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August 3, 2005

BY EMAIL

To: Regional Managers

From: Bill Howard
Director
Revenue Branch

Re: Amendment No. 2 to the *Cruising Manual*

I hereby approve Amendment No. 2 to the *Cruising Manual*, and attach a copy for your use. The following sections have been amended.

Section 3.5.6.3:	Expansion of the hemlock algorithm to the whole Interior.
Chapter 6:	Position 60 changed to reflect the updates for the Interior hemlock and dead potential white pine algorithms.
Chapter 7:	Position 17 to 18 map area statement code no longer required for the Interior hemlock algorithm.
Appendix 7:	Interior log grade algorithm flowchart updated.

This amendment will come into force on September 1, 2005. Further amendments or revisions to this manual require my approval.



Bill Howard
Director
Revenue Branch

Attachment

pc: Grant Parnell, Director, Operations, BC Timber Sales



Amendments

Amendment No. 2 - Effective September 1, 2005

For your convenience the current amendment updates appear in red text. All changed graphics are indicated with a red arrow . Two arrows  represents text removed.

Section	Description
Section 3.5.6.3	Expansion of the hemlock algorithm to the whole Interior.
Chapter 6: Position 60	Reference updates for the interior hemlock and dead potential white pine algorithms.
Chapter 7: Position 17 to 18	Map area statement code no longer required for the interior hemlock algorithm.
Appendix 7	Interior log grade algorithm flowchart updated.

Figure A.40	Damage Call Matrix for Uprooted, Ice Damaged and Wind Sheared Trees.	A-78
Figure A.41	Example of Mechanical Damage.	A-80
Figure A.42	Interior Log Grade Algorithm - This Table Converts the Third of a Tree into Log Number.	A-82
Figure A.43	Interior Hemlock.	A-83
Figure A.44	Dead Potential White Pine Log Grade Algorithm.	A-84
Figure A.45	Forest Region and District Boundaries.	A-86
Figure A.46	Fdc – Coastal Douglas-Fir.	A-89
Figure A.47	Hwc – Western Hemlock - Coast.	A-91
Figure A.48	Fdi – Interior Douglas-Fir ere.	A-92
Figure A.49	Hwi – Interior Western Hemlock.	A-93
Figure A.50	Act – Black Cottonwood - Provincial.	A-95
Figure A.51	At - Trembling Aspen - Provincial.	A-96
Figure A.52	Ba – Amabilis Fir – All Balsam Species - Provincial.	A-98
Figure A.53	Cw – Western Redcedar - Provincial.	A-100
Figure A.54	Dr – Red Alder - Provincial.	A-101
Figure A.55	Lw – Western Larch – Provincial.	A-102
Figure A.56	Pli – Lodgepole Pine - Provincial.	A-103
Figure A.57	Pw – Western White Pine – Provincial.	A-104
Figure A.58	Py – Ponderosa Pine – Provincial.	A-105
Figure A.59	Sb – Black Spruce – Provincial.	A-106
Figure A.60	Ss – Sitka Spruce - Provincial.	A-108
Figure A.61	Sw – White and Englemann Spruce - Provincial.	A-109
Figure F.1	FS 693 - Provincial Cruise Plan (Page 1 of 2).	F-2
Figure F.2	FS 693 - Provincial Cruise Plan (Page 2 of 2).	F-3
Figure F.3	FS 694 - Provincial Cruise Plan and Map Check List.	F-4
Figure F.4	FS 695 - Provincial Office Check of Field Cruise Data.	F-5
Figure F.5	FS 696 - Provincial Field Check Cruise Summary.	F-6
Figure F.6	FS 697 - Provincial Compilation Check Form.	F-7
Figure F.7	FS 698 – Provincial Comparative Cruise Checklist.	F-8

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of the tree in each 10 m log. By estimating percent firmwood in each 10 m log, the firmwood percent of the tree can be determined.

1. Dead Standing

Decay percent is difficult to assess on standing trees, "Sounding" with an axe or equivalent implement can be helpful. Before sounding, look for overhead hazards that may be dislodged.

2. Dead Down

Good judgement must be exercised in applying tree classes to down material. Since some species are more resistant to decay than others, decisions will therefore be influenced by the tree species involved as well as by local climatic conditions. C, Cy, F, S, P and L are the most decay resistant species and are less likely to exhibit extensively sloughing bark and conks. Other species exhibiting these characteristics are more likely to be "Dead Useless". However, it should be remembered that in drier areas, dead and down Pl and Py may be entirely bark-free yet still be relatively sound.

Pathology is required on all dead potential trees on the coast, dead potential hemlock in the interior for use in the log grade algorithms.

The only exception to the green and/or red needle rule is for *abies lasiocarpa* in the Interior, where the following guidelines will apply:

Indications – One or More Must be Present

1. Sap-rot and/or,
2. Deep checking and/or,
3. Loose or shedding bark.

Contraindications – None can be Present for Tree Classes 3, 7 and 9 Trees

1. Live Cambium.
2. Green needles.
3. Pitching that is on the end of a log or on exposed wood and not under the bark.
4. Live bark beetles are present.

If there is any doubt after applying the indicators and contraindicators, then the tree will be classified as green.

3.5.6.4 Tree Class 4 (Dead Useless)

Dead standing trees that have less than 50 percent of their original gross volume in firmwood content or otherwise fails to meet the criteria of a dead potential tree as described in Section 3.5.6.3 will be classified as "dead useless" trees. Only dead useless standing trees will be tallied (dead useless down trees are *not* tallied). Dead useless trees are considered standing if they are leaning into another tree. Dead useless standing trees will not be compiled for volume, but along with Live Useless trees, provide a record of snag density in the stand for appraisal purposes. Only trees equal or greater than 3 m high and equal or greater than the minimum timber merchantability specifications must be tallied. Estimate their actual observed height and the original DBH, not an estimate of the stems original height.

3.5.6.5 Tree Class 5 (Mature)

A mature conifer tree is defined as any tree over 120 years old. A mature deciduous tree is defined as any tree over 40 years old. The exceptions are:

- a. Aspen and Cottonwood in FIZ K and L where tree classes 5 or 7 will be used for trees 141 years and older,
- b. Coastal cruises where there are trees between 121 and 140 years old, then tree classes 5 and 7 will be used for trees 141 years and older.

A reasonable number of mature ages should be sampled along with the age drilling of the main stand component.

3.5.6.6 Tree Class 6 (Live Useless)

Live Useless trees are trees that have only one or two live limbs. They are combined with TC 4 for the compilation of percent snags. This tree class must not be confused with a Tree Class 2 tree, which has a high proportion of rot due to konk.

Cedar and Cypress The tree must be almost completely rotten or hollow with just a thin shell of sound wood remaining. The low proportion of sound wood must be obvious (i.e., rotten or hollow knots, and large open scar).

Hemlock, Balsam, Fir, Pine & Spruce The tree must be broken off in the lower or middle thirds (i.e., at least the top third must be missing) with only a few live branches and almost completely rotten or hollow.

3.5.6.7 Tree Class 7 (Mature Dead Potential)

This class is a combination of Veteran and Dead Potential so that the correct loss factor tables are applied in the compilation. The guidelines for TC 3 and TC 5 apply.

Positions 52 to 56

These columns are not in use.

Position 59 Selective Cutting

L	leave tree
Blank or C	cut tree

Position 60 Miscellaneous - optional data collection.

Root Rot	Description
J = light	Tree within a disease centre or within 10 m of a tree or stump that is symptomatic or killed by root disease.
K = moderate	Tree with root disease crown symptoms.
L = heavy	Tree with root disease confirmed by stain, decay, fruiting bodies or basal resinous.

Interior Log Grade Algorithm

Sap rot and weather checks can be collected in the root rot column, column 60.

The sap rot and weather check codes are as follows:

- a. record by tree third as per pathological indicator location codes 1 to 7,
- b. record codes 1 to 7 for tree thirds that will not be suitable to produce 50 percent lumber,
- c. coding is the same as pathological indicator tree positions,
- d. also see Position 45, spiral grain for code definitions, and
- e. knot code 6 (see Section 6.3.2, Position 50 and 51) in the first 5 m log will grade the first log lumber reject and a knot code 6 in the second 5 m log will grade the second log lumber reject.

Refer to Appendix 7 for a more detailed description of the algorithm.

The hemlock and dead white pine grade algorithms are used for interior appraisals. The hemlock algorithm is found in Figure A.43 and the white pine algorithm is found in A.44.

Sap rot and suncheck codes are required for the dead potential white pine algorithm. The procedure is outlined in A.7.2(3).

Positions 61 to 63 Damage Codes (see Section A.6)

Damage codes are to be used at all times, and shall be recorded as they appear at the time of the cruise with no attempt to predict the future condition of the trees. Where damage is tallied it will be compiled and reported.

The codes are for appraisal reporting purposes and for net volume adjustment purposes in compilation.

All damage types will be compiled for net volume. Where multiple damage is recorded for a single tree, the most severe damage type will be compiled for that tree.

All damage types will be reported in the cruise as a percentage of the cruise net volume.

Position 61 Insect and Disease Codes (see Appendix 6.13)**Position 62 Fire Damage Codes (see Appendix 6.2)****Position 63 Down Trees (see Appendix 6.3)****6.3.3 Card Type 3****Position 36, Columns 37 - 39 Sample Tree Details**

Do not estimate heights for card type 3 sample trees. Sample tree details may be entered for count plots.

Refer to Sections 3.5.3.4 and 8.4 for details regarding the use of height/diameter curves.

Refer to Section 3.5.9 for details regarding the collection of tree ages.

Counted Age at DBH

This is the Breast Height Age referenced above.

Horizontal Distance from Plot Centre

This is the measured distance from the plot centre to the face of standing trees at DBH plus half the DBH and on the top side at mid point for down trees.

If the cutting permit occupies both Wet and Dry Belt BEC zones, subzones or variants, compile using the zone with the highest Douglas fir total net volume based on the cruise data.

Position 15 Tree Class Combinations

This column states which tree classes will be included in the final volume.

Blank or 0	useless volumes excluded - if only residual, suspect and dead potential tree volumes are required,
1	useless volumes included - if residual, suspect, dead potential plus live and dead useless volumes are required. Do Not use for appraisal purposes. Reports will be titled "Not for Appraisal Purposes".

Position 16 Species Compilation

This column indicates whether all the species on the sale are to be compiled in the same manner or whether an exception is required. For example:

1. Cedar poles or veneer for only Douglas Fir (not programmed as yet).
2. The stump height, top dib, DBH limit or log length could be altered for one species on the sale (i.e., in the Interior, lodgepole pine is compiled to 12.5 cm plus, while all other species are compiled to a 17.5 cm DBH).

Enter:

0	if all species are to be compiled in the same manner.
1	if all species are to be compiled the same with an exception.

Positions 17 to 18 Type of Compilation (majority of species)

The code for the appropriate end product or combination of products is entered. Present appraisals require option 3 for the interior, option 32 for the coast.

03	Lumber including all logs.
32	Coast Integrated Company - with Peeler segregation

Compilation Standard

Specify the timber merchantability specifications required. This will be for the majority of the species.

Positions 19 to 21 DBH Lower Limit

Specify to the nearest 0.1 cm the minimum DBH to be compiled.

Coast:	Mature (121 yrs +) = 17.5 cm Immature (< 121 yrs) = 12.0 cm	Interior	Lodgepole Pine = 12.5 cm Other Species = 17.5 cm
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Positions 22 to 24 Stump Height

Specify Stump Height required to the nearest cm (e.g., timber merchantability specifications = 30 cm).

Positions 25 to 27 Top Diameter

Specify top dib for the tree to the nearest 0.1 cm

Coast	Mature (121 yrs +) = 15 cm Immature (<121 yrs) = 10 cm
Interior	10 cm

Red cedar (Interior only):

- if greater than 50 percent of the red cedar net volume is in trees less than 141 years the top diameter inside bark is 10 cm, and
- if greater than or equal to 50 percent of the red cedar net volume is in trees greater than 140 years the top diameter inside bark is 15 cm.

Positions 28 to 29 Log Lengths (to the nearest metre)

Log Lengths for product analysis. If not equal to 5 m for Interior or 10 m for Coast, reports are titled "Not for Appraisal Purposes".

One exception is the portion of the Kalum Forest District west of the Cascade Mountains administrative line in coastal FIZ A utilizes Interior appraisals. This area is permitted to use 5 m logs for interior appraisal purposes.

Log Lengths for other purposes can be 1 to 99 m.

(Zero) 0 = total tree length between stump height and top dib.

Appendix 7 Interior Log Grade Algorithm

The Interior Log Grade Algorithm is for the ministry compilation program. Industry compilers may also include it.

A.7.1 Assumption

Pathological and quality indicators on the tree can predict grade.

A.7.2 Procedures

1. The compilation program utilizes the table below for allocation of path in thirds to the logs.
2. Conk, blind conk, frost crack, rotten branch, D & B top and spiral grain, are collected as per the manual.
3. Saprot/checks are recorded in the root rot column. At least 50 percent of the log must be suitable for lumber. Sound cores must be at least 10 cm top diameter, and logs less than 15 cm top diameter are allowed only one check 4 cm deep or more to be classified as sawlog. Code the pathological indicator tree third positions 1 to 7 for each third that *does not* qualify as lumber.
4. If four or more branches over 10 cm in the first 5 m of the tree, record knot code 6 in position 50 on the cruise tally card. If four or more branches over 10 cm in the second 5 m of the tree record knot code 6 in position 51 of the cruise tally card.

The body of the table contains the log number that is affected (e.g., a code of 3 (top third) in a 6 log tree affects 5 and 6). Knot Code 6 is the exception; it applies to the 5 m log where the large knots occur.

The tree thirds that are affected in the tree will be converted to 5 m logs depending on the merchantable height of the tree. Refer to Appendix 10 of the *Cruise Compilation Manual* for the matrix that converts tree thirds to the number logs.

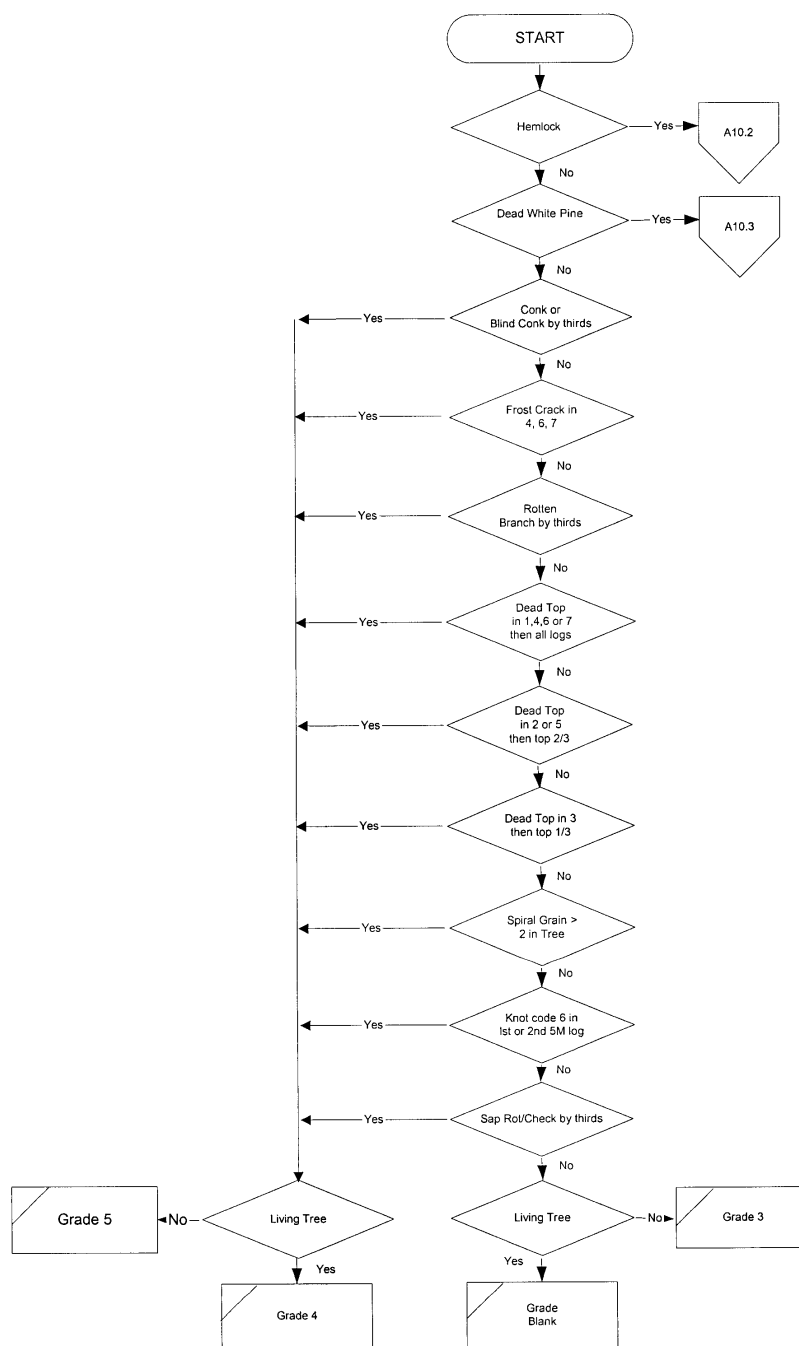


Figure A.42 Interior Log Grade Algorithm - This Table Converts the Third of a Tree into Log Number.

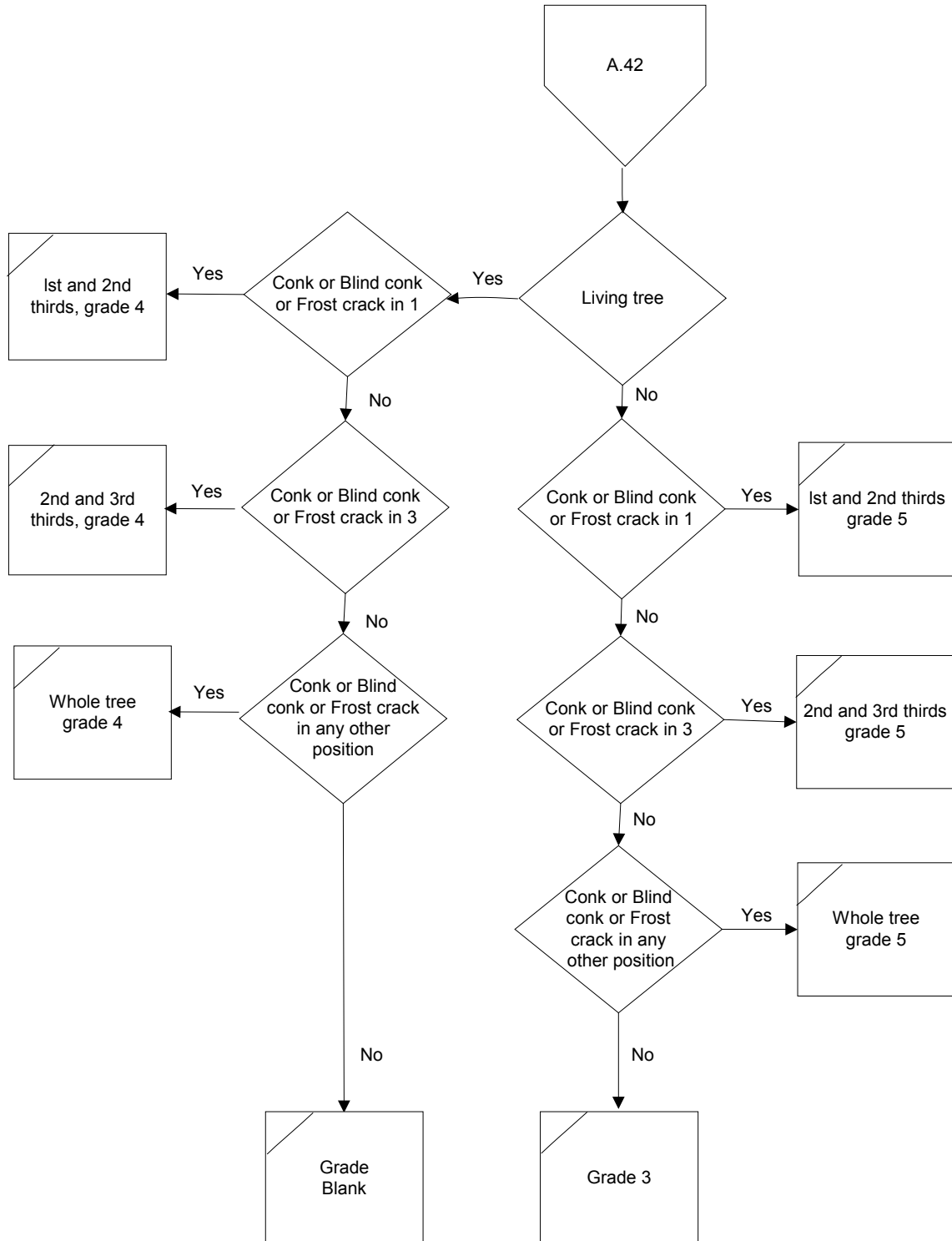


Figure A.43 Interior Hemlock.

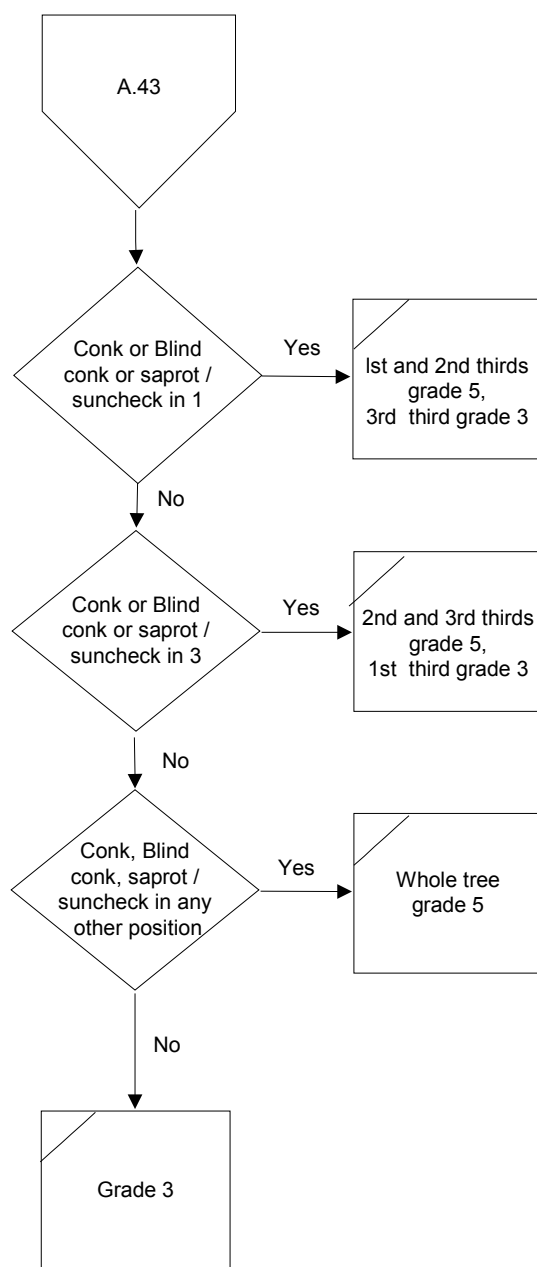


Figure A.44 Dead Potential White Pine Log Grade Algorithm.

Refer to Sections 3.5.6.3 and A.7.2 for details regarding the data collection for dead potential white pine.