Improved trail  
 7 Unimproved trail  
 8 Livestock trails  
 9 Game trails

**Evidence**

Code 0 None  
 1 Locked gate  
 2 Keep out  
 3 Not trespassing  
 4 No hunting  
 5 No fishing  
 6 No dumping  
 7 Other posted signs  
 8 Owner contact  
 9 Other evidence

**Soil Texture**

Code 1 Sands  
 2 Sandy loams  
 3 Loams  
 4 Clay loams  
 5 Clays

**Structure**

Code 1 Prismatic  
 2 Columnar  
 3 Angular blocky  
 4 Subangular blocky  
 5 Platy  
 6 Granular

**Soil Slope Length**

Code 0 No obstruction, no slope, or location center in primary water.  
 1 1 - 99  
 2 100 - 199  
 3 200 - 299  
 4 300 - 399  
 5 400 - 499  
 6 500 - 599  
 7 600 - 699  
 8 700 - 799  
 9 800 +

**Micro Slope Length (Feet)**

Code 0 None  
 1 1-30  
 2 31-60  
 3 61-90  
 4 91-120  
 5 121-150  
 6 151-180  
 7 181-210  
 8 211-240  
 9 240+

**Distance**

Code 0 Adjacent (200 feet or less)  
 1 201-300 feet  
 2 301-500 feet  
 3 501-700 feet  
 4 701-900 feet  
 5 901-1100 feet  
 6 1100-1320 feet  
 7 1/4-1/2 mile (1320-2640 feet)  
 8 1/2-1 mile  
 9 1 mile or more

**Sheet erosion** - Is a term applied to the removal of more or less uniform layer of material from the soil surface.

**Rill erosion** - Is applied to the type of erosion which results in the formation of small channels in the land surface.

**Urban buildup--residential, industrial, and recreation developments.** Include areas with concentrations of houses, cabins, or vacation homes.

**Lakes and reservoirs--** Including inlets, necks and coves attached to larger bodies of open water.

**Rivers and streams--** averaging over 30 feet wide within the condition of the forest location.

**Reserved forest land--** Including parks and campgrounds not considered urban buildup.

**Agricultural lands--** Including cropland, improved pasture, idle farmland, other farmland, homesteads, and other lands used primarily to support agricultural activities.

**Unproductive timberland or woodland--** Includes any forest type or size class meeting definitions of unproductive timberland or woodland.

**Major highways--** Interstate and other U.S. highways, beltways, and heavily traveled state roads.

**Other roads--** Include other state roads, county roads, and other well maintained roads. Includes powerlines, railroads, gaslines, drainage ditches, etc.

**Rangeland--** Includes all natural rangeland, including alpine or openings, not qualifying as forest land (10 percent crown cover).

**None (no evidence)**  
 Burned within past year  
 Burned within past 1-3 years  
 Burned within past 3-10 years  
 Burned beyond 10 years

**None**  
 Within last year  
 Within past 1-3 years  
 Within past 3-10 years  
 Beyond 10 years

**None**  
 1-5 acres  
 6-10 acres  
 11-20 acres  
 21-40 acres  
 41-160 acres  
 161-640 acres (1- sq. mile)  
 1-5 square miles  
 5-20 square miles  
 21+ square miles

**None**  
 Fuel wood or groundwood-woodland  
 Christmas trees-woodland  
 Overwood removal-Timberland  
 Thinning-Timberland  
 Selective harvest-Timberland  
 Clearcut-Timberland  
 Seed Tree-Timberland  
 Other-Timberland  
 Land clearing-any forest

UNDERSTORY VEGETATION DESCRIPTION FORM

State \_\_\_ County \_\_\_ Map Number \_\_\_ Forest \_\_\_  
 Card Type 4 Location \_\_\_ Point Number \_\_\_ Working Circle \_\_\_  
 Sample Area \_\_\_ Owner \_\_\_ Region \_\_\_

	PART 1 - SPECIES LIST BY COVER CLASS AND LAYER												PART 2 - PLANT GROUP COVER CLASS BY LAYER				POINT NUMBER	
	TREES			SHRUBS			FORBS			GRAMINOIDS			Layer	TREES	SHRUBS	FORBS		GRAMINOIDS
	Species	Cover	Layer	Species	Cover	Layer	Species	Cover	Layer	Species	Cover	Layer						
	XXXXX	X	X	XXXXX	X	X	XXXXX	X	X	XXXXX	X	X						
Dominant Species													3 (6.1' +)					1
													2 (1.6-6')					
													1 (0-1.5')					
Forage preference		/	/	/	/	/	/	/	/	/	/	/	3					2
		/	/	/	/	/	/	/	/	/	/	/	2					
		/	/	/	/	/	/	/	/	/	/	/	1					
													3					3
													2					
													1					
													3					4
													2					
													1					
													3					5
													2					
													1					

4/11/83

WOODLAND TREE SEGMENTATION RECORD

Rev. 3/01

STATE/CO 12 / 345 FOREST/ AGENCY/ DISTRICT \_\_\_\_\_ WORKING CIRCLE/ RESERVATION/ PLANNING UNIT \_\_\_\_\_

REGION/ AREA/ RESOURCE AREA \_\_\_\_\_ DATE \_\_\_\_\_

LOCATION NO. 6709 OWNER 1011 CARD TYPE 12 SAMPLE AREA 1314 CREW \_\_\_\_\_

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DDH 23 24 25  
 NO. STEMS 26 27 MIN CROWN WIDTH 28 29 MAX CROWN WIDTH 30 31  
 TOTAL HIT 32 33 NO SEGMENTS 34 35 ESTIMATOR 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2-- INCH SEGMENT MIDPOINT DIAMETER CLASS				
	2	4	6	10	12 14 16
SUMMARY	2	4	6	0	0
COUNT	2	4	6	0	0

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DDH 23 24 25  
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RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS			
	2	4	6	8
SUMMARY				
COUNT				

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DBH 23 24 25  
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COUNT				

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SUMMARY				
COUNT				

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 TOTAL HIT 32 33 NO SEGMENTS 34 35 ESTIMATOR 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS			
	2	4	6	8
SUMMARY				
COUNT				



# TREE 1

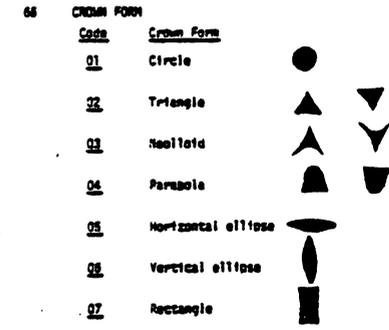
Crown Form 66

**Code** **Tree History**  
 00 Non-tallied site trees  
 01 Live tallied trees  
 02 Salvable dead trees:  
 a. <5.0 inches DBH (3.0+ inches DRC for other species)  
 b. Standing or down  
 c. Cubic-foot volume is <50 percent rotten or missing  
 03 Mortality trees:  
 a. <5.0 inches DBH (3.0+ inches DRC for other species)  
 b. Standing or down  
 c. Less than 5 years dead  
 d. Not a rough or rotten (cull) tree at time of death  
 (i.e., <67 percent cubic-foot defect at time of death)  
 04 Non-salvable dead trees:  
 a. <5.0 inches DBH  
 b. Standing or down  
 c. Cubic-foot volume is >50 percent rotten or missing  
 d. Firm enough to hold together if handled  
 05 Woodland seedling count  
 a. <1.0 inch DRC  
 06 This code indicates (a) last entry for that point and (b) that a sapling fixed plot was measured. Cover class and plant association will also be recorded.  
 07 This code indicates (a) last entry for that point and (b) that a sapling fixed plot was not measured. Cover class and plant association will also be recorded.

**Crown Form:** For all live tallied trees 1.0 DBH or DRC and larger, crown form will consist of a 2-digit code, where the first digit will be foliage density value. These codes are:

**CODE**  
 1 ---- Sparse foliage density.--Few branches on tree and numerous gaps in branches allowing light to penetrate through the crown. Areas allowing light to penetrate are large and more numerous than areas with foliage.  
 2 ---- Medium foliage density.--In this situation, light penetrates through the crown but the areas of no foliar cover are small and less numerous than those with foliar cover.  
 3 ---- Dense foliage density.--Foliage density is almost solid allowing very little in the way of penetrating light.

**Stand Class** **Relative Crown Canopy Position** **Code**  
 Even-aged (1) or a. Tree within main canopy 21  
 Even-aged clump (2) b. Tree is a relict (veteran), seedling, sapling, or other tree in the main canopy 22  
 Two-storied (3) a. Tree within upper story 31  
 b. Tree within lower story 32  
 c. Tree is a relict, seedling, sapling, or other tree in a story above (i.e., not a component of upper or lower story) 33  
 Uneven-aged (4) a. Tree within an uneven-aged stand 41



**66, 69 CROWN RATIO**

Code	Live Crown (Percent of total tree height)
1	1 - 10
2	11 - 20
3	21 - 30
4	31 - 40
5	41 - 50
6	51 - 60
7	61 - 70
8	71 - 80
9	81 - 100

Using the following 1-digit code, record crown class for all live trees 1.0 inch DBH or DRC and larger.

**Code**  
 1 Open group  
 2 Dominant  
 3 Intermediate  
 4 Overtopped

**60 SITE TREE**  
**Code** **Site Tree**  
 1 Tallied on a variable or fixed plot, suitable  
 2 Not tallied on a variable or fixed plot, suitable  
 3 Tallied on a variable or fixed plot, unsuitable  
 4 Not tallied on a variable or fixed plot, unsuitable

**0001** Record species for all live and dead trees tallied using the following 3-digit codes:

Code	Common Name	Scientific Name
013	White fir	Abies concolor
017	Grande fir	Abies grandis
018	Corkbark fir	Abies lasiocarpa var. arizonica
019	Suwalpine fir	Abies lasiocarpa
020	California red fir	Abies magnifica
023	Pacific yew	Taxus brevifolia
031	Arizona cypress	Cupressus arizonica
032	Common juniper	Juniperus communis
033	California juniper	Juniperus californica
034	Alligator juniper	Juniperus occidentalis
035	Western juniper	Juniperus occidentalis
036	Utah juniper	Juniperus osteosperma
037	Rocky Mountain juniper	Juniperus scopulorum
038	One-seed juniper	Juniperus monosperma
039	Suwalpine larch	Larix laricina
040	Western larch	Larix laricina
041	Inconce cedar	Larix laricina
042	Engelmann spruce	Picea engelmannii
043	White spruce	Picea glauca
044	Blue spruce	Picea canadensis
045	Whitebark pine	Pinus albicarpa
046	Bristlecone pine	Pinus attenuata
047	Parish pine	Pinus attenuata
048	Common piñon	Pinus edulis
049	Longleaf pine	Pinus longaeva
050	Apache pine	Pinus monophylla
051	Limb pine	Pinus rigida
052	Southwestern white pine	Pinus sabiniana
053	Jeffrey pine	Pinus jeffreyi
054	Super pine	Pinus lambertiana
055	Chimney pine	Pinus lambertiana
056	Western white pine	Pinus monticola
057	Ponderosa pine	Pinus ponderosa
058	Singleleaf piñon	Pinus monophylla
059	Northern piñon	Pinus edulis
060	Arizona pine	Pinus ponderosa var. arizonica
061	Blackjack pine	Pinus ponderosa
062	Yellow pine	Pinus ponderosa
063	Douglas-fir	Pseudotsuga mucronata
064	Western redcedar	Thuja plicata
065	Western hemlock	Tsuga heterophylla
066	Mountain hemlock	Tsuga mertensiana

Softwood bole sections to be observed for estimating surface defect are dependent upon DBH as follows:

DBH (inches)	Section Observed (above a 1-foot stump)
5.0 - 8.9	the first 8.0 feet
9.0 -	the first 16.0 feet

Using 2-digit codes, record softwood surface defect. The first digit describes size of the largest ring limit and the second digit codes size of the largest snag limit or knot.

Code	Diameter of Largest Ring or Knot (inches)
1	1.0 - 1.9
2	2.0 - 2.9
3	3.0 - 3.9
4	4.0 - 4.9
5	5.0 - 5.9
6	6.0 - 6.9
7	7.0 - 7.9
8	8.0 -

**NOTE:** If there are no live limits, dead limits, or knots in the bole section observed, record 11 (Code 1 also indicates no limits or knots).

**72-75 INTERNAL AND TOTAL VOLUME LOSS**

Code	Volume Loss (%)
1	1 - 10
2	11 - 20
3	21 - 30
4	31 - 40
5	41 - 50
6	51 - 60
7	61 - 67
8	68+
9	None

**76 CAUSE OF DEATH**

Code	Cause of Death
10	Insects
20	Disease
30	Fire
40	Animal
50	Weather
60	Suppression
70	Unknown and other mortality
80	Logging and related activity

**Condition of Dead 76.**

**Condition of Dead:** For all salvable and non-salvable timber species, record whether the tree is standing or down. For other species, only code for salvable dead.

Code	Condition of Dead
01	Standing
02	Down

Hardwood bole sections to be observed for estimating surface defect are dependent upon DBH as follows:

DBH (inches)	Section Observed (above a 1-foot stump)
5.0 - 6.9	the first 8.0 feet
7.0 - 10.9	the first 12.0 feet
11.0+	the first 16.0 feet

Using the following 2-digit codes, record the summed clear panel lengths to the last whole foot:

Code	Summed Clear Panel Length (feet)
10	No clear panel of at least 2 feet
20	2 - 3
30	4 - 5
40	6 - 7
50	8 - 9
60	10 - 11
70	12 - 13
80	14 - 15
90	16

**NOTE:** Use the above procedure for estimating surface defect on western white pine and ponderosa pine as well as commercial hardwoods.

**76 DAMAGE CODES**

Code	Damage
01	No serious damage
10	Unidentified insect
11	Bark beetles
12	Defoliators
20	Unidentified disease
21	Rusts
22	Rots
23	Slight
24	Mistletoe (complete item 20)
30	Fire
40	Unidentified animal
41	Domestic animal
42	Porcupine girdling
43	Wildlife browse (other than porcupine)
44	Other wildlife damage (trampling, etc.)
50	Unidentified weather
51	Wind
52	Lightning
53	Snow
54	Air pollution
55	Chemical
56	Flooding
57	Drought
60	Suppression
70	Unidentifiable/unknown
71	Leaning 15° from vertical
72	Formed/multiple stem below merchantable top, seedlings/saplings with multiple stems
73	Broken top
74	Dead top
75	Half tree
76	Unhealthy foliage
77	Excessive taper
78	Formed/multiple stem above merchantable top
79	Heartwood scar on bole
80	Logging or human damage

Code	Common Name	Scientific Name
100	Acacia	Acacia sp.
101	Rocky Mountain maple	Acer glabrum
102	Bigtooth maple	Acer grandidentatum
103	Banister	Acer negundo
104	Alder (white and thimbleleaf)	Alnus sinuata, tenuifolia, etc.
105	Red and Arizona alder	Alnus rubra, oblongifolia only
106	White alder	Alnus rhombifolia
107	Nedrone	Arbutus sp.
108	Birch (water and bog)	Betula sp.
109	Paper birch	Betula papyrifera
110	Hackberry	Celtis sp.
111	Redbud	Cornus sp.
112	Curleaf mountain mahogany	Cercocarpus ledifolius
113	Algerleaf mountain mahogany	Cercocarpus montanus
114	Hairy mountain mahogany	Cercocarpus breviflorus
115	Strawberry mountain mahogany	Cercocarpus betuloides
116	Littleleaf mountain mahogany	Cercocarpus intricatus
117	Doanwood	Cornus sp.
118	Pacific and red-osier dogwood	Cornus nuttallii, stolonifera
119	Hawthorn (black and Columbia River)	Crataegus sp.
120	Ash (Rocky Mountain)	Fraxinus sp.
121	Salix	Juglans sp.
122	Ruberry	Rhus sp.
123	Sycamore	Platanus sp.
124	Cottonwood and poplar	Populus sp.
125	Blasam poplar	Populus balsamifera
126	Plains cottonwood	Populus deltoides
127	Quaking aspen	Populus tremuloides
128	Black cottonwood	Populus trichocarpa
129	Fremont poplar	Populus fremontii
130	Narrowleaf cottonwood	Populus angustifolia
131	Mesquite	Prosopis sp.
132	Cherry-Peach-Plum	Prunus sp.
133	Sitter cherry	Prunus sp.
134	Common chokecherry	Quercus sp.
135	Oak-occidentalis	Quercus arizonica
136	Arizona white oak	Quercus agrifolia
137	Emery oak	Quercus emoryi
138	Gambel oak	Quercus gambelii
139	Chinkapin oak	Quercus muhlenbergii
140	Mexican blue oak	Quercus oblongifolia
141	Oak-serranum	Quercus sp.
142	New Mexico locust	Robinia neomexicana
143	Willow	Salix sp.
144	Tamarisk	Tamarix sp.
145	Miscellaneous hardwoods	--

Table J-1. Percentage of cubic-foot volume (1-foot stump to 4-inch top DBH) by 4-foot sections

Logs per tree	4-foot sections																													
	Log No. 1				Log No. 2				Log No. 3				Log No. 4				Log No. 5				Log No. 6				Log No. 7					
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30



APPENDIX 2

BASELINE DETERMINATION

Appendix 2.1 Map/photo technique for establishing baseline and determining scale.

1. Pick two points on the appropriate USGS quad map that are easily identifiable on the aerial photo. Vegetation lines on the quad are not accurate, so pick points such as road and stream intersections. Mountain tops may be used but it is extremely important that the top is identifiable by stereoscopic viewing. Points should be picked within the photo effective area and should lie in a general east-west direction.
2. After locating points, pinprick them on the quad map and on the photo. Points should always be located stereoscopically on the photo.
3. The eastern most point on the quad is point "A" and the western most point is point "B".
4. Determine the elevations of points A, B, and for the plot. Elevations must be recorded as accurately as possible so interpolation will have to be done between topographic lines. Record the elevations on the PLOT/PHOTO SCALE WORKSHEET (Figure 1) for the two points on the plot.
5. Label the points on the map and on the photo.
6. Connect the points on the map by drawing a straight line between them. To connect points on the photo, use the following procedures:

Work on the back of the photo.  
Turn photo protractor face (upside) down.

7. Measure distance between points A and B on the quad map. Make all measurements using the same units, and for accuracy take two separate measurements and average them. Record this value under the Baseline Map Distance on the PLOT/PHOTO SCALE WORKSHEET. The finer the divisions on the ruler being used, the better the results will be.
8. Measure distance between points A and B on the photo. Take two measurements and average and enter under Baseline Photo Distance.
9. Determine azimuth to nearest degree from point A to B. Use following procedures:
  - A. Draw a true north-south or east-west line on the quad map by using UTM "tick" marks. Make sure that this line intersects the A-B line.

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Appendix 2.1 (continued)

B. Place photo protractor on the true north-south or east-west line. If it is a north-south line, the protractor should be placed so that the line runs through 0 and 180 degrees, 90 and 270 degrees for an east-west line.

C. Slide protractor along line until the cross mark in the center is over the intersection of the A-B line and the true north-south or east-west line.

D. Read and record the azimuth of the line going from A to B, not B to A. This is recorded under the A to B Baseline Truth Azimuth.

10. Enter Plot Number, Map Number, and Map Declination in appropriate columns. Map declination is found at base of quad map.

11. Attach a Photo Measurement Information/Reference Point Documentation sheet to the back of the photo. Do not cover points on back of photo.

12. Circle and identify points A and B on the back of the photo, draw a line from A to B and place an arrow at the end of the line showing proper direction.

13. To determine Baseline Photo Scale Reciprocal (PSR):

$$\text{Baseline PSR} = \frac{(\text{Baseline Map Distance} \times \text{Map Scale Reciprocal})}{\text{Baseline Photo Distance}}$$

If Map Scale is 1:24,000 then Map Scale Reciprocal is 24,000.

14. Elevation average: (Elevation Point A + Elevation Point B)/2

15. Plot Photo Scale Reciprocal computation. The scale of a photo does not remain the same over the entire photo. Baseline photo scale is an average for points A and B. As elevation increases from this average, scale becomes larger, as elevation decreases scale gets smaller.

$$\text{Plot Photo Scale Reciprocal} = \frac{H - P_e}{f}$$

where: H = flying height above sea level

$P_e$  = plot elevation

f = camera focal length

NOTE: Units should be the same for all values.

$$H = (B_{\text{PSR}} \times f) + AB_e$$

where:  $B_{\text{PSR}}$  = Baseline Photo Scale Reciprocal (step 13)

f = camera focal length

$AB_e$  = average elevation of points A and B

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## Appendix 2.2 Ground/Photo Technique for Establishing a Baseline

This method is an alternative method for establishing a baseline. It can only be used in the field.

A. Select two features easily identifiable on both the ground and on the aerial photo with the plot location. Trees, road intersections, or other landmarks within sight of each other are commonly used. The points should be at least 600 feet apart and at the same relative elevation. Do not use railroad lines or powerline poles as they will influence compass readings.

B. Pinprick these two landmarks on the photo.

C. On the back of the photo, draw a thin straight line through the center of the two pinpricks.

D. With a compass, measure the azimuth between the two landmarks. Record it on the back of the photo. This value should be measured to the nearest degree.

E. Place an arrow on the line on the back of the photo indicating which direction the azimuth was taken.

F. Baseline Photo Scale Reciprocal is determined using the formula:

$$\text{Baseline PSR} = \text{Ground Distance}/\text{Photo Distance}$$

Note: Use same units for both ground and photo distances.  
It is usually easier to convert ground distance to inches.

Example: Ground Distance = 782 feet = 9384 inches  
Photo Distance = 1.5 inches  
Baseline PSR =  $9384/1.5 = 6256$

G. Begin with step 14  to determine Plot PSR.

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APPENDIX 3  
TREE MEASUREMENTS



### APPENDIX 3.1 VARIABLE-RADIUS PLOT CRUISING

While there are a number of different methods to determine whether a tree will be counted "in" or not, only two of the most commonly used methods will be described here. Both rely on the projection of a fixed angle (Figure 3-1).

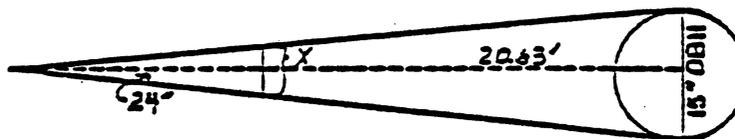
#### I. Angle Gauge

The angle gauge is a very inexpensive piece of equipment to buy. It can also be made with a minimum of effort. The following procedures should be followed in using an angle gauge:

- a. Stand with your eye directly over the point center.
- b. Hold the end of the chain between your teeth or against your cheek below eye level.
- c. Pull the gauge so the chain is taut.
- d. Rotate clockwise starting at 0° azimuth.
- e. Using the appropriate BAF (Figure 3-2), any tree at DBH which appears larger than the opening will be tallied. Those trees which just fill the opening are "borderline" and should be measured using the limiting distance table. See Figure 3-3 for trees being determined for tally with a 40 BAF angle gauge.

To construct your own angle gauge, use the following procedures:

- a. Obtain the plot radius factor for the BAF you wish to use.
- b. Pick any tree diameter and determine the maximum distance that you can be from that tree and still tally it.
- c. Using your compass, clinometer, or any piece of equipment with a straight edge, connect a piece of string to it. Cut the string to any desired length (22-28 inches is a good length) and measure the exact length. This piece of string will be used in the exact same fashion as the chain on the manufactured angle gauge.
- d. Using similar triangles, determine the width that would be needed on an angle gauge to call the tree borderline.
- e. EXAMPLE - - If using a 40 BAF, the plot radius factor is 1.375. Connect a 24-inch piece of string to a clinometer. If a 15 inch DBH tree is being measured, the cruiser could be  $15.0 \times 1.375 = 20.63$  feet away and still tally the tree.



Using equilateral triangles:  $\frac{15.0''}{20.63'} = \frac{x}{24''}$

where X is the distance in inches which will be measured on a straight side of the clinometer.

Solving for X,  $X = 1.45$  inches.

Lay a ruler on the straight side of the clinometer. Put a piece of tape at 0.0 inches and one at 1.45 inches. Hold the string end in your mouth or just below eye level. Hold the clinometer out so that the string is taut. Start at  $0^{\circ}$  azimuth and move clockwise always with your eye over the point. Every tree which appears larger at DEE than the corresponding distance on the clinometer is a tally tree. Those trees which appear to be about the same size at DEE as the distance on the clinometer should have their limiting distance checked.

## II. Wedge Prism

The wedge prism is similar to an angle gauge except that the prism, not the human eye, is used to project the angle. The following procedures will be followed when using a wedge prism.

- a. Hold the prism directly over point center.
- b. Begin at  $0^{\circ}$  azimuth and rotate in a clockwise direction.
- c. Observe trees both through and over the wedge prism. If the edge of the direct and transmitted images overlap, the tree is "in" and is tallied (Figure 3-3).

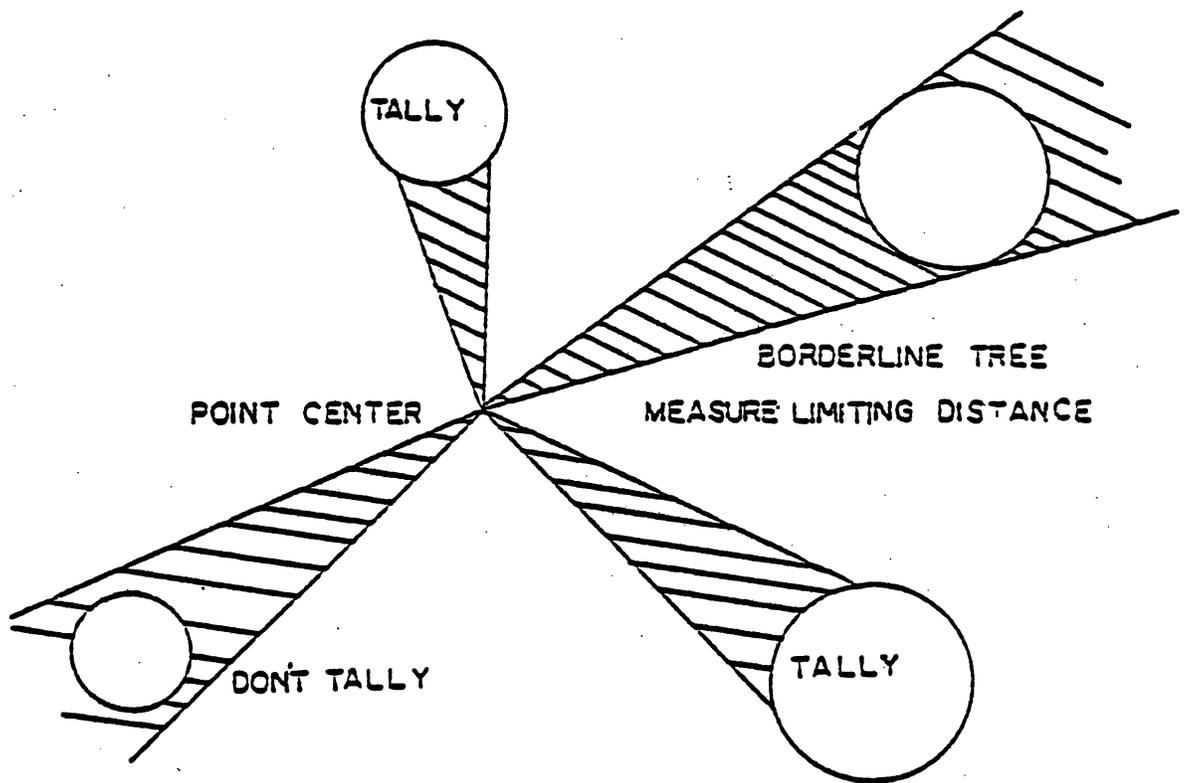


Figure 3-1. Projection of a fixed angle, either with a wedge prism or the human eye, to determine tally trees.

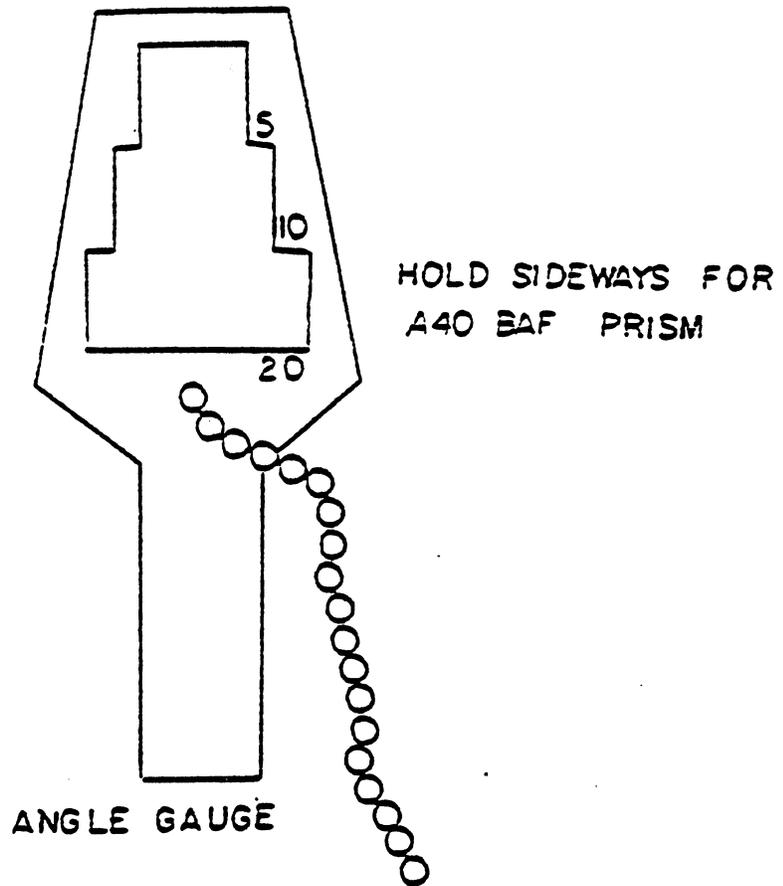
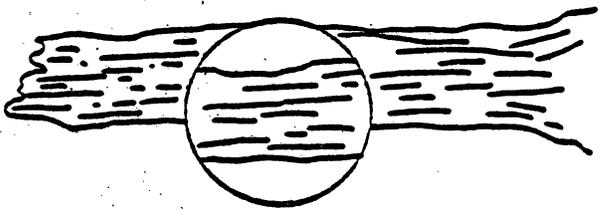
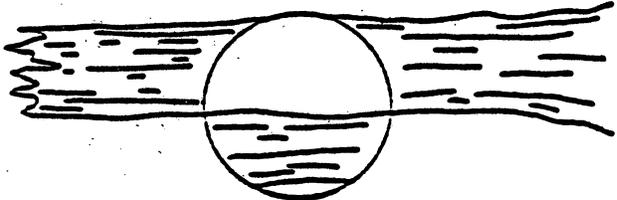
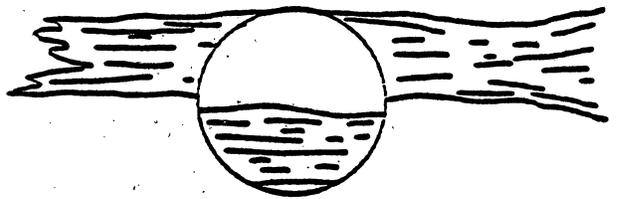


Figure 3-2. An angle gauge with basal area factors of 5, 10, 20, and 40.



OUT

BORDERLINE

IN

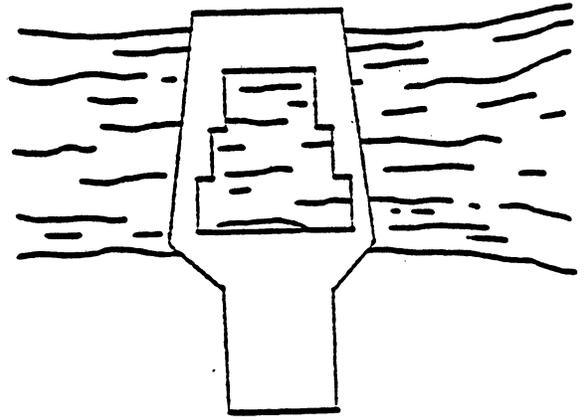
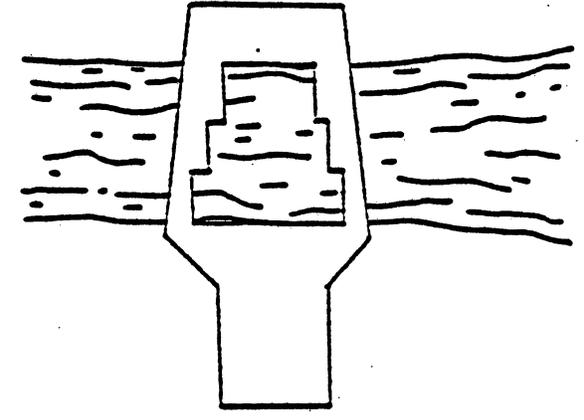
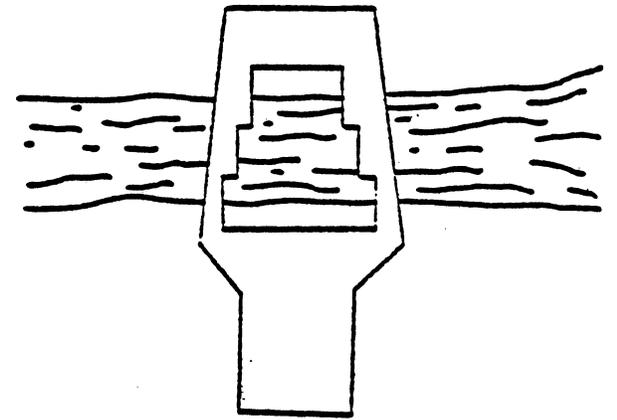


Figure 3-3. Using a wedge prism (top) and an angle gauge (bottom) to determine which trees to tally.

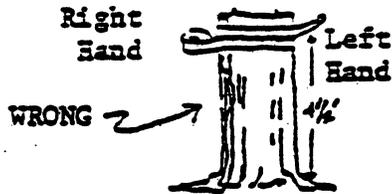




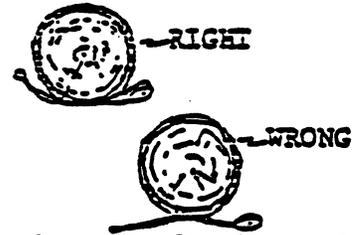
Left Handed-right hand crossed under



Left Handed- right hand crossed over

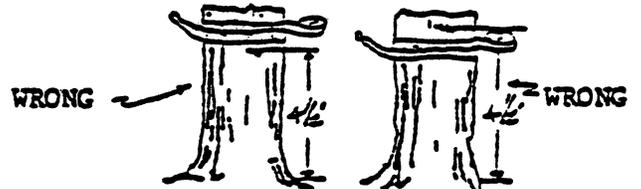
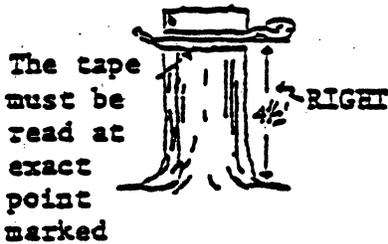


Right Handed-left hand crossed over



Press the tape firmly against the tree. Do not pull it out at a tangent to the tree at the point of measurement.

Be sure to measure at the mark.



Always assume that the 4 1/2 foot DBH point is at the top of the lower tape at this point



The tape must be at right angles to lean of tree



Don't place tape at abnormal place on the bole





## Appendix 3.2 Tree Height Measurements.

The following procedures will be followed to produce accurate tree height data:

A. Always take tree height measurements from a horizontal distance 1-1/2 times the height of the tree being measured unless the stand is dense and it is not possible to see the top and base of the tree from the desired distance.

B. It is recommended that the distance at which tree is measured is a multiple of 50 (50, 100, 150, etc.). This allows easier calculations for tree height. If it is not possible to use multiples of 50, try for multiples of 10.

C. Whenever possible, take tree height measurements standing on a plane approximately even with the base of the tree or on a plane above the base of the tree. The most important factor, however, is to be able to clearly see the base and top of the tree.

D. If the tree is leaning, stand perpendicular to the plane of the tree's lean and then measure tree height where the top of the tree would be if it were standing straight.

E. The estimator will shout the upper and lower readings to the recorder who will shout them back to make sure that he heard them correctly.

F. The recorder and estimator will do the calculation necessary to determine total tree height. They will check their calculations by comparing with each other. If a calculator is used, the recorder should do the calculation twice as a check for accuracy.

G. The formula for tree height with a clinometer is:

$$[UR + (LR)(-1)] \times \frac{D}{100} = \text{Tree Height}$$

where: UR = upper reading  
LR = lower reading  
D = horizontal distance from tree in feet

See Figure 3.4 for examples of tree height measurements.

H. If a tree is missing its top or has several leaders as a result of losing a top, then an estimate must be made of the height that the tree would be if this loss of height growth had not occurred. This is the estimate that will be recorded.

Appendix 3.2 (continued)

Generally, if the length lost is considerable, then the easiest way to estimate the loss is to obtain the height of an undamaged tree whose DBH, age, and history appear similar and assign that height to the tree with a missing top. If the tree appears to have lost very little height growth, then measure the tree's present height and add the amount of growth you estimate has been lost to the measured height.

If a tree top is still intact on the ground, the most accurate way to get its true height is to measure the length on the ground and add it to the height of the standing stub.

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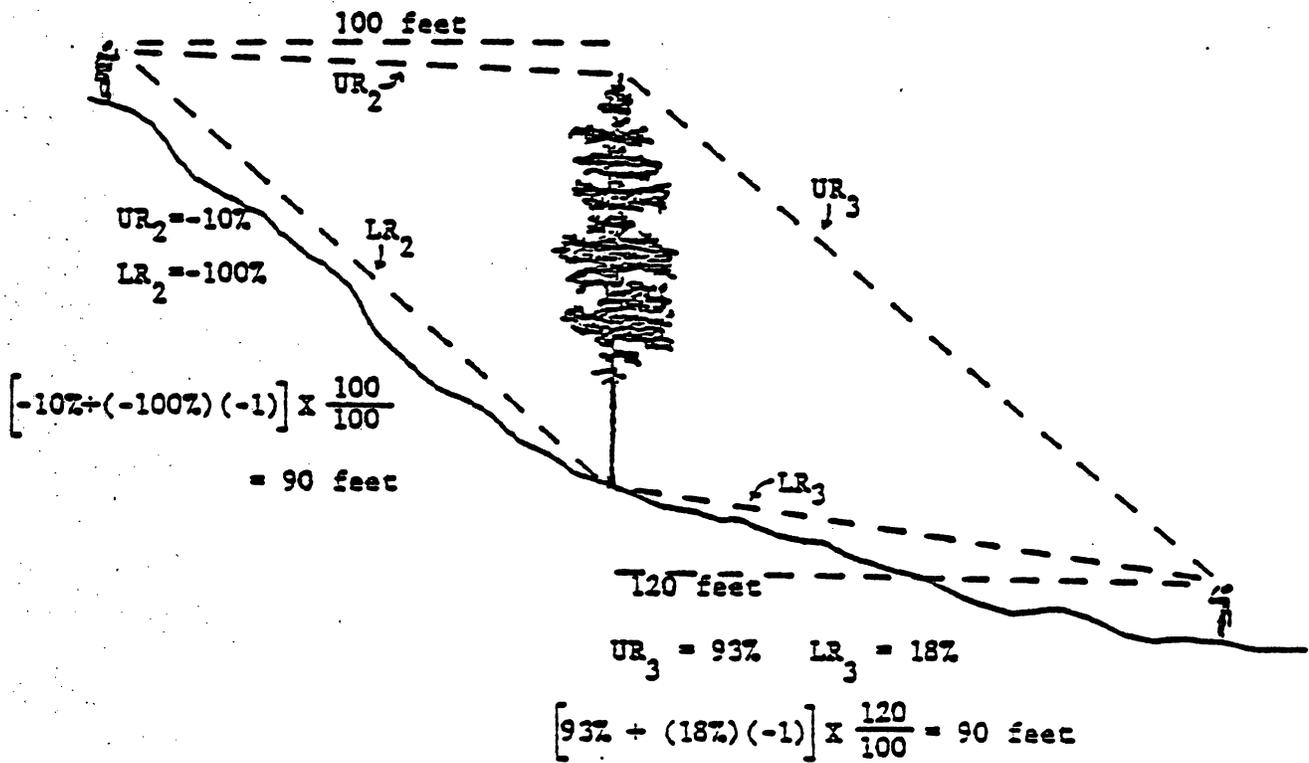
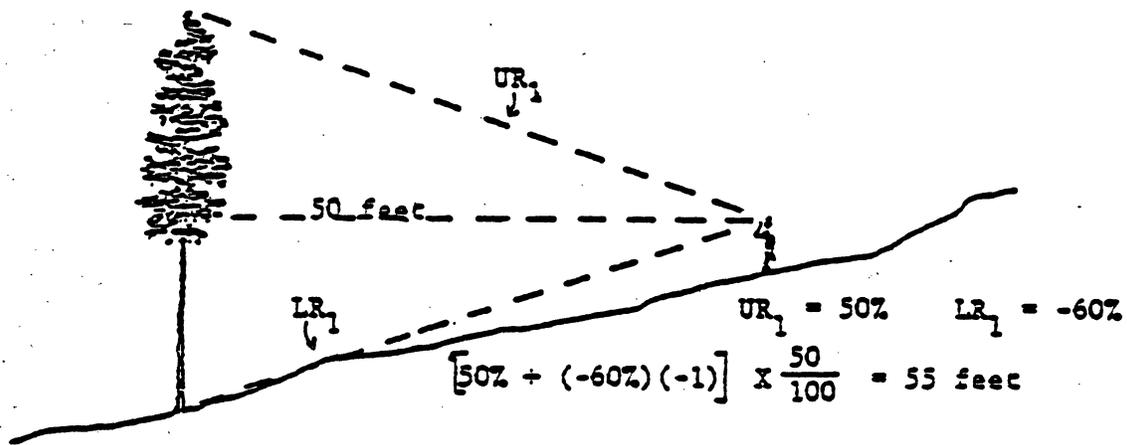


Figure 3.4 Examples of height measurement using a clinometer.



### Appendix 3.3 Boring for Radial Growth and Age.

Despite their appearance, increment borers are DELICATE AND EXPENSIVE equipment items. Extreme care should be exercised in their use.

Borers consist of three parts: (1) a handle, (2) a bit, (3) an extractor. The tip of the bit is made of fine, thin steel and is easily damaged. The bit narrows at the tip so that the core is smaller than the tube and can be extracted easily. If the cutting edge on the bit is nicked, it is not possible to get a satisfactory resharpening job because of this small tapering. Trying to resharpen a bit with a nick creates a larger core of wood which will jam in the tube. For this reason, these rules must be observed.

1. If a core becomes jammed, DO NOT use a nail or other hard object to attempt to push it out. Trying to push the core out from the end opposite the auger only causes further jamming in the narrowed auger tip. The best means for removing a severely jammed core is to place it in a low heat oven (200 degrees) for a couple of hours. This cuts the moisture content of the wood, causing it to shrink without ruining the temper of the steel.

2. Be careful not to go completely through small trees. You may not be able to get the bit back out.

3. Do not dull the bit by boring hard, dead wood.

4. Do not bore juniper or mountain mahogany trees.



APPENDIX 4

WOODLAND TREE SEGMENTATION  
PROCEDURE



## WOODLAND TREE SEGMENTATION PROCEDURE

To obtain data for the construction of volume estimation equations for other tree species (not timber species) characteristic of woodland forest types in the Rocky Mountain States, a visual tree segmentation procedure has been developed. Species included are all hardwoods other than aspen and cottonwood, and only pinyon and juniper softwoods. The procedure is applied to trees with at least one live stem having a minimum 3-inch DRC (diameter root collar), and is used to visually estimate lengths and diameter of all live or dead stem or branch segments having a minimum midpoint diameter of 2.0 inches, to a minimum diameter of 1 1/2-inches, and minimum lengths of 1 foot.

Generally, tree species must be of tree form to be included, i.e., capable of yielding, now or prospectively, at least one stem 3.0 inches or larger DRC, and an aggregate of 8 feet of live or dead segment length from segments meeting minimum size requirements.

Trees not meeting these specifications are considered brush form and not capable of producing usable wood material. Tree species in brush form are not considered tree stocking in defining forest land. Usually a particular site can be called forest or nonforest land based upon general tree form, rather than evaluating each individual tree.

Use the segment record sheet to tally the number of segments, independently for each tree by 2-foot length class and 2-inch midpoint diameter class. A segment is any live or dead portion (stems or branches), of a tree with at least one main stem 3.0 inches or larger DRC, that is at least 1 foot long, but not exceeding 9 feet, and at least 2-inch diameter at the midpoint, with a minimum diameter of 1.5 inches at the small end. The shorter segments usually occur immediately before a fork or at the upper end of a stem where the diameter decreases to 1.5 inch. Occasionally segments in stems less than 3.0 inches DRC may meet minimum segment size requirements and may be tallied if the tree has at least one stem 3.0 inches or larger DRC.

Segments should be tallied in as long a length as possible to 9 feet while maintaining uniform taper and a straight length. Segments should be broken into smaller pieces when crooks, forks, excessive taper or diameter reduction occur. The segment tally should represent the potential utilization of the tree by diameter classes and straight lengths of material.

However, segment dimensions must be carried into forks to insure that all the tree volume is included. Occasionally, segments must be "adjusted" to fit the length categories by visually moving a small section from one segment to an adjacent section. In other words, estimate the sectioned content of the tree in a way to most accurately describe the actual cubic foot content, without destroying the basic utility of the segment tally by size class. Keep in mind that each length class includes 1-foot on either side of the midpoint diameter, and diameter classes include 1-inch on either side of the midpoint diameter, with the exception of the 1.5-inch minimum diameter for the 2-inch class.

A systematic method of evaluating each tree is used to avoid (1) tallying a segment more than once, and (2) not tallying a segment that should be tallied. Begin at the ground and determine the first segment. On multiple stemmed trees at the DRC measurement point, always begin with the largest diameter main stem. After the first segment has been tallied, look for any limbs that branch from the first segment which have one or more segments in them. If such limbs exist, then begin with the lowest one on the segment and tally the segments of the limb.

Proceed up the first segment until all limbs have been tallied. If a fork does not occur at the top of the first segment, then proceed up the main stem to the top of the next segment and tally it. If a fork does occur at the top of the first segment, then proceed tallying segments up the smaller stem of the fork. Whenever a fork is encountered, always proceed up the smaller stem first, then up the next larger stem from the fork.

When any stem has been completely evaluated, always drop back to the last fork encountered and evaluate the next larger stem. In this manner the entire main stem will be evaluated with little chance of tallying a segment more than once or of missing a segment to be tallied. If the tree has more than one stem at DRC, return to the next smaller stem and again proceed up the stem.

See the following diagrams which illustrate the order of tallying segments in three differently formed trees. The numbers indicate the order of tallying. A reference pole leaned against the tree will help to evaluate the length and diameter of segments.

Tally segments on the tree segmentation form by using the dot count method. When the tree has been completed, summarize the dot counts in the space provided. All heading and tree information is recorded the same as for regular tally trees. Also record the total number of segments tallied, and use code 99 when 100 or more are tallied. In this case write the actual number of segments tallied in a blank space following column 37, and circle the number.

Multiple stems at DRC are recorded in the space provided, so the EDRC can be computed conveniently, either in the field or later. Segmented trees should always have stem diameters (DRC) recorded to the last tenth inch.

2-Foot Length Classes<sup>1/</sup>

<u>Class</u>	<u>Lengths</u>
2	1-3
4	3-5
6	5-7
8	7-9

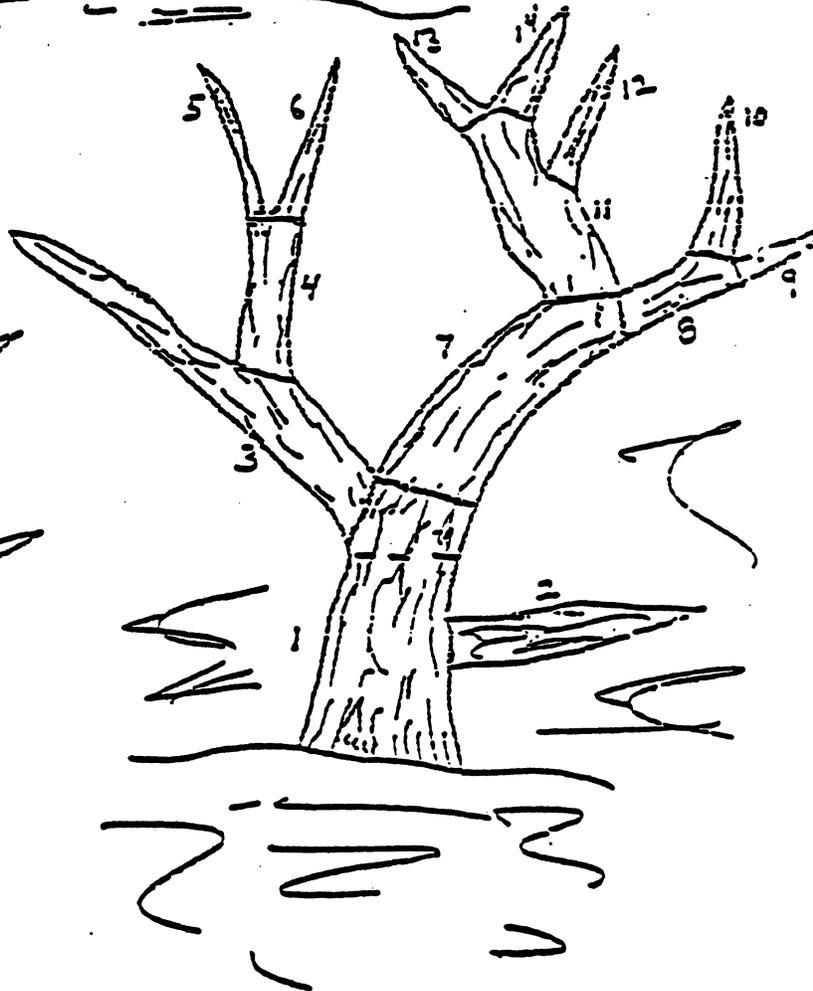
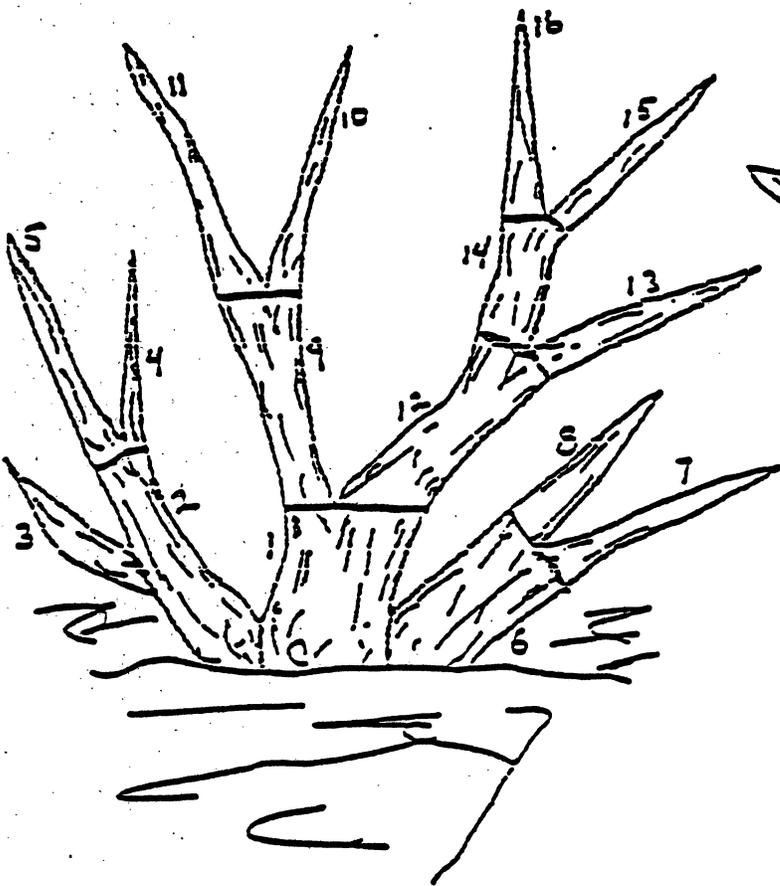
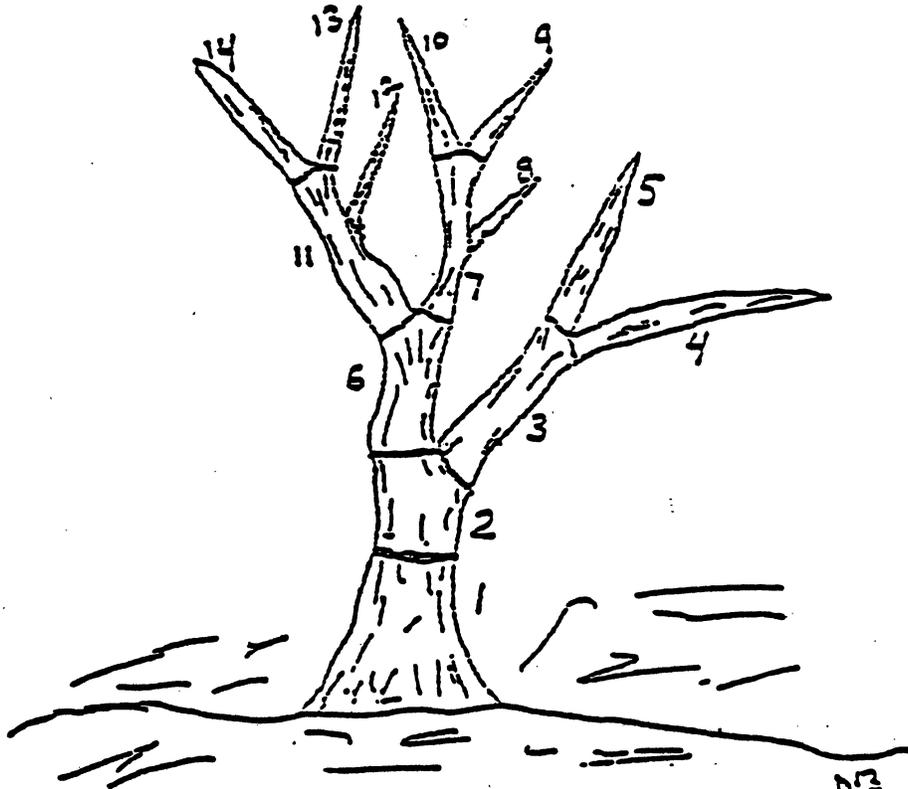
2-Inch Diameter Classes<sup>1/</sup>

<u>Class</u>	<u>Diameters</u>
2	1.5-3
4	3-5
6	5-7
8	7-9
10	9-11
12	11-13
14	13-15
16	15-17
etc.	

<sup>1/</sup>Although exact classes would be more specific, i.e. 2' = 1.0-2.9', nominal classes are shown for ease in field reference, since the measurements are visually estimated.



Order of Segment Tally





WOODLAND TREE SEGMENTATION RECORD

FOREST/ AGENCY/ DISTRICT 04 WORKING CIRCLE/ RESERVATION/ PLANNING UNIT 05 REGION/ AREA/ RESOURCE AREA 07 DATE 6-15-88

OCCASION NO. 0124 OWNER 11 CARD TYPE 5 SAMPLE AREA 08 CREW D. Schmidt, S. Langdon

TREE NO. 0 SPECIES 133 DRC 125 DBH 23 24 25  
15 16 17 18 19 20 21 22

NO. STEMS 0 MIN CROWN WIDTH 1 MAX CROWN WIDTH 1 2  
26 27 28 29 30 31

TOTAL HIT 1 NO SEGMENTS 14 ESTIMATOR 02  
32 33 34 35 36 37

TREE NO. 0 SPECIES 133 DRC 125 DBH 23 24 25  
15 16 17 18 19 20 21 22

NO. STEMS 0 MIN CROWN WIDTH 1 MAX CROWN WIDTH 1 2  
26 27 28 29 30 31

TOTAL HIT 1 NO SEGMENTS 14 ESTIMATOR 02  
32 33 34 35 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS						
	2	4	6	8	10	12	14
SUMMARY	2	21	1	1	1	1	24
COUNT	2	4	6	0	21	4	6
	2	4	6	0	21	4	6
	2	4	6	0	21	4	6

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS						
	2	4	6	8	10	12	14
SUMMARY	2	3	1	1	1	1	16
COUNT	2	4	6	0	21	4	6
	2	4	6	0	21	4	6
	2	4	6	0	21	4	6

TREE NO. 0 SPECIES 720 DRC 120 DBH 23 24 25  
15 16 17 18 19 20 21 22

NO. STEMS 0 MIN CROWN WIDTH 2 MAX CROWN WIDTH 2 2  
26 27 28 29 30 31

TOTAL HIT 3 NO SEGMENTS 55 ESTIMATOR 01  
32 33 34 35 36 37

TREE NO. 0 SPECIES 65 DRC 168 DBH 23 24 25  
15 16 17 18 19 20 21 22

NO. STEMS 0 MIN CROWN WIDTH 1 MAX CROWN WIDTH 1 2  
26 27 28 29 30 31

TOTAL HIT 2 NO SEGMENTS 42 ESTIMATOR 01  
32 33 34 35 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS						
	2	4	6	8	10	12	14
SUMMARY	2	21	4	1	1	1	18
COUNT	2	4	6	0	21	4	6
	2	4	6	0	21	4	6
	2	4	6	0	21	4	6

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2 - INCH SEGMENT MIDPOINT DIAMETER CLASS						
	2	4	6	8	10	12	14
SUMMARY	2	12	1	1	1	1	10
COUNT	2	4	6	0	21	4	6
	2	4	6	0	21	4	6
	2	4	6	0	21	4	6

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WOODLAND TREE SEGMENTATION RECORD

FOREST/ AGENCY/ DISTRICT 04 WORKING CIRCLE/ RESERVATION/ PLANNING UNIT 05 REGION/ AREA/ RESOURCE AREA 07 DATE 6-15-88

OCCASION NO. 0126 OWNER 1011 CARD TYPE 5 SAMPLE AREA 08 CREW D. Schmidt S. Langdon

TREE NO. 15 16 SPECIES L 33 DRC 12 5 DBH 23 24 25  
 NO. STEMS 26 27 MIN CROWN WIDTH 1 0 MAX CROWN WIDTH 1 2  
 TOTAL HT 32 33 NO SEGMENTS 34 35 ESTIMATOR 2 2

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DBH 23 24 25  
 NO. STEMS 26 27 MIN CROWN WIDTH 20 29 MAX CROWN WIDTH 30 31  
 TOTAL HT 32 33 NO SEGMENTS 34 35 ESTIMATOR 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2	4	6	8	10	12	14	16
SUMMARY	2	4	6	0	0	0	0	0
COUNT	2	4	6	0	0	0	0	0

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2	4	6	8	10	12	14	16
SUMMARY	2	4	6	0	0	0	0	0
COUNT	2	4	6	0	0	0	0	0

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DBH 23 24 25  
 NO. STEMS 26 27 MIN CROWN WIDTH 20 29 MAX CROWN WIDTH 30 31  
 TOTAL HT 32 33 NO SEGMENTS 34 35 ESTIMATOR 36 37

TREE NO. 15 16 SPECIES 17 18 19 DRC 20 21 22 DBH 23 24 25  
 NO. STEMS 26 27 MIN CROWN WIDTH 20 29 MAX CROWN WIDTH 30 31  
 TOTAL HT 32 33 NO SEGMENTS 34 35 ESTIMATOR 36 37

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2	4	6	8	10	12	14	16
SUMMARY	2	4	6	0	0	0	0	0
COUNT	2	4	6	0	0	0	0	0

RECORD MULTIPLE STEMS DRC BELOW:

2-FT LENGTH CLASS	2	4	6	8	10	12	14	16
SUMMARY	2	4	6	0	0	0	0	0
COUNT	2	4	6	0	0	0	0	0

APPENDIX 5

GLOSSARY



## G L O S S A R Y

- ACCEPTABLE TREE** This is a live tree that meets specified standards of size and quality, but does not qualify as a desirable tree (see Tree Class, Item 77).
- ACCRETION** Annual increase in net volume of trees in a size class, and the increase in net volume of trees after reaching a measured size class during the year.
- AFFORESTED AREAS** Lands formerly not in tree cover, but converted to forests by planting or seeding.
- AGE CLASS** A timber stand classification based on grouping tree ages into classes of: (1) 10 years, for trees 1-100 years old (e.g., 1-10, 11-20, etc.); (b) 20 years, for trees 101-200 years old (e.g., 101-120, 121-140, etc.); (c) 201-300 years; and (d) 301+ years.
- ALLOWABLE CUT** The volume of timber that would be cut on productive timberland during a given period under specified management plans for sustained production, such as those in effect on National Forests.
- ALLUVIAL FAN** A gently sloping fan-shaped land form located at the base of mountain slopes or escarpments and formed by deposition of material from ephemeral stream flow.
- ALPINE** The zone of low arctic-type vegetation above tree line.
- AREA CONDITION CLASS** A classification of productive timberland based upon stocking by desirable trees and other conditions affecting current and prospective timber growth.
- AVAILABLE CUT** The volume of timber that would be available for cutting on productive timberland during a given period under specified assumptions concerning growth, cut, mortality, and forest management practices.
- AZIMUTH** The horizontal angle or bearing of a point, measured clockwise from north. NOTE: The azimuth plus 180° from the azimuth is termed the back azimuth.
- BASAL AREA** The area of the cross section of a tree stem at the point where diameter is measured and inclusive of bark.
- BASAL AREA FACTOR (BAF)** The basal area factor is an index for the sampling angle used in variable plot tree cruising. The BAF is the amount of basal area each tally tree represents per acre, when a single point is sampled, since the plot size is directly proportional to the tree basal area, or diameter squared.

BASE LINE A reference line of sight located and measured on both the aerial photo and the ground.

BENCH A long, narrow gently sloping plain (tread) whose ratio of length to width is greater than 10:1.

BOLE The main stem of a tree. For estimating cubic-foot cull, bole is that section between a 1-foot stump and 4-inch top DOB.

BUREAU OF LAND MANAGEMENT LANDS Federal land administered by the Bureau of Land Management.

CAIRN A heap of stones piled up as a landmark.

CENSUS WATER Water areas larger than 40 acres and 660 feet wide.

CLEAR PANEL A section of the tree surface one-fourth the circumference of the tree, at least two feet long and free of defects such as limbs, knots, bumps, bark distortions which indicate overgrown knots or holes, and adventitious twigs.

CODOMINANT See "Crown Class, Codominant."

CONDITION In reference to vegetative condition, forest condition, or general condition, this term means an area of land and/or vegetation with relatively homogeneous appearance, characteristics, or structure which would permit uniform management activities over the area. Vegetative condition implies relatively homogeneous species composition, size, and distribution. Gradations from one condition to another are often gradual, and only abrupt changes need be considered in the context of these procedures.

CONK The fruiting body of a wood-destroying fungus which projects from the bole, roots, or other tree part.

COUNTY LANDS See "State, County, and Municipal Lands."

COVER CLASS A term used to designate the vegetative cover condition of the area immediately surrounding a point of the field sample.

CROOK A defect in logs, poles, or piling consisting of an abrupt curvature.

CROPLAND Land currently used for farm crops which is harvested on a regular basis.

## CROWN CLASS

A classification of timber trees based on dominance in relation to adjacent trees in the stand as indicated by crown development and amount of light received from above and the sides.

Codominant: Trees with crowns forming the general level of the canopy and receiving full light from above, and comparatively little from the sides. Their crowns are usually medium-sized and more or less crowded on the sides.

Dominant: Trees with crowns extending above the general level of the canopy and receiving full light from above and partly from the sides. These trees are usually larger than the average trees in the stand, and have well-developed crowns which may be somewhat crowded on the sides.

Intermediate: Trees shorter than those in the two preceding classes and whose crowns are either below or extending into the canopy formed by codominant and dominant trees. Their crowns receive little direct light from above, and none from the sides; and are usually small and considerably crowded on the sides.

Open Grown: Trees with crown which have received full light from above and from all sides throughout all or part of the life of the tree, particularly during early development.

Overtopped: Trees with crowns entirely below the general level of the crown canopy receiving no direct light either from above or from the sides.

## CROWN COVER

The ground area covered by a crown, as defined by the vertical projection of its outermost perimeter.

## CROWN RATIO

The percent of a tree's total height which supports live crown. This live crown must be effectively contributing to tree growth. (See Items 68 and 69 for an explanation of uncompact and compacted crown ratio.)

## CULL

Portions of a tree that are unusable for wood products because of rot, form, or other defect.

## CULL TREE

For timber species: A live tree which fails to meet the specifications for growing-stock trees. Cull trees do not now, or prospectively, contain at least one 8-foot bolt of usable wood.

For other tree species: Total volume loss is 68 percent or greater.

DBH	A point 4-1/2 feet above the ground on the uphill side of a tree, where, on a normally formed tree, the tree diameter is measured. Height of DBH may vary on abnormally formed trees.
DESIRABLE TREE	<p><u>For timber species:</u> A live growing-stock tree: (a) having no serious defects in quality which limit present or prospective use for timber products, (b) of relatively high vigor, and (c) containing no pathogens that may result in death or serious deterioration before rotation age, and (d) not a cull tree. (NOTE: This is the type of tree forest managers attempt to grow (i.e., the trees favored in cultural operations).) In over-rotation-age stands, desirable trees are low-risk trees.</p> <p><u>For other tree species:</u> A live tree of unusually good form. It is usually single-stemmed; dominant, codominant, or solitary; has a full crown and uniform taper. Stems of oak or juniper form or will form posts.</p>
DEVELOPED FOREST LAND	This is forest land (timberland or woodland) which will probably <u>not</u> be managed for timber production or wood products because of development for recreational or residential use. These areas are identified by the presence of campsites, homes, or a high road density, and are generally found in subdivisions, small tracts, or corporate ownership.
DIAMETER CLASS	A grouping of tree diameters (DBH or DRC). Two-inch diameter classes are usually used in Renewable Resources Evaluation, with the even-inch the appropriate mid-point for a class. For example, the 6-inch class includes trees 5.0 through 6.9 inches DBH inclusive.
DIB	Diameter inside bark.
DOB	Diameter outside bark.
DOMINANT	See "Crown Class, Dominant."
DRC	This is "Diameter at Root Collar" and is measured on other tree species approximately at ground level; i.e., at the root collar.
DUFF	See "Litter."
EPHÉMERAL STREAM	See "Stream, Ephemeral."
ESTABLISHED SEEDLING	A tree less than 1.0 inches d.b.h. (timber species) or DRC (other species) with its root system in mineral soil, and no disease or insect infestation present.
EVEN-AGED CLUMP	See "Stand Class," Item 20.
FACE	A section of the tree stem surface one-fourth the circumference and extending full length of the stem.

FARM	Either a place operated as a unit of 10 or more acres from which the sale of agricultural products totals \$50 or more annually, or a place operated as a unit of less than 10 acres from which the sale of agricultural products for a year amounts to at least \$250. Places having less than the \$50 or \$250 minimum estimated sales in a given year are also counted as farms if they can normally be expected to produce products in sufficient quantity to meet the requirement of the definition.
FARM OPERATOR	A person who operates a farm either doing the work himself or directly supervising the work.
FARMER-OWNED LANDS	Lands owned by farm operators. (NOTE: These exclude land land leased by farm operators from non-farm owners, such as railroad companies and states.)
FARMER-OWNED, LEASED	Lands owned by farm operators but leased to forest industry.
FIELD LOCATION	This is another name for an individual 5-point cluster or 1/10- and 1/20-acre fixed plot.
FIXED-RADIUS PLOT	A circular sample plot of a specified radius.
FOREST INDUSTRY LANDS	Lands owned by companies or individuals operating wood-using plants.
FOREST LAND	This is land at least 10 percent stocked (5 percent crown cover) by timber or woodland trees, or formerly having had such tree cover. Evidence of adequate stocking in the past may be the presence of stumps, downed tree stems, snags, and so forth. The minimum area for classification of forest land is 1 acre. Roadside, streamside, and shelterbelt strips of timber must be at least 120 feet wide to qualify as forest land. Unimproved roads, trails, streams, and clearings in forest areas shall be classed as forest land if less than 120 feet wide.
FORKED TREE	This is a tree whose merchantable stem separates into two or more smaller stems. For timber tree species, this separation must occur above DBH to be considered a fork. If a stem separates from the main bole at more than a 30½ angle, the stem will be called a branch. If the base diameter of any separated stem is one-fourth or less the diameter of the main stem (diameter of main stem is measured 1 foot below the separation), then the separated stem will be called a sucker limb, not a fork. For other tree species (not timber), a fork may occur at any height, including below ground level. Limbs and stems are not separated.

GEOGRAPHIC TREE CENTER	The geographic tree center is used as the center of other tree species which fork below DRC. This center is defined as the center of a polygon scribed by connecting the centers of the outermost stems in the tree at the DRC point.
GLACIAL CIRQUE	A land form with overall negative relief (concave), with a glacially-formed amphitheater-like carving in the mountain side, and with steep slopes providing the headwaters for drainage.
GLACIAL LATERAL MORaine	See "Moraine, Lateral."
GLACIAL TERMINAL MORaine	See "Moraine, Terminal."
GROSS GROWTH	Annual increase in net volume of trees in the absence of cutting and mortality (includes ingrowth and accretion).
GROUND LAND USE	See Section B.3 and Item 16.
GROWING-STOCK TREE	(a) A live tree of timber species which now, or prospectively, contains at least one merchantable 12-foot saw log for softwoods or 8-foot saw log for hardwoods; (b) An other tree species which qualifies as either desirable or acceptable, not cull.
GROWING-STOCK VOLUME	Net volume in cubic feet of growing-stock trees. For timber species, this is 5.0 inches DBH and larger measured from a 1-foot stump to a minimum 4.0-inch top DOB of the central stem, or to the point where the central stem breaks into limbs. For other tree species this is the net volume of growing-stock trees between 3.0- inches DRC and a minimum 1.0-inch top DOB.
GROWTH	See "Gross Growth," "Ingrowth," and "Net Growth."
HARDWOODS	Dicotyledonous trees, usually broad-leaved and deciduous, belonging to the botanical group Angio spermae.
HERBACEOUS	Of or relating to a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue, but dies down at the end of a growing season.
IMPROVED PASTURE	Land currently improved for grazing by cultivation, seeding, irrigation, or clearing of trees or brush by herbicides or other means.

IMPROVED  
ROAD

All roads graded or otherwise maintained for continuing use and with at least a 30-foot right-of-way. This includes the entire right-of-way of all operating railroads. Roads not meeting these standards will be considered unimproved. (NOTE: When determining whether a plot is Forest or Nonforest Land, consider that improved roads have no minimum width. For example, if Point 1 falls on an improved road that is less than 30 feet wide, the plot is classified as nonforest. See also "Nonforest Land.")

INDIAN LANDS

Tribal lands held in fee by the Federal government, but administered for Indian tribal groups and Indian trust allotments (by BIA assistance).

INDUSTRIAL  
WOOD

All roundwood products, except fuelwood. See roundwood products definition.

INGROWTH

The number or net volume of trees that grow large enough during a specified year to qualify as saplings, poletimber, or sawtimber.

INHIBITING  
VEGETATION

Includes all vegetation which is considered to repress the natural establishments of timber species seedlings. See "Cover Class," Item 77.

INTERMEDIATE

See "Crown Class, Intermediate."

INTERMITTENT  
STREAM

See "Stream, Intermittent."

INTERNAL VOLUME

A measure of the cubic-foot cull volume due to LOSS rotten and/or missing bole sections in all live and dead trees of timber species 5.0 inches DBH and larger. For other tree species, this is the cubic volume loss in trees 3.0 inches DBH or larger.

INTERNATIONAL  
1/4-INCH RULE

The standard board-foot log rule adopted nationally by the Forest Service for the presentation of Resource Evaluation timber volume statistics.

LAND AREA

(1) Bureau of the Census -- The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains (omitting tidal flats below mean high tide); streams, sloughs, estuaries, and canals less than 1/8 statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area.  
(2) Renewable Resource Evaluation -- The same as the Bureau of the Census, except minimum width of streams and so forth is 120 feet and minimum size of lakes and so forth is 1 acre.

LIMB

That part of a timber species above the stump which does not meet the requirement of sawlogs or upper stem portions, including all live, sound branches to a minimum of 4.0 inches DOB.

LIMITING DISTANCE	Used in variable plot sampling, this is the distance between the sample point center and the point where a tree of a given diameter will be a "borderline" tree. This distance is a function of the plot radius factor for a given basal area factor times the diameter of the tree in question. A tree is tallied if it is within its limiting distance from the sample point center.
LITTER	The uppermost layer of organic debris on a forest floor; that is, essentially the freshly fallen, or only slightly decomposed vegetable material, mainly foliage, but also bark fragments, twigs, flowers, fruits, and so forth. NOTE: This and the less decomposed humus are together often termed <u>duff</u> .
LOGGING RESIDUES	The unused portions of trees cut or killed by logging.
MAI	Mean Annual Increment (MAI) is increase in volume of a tree for a given number of years divided by that number of years, usually the accepted rotation age.
MATURE TREE	A tree of timber species past rotation age (80 years for aspen, 120 years for all other timber species).
MERCHANTABLE BOLE	That portion of ST or PT trees of timber species between a 1-foot stump and a 4-inch top DOB. For other tree species, all stems + 3.0 + DRC to a minimum 1.0-inch top DOB.
MERCHANTABLE TREE	See "Growing-Stock Tree."
MISCELLANEOUS FEDERAL LANDS	Federal lands other than National Forest, National Park Service, Bureau of Land Management, and Indian lands.
MISCELLANEOUS PRIVATE LANDS	Privately owned lands other than forest industry and farmer-owned lands.
MORaine	A land form built chiefly by the direct action of glacial ice and composed of glacial drift. <u>Lateral Moraine</u> -- A ridge-like moraine carried on and deposited at the side margin of a valley glacier, composed chiefly of rock fragments derived from valley walls. <u>Terminal Moraine</u> -- A moraine produced at the front end of an actively flowing glacier. This moraine marks the glacier's farthest advance, usually has the form of a massive arcuate ridge or complex of ridges, and is underlain by till and other drift types.
MORTALITY	Number or sound-wood volume of <u>growing-stock</u> trees dying from natural causes during a specified period.
MORTALITY TREE	A tree, standing or down, that has died within the past 5 years and was not a cull tree at its time of death.

MUNICIPAL LANDS	See "State, County, and Municipal Lands."
NATIONAL FOREST LANDS	Federal lands which have been legally designated as National Forests or purchase units, and other lands under the administration of the Forest Service, including experimental areas.
NATIONAL PARK SERVICE LANDS	Federal lands administered by the National Park Service, (e.g., National Parks, Historic Sites, Monuments, Recreation Areas, etc.).
NET ANNUAL GROWTH	The increase in volume of a specified size class for a specific year. (NOTE: Components of net annual growth include the increment in net volume of trees at the beginning of the specific year surviving to its end, plus volume of trees reaching the size class during the year, minus the volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)
NET VOLUME	The gross volume of a tree less deductions for rot, sweep, or other defects influencing use for wood products.
NONCENSUS WATER	For purposes of this inventory, noncensus water is 1-40 acres in size and 120-660 feet in width.
NONFOREST LAND	Land that has never supported forests and lands presently or formerly forested where use for timber management is precluded by development for other uses. (NOTE: Includes areas used for crops, improved pasture, residential areas, city parks, improved roads of any width and adjoining clearings, power line and pipe line clearings of any width, and bodies of water 1-40 acres in size classified by the Bureau of the Census as land. If intermingled in forest areas, unimproved roads and nonforest strips must be more than 120 feet wide, and clearings and so forth more than 1 acre in size to qualify as nonforest land.)
NONRESERVED LAND	Public land not withdrawn from grazing and timber harvesting (e.g., Bureau of Land Management or Forest Service land <u>not</u> within the boundaries of Wilderness or Primitive areas). See "Reserved Land."
NONSALVABLE DEAD TREES	All standing and down dead trees of timber species that are 5.0 inches DBH and larger and greater than 50 percent rotten on a cubic-foot basis.
NONSTOCKABLE	Areas of forest land not capable of supporting tree seedlings because of the presence of rock, water, roads, and so forth.

NONSTOCKED LAND	Forest land less than 16.7 percent stocked with growing-stock trees; that is, forest land with less than 10 percent crown cover (e.g., recently harvested, burned, or windthrown areas).
OFF-SITE TREE	A tree that is growing on a site to which it is not naturally adapted.
OLD-GROWTH SAWTIMBER STANDS	Sawtimber stands in which the plurality of stocking is in old-growth sawtimber trees.
OLD-GROWTH SAWTIMBER TREES	Trees of timber species that are at least 100 years old.
OTHER FEDERAL LANDS	Federal lands other than National Forest lands (i.e., lands administered by the Bureau of Land Management, and other Federal agencies).
OTHER PUBLIC LANDS	All state, county, municipal, and Federal lands other than National Forests.
OTHER TREE SPECIES	This category includes all species of hardwoods, except aspen and cottonwoods (e.g., mountain mahogany, oak, maple, etc.). Softwoods included in this category are pinyon, juniper and yew species.
OVERGROWN KNOT	The scar left in the bark by a limb completely overgrown, but still outlined by the circular configuration in the bark.
OVERSTOCKED AREAS	Areas where growth of trees is significantly reduced by excessive numbers of trees. (NOTE: Timberland stands will be considered overstocked if stocking is 133 percent or more, when 100 percent represents the minimum level of stocking required to make full use of the site.) See also "Stocking."
OVERTOPPED	See "Crown Class, Overtopped."
OWNERSHIP	A classification of land based upon the status of the title holder. Property owned by one owner, regardless of the number of parcels in a specified area.
PATHOGEN	An organism capable of causing disease.
PERENNIAL STREAM	See "Stream, Perennial."
PLOT CENTER	This is <u>Point 1</u> of the 5-point cluster system used to sample timberland, and also the center of the 1/10- and 1/20-acre fixed plots used to sample woodland.
PLOT RADIUS FACTOR	The distance per unit of tree diameter from the sample point center to a point at which the tree would be a "borderline" tree. See "Limiting Distance."

POINT CENTER

Also called "sample point center." This is the center of the variable- and fixed-radius plots. It is the exact location of each of the five cluster points and is marked by a stake.

POLETIMBER  
STAND

See "Stand-Size Class -- Poletimber Stand."

POLETIMBER  
TREES

Growing-stock trees of timber species at least 5.0 inches DBH but smaller than 9.0 inches DBH for softwoods and 11.0 inches DBH for hardwoods.

PRODUCTIVE  
TIMBERLAND

See "Timberland, Productive."

PRODUCTIVE  
RESERVED  
TIMBERLAND

Productive timberland withdrawn from timber utilization through: (a) statute or administrative designation, or (b) exclusive use for Christmas tree production. Examples of productive reserved timberland are Wilderness Areas, National and State Parks, etc.

PROJECTED SAW LOG  
PORTION

See "Saw Log Portion."

POSTWOOD

The material usable for posts in other tree species.

RANGELAND

All land with natural plant cover composed principally of native grasses, forbs, or shrubs valuable for forage. NOTE: For land use classification, this does not include land manipulated by man. See "Improved Pasture."

REFERENCE  
POINT

See Section A.3.

RELICT

A tree which, through the operation of some compensatory or protective environmental feature(s) has survived some major change (e.g., climatic, land use, etc.) that has altered the general vegetation of the surrounding territory.

RESERVED LAND

Public land withdrawn from grazing and wood harvesting through statute or administrative designation (e.g., National Parks and Monuments, Wilderness and Primitive Areas, etc.).

ROTATION

The period of years between establishment of a stand of timber and the time when it is considered ready for cutting and regeneration.

ROTATION AGE

The age of a stand when it is considered ready for harvesting. For the Intermountain Region, rotation age is 80 years for aspen and 120 years for all other species.

ROTTEN TREE

(a) For trees of timber species:

Total volumes of these trees (cubic-foot) are culled mainly because of rotten or missing bole sections.

If a live ST or PT tree has more than 67 percent of its volume (cubic-foot) culled, and more than half of this cull is due to rotten and/or missing bole sections, then the tree is a rotten cull. Live sapling or seedlings with any rotten defect.

On a cubic-foot basis: If a tree does not contain at least one 8-foot bolt of usable wood because of rotten or missing bole sections, then the tree is a rotten cull (cubic-foot).

(b) For other tree species: Trees 3.0 inches DRC or larger with more than 67 percent of the gross cubic foot volume is culled, and more than half of the cull material is in rotten or missing volume. Saplings (1.02.9 DRC) or seedlings with any rotten defect.

ROUGH TREE  
(SOUND CULL)

(a) For trees of timber species:

If a live ST or PT tree has more than 67 percent of its volume (cubic-foot) culled, and more than half of this cull is due to form or sound defects, then the tree is a rough cull. Form and sound defects include: severe sweep and crook, forks, extreme form reduction, excessive limbiness, lightning scars, deep splits and cracks, and severe twist.

On a cubic-foot basis: If a tree does not contain at least one 8-foot bolt of usable wood because of form defects (not including lightning scars, splits, and cracks), then the tree is a rough cull (cubic-foot).

Live sapling and seedling trees without rotten defect which are unlikely to become growing-stock PT because of serious defects such as severe crook, disease, animal, fire, or weather damage, suppression, etc., are rough trees.

ROUGH TREE  
(con.)

(b) For other tree species:

Trees 3.0 inches DRC or larger with more than 67 percent of the gross cubic foot volume is culled, and more than half of the cull material is deadwood. Sapling or seedling trees without rotten defect, but with deadwood which will prohibit the tree from meeting growing stock standards when it reaches 3.0 inches DRC.

ROUNDWOOD  
PRODUCTS

Logs, bolts, or other round sections cut from trees for industrial or consumer uses. (NOTE: Includes saw logs, veneer logs and bolts, cooperage logs and bolts, pulpwood, piling, poles, hewn ties, mine timbers, and various other round, split, or hewn products.)

SALVABLE DEAD  
TREES

All standing and down dead trees that are at least 5.0 inches DBH (timber species) or 3.0 inches DRC (other tree species), and that are less than 50 percent rotten on a cubic-foot basis).

SAMPLE AREA

The area of land included for the application of a statistical sample in estimating renewable resources. The gross sample area usually includes a group of counties. The net sample area is certain lands within these counties, depending upon ownership category and/or previous inventories or reserved status.

SAMPLE POINT

One of the five subsamples which comprise a 5-point cluster field sample location.

SAPLINGS

Trees 1.0 to 4.9 inches DBH (timber species) or 1.0 to 2.9 inches (other tree species).

SAW LOG

A log from timber species meeting minimum standards of diameter, length, and defect so as to yield commercial size lumber or veneer products.

SAWTIMBER  
STAND

See "Stand-Size Class, Sawtimber Stand."

SAWTIMBER  
TREES

Trees of timber species which are at least 9.0 inches DBH for softwoods and 11.0 inches DBH for hardwoods.

SCRIBNER RULE	The common board-foot log rule used in determining volume of sawtimber in the Western States.
SEEDLING	All live trees less than 1.0 inch DBH or DRC. See "Established Seedling."
SEEDLING/SAPLING STAND	See "Stand-Size Class, Seedling/Sapling Stand."
SHELTERBELT	A plantation of trees or shrubs established to serve as a windbreak to prevent wind erosion, protect farm buildings, and otherwise moderate the microclimate.
SITE	An area considered in terms of its environment, particularly as this determines the type and quality of vegetation the area can support.
SITE CLASS	This is a measure of the relative productive capacity of a site for the crop or stand under study, based, for example, on volume, height, or the mean annual increment that is attained or attainable at a given age.
SITE INDEX CLASS	A particular measure of site class, based on the height of the dominant trees in a stand at an arbitrarily chosen age.
SITE TREE	A tree used to provide a measure of site index.
SIZE CLASS	See "Tree Size Class."
SLASH	Residues from logging activities or from natural breakup of the stand caused by insects, disease, weather, etc. Slash includes logs, stems, heavier branch wood, stumps, etc.
SOD	A more or less continuous cover of grass and/or herbaceous plants.
SOFTWOODS	Coniferous trees, usually evergreen, having needle- or scale-like leaves and belonging to the botanical group Gymnospermae.
SOUND KNOT OR LIMB	Knots or limbs intergrown or encased with the surrounding wood and with no indication of decay. Bark may or may not be present on the limbs.
STAND CLASS	The designation of a timber stand by age class distribution (e.g., even-aged, two-storied, uneven-aged).

STAND-SIZE  
CLASS

A classification of timberland based on the predominant size of growing-stock trees in the area (i.e., sawtimber, poletimber, seedling/sapling).

Nonstocked Land -- Timber or woodland less than 10 percent stocked with growing-stock trees (e.g., recently harvested land).

Poletimber Stand -- A stand at least 10 percent stocked with growing-stock timber species, half or more of which are pole- and/or sawtimber trees, and where poletimber stocking is greater than that of sawtimber.

Sawtimber Stand -- A stand at least 10 percent stocked with growing-stock timber species, half or more of which are sawtimber and/or poletimber trees, and where the sawtimber stocking is equal to, or greater than, that of poletimber.

Seedling/Sapling Stand -- A stand at least 10 percent stocked with growing-stock timber- or other species, where more than half of this stocking is seedlings and/or saplings. See "Stand-Size Class," Item 23.

STATE, COUNTY  
AND MUNICIPAL  
LANDS.

Lands owned by states, counties, and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

STOCKING

The degree of occupancy of timberland by trees, measured by basal area and/or the number of trees in a stand by size or age and spacing, compared to the basal area and/or number of trees required to fully utilize the growth potential of the land. Basal area per acre provides a measure of stocking for stands with trees 5.0 inches DBH and larger, and number of trees per acre for stands with only trees less than 5.0 inches DBH.

Basal area stocking standards are set so that 100 percent (60 percent of normal, using normal yield table data) is the minimum level of stocking required to make full use of the site. This is the point at which further increases in density would result in no increase in net growth per acre. Stands will be considered overstocked if stocking is 133 percent or more. Stands less than 10 percent stocked with timber species are considered woodland or nonforest, unless they are nonstocked.

The stocking percent of timber species determines timberland type and delineates timberland from woodland or nonforest land. Stocking percent of growing-stock trees determines stand-size and age classifications. And stocking percent of desirable (10-class) trees delineates area condition classes.

STOCKING PERCENT	Current area occupancy (stocking) in relation to specified stocking standards.
STOCKING STANDARD	The number, size, and spacing of trees considered necessary to make full use of a site.
STREAM	A body of running water. <u>Ephemeral</u> -- A stream which flows only in direct response to precipitation or surface run-off. <u>Intermittent</u> -- A stream which flows for protracted periods only when it receives ground water discharge or long-continued contributions from melting snow or other surface and shallow subsurface sources. <u>Perennial</u> -- A stream which flows year-round.
STREAM BOTTOM	A gently sloping stream pathway subject to frequent inundation.
STREAM TERRACE	A gently sloping stream pathway not subject to frequent inundation.
STUMP HEIGHT	The height of the top of a stump above ground level. For purposes of this inventory, stump height is equal to 1.0 foot.
SUPPRESSION	The process whereby certain trees, shrubs, etc., in a community become weakened, essentially through the competition of neighbors (natural suppression), but also by extension, through man's intervention (e.g., his selective lopping, girdling, or cutting back) and selective browsing by his livestock (artificial suppression).
SWEEP	Curve in a stream or log as distinct from an abrupt bend (crook).
TIMBERLAND	This is forest land with 5 percent or more of tree cover consisting of trees of timber species.
TIMBERLAND, PRODUCTIVE	Forest land producing, or capable of producing, crops of industrial wood (timber species) from trees and not withdrawn from timber utilization by statute or administrative regulation. This classification includes areas suitable for management to grow crops of industrial wood (i.e., forest land generally of a site quality capable of producing greater than 20 cubic feet of wood per acre per year). Currently inaccessible and inoperable areas are included. Nonstocked areas that have the potential to be $\geq 10$ percent stocked and otherwise meet the requirements are considered to be productive forest land (e.g., recently harvested or burned areas).
TIMBERLAND, UNPRODUCTIVE	Forest land incapable of producing 20 cubic feet per acre per year of industrial wood (timber species) from trees under natural conditions because of adverse site conditions. (NOTE: Adverse conditions, include sterile soils, dry climate, poor drainage, high elevation, and/or rocky slopes.)

TIMBER PRODUCTS	Roundwood products and plant by-products. (NOTE: Timber products output includes roundwood products cut from growing-stock on timberland; from other sources, such as cull trees, salvable dead trees, limbs, and saplings; from trees on woodland and nonforest lands; and from plant by-products):
TIMBER REMOVALS	The net volume of growing-stock trees removed from the inventory by harvesting, cultural operations (such as timber stand improvement), land clearing, or changes in land use.
TIMBER SPECIES	Those species that are usually desirable for conversion into conventional timber products, such as lumber, plywood, and pulp.
FOREST TYPE	A classification of forest and woodland based upon the species forming a plurality of live-tree stocking. Forest/woodland type should reflect the <u>predominating</u> tree cover over the condition surrounding the sample area. (NOTE: Plot species data may, on occasion, give an erroneous indication of forest/woodland type if plot sample is not typical of general type.)
TOTAL VOLUME LOSS	The sum of volume losses due to rotten or missing wood <u>plus</u> "other" volume losses due to sweep, crook, deep splits and cracks, forks, lightning scars, excessive limbiness, extreme form reduction, twist, and other form defects. "Other" volume loss is limited to dead material for other species.
TREE CLASS	A classification assigned to each live tree based on the following physical characteristics: surface defect, internal and total volume loss, internal defects, crown ratio and class, and damage. (See also "Desirable Tree," "Acceptable Tree," "Rough Tree," and "Rotten Tree.")
TREE FORM	Some tree species grow in a brush form as well as tree form. Timber species listed are always considered to be tree form, but <u>other</u> tree species must meet the following definition to be considered tree form.  To be tree form, an other tree species must be capable of yielding, now or prospectively, an aggregate of 8 feet of live or dead segment length from stem(s) 3.0 inches or larger DRC, from segments meeting minimum size requirements of 1-1/2 inch small end and 1 foot length.  In classifying woodland versus nonforest, tree form trees must occupy at least 5 percent crown cover, with a minimum area of 1 acre, to be considered forest land.
TREE SIZE CLASS	A classification of trees based on diameter at breast height outside bark (i.e., sawtimber trees, poletimber trees, saplings, and seedlings).

TWO-STORIED  
STAND See "Stand Class," Item 20.

UNDEVELOPED LAND This is land which is being used for wood production and/or grazing, and is not developed for recreation or residential use. See "Developed Land."

UNEVEN-AGED  
STAND See "Stand Class," Item 20.

UNIMPROVED ROAD A road not maintained for continued use, and a maintained road with less than a 30-foot right-of-way. See "Improved Road."

UPPER-STEM  
PORTION That part of the bole of sawtimber trees above the saw log to a minimum top of 4.0 inches outside bark or to the point where the central stem breaks into limbs.

URBAN AND OTHER  
AREAS Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial, or recreational purposes; schoolyards; cemeteries; improved roads; railroads; airports; beaches; powerlines, pipelines, and other rights-of-way; or other nonforest land not included in any other specified land use class.

VARIABLE-RADIUS  
PLOT A plot on which a predetermined critical angle is projected from a central point and swept in a full circle to determine the basal area (tree count) and volume per unit of area. The radius of this plot is a function of a tree's basal area and is therefore variable.

WATER (1) Bureau of the Census -- Streams, sloughs, estuaries, and canals more than 1/8 statute mile in width; and lakes, reservoirs, and roads more than 40 acres in area.

(2) Renewable Resources Evaluation -- The same as the Bureau of the Census, except minimum width of streams and so forth is 120 feet and minimum size of lakes and so forth is 1 acre.

WOODLAND This is forest land with 5 percent or less of tree cover consisting of timber species.

WOODLAND,  
HIGH SITE See "High Site Woodland," Section B.7.

WOODLAND,  
LOW SITE See "Low Site Woodland," Section B.8.

YOUNG-GROWTH  
SAWTIMBER STANDS Sawtimber stands in which 50 percent or more of the stand is occupied by young-growth sawtimber trees.

YOUNG-GROWTH  
SAWTIMBER TREES Sawtimber trees less than 100 years old.

APPENDIX 6

MULTIRESOURCE DATA



## MULTIRESOURCE CHARACTERISTICS

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Wildlife Cover	111	3
Vegetative Concealment	112	3
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Grazing Intensity	115	5
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Litter Depth	121	7
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## INTRODUCTION

With the passage of the Forest and Rangeland Resources Planning Act of 1974 (RPA), the role of Renewable Resources Evaluation (formerly Forest Survey) has expanded to include all the renewable resources. To meet some of the information needs of the RPA, a broad scale evaluation of various resource uses and their interactions is essential in assessing forest and rangeland renewable resources.

Over the years reliable timber resources information has been collected by Resources Evaluation crews. If one examines the list of land and timber parameters collected, such as forest type, stand age, elevation, or slope; one could generalize about how each item might relate to range, recreation, wildlife, soil, or water. With the following data, we will attempt to develop relationships between the resources and land use. This information will improve our ability to predict future land use patterns and the availability of the renewable resources.

In addition, a description of the lesser vegetation at each sample location will be made to determine the horizontal and vertical distribution, cover, diversity, and composition of tree foliage and other vegetation. From these data biomass of the various vegetation components may be determined, and the data can be screened to estimate the amount of habitat or conditions suitable for various uses.

### SECTION A. MULTIRESOURCE CHARACTERISTICS

On the Multiresources Characteristics Record Sheet record the appropriate codes for the first ten items listed below. Refer to the Timber Field Location Record sheet for all codes except card type. Record Card Type 3 for this sheet.

Columns	Name	Item
1-2	State	101
3-6	Map Number	102
7-10	Point Number	103
11	Card Type	104
12	Region	105
13-14	Forest	106
15-16	Working Circle	107
17-18	Sample Area	108
19-21	County	109
22-25	Location Number	110

The following items are recorded by making observations in the vicinity of the sample location. The location center is point number one of a cluster sample locations or the center of the plot for fixed plot sample locations. Most observations are made viewing the general vegetation and topographic site in which the sample location falls, although the observer usually need not move off the sample location to make adequate observations. Remember, however, that land use classes have a 1-acre minimum size, so observations should not be made intirely in small inclusions of other land classes.

Wildlife Cover, 111

Wildlife Cover (Col. 25-31)--Identify the primary, secondary and tertiary type of cover that would have the most influence on wildlife habitat. Cover will be observed in the condition where the inventory location is measured. Do not assign a secondary or tertiary cover item without a primary cover item. Record as a 2-digit code.

<u>Code</u>	<u>Cover</u>
00	No cover
01	Logging slash or brush pile
02	Windrows
03	Mill residues (slabs, etc.)
04	Abandoned structures
05	Vegetative thickets
06	Hollow log
07	Hollow stump
08	Fallen tree, limb, or top
09	Rock outcrops
10	Rock pile
11	Gullies
12	Coves
13	Burrows
14	Marsh condition
15	Litter or trash pile
16	Artificial cover

Vegetative Concealment, 112

Vegetative Concealment (Col. 32)--A 1-digit code will be recorded to indicate the density of vegetation from ground level to 6 feet. As each of the inventory points are chained, the rear chainman will make an assessment of the vegetative concealment. This will be based on how much of the head chainman can be seen at a distance of 100 feet. Record the code best describing the average conditions for the location.

<u>Code</u>	<u>Concealment Class</u>
1	Cruiser can be easily seen
2	Cruiser partially obscured
3	Cruiser not easily seen
4	Cruiser completely obscured

Browsing, 113

Browsing (Col. 33)--Intensity of utilization by wildlife on herbage and/or browse will be determined for each sample location. Both herbage and browse components will be examined together. Record a 1-digit code that best describes the browse utilization.

<u>Code</u>	<u>Degree of Browsing</u>
0	No browsing
1	Light browsing--difficult to find browsed plants in the sample area, less than 5 percent of plants grazed.
2	Moderate browsing--frequently find browsing in the sample area.
3	Heavy browsing--generally more than 35 percent of plants in the sample area are browsed.

Wildlife Use, 114

Wildlife Use (Col. 34-36)--Code the primary, secondary, and tertiary wildlife use based upon visual evidence of use, such as sightings, trails, droppings, browsed vegetation, or debarked trees. Code the type of wildlife having the most significant impact on the vegetative condition, and/or site beginning with the most significant, then second and third. Note: Impact on vegetation or site does not necessarily mean damage; level of use is the information of interest.

<u>Code</u>	<u>Wildlife</u>
0	None apparent
1	Deer
2	Elk
3	Moose
4	Antelope
5	Bear
6	Beaver
7	Porcupine
8	Rabbits and small mammals
9	Other

Grazing Intensity, 115

Grazing Intensity (Col. 37)--Intensity of utilization by livestock on the grasses, forbs, and shrubs will be determined by recording a 1-digit code to indicate the level of grazing intensity in the sample area.

<u>Code</u>	<u>Grazing Intensity</u>
0	None
1	Light grazing--difficult to find grazed plants. Less than 35 percent of plants grazed.
2	Moderate grazing--frequently find grazing on the sample acre. Generally 35 to 70 percent of plants are grazed.
3	Heavy grazing--extensive evidence of grazing on the sample acre. Generally more than 70 percent of plants grazed.

Livestock Access, 116

Livestock Access (Col. 38)--Record the 1-digit code which best describes the accessibility of the sample location to livestock for grazing use. Consider topography, remoteness, access, and seasonal availability.

<u>Code</u>	<u>Description</u>
1	Area fenced and readily available for grazing use, accessible all year, i.e. near farms, main roads, towns.
2	Area not fenced but readily available for grazing use, accessible all year.
3	Area fenced and readily available for grazing use, general summer range areas.
4	Area not fenced but readily available for grazing use, general summer range areas.
5	Area located in high mountains, useful only for limited summer range.
6	Area generally not suitable for livestock range use because of very limited forage potential.
7	Area generally not suitable for livestock range use because of terrain and very limited forage potential.

People Use, 117

People Use (Col. 39-41)--This item refers to any use of the forest condition not associated with normal timber harvesting, thinning, TSI, fire protection and pest control. Signs of people may include such things as foot trails, horse trails, jeep roads, campsites and tire tracks from trail bikes. Record people use as a 1-digit code.

<u>Code</u>	<u>People Use</u>
0	No evidence of people use
1	Occasional use
2	Moderate use
3	Intensive use

Recreation Use, 118

Recreation Use (Col. 42-44)--Identify the primary, secondary, and tertiary type of recreation use, based on available evidence that prevails at each sample location. Record each use as a 1-digit code. Do not assign a secondary or tertiary use without a primary use.

<u>Code</u>	<u>Recreation Use</u>
0	None
1	Hiking
2	Hunting
3	Camping
4	Fishing
5	Trail bikes
6	Horse trails
7	Jeep trails
8	Boating
9	Other

Trails or Roads, 119

Trails or Roads (Col. 45)--Record as a 1-digit code the evidence that trails or roads are on or in the immediate vicinity of the sample location. Record the highest level of development.

<u>Code</u>	<u>Trails or Roads</u>
0	None
1	Paved highway
2	Gravel road
3	Dirt road
4	Unimproved road/powerlines, etc.
5	Jeep road
6	Improved trail
7	Unimproved trail
8	Livestock trails
9	Game trails

Availability, 120

Availability (Col. 46-47)--For the property containing the forest sample location record a 2-digit code to indicate whether the property is posted or restricted from public use. Record the most significant evidence as primary and any other evidence as secondary.

<u>Code</u>	<u>Evidence</u>
0	None
1	Locked gate
2	Keep out
3	Not trespassing
4	No hunting
5	No fishing
6	No dumping
7	Other posted signs
8	Owner contact
9	Other evidence

Litter Depth, 121

Litter Depth (Col. 48-49)--Record to the nearest 0.1 inch, using a 2-digit code, the average litter depth for the location. Litter consists of undecomposed leaves and/or needles, together with twigs, bark, etc. If less than .05, record 00.

Humus Depth, 122

Humus Depth (Col. 50-52)--Record to the nearest 0.1 inch, using a 3-digit code, the average humus depth for the location. Humus is the organic layer unrecognizable as to origin, immediately beneath the litter layer from which it is derived.

Soil Texture, 123

Soil Texture (Col. 53-54)--Record as a 2-digit code. Soil texture or the soil surface is determined by the feel of moist soil when it is rubbed between thumb and fingers (refer to soil reference attached). Record the A horizon texture first, then the B horizon, from a representative sample in the location area.

<u>Code</u>	<u>Soil Texture</u>
1	Sands
2	Sandy loams
3	Loams
4	Clay loams
5	Clays

Soil Group, 124

Soil Group (Col. 55)--Determine the proper soil group.

<u>Code</u>	<u>Group</u>
1	Very shallow--less than 10 inches deep.
2	Shallow--10 to 20 inches deep.
3	Deep and moderately deep - more than 20 inches to strata prohibiting root development.
4	Coarse soils - soils with average coarse fragment volumes greater than 50 percent and textures coarser than sandy loam in the top 20 inches of the soil profile.

Percent Bare Ground, 125

Percent Bare Ground (Col. 56-57)--Record to the nearest 1 percent, using a 2-digit code, the percent of the sample area that is bare ground. Bare ground is exposed soil and rock fragments up to 3/4-inch (longest dimension).

Percent Compaction, 126

Percent Compaction (Col. 58-59)--Record to the nearest 5 percent, using a 2-digit code, any recent evidence that the sample area has become compacted due to logging and/or trampling by livestock, wildlife, or man. If the entire sample acre has experienced compaction, record 99 percent. Soil compaction will be defined as the packing together of soil particles by forces exerted at the soil surface resulting in an increase in soil density through a decrease in pore space.

Soil Structure, 127

Soil Structure (Col. 60)--Record the soil structure code which best describes the soil in the vicinity of the field location.

<u>Code</u>	<u>Structure</u>
1	Prismatic
2	Columnar
3	Angular blocky
4	Subangular blocky
5	Platy
6	Granular

TYPES OF SOIL STRUCTURE



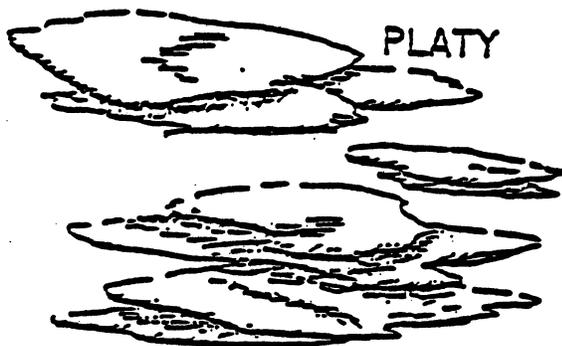
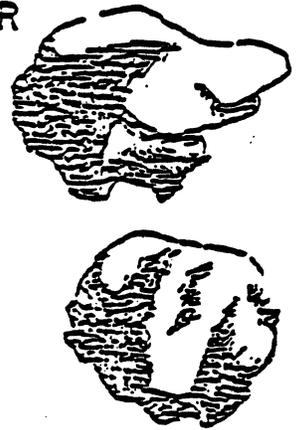
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COLUMNAR



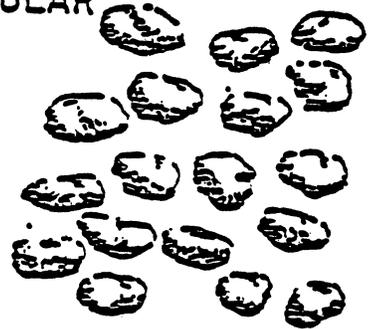
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BLOCKY

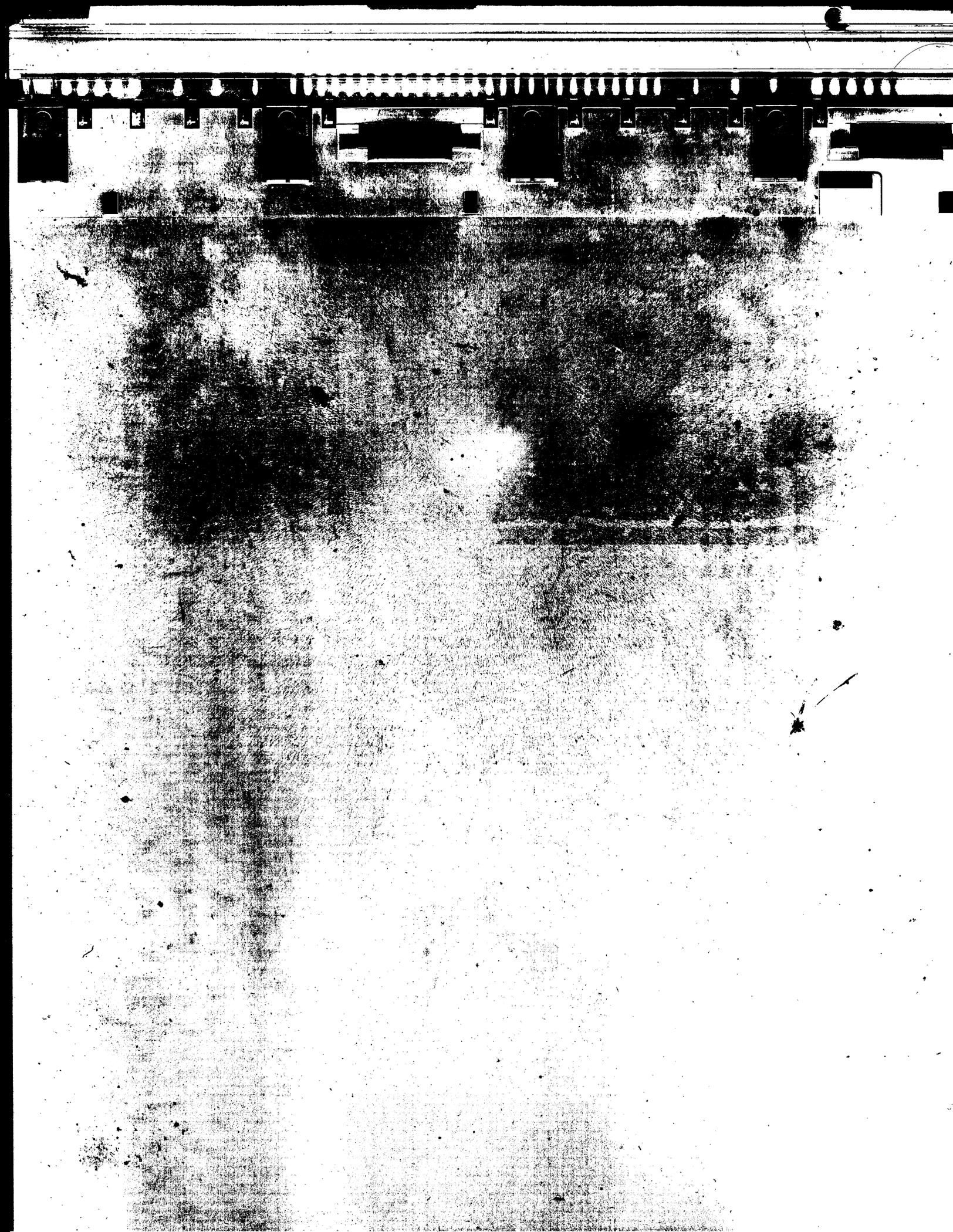
SUB-ANGULAR  
BLOCKY



PLATY

GRANULAR





Soil Erosion (Col. 61)--Soil erosion is the process of removal of soil material by running water, wind or gravitational creep. Factors that affect soil erosion are climate, nature of the soil, slope, vegetation and cultivation practices. The degree of soil erosion will be determined on each forest location by examining the amount of soil on the location area that has been removed by the flow of water. Record a 1-digit code.

<u>Code</u>	<u>Degree of erosion</u>
0	None
1	Light (very little sheet erosion)
2	Medium (both sheet and rill erosion)
3	High (bad rill erosion-gullies)

Sheet erosion - is a term applied to the removal of more or less uniform layer of material from the soil surface.

Rill erosion - is applied to the type of erosion which results in the formation of small channels in the land surface.

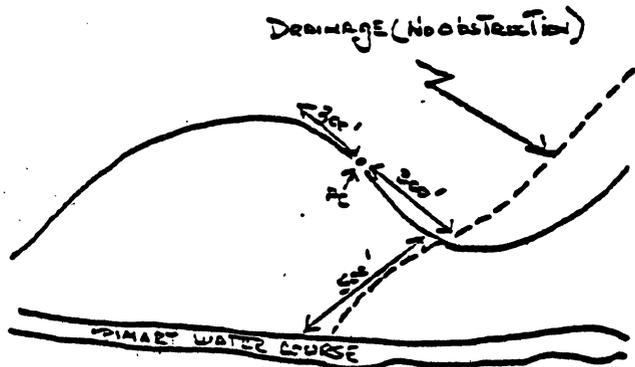
#### Slope Length, 129

Slope Length (Col. 62-64)--In the mountain regions potential erodibility hazards exist on many forested acres, primarily due to the slope length and percent slope. The harvesting of trees on steep slopes close to a water course can cause varying degrees of non-point source pollution depending on the degree of disturbance. To quantify the potential erodibility risks, a slope length will be determined based on the topographic features associated with each sample location. A 3-digit code will be used to code the length of slope from the highest point that drains through the location to the primary water course. Small and large, year-round streams, rivers and lakes are examples of primary water courses.

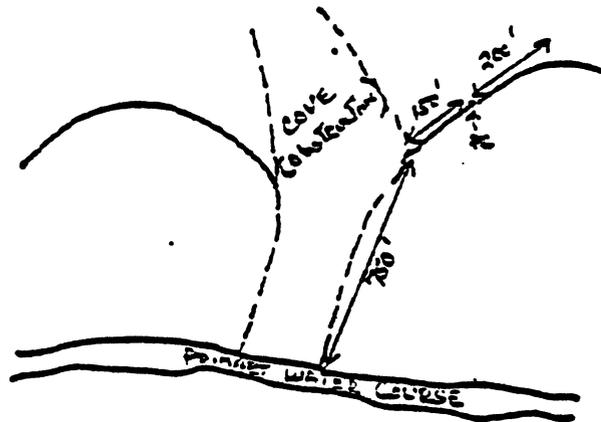
The left digit will indicate the length of slope from the ridgetop to the center of point 1 (plot center). The middle digit will indicate the distance from location center to the first definite obstruction encountered by surface water such as a water course, stream levee, large hollow or cove, or depression. To qualify as an obstruction, it must break the flow of surface water and serve as a catchment of soil particles for the entire sample area. If there is no obstruction, the middle digit will be coded 0. When obstructions occur, the right digit will indicate the distance from the obstruction to the primary water course. If there is no obstruction, the right digit will (1) reflect the distance from plot center to the primary water course or (2) show that the location center falls in the primary water course.

Where no slope exists, erosion presents only a minor problem. Since the proximity of water is essential for wildlife, recreation use and livestock use, the right digit of the slope length item will be used to indicate

MOUNTAINS

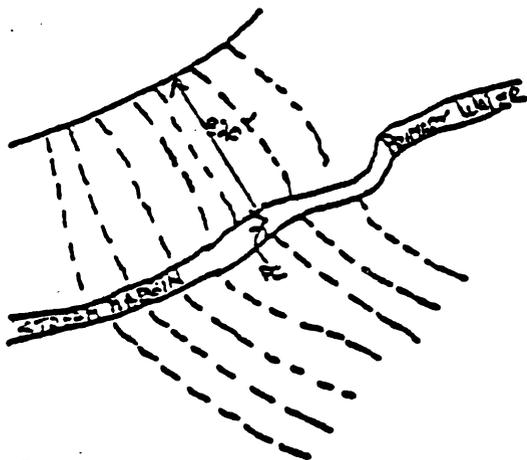


Coding: 309

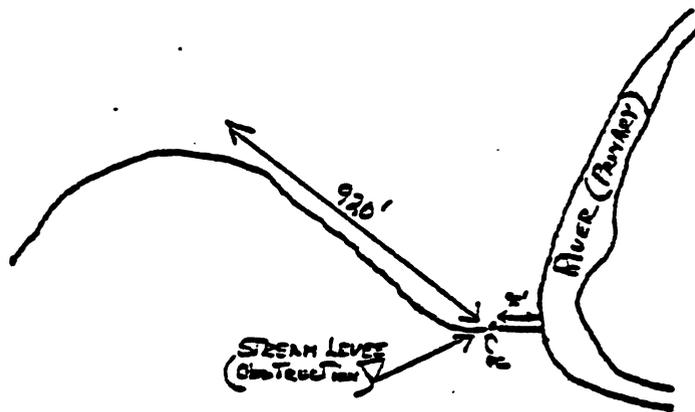


Coding: 328

POORHILLS



Coding: 900

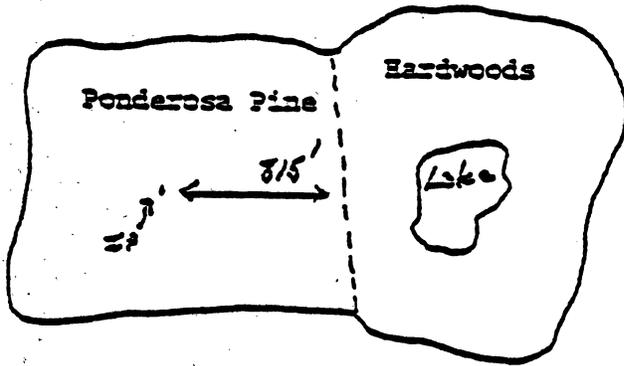


Coding: 911

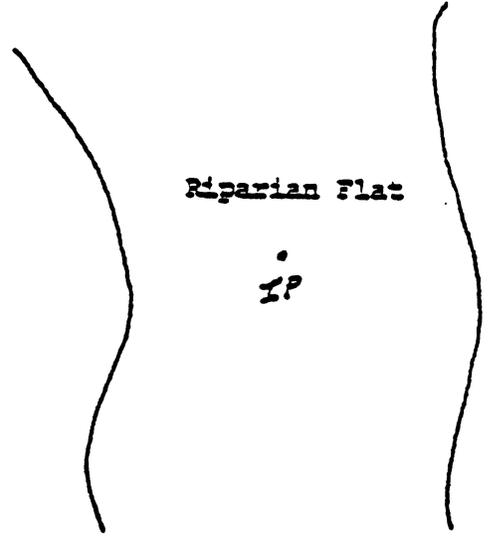
PC = Plot center

SLOPE LENGTH ILLUSTRATIONS  
(cont.)

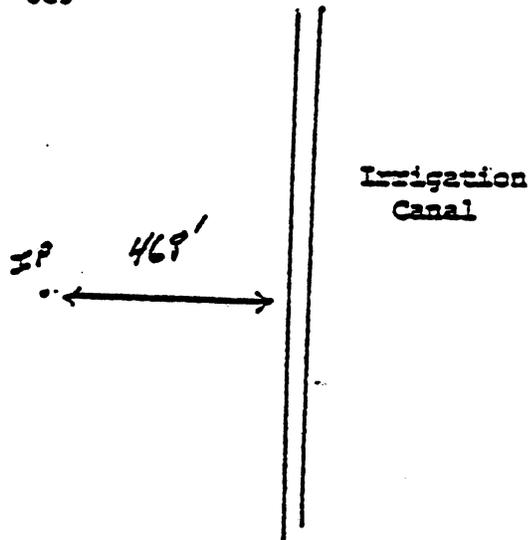
NO SLOPE



Coding: 009



Coding: 000



Coding: 005

the distance from location center to the nearest primary water course or water body. (A water course will be defined as a primary canal, stream, or river; and a water body as a pond or lake.) To code slope length, the left and middle digit will be 00, and right digit will reflect the distance from location center to the nearest primary water.

<u>Code</u>	<u>Slope Length or Distance to Water</u>
	- - Feet from sample center - -
0	No obstruction, no slope, or location center in primary water.
1	1 - 99
2	100 - 199
3	200 - 299
4	300 - 399
5	400 - 499
6	500 - 599
7	600 - 699
8	700 - 799
9	800 +

#### Micro Slope Length, 130

Micro Slope Length (Col. 65)--Micro slope length is a more refined measure of slope length than slope length. Micro slope length is defined as the distance from the point of origin (this is the point where the water starts to flow down slope) to either: (1) the point where the slope decreases to the extent that deposition begins or (2) the point where runoff enters a well-defined channel (gully, ditch, or stream) that may be part of a drainage network or a constructed channel such as a terrace, diversion, or road. At location center look up and down slope and visualize path of surface runoff as if area was total bare ground. Look for subtle topographic features.

<u>Code</u>	<u>Micro Slope Length</u>
	<u>(Feet)</u>
0	None
1	1-30
2	31-60
3	61-90
4	91-120
5	121-150
6	151-180
7	181-210
8	211-240
9	240+

Water Proximity, 131

Water Proximity (Col. 65)--Record the distance to the nearest permanent or reoccurring source of surface water. Consider only lake, reservoirs, ponds, and perrenial streams (of any width). Those water sources which may be dry in extremely dry weather should be included. Consider springs and seepage where observed if they appear permanent.

<u>Code</u>	<u>Distance</u>
0	Adjacent (200 feet or less)
1	201-300 feet
2	301-500 feet
3	501-700 feet
4	701-900 feet
5	901-1100 feet
6	1100-1320 feet
7	1/4-1/2 mile (1320-2640 feet)
8	1/2-1 mile
9	1 mile or more

Water Type, 132

Water Type (Col. 67)--Record the water type from the code list for the water recorded above.

<u>Code</u>	<u>Type</u>
0	None
1	Permanent, full time
2	Permanent, seasonal
3	Temporary or flooded
4	Occasional (recurring)
5	Catch basin
6	Irrigation
7	Other

Land Use Impact, 133

Land Use Impact (Col. 68-70)--Record the three land use impact categories nearest to the sample location. Record the nearest first, next second, and third last.

<u>Code</u>	<u>Land Use Impact Categories</u>
1	<u>Urban buildup</u> --residential, industrial, and recreation developments. Include areas with concentrations of houses, cabins, or vacation homes.
2	<u>Lakes and reservoirs</u> --including inlets, necks and coves attached to larger bodies of open water.

<u>Code</u>	<u>Land Use Impact Categories</u>
3	<u>Rivers and streams</u> --averaging over 30 feet wide within the condition of the forest location.
4	<u>Reserved forest land</u> --including parks and campgrounds not considered urban buildup.
5	<u>Agricultural lands</u> --including cropland, improved pasture, idle farmland, other farmland, homesteads, and other lands used primarily to support agricultural activities.
6	<u>Unproductive timberland or woodland</u> --includes any forest type or size class meeting definitions of unproductive timberland or woodland.
7	<u>Major highways</u> --interstate and other U.S. highways, beltways, and heavily traveled state roads.
8	<u>Other roads</u> --include other state roads, county roads, and other well maintained roads. Includes powerlines, railroads, gaslines, drainage ditches, etc.
9	<u>Rangeland</u> --includes all natural rangeland, including alpine or openings, not qualifying as forest land (10 percent crown cover).

Size of Condition. 134

Size of Condition (Col. 71)--Record the code which applies to the size of the relatively homogeneous vegetative condition including the sample location.

<u>Code</u>	<u>Size</u>
1	1-5 acres
2	6-10 acres
3	11-20 acres
4	21-40 acres
5	41-160 acres
6	161-640 acres (1 sq. mile)
7	1-5 square miles
8	5-20 square miles
9	21+ square miles

Size of Forested Area, 135

Size of Forested Area (Col. 72)--Record the code which applies to the size of the continuous forested area surrounding the location. Any land use classification or ownership may be included. Use the code list above.

Burn History, 136

Burn History (Col. 73)--For each sample location, look for evidence of past fires; estimate the number of years ago it was burned. If there is evidence of more than one fire, record the most recent. Record as a 1-digit code.

<u>Code</u>	<u>Burn History</u>
0	None (no evidence)
1	Burned within past year
2	Burned within past 1-3 years
3	Burned within past 3-10 years
4	Burned beyond 10 years

Cutting History, 137

Cutting History (Col. 74)--Estimate the time since last timber or wood harvesting in the condition being sampled. Record the appropriate 1-digit code.

<u>Code</u>	<u>Cutting History</u>
0	None
1	Within last year
2	Within past 1-3 years
3	Within past 3-10 years
4	Beyond 10 years

Type of Cutting, 138

Type of Cutting (Col. 75-76)--Record the type of cutting if there is evidence of past cutting of trees. Record the two codes which indicate the most recent and a previous harvest, if any.

<u>Code</u>	<u>Apparent Cutting Purpose</u>
0	None
1	Fuel wood or groundwood-woodland
2	Christmas trees-woodland
3	Overwood removal-Timberland
4	Thinning-Timberland
5	Selective harvest-Timberland
6	Clearcut-Timberland
7	Seed Tree-Timberland
8	Other-Timberland
9	Land clearing-any forest

Blank, 139

Blank (Col. 78-78)

Owner, 140

Owner (Col. 79-80)--Record the appropriate ownership code as recorded on the Timber Field Location Record sheet.

MULTIRESOURCE DATA

101 State \_\_\_\_\_ 104 Card Type \_\_\_\_\_ 107 Working Circle \_\_\_\_\_ 110 Location Number \_\_\_\_\_  
 102 Map Number \_\_\_\_\_ 105 Region \_\_\_\_\_ 108 Sample Area \_\_\_\_\_  
 103 Point Number \_\_\_\_\_ 106 Forest \_\_\_\_\_ 109 County \_\_\_\_\_

111 Wildlife Cover	112 Vegetative Concealment	113 Browsing	114 Wildlife Use	115 Grazing Intensity	116 Livestock Access	117 People Use	118 Recreation Use	119 Trails or Roads	120 Availability	121 Litter Depth	122 Humus Depth	123 Soil Texture	124 Soil Group	125 Percent Bare Ground	126 Percent Compaction	127 Soil Structure	128 Soil Erosion	129 Slope Length	130 Micro Slope Length	131 Water Proximity	132 Water Type	133 Land Use Impact	134 Size of Condition	135 Size of Forested Area	136 Burn History	137 Cutting History	138 Type of Cutting	139	140 Owner
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Cover 111 Degree of Browsing 113

Code	Description	Code	Code
00	No cover	0	No browsing
01	Logging slash or brush pile	1	Light browsing--difficult to find
02	Windrows	1	browsed plants in the sample area,
03	Mill residues (slabs, etc.)	2	less than 5 percent of plants grazed.
04	Abandoned structures	3	Moderate browsing--frequently find
05	Vegetative thickets	3	browsing in the sample area.
06	Hollow log		
07	Hollow stump		
08	Fallen tree, limb, or top		
09	Rock outcrops		
10	Rock pile		
11	Gullies		
12	Coves		
13	Burrows		
14	Marsh condition		
15	Litter or trash pile		
16	Artificial cover		
	Wildlife 114	0	None
	None apparent	1	Light grazing--difficult to find
	Deer	1	grazed plants. Less than 35 per-
	Elk	2	cent of plants grazed.
	Moose	2	Moderate grazing--frequently find
	Antelope	2	grazing on the sample acre. Generally
	Bear	3	35 to 70 percent of plants are grazed.
	Beaver	3	Heavy grazing--extensive evidence of
	Porcupine	3	grazing on the sample acre. Generally
	Rabbits and small mammals	3	more than 70 percent of plants grazed.
	Other	3	

Code	Description	Code	Code
1	Area fenced and readily available for grazing use, accessible all year, i.e. near farms, main roads, towns.	1	No evidence of people use
2	Area not fenced but readily available for grazing use, accessible all year.	2	Occasional use
3	Area fenced and readily available for grazing use, general summer range areas.	3	Moderate use
4	Area not fenced but readily available for grazing use, general summer range areas.	4	Intensive use
5	Area located in high mountains, useful only for limited summer range.		
6	Area generally not suitable for livestock, range use because of very limited forage potential.		
7	Area generally not suitable for livestock, range use because of terrain and very limited forage potential.		

Code	Description	Code	Code
112	Concealment Class	112	
1	Cruiser can be easily seen		
2	Cruiser partially obscured		
3	Cruiser not easily seen		
4	Cruiser completely obscured		

**Land Use Impact Categories 111**

- 1 Urban bulldozer--residential, industrial, and recreation developments. Include areas with concentrations of houses, cabins, or vacation homes.
- 2 Lakes and reservoirs--including inlets, weirs and covers attached to larger bodies of open water.
- 3 Rivers and streams--averaging over 30 feet wide within the condition of the forest location.
- 4 Reserved forest land--including parks and campgrounds not considered urban bulldozer.
- 5 Agricultural lands--including cropland, improved pasture, tile farmland, other farmland, homesteads, and other lands used primarily to support agricultural activities.
- 6 Unproductive timberland or woodland--includes any forest type or size class meeting definitions of unproductive timberland or woodland.
- 7 Major highways--interstate and other U.S. highways, beltways, and heavily traveled state roads.
- 8 Other roads--include other state roads, county roads, and other well maintained roads. Includes powerlines, railroads, gaslines, drainage ditches, etc.
- 9 Rangeland--includes all natural rangeland, including alpine or openings, not qualifying as forest land (10 percent crown cover).

**Code**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

**Degree of erosion 120**

- 0 None
  - 1 Light (very little sheet erosion)
  - 2 Medium (both sheet and rill erosion)
  - 3 High (bad rill erosion-gullies)
- Sheet erosion - is a term applied to the removal of more or less uniform layer of material from the soil surface.
- Rill erosion - is applied to the type of erosion which results in the formation of small channels in the land surface.

**Slope Length or Distance to Water 129**

- 0 In obstruction, no slope, or location center in primary water.
- 1 1 - 99
- 2 100 - 199
- 3 200 - 299
- 4 300 - 399
- 5 400 - 499
- 6 500 - 599
- 7 600 - 699
- 8 700 - 799
- 9 800 +

**Recreation Use 110**

- 0 None
- 1 Hiking
- 2 Hunting
- 3 Camping
- 4 Fishing
- 5 Trail bikes
- 6 Horse trails
- 7 Jeep trails
- 8 Boating
- 9 Other

**Trails or Roads 119**

- 0 None
- 1 Paved highway
- 2 Gravel road
- 3 Dirt road
- 4 Unimproved road/powerlines, etc.
- 5 Jeep road
- 6 Improved trail
- 7 Unimproved trail
- 8 Livestock trails
- 9 Game trails

**Micro Slope Length 130**

- 0 None
- 1 1-30
- 2 31-60
- 3 61-90
- 4 91-120
- 5 121-150
- 6 151-180
- 7 181-210
- 8 211-240
- 9 240+

**Soil Texture 123**

- 1 Sands
- 2 Sandy loams
- 3 Loams
- 4 Clay loams
- 5 Clays

**Evidence 120**

- 0 None
- 1 Locked gate
- 2 Keep out
- 3 Not trespassing
- 4 No hunting
- 5 No fishing
- 6 No dumping
- 7 Other posted signs
- 8 Owner contact
- 9 Other evidence

**Code**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

**Distance 131**

- 0 Adjacent (200 feet or less)
- 1 201-300 feet
- 2 301-500 feet
- 3 501-700 feet
- 4 701-900 feet
- 5 901-1100 feet
- 6 1100-1320 feet
- 7 1/4-1/2 mile (1320-2640 feet)
- 8 1/2-1 mile
- 9 1 mile or more

**Code**

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

**Group 124**

- 1 Very shallow--less than 10 inches deep.
- 2 Shallow--10 to 20 inches deep.
- 3 Deep and moderately deep - more than 20 inches to strata prohibiting root development.
- 4 Coarse soils - soils with average coarse fragment volumes greater than 50 percent and textures coarser than sandy loam in the top 20 inches of the soil profile.

**Code**

- 1
- 2
- 3
- 4

**Code**

- 0 None (no evidence)
- 1 Burned within past year
- 2 Burned within past 1-3 years
- 3 Burned within past 3-10 years
- 4 Burned beyond 10 years

**Code**

- 0 None
- 1 Within last year
- 2 Within past 1-3 years
- 3 Within past 3-10 years
- 4 Beyond 10 years

**Code**

- 1 1-5 acres
- 2 6-10 acres
- 3 11-20 acres
- 4 21-40 acres
- 5 41-160 acres
- 6 161-640 acres (1 sq. mile)
- 7 1-5 square miles
- 8 5-20 square miles
- 9 21+ square miles

**Code**

- 1 None
- 2 Permanent, full time
- 3 Permanent, seasonal
- 4 Temporary or flooded
- 5 Occasional (recurring)
- 6 Catch basin
- 7 Irrigation
- 8 Other

**Code**

- 1 132
- 2 133
- 3 134
- 4 135

**Code**

- 0 None
- 1 Within last year
- 2 Within past 1-3 years
- 3 Within past 3-10 years
- 4 Beyond 10 years

**Code**

- 0 None
- 1 Fuel wood or groundwood-woodland
- 2 Christmas trees-woodland
- 3 Overwood removal-Underland
- 4 Thinning-Underland
- 5 Selective harvest-Underland
- 6 Clearcut-Underland
- 7 Seed tree-Underland
- 8 Other-Underland

**Code**

- 0 None
- 1 Within last year
- 2 Within past 1-3 years
- 3 Within past 3-10 years
- 4 Beyond 10 years

**Code**

- 0 None
- 1 Within last year
- 2 Within past 1-3 years
- 3 Within past 3-10 years
- 4 Beyond 10 years

**Code**

- 0 None
- 1 Within last year
- 2 Within past 1-3 years
- 3 Within past 3-10 years
- 4 Beyond 10 years

APPENDIX 7

UNDERSTORY VEGETATION DESCRIPTION

## UNDERSTORY VEGETATION DESCRIPTION

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## UNDERSTORY VEGETATION DESCRIPTION

Understory vegetation data will be collected at each forested sample location. Information will be collected for all vegetation except timber tree species 1.0 inch d.b.h. or larger, and other tree species 1.0 inch d.r.c. or larger on woodland plots.

### SAMPLE PLOT SIZE

Part II of the understory vegetation data will be estimated and recorded on 1/20 acre circular plots surrounding each sample point. The radius of a circular 1/20 acre plot is 26.3 feet.

### SAMPLE IDENTIFICATION

State  
PI Map Number  
PI Point Number  
Sample Area  
County  
Location Number

State, PI Map Number, PI Point Number, Sample Area, County and Location Number--record the same codes for these items as recorded on the Field Location Record Sheet (Card Type 1).

### VEGETATION DESCRIPTION

The understory vegetation description will be broken down into two parts. Part I will be a summary of the major species on the whole plot. Part II will be done on each sample point.

Part I entails an assessment of the major species on the plot which constitute at least 5% cover. A cover class and vegetation layer will be assigned to the predominant species recorded under the appropriate plant group heading.

Part II entails an assessment of the plant groups on the plot by layer--0-1.5', 1.6-6', 6.1'+. Within each layer, a cover class will be assigned to each plant group that occurs.

## GENERAL DEFINITIONS

### Plant Group

The vegetation on each plot is broken down into four growth forms or plant groups; trees, shrubs, forbs, and graminoids, which are defined as follows:

#### PLANT GROUPS

**TREES:** Woody, single-stemmed plants. All timber tree species are considered trees and will be recorded under the TREES plant group. Other tree species will be recorded under TREES when they meet the criteria for trees - otherwise they will be recorded under SHRUBS.

Timberland plots - Record all timber species <1.0" d.b.h. Record all other tree species which are single stemmed, regardless of d.r.c.

Woodland plots - Record all timber species <1.0" d.b.h. Record all other tree species which are single stemmed and <1.0" d.r.c.

**SHRUBS:** Woody, multiple stemmed plants. Other tree species which are multiple stemmed, fork above or below ground, and have no dominant main stem will be recorded under the SHRUBS plant group. For the purposes of the understory vegetation descriptions, distinction between trees and shrubs should be made in terms of growth form, rather than species. If plants of one species happen to occur on the same plot in both tree and shrub form, classify all the plants of that species as either one form or the other. If there is a question as to whether a species is shrub form or tree form, classify it as a shrub. Cactus would be classified in the shrub category.

**FORBS:** Herbaceous, broad leaved plants; includes vines and ferns.

**GRAMINOIDS:** Grasses and grass-like (rushes and sedges).

### Crown Canopy Cover Class

Crown canopy cover is defined as the area of ground surface covered by the canopy of a plant. Canopy coverage will be estimated by assigning one of the following coverage classes to each plant group:

Table 1--Crown Canopy Cover Class Codes,  
definitions and area representation

CROWN CANOPY COVER CLASS CODES	PERCENT CROWN CANOPY COVERAGE	Maximum Size of Area Covered for 1/20 acre plot
1	2-5%	5.9 foot radius
2	6-25%	13.2 foot radius
3	26-50%	1/2 of total area
4	51-75%	3/4 of total area
5	76-95%	95% of total area
6	96-100%	100% of total area

A crown canopy coverage class will be given to individual species in Part I, and to plant groups in Part II. These cover classes are the same as those used in Habitat Typing.

In a 1/20 acre plot, a circle 5.9 feet in radius or a square 10.4 feet on a side would represent 5% of the total plot area. Any one species would have to cover at least this much ground for it to be recorded.

#### ENTRIES TO BE RECORDED

##### Part I

##### Species

In the appropriate plant group column, record up to five species which occur on the plot with 5% cover or greater. If there are more than five species per plant group on a plot, record the most dominant first. In most cases the species being recorded will be indicator species. Species codes will be assigned according to the conventions used in Intermountain Range Plant Names and Symbols, General Technical Report INT-38. If the abbreviation for a certain species is not listed in the handbook, record the abbreviation for that species using the first two letters of both the genus and species, and write out the scientific name at the bottom of the page. These codes will be recorded in capital letters under the appropriate species column. In the event qualifying species cannot be identified to species level, record UNKN1 in the species column for the first unknown, UNKN2 for the second unknown, and so forth. A specimen of each unknown should be collected, identified as to location number, point number, plant group, and UNKN\_ code and returned to the field supervisor. Collect more than one specimen where possible, and include roots and flowers or seed heads.

##### Species Canopy Cover Class

For each species recorded, crown canopy cover should be determined. Canopy coverage can be estimated by assigning one of the coverage classes presented in Table 1. Crown canopy cover is identified as the area of ground surface covered by, in this case, the canopy of each plant species.

Species  
Vegetation  
Layer

For each species recorded, one of the following vegetation layers will be assigned. These layers will illustrate the vertical diversity of the plot.

<u>Code</u>	<u>Item</u>
1	Layer 1 - (0-1.5')
2	Layer 2 - (1.6-6')
3	Layer 3 - (6.1'+)

The 1.5 and 6 foot boundaries should be considered approximate. For example, layer 1 should be visualized as graminoids, forbs, and low shrubs which occur below your knee. Layer 2 should include those plants which occur between knee and eye level, possibly grasses or forbs, but usually medium shrubs. Layer 3 includes plants occurring above eye level and would be almost exclusively trees and tall shrubs. A species can be assigned only one vegetative layer. If a species is found in more than one layer, assign the layer in which the bulk of that species occurs. If a species occurs equally in more than one layer, record the highest layer in which it occurs.

PART II

Cover Class By  
Layer and Plant  
Group

In Part II, a canopy cover class will be assigned to each plant group that occurs in each of the three plant layers. Plant groups recorded in each layer will include plants whose heights end in that layer. Thus, any shrub whose height is over six feet will be considered in layer 3, any shrub whose height is between 1.5 and 6 feet will be considered in layer 2, and so forth.

If a plant group does not occur within a layer or does not constitute at least 5% cover in that layer, record zero for the cover class. Estimate the cover by assigning the appropriate cover class found in Table 1. Crown canopy cover is identified as the area of ground surface covered by, in this case, the canopy of each plant group occurring in each of the three layers.

One species may be represented on a plot by plants growing in two layers. In Part I, because each species could be assigned only one layer, the layer in which the bulk of the species occurred was recorded. In Part II, species detail is not a consideration. Although the same plant cannot be assigned to two layers, plants from the same species may occur in more than one layer. For example, sagebrush plants may occur with heights ranging from 1 foot to 5 feet. Those plants whose heights are between 0 and 1.5 feet would be considered in layer 1, and those plants whose heights are between 1.6 and 6 feet would be considered in layer 2.

This procedure will be useful in picking up plants which were too insignificant to record by species, but which may contribute when grouped together.

### Code List

#### Cover Codes

<u>% Cover</u>	<u>Code</u>
5%	1
6-25%	2
26-50%	3
51-75%	4
76-95%	5
96-100%	6

#### Layer Codes

<u>Height (feet)</u>	<u>Code</u>
0-1.5	1
1.6-6	2
6.1+	3

### PREFERRED FORAGE SPECIES

The following species are considered to be preferred for forage by different livestock and big game animals in Wyoming. Any occurrence of these species on a plot must be recorded. If the cover of a preferred species is 5% or greater it will be recorded in the usual manner. If a preferred species occurs with less than 5% cover it will be recorded in the space designated forage preference species.

#### Grasses

Montana wheatgrass	Agropyron albicans
Griffiths wheatgrass	Agropyron griffithsii
Bluebunch wheatgrass	Agropyron spicatum
Slender wheatgrass	Agropyron trachycaulum
Red top	Agrostis alba (= A. stolonifera)
Spike bentgrass	Agrostis exarata
Thurber bentgrass	Agrostis thurberiana
Big bluestem	Andropogon gerardi

Grasses (con.)

Sand bluestem

*Andropogon hallii*

Little bluestem

*Andropogon scoparius* =  
(*Schizachyrium scoparium*)

Sideoats grama

*Bouteloua curtipendula*

Nodding brome

*Bromus anomalus*

Mountain brome

*Bromus carinatus*

Smooth brome

*Bromus inermis*

Northern reedgrass

*Calamagrostis inexpansa*

Bluejoint reedgrass

*Calamagrostis canadensis*

Prairie sand reed

*Calamovilfa longifolia*

Sedges

*Carex* spp.

California danthonia

*Danthonia californica*

Parry danthonia

*Danthonia parryi*

Onespike danthonia

*Danthonia unispicata*

Tufted hairgrass

*Deschampsia caespitosa*

Canada wildrye

*Elymus canadensis*

Basin wildrye

*Elymus cinereus*

Blue wildrye

*Elymus glaucus*

Salina wildrye

*Elymus salinus*

Idaho fescue

*Festuca idahoensis*

Sheep fescue

*Festuca ovina*

Sweet grass

*Hierochloa odorata*

Spike fescue

*Leucopoa Kingii* =  
(*Hesperochloa Kingii*)

Grasses (con.)

Bloomer ricegrass	Oryzopsis Bloomerii
Indian ricegrass	Oryzopsis hymenoides
Switch grass	Panicum virgatum
Alpine timothy	Phleum alpinum
Mutton bluegrass	Poa fendleriana = (P. cusickii)
Alkali bluegrass	Poa juncifolia
Sandberg bluegrass	Poa sandbergii = (P. ampla, P. nevadensis, P. canbyi)
Nuttal alkali grass	Puccinellia airoides
Blowout grass	Redfieldia flexuosa
Bottlebrush squirreltail	Sitanion hystrix
Indian grass	Sorghastrum nutans
Prairie cordgrass	Spartina pectinata
Alkali sacaton	Sporobolus airoides
Prairie dropseed	Sporobolus heterolepis
Columbia needlegrass	Stipa columbiana
Letterman needlegrass	Stipa lettermanii
Western needlegrass	Stipa occidentalis
Richardson needlegrass	Stipa Richardsonii
Green needlegrass	Stipa viridula
Williams needlegrass	Stipa Williamsii
Spike trisetum	Trisetum spicatum
Wolfs trisetum	Trisetum wolfii

### Forbs

Milkvetch	Astragalus spp.
Arrowleaf balsamroot	Balsamorhiza sagittata
Hawksbeard	Crepis spp.
Sticky geranium	Geranium viscosissimum
Little sunflower	Helianthella
Cow parsnip	Heracleum lanatum
Waterleaf	Hydrophyllum spp.
Dotted gayfeather	Liatris punctata
Bluebells	Mertensia spp.
Penstemon	Penstemon spp.
Prairie clover	Petalostemon spp.
Prairie coneflower	Ratibida spp.
Blue-eyed grass	Sisyrinchium demissum
Scarlet globemallow	Sphaeralcea coccinea
Meadow rue	Thalictrum spp.
Clover	Trifolium spp.
Vallerian	Valleriana spp.
American velch	Vicia americana

### Shrubs

Service berry	Amelanchier spp.
Silver sagebrush	Artemesia cana
Black sagebrush	Artemesia nova
Bud sagebrush	Artemesia spinescens
Fourwing saltbush	Atriplex canescens

Shrubs (con.)

Gardner's saltbush

*Atriplex gardneri*

Snowbush ceanothus

*Ceanothus velutinus*

Winterfat

*Ceratoides lanata*

True mountain mahogany

*Cercocarpus montanus*

Curleaf mountain mahogany

*Cercocarpus ledifolius*

Rubber rabbitbrush

*Chrysothamnus nauseosus*

Low Douglas rabbitbrush

*Chrysothamnus pumilus*

Dogwood

*Cornus* spp.

Chokecherry

*Prunus virginiana*

Antelope bitterbrush

*Purshia tridentata*

Willow

*Salix* spp.

UNDERSTORY VEGETATION DESCRIPTION FORM

State \_\_\_ County \_\_\_ Map Number \_\_\_ Forest \_\_\_  
 Card Type 4 Location \_\_\_ Point Number \_\_\_ Working Circle \_\_\_  
 Sample Area \_\_\_ Owner \_\_\_ Region \_\_\_

	PART 1 - SPECIES LIST BY COVER CLASS AND LAYER												PART 2 - PLANT GROUP COVER CLASS BY LAYER					POINT NUMBER
	TREES			SHRUBS			FORBS			GRAMINOIDS			Layer	TREES	SHRUBS	FORBS	GRAMINOIDS	
	Species	Cover	Layer	Species	Cover	Layer	Species	Cover	Layer	Species	Cover	Layer						
	XXXXX	X	X	XXXXX	X	X	XXXXX	X	X	XXXXX	X	X						
Dominant Species	ABLA	1	2	RICE	2	2	VIQB	1	1	AGRO	3	1	3 (6.1' +)	0	0	0	0	1
	ABGR	1	1				PRVU	1	2	PHPR	2	1	2 (1.6-6')	1	2	0	0	
							CIVU	1	1				1 (0-1.5')	1	0	4	4	
													3	0	0	0	0	
Forage preference	CEBE		2	ARCA		1				BRAN		1	2	0	1	0	0	2
													1	2	0	1	5	
													3	0	0	0	0	
													2	0	4	0	0	
													1	1	0	2	3	3
													3	0	2	0	0	
													2	0	2	0	0	4
													1	0	3	2	3	
													3	1	0	0	0	5
													2	0	3	0	0	
													1	1	0	1	2	

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