

Appendix 1: Health and Vigour Criteria for Overstory Crop trees

BASED ON SUSPECT INDICATORS (PROVINCIAL CRUISING MANUAL – JUNE 2007)

CONKS, Heartrot conks on roots, live branches or trunks, as considered below:

Conks are the fruiting bodies (sporophores) of decay fungi and are definite and reliable indicators of decay. Conks occur anywhere on the main stem, branches and exposed roots of the tree but appear most frequently around knots and on the underside of both dead branch stubs and live branches. Only specific root, butt and heart rot conks are suspect indicators. Slash conks are not suspect indicators.

It is necessary to be able to recognize the conks of the major heart rotting fungi found on living conifers and hardwoods. On conifers, the main conks to recognize are, *Echinodontium tinctorium*, *Phellinus (Fomes) pini*, *Phaeolus (Polyporous) schweinitzii* and *Fomitopsis (Fomes) pinicolii*. On hardwoods, the main conks are *Phellinus igniarius* and *Phellinus tremulae*. See the following host list for major and some minor heartwood decay species.

Conks vary in size and shape and therefore are hard to spot, particularly when they are just developing or occur on the upper trunk. Conks of *E. tinctorium* and *Phellinus pini*, frequently appear as a small hoof-like or shelf-like structure on the underside of dead branch stubs on the middle and/or lower trunk of an infected tree. Moss-covered branch stubs and burls often resemble conks, particularly when viewed from directly below; it is important therefore to view the tree from the side before making a decision.

P. schweinitzii

P. schweinitzii is the cause of brown cubical root and butt rot of most conifers but Douglas-fir and spruce are the most susceptible. The fruiting bodies may occur:

- on the base of a tree,
- on the ground up to 2 m from the tree where no exposed roots are evident, or
- on the exposed roots.

If a *P. schweinitzii* conk is mid-way between:

- Two living susceptible trees only one tree is considered to be infected.
- A highly susceptible species (e.g., Douglas-fir) and a less susceptible species (e.g., red cedar), the most susceptible species is considered to be infected.
- A living tree and a stump showing brown cubical rot, and it is not on a root of the live tree, it is assumed to be associated with the stump.

Blind Conks

Blind conks are pronounced swellings or depressions around knots caused mainly by *P. pini* on conifers and *P. tremulae* on aspen and if identified correctly, are definite indicators of decay (see Figure A.4). The swelling or depression results from the tree attempting to heal over an abortive conk; a newly developing conk; or a point from which an old conk has dropped. Non-typical forms may appear as small branch holes or branch stubs at the base of trees. This form is often found in over-mature Douglas-fir and balsam species in the coast-interior transition zone (e.g., Boston Bar). Therefore over-mature trees with basal branch stubs should be examined for blind conk.

Poor trees should have only those indicators which have a high chance of being blind conk such as large swollen knots and large caved-in knots. Do not call small knots and knot indicators on any species.

WOUNDS/ SCARS

A tree will be considered a non crop tree with a wound or scar on the main stem (or secondary leader) that is not recent in origin. This is interpreted as the injury having not occurred within approximately the past five years. These may be open or closed wounds and generally have the following characteristics:

- Aging - the scar or cat-face should show greyed or weathered wood and enough decay, when combined with other factors, indicates little or no value.

(PROVINCIAL CRUISING MANUAL – JUNE 2007)

- Severe Recent Wound²⁵ Wounding as described in the Wounding and Decay Guidebook (BC MoF 1997) identifies different damage types that may lead to decay and possibly death. The guidebook breaks out damage criteria by management regime and by species groups.

Species susceptibility to decay, ranked from greatest to least

Broadleaf

B, H, Lw, Ss and Cw under 60 years

Yc, Sx and Cw over 60 years

Fd, Pw

Pl, Py

Based on the species group use the following to help identify trees susceptible to mortality:

Fd, Pl, Py and Pw:

- A wound that girdles more than half the stem circumference.

ALL OTHER
CONIFERS:

- A wound girdles more than a third of stem circumference.
- A wound on a supporting root within 1 m of the stem.

All Broadleaf
species:

- A gouge (splintered wood) any size.
- A wound girdles more than a third of stem circumference.
- A wound exceeding 400 cm² on the stem.
- A wound on a supporting root within 1 m of the stem.
- One gouge (splintered wood) any size.

²⁵ Based on the 1997 BC Tree Wounding and Decay Guidebook recommendations for short term retention (20 years). The assumption is that these trees are at significant risk of mortality over the rotation.

The presence of the following should be used to make the designation of non-crop – may wish to review in the field, these indicators could be used as a separate category – risker.

FORK OR PRONOUNCED CROOK

Any tree with a fork or pronounced crook as described below:

A fork or crook is the result of damage to the main leader of the tree where one or more lateral limbs take over as the main stem. Fork or crook is called if severe enough to indicate that the original injury exposed the wood and provided an entrance point for decay fungi. Forks or crooks are to be called between the root collar and the minimum top diameter specified in the cutting authority document.

Forks are used to indicate a poor tree for any of the following conditions:

- The main stem is markedly forked to indicate that 2 or more leaders have resulted from serious damage to the original leader.
- The diameter of the main stem changes excessively from its normal taper to indicate that a serious injury has occurred. For cruising purposes, the diameter change must be at least 10 percent.
- Where there is not evidence of a broken top in the stem at the fork/crook position and neither of the leaders are merchantable, record fork/crook.

Crooks are used to indicate a poor tree if:

- There is at least a 10 percent diameter change in the bole above and below the crook.
- The offset is severe enough to indicate that damage occurred to the main stem. For cruising purposes, the offset must be at least 50 percent of the diameter of the tree at the crook.
- There is a high likelihood that the stem could be snapped or broken by winds or snow-loading during the rotation.

Some forks and crooks are not used as “RISKER” indicators. Forks and crooks may be a growth characteristic of the tree species (for example deciduous species) or may have developed from malformation of the terminal leader due to insect or mistletoe attack. In addition, a fork may be confused with a branch. Forks or crooks which are not used as indicators of poor trees are as follows:

- Crooks with a minor offset (for cruising purposes, an offset less than 50 percent of the diameter of the tree at the crook).
- Small sharply angled branches or spikes (for cruising purposes, less than a 10 percent change in the diameter of the main stem).
- Natural forking in deciduous tree species.
- If the damage is less than 5 years old and/or occurs above the minimum timber merchantability specifications specified in the Timber Utilization Policy (Coast or Interior).
- Flattening of the top of the tree caused by wind or natural outgrowth.

Live Crown criteria;

A minimum of 30 % live crown unless otherwise described.

MISTLETOE TRUNK INFECTIONS

Only trees with a Hawthorn index ²⁶ ≤ 3 without severe branch or stem swelling can contribute as a crop tree

Characteristics and impacts are described below:

Trunk infections of mistletoe are indicated either by abnormal swelling or malformations of the trunk at the point of infection, or by clusters of dead and broken branches on the trunk or on hypertrophied branches immediately adjacent to the trunk.

Wood-rotting fungi gain entrance to the trunk through the dead hypertrophied branches or branch stubs where the swelling is on, or adjacent to the trunk. This can often put the tree at a high risk of breakage from wind or snow.

Do not include mistletoe on living limbs or limbs that are swollen only at some distance from the trunk. Include only those branch infections in which the swelling has clearly extended to trunk.

Vigour criteria specific to Western Red cedar:

Consider a crop tree if live and sound with greater than 2/3rd of the stem producing ≥50 % merchantable timber product. Trees with spiral grain are not considered as crop trees.

²⁶ Hawthorn six-class dwarf mistletoe rating system as identified at the following link:
<http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/dwarf/fig5.htm>