

Division of Forestry – Silviculture Handbook

Draft Guidance – Chapter 24, Marked Timber Evaluation Procedure and Evaluation Sheet (Appendix A)

The attached guidance is a revision to the Silviculture Handbook (Handbook 2431.5), Chapter 24, regarding the *Marked Timber Evaluation Procedure and Evaluation Sheet (Appendix A)*. The Silviculture Handbook is used primarily by State, County, industrial, and cooperating consultant foresters to provide appropriate silvicultural information and recommendations for managing forested lands.

This Silviculture Handbook revision was the result of recommendations from the Stand Evaluation MFL Task Efficiencies Working Group. They completed a revision of this portion of Chapter 24 in March, 2015 and the revision was subsequently reviewed by the Division of Forestry's Field Operations Team and the Wisconsin Silviculture Guidance Team. The *Marked Timber Evaluation Procedure and Evaluation Sheet* is a field tool used to determine if a silvicultural prescription was successfully implemented during the tree marking/designation process and applies only to uneven-aged harvests and even-aged intermediate thinnings. The reason for the revision is to clarify how to use the tool, as well as make several minor editing and formatting changes to improve readability. Language regarding when to use the tool was removed from the Silviculture Handbook and will be clarified in other Department handbooks.

Comments related to this draft guidance document should be sent to Greg Edge, Gregory.Edge@wisconsin.gov; (608) 785-9011. Once the 21 day notice is complete, all comments will be considered and revisions will be made to the guidance as needed. Final guidance will be made available to appropriate internal and external stakeholders, and will be posted at: <http://dnr.wi.gov/topic/forestmanagement/silviculture.html>

Tree Marking Evaluation Methods

Marked Timber Evaluation Procedure and Evaluation Sheet (Appendix A)

The Division of Forestry is responsible for reviewing and approving cutting notices and reports on lands under the Managed Forest Law, State Lands, County Forest, and other programs to determine if the timber sale establishment field work is consistent with the management described on the cutting notice or silvicultural prescription for the harvest. The following field evaluation tool, found in Appendix A of this chapter, may be used to determine if a silvicultural prescription was successfully implemented during the harvest marking/designation process. This tool is only applicable to marked uneven-aged harvests and even-aged intermediate thinnings where residual basal area and order of removal play an important role in the success of the treatment, with a focus on timber production. Timber marking for other silvicultural treatments will need to be evaluated using different stand assessment criteria.

The Marked Timber Evaluation Procedure and Evaluation Sheet located in Appendix A of this chapter have been developed by department staff to assist with evaluating a marked harvest. In the event that an initial evaluation suggests that a timber marking is unacceptable, additional plot work may be necessary to ensure an accurate, defensible evaluation. This procedure is provided as one of a number of decision making tools in the evaluation process of a marked timber harvest. Other considerations needing evaluation may include: BMPs for water quality, invasive species, Natural Heritage Inventory (NHI), archeological, historical, cultural, tree retention, and paint marks.

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Appendix A. Marked Timber Evaluation Procedure & Evaluation Sheet

This evaluation sheet can be used to evaluate marked uneven-aged harvests and even-aged intermediate thinnings. Stand management objectives, prescriptions, and residual target basal area should be clearly stated prior to marking. The attached field data collection sheet and procedure is designed as a tool to help evaluate how effectively the prescribed silviculture system has been applied. Once the timber harvest has been marked, it may be evaluated for meeting criteria set forth in the WI DNR Silviculture Handbook, forest management plan, and/or cutting prescription (i.e. MFL Cutting Notice or public land Timber Sale Notice Form 2460).

NUMBER OF PLOTS

Recommendation for the minimum number of plots to measure: 1 plot for every 4 acres of the sale area with a minimum of 5 well-spaced plots per stand within the sale area. (Example 32 acre sale / 4 = 8 plots). Plots shall be systematically spaced to sample the entire sale area. If the initial sample does not pass for any reason, additional sampling may be necessary. Note: It is not the intent of the evaluation to take a statistically sound number of plots. Plot intensity will increase if problems are noted in the initial sample. The follow-up sample may be up to one plot per acre. On large timber sales, professional judgment should be used to determine if marking evaluation is warranted over the entire sale area or only on a subsample of the sale area if initial results are good.

PLOT SAMPLING

Basal Area and Individual Tree Quality: At each plot, data will be collected on the Marked Timber Evaluation Sheet. The data includes marked (Cut Tree) and residual (Leave Tree) basal area (BA) by species and size classes (5-11" pole, 11-14" sm. saw, 15-19" med. saw, and 20+" lg. saw). BA will be determined using a 10 BAF tool. At each plot, tally individual trees under species code (if needed) and also under basal area size class columns. It may be easiest to first tally marked trees (C - Cut) and then residual trees (L - Leave). Trees may be tallied with "dot tally" or utilizing the growing stock classifications listed below. Classifying the trees may help paint a picture of the quality of the marking job.

Each tree may be classified based on tree risk, vigor and quality as follows:

- "1" means crop tree: See definition in Silviculture Handbook Ch. 24
- "2" means average tree: Better than class 3 but not a crop tree; acceptable growing stock.
- "3" means obvious cut tree: High risk (See definition in Silviculture Handbook Ch. 24), obvious low vigor/quality tree to release higher classified tree; unacceptable growing stock.

PLOT EVALUATION

The marking of each individual plot will be evaluated (graded) on the following basis:

- Residual basal area
- Stand quality - order of removal is followed to achieve target residual basal area
- Other considerations: canopy gaps, paint marks, insect & disease concerns, BMPs, wildlife considerations, endangered resource considerations, etc.

If any of these criteria receive an unacceptable rating, then the plot receives an unacceptable rating. Each of these criteria are described in greater detail below.

Basal Area Rating: For an individual plot to be rated acceptable, the residual basal area must fall within the following range around the stated Target BA:

- For Target BA ending in zero: the acceptable range will be from Target BA minus 10 to plus 20 ft² (e.g., Target BA 90 ft² then acceptable for plot is ≥ 80 and ≤ 110 ft²).
- For Target BA ending in five: the acceptable range will be from Target BA minus 15 to plus 15 ft² (e.g., Target BA 85 ft² then acceptable for plot is ≥ 70 and ≤ 100 ft²).

However, no matter which method is utilized, the lower acceptable BA will be no less than the B-line for even-aged stocking guides and 70 ft² for NH uneven-aged stands.

The plot will be rated based on the residual BA as follows:

- "+" The residual basal area falls within the following range around the stated Target BA:
 - ✓ Target BA ending in zero: residual BA within -10 to +20 ft²
 - ✓ Target BA ending in five: residual BA within -15 to +15 ft²
- "-" The residual basal area falls outside the specified range around the stated Target BA

- “NA” Used for plots that have an acceptable reason for not falling within the target BA range, for example:
 - ✓ Initial BA was below the target BA range
 - ✓ Residual BA was below target BA range after only high risk trees were removed
 - ✓ Plot is within an uneven-aged gap
 - ✓ Aspen patch to be removed (stand inclusions)
 - ✓ Residual BA is > the target BA range and silviculture guidelines were followed leaving the BA appropriately higher than target range. Examples might include the following:
 - * No more than 1/3 of the initial BA should be removed
 - * Hemlock or white cedar are present as stand inclusions (at least 50% of BA)
 - * High percentage of basswood

Stand Quality - Order of Removal Rating: Designation of trees for harvest at each plot will be evaluated and rated in regards to improving and maintaining overall stand quality by correctly applying the order of removal as agreed upon in the cutting prescription, or, if not listed in cutting prescription, as Defined in Chapter 24 of the Silviculture Handbook.

Application of the standard order of removal (See Silviculture Handbook Chapter 24):

1. High risk of mortality or failure (unless retained as a wildlife tree)
Were high risk trees removed?
2. Release crop trees
Did crop trees needing release have at least partial release by marking neighboring tree of lesser quality?
Note: Some crop trees may already have full or partial release, therefore requiring no further release.
3. Low crown vigor
Were trees of the low crown vigor marked for removal?
4. Poor stem form and quality
Were trees with poor stem form and quality relative to adjacent individual trees marked for removal?
5. Less desirable species
Is species diversity maintained and desired species composition achieved?

In order to better quantify what is and is not acceptable variation in order of removal marking, the growing stock classification system listed above (i.e., crop tree, average tree, obvious cut tree) may help in the evaluation process. The order of removal criteria can then be individually evaluated and rated. Finally, each plot is given a total order of removal rating as follows:

- “+” **Good:** tree designation correctly applied within the plot.
Example: If the marking follows the order of removal, then the rating is “+” (Good).
- “0” **Acceptable:** Tree designation is not perfect but is acceptable (still meets stand objectives).
Example: If you are questioning a tree that is marked vs. lesser quality tree left, and they both are in the same classification (both are average), then, although not desirable, this would be an example of acceptable variation and the rating is “0” (Acceptable).
- “-” **Unacceptable:** Tree designation is not consistently and correctly applied within the plot (cutting marked tree(s) will result in degradation of stand quality and/or vigor).
Example: If the marked tree is in a higher classification than the lesser quality tree retained (average class tree marked and obvious cut tree left, or crop tree marked and average class tree left), then this would be unacceptable and the rating is “-” (Unacceptable).
- “NA” Used for plots that have an acceptable reason for not following criteria.
Example: No high risk trees, no crop trees on plot, or desired residual stocking achieved before a criterion applied.

Other Plot Evaluation Considerations: Other considerations, as stated in the cutting prescription, that may need to be evaluated on plot include: canopy gaps, paint marks, insect & disease concerns, BMPs, wildlife, and endangered resources. These considerations can be rated, such as the canopy gap example below, or described in plot remarks.

Canopy Gap Rating - For uneven-aged management, evaluate canopy gaps (appropriate size & cleaned of poor quality saplings & poles). Criteria are found in the Silviculture Handbook, Chapters 21 and 40.

- “+” means appropriate size gap (see table 40.8), and it is designated to be cleaned.
- “-“ means the gap was not appropriate size or not correctly designated to be cleaned.
- “NA” means a gap did not fall within the plot.

Paint Marks - Marked trees must have an adequate volume of paint and have adequate stump mark at ground level. Preferably stump marks will be located in crevasses of the stump. In order to facilitate marking, checking, and harvesting, there should be at least two marks on opposite sides of the tree.

Plot Evaluation Remarks: Use space below stand quality rating for plot remarks, including other considerations.

Plot Grade: Grade each plot as good, acceptable, or unacceptable based on basal area, order of removal, and other considerations. If any of these criteria receive an unacceptable rating, then the plot is graded unacceptable.

- “G” or “+” **Good:** Marking correctly achieved basal area target range, and quality factors correctly applied.
- “A” or “0” **Acceptable:** Marking achieved basal area target range, and quality factors acceptable.
- “U” or “-“ **Unacceptable:** Marking did not achieve basal area target range and/or quality factors incorrectly applied.

SALE EVALUATION

The data collected may be used to assess compliance of stand wide timber marking with acceptable silviculture guidelines and/or stated cutting prescriptions. Summarize the data, and compute average cut and residual basal area, as well as plot grades. Whereas it is acceptable for wider individual plot BA variation, stand averages should be closer to the target BA (+/- 10%).

Minimum requirements for sale approval are:

- Average residual BA within +/-10% of target BA, and no less than B-line for even-aged stocking guides and 70 ft² for uneven-aged NH stands.
- At least 70% total plot grades tally “G” or “A”
 - ✓ If excessive number of plots are rated A (>40%), then a follow-up discussion should occur with the marker with possible corrections and/or opportunities for improvement.

If evaluation determines that the proposed treatment meets these minimum timber marking standards and conforms to stated silviculture guidelines as found in the WI DNR Silviculture Handbook and/or cutting prescription (i.e. MFL Cutting Notice or public land Timber Sale Notice Form 2460), then the sale will be deemed to meet silvicultural standards.

If evaluation determines that the proposed treatment does not meet these minimum timber marking standards and does not conform to stated silviculture guidelines as found in the WI DNR Silviculture Handbook and/or cutting prescription (i.e. MFL Cutting Notice or public land Timber Sale Notice Form 2460), then the sale does not meet silvicultural standards and corrective action should be implemented. Once corrected, the sale may be re-evaluated using the above process.

Silviculture Handbook

MARKED TIMBER EVALUATION SHEET Rev. 6/10							Property:		Sec.	T	R	Desc.							
Estimator:							Date:		Covertypes:			Page ___ of ___							
Pt. #	Species Code						Basal Area (Target BA)					Stand Quality - Order of Removal					Total OOR Rating	Other Rating e.g. Gap	Total Plot Grade
							Pole 5-9/11	Saw-Sm 9/11-14	Saw-Md 15-19	Saw-Lg 20+	TOTAL	BA Rating	Risk Trees Removed	Crop Trees Released	Vigor	Quality			
1C																			
1L												Comments:							
2C																			
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10L												Comments:							
C-Total											C-Total	Comments regarding the stand:							
C-Avg											C-Avg								
L-Total											L-Total							Stand Quality Rating: Each aspect of stand quality is rated separately.	
L-Avg											L-Avg	+ = Good: Plot met expectations for Order of Removal. 0 = Acceptable: Plot did not fully achieve Order of Removal, but still meets management objective. - = Unacceptable: Plot did not implement the Order of Removal correctly.							
TREE CLASSIFICATION: (Trees recorded by class for species and basal area size class.)																			
1 = Obvious crop tree: See definition in Silviculture Handbook Chapter 24																			
2 = Average tree: Better than class 3, but not a crop tree.																			
3 = Obvious cut tree: High risk, suppressed, low vigor to release higher classed tree.																			
												TOTAL PLOT GRADE: G = Good; A = Acceptable; U = Unacceptable.							

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