

FOREST MANAGEMENT CLIPBOARD

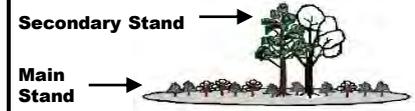
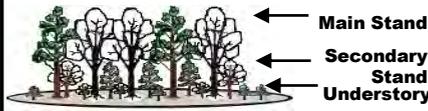
Steps to Assess, Plan, Design, and Implement a Forest Management Project

1. Discuss landowner goals and objectives. **1** Is there a need for a management plan? Gather field inventory data for all forest stand strata using fixed or variable radius plots and forest stand improvement inventory forms. Determine if a harvest permit is required. **2 - 8**
2. Compute correlations between average Trees/Acre, spacing, Basal Area, and diameter-at-breast-height or diameter-at-root-collar. Consider landowner objectives. **9** (Field Office Technical Guide – Forest Stand Improvement Inventory Forms – Section 4)
3. Complete an environmental evaluation of all benchmark conditions. (FOTG – Section 1)
4. Discuss management options and conservation treatment alternatives based on current conditions, forest ecology, and landowner goals: **10**
 - Forest stand enhancement – growth, thinning, harvest-reforestation, pests, aesthetics, wildlife, grazing, recreation **11**
 - Marketing -- forest product types, mills, hunting, recreational and other opportunities
 - Access and erosion control -- access roads, trails and landings, water bar spacing **12** critical area planting, streamside management areas **13**
 - Wildfire risk reduction -- firebreaks, fuel breaks, forest slash treatment, integration of access roads and trails, defensible space. **14**
5. Consider and select a slash treatment method. **15**
6. Return to the unit and mark/flag "leave" trees to demonstrate desired spacing. **16**

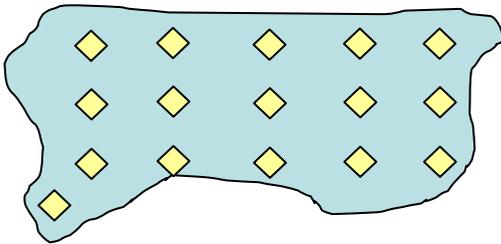
1 Purposes for Forest Stand Improvement (Practice 666) and Potential Landowner Goals

Increase the quantity and quality of forest products by manipulating stand density and structure.	Achieve a desired understory plant community for special forest products, grazing and browsing.
Harvest forest products (including an objective for renewable energy production).	Restore natural plant communities.
Initiate forest stand regeneration.	Improve aesthetic, recreation, and open space values.
Reduce wildfire hazard.	Improve wildlife habitat.
Improve forest health reducing the potential of damage from pests and moisture stress.	

2 Common Forest Stand Layers or Strata

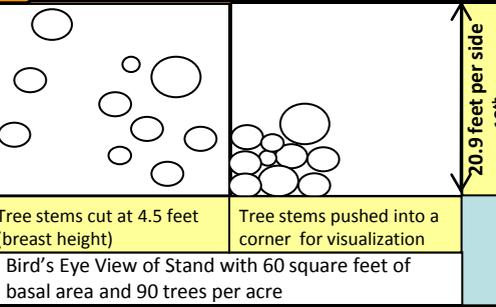


3 Sample Inventory Plot Layout – 160 acres, 10% sample with 16 plots

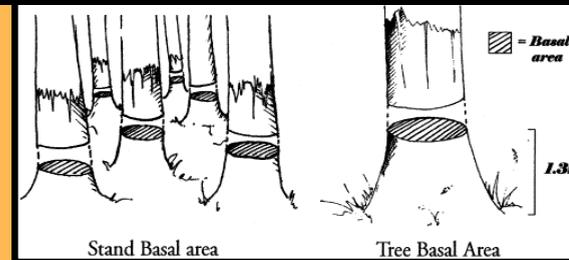


Number of plots and the layout will depend on stand type and diversity.

4 Visual Aids to Explain Basal Area



Use these images to understand and explain how square feet of basal area per acre relates to tree density.



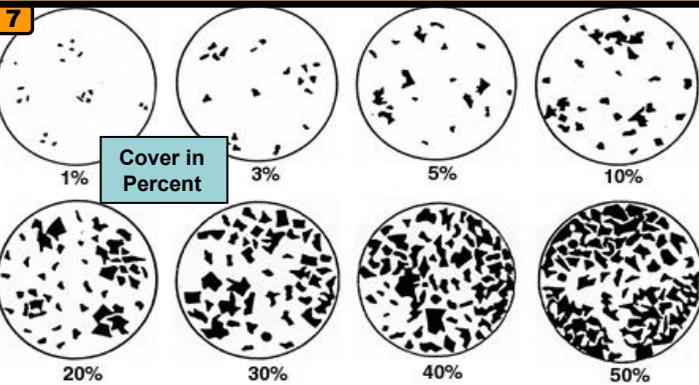
5 Is a Harvest Permit Required?

- Is it Private Land (not Tribal)?
- Are forest products being sold, or exchanged for services, on:
- 25 acres or more in a calendar year of larger material?
 - 75 acres or more in a calendar year of fuel wood?
- Note that every tree species in New Mexico is considered commercial. (Even oak if harvested with other commercial species)
- Follow Specs/Job Sheets and you should be in compliance with Best Management Practices.

6 Calculation: Equivalent Diam. at Root Collar for Multiple-Stemmed Trees

Instructions: Measure the diameter of each stem taller than 4.5 feet at the base of the stem approximately 12" off the ground.

$$EDRC = \sqrt{drc^2 + drc^2 + drc^2 + \dots} \text{ (the sq rt of the sum of the squared diam.)}$$



8 Forestry Conversion Factors

- 1 acre = 43,560 sq. ft. = 4,047 sq. meters = 0.405 hectares
- 1 cord = 85 cubic feet wood or 128 cuft wood + voids
- 1/1000-acre plot = 3.7 feet radius or 6.6 feet x 6.6 feet
- 1/500-acre plot = 5.3 feet radius or 9.3 feet x 9.3 feet
- 1/250-acre plot = 7.4 feet radius or 13.2 feet x 13.2 feet
- 1/100-acre plot = 11.8 ft. radius or 20.9 feet x 20.9 feet
- 1/20-acre plot = 26.3 feet radius or 46.7 feet x 46.7 feet
- 1/10-acre plot = 37.2 feet radius or 66 feet x 66 feet
- 1/4-acre plot = 58.9 feet radius or 104.4 feet x 104.4 feet
- 1/2-acre plot = 83.3 feet radius or 147.6 feet x 147.6 feet
- 1-acre plot = 118' radius or 209' x 209'; 1 meter = 39.37"

10
20
Basal Area Factor
at 24" reach from eye

9 Trees per Acre and Basal Area related to Average Diameter											
Avg DBH (in)	Square Ft. of Basal Area per Acre										
	40	50	60	70	80	90	100	110	120	140	
	Number of Trees Per Acre										
2	1834	2292	2750	3209	3667	4125	4584	5042	5501	6417	
4	458	573	688	802	917	1031	1146	1261	1375	1604	
6	204	255	306	357	407	458	509	560	611	713	
8	115	143	172	201	229	258	286	315	344	401	
10	73	92	110	128	147	165	183	202	220	257	
12	51	64	76	89	102	115	127	140	153	178	
14	37	47	56	65	75	84	94	103	112	131	
16	29	36	43	50	57	64	72	79	86	100	

If your trees are about 8" in diameter at breast height and you want to stock your land at 60 square feet of basal area per acre, you would have about 170 trees per acre.

150
140
130
Tree Height Scale
(read direct at 100 feet horizontal distance from tree holding scale 6" from eye)

10 Recommended Target Basal Area by Cover Type, Site Index, and Fire Regime				
Site Index	Piñon-Juniper	Ponderosa Pine	Mixed Conifer	Spruce-fir
Low SI	10-30 Savannah	40-50	80-90	Varies widely
Mid-Range SI	90-100 Persistent	50-70	90-100	Approx. 80-160
High SI		70-80	100-120	
Fire Regime (yrs)	Sav-freq. PW-infreq.	3-10	15-30 (dry) 100+ (wet)	300+

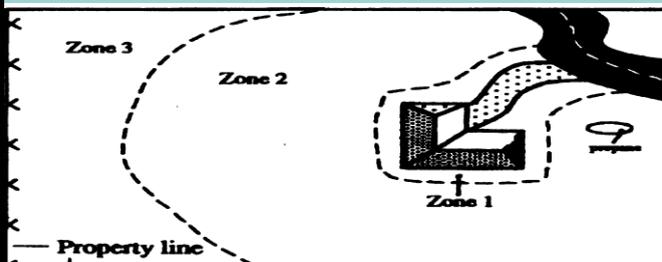
11 Hawksworth Dwarf Mistletoe Rating		
Instructions Step 1 – divide live crown into thirds Step 2 – rate each third separately 0 = no visible infections 1 = light (1/2 or less of total number of branches infected) 2 = heavy infection (more than 1/2 total number of branches in the third infected.) Step 3 = Add ratings of thirds to obtain rating for total tree.		Example If this third has no visible infections, its rating is (0).
		If this third is lightly infected, its rating is (1).
		If this third is heavily infected, its rating is (2).
		This tree gets a rating of 0 + 1 + 2 = 3

12 Road/Trail Drainage Guide	
Minimum legal requirements, spacing between water bars by % grade	
% Grade	Distance* (ft)
0-4.9	150
5.0-9.9	130
10.0-14.9	75
15.0-24.9	50
25.0-40	25

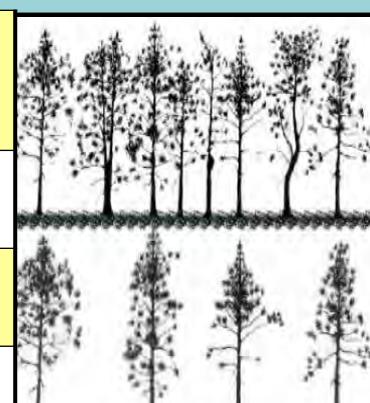
*Measured on/along road slope. More specific data dependent on aspect, parent material, and slope location found in Forest Practice Guidelines.

13 Streamside Management Area Guide	
% Slope (above stream)	Buffer Strip Width* (ft)
0	50
10	70
20	90
30	110
40	130
50	160
60	180
70	200

*Measured as horizontal distance.

14 Defensible Space Zones	
	Defensible Space is typically implemented around structures where wildfire presents a significant hazard. Zone 1 is 0-30 feet minimum (more depending on slope and plant type) where residual plants are lean, green, clean and well spaced. Zone 2 is from 30-100 feet and where heavy thinning should occur. Zone 3 is from 100- property boundary and where continued thinning should occur. www.livingwithfire.com

15 Slash Treatment Guidelines (Practice 384)	
Chipping – generally in defensible space or smaller projects. Leaves material on the ground in small chips. (avg depth 2", no >6")	
Mastication – often includes tree thinning in payment. Leaves material on the ground in chunks. (max depth 6-8", max length 3')	
Lop and Scatter – when material is left on the ground in small lengths. (max depth 3', max length 4')	
Pile and burn, Pile and remove – when material is left on the ground in piles for prescribed burning or for removal. (max - 12' by 12')	

16 Leave Tree Considerations	
Always think about the future quality of the stand when selecting residual trees.	
Work within the limitations of the stand and to the extent possible:	
Select healthy, well-formed trees without visible defect, decay, etc.	
On a tree with multiple stems or forks, take all or none.	

