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HOW TO PREPARE A SILVICULTURAL PRESCRIPTION FOR UNEVEN-AGED MANAGEMENT

PUEBLO, COLORADO

HOW TO PREPARE A SILVICULTURAL PRESCRIPTION

FOR UNEVEN-AGED MANAGEMENT

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INTRODUCTION

The Land and Resource Management Plan for the Pike and San Isabel National Forests specifies that uneven-aged management will be used in certain management areas for every species except aspen. Table 1 summarizes timber standards and guidelines from the Pike and San Isabel National Forests' Forest Plan. When reviewing Table 1, you'll notice that selection cutting is the primary cutting method (which means it will be used 80 percent or more of the time) in four management areas for spruce/fir stands, 1 management area for lodgepole pine, mixed conifer or ponderosa pine stands, and five management areas for other forest types except aspen. This emphasis on selection cutting is considerably greater than at any time in the past.

Uneven-aged management has only been attempted in one project area on the Pike and San Isabel National Forests (Jones Mountain area on Salida District). Some of the material in this paper represents the process used to prepare prescriptions and marking guides for the Jones Mountain timber sale.

In October of 1983, the Pike and San Isabel National Forests held a timber workshop, part of which was devoted to training about uneven-aged management. During the workshop, participants visited an uneven-aged spruce/fir stand for which a prescription and marking guide had been prepared (site 103510-0010 on Greenhorn Mountain, San Carlos Ranger District). They were divided into several groups and then attempted to implement the marking guide (but not with paint guns). The stand data and certain other information in this paper was taken from the October, 1983 timber workshop.

WHAT IS UNEVEN-AGED MANAGEMENT?

Uneven-aged management is manipulation of a stand for continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of age classes to provide a sustained yield of forest products. Selection involves the removal of both immature and mature trees, either in groups or individually, to maintain an uneven-aged stand structure. Since uneven-aged management is usually applied in uneven-aged stands, it would be helpful to discuss the differences between even-aged and uneven-aged stands.

Foresters generally classify stands on the basis of age-class composition. Strictly defined, an **even-aged stand** is one in which all trees are the same age (as in a plantation), but in common field usage, even-aged stands can have ages ranging up to 20 percent of the rotation length. Even-aged stands have a "bell shaped" diameter distribution, as shown below (from Daniel et al. 1979):

Table 1.--**Timber Standards and Guidelines From the Pike and San Isabel National Forests' Land and Resource Management Plan.**

MAs	ROTATIONS	GROW STOCK LEVELS	CUTTING CYCLES	ADOPT. VQOs	MIN STK	MIN. HEIGHT	CUT. METHODS
			SPRUCE/FIR COVER TYPE				
2A	100-180	60-160	20-30	PR	150	25%	SHELTERWOOD
2B	100-180	60-160	20-30	PR	150	25%	SHELTERWOOD
3A	100-180	60-160	20-30	PR	150	25%	SHELTERWOOD
4B	90-140	60-160	10-50	MOD	150	6'	CC & SELECT.
4D	NS(50-180)	NS(60-160)	NS(10-50)	MOD	150	6'	CC, SW & SEL
5B	NA	60-160	20-30	MOD	150	6'	SELECTION
6B	NS(50-180)	NS(60-160)	NS(10-50)	MOD	150	6'	CC & SHELTER.
7A	90-180	80-160	10-50	PR;MOD	150	25%;6'	CC & SHELTER.
7D	50-90	80-160	10-30	PR;MOD	150	25%;6'	SHELTERWOOD
9A	NA	90-160	20-30	PR	150	25%	SELECTION
9B	90-180	60-160	10-50	MOD	150	6'	CC & SELECT.
10E	90-180	60-160	10-50	MOD	150	6'	CC & SHELTER.
			LODGEPOLE PINE COVER TYPE				
2A	90-140	80-140	10-50	PR	150	25%	CLEARCUT
2B	90-140	80-140	10-50	PR	150	25%	CLEARCUT
3A	90-140	80-140	10-50	PR	150	25%	CLEARCUT
4B	90-140	60-160	10-50	MOD	150	6'	CLEARCUT
4D	NS(50-140)	NS(80-120)	NS(10-50)	MOD	150	6'	CC & SHELTER.
5B	90-140	60-160	10-50	MOD	150	6'	CLEARCUT
6B	90-140	NS(80-120)	NS(10-50)	MOD	150	6'	CLEARCUT
7A	90-180	80-160	10-50	PR;MOD	150	25%;6'	CLEARCUT
7D	50-90	80-140	10-30	PR;MOD	150	25%;6'	CLEARCUT
9A	NA	90-160	20-30	PR	150	25%	SELECTION
9B	90-180	60-160	10-50	MOD	150	6'	CLEARCUT
10E	90-180	80-160	10-50	MOD	150	6'	CLEARCUT
			ASPEN COVER TYPE				
2A	80-120	NA	NA	PR	300	25%	CLEARCUT
2B	80-120	NA	NA	PR	300	25%	CLEARCUT
3A	80-120	NA	NA	PR	300	25%	CLEARCUT
4B	80-120	NA	NA	MOD	300	6'	CLEARCUT
4D	80-120	NA	NA	MOD	300	6'	CLEARCUT
5B	80-120	NA	NA	MOD	300	6'	CLEARCUT
6B	80-120	NA	NA	MOD	300	6'	CLEARCUT
7A	80-120	NA	NA	PR;MOD	300	25%;6'	CLEARCUT
7D	60-80	NA	NA	PR;MOD	300	25%;6'	CLEARCUT
9A	80-120	NA	NA	PR	300	25%	CLEARCUT
9B	80-120	NA	NA	MOD	300	6'	CLEARCUT
10E	80-120	NA	NA	MOD	300	6'	CLEARCUT

Table 1.--(continued)

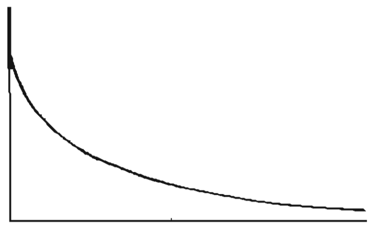
MAs	ROTATIONS	GROW STOCK LEVELS	CUTTING CYCLES	ADOPT. VQOs	MIN STK	MIN. HEIGHT	CUT. METHODS
			MIXED CONIFER (DF/WF) AND PONDEROSA PINE COVER TYPES				
2A	100-180	60-160	20-30	PR	190	25%	SHELTERWOOD
2B	100-180	60-160	20-30	PR	190	25%	SHELTERWOOD
3A	100-180	60-160	20-30	PR	190	25%	SHELTERWOOD
4B	100-160	60-160	20-30	MOD	190	6'	SHELTERWOOD
4D	NS(50-180)	NS(60-160)	NS(20-30)	MOD	190	6'	SHELTERWOOD
5B	100-160	60-160	20-30	MOD	190	6'	SHELTERWOOD
6B	100-160	NS(60-160)	NS(20-30)	MOD	190	6'	SHELTERWOOD
7A	100-160	60-160	20-30	PR;MOD	190	25%;6'	SHELTERWOOD
7D	50-90	80-160	10-30	PR;MOD	190	25%;6'	SHELTERWOOD
9A	NA	90-160	20-30	PR	190	25%	SELECTION
9B	90-180	60-160	10-50	MOD	190	6'	CLEARCUT
10E	100-160	60-160	20-30	MOD	190	6'	SHELTERWOOD
			OTHER FOREST TYPES				
2A	100+	60-120	10-50	PR	NS	NS	CC & SHELTER.
2B	100+	60-120	10-50	PR	NS	NS	CC & SHELTER.
3A	100+	60-120	10-50	PR	NS	NS	CC & SHELTER.
4B	100+	60-120	10-50	MOD	NS	NS	CC & SHELTER.
4D	NS(70+)	NS(60-120)	NS(10-50)	MOD	NS	NS	CC, SW & SEL
5B	100+	60-120	10-50	MOD	NS	NS	CC, SW & SEL
6B	NS(70+)	NS(60-120)	NS(10-50)	MOD	NS	NS	CC, SW & SEL
7A	100+	60-120	10-50	PR;MOD	NS	NS	CC & SHELTER.
7D	70+	60-120	10-30	PR;MOD	NS	NS	CC & SHELTER.
9A	NA	90-160	20-30	PR	NS	NS	SELECTION
9B	100+	60-120	20-40	MOD	NS	NS	CC & SELECT.
10E	100+	60-120	10-50	MOD	NS	NS	CC & SHELTER.

NA: NOT APPLICABLE; NS: NOT SPECIFIED IN MANAGEMENT AREA PRESCRIPTION (DEFAULTS TO FOREST DIRECTION).

MANAGEMENT AREA EMPHASES

2A: SEMIPRIMITIVE, MOTORIZED RECREATION OPPORTUNITIES.
2B: RURAL AND ROADED NATURAL RECREATION OPPORTUNITIES.
3A: SEMIPRIMITIVE, NONMOTORIZED RECREATION OPPORTUNITIES.
4B: WILDLIFE HABITAT FOR MANAGEMENT INDICATOR SPECIES.
4D: ASPEN MANAGEMENT.
5B: BIG GAME WINTER RANGE MANAGEMENT.
6B: LIVESTOCK GRAZING MANAGEMENT.
7A: WOOD FIBER PRODUCTION (SAWTIMBER-SIZED PRODUCTS).
7D: WOOD FIBER PRODUCTION (FUELWOOD MANAGEMENT).
9A: RIPARIAN AREA MANAGEMENT.
9B: INCREASED WATER YIELDS.
10E: MUNICIPAL WATERSHED MANAGEMENT.

Uneven-aged stands have at least three distinct age classes and usually have gaps in their age-class distribution. They have a diameter distribution with an "inverse-J" shape, as shown below (from Daniel et al. 1979):



The main biological differences between even-aged and uneven-aged stands can be compared as follows (adapted from Daniel et al. 1979):

	EVEN-AGED STANDS	UNEVEN-AGED STANDS
Canopy	A level, shallow canopy on slender stems.	A deep, irregular canopy with sturdy boles.
Wind Hazard	Careful management required to prevent windthrow losses, especially for shallow-rooted species.	Wind hazard very low.
Small Trees	Small trees are suppressed; release is unlikely.	Small trees are future crop trees and will respond to release.
Species Composition	Includes high percentage of shade-intolerant, seral species.	Includes high percentage of shade-tolerant, climax species.
Regeneration	Occurs over a short period.	Occurs continuously or over a long time period.
Site	Site exposed to erosion and harsh environmental effects during regeneration phase.	Openings are always protected by adjacent trees.
Site Control	Site may be lost to competing vegetation during regeneration; unwanted vegetation is easier to control.	Site conditions stable; undesirable vegetation difficult to control.
Hazards	Subject to serious fire, insect and disease losses.	Fire, diseases, and insect losses less likely to be serious.
Slash	A one-time, heavy accumulation which adds to insect and fire hazard.	Continous production of light slash and low insect or fire hazard.

There are two cutting methods used during implementation of uneven-aged management: individual tree selection and group selection.

Individual tree selection involves the removal of individual trees rather than groups of trees (see figure 1). This cutting method provides maximum flexibility in choosing trees to cut or leave, but is applicable only in uniformly spaced stands with irregular or all-aged structures. In mixed stands, it leads to an increase in the proportion of shade-tolerant species.

Group selection is an ideal cutting method in uneven-aged stands with a groupy or clumpy structure. It can maintain a higher proportion of shade-intolerant species in a mixed stand than individual tree selection. For this purpose, larger groups are more effective than smaller ones. When groups approach maximum size (about 2 acres), they resemble small clearcut patches or the group shelterwood cutting method. Group selection cutting is distinguished from small-patch clearcutting because its intent is to create a balance of age

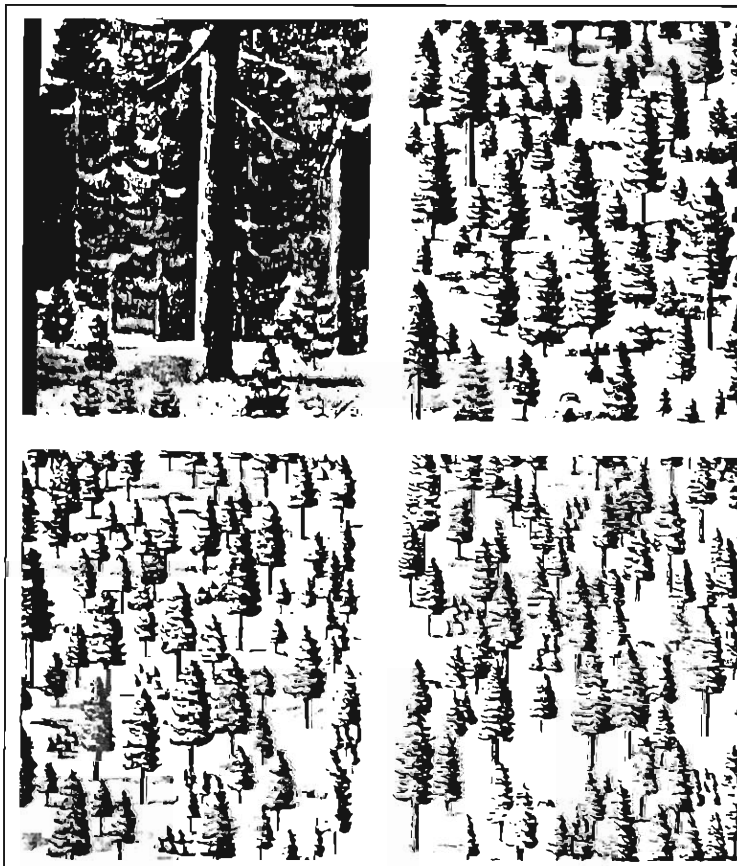


Figure 4. **Single-tree Selection System.** *Cuts are made more often than in other systems, but since the entire stand is never removed, appearances are not much affected. Undesirable trees are removed, overly dense areas are thinned, and mature trees are harvested during each cut. Seedlings of shade-tolerant species develop wherever they can find room. The stand contains trees of many ages.*

[Reproduced from **Choices in Silviculture for American Forests**, by the Society of American Foresters, 1981] or size classes as a mosaic of small, contiguous groups. Some advantages of the group selection method are:

1. **Less tolerant trees can be maintained in the stand composition.** In many areas, the intolerant species are more valuable commercially (ponderosa pine on many Douglas-fir habitat types, for example), or wildlife objectives may emphasize maintenance of species diversity (retention of small aspen clones or lodgepole pine inclusions within an uneven-aged spruce/fir stand, for instance).

2. **Logging damage can be reduced** because equipment movement tends to concentrate in the openings.

3. **Logging costs are reduced somewhat** (as compared to individual tree selection) because the cut trees are concentrated.

Some disadvantages or dangers of the group selection method are:

1. There may be a tendency to make the groups so large that the essential elements of uneven-aged management -- site protection and an all-aged stand structure -- are diminished.

2. Harvest entries tend to emphasize removal of mature trees in groups; weedings, thinnings, improvement cuts and other cultural operations in immature trees may be ignored.

3. When large groups are used, the esthetic advantages of uneven-aged management may be compromised.

The advantages and disadvantages of selection cutting can be summarized as follows (these pertain mostly to the "classical" application of uneven-aged management -- individual-tree selection cutting):

ADVANTAGES

1. Selection is the only cutting method capable of regenerating and perpetuating an uneven-aged stand (although most uneven-aged stands will regenerate themselves without man's intervention).

2. Establishing reproduction is usually easy because sites are protected and a heavy seed source is always present. The need to practice artificial reforestation, and incur its high costs, is rare with uneven-aged management.

3. Site protection is maximized -- there is little direct exposure to sunlight and wind.

4. Selection may be the best cutting method available for protection of sensitive esthetic values (recreation sites, heavily-used road corridors, etc.).

5. Damage from windfall and snow breakage is minimal.

6. Stands managed with selection cutting may be more stable ecologically, which would increase their natural resistance to catastrophes such as wildfire, insect outbreaks and disease epidemics.

7. Maintenance of high water quality is easy with selection cutting, especially if specified roads, temporary roads and designated skid trails are properly maintained.

8. A large amount of vertical diversity is provided by uneven-aged stands, which favors wildlife species requiring late-seral or old-growth habitats.

DISADVANTAGES

1. Logging costs are higher than for most even-aged cutting methods. However, the preparatory cut of a three-step shelterwood is probably as expensive as selection cutting in most of our spruce/fir stands.

2. There is high potential for logging damage to the residual stand, which includes our future crop trees. This disadvantage is especially true for individual tree selection.

3. Layout, marking, administration and other implementation jobs require great skill.

4. Stem quality and product value is lower than for even-aged stands, especially on poor sites. This occurs because trees in uneven-aged stands are able to maintain full crowns for most of their lives. Since self-pruning is inhibited, more knots and other grade defect ultimately result.

5. Livestock grazing is not generally possible because herbage production is very low, and grazing damage to regeneration would be unavoidable.

6. It's difficult to keep the intensive and costly inventory records associated with uneven-aged management. When group selection is used, it's difficult to keep track of individual groups and schedule them for cultural treatments, regeneration surveys, etc.

7. It's difficult to predict future growth and yield for selection cutting methods. In Region Two, the GROW program provides some capability for simulating uneven-aged management, but it's not ideal for that use. Until we have access to an individual-tree or diameter-class model with ample cutting flexibility, it will be difficult to predict the future consequences of uneven-aged prescriptions.

8. If applied incorrectly, selection cutting can result in a high-grade, with a genetically inferior stand being the ultimate result.

9. It's difficult to scarify seedbeds or complete other site preparation activity (such as prescribed burning), especially with individual tree selection. This means that species capable of establishing in litter and duff (true firs, for example) are favored over those requiring a mineral soil seedbed (Engelmann spruce, for instance).

WHAT STANDS QUALIFY FOR UNEVEN-AGED MANAGEMENT?

When completing presale planning for project areas where uneven-aged management is being contemplated, the following factors should be considered:

1. Selection cutting may be applied to a wide variety of stands, but **the conversion process is much simpler in stands that are already multi-storied or uneven-aged.** The stand should have good vigor and not be highly defective. It could have a component of shade-intolerant species, but shouldn't be dominated by them because the stand's regeneration will have to occur in shaded or partially-shaded conditions.

2. On the Pike and San Isabel National Forests, uneven-aged management seems **best adapted to stands with a high component of climax species.** For example, selection cutting could be accomplished easier on sites where ponderosa pine is climax (i.e., ponderosa pine habitat types) than on those where it's seral to Douglas-fir. Because of their intolerance for shade, seral stands of lodgepole pine or aspen provide few opportunities to practice uneven-aged management. But remember that not all stands of lodgepole pine or aspen are seral; climax stands of these types could probably be managed using group selection cutting.

3. **The site and species to be managed must tolerate frequent entries.** Areas with fragile soils or other limiting site factors may not qualify. Neither may stands comprised chiefly of true firs or other easily-damaged species.

4. **Unroaded areas will require a high initial investment** to develop an acceptable road system. Volumes removed in the first entry will often be lower than those produced by using even-aged cutting methods; in unroaded areas, this could have a major effect on the sale's financial viability.

5. Stands managed using an uneven-aged cutting method usually require **more administration than areas regulated with even-aged management.** Sale layout and logging requirements are more complex, and will result in sale preparation being more expensive than normal (as compared to even-aged management).

6. **Low volumes per acre and low-value products** (small-diameter trees) will be removed at each entry, especially on sites of low productivity.

After you've considered these factors and identified some stands that qualify for uneven-aged management, it's time to regulate their diameter distribution.

REGULATING AN UNEVEN-AGED STAND STRUCTURE

In even-aged management, yields are regulated by controlling the area in each age-class and the rotation length, which is the time required to grow trees to maturity. Managed, even-aged forests are characterized by a mix of stands of varying ages.

For uneven-aged management, yields are regulated through control over growing stock. Managed, uneven-aged stands are characterized by trees of many sizes occurring individually or in groups. Since an entire stand is treated under uneven-aged management, area objectives (treat 1/3 of the site, etc.) are immaterial. If a silviculturist says that he or she intends to treat 25 percent of a site with group-selection, it's a sure tipoff that an even-aged treatment (group shelterwood or small-patch clearcutting) will actually be used because regulation is based on area, not growing stock.

Once you've decided to implement uneven-aged management, the following stand regulation objectives must be established:

1. An optimum diameter-class distribution must be described.

2. A maximum tree size (diameter) objective must be established.

3. An optimum cutting cycle must be determined.

4. A strategy should be developed for converting the existing stand to the desired condition (the desired condition is described by the diameter-class and maximum tree size objectives -- items 1 and 2 above).

5. A strategy should be developed for maintaining the optimum diameter distribution once it has been reached.

The balance of this paper describes a procedure for developing silvicultural prescriptions that incorporate the regulation objectives given above.

PRESCRIPTION PREPARATION PROCEDURE

This section provides a step-by-step process for regulating an uneven-aged stand structure. Since some specialized terms about uneven-aged management will be used, they are defined in a short glossary (Appendix A).

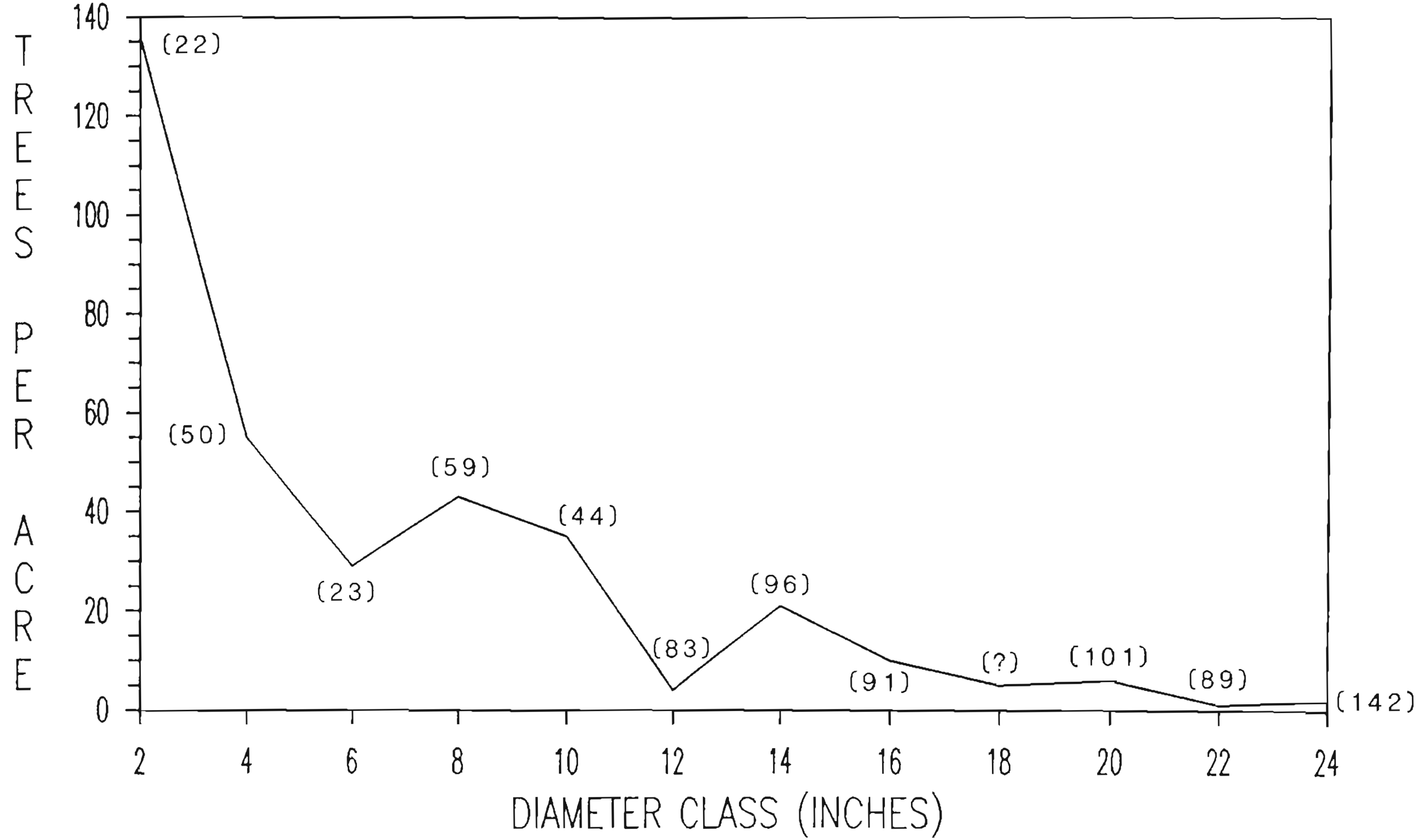
The process is best described with an example, so I've chosen an uneven-aged stand on the San Carlos Ranger District for this exercise.

1. Graph the stand table, using data provided on page type 2 of the Stage II stand examination printout. See figure 2 for an example using an actual stand (location 103510, site 10) from San Carlos District. The Stage II printout for this stand is also included as appendix B.

2. Choose a maximum diameter tree to be grown and a total residual stand basal area objective. For site 103510/0010, I chose a maximum diameter of 24 inches and a residual basal area objective of 100 square feet per acre. These selections can be based on several factors, but site productivity should always be considered. Productivity affects a site's capability to grow a certain-size tree, as well as the amount of tree density a site can support and still produce acceptable growth (low-productivity sites can carry less stocking than highly productive ones). The Land and Resource Management Plan allows a wide range of residual basal areas and cutting cycles (see the Silvicultural Prescriptions section in Forest Direction). I recommend the following:

FIGURE 2: EXISTING STAND DATA FOR SITE 103510-0010

(NUMBERS IN PARENTHESES ARE AVERAGE AGES BY DBH CLASS)



Site Quality	100-Year Site Index	Residual Basal Area (S.F./Ac.) Spruce/Fir	Ponderosa Pine	Mixed Conifer	Max DBH (Inch)	Cutting Cycle (Years)
High	> 70 ft.	120	80	100	24	10-20
Medium	50-70 ft.	100	80	80	20-22	20-30
Low	< 50 ft.	80	60	60	16-18	30-40

3. **Choose a "Q-factor" for the stand.** A Q-factor is the ratio of trees in one diameter class to those in the adjoining (larger) class. For example, a Q-factor of 1.5 means that the 4-inch diameter class should have 1.5 times more trees than the 6-inch class. Some points to consider when deciding which Q-factor to use:

a. Low Q-factors emphasize large-diameter trees and discriminate against smaller size classes.

b. High Q-factors emphasize small-diameter trees; less stocking in larger classes is produced.

c. Is a market available for small-diameter trees (fuelwood, etc.)? If it isn't, a high Q-factor should probably be avoided.

d. If markets for both small- and large-diameter products are available, consider choosing a Q-factor close to the stand's existing diameter distribution.

Since the San Carlos District has a market for small-diameter trees (fuelwood), I decided to choose a Q-factor that best fits the stand's current structure. Choosing a Q-factor close to the stand's existing diameter distribution (akin to a "go with the flow" philosophy) allows quicker attainment of the desired stand structure, and initial harvests are less severe environmentally.

Because the existing stand has moderate densities in most diameter classes (see fig. 2), I'll evaluate two "middle of the road" Q-factors: 1.3 and 1.5. If the current structure had been skewed in one direction or the other, I would have evaluated factors emphasizing smaller trees (1.1 or 1.2) or larger ones (1.6 or 1.7). Remember that the current stand structure does not have to dictate the future one; an existing stand could have many small-diameter trees, but you still choose a Q-factor emphasizing large stems because the markets for that material are better.

4. **Determine a K-factor from the table below for the Q-factors you want to graph:**

K-Factors for Given Q-Factors and Maximum Diameters

Maximum Diameter Objective (Inch)	*************** 1.1	1.2	1.3	Q-Factor 1.4	1.5	1.6	*************** 1.7
24	18.5	24.8	34.3	48.1	68.0	97.3	139.3
22	14.0	18.2	24.0	32.1	43.4	58.9	80.1
20	10.3	13.0	16.4	21.1	27.2	35.2	45.6
18	7.4	9.0	11.0	13.5	16.7	20.6	25.5

Note: These factors are meant to be used with 2-inch diameter classes only; if you want to regulate an uneven-aged stand using 1-inch diameter classes (not recommended), these factors won't help you prepare Q-factor reference curves.

Since the curves to be graphed are for Q-factors of 1.3 and 1.5, the K-factors I'll need are 34.3 and 68.0 (using a maximum tree-size objective of 24 inches).

5. **Divide the K-factor into the residual basal-area objective to compute the number of trees in the largest size class** (24-inch class in our example). For a Q-factor of 1.3, this result is 2.92 (100 divided by 34.3); for a Q-factor of 1.5, the result is 1.47 (100 divided by 68.0).

6. **Multiply the result from step 5 by the Q-factor to compute the number of trees in the next smaller diameter class.** Since the number of 24-inch trees was computed to be 2.92 for a Q-factor of 1.3 and 1.47 for a Q-factor of 1.5, the number of trees in the 22-inch diameter class is 3.8 for a Q-factor of 1.3 (2.92 times 1.3) and 2.2 for a Q-factor of 1.5 (1.47 times 1.5). Continue this process until you've computed the number of trees for each 2-inch diameter class. In my example, the results are:

DBH CLASS	TREES/ACRE (Q=1.3)		TREES/ACRE (Q=1.5)	
(INCHES)	ACTUAL	ROUNDED	ACTUAL	ROUNDED
2	52.39	52	127.44	127
4	40.30	40	84.96	85
6	31.00	31	56.64	57
8	23.84	24	37.76	38
10	18.34	18	25.17	25
12	14.11	14	16.78	17
14	10.85	11	11.19	11
16	8.35	8	7.46	7
18	6.42	6	4.97	5
20	4.94	5	3.32	3
22	3.80	4	2.21	2
24	2.92	3	1.47	1

7. Now that the mathematical gyrations are complete, it's time to **plot the reference curves** for Q-factors of 1.3 and 1.5. It's easiest to do this on the same sheet you used to graph the stand table data (fig. 2). The stand table and reference curves plotted on a single graph are shown as figure 3.

8. **Compare the existing stand structure with the plotted reference curves and decide which Q-factor "fits" best.** Since figure 3 indicates that a Q-factor of 1.3 is closest to the existing structure, I've decided to use it when prescribing uneven-aged management for site 103510-0010.

9. **Prepare a table comparing existing tree densities with those we hope to achieve in the future** (desired stand condition). This comparison is included as Table 1. I also prepared another graph showing existing and desired (future) tree densities (the desired condition is the same as the reference curve for a Q-factor of 1.3). This graph is included as figure 4. By using Table 1 and figure 4, it's easy to see which diameter classes have surplus

FIGURE 3: COMPARING Q-FACTORS OF 1.3 AND 1.5

WITH EXISTING STAND DATA FOR SITE 103510-0010

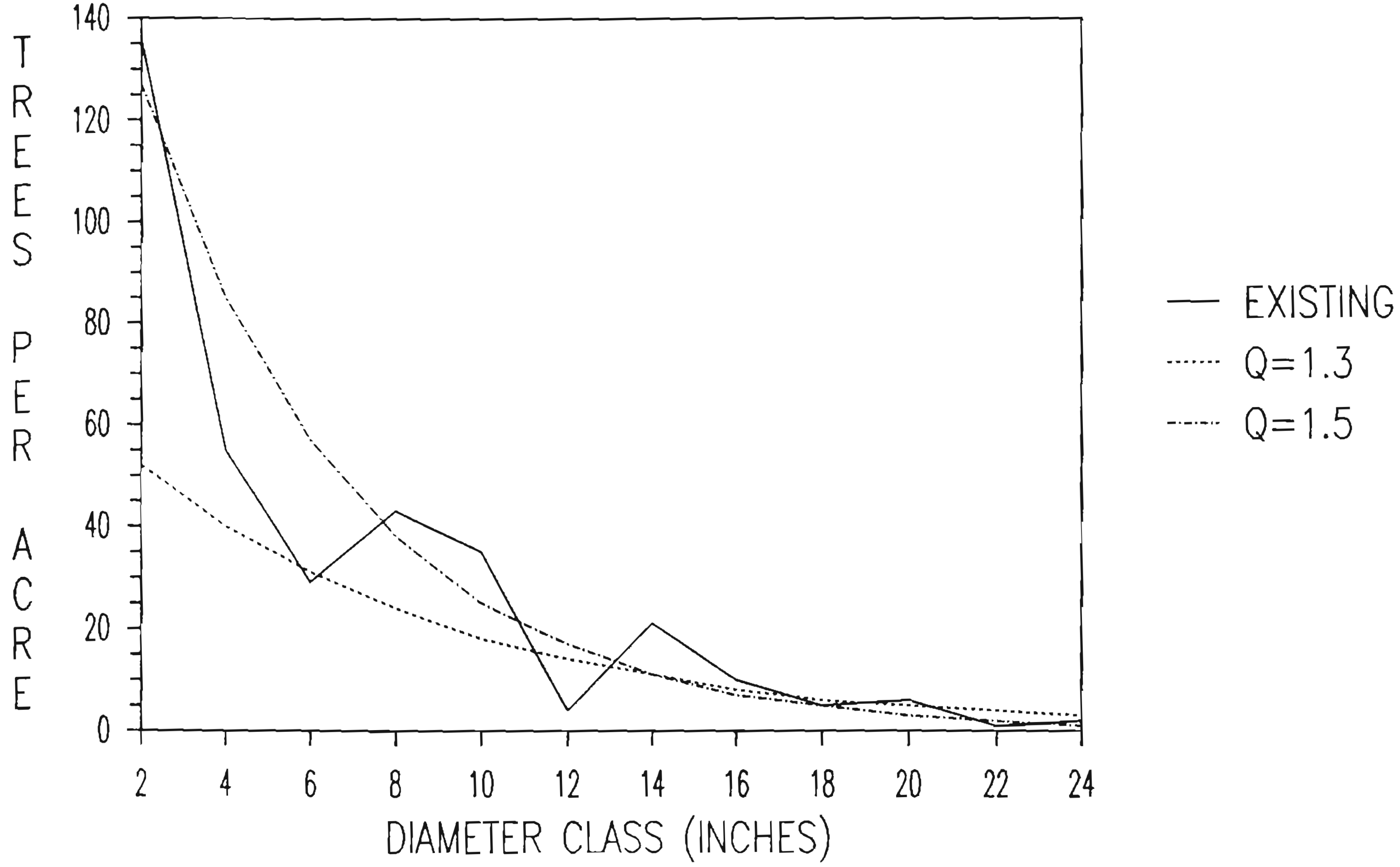


FIGURE 4: EXISTING AND DESIRED DIAMETER DISTRIBUTION

(DESIRED DISTRIBUTION CORRESPONDS TO A Q-FACTOR OF 1.3)

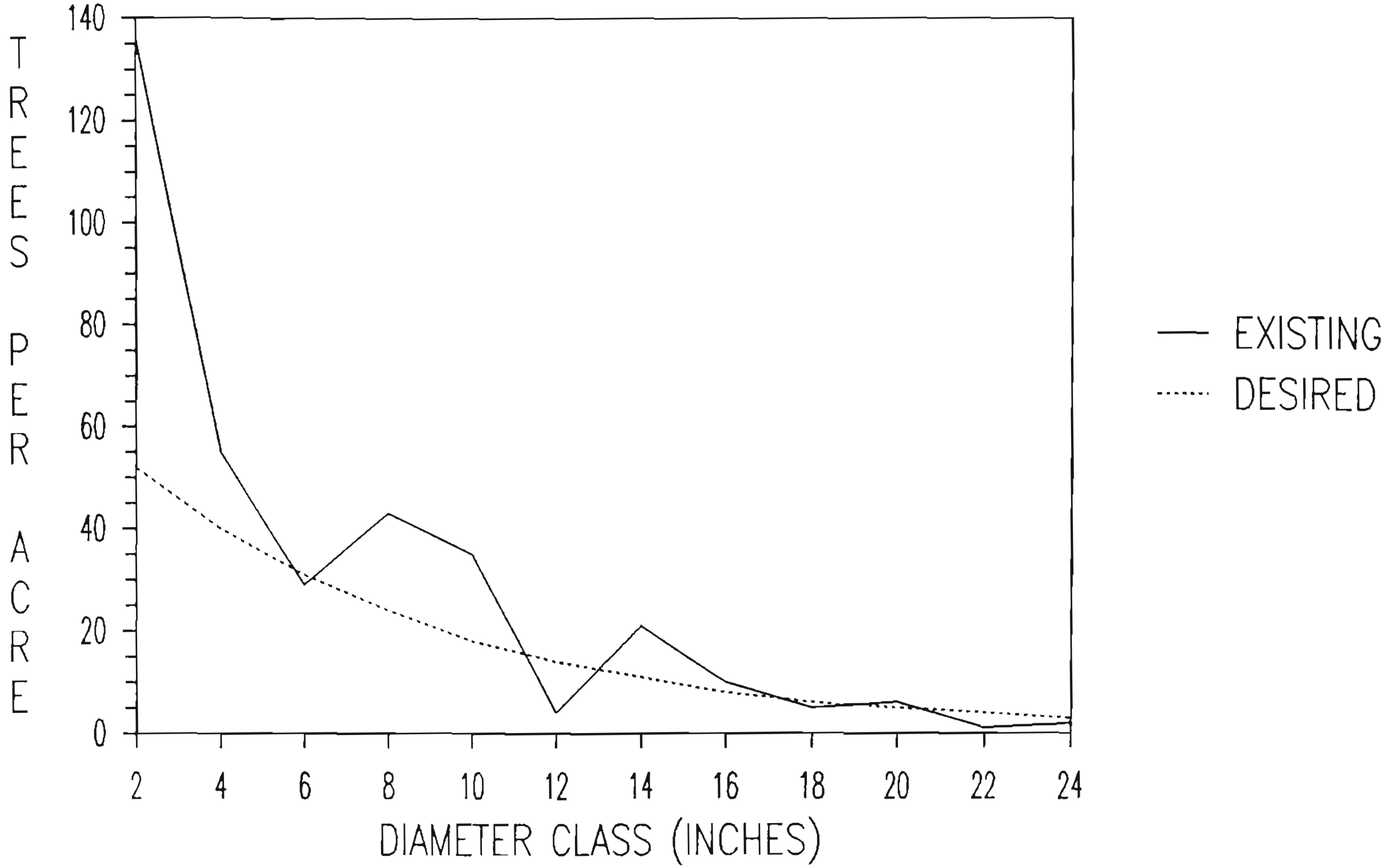


Table 1: Existing and Desired Diameter Distributions for Site 103510-0010, San Carlos Ranger District.

COLUMN:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		EXISTING STAND		DESIRED STAND (Q-FACTOR=1.3)		SURPLUS STEMS (CUT TREES)		RESIDUAL STAND	
DBH CLASS (In.)	BASAL AREA (S.F.)	Trees/ Acre	Basal Area	Trees/ Acre	Basal Area	Trees/ Acre	Basal Area	Trees/ Acre	Basal Area
2 *	.022	136	3.0	52	1.1	0	0	136	3.0
4	.087	55	4.8	40	3.5	0	0	55	4.8
6	.196	29	5.7	31	6.1	0	0	29	5.7
8	.349	43	15.0	24	8.4	19	6.6	24	8.4
10	.545	35	19.1	18	9.8	17	9.3	18	9.8
12	.785	4	3.1	14	11.0	0	0	4	3.1
14	1.069	21	22.4	11	11.8	10	10.7	11	11.8
16	1.396	10	14.0	8	11.2	2	2.8	8	11.2
18	1.767	5	8.8	6	10.6	0	0	5	8.8
20	2.182	6	13.1	5	10.9	1	2.2	5	10.9
22	2.640	1	2.6	4	10.6	0	0	1	2.6
24	3.142	2	6.3	3	9.4	0	0	2	6.3
TOTAL		347	117.9	216	104.4	49	31.6	298	86.4

* Does not include the seedling size class (682 growing-stock seedlings/acre).

COLUMN DESCRIPTIONS

1: Basal area of a tree with a diameter equal to the midpoint of the diameter class.

2: Densities of live, growing-stock trees (typically taken from "page type 2" of a Stage II printout).

3: Multiply the value in column 1 by tree density in column 2 to compute these values.

4: Densities of live, growing-stock trees associated with the selected Q-factor (these were computed in step 6 of the stand regualation process; see page 12).

5: Multiply the value in column 1 by tree density in column 4 to compute these values.

6: Subtract the value in column 4 from the value in column 2 unless column 4 is larger, in which case 0 would be entered in this column. Always enter a value of 0 for all classes below your "minimum threshold diameter," which is usually 5 or 7 inches DBH depending upon whether a multi-product sale will be prepared.

7: Multiply the value in column 1 by tree density in column 6 to compute these values.

8: Subtract the value in column 6 from the value in column 2 (existing tree densities) to compute these values.

9: Multiply the value in column 1 by tree density in column 8 to compute these values.

stocking and which have a deficit of trees. The information in Table 1 will be very useful when preparing a prescription and marking guide for site 103510-0010.

After preparing Table 1, you may want to graphically compare the desired and residual stand structures. Such a plot would show how close the residual and desired structures would be after an initial harvest. I've prepared that plot for our example stand and it's included as figure 5.

10. Choose a cutting cycle. How should one be selected? You should consider the following factors when making that decision:

A. Site Quality. Highly-productive sites will recover more quickly, and respond faster to a cultural treatment, than those with low productivity (see page 9 for more information about the effects of site quality).

B. Projected Volume Production. Harvest entries are usually controlled by an economic or merchantability threshold; below the threshold volume (removal of 2000 board feet or more per acre, for example), an entry may not be economically viable. If a stand can't grow fast enough to produce the threshold volume in a specified time period (10 years, let's say), then it's fruitless to consider that time period as a cutting cycle. Highly-productive sites will add volume faster than low-quality sites, and can be regulated using shorter cutting cycles.

C. Other Resource Considerations. If an uneven-aged stand is located in an area with high erosion potential, sensitive soils or wildlife objectives emphasizing solitude, long cutting cycles may be selected regardless of a site's potential productivity.

11. **Put the stand data into a growth and yield simulator (GROW in this instance) and test alternative cutting strategies for future entries.** These simulations will show you how soon the classes with deficits will reach optimum stocking, and how many seedlings must become established following each entry to assure perpetuation of an uneven-aged condition. Growth and yield simulations also provide valuable information about the outputs or consequences associated with a particular treatment (such as the residual basal area, average stand diameter, residual stem density, and average stand height after harvest).

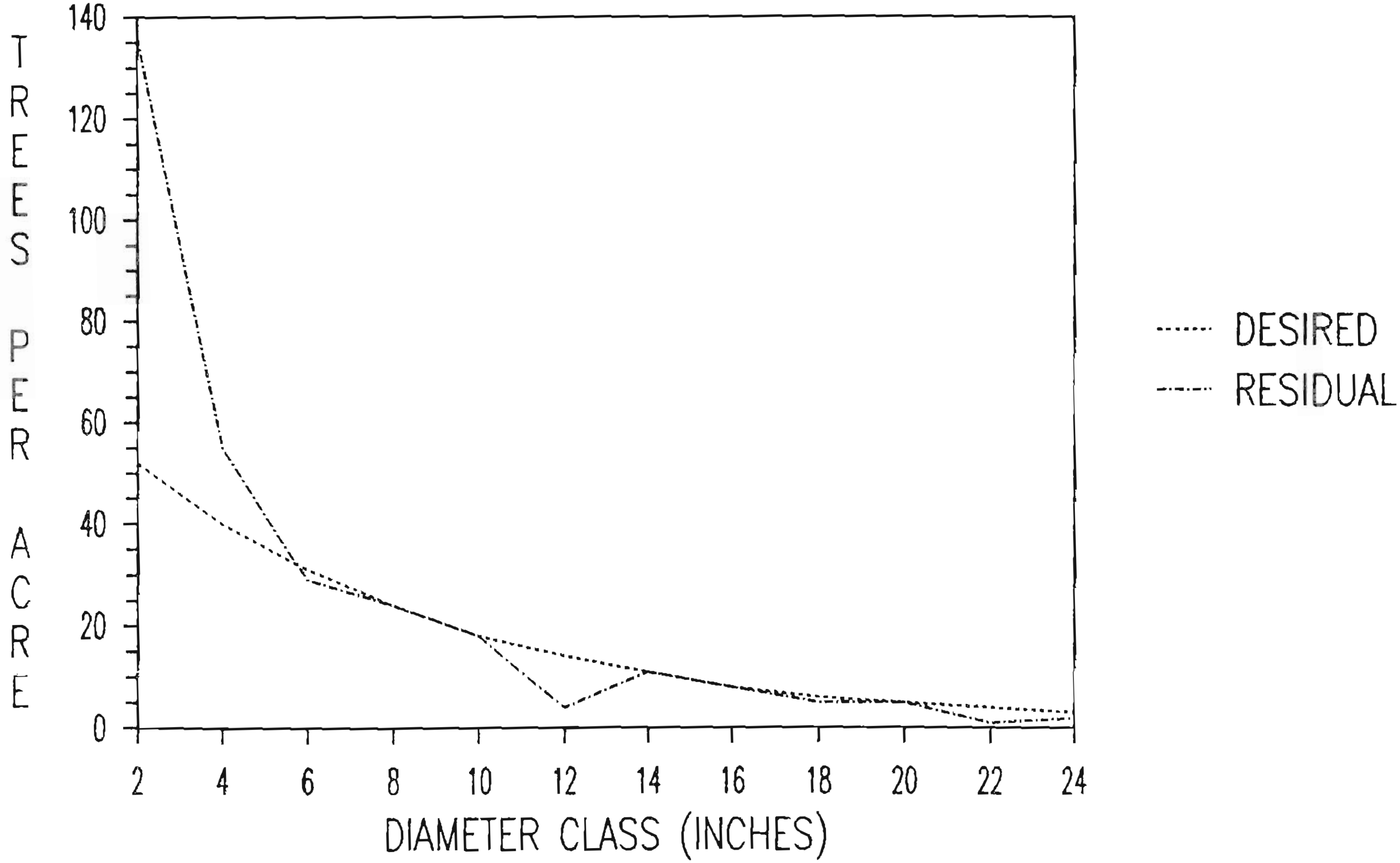
Completing growth and yield simulations using the GROW model will require the following steps:

A. Run mortality tests to calibrate GROW's mortality functions. My example stand has gross growth of 54.8 cubic feet per acre per year, mortality of 31.8 cf/ac/yr from spruce beetle activity, and a resultant net growth of 23 cf/ac/yr. Simulations with differing values for GROW's mortality variables (MOR5 and MOR9) were made until one was obtained with a net growth rate close to that for site 103510-0010.

B. Run simulations to test alternative prescriptions. The following prescriptions were tested for site 103510-0010:

FIGURE 5: DESIRED AND RESIDUAL DIAMETER DISTRIBUTION

(DESIRED DISTRIBUTION CORRESPONDS TO A Q-FACTOR OF 1.3)



1. Selection entries on a 10-year cutting cycle. Seedlings were established after each entry, a residual basal area of 100 square feet per acre was used, and trees were removed from all diameter classes after first cutting all trees 26-inches DBH and larger. [GROW uses a minimum threshold diameter of 5 inches -- only trees larger than that are harvested.]

2. Selection entries on a 20-year cutting cycle. Otherwise, the same specifications as for number 1 above.

Note: I didn't evaluate selection entries on a 30-year cutting cycle because this site's productivity (site index of 78 feet at 100 years) results in too much volume production to reasonably analyze long cutting cycles (30 or 40 years). Average harvest volume was about 2,500 board feet per acre with a 10-year cutting cycle, and 5,500 board feet per acre with a 20-year cutting cycle, once the stand's diameter distribution had been regulated (see pages 38 and 46 in appendix C).

C. Evaluate the prescription simulations and modify them if necessary.

These simulations were completed for site 103510-0010 and are included as appendix C.

How well does the GROW model simulate uneven-aged prescriptions? Unfortunately, not very well (see figure 6). GROW can't produce a stand structure identical to the one we desire (or even one close to it) because it doesn't allow users to enter a Q-factor, or specify harvest trees by individual diameter class. Either capability would allow us to produce simulations where managed stand structures eventually match the desired ones.

One note regarding attainment of your residual basal area objective -- **when existing density is very high (200 or more square feet of basal area per acre), you'll probably need to reach your residual basal area goal in stages.** Otherwise, the first entry will be too severe, resulting in unacceptable damage to the residual stand, windthrow, or an excessively large percentage of the project area being treated in one entry. Generally, the initial entry shouldn't remove more than about 40 percent of the existing basal area (less in high windrisk situations).

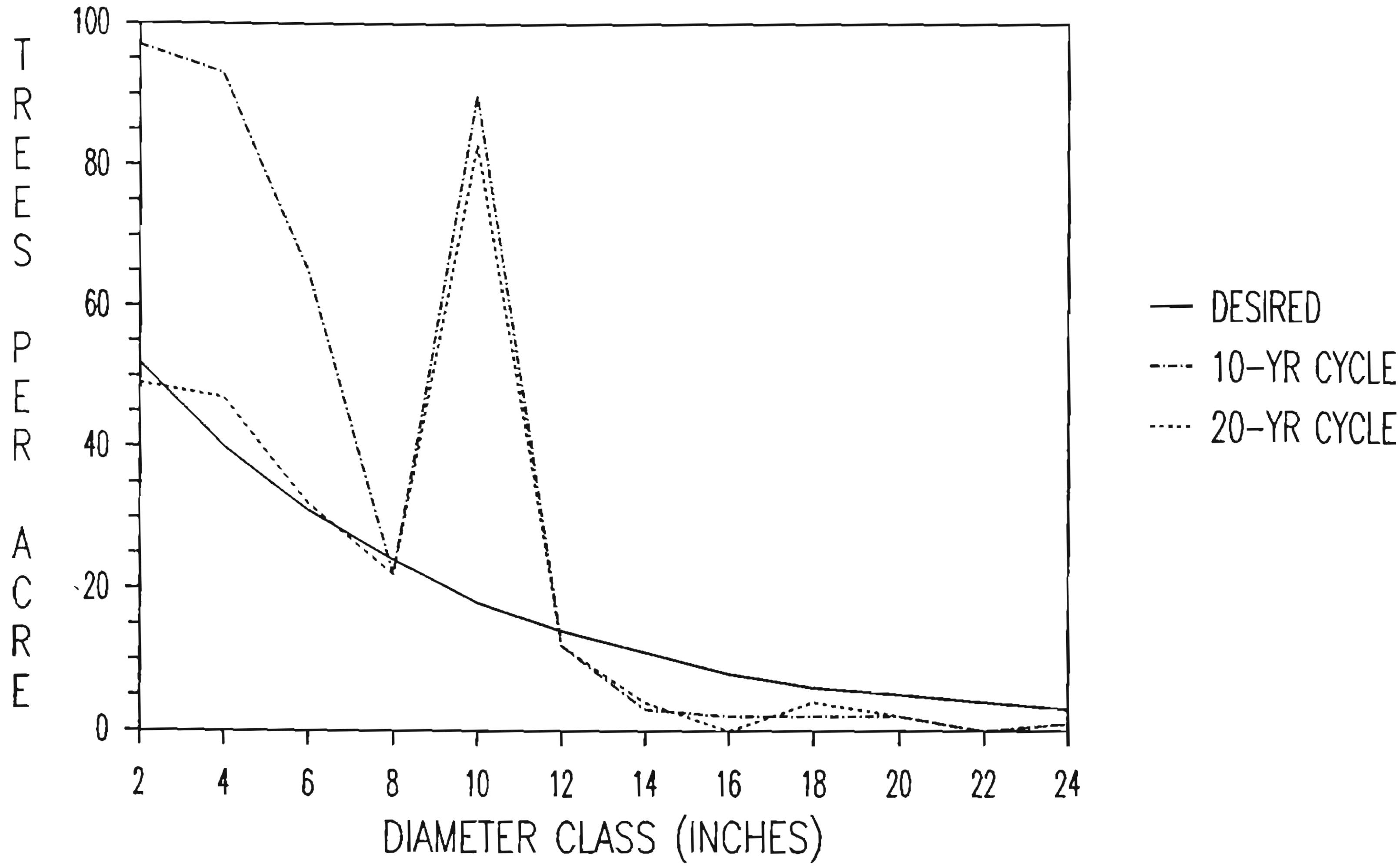
In uneven-aged stands with high susceptibility to spruce beetle attack, pressure to meet the residual basal area objective in one entry (rather than stages) may be especially great. [Susceptibility to spruce beetle attack is based on several criteria, but stands with more than 150 square feet per acre of basal area are generally in a high risk category.]

12. **Incorporate the data from Table 1 and the appropriate growth and yield simulation in a silvicultural prescription.** I've attempted to do this for site 103510-0010, and the resultant prescription is included in appendix D.

13. If the prescription is too complex for direct use by your marking crew, **translate the first entry into marking guides**. Once again, I've attempted to do this and the result is included in appendix D.

FIGURE 6: DESIRED AND SIMULATED DIAMETER DISTRIBUTIONS

(SIMULATIONS FROM GROW MODEL FOR 2 CUTTING CYCLES)



A note regarding the prescription phase (steps 12 and 13 above) -- a wise silviculturist once said: "**Good physicians do not prescribe treatment without first examining the patient, and so it should be with silviculturists.**" I've examined the patient (site 103510-0010) and the result (a site diagnosis) is also included in appendix D.

WHAT IT TAKES TO MAKE UNEVEN-AGED MANAGEMENT WORK

Proper application of uneven-aged management is complex, especially when compared with even-aged management. If you prescribe selection cutting for a stand, you need the following items to really make it work:

1. **Detailed stand information.** Better information than we are now gathering is needed. A typical Stage II inventory, even if completed to survey level 4 standards, won't provide reliable information if only 1 point is sampled for every 10 acres of site area. Remember that the old "1 point for every 10 acres" guideline (which has been used in Region 2 for almost as long as Stage II inventories have been collected) was designed to be statistically accurate for basal area only. When preparing a silvicultural prescription for uneven-aged management, good information about tree densities is much more important than accurate data about basal area.

2. **A silvicultural prescription.** The silvicultural prescription should incorporate the stand regulation objectives discussed on page 9. It should also describe the desired condition expected in the future. Treatment specifications should be detailed enough that the prescription could be used for follow-up monitoring and evaluation. If marking guides are used, the prescription probably has more usefulness for post-treatment monitoring than it does for on-the-ground preparation of the initial harvest (although the prescription was a prerequisite for preparation of marking guides).

3. **Good stand records.** The silvicultural prescription, and the stand structure objectives it contains, must be retained. Uneven-aged management won't work if we set different stand regulation objectives for each entry. Follow-up information (regeneration surveys, post-treatment examinations, etc.) is important for evaluating all silvicultural treatments, but especially so for uneven-aged management. Reaching the diameter distribution we desire will require establishment of natural regeneration after each entry; maintenance of good stand records (in site folders and a computerized data base system, like Region Two's Resource Information System -- RIS) will be the easiest way to monitor and evaluate our progress toward those objectives.

4. **Tight control.** A silvicultural prescription for uneven-aged management is more complex and detailed than those prepared for even-aged cutting methods. Prescription objectives will never be attained if sloppy layout, marking or logging result in a woods job having little resemblance to the desired stand structure.

5. **Skilled help.** Both the professional-level prescription and technician-level marking must be done with more expertise than we're accustomed to using. Markers must not only select cut trees based on damages, vigor, form and other typical marking criteria, but they also have to keep detailed records

on tree-tally forms or tallywhackers as marking progresses. Cut-tree selection is complicated further because all diameter classes (above a minimum threshold diameter) are generally treated; this differs from partial cutting in even-aged stands where nothing but large, codominant and dominant trees are left.

6. **Discipline.** A long-term commitment is needed. Sometimes, the Forest Service or its Rangers, foresters, planning teams or silviculturists don't want to be tied-down with a long-term plan or prescription, especially if they perceive it as restricting their future flexibility. Occasionally, an employee new to an area may be unwilling to find out what his or her predecessor intended for a stand, much less execute the next step as it was planned.

Unfortunately, many practitioners of the art of uneven-aged management haven't been able (or willing?) to meet the requirements given above. The result was not unexpected -- widespread dissatisfaction with uneven-aged management and a national trend in the late 1940s and 1950s toward exclusive use of even-aged cutting methods.

USING COMMON SENSE WHEN APPLYING UNEVEN-AGED MANAGEMENT

Uneven-aged management has acquired a tarnished reputation because it's perceived to be cumbersome, complex, impractical and uneconomical. In many situations, these claims are true and uneven-aged management shouldn't be used. Some recommendations regarding when and how to use uneven-aged cutting methods:

1. **Work in areas with high resource values.** Uneven-aged management is well suited to sensitive road corridors, developed recreation sites and administrative sites, but only if they're valuable enough to guarantee that a good job will result.

Normally, timber values in the outback are not high enough to prevent a hasty job. The high preparation and administration costs of selection cutting will put undue pressure on the sale layout personnel to remove all of the big or high-value stumpage. The result can be another example of a "mill cut" or "high-grade" operation under the guise of uneven-aged management.

2. **Don't try to do too much.** Limit the amount of uneven-aged management you attempt. With our limited manpower and financial resources, attempts to manage thousands of acres using individual-tree or group selection can only result in a series of botched partial cuts. The bottom line is: don't bite off more selection than you can successfully chew!

3. **Make your job easier whenever possible.** It is more practical to prepare marking guides based on 5- or 6-inch diameter classes than the 2-inch classes used in Table 1. You should continue using 2-inch diameter classes to prepare your inverse J-curves and compare stand tables (Table 1), but aggregate these into larger classes during marking.

If you're preparing a multi-product timber sale, it might be possible to work with 5 classes: 1- to 5-inch trees, 6- to 10-inch trees, 11- to 15-inch trees, 16- to 20-inch trees and 21-inch and greater trees. Since 1- to 5-inch trees are below your merchantability threshold and wouldn't be marked, the markers have only four classes to worry about (and keep records on as the marking job progresses). If a multi-product sale isn't used, four classes would probably be appropriate: 1- to 6-inch trees, 7- to 12-inch trees, 13- to 18-inch trees and 19-inch and greater trees. Since the 1- to 6-inch trees would not be marked, the markers would only have three classes to keep track of.

Aggregating 2-inch diameter classes into larger ones for marking works best when adjacent classes have a similar situation -- such as surplus trees that should be harvested, or a stocking deficit. When adjacent, 2-inch classes include a mix of treatment needs, such as some with surplus trees and others with stocking deficits, aggregation may not work as well.

4. **Guides for choosing a Q-factor are subjective.** Keep in mind that your objectives in practicing uneven-aged management are to: a) establish good conditions for growth and stand development; b) provide a sustained yield of wood products; and c) maximize yield by establishing a harvest system where removals equal growth. As you gain experience with uneven-aged management, you'll discover which Q-factors are best meeting these objectives while simultaneously producing the stand structure you want.

5. **Work with the existing stand structure whenever possible.** A stand's existing diameter distribution should have a major effect on your choice of a Q-factor and other regulation objectives. Attempts to "strong-arm" a certain diameter distribution in a stand where it doesn't really fit is a good way to make a difficult job even harder.

SELECTED REFERENCES ABOUT UNEVEN-AGED MANAGEMENT

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APPENDIX A: TERMINOLOGY AND DEFINITIONS FOR UNEVEN-AGED MANAGEMENT

Uneven-aged Silvicultural System. Manipulation of a forest or stand for continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of age classes to provide a sustained yield of forest products. Treatments that develop and maintain uneven-aged stands are the individual-tree and group selection cutting methods.

Individual-Tree Selection Cutting. Removal of selected trees from specified size or age classes, over an entire stand area, to meet predetermined diameter distribution and species composition objectives.

Group Selection Cutting. Removal of small groups of trees to meet predetermined diameter distribution and species composition objectives. The distance across an opening created by this cutting method is usually no more than 1 to 2 times the surrounding tree height, up to a maximum size of 2 acres.

Improvement Cuttings. Cuttings made in poletimber or sawtimber stands to improve their composition and quality, mainly by removing trees of undesirable species, form or condition from the main canopy.

Release Cuttings. Cuttings which free young trees (seedlings or saplings) from the competition of undesirable trees that threaten to suppress them.

Cutting Cycle. A specified time interval between harvests in an uneven-aged stand.

Reserve Growing Stock. The specified stocking to be retained after an uneven-aged entry. Usually expressed in terms of basal area and is sometimes called residual basal area.

Diameter Distribution. The desired number of trees in each of a stand's diameter classes. It can be portrayed as a mathematically-derived curve, the shape of which is controlled by a stand's Q-factor and its maximum diameter.

Maximum Diameter. The largest diameter (DBH) that trees will be allowed to reach before cutting. This, along with a specified Q-factor, controls a stand's diameter distribution.

Q-Factor. The ratio of trees in one diameter class to those in the adjoining (larger) class. Low Q-factors have less difference in the number of trees in adjacent diameter classes than high Q-factors.

K-Factor. A mathematical coefficient which simplifies computing the number of trees in the largest diameter class when regulating an uneven-aged stand.

J-Curve. A curve that expresses the desired diameter distribution for an uneven-aged stand. It is shaped like an inverse "J".

APPENDIX B: STAGE II PRINTOUT FOR SITE 103510-0010

LOC-SITE 103510-0010	FOREST 12 DISTRICT 3 SURVEY DATE 8309	NET MERCH FACTORS PAGE TYPE 1
COMBINATION RUN	DATA FOR UNEVEN-AGED MANAGEMENT WORKSHOP	SAMPLE POINTS 11 SAMPLE TREES 88
SPRUCE-FIR SAWTIMBER	ORIGIN DATE 1895 STAND ACRES 40	BAF 0 FPS 300 GP 0 SURVEY TYPE 4

PER ACRE MEASUREMENTS BY TREE CLASS

MEASUREMENT	DESIRABLE	ACCEPTABLE	GROWINGSTK	CULL	LIVE	SND DEAD	TOTAL	CV%(TOTAL)	SE%(TOTAL)	70%CI(TOTL)
TREES (0IN+)	888.	142.	1029.	3245.	4275.	4.	4279.	108.	32.	1492.
BASAL (5IN+)	80.	28.	108.	0.	108.	7.	115.	46.	14.	17.
CUBIC (5IN+)	1832.	545.	2377.	0.	2377.	159.	2536.	50.	15.	409.
SCRIB (9IN+)	7207.	1417.	8624.	0.	8624.	669.	9293.	55.	16.	1659.
SCRIB (7IN+)	7295.	1840.	9135.	0.	9135.	669.	9804.	52.	15.	1628.

GROSS VOLUME PER ACRE OF LIVE TIMBER SPECIES

SCRIB7+	SCRIB8+	SCRIB9+	MER-CU5+	TOT-CU3+
10822.	10441.	10285.	2571.	2811.

OF LIVE OTHER SPECIES 3 INCHES+ DRC (CHOJNACKY, INT-339)

JUNIPER	PINYON	OAK	OTHER HARDWOOD	TOTAL
0.	0.	0.	0.	0.

PER ACRE DEAD TOTAL STEM CUBIC VOL (5IN+)

SOUND DEAD: STANDING	DOWN;	NONSOUND DEAD: STANDING;	TOTAL
182.	0.	0.	182.

LODGEPOLE TREES (5IN+)

OPEN CONES	CLOSED CONES	NO CONES
0.%	0.%	0.%

PER ACRE STAND AVERAGES

STORY	DBH	HEIGHT	AGE	STEMS	BA	CUBIC(5IN+)	SCRIB(9IN+)
UNDER	1.4	7	20	943	28	287.93	184.04
OVER	13.0	59	90	86	87	2088.66	8440.37
TOTAL	10.4	50	75	156	108	2376.59	8624.41

NUMBER OF STANDING SNAGS PER ACRE

HARD	SOFT	QMD(5IN"+)
0	0	.0

LIVE MISTLETOE TREES PER ACRE

DBH	LODGEPOLE	DOUGFIR	PONDEROSA	OTHERS
0-5"	0.	0.	0.	0.
5IN+	0.	0.	0.	0.

HAWKSWORTH MISTLETOE RATING

UNDERSTORY	OVERSTORY	TOTAL
0	0	0

SPRUCE BEETLE RISK

3

PERCENT OF NONSTOCKED POINTS PER ACRE DUE TO

OTHER	>75% HIGH BRUSH	>75% LOW BRUSH	>75% SOD	>75% DUFF	>75% SLASH	>25% NONSTOCKED NOT OVERTOPPED	>25% NONSTOCKED OVERTOPPED
0.	0.	0.	0.	0.	0.	0.	0.

PERCENT OF NONSTOCKABLE POINTS PER ACRE DUE TO

OTHER	ROCKY MTN JUNIPER	BEDROCK-BOULDERS	POOR SOIL DRAINAGE	SOIL DEPTH	SOIL EROSION	CLAY CONTENT	CLIMAX NC SPECIES
0.	0.	0.	0.	0.	0.	0.	0.

PER ACRE GROWING STOCK GROWTH AND MORTALITY

ANNUAL PER ACRE GROWTH BASED ON 17 TALLIED GROWTH TREES

MEASURE	INGROWTH	ACCRETION	GROSS	MORT	LOG.	NET
CUBIC(5IN+)	.0	54.8	54.8	31.8	.0	23.0
SCRIB(9IN+)	349.7	159.2	509.0	133.7	.0	375.[illegible]
STEMS(5IN+)	.00			.84	.00	

ANNUAL PER ACRE MORTALITY BY CAUSE

MEASURE	INSECT	DISEASE	FIRE	ANIMAL	WEATHER	SUPP.	UNKNOWN
CUBIC(5IN+)	31.80	.00	.00	.00	.00	.00	.00
SCRIB(9IN+)	133.74	.00	.00	.00	.00	.00	.00
STEMS(5IN+)	.84	.00	.00	.00	.00	.00	.00
STMS(1-4.9)	.00	.00	.00	.00	.00	.00	.00

NUMBER OF LIVE STEMS PER ACRE DAMAGED BY

DAMAGE	0-4.9IN	5-8.9IN	9IN+	DAMAGE	0-4.9IN	5-8.9IN	9IN+	DAMAGE	0-4.9IN	5-8.9IN	9IN+
1- NONE	4036.4	49.9	80.9	22- BUTT ROT	.0	.0	1.2	61- SUPPRESSION	81.8	.0	.0
76- UNHEAL. POL.	.0	12.5	1.7	79- SWEEP & CROOK	.0	9.0	1.1				

* LOC-SITE 103510-0010 *   * FOREST 12 DISTRICT 3 SURVEY DATE 8309 *   * NET MERCH FACTORS PAGE TYPE 2 *
* COMBINATION RUN *   * DATA FOR UNEVEN-AGED MANAGEMENT WORKSHOP *   * SAMPLE POINTS 11 SAMPLE TREES 88 *
* SPRUCE-FIR SAWTIMBER *   * ORIGIN DATE 1895 STAND ACRES 40 *   * BAF 0 FPS 300 GP 0 SURVEY TYPE 4 *

* * PER ACRE STAND SUMMARY OF LIVE GROWING STOCK TREES * *

DIAMETER (INCHES)	TOT STM	HWD STM	AVG DBH	AVG HGT	TOT BA	HWD BA	TOT CUB	HWD CUB	TOT SCB	HWD SCB	TOT INT	HWD INT	SFT DBH AN. INC	HWD DBH AN. INC	SFT HT AN.INC	HWD HT AN.INC	SFT AGE	HWD AGE
0- .9	681.8	.0	.0	1.7	.0	.0	0.	0.	0.	0.	0.	0.	.00	.00	.160	.000	12.	0.
1- 1.9	54.5	.0	1.2	7.5	.5	.0	0.	0.	0.	0.	0.	0.	.05	.00	.000	.000	22.	0.
2- 2.9	81.8	.0	2.3	13.3	2.4	.0	0.	0.	0.	0.	0.	0.	.05	.00	.000	.000	22.	0.
3- 3.9	54.5	.0	3.5	20.0	3.7	.0	0.	0.	0.	0.	0.	0.	.04	.00	.400	.000	50.	0.
4- 4.9	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	.04	.00	.400	.000	50.	0.
5- 5.9	14.9	.0	5.8	22.0	2.7	.0	13.	0.	0.	0.	0.	0.	.18	.00	.825	.000	23.	0.
6- 6.9	14.0	.0	6.9	40.0	3.6	.0	48.	0.	0.	0.	0.	0.	.18	.00	.825	.000	23.	0.
7- 7.9	33.5	.0	7.4	44.2	10.0	.0	154.	0.	362.	0.	0.	0.	.10	.00	.506	.000	59.	0.
8- 8.9	9.0	.0	8.6	40.0	3.6	.0	52.	0.	148.	0.	0.	0.	.10	.00	.506	.000	59.	0.
9-10.9	34.6	.0	9.5	50.4	17.3	.0	316.	0.	1037.	0.	1255.	0.	.13	.00	.665	.000	44.	0.
11-12.9	4.1	.0	11.0	61.0	2.7	.0	62.	0.	228.	0.	276.	0.	.07	.00	.334	.000	83.	0.
13-14.9	21.3	.0	13.7	63.2	21.8	.0	522.	0.	2060.	0.	2492.	0.	.09	.00	.378	.000	96.	0.
15-16.9	10.2	.0	16.2	68.8	14.5	.0	384.	0.	1615.	0.	1955.	0.	.08	.00	.307	.000	91.	0.
17-18.9	5.4	.0	17.5	64.9	9.1	.0	226.	0.	964.	0.	1166.	0.	.00	.00	.000	.000	0.	0.
19-20.9	5.9	.0	19.9	69.5	12.7	.0	340.	0.	1498.	0.	1813.	0.	.12	.00	.403	.000	101.	0.
21-22.9	1.1	.0	21.0	57.0	2.7	.0	60.	0.	258.	0.	312.	0.	.08	.00	.185	.000	89.	0.
23-24.9	2.3	.0	23.9	76.8	7.3	.0	199.	0.	964.	0.	1166.	0.	.10	.00	.282	.000	142.	0.
25-26.9	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	.00	.00	.000	.000	0.	0.
27-28.9	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	.00	.00	.000	.000	0.	0.
29-30.9	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	.00	.00	.000	.000	0.	0.
31-99.9	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	.00	.00	.000	.000	0.	0.
0-99.9	1029.1	.0	.0	.0	114.8	.0	2377.	0.	9135.	0.	10436.	0.	.00	.00	.000	.000	0.	0.

* * SITE TREE INFORMATION * *

SPECIES	DBH AGE	TOT AGE	HEIGHT	CLASS	SURVEY YIELD	GROSS YIELD	SITE/BASE USING TOTAL TREE AGE: BRICKELL	ALEXANDER	HORNIBROOK	* SITE/BASE USING DBH AGE *: ALEXANDER	MINOR	EDMINSTER
ENGELMANN SPRUCE	23.	38.	22.	1.	45.	0.	30./50	0./100	0./100	76./100	0./100	0./100
ENGELMANN SPRUCE	44.	59.	46.	1.	59.	0.	40./50	0./100	0./100	79./100	0./100	0./100
ENGELMANN SPRUCE	91.	106.	71.	1.	69.	0.	46./50	0./100	0./100	75./100	0./100	0./100
ENGELMANN SPRUCE	83.	98.	61.	1.	57.	0.	39./50	0./100	0./100	68./100	0./100	0./100
ENGELMANN SPRUCE	79.	94.	63.	1.	62.	0.	42./50	0./100	0./100	73./100	0./100	0./100
ENGELMANN SPRUCE	85.	100.	73.	2.	73.	0.	48./50	0./100	0./100	80./100	0./100	0./100
ENGELMANN SPRUCE	47.	62.	60.	1.	79.	0.	51./50	0./100	0./100	95./100	0./100	0./100
AVERAGE ENGELMAN	65.	80.	57.	1.	63.	0.	42./50	0./100	0./100	78./100	0./100	0./100

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* LOC-SITE 103510-0010 *	* FOREST 12 DISTRICT 3 SURVEY DATE 8309 *	* NET MERCH FACTORS PAGE TYPE 3 *
* COMBINATION RUN *	* DATA FOR UNEVEN-AGED MANAGEMENT WORKSHOP *	* SAMPLE POINTS 11 SAMPLE TREES 88 *
* SPRUCE-FIR SAWTIMBER *	* ORIGIN DATE 1895 STAND ACRES 40 *	* BAF 0 FPS 300 GP 0 SURVEY TYPE 4 *

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** E C O L O G I C A L S U M M A R Y O F A L L L I V E T R E E S (COOL-MOIST TO WARM-DRY) **

TREES DIAMETER	ENGELM SPRUCE	CORKBK ALPFIR	WB/BC PINE	LODGE PINE	ASPEN	DOUG FIR	WHITE FIR	PONDER PINE	COTTON WOOD	LIMBER PINE	OTHER SOFT	PINYON PINE	JUNI PER	OTHER HARD	TOTAL
.0- .0	3572.7	272.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	3845.5
.1- .9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
1.0- 2.9	190.9	.0	.0	.0	27.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	218.2
3.0- 4.9	54.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	54.5
5.0- 6.9	28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	28.9
7.0- 8.9	42.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	42.5
9.0-10.9	34.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	34.6
11.0-12.9	4.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	4.1
13.0-14.9	21.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	21.3
15.0-16.9	10.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	10.2
17.0-18.9	5.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.4
19.0-20.9	5.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	5.9
21.0-22.9	1.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.1
23.0-24.9	2.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	2.3
25.0-26.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27.0-28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29.0-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.0- 4.9	3818.2	272.7	.0	.0	27.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	4118.2
5.0- 8.9	71.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	71.4
9.0-99.9	85.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	85.0
.0-99.9	3974.5	272.7	.0	.0	27.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	4274.5
BASAL AREA															
.0- 4.9	6.9	.0	.0	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	7.5
5.0- 8.9	20.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	20.0
9.0-99.9	88.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	88.2
.0-99.9	115.1	.0	.0	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.0	115.7

** P E R A C R E P O I N T S U M M A R Y O F S T E M S & B A S A L A R E A (ALL LIVE TREES) **

	*********** T I M B E R	S P E C I E S ***********							******* O T H E R	S P E C I E S *******						ALL TREES	
POINT	----------- TREES PER ACRE	-------------					BASAL AREA		------ TREES PER ACRE	------				BASAL AREA		MISTLETOE	
NUMB.	0-5"	5-9"	9-12"	12-99"	ALL	SOFT	LIVE	SOFT	0-3"	3-9"	9-99"	ALL	SOFT	LIVE	SOFT	TREES	DMR
1	300.0	163.5	59.7	12.5	535.7	535.7	90.0	90.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	1200.0	100.4	.0	96.7	1397.2	1397.2	171.2	171.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	1200.0	.0	162.8	55.8	1418.5	1418.5	180.0	180.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4	4800.0	.0	.0	81.5	4881.5	4881.5	120.0	120.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	300.0	.0	113.4	25.1	438.5	138.5	96.5	90.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	1500.0	.0	.0	110.3	1610.3	1610.3	121.6	121.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	6000.0	.0	.0	.0	6000.0	6000.0	47.9	47.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
8	13200.0	422.0	.0	38.5	13660.5	13660.5	200.0	200.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	1200.0	.0	.0	58.0	1258.0	1258.0	81.6	81.6	.0	.0	.0	.0	.0	.0	.0	.0	.0
10	12000.0	99.2	.0	.0	12099.2	12099.2	40.0	40.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	3600.0	.0	90.5	30.0	3720.6	3720.6	123.7	123.7	.0	.0	.0	.0	.0	.0	.0	.0	.0

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- P E R A C R E S T A N D T A B L E S U M M A R I E S F O R T I M B E R S P E C I E S O N L Y -

ENGELMANN SPRUCE (093)

DIAMETER	STEMS						BASAL AREA				CUBIC VOLUME				SCRIBNER VOLUME			SAWLOG CUB 7+		
			SND	ROTN						SND				SND			SND			SND
(INCHES)	DES	ACC	CULL	CULL	SALV	MORT	DES	ACC	CULL	DEAD	DES	ACC	CULL	DEAD	DES	ACC	DEAD	DES	ACC	DEAD
0- .9	627.3	27.3	2918.2	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1- 2.9	81.8	54.5	54.5	.0	.0	.0	1.1	1.8	.3	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3- 4.9	54.5	.0	.0	.0	.0	.0	3.7	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 6.9	14.9	14.0	.0	.0	.0	.0	2.7	3.6	.0	.0	13.	48.	0.	0.	0.	0.	0.	0.	0.	0.
7- 8.9	9.1	33.4	.0	.0	.0	.0	2.7	10.9	.0	.0	39.	166.	0.	0.	87.	423.	0.	36.	150.	0.
9-10.9	26.4	8.2	.0	.0	.0	.0	13.6	3.6	.0	.0	255.	61.	0.	0.	853.	184.	0.	230.	55.	0.
11-12.9	4.1	.0	.0	.0	.0	.0	2.7	.0	.0	.0	62.	0.	0.	0.	228.	0.	0.	56.	0.	0.
13-14.9	21.3	.0	.0	.0	.0	.0	21.8	.0	.0	.0	522.	0.	0.	0.	2060.	0.	0.	470.	0.	0.
15-16.9	10.2	.0	.0	.0	.0	.0	14.5	.0	.0	.0	384.	0.	0.	0.	1615.	0.	0.	346.	0.	0.
17-18.9	5.4	.0	.0	.0	.0	4.2	9.1	.0	.0	7.3	226.	0.	0.	159.	964.	0.	669.	204.	0.	143.
19-20.9	4.1	1.7	.0	.0	.0	.0	9.1	3.6	.0	.0	238.	102.	0.	0.	1047.	451.	0.	214.	92.	0.
21-22.9	.0	1.1	.0	.0	.0	.0	.0	2.7	.0	.0	0.	60.	0.	0.	0.	258.	0.	0.	56.	0.
23-24.9	1.1	1.2	.0	.0	.0	.0	3.6	3.6	.0	.0	92.	107.	0.	0.	440.	524.	0.	86.	101.	0.
25-26.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
27-28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
29-30.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0- 4.9	763.6	81.8	2972.7	.0	.0	.0	4.8	1.8	.3	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5-99.9	96.7	59.7	.0	.0	.0	4.2	80.0	28.2	.0	7.3	1832.	545.	0.	159.	7295.	1840.	669.	1641.	454.	143.
0-99.9	860.3	141.5	2972.7	.0	.0	4.2	84.8	30.0	.3	7.3	1832.	545.	0.	159.	7295.	1840.	669.	1641.	454.	143.

CORKBARK FIR (018)

DIAMETER	STEMS						BASAL AREA				CUBIC VOLUME				SCRIBNER VOLUME			SAWLOG CUB 7+		
			SND	ROTN						SND				SND			SND			SND
(INCHES)	DES	ACC	CULL	CULL	SALV	MORT	DES	ACC	CULL	DEAD	DES	ACC	CULL	DEAD	DES	ACC	DEAD	DES	ACC	DEAD
0- .9	27.3	.0	245.5	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1- 2.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3- 4.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 6.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7- 8.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9-10.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11-12.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13-14.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-16.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17-18.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
19-20.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21-22.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
23-24.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-26.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
27-28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
29-30.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0- 4.9	27.3	.0	245.5	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0-99.9	27.3	.0	245.5	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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- P E R A C R E S T A N D T A B L E S U M M A R I E S F O R T I M B E R S P E C I E S O N L Y -

ASPEN (746)

DIAMETER	STEMS						BASAL AREA				CUBIC VOLUME				SCRIBNER VOLUME			SAWLOG CUB 7+		
(INCHES)	DES	ACC	SND CULL	ROTN CULL	SALV	MORT	DES	ACC	CULL	SND DEAD	DES	ACC	CULL	SND DEAD	DES	ACC	SND DEAD	DES	ACC	SND DEAD
0- .9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1- 2.9	.0	.0	27.3	.0	.0	.0	.0	.0	.6	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3- 4.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 6.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7- 8.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9-10.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11-12.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
13-14.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
15-16.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
17-18.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
19-20.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21-22.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
23-24.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
25-26.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
27-28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
29-30.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0- 4.9	.0	.0	27.3	.0	.0	.0	.0	.0	.6	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0-99.9	.0	.0	27.3	.0	.0	.0	.0	.0	.6	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ALL TIMBER TREES

DIAMETER	STEMS						BASAL AREA				CUBIC VOLUME				SCRIBNER VOLUME			SAWLOG CUB 7+		
(INCHES)	DES	ACC	SND CULL	ROTN CULL	SALV	MORT	DES	ACC	CULL	SND DEAD	DES	ACC	CULL	SND DEAD	DES	ACC	SND DEAD	DES	ACC	SND DEAD
0- .9	654.5	27.3	3163.6	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1- 2.9	81.8	54.5	81.8	.0	.0	.0	1.1	1.8	.9	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3- 4.9	54.5	.0	.0	.0	.0	.0	3.7	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5- 6.9	14.9	14.0	.0	.0	.0	.0	2.7	3.6	.0	.0	13.	48.	0.	0.	0.	0.	0.	0.	0.	0.
7- 8.9	9.1	33.4	.0	.0	.0	.0	2.7	10.9	.0	.0	39.	166.	0.	0.	87.	423.	0.	36.	150.	0.
9-10.9	26.4	8.2	.0	.0	.0	.0	13.6	3.6	.0	.0	255.	61.	0.	0.	853.	184.	0.	230.	55.	0.
11-12.9	4.1	.0	.0	.0	.0	.0	2.7	.0	.0	.0	62.	0.	0.	0.	228.	0.	0.	56.	0.	0.
13-14.9	21.3	.0	.0	.0	.0	.0	21.8	.0	.0	.0	522.	0.	0.	0.	2060.	0.	0.	470.	0.	0.
15-16.9	10.2	.0	.0	.0	.0	.0	14.5	.0	.0	.0	384.	0.	0.	0.	1615.	0.	0.	346.	0.	0.
17-18.9	5.4	.0	.0	.0	.0	4.2	9.1	.0	.0	7.3	226.	0.	0.	159.	964.	0.	669.	204.	0.	143.
19-20.9	4.1	1.7	.0	.0	.0	.0	9.1	3.6	.0	.0	238.	102.	0.	0.	1047.	451.	0.	214.	92.	0.
21-22.9	.0	1.1	.0	.0	.0	.0	.0	2.7	.0	.0	0.	60.	0.	0.	0.	258.	0.	0.	56.	0.
23-24.9	1.1	1.2	.0	.0	.0	.0	3.6	3.6	.0	.0	92	107.	0.	0.	440	524.	0.	86.	101.	0.
25-26.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
27-28.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
29-30.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31-99.9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0- 4.9	790.9	81.8	3245.5	.0	.0	.0	4.8	1.8	.9	.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5-99.9	96.7	59.7	.0	.0	.0	4.2	80.0	28.2	.0	7.3	1832.	545.	0.	159.	7295.	1840.	669.	1641.	454.	143.
0-99.9	887.6	141.5	3245.5	.0	.0	4.2	84.8	30.0	.9	7.3	1832.	545.	0.	159.	7295.	1840.	669.	1641.	454.	143.

LOC-SITE 103510-0010	FOREST 12 DISTRICT 3 SURVEY DATE 8309	NET MERCH FACTORS PAGE TYPE 5
COMBINATION RUN	DATA FOR UNEVEN-AGED MANAGEMENT WORKSHOP	SAMPLE POINTS 11 SAMPLE TREES 88
SPRUCE-FIR SAWTIMBER	ORIGIN DATE 1895 STAND ACRES 40	BAF 0 FPS 300 GP 0 SURVEY TYPE 4

STAND SUMMARY MANAGEMENT AREA 9B

**** RIS CARD TYPE 5 DATA ****

TREE SURVEY TYPE:	4	BF SW:	9135
TREE SURVEY DATE:	0	CUBIC SAW SW:	2110
FOREST TYPE:	SF	CUBIC SAW HW:	0
STAND SIZE CLASS:	9	CUBIC POLE SW:	267
PCT NON STOCK:	0	CUBIC POLE HW:	0
ORIGIN DATE:	1895	CUBIC CULL:	0
DBH:	10	CUBIC SND DEAD:	159
HT:	50	PCT DOWN SND DEAD:	0
BA:	108	HARD SNAGS:	0
TOTAL TREES:	4275	SOFT SNAGS:	0
LARGE TREES:	156	GROSS CUBIC GROWTH:	55
SEROTINY:	0	CUBIC MORT:	32
DAMAGE:	76 (UNH. FOLIAGE)		
MISTLETOE:	0 (ABSENT)		
BEETLE RATING:	3		

**** LIVE TREE STOCKING ****

* BASAL AREA X DBH **

1-4	5-8	9-15	16-99
8	20	47	41

**** BASAL AREA X SPECIES GROUP (1"+) *****

FIR	SPR	PP	OP	LP	DF	AS	OH	OS
0	115	0	0	0	0	1	0	0

TREES(1+)	BAA	QMD	SDI	AGE	MAI	PAI	YIELD	SCRIB(7+)	CUBIC(7+)
429	116	7.0	242	92	25	23	63	9135	2316

APPENDIX C: GROW PRINTOUTS FOR UNEVEN-AGED MANAGEMENT SIMULATIONS

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SUMMARY OF INPUT DATA
01/07/82 CORRECTED 7-9 INCH PONDEROSA VOLUME
*****TITLE CARD***************
TITL=1[illegible]516-0010. UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE)                    GROW VERSION 010782
*****INFORMATION CARD*********
IFOR=12 IWC=1 ISF= 4 IUMGT= 0 IMGT=22 LOPT=2 IREP= 2 IADD= 1 MOR5= 2 IDAT=0 IEQA=0 ISI= 78
MOR9= 3 IADD9= 0 JDAT=0 IRDM=7 NCU=2377 NBF= 9135 IBA= 115 ICFR= 200 IBFR= 1000 IDEB=   1 IPER= 5 ILIM=9999 IVOL=0 NBA=  0
THE GROWTH AND MORTALITY INTERVAL BETWEEN PERIODS 1 AND 2 HAS BEEN SET TO  5 YEARS
THE GROWTH AND MORTALITY INTERVAL BETWEEN PERIODS 2 AND 3 IS 5 YEARS
THE GROWTH AND MORTALITY INTERVAL BETWEEN ALL OTHER PERIODS IS 10 YEARS
*****MANAGEMENT CUTS**********
CUT( 1)= 100.  CUTL( 1)=   2.  JOPT( 1)=    1  NOPT( 1)=    1  G3( 1)=   0.
CUT( 2)= 100.  CUTL( 2)=   4.  JOPT( 2)=    1  NOPT( 2)=    1  G3( 2)=  53.
CUT( 3)= 100.  CUTL( 3)=   5.  JOPT( 3)=    1  NOPT( 3)=    1  G3( 3)=  53.
CUT( 4)= 100.  CUTL( 4)=   6.  JOPT( 4)=    1  NOPT( 4)=    1  G3( 4)=  53.
CUT( 5)= 100.  CUTL( 5)=   7.  JOPT( 5)=    1  NOPT( 5)=    1  G3( 5)=  53.
CUT( 6)= 100.  CUTL( 6)=   8.  JOPT( 6)=    1  NOPT( 6)=    1  G3( 6)=  53.
CUT( 7)= 100.  CUTL( 7)=   9.  JOPT( 7)=    1  NOPT( 7)=    1  G3( 7)=  53.
CUT( 8)= 100.  CUTL( 8)=  10.  JOPT( 8)=    1  NOPT( 8)=    1  G3( 8)=  53.
CUT( 9)= 100.  CUTL( 9)=  11.  JOPT( 9)=    1  NOPT( 9)=    1  G3( 9)=  53.
CUT(10)= 100.  CUTL(10)=  12.  JOPT(10)=    1  NOPT(10)=    1  G3(10)=  53.
CUT(11)= 100.  CUTL(11)=  13.  JOPT(11)=    1  NOPT(11)=    1  G3(11)=  53.
CUT(12)= 100.  CUTL(12)=  14.  JOPT(12)=    1  NOPT(12)=    1  G3(12)=  53.
CUT(13)= 100.  CUTL(13)=  15.  JOPT(13)=    1  NOPT(13)=    1  G3(13)=  53.
CUT(14)= 100.  CUTL(14)=  16.  JOPT(14)=    1  NOPT(14)=    1  G3(14)=  53.
CUT(15)= 100.  CUTL(15)=  17.  JOPT(15)=    1  NOPT(15)=    1  G3(15)=  53.
CUT(16)= 100.  CUTL(16)=  18.  JOPT(16)=    1  NOPT(16)=    1  G3(16)=  53.
CUT(17)= 100.  CUTL(17)=  19.  JOPT(17)=    1  NOPT(17)=    1  G3(17)=  53.
CUT(18)= 100.  CUTL(18)=  20.  JOPT(18)=    1  NOPT(18)=    1  G3(18)=  53.
CUT(19)= 100   CUTL(19)=  21.  JOPT(19)=    1  NOPT(19)=    1  G3(19)=  53.
CUT(20)= 100.  CUTL(20)=  22.  JOPT(20)=    1  NOPT(20)=    1  G3(20)=  53.
CUT(21)= 100.  CUTL(21)=  23.  JOPT(21)=    1  NOPT(21)=    1  G3(21)=  53.
CUT(22)= 100.  CUTL(22)=  24.  JOPT(22)=    1  NOPT(22)=    1  G3(22)=  53.
*****INITIAL STAND************
BC(1, 1,1)=682.0  DBH( 1)=   .0  HT( 1)=  1.6
BC(1, 2,1)=136.0  DBH( 2)=  1.8  HT( 2)= 11.0
BC(1, 3,1)= 55.0  DBH( 3)=  3.5  HT( 3)= 20.0
BC(1, 4,1)= 28.9  DBH( 4)=  6.3  HT( 4)= 30.7
BC(1, 5,1)= 42.5  DBH( 5)=  7.7  HT( 5)= 43.3
BC(1, 6,1)= 34.6  DBH( 6)=  9.5  HT( 6)= 50.4
BC(1, 7,1)=  4.1  DBH( 7)= 11.0  HT( 7)= 61.0
BC(1, 8,1)= 21.3  DBH( 8)= 13.7  HT( 8)= 63.2
BC(1, 9,1)= 10.2  DBH( 9)= 16.2  HT( 9)= 68.8
BC(1,10,1)=  5.4  DBH(10)= 17.5  HT(10)= 64.9
BC(1,11,1)=  5.9  DBH(11)= 19.9  HT(11)= 69.5
BC(1,12,1)=  1.1  DBH(12)= 21.0  HT(12)= 57.0
BC(1,13,1)=  2.3  DBH(13)= 23.9  HT(13)= 76.8
BC(1,14,1)=   .0  DBH(14)=   .0  HT(14)=   .0
BC(1,15,1)=   .0  DBH(15)=   .0  HT(15)=   .0
BC(1,16,1)=   .0  DBH(16)=   .0  HT(16)=   .0
BC(1,17,1)=   .0  DBH(17)=   .0  HT(17)=   .0
*****COEFFICIENTS USED********
SCRIB. VOL. LT 21IN  =  -.118510000+02+(   .114900000+01*DBH*DBH*HT/10C
SCRIB. VOL. GE 21IN  =   .162000000+01+(   .115800001+01*DBH*DBH*HT/100. )
CUBIC VOL. LT 21IN   =   480000000+00+(    .214000000+00*DBH*DBH*HT/100. )
CUBIC VOL. GE 21IN.  =   .190409999+02+(   .174000001+00*DBH*DBH*HT/100. )
CURRENT ANNUAL DBH INC. = (   .349900001-01) + (   .122999999-02 X DBH) + (  - 528199998-04 X DBH X DBH) + (  -.503499999-03 X BA)
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103510-0010 UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(1)				CUT(1)				RESIDUAL(1)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	682	0	0	0	0	0	0	0	682	0	0	0
2	136	0	0	0	0	0	0	0	136	0	0	0
4	55	0	0	0	0	0	0	0	55	0	0	0
6	29	6	0	89	0	0	0	0	29	6	0	89
8	43	14	0	254	0	0	0	0	43	14	0	254
10	35	17	1398	353	0	0	0	0	35	17	1398	353
12	4	3	299	67	0	0	0	0	4	3	299	67
14	21	22	2651	551	0	0	0	0	21	22	2651	551
16	10	15	1995	399	0	0	0	0	10	15	1995	399
18	5	9	1169	232	0	0	0	0	5	9	1169	232
20	6	13	1796	350	0	0	0	0	6	13	1796	350
22	1	3	322	69	0	0	0	0	1	3	322	69
24	2	7	1172	219	0	0	0	0	2	7	1172	219
26	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0
ALL	1029	108	10802	2584	0	0	0	0	1029	108	10802	2584

	STAND(2)				CUT(2)				RESIDUAL(2)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	675	0	0	0	0	0	0	0	675	0	0	0
2	134	0	0	0	0	0	0	0	134	0	0	0
4	54	0	0	0	0	0	0	0	54	0	0	0
6	29	7	0	104	3	1	0	10	26	6	0	94
8	43	15	0	292	4	2	0	29	38	14	0	263
10	35	19	1638	398	3	2	161	39	31	17	1477	359
12	4	3	339	74	0	0	33	7	4	3	306	67
14	21	23	2917	600	2	2	287	59	19	21	2629	541
16	9	14	1945	387	1	1	192	38	8	13	1753	349
18	5	9	1255	248	1	1	124	24	5	9	1131	224
20	5	11	1582	308	0	1	156	30	4	10	1427	278
22	1	3	339	72	0	0	33	7	1	2	306	65
24	2	6	1041	193	0	1	103	19	2	6	938	174
26	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0
ALL	1017	111	11056	2677	15	11	1089	264	1002	100	9967	2413

	STAND(3)				CUT(3)				RESIDUAL(3)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	668	0	0	0	0	0	0	0	668	0	0	0
2	132	0	0	0	0	0	0	0	132	0	0	0
4	53	0	0	0	0	0	0	0	53	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
8	64	23	0	413	0	0	0	0	64	23	0	413
10	31	18	1724	405	0	0	0	0	31	18	1724	405
12	4	3	346	74	0	0	0	0	4	3	346	74
14	19	22	2895	591	0	0	0	0	19	22	2895	591
16	0	0	0	0	0	0	0	0	0	0	0	0
18	13	22	3112	615	0	0	0	0	13	22	3112	615
20	4	10	1515	294	0	0	0	0	4	10	1515	294
22	1	3	323	67	0	0	0	0	1	3	323	67
24	2	6	981	181	0	0	0	0	2	6	981	181
26	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0
ALL	992	108	10897	2640	0	0	0	0	992	108	10897	2640

	STAND(4)				CUT(4)				RESIDUAL(4)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	0	0	0	0	0	0	0	0	0	0	0	0
2	654	0	0	0	0	0	0	0	654	0	0	0
4	129	0	0	0	0	0	0	0	129	0	0	0
6	53	8	0	137	13	2	0	33	40	6	0	104
8	26	9	0	150	6	2	0	36	20	7	0	114
10	38	19	1597	400	9	5	386	97	29	14	1210	303
12	35	25	2753	606	8	6	666	147	26	19	2087	460
14	0	0	0	0	0	0	0	0	0	0	0	0
16	19	25	3505	704	5	6	848	170	15	19	2656	534
18	8	15	2221	436	2	4	538	106	6	11	1683	330
20	5	10	1404	275	1	2	340	66	4	7	1064	208
22	5	14	2148	424	1	3	520	103	4	11	1628	322
24	0	0	0	0	0	0	0	0	0	0	0	0
26	2	6	1077	195	0	2	261	47	1	5	816	148
28	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0
ALL	975	132	14703	3328	46	32	3559	806	928	100	11144	2522

103510-0010: UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1
ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(5)				CUT(5)				RESIDUAL(5)				STAND(6)				CUT(6)				RESIDUAL(6)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	53	0	0	0	0	0	0	0	53	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	640	0	0	0	0	0	0	0	640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	126	0	0	0	0	0	0	0	126	0	0	0	627	0	0	0	0	0	0	0	627	0	0	0
6	40	8	0	153	4	1	0	15	36	8	0	138	126	21	0	342	33	5	0	90	93	15	0	252
8	0	0	0	0	0	0	0	0	0	0	0	0	36	10	0	198	10	3	0	52	27	7	0	146
10	49	26	2236	548	5	3	216	53	44	24	2020	495	18	10	714	181	5	3	188	48	13	7	526	133
12	24	19	2288	490	2	2	221	47	21	18	2067	442	26	19	2067	456	7	5	544	120	19	14	1524	336
14	3	3	419	86	0	0	40	8	3	3	379	77	24	23	3096	641	6	6	814	169	18	17	2281	472
16	15	22	3185	632	1	2	307	61	13	19	2877	571	0	0	0	0	0	0	0	0	0	0	0	0
18	6	12	1958	382	1	1	189	37	6	11	1769	345	13	22	3406	670	3	6	896	176	10	16	2511	494
20	4	8	1223	238	0	1	118	23	3	7	1105	215	6	12	2039	395	1	3	536	104	4	9	1502	291
22	3	[illegible]	1519	291	0	1	146	28	3	8	1373	263	3	8	1314	260	1	2	346	68	2	6	969	192
24	1	2	304	60	0	0	29	6	1	2	275	54	4	11	1835	345	1	3	483	91	3	8	1353	255
26	1	5	893	159	1	5	893	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	964	116	14025	3038	15	16	2159	437	949	100	11866	2601	987	136	14472	3487	67	36	3806	917	920	100	10666	2570

	STAND(7)				CUT(7)				RESIDUAL(7)				STAND(8)				CUT(8)				RESIDUAL(8)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	49	0	0	0	0	0	0	0	49	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	614	0	0	0	0	0	0	0	614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	93	21	0	369	14	3	0	55	79	18	0	314	614	102	0	1699	331	55	0	917	283	47	0	782
8	27	10	0	202	4	1	0	30	23	8	0	172	79	23	0	446	43	12	0	241	36	11	0	205
10	13	9	732	172	2	1	110	26	11	7	622	146	23	10	920	232	12	5	496	125	10	5	424	107
12	19	16	1983	421	3	2	297	63	16	14	1686	358	11	9	829	184	6	5	447	100	5	4	382	85
14	16	17	2413	492	2	3	361	74	13	15	2052	418	16	16	2139	443	9	9	1154	239	8	7	985	204
16	2	2	416	83	0	0	62	12	2	2	354	70	15	19	2933	586	8	10	1582	316	7	9	1350	270
18	10	18	2939	573	1	3	440	86	8	15	2499	488	0	0	0	0	0	0	0	0	0	0	0	0
20	4	10	1717	331	1	1	257	50	4	8	1460	281	8	17	2897	562	4	9	1563	303	4	8	1334	259
22	2	6	1091	210	0	1	163	31	2	6	928	179	6	15	2754	520	3	8	1486	281	3	7	1268	239
24	2	7	1251	230	0	1	187	34	2	6	1064	195	0	0	0	0	0	0	0	0	0	0	0	0
26	1	2	247	47	0	0	37	7	0	1	210	40	2	8	1403	254	1	5	863	157	1	3	540	98
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	956	118	12789	3129	28	18	1914	468	928	100	10874	2661	976	219	13875	4927	418	119	7592	2678	557	100	6283	2249

03510-0010. UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(9)				CUT(9)				RESIDUAL(9)				STAND(10)				CUT(10)				RESIDUAL(10)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	47	0	0	0	0	0	0	0	47	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	283	64	0	1142	51	12	0	206	232	53	0	936	0	0	0	0	0	0	0	0	0	0	0	0
8	36	13	0	284	7	2	0	51	30	11	0	232	232	69	0	1327	44	13	0	251	188	56	0	1076
10	10	6	607	141	2	1	110	26	9	5	497	116	38	19	1926	462	7	4	365	87	31	16	1561	374
12	5	5	493	106	1	1	89	19	4	4	404	87	0	0	0	0	0	0	0	0	0	0	0	0
14	8	8	1224	248	1	2	221	45	6	7	1003	203	4	4	509	106	1	1	96	20	3	4	413	86
16	6	9	1393	276	1	2	252	50	5	7	1141	226	11	16	2582	511	2	3	489	97	9	13	2093	414
18	1	1	230	45	0	0	42	8	1	1	188	37	1	1	220	43	0	0	42	8	0	1	178	35
20	4	8	1532	296	1	2	277	53	3	7	1255	242	0	0	0	0	0	0	0	0	0	0	0	0
22	2	5	887	164	0	1	160	30	1	4	726	134	3	8	1483	281	1	1	281	53	3	6	1203	228
24	1	3	532	98	0	1	96	18	1	2	436	80	2	7	1292	234	0	1	245	44	2	5	1048	190
26	1	3	592	105	1	3	592	105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	604	125	7489	2904	65	25	1838	611	539	100	5651	2293	585	123	8012	2964	55	23	1517	561	530	100	6495	2403

	STAND(11)				CUT(11)				RESIDUAL(11)				STAND(12)				CUT(12)				RESIDUAL(12)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	46	8	0	129	10	2	0	29	36	6	0	100	82	16	0	274	17	3	0	57	65	13	0	217
8	188	71	0	1482	42	16	0	333	146	55	0	1149	0	0	0	0	0	0	0	0	0	0	0	0
10	24	13	1438	333	5	3	323	75	19	10	1115	258	146	68	6182	1543	30	14	1287	321	115	54	4895	1221
12	7	5	724	153	2	1	163	34	5	4	561	119	24	17	2231	480	5	4	464	100	19	14	1766	380
14	3	4	510	104	1	1	115	23	3	3	395	81	0	0	0	0	0	0	0	0	0	0	0	0
16	5	7	1195	236	1	2	269	53	4	6	926	183	3	4	480	96	1	1	100	20	2	3	380	76
18	4	7	1294	252	1	2	291	57	3	6	1003	195	7	12	2267	441	1	3	472	92	6	10	1795	349
20	0	1	206	40	0	0	46	9	0	1	160	31	0	1	183	35	0	0	38	7	0	1	145	28
22	3	7	1355	251	1	1	305	56	2	5	1051	195	2	6	1176	213	0	1	245	44	2	4	931	169
24	1	4	728	130	0	1	164	29	1	3	564	101	0	0	0	0	0	0	0	0	0	0	0	0
26	1	2	430	77	0	1	97	17	0	2	333	59	1	5	988	174	1	2	495	87	1	2	493	87
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	576	129	7879	3187	63	29	1771	716	513	100	6108	2470	559	128	13507	3257	56	28	3101	729	503	100	10406	2528

1:3510-0010. UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1
ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(13)				CUT(13)				RESIDUAL(13)				STAND(14)				CUT(14)				RESIDUAL(14)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	82	16	0	277	18	4	0	60	65	13	0	217	82	16	0	276	16	3	0	55	66	13	0	220
8	28	8	0	163	6	2	0	35	22	7	0	128	51	17	0	341	10	3	0	68	40	14	0	272
10	115	65	6939	1602	25	14	1506	348	90	51	5433	1254	0	0	0	0	0	0	0	0	0	0	0	0
12	15	12	1569	332	3	3	340	72	12	9	1228	260	102	72	8919	1935	20	14	1790	388	81	57	7129	1547
14	4	4	713	144	1	1	155	31	3	3	558	113	3	4	686	137	1	1	138	27	3	3	549	109
16	2	3	455	90	0	1	99	20	2	2	356	71	0	0	0	0	0	0	0	0	0	0	0	0
18	3	5	1023	199	1	1	222	43	2	4	801	156	4	7	1352	263	1	1	271	53	3	6	1081	210
20	3	5	1065	205	1	1	231	45	2	4	834	161	2	5	953	183	0	1	191	37	2	4	762	146
22	0	1	170	31	0	0	37	7	0	1	133	24	0	1	150	27	0	0	30	5	0	0	120	22
24	2	5	1037	185	0	1	225	40	1	4	812	145	1	4	898	158	0	1	180	32	1	3	718	126
26	1	2	541	94	0	1	117	20	1	2	423	73	1	2	462	79	1	2	462	79	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	549	128	13511	3323	55	28	2932	721	494	100	10579	2602	540	127	13422	3398	50	27	3063	745	490	100	10359	2653

	STAND(15)				CUT(15)				RESIDUAL(15)				STAND(16)				CUT(16)				RESIDUAL(16)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	83	16	0	279	18	3	0	59	65	13	0	220	82	16	0	277	16	3	0	53	66	13	0	224
8	52	17	0	348	11	4	0	74	41	14	0	274	52	17	0	348	10	3	0	67	42	14	0	281
10	18	8	757	188	4	2	161	40	14	7	596	148	32	16	1613	386	6	3	309	74	26	13	1304	312
12	72	57	7687	1626	15	12	1631	345	57	45	6056	1281	0	0	0	0	0	0	0	0	0	0	0	0
14	9	10	1565	316	2	2	332	67	7	8	1233	249	64	61	9230	1891	12	12	1768	362	52	49	7462	1529
16	3	4	664	131	1	1	141	28	2	3	523	103	2	3	625	122	0	1	120	23	2	3	505	99
18	1	2	394	77	0	1	84	16	1	2	310	61	0	0	0	0	0	0	0	0	0	0	0	0
20	2	4	857	165	0	1	182	35	2	3	675	130	3	6	1131	217	0	1	217	42	2	5	914	176
22	2	5	1026	187	0	1	218	40	1	4	809	148	1	3	789	142	0	1	151	27	1	3	638	115
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	20	0	0	22	4	0	0	92	16
26	1	3	790	137	0	1	168	29	1	3	623	108	1	3	682	117	1	3	682	117	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	536	127	13742	3454	51	27	2916	733	485	100	10825	2721	531	127	14183	3520	46	27	3268	769	485	100	10916	2752

103510-0010: UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1
ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(17)				CUT(17)				RESIDUAL(17)				STAND(18)				CUT(18)				RESIDUAL(18)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	83	16	0	281	17	3	0	59	66	13	0	222	82	16	0	277	17	3	0	58	65	13	0	220
8	53	18	0	356	11	4	0	75	42	14	0	281	53	18	0	354	11	4	0	74	42	14	0	280
10	33	17	1665	398	7	4	349	84	26	13	1316	315	33	17	1671	400	7	4	348	83	26	13	1323	317
12	11	8	922	202	2	2	193	42	9	6	728	160	20	15	1891	407	4	3	393	85	16	12	1498	322
14	46	49	7784	1573	10	10	1633	330	36	39	6151	1243	36	44	7538	1502	8	9	1568	312	29	35	5970	1189
16	6	8	1478	291	1	2	310	61	5	6	1168	230	5	7	1392	272	1	1	290	57	4	6	1103	215
18	2	3	597	116	0	1	125	24	1	2	472	91	1	2	551	106	0	1	115	22	1	2	436	84
20	1	2	333	64	0	0	70	14	1	1	263	51	0	0	0	0	0	0	0	0	0	0	0	0
22	1	3	729	133	0	1	153	28	1	2	576	105	2	4	958	175	0	1	199	36	1	3	759	138
24	1	3	811	143	0	1	170	30	1	3	641	113	1	3	624	109	0	1	130	23	1	2	494	86
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	14	0	0	17	3	0	0	66	11
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	531	127	14318	3556	50	27	3004	746	481	100	11314	2810	527	126	14709	3615	48	26	3060	752	479	100	11650	2863

	STAND(19)				CUT(19)				RESIDUAL(19)				STAND(20)				CUT(20)				RESIDUAL(20)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	82	16	0	278	17	3	0	57	66	13	0	221	83	16	0	278	17	3	0	57	66	13	0	221
8	52	17	0	351	11	4	0	72	41	14	0	279	52	17	0	349	11	4	0	72	41	14	0	278
10	33	17	1673	400	7	3	343	82	26	14	1331	318	33	17	1676	401	7	4	345	83	26	14	1331	319
12	21	15	1912	411	4	3	392	84	16	12	1520	327	21	15	1931	415	4	3	397	85	17	12	1533	330
14	7	7	960	198	1	1	197	40	6	5	763	157	13	13	1936	395	3	3	398	81	10	10	1537	314
16	29	39	7208	1420	6	8	1477	291	23	31	5731	1129	23	35	6828	1333	5	7	1405	274	18	28	5423	1059
18	4	6	1299	252	1	1	266	52	3	5	1033	200	3	6	1205	232	1	1	248	48	2	4	957	184
20	1	2	505	97	0	0	103	20	1	2	401	77	1	2	460	88	0	0	95	18	1	1	365	70
22	1	1	278	52	0	0	57	11	0	1	221	41	0	1	247	45	0	0	51	9	0	1	196	36
24	1	2	571	100	0	0	117	21	1	2	454	80	1	2	489	85	0	0	101	17	0	2	388	67
26	1	2	601	103	0	1	179	31	0	2	422	73	0	2	450	77	0	0	93	16	0	1	358	61
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	525	126	15006	3662	47	26	3131	760	477	100	11876	2902	523	126	15221	3699	47	26	3132	761	476	100	12089	2938

103510-0010: UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(21)				CUT(21)				RESIDUAL(21)				STAND(22)				CUT(22)				RESIDUAL(22)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	83	16	0	278	16	3	0	54	66	13	0	224	83	16	0	280	17	3	0	57	66	13	0	222
8	52	17	0	351	10	3	0	68	42	14	0	282	53	18	C	356	11	4	0	73	42	14	0	283
10	33	17	1669	399	6	3	326	78	26	14	1344	321	33	17	1680	402	7	4	345	83	26	14	1335	319
12	21	15	1939	417	4	3	378	81	17	12	1560	336	21	15	1966	423	4	3	404	87	17	12	1562	336
14	17	18	2887	585	3	4	563	114	14	15	2324	471	18	19	2967	601	4	4	609	123	14	15	2357	477
16	0	0	0	0	0	0	0	0	0	0	0	0	4	5	899	177	1	1	185	36	3	4	714	141
18	18	31	6386	1238	4	6	1246	242	15	25	5140	997	15	28	5990	1155	3	6	1230	237	12	22	4760	918
20	2	5	1105	212	0	1	216	41	2	4	890	171	2	4	1019	195	0	1	209	40	1	3	810	155
22	1	2	412	75	0	0	80	15	1	1	331	60	1	1	360	64	0	0	74	13	0	1	286	51
24	0	1	218	39	0	0	43	8	0	1	176	31	0	1	194	34	0	0	40	7	0	1	154	27
26	1	3	797	136	0	2	462	79	0	1	335	58	0	1	358	61	0	0	73	13	0	1	284	49
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	522	126	15413	3730	45	26	3314	780	477	100	12099	2950	523	126	15431	3748	47	26	3168	769	476	100	12263	2978

	STAND(23)				CUT(23)				RESIDUAL(23)				STAND(24)				CUT(24)				RESIDUAL(24)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	104	0	0	0	0	0	0	0	104	0	0	0	104	0	0	0	0	0	0	0	104	0	0	0
2	97	0	0	0	0	0	0	0	97	0	0	0	97	0	0	0	0	0	0	0	97	0	0	0
4	93	0	0	0	0	0	0	0	93	0	0	0	93	0	0	0	0	0	0	0	93	0	0	0
6	83	16	0	278	16	3	0	55	66	13	0	223	83	16	0	280	17	3	0	56	66	13	0	223
8	53	18	0	356	10	3	0	70	42	14	0	286	53	18	0	358	11	4	0	72	42	14	0	286
10	33	17	1688	404	7	3	332	80	27	14	1355	324	34	17	1708	409	7	3	343	82	27	14	1365	327
12	21	15	1958	421	4	3	386	83	17	12	1573	338	21	16	1967	423	4	3	395	85	17	12	1572	338
14	18	19	2979	603	4	4	587	119	14	15	2392	484	18	19	3028	613	4	4	608	123	15	15	2420	490
16	7	9	1772	347	1	2	349	68	5	8	1423	279	7	10	1816	356	1	2	365	72	5	8	1451	285
18	0	0	0	0	0	0	0	0	0	0	0	0	2	4	804	156	0	1	161	31	2	3	643	125
20	12	24	5495	1055	2	5	1082	208	9	19	4413	847	9	21	5051	966	2	4	1014	194	7	17	4037	772
22	2	5	1221	220	0	1	240	43	2	4	981	176	1	3	795	142	0	1	160	29	1	3	635	113
24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	268	47	0	0	54	9	0	1	214	37
26	1	2	473	81	0	1	336	57	0	1	136	24	0	1	149	26	0	1	149	26	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	522	126	15585	3765	45	26	3312	782	477	100	12273	2982	523	126	15586	3774	46	26	3249	778	477	100	12337	2996

103510-0010 UNEVEN-AGED MANAGEMENT (10-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

SIMULATION SUMMARY TABLE OF NET STAND VOLUMES

		INVENTORY												TREATMENT										
PER	DATE	STMS (5+)	STMS (0+)	BA (5+)	SCRB (9+)	SCRB (9-)	CUBE SAW	CUBE TPWD	CUBE POLE	CUBE (5+)	DBH (5+)	HT (5+)		STMS (5+)	STMS (0+)	BA (5+)	SCRB (9+)	SCRB (9-)	CUBE SAW	CUBE TPWD	CUBE POLE	CUBE (5+)	DBH (5+)	HT (5+)
1	1983	156	1029	108	9135	553	2076	219	82	2377	10.4	49.7												
2	1988	154	1017	111	9350	748	2140	227	96	2463	10.7	50.9	CUT	15	15	11	921	74	212	22	9	243	10.7	50.9
													RESIDUAL	139	1002	100	8429	674	1928	205	87	2220	10.7	50.9
3	1993	139	992	108	9215	983	2195	234	0	2429	11.2	52.5												
4	2003	192	975	132	12434	310	2664	271	126	3061	10.2	50.6	CUT	46	46	32	3010	75	644	66	31	741	10.2	50.6
													RESIDUAL	145	928	100	9424	235	2020	205	95	2320	10.2	50.6
5	2013	145	964	116	11861	0	2407	247	141	2795	11.2	55.0	CUT	15	15	16	1826	0	356	32	14	402	12.4	57.2
													RESIDUAL	130	949	100	10035	0	2051	215	127	2393	11.0	54.7
6	2023	256	987	136	12239	374	2626	267	315	3208	8.8	47.3	CUT	67	67	36	3219	98	691	70	83	844	8.8	47.3
													RESIDUAL	189	920	100	9020	276	1935	197	232	2364	8.8	47.3
7	2033	189	956	118	10815	566	2303	236	339	2878	9.7	52.0	CUT	28	28	18	1619	85	345	35	51	431	9.7	52.0
													RESIDUAL	161	928	100	9196	481	1958	201	288	2448	9.7	52.0
8	2043	775	976	219	11734	896	2701	268	1563	4532	6.6	39.5	CUT	418	418	119	6420	483	1474	146	843	2463	6.6	39.5
													RESIDUAL	356	557	100	5313	413	1227	122	720	2069	6.6	39.5
9	2053	356	604	125	6333	813	1472	149	1050	2671	7.5	44.4	CUT	65	65	25	1554	147	340	32	190	562	7.7	44.9
													RESIDUAL	291	539	100	4779	666	1132	117	860	2109	7.5	44.3
10	2063	291	585	123	6776	2723	2473	254	0	2727	8.4	49.4	CUT	55	55	23	1283	515	468	48	0	516	8.4	49.4
													RESIDUAL	236	530	100	5493	2208	2005	206	0	2210	8.4	49.4
11	2073	282	576	12[illegible]	6663	4293	2549	264	119	2932	8.7	51.2	CUT	63	63	29	1498	965	573	59	27	659	8.7	51.2
													RESIDUAL	219	513	100	5165	3328	1976	205	92	2272	8.7	51.2
12	2083	265	559	128	11423	0	2484	260	252	2996	8.9	52.6	CUT	56	56	28	2622	0	561	57	53	671	9.1	52.9
													RESIDUAL	209	503	100	8800	0	1923	203	199	2325	8.9	52.5
13	2093	255	549	128	11426	339	2533	269	255	3057	9.1	53.5	CUT	55	55	28	2480	74	550	58	55	663	9.1	53.5
													RESIDUAL	200	494	100	8946	265	1983	211	200	2394	9.1	53.5
14	2103	246	540	127	11351	855	2595	277	254	3126	9.2	54.1	CUT	50	50	27	2590	172	575	59	51	685	9.3	54.6
													RESIDUAL	196	490	100	8760	683	2020	218	203	2440	9.1	54.0
15	2113	242	536	127	11621	874	2640	280	257	3177	9.2	54.5	CUT	51	51	27	2466	186	561	59	54	674	9.2	54.5
													RESIDUAL	191	485	100	9154	688	2079	221	203	2503	9.2	54.5
16	2123	237	531	127	11994	874	2695	288	255	3238	9.3	54.8	CUT	46	46	27	2764	167	598	60	49	707	9.5	55.5
													RESIDUAL	191	485	100	9231	707	2097	228	206	2532	9.2	54.6
17	2133	237	531	127	12108	895	2722	291	258	3271	9.2	54.9	CUT	50	50	27	2540	188	571	61	54	686	9.2	54.9
													RESIDUAL	187	481	100	9568	707	2151	230	204	2585	9.2	54.9
18	2143	233	527	126	12439	890	2774	296	255	3325	9.3	55.0	CUT	48	48	26	2588	185	577	62	53	692	9.3	55.0
													RESIDUAL	185	479	100	9852	705	2197	234	202	2634	9.3	55.0
19	2153	231	525	126	12690	885	2812	302	255	3369	9.3	55.0	CUT	47	47	26	2648	181	585	62	52	699	9.3	55.1
													RESIDUAL	183	477	100	10043	704	2227	240	203	2670	9.3	55.0
20	2163	229	523	126	12872	878	2840	307	256	3403	9.3	55.0	CUT	47	47	26	2649	181	584	63	53	700	9.3	55.0
													RESIDUAL	182	476	100	10223	697	2256	244	203	2703	9.3	55.0
21	2173	228	522	126	13034	882	2867	308	256	3431	9.3	55.0	CUT	45	45	26	2803	172	605	63	50	718	9.4	55.4
													RESIDUAL	183	477	100	10232	710	2262	245	206	2714	9.2	54.9
22	2183	229	523	126	13050	895	2877	313	258	3448	9.2	54.9	CUT	47	47	26	2679	184	590	64	53	707	9.2	54.9
													RESIDUAL	182	476	100	10371	711	2287	249	205	2739	9.2	54.9
23	2193	228	522	126	13180	895	2897	310	256	3463	9.2	54.8	CUT	45	45	26	2801	176	606	63	50	719	9.3	55.2
													RESIDUAL	183	477	100	10379	719	2291	247	206	2743	9.2	54.8
24	2203	229	523	126	13181	900	2901	314	257	3472	9.2	54.8	CUT	46	46	26	2748	181	600	64	52	716	9.3	54.9
													RESIDUAL	183	477	100	10433	719	2301	250	205	2756	9.2	54.7

LOWER LIMIT OF SAWTIMBER UTILIZATION FOR SCRB, CUBE SAW, AND CUBE TPWD IS 7.0 INCHES DBH

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SUMMARY OF INPUT DATA
01/07/82 CORRECTED 7-9 INCH PONDEROSA VOLUME
*****TITLE CARD***************
TITL=103510-0010  UNEVEN-AGED MANAGEMENT (20-YEAR CUTTING CYCLE)                         GROW VERSION 010782
*****INFORMATION CARD*********
IFOR=12 IWC=1 ISP= 4 IUMGT= 0 IMGT=12 LOPT=2 IREP= 2 IADD= 1 MOR5= 2 IDAT=0 IEGA=0 ISI= 78
MOR9= 3 IADD9= 0 JDAT=0 IRDM=7 NCU=2377 NBF= 9135 IBA= 115 ICFR= 200 IBFR= 1000 IDEB=   1 IPER= 5 ILIM=9999 IVOL=0 NBA=  0
THE GROWTH AND MORTALITY INTERVAL BETWEEN PERIODS 1 AND 2 HAS BEEN SET TO  5 YEARS
THE GROWTH AND MORTALITY INTERVAL BETWEEN PERIODS 2 AND 3 IS 5 YEARS
THE GROWTH AND MORTALITY INTERVAL BETWEEN ALL OTHER PERIODS IS 10 YEARS
*****MANAGEMENT CUTS**********
CUT( 1)= 100.  CUTL( 1)=   2.  JOPT( 1)=   1  NOPT( 1)=   1  G3( 1)=   0.
CUT( 2)= 100.  CUTL( 2)=   4.  JOPT( 2)=   1  NOPT( 2)=   1  G3( 2)=  54.
CUT( 3)= 100.  CUTL( 3)=   6.  JOPT( 3)=   1  NOPT( 3)=   1  G3( 3)=  54.
CUT( 4)= 100.  CUTL( 4)=   8.  JOPT( 4)=   1  NOPT( 4)=   1  G3( 4)=  54.
CUT( 5)= 100.  CUTL( 5)=  10.  JOPT( 5)=   1  NOPT( 5)=   1  G3( 5)=  54.
CUT( 6)= 100.  CUTL( 6)=  12.  JOPT( 6)=   1  NOPT( 6)=   1  G3( 6)=  54.
CUT( 7)= 100.  CUTL( 7)=  14.  JOPT( 7)=   1  NOPT( 7)=   1  G3( 7)=  54.
CUT( 8)= 100.  CUTL( 8)=  16.  JOPT( 8)=   1  NOPT( 8)=   1  G3( 8)=  54.
CUT( 9)= 100.  CUTL( 9)=  18.  JOPT( 9)=   1  NOPT( 9)=   1  G3( 9)=  54.
CUT(10)= 100.  CUTL(10)=  20.  JOPT(10)=   1  NOPT(10)=   1  G3(10)=  54.
CUT(11)= 100.  CUTL(11)=  22.  JOPT(11)=   1  NOPT(11)=   1  G3(11)=  54.
CUT(12)= 100.  CUTL(12)=  24.  JOPT(12)=   1  NOPT(12)=   1  G3(12)=  54.
*****INITIAL STAND************
BC(1, 1,1)=682.0  DBH( 1)=   .0  HT( 1)=  1.6
BC(1, 2,1)=136.0  DBH( 2)=  1.8  HT( 2)= 11.0
BC(1, 3,1)= 55.0  DBH( 3)=  3.5  HT( 3)= 20.0
BC(1, 4,1)= 28.9  DBH( 4)=  6.3  HT( 4)= 30.7
BC(1, 5,1)= 42.5  DBH( 5)=  7.7  HT( 5)= 43.3
BC(1, 6,1)= 34.6  DBH( 6)=  9.5  HT( 6)= 50.4
BC(1, 7,1)=  4.1  DBH( 7)= 11.0  HT( 7)= 61.0
BC(1, 8,1)= 21.3  DBH( 8)= 13.7  HT( 8)= 63.2
BC(1, 9,1)= 10.2  DBH( 9)= 16.2  HT( 9)= 68.8
BC(1,10,1)=  5.4  DBH(10)= 17.5  HT(10)= 64.9
BC(1,11,1)=  5.9  DBH(11)= 19.9  HT(11)= 69.5
BC(1,12,1)=  1.1  DBH(12)= 21.0  HT(12)= 57.0
BC(1,13,1)=  2.3  DBH(13)= 23.9  HT(13)= 76.8
BC(1,14,1)=   .0  DBH(14)=   .0  HT(14)=   .0
BC(1,15,1)=   .0  DBH(15)=   .0  HT(15)=   .0
BC(1,16,1)=    0  DBH(16)=   .0  HT(16)=   .0
BC(1,17,1)=    0  DBH(17)=   .0  HT(17)=   .0
*****COEFFICIENTS USED********
SCRIB.VOL.LT.21IN.  =  -.118510000+02+(  .114900000+01*DBH*DBH*HT/100.)
SCRIB.VOL.GE.21IN.  =   .162000000+01+(  .115800001+01*DBH*DBH*HT/100.)
CUBIC VOL.LT.21IN.  =   .480000000+00+(  .214000000+00*DBH*DBH*HT/100.)
CUBIC VOL.GE.21IN.  =   .190409999+02+(  .174000001+00*DBH*DBH*HT/100.)
CURRENT ANNUAL DBH INC. = (  .349900001-01) + (  .122999999-02 X DBH) + (  -.528199998-04 X DBH X DBH) + (  -.503499999-03 X BA)
                 + (  .113000000-05 X BA X BA) + (  .116800000-02 X SITE INDEX)
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103510-0010: UNEVEN-AGED MANAGEMENT (20-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(1)				CUT(1)				RESIDUAL(1)				STAND(2)				CUT(2)				RESIDUAL(2)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	682	0	0	0	0	0	0	0	682	0	0	0	675	0	0	0	0	0	0	0	675	0	0	0
2	136	0	0	0	0	0	0	0	136	0	0	0	134	0	0	0	0	0	0	0	134	0	0	0
4	55	0	0	0	0	0	0	0	55	0	0	0	54	0	0	0	0	0	0	0	54	0	0	0
6	29	6	0	89	0	0	0	0	29	6	0	89	29	7	0	104	3	1	0	10	26	6	0	94
8	43	14	0	254	0	0	0	0	43	14	0	254	43	15	0	292	4	2	0	29	38	14	0	263
10	35	17	1398	353	0	0	0	0	35	17	1398	353	35	19	1638	398	3	2	161	39	31	17	1477	359
12	4	3	299	67	0	0	0	0	4	3	299	67	4	3	339	74	0	0	33	7	4	3	306	67
14	21	22	2651	551	0	0	0	0	21	22	2651	551	21	23	2917	600	2	2	287	59	19	21	2629	541
16	10	15	1995	399	0	0	0	0	10	15	1995	399	9	14	1945	387	1	1	192	38	8	13	1753	349
18	5	9	1169	232	0	0	0	0	5	9	1169	232	5	9	1255	248	1	1	124	24	5	9	1131	224
20	6	13	1796	350	0	0	0	0	6	13	1796	350	5	11	1582	308	0	1	156	30	4	10	1427	278
22	1	3	322	69	0	0	0	0	1	3	322	69	1	3	339	72	0	0	33	7	1	2	306	65
24	2	7	1172	219	0	0	0	0	2	7	1172	219	2	6	1041	193	0	1	103	19	2	6	938	174
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	1029	108	10802	2584	0	0	0	0	1029	108	10802	2584	1017	111	11056	2677	15	11	1089	264	1002	100	9967	2413

	STAND(3)				CUT(3)				RESIDUAL(3)				STAND(4)				CUT(4)				RESIDUAL(4)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	668	0	0	0	0	0	0	0	668	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	132	0	0	0	0	0	0	0	132	0	0	0	654	0	0	0	0	0	0	0	654	0	0	0
4	53	0	0	0	0	0	0	0	53	0	0	0	129	0	0	0	0	0	0	0	129	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	53	8	0	137	13	2	0	33	40	6	0	104
8	64	23	0	413	0	0	0	0	64	23	0	413	26	9	0	150	6	2	0	36	20	7	0	114
10	31	18	1724	405	0	0	0	0	31	18	1724	405	38	19	1597	400	9	5	386	97	29	14	1210	303
12	4	3	346	74	0	0	0	0	4	3	346	74	35	25	2753	606	8	6	666	147	26	19	2087	460
14	19	22	2895	591	0	0	0	0	19	22	2895	591	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	19	25	3505	704	5	6	848	170	15	19	2656	534
18	13	22	3112	615	0	0	0	0	13	22	3112	615	8	15	2221	436	2	4	538	106	6	11	1683	330
20	4	10	1515	294	0	0	0	0	4	10	1515	294	5	10	1404	275	1	2	340	66	4	7	1064	208
22	1	3	323	67	0	0	0	0	1	3	323	67	5	14	2148	424	1	3	520	103	4	11	1628	322
24	2	6	981	181	0	0	0	0	2	6	981	181	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	2	6	1077	195	0	2	261	47	1	5	816	148
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	992	108	10897	2640	0	0	0	0	992	108	10897	2640	975	132	14703	3328	46	32	3559	806	928	100	11144	2522

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ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(5)				CUT(5)				RESIDUAL(5)				STAND(6)				CUT(6)				RESIDUAL(6)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	640	0	0	0	0	0	0	0	640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	126	0	0	0	0	0	0	0	126	0	0	0	627	0	0	0	0	0	0	0	627	0	0	0
6	40	8	0	153	0	0	0	0	40	8	0	153	126	20	0	338	40	6	0	108	86	14	0	230
8	0	0	0	0	0	0	0	0	0	0	0	0	40	11	0	215	13	4	0	69	27	8	0	147
10	49	26	2236	548	0	0	0	0	49	26	2236	548	20	11	777	198	6	3	248	63	13	7	529	135
12	24	19	2288	490	0	0	0	0	24	19	2288	490	29	20	2259	499	9	7	721	159	20	14	1538	339
14	3	3	419	86	0	0	0	0	3	3	419	86	26	26	3390	703	8	8	1082	224	18	17	2308	478
16	15	22	3185	632	0	0	0	0	15	22	3185	632	0	0	0	0	0	0	0	0	0	0	0	0
18	6	12	1958	382	0	0	0	0	6	12	1958	382	15	24	3741	736	5	8	1194	235	10	16	2547	501
20	4	8	1223	238	0	0	0	0	4	8	1223	238	6	13	2241	434	2	4	716	139	4	9	1526	296
22	3	9	1519	291	0	0	0	0	3	9	1519	291	4	9	1446	287	1	3	462	91	3	6	984	195
24	1	2	304	60	0	0	0	0	1	2	304	60	4	12	2020	381	1	4	645	122	3	8	1375	259
26	1	5	893	159	0	0	0	0	1	5	893	159	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	1	5	968	171	1	5	968	171	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	965	116	14025	3038	0	0	0	0	965	116	14025	3038	950	152	16843	3960	88	52	6036	1381	863	100	10807	2580

	STAND(7)				CUT(7)				RESIDUAL(7)				STAND(8)				CUT(8)				RESIDUAL(8)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	614	0	0	0	0	0	0	0	614	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	86	19	0	337	0	0	0	0	86	19	0	337	614	99	0	1656	350	57	0	945	264	43	0	712
8	27	10	0	204	0	0	0	0	27	10	0	204	113	36	0	743	65	21	0	424	49	16	0	319
10	13	9	737	173	0	0	0	0	13	9	737	173	0	0	0	0	0	0	0	0	0	0	0	0
12	20	16	2003	426	0	0	0	0	20	16	2003	426	13	10	971	217	8	6	554	124	6	4	417	93
14	16	18	2442	498	0	0	0	0	16	18	2442	498	20	19	2515	521	11	11	1434	297	8	8	1080	224
16	2	3	422	84	0	0	0	0	2	3	422	84	18	23	3461	693	10	13	1974	395	8	10	1487	298
18	10	18	2983	582	0	0	0	0	10	18	2983	582	0	0	0	0	0	0	0	0	0	0	0	0
20	4	10	1744	336	0	0	0	0	4	10	1744	336	10	20	3433	666	6	11	1958	380	4	9	1475	286
22	3	7	1109	214	0	0	0	0	3	7	1109	214	7	18	3272	619	4	10	1866	353	3	8	1406	266
24	2	7	1272	234	0	0	0	0	2	7	1272	234	0	0	0	0	0	0	0	0	0	0	0	0
26	1	2	251	47	0	0	0	0	1	2	251	47	3	10	1670	303	2	6	1070	195	1	3	599	108
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	902	117	12964	3136	0	0	0	0	902	117	12964	3136	899	235	15320	5419	455	135	8856	3113	444	100	6464	2306

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ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(9)				CUT(9)				RESIDUAL(9)				STAND(10)				CUT(10)				RESIDUAL(10)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	264	58	0	1042	0	0	0	0	264	58	0	1042	0	0	0	0	0	0	0	0	0	0	0	0
8	37	13	0	281	0	0	0	0	37	13	0	281	264	75	0	1447	84	24	0	460	180	51	0	987
10	12	6	658	154	0	0	0	0	12	6	658	154	49	24	2342	567	15	8	744	180	33	16	1598	387
12	6	5	540	116	0	0	0	0	6	5	540	116	0	0	0	0	0	0	0	0	0	0	0	0
14	8	9	1345	273	0	0	0	0	8	9	1345	273	6	6	671	141	2	2	213	45	4	4	458	96
16	7	10	1535	304	0	0	0	0	7	10	1535	304	15	21	3429	680	5	7	1090	216	11	14	2339	464
18	1	1	254	49	0	0	0	0	1	1	254	49	1	1	294	57	0	0	93	18	1	1	200	39
20	4	9	1695	327	0	0	0	0	4	9	1695	327	4	10	1915	368	1	3	609	117	3	7	1306	251
22	2	5	983	182	0	0	0	0	2	5	983	182	0	0	0	0	0	0	0	0	0	0	0	0
24	1	3	590	109	0	0	0	0	1	3	590	109	3	9	1736	316	1	3	552	100	2	6	1184	215
26	1	4	658	117	0	0	0	0	1	4	658	117	1	4	714	126	1	4	714	126	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	495	125	8258	2955	0	0	0	0	495	125	8258	2955	491	150	11100	3701	110	50	4014	1262	381	100	7086	2439

	STAND(11)				CUT(11)				RESIDUAL(11)				STAND(12)				CUT(12)				RESIDUAL(12)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	8	0	126	0	0	0	0	47	8	0	126	47	10	0	179	16	3	0	59	31	7	0	120
8	180	65	0	1367	0	0	0	0	180	65	0	1367	C	0	C	0	0	0	0	0	0	0	0	0
10	25	14	1427	333	0	0	0	0	25	14	1427	333	205	96	8976	2223	68	32	2977	737	137	64	5999	1486
12	8	6	797	170	0	0	0	0	8	6	797	170	8	7	1006	209	3	2	334	69	5	5	672	140
14	4	5	567	116	0	0	0	0	4	5	567	116	0	0	0	0	0	0	0	0	0	0	0	0
16	6	8	1335	264	0	0	0	0	6	8	1335	264	10	14	2248	445	3	5	746	148	7	9	1502	297
18	5	8	1451	283	0	0	0	0	5	8	1451	283	5	9	1671	324	2	3	554	107	3	6	1116	216
20	1	1	232	45	0	0	0	0	1	1	232	45	1	1	263	51	0	0	87	17	0	1	176	34
22	3	8	1530	284	0	0	0	0	3	8	1530	284	3	8	1698	310	1	3	563	103	2	5	1135	207
24	1	4	824	147	0	0	0	0	1	4	824	147	1	4	901	159	0	1	299	53	1	3	602	106
26	1	3	487	87	0	0	0	0	1	3	487	87	1	3	529	93	1	3	529	93	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	432	128	8650	3223	0	0	0	0	432	128	8650	3223	428	152	17293	3992	93	52	6090	1387	335	100	11203	2606

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ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(13)				CUT(13)				RESIDUAL(13)				STAND(14)				CUT(14)				RESIDUAL(14)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	125	0	0	0	0	47	7	0	125	47	10	0	178	15	3	0	55	32	7	0	123
8	31	9	0	171	0	0	0	0	31	9	0	171	31	11	0	231	10	3	0	72	22	8	0	160
10	120	65	6785	1587	0	0	0	0	120	65	6785	1587	120	77	9065	2011	37	24	2809	623	83	53	6256	1388
12	17	13	1679	358	0	0	0	0	17	13	1679	358	17	15	2116	439	5	5	656	136	12	10	1461	303
14	5	5	846	172	0	0	0	0	5	5	846	172	5	6	1029	206	2	2	319	64	4	4	710	142
16	3	4	546	109	0	0	0	0	3	4	546	109	0	0	0	0	0	0	0	0	0	0	0	0
18	4	7	1234	240	0	0	0	0	4	7	1234	240	7	12	2061	401	2	4	639	124	4	8	1422	277
20	4	7	1490	287	0	0	0	0	4	7	1490	287	3	7	1462	281	1	2	453	87	2	5	1009	194
22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	232	42	0	0	72	13	0	1	160	29
24	2	6	1265	227	0	0	0	0	2	6	1265	227	2	6	1390	245	1	2	431	76	1	4	960	169
26	1	3	662	115	0	0	0	0	1	3	662	115	1	3	718	124	1	3	718	124	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	386	126	14506	3390	0	0	0	0	386	126	14506	3390	382	148	18073	4159	73	48	6095	1374	309	100	11978	2785

	STAND(15)				CUT(15)				RESIDUAL(15)				STAND(16)				CUT(16)				RESIDUAL(16)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	124	0	0	0	0	47	7	0	124	47	10	0	178	15	3	0	55	32	7	0	122
8	32	9	0	176	0	0	0	0	32	9	0	176	32	11	0	238	10	4	0	74	22	8	0	164
10	22	10	846	216	0	0	0	0	22	10	846	216	22	12	1188	280	7	4	370	87	15	8	818	193
12	83	63	8258	1761	0	0	0	0	83	63	8258	1761	83	73	10422	2164	26	23	3243	674	57	50	7178	1491
14	12	12	1835	373	0	0	0	0	12	12	1835	373	12	13	2231	447	4	4	694	139	8	9	1537	308
16	4	5	864	171	0	0	0	0	4	5	864	171	4	5	1023	201	1	2	319	62	3	4	705	138
18	2	3	518	101	0	0	0	0	2	3	518	101	0	0	0	0	0	0	0	0	0	0	0	0
20	3	6	1133	218	0	0	0	0	3	6	1133	218	4	10	1880	362	1	3	585	113	3	7	1295	249
22	2	6	1365	251	0	0	0	0	2	6	1365	251	2	6	1322	240	1	2	412	75	1	4	911	165
24	0	0	0	0	0	0	0	0	0	0	0	0	0	1	192	34	0	0	60	10	0	1	132	23
26	1	5	1058	184	0	0	0	0	1	5	1058	184	1	5	1152	198	0	2	359	62	1	3	794	137
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	360	125	15877	3575	0	0	0	0	360	125	15877	3575	356	145	19411	4341	65	45	6041	1351	291	100	13370	2990

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ALL TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(17)				CUT(17)				RESIDUAL(17)				STAND(18)				CUT(18)				RESIDUAL(18)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	124	0	0	0	0	47	7	0	124	47	10	0	178	13	3	0	50	34	7	0	128
8	55	19	0	397	0	0	0	0	55	19	0	397	32	11	0	237	9	3	0	66	23	8	0	171
10	15	10	1121	249	0	0	0	0	15	10	1121	249	22	12	1223	288	6	3	343	81	16	9	881	207
12	0	0	0	0	0	0	0	0	0	0	0	0	15	11	1455	311	4	3	408	87	11	8	1048	224
14	57	58	9020	1834	0	0	0	0	57	58	9020	1834	57	65	10972	2197	16	18	3073	615	41	47	7899	1582
16	8	10	1867	369	0	0	0	0	8	10	1867	369	8	12	2210	433	2	3	619	121	6	8	1591	312
18	3	4	836	162	0	0	0	0	3	4	836	162	3	4	969	187	1	1	272	52	2	3	698	135
20	1	3	472	91	0	0	0	0	1	3	472	91	1	3	534	103	0	1	150	29	1	2	385	74
22	3	9	2057	372	0	0	0	0	3	9	2057	372	2	5	1159	209	1	1	325	58	1	4	834	150
24	0	1	142	25	0	0	0	0	0	1	142	25	1	5	1124	197	0	1	315	55	1	3	809	142
26	1	4	867	148	0	0	0	0	1	4	867	148	0	1	152	26	0	0	43	7	0	0	109	19
28	0	0	0	0	0	0	0	0	0	0	0	0	1	4	936	158	1	4	936	158	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	342	124	16382	3771	0	0	0	0	342	124	16382	3771	338	143	20735	4525	54	43	6481	1381	284	100	14254	3144

	STAND(19)				CUT(19)				RESIDUAL(19)				STAND(20)				CUT(20)				RESIDUAL(20)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	125	0	0	0	0	47	7	0	125	47	10	0	178	14	3	0	52	33	7	0	126
8	57	20	0	414	0	0	0	0	57	20	0	414	34	12	0	248	10	3	0	72	24	8	0	176
10	16	10	1208	268	0	0	0	0	16	10	1208	268	23	12	1275	300	7	4	371	87	17	9	903	213
12	11	9	1347	280	0	0	0	0	11	9	1347	280	16	12	1568	335	5	3	457	98	11	8	1111	238
14	0	0	0	0	0	0	0	0	0	0	0	0	11	11	1669	340	3	3	486	99	8	8	1183	241
16	41	53	9595	1898	0	0	0	0	41	53	9595	1898	41	60	11362	2227	12	17	3311	649	29	42	8051	1578
18	8	13	2695	522	0	0	0	0	8	13	2695	522	6	10	2184	422	2	3	636	123	4	7	1548	299
20	0	0	0	0	0	0	0	0	0	0	0	0	2	4	924	177	1	1	269	52	1	3	655	125
22	2	6	1385	250	0	0	0	0	2	6	1385	250	1	2	503	92	0	1	146	27	1	2	356	66
24	1	4	895	155	0	0	0	0	1	4	895	155	1	4	1030	180	0	1	300	52	1	3	730	127
26	0	0	117	20	0	0	0	0	0	0	117	20	1	4	1078	185	0	2	402	69	1	3	676	116
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	335	123	17242	3931	0	0	0	0	335	123	17242	3931	331	142	21592	4685	53	42	6380	1380	278	100	15213	3305

103510-0C10 UNEVEN-AGED MANAGEMENT (20-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1
AL_ TREES ARE GROWING STOCK--TREE VOLUMES ARE GROSS

	STAND(21)				CUT(21)				RESIDUAL(21)				STAND(22)				CUT(22)				RESIDUAL(22)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	C	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	125	0	0	0	0	47	7	0	125	47	10	0	179	13	3	0	49	34	7	0	130
8	57	20	0	419	0	0	0	0	57	20	0	419	33	12	0	245	9	3	0	67	24	9	0	179
10	17	10	1239	275	C	0	0	0	17	10	1239	275	24	13	1314	309	7	3	357	84	17	9	956	225
12	11	10	1430	297	0	0	0	0	11	10	1430	297	17	12	1610	344	4	3	438	94	12	9	1172	251
14	8	9	1461	293	0	0	0	0	8	9	1461	293	11	11	1772	361	3	3	482	98	8	8	1290	263
16	0	0	0	0	0	0	0	0	0	0	0	0	8	10	1753	347	2	3	477	94	6	7	1276	253
18	29	47	9533	1854	0	0	0	0	29	47	9533	1854	29	52	11053	2137	8	14	3007	581	21	38	8046	1556
20	5	11	2544	488	0	0	0	0	5	11	2544	488	4	9	2047	392	1	2	557	107	3	6	1490	285
22	0	0	0	0	0	0	0	0	0	0	0	0	1	3	835	150	0	1	227	41	1	2	608	109
24	2	5	1181	207	0	0	0	0	2	5	1181	207	1	2	438	78	0	1	119	21	0	1	318	57
2c	1	3	721	123	0	0	0	0	1	3	721	123	1	3	835	143	0	1	227	39	1	2	608	104
28	0	0	0	0	0	0	0	0	0	0	0	0	1	3	764	129	1	3	764	129	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	329	123	18109	4080	C	0	0	0	329	123	18109	4080	325	140	22422	4814	49	40	6657	1404	276	100	15765	3410

	STAND(23)				CUT(23)				RESIDUAL(23)				STAND(24)				CUT(24)				RESIDUAL(24)			
DBH	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV	STM	BA	BFV	CFV
***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***	***	**	***	***
0-1	54	0	0	0	0	0	0	0	54	0	0	0	52	0	0	0	0	0	0	0	52	0	0	0
2	50	0	0	0	0	0	0	0	50	0	0	0	49	0	0	0	0	0	0	0	49	0	0	0
4	48	0	0	0	0	0	0	0	48	0	0	0	47	0	0	0	0	0	0	0	47	0	0	0
6	47	7	0	125	0	0	0	0	47	7	0	125	47	10	0	179	13	3	0	49	34	7	0	130
8	58	20	0	427	0	0	0	0	58	20	0	427	34	12	0	252	9	3	0	69	25	9	0	184
10	17	11	1312	291	0	0	0	0	17	11	1312	291	24	13	1333	313	7	3	362	85	18	9	971	228
12	12	10	1509	313	0	0	0	0	12	10	1509	313	17	13	1705	364	5	4	463	99	13	9	1242	266
14	8	9	1594	319	0	0	0	0	8	9	1594	319	12	12	1871	381	3	3	508	103	9	9	1363	277
16	6	8	1531	300	0	0	0	0	6	8	1531	300	8	11	1913	379	2	3	519	103	6	8	1394	276
18	0	0	0	0	0	0	0	0	0	0	0	0	6	9	1794	349	2	2	487	95	4	6	1307	254
20	24	49	11036	2120	0	0	0	0	24	49	11036	2120	21	46	10640	2039	6	12	2887	553	15	33	7753	1485
22	1	3	659	117	0	0	0	0	1	3	659	117	3	8	1898	341	1	2	515	93	2	6	1383	248
24	0	0	0	0	0	0	0	0	0	0	0	0	1	3	709	124	0	1	192	34	1	2	516	91
26	1	4	1000	172	0	0	0	0	1	4	1000	172	0	2	383	66	0	0	104	18	0	1	279	48
28	0	0	0	0	0	0	0	0	0	0	0	0	1	3	687	116	1	3	687	116	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL	327	122	18640	4185	0	0	0	0	327	122	18640	4185	323	140	22932	4904	48	40	6723	1415	275	100	16209	3489

IC3510-0010 UNEVEN-AGED MANAGEMENT (20-YEAR CUTTING CYCLE) GROW VERSION 010782 IREP= 1

SIMULATION SUMMARY TABLE OF NET STAND VOLUMES

		INVENTORY												TREATMENT										
PER	DATE	STMS (5+)	STMS (0+)	BA (5+)	SCRB (9+)	SCRB (9-)	CUBE SAW	CUBE TPWD	CUBE POLE	CUBE (5+)	DBH (5+)	HT (5+)		STMS (5+)	STMS (0+)	BA (5+)	SCRB (9+)	SCRB (9-)	CUBE SAW	CUBE TPWD	CUBE POLE	CUBE (5+)	DBH (5+)	HT (5+)
1	1983	156	1029	108	9135	553	2076	219	82	2377	10.4	49.7												
2	1988	154	1017	111	9350	748	2140	227	96	2463	10.7	50.9	CUT	15	15	11	921	74	212	22	9	243	10.7	50.9
													RESIDUAL	139	1002	100	8429	674	1928	205	87	2220	10.7	50.9
3	1993	139	992	108	9215	983	2195	234	0	2429	11.2	52.5												
4	2003	192	975	132	12434	310	2664	271	126	3061	10.2	50.6	CUT	46	46	32	3010	75	644	66	31	741	10.2	50.6
													RESIDUAL	145	928	100	9424	235	2020	205	95	2320	10.2	50.6
5	2013	145	965	116	11861	0	2407	247	141	2795	11.2	55.0												
6	2023	271	950	152	14244	396	3030	302	311	3643	9.0	48.0	CUT	88	88	52	5105	127	1068	103	99	1270	9.2	48.3
													RESIDUAL	184	863	100	9139	269	1962	199	212	2373	8.9	47.8
7	2033	184	902	117	10963	563	2336	239	310	2885	9.8	52.5												
8	2043	798	899	235	12956	1818	3149	312	1524	4985	6.7	40.1	CUT	455	455	135	7489	1037	1816	179	869	2864	6.7	40.1
													RESIDUAL	343	444	100	5466	781	1333	133	655	2121	6.6	40.0
9	2053	343	495	125	6984	789	1599	161	958	2718	7.6	45.0												
10	2063	343	491	150	9387	2774	3081	324	0	3405	8.4	49.7	CUT	110	110	50	3395	882	1053	108	0	1161	8.5	49.9
													RESIDUAL	233	381	100	5992	1892	2028	216	0	2244	8.4	49.6
11	2073	280	432	128	7315	3839	2583	266	116	2965	8.7	51.3												
12	2083	280	428	152	14624	0	3177	330	165	3672	9.5	56.0	CUT	93	93	52	5150	0	1108	113	55	1276	9.6	56.1
													RESIDUAL	187	335	100	9474	0	2069	217	110	2397	9.5	55.9
13	2093	234	386	126	12267	323	2715	288	115	3118	9.4	55.7												
14	2103	234	382	148	15284	633	3311	351	164	3826	10.3	60.4	CUT	73	73	48	5154	196	1100	113	51	1264	10.4	60.8
													RESIDUAL	161	309	100	10130	437	2211	238	113	2562	10.2	60.3
15	2113	208	360	125	13427	330	2874	301	114	3289	9.8	58.5												
16	2123	208	356	145	16415	651	3464	366	163	3993	10.7	63.2	CUT	65	65	45	5109	203	1078	114	51	1243	10.7	63.2
													RESIDUAL	143	291	100	11307	448	2386	252	112	2750	10.7	63.2
17	2133	190	342	124	13854	1071	3040	315	114	3469	10.1	60.1												
18	2143	190	338	143	17535	647	3622	378	163	4163	11.0	64.8	CUT	54	54	43	5481	181	1112	112	46	1270	11.2	65.4
													RESIDUAL	136	284	100	12054	466	2510	266	117	2892	10.9	64.6
19	2153	183	335	123	14581	1117	3166	335	115	3616	10.2	60.8												
20	2163	183	331	142	18260	678	3748	398	164	4310	11.0	65.5	CUT	53	53	42	5395	198	1104	117	48	1269	11.1	65.6
													RESIDUAL	130	278	100	12865	480	2644	281	116	3040	11.0	65.4
21	2173	177	329	123	15314	1138	3286	352	115	3753	10.2	61.1												
22	2183	177	325	140	18962	671	3856	408	164	4428	11.1	65.7	CUT	49	49	40	5630	183	1131	116	45	1292	11.3	66.3
													RESIDUAL	128	276	100	13332	488	2725	292	119	3137	11.0	65.5
23	2193	175	327	122	15763	1161	3372	363	115	3850	10.2	61.0												
24	2203	175	323	140	19393	692	3935	411	165	4511	11.1	65.6	CUT	48	48	40	5685	188	1141	116	45	1302	11.2	66.2
													RESIDUAL	127	275	100	13708	504	2794	295	120	3210	11.0	65.4

LOWER LIMIT OF SAWTIMBER UTILIZATION FOR SCRB, CUBE SAW, AND CUBE TPWD IS 7.0 INCHES DBH

APPENDIX D: DIAGNOSIS, PRESCRIPTION AND MARKING GUIDE FOR SITE 103510-0010.

SITE SUMMARY AND DIAGNOSIS

LOCATION 103510 SITE 0010 COMPONENT 660 M.A. 9B

MGMT. EMPHASIS Increase water yields by manipulating vegetation.

SITE DATA

AREA (AC.) 40 ASPECT Northeast ELEVATION (FT.) 11,000 SLOPE % 0 to 15

SLOPE POSITION Moist Sidehill WIND RISK Moderate GRAZING USE Light

SOILS: DEPTH 35 to 40" TEXTURE Loam EROSION HAZARD Low

COMPACTION HAZARD Moderate FUEL LOADING: ~ 2 tons/ac. PHOTO 45 (GTR INT-98)

SITE INDEX 78/100 SPECIES PIEN CURVE Alexander PROD (CF/AC/YR) 63

HABITAT TYPE ABLA/Erigeron eximius; EREX phase ACCESS Treatment area accessible from Greenhorn Road (FDR 403) southeast of Ophir Creek Road (FDR 400).

ROS Roaded Natural VQO NTE Modification EVC Change not noticed VAC Medium

VEGETATION DATA

SURVEY DATE 9/1983 SURVEY LEVEL 4 SURVEY QUALITY Good TYPE & SIZE SF 9

STOCKING (% BA) OM 6 ST 71 PT 17 SAP 6 SEED (T/A) 682/3845

STRUCTURE Uneven-aged, with abundant seedlings and saplings present.

ACCRETION (CF/AC/YR) 54.8 INGROWTH None MORTALITY 31.8 NET 23.0

PRIOR CUTTING? No WHEN; HOW?

SPECIES	VOLUME/ACRE MBF	CF	B.A.	AVG DBH	GS TREES PER ACRE S & S/POLES/SAWT.			AGE	MAJOR DAMAGES/PESTS
PIEN	9.8	2536	122	10"	845*/	71/	86	15/60	Spruce Beetle
ABLA	0	0	0	0"	27**/	0/	0	15	Suppression
POTR2	(27 cull saplings per acre -- 2" DBH -- present)								Suppression
* 2918 cull seedlings also present; ** 245 cull seedlings also present.									
TOTAL	9.8	2536	122	10"	872/	71/	86		

VEGETATION COVER

TREES 50% DOMINANT SPECIES PIEN; ABLA; POTR2
SHRUBS 15% DOMINANT SPECIES LOIN; RIMO2; VAMY
FORBS 30% DOMINANT SPECIES EREX1; FRVI; ORPA
GRASSES 5% DOMINANT SPECIES BRCI; LUPA2; TRSP
LITTER/DUFF 75% MOSS/LICHEN 10% ROCK 0-5% BARE GROUND None

SEED SOURCE POTENTIAL Good for Engelmann spruce; poor for other species.

RELATIONSHIP TO ADJACENT SITES Adjoined by a willow site (028) to the NE, grass site (042) to the SE, location boundary to the S and other S-F to the W.

COMMENTS The Greenhorn road (FDR 403) runs through this site in a northwest-southeast direction. This site was severely burned in the far past (at least 120 to 150 years ago).

TREATMENT ALTERNATIVES

1. **Defer treatment for now.** Reinventory and diagnose again in 10 or 20 years.

2. **Remove overstory and manage the existing understory.**

3. **Perpetuate an uneven-aged condition with group selection entries** every 10 or 20 years.

4. **Perpetuate an uneven-aged condition with individual-tree selection entries** every 10 or 20 years.

RECOMMENDED TREATMENT AND RATIONALE

Group selection cutting method. This stand's overstory is naturally clumpy or groupy and group selection will readily perpetuate that condition. Overstory removal would do little to increase water yield, and is premature at this point anyway (overstory is only 60 years old at BH). Individual-tree selection would perpetuate an uneven-aged condition, but would do little (if anything) to increase water yields. Group selection would also be effective at reducing spruce beetle mortality.

PRESCRIPTION NEEDED? Yes WHEN? After approval of a NEPA document.

URGENCY TO IMPLEMENT RECOMMENDED TREATMENT:

a. ASAP ____ b. BY 5 YEARS ____ c. BY 10 YEARS ✓ d. DELAY TO ________

WHY? Stand is vigorous now, but prompt entry could reduce beetle mortality.

SITE BOUNDARY MODIFICATIONS NEEDED (HOW AND WHY)? Yes, because SE corner of site 10 (area covered by this diagnosis) is uneven-aged; balance often isn't.

ADDITIONAL EVALUATION NEEDED? Analysis of visual consequences by an L.A.

PREPARED BY: David C. Powell DATE 9/30/83

APPROVED BY: Lyle Watts DATE 10/1/83

SILVICULTURAL PRESCRIPTION FOR SITE 103510-0010

OBJECTIVES: Manage forest vegetation to increase water yields.

EXISTING CONDITION	DESIRED CONDITION
Clumpy or groupy, uneven-aged stand of Engelmann spruce, subalpine fir (minor) and aspen (as suppressed saplings only). Advance spruce and fir regeneration is abundant.	Vigorous, uneven-aged stand of Engelmann spruce, subalpine fir and aspen. When possible, initial treatments should reestablish a seral stage of aspen dispersed thruout the site as small clones.

PRESCRIPTION SPECIFICATIONS

YEAR	ACTIVITY	SPECIFICATIONS
0	Layout and Mark Group Selection Cuts (4152)	Mark cut trees with red paint. Remove small groups or clumps, being sure to stay with the natural group size, and mark or leave the entire group. One of every three groups comprised mainly of 7- to 18-inch trees should be marked for removal, as shown below:

DBH Group (Inch)	Desired Stocking (Trees Per Acre)	Existing Stocking (Trees Per Acre)	Percent of Desired
0-6	NO MARKING IN THESE GROUPS!		
7-12	56	82	146
13-18	25	36	144
19-24	12	9	75
25+	MARK ALL OF THESE GROUPS!		

Don't mark any groups comprised of trees from 19- to 24-inches DBH in this entry.
Stand regulation objectives for this entry are:
Q-factor: 1.3.
Residual Basal Area: 100 square feet per acre.
Maximum Tree Size: 24 inches DBH.
Desired Diameter Distribution is:

DBH CLASS (In.)	EXISTING STAND Trees/ Acre	DESIRED STAND Trees/ Acre	CUT TREES Trees/ Acre	RESIDUAL STAND Trees/ Acre
2 *	136	52	0	136
4	55	40	0	55
6	29	31	0	29
8	43	24	19	24
10	35	18	17	18

YEAR	ACTIVITY	SPECIFICATIONS

DBH CLASS (In.)	EXISTING STAND Trees/ Acre	DESIRED STAND Trees/ Acre	CUT TREES Trees/ Acre	RESIDUAL STAND Trees/ Acre
12	4	14	0	4
14	21	11	10	11
16	10	8	2	8
18	5	6	0	5
20	6	5	1	5
22	1	4	0	1
24	2	3	0	2
TOTAL	347	216	49	298

* Does not include the seedling size class (682 growing-stock seedlings/acre).

Stems/Acre Before Cut: 1017; **After:** 1002
BA (SF/Ac) Before Cut: 111; **After:** 100
DBH (In) Before Cut: 10.7; **After:** 10.7
Cubic Feet Per Acre After Cut: 2220
Board Feet Per Acre After Cut: 9100
Estimated Sawtimber Yield: 1700 bf/acre
Estimated Products Yield: 0.4 cords/acre

YEAR	ACTIVITY	SPECIFICATIONS
5	Post-Treatment Evaluation (4347)	Evaluate site following treatment to determine if the desired results were obtained. In addition to treated areas, evaluate seedling and sapling groups (untreated this entry) and decide if release and weeding should be completed.
5	Spruce Beetle Control (8115)	Evaluate spruce beetle populations and initiate treatment if necessary.
10	Regeneration Survey (4341)	Complete surveys in a representative sample of treated groups to determine the quantity, spacing and quality of established regeneration At least 55 well-formed seedlings per acre should be present, of which half or more should be Engelmann spruce.
11	Natural Regeneration Certification (4380)	If regeneration meets minimum specifications contained in the Land and Resource Management Plan for the Pike and San Isabel National Forests (150 or more seedlings per acre at least 6' tall), certify that those requirements have been met. Load appropriate certification records in the District's RIS data base. Note: 36 CFR 219.27 C (3) requires that a cutover area contain the minimum number, size, distribution and species composi-

YEAR	ACTIVITY	SPECIFICATIONS
		tion of regeneration, as specified in the Forest Plan, within 5 years of selection cutting. I don't foresee a problem attaining the Plan's objectives regarding the minimum number, distribution or species composition of regeneration. But, harvested areas will continue to qualify as openings for many years after treatment because the Forest Plan requires that trees be 6-feet or taller before a cutover area is no longer considered an opening!
18	Stand Examination (4311) and Site Diagnosis (4320)	Complete an intensive stand examination and a new site diagnosis to verify that continuation of this prescription is still appropriate.
19	Prescription Preparation (4330)	Prepare a silvicultural prescription for the second entry in this stand. Obtain treatment specifications from the growth and yield simulations used for this prescription, or prepare new simulations using data from the updated inventory. If new simulations are completed, they should utilize the same stand regulation objectives embodied in this prescription (Q-factor, residual basal area, maximum tree size, etc.).

Prepared By: David C. Powell — 9/30/83

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Date

MARKING GUIDE FOR SITE 103510-0010

You'll be marking in the southeast corner of this site, approximately 40 acres in all. The silvicultural prescription calls for group selection, a cutting method in the uneven-aged silvicultural system.

You should expect to find a stand with **small clumps or groups of Engelmann spruce and corkbark fir trees**, most of which are still young, vigorous and growing well.

The volume to be marked is light, averaging about 1000 board feet per acre in most areas. All of this volume will be in groups; the area between groups will not be marked right now.

Your marking objectives are:

1. **Concentrate on recognizing the natural groups or clumps** before deciding whether to mark or leave them. Most groups are small, averaging a quarter-acre or less in size.

2. **All of a group will be marked or left.** There will be no partial cutting in the groups!

3. The primary objective of this entry is to **remove one out of every three groups where more than half of the trees are between 7 and 18 inches in diameter.** To do this properly, you should:

   A. Identify the naturally-occurring groups. They'll vary in size across the treatment area.

   B. Assign each group to one of the following classes:

      1. More than half the trees are from 0 to 6 inches diameter.

      2. More than half the trees are from 7 to 18 inches diameter.

      3. More than half the trees are from 19 to 24 inches diameter.

      4. More than half the trees are 25 inches or more in diameter.

      Note: You can best accomplish this by measuring some of the group's trees with a D-tape or Biltmore stick. Although it's considered an obsolete piece of equipment, the Biltmore stick would probably be faster. Don't estimate diameters unless you're checking yourself fairly often.

   C. Record on a tree-tally sheet or tallywhackers the number of 7-18 inch diameter groups you've encountered, and how many of those have been marked for removal. Two tallywhackers might work well for this job -- one to record how many 7-18" DBH groups have been found, and the other to keep track of how many were marked.