BC Coastal Windthrow Assessment Reference FORM A – Side 1

Definitions

- 'Biophysical Hazard' is the combination of the 'Topographic', 'Soils', and 'Stand Hazard' components. It represents the intrinsic windloading and wind stability of trees on the site prior to harvesting.
- 'Harvesting Hazard' is the way in which harvesting layout increases or decreases the windloading on trees or their inter-tree support. (For example, boundaries that run at right angles to damaging wind direction at the downwind end of a clearcut are high-hazard treatments.)
- 'Windthrow Likelihood' is the expected level of windthrow and is the combination of Biophysical Hazard and Treatment Hazard.
- 'Windthrow Consequence' is the probable level of impact on specific management objectives and values if the expected level of windthrow occurs. It is based on the diagnostic questions for windthrow consequence (See Field Form 4 – side B). If wind damage conflicts with your management objectives, the impact is negative. The level of acceptable windthrow in a given management scenario should be included in your management plans and prescriptions.
- 'Windthrow Risk' is the potential for a negative consequence from windthrow caused by endemic winds. It is the combination of Windthrow Likelihood and Consequence.
- 'Endemic' winds are peak winds expected to recur every 1-3 years in a given location, as distinct from 'Catastrophic' winds, which recur very infrequently (typically > 20 years between events). If a portion of your operating area shows a pattern of repeated edge windthrow or salvage over a period of several years, you have a problem of endemic windthrow.

Assessment Steps

Office

1. Observe windthrow patterns at the landscape and stand level to determine orientation and recurrence of damaging winds. Use probability maps, GoogleEarth™ and other tools to help.
2. Determine initial potential consequences on the proposed block based on relevant plans and the rough paper plan for layout (based on recce information). Check SOPs for pre-established windthrow tolerance levels for some values.
3. Choose nearby previously-harvested blocks with edges or retention strata that have similar situations for windthrow as the proposed block (if possible).
4. Determine the boundaries or portions of the proposed block where you should focus your assessment efforts.

Field

5. With the nearby selected harvested blocks, calibrate the assessment on a High Harvest Hazard boundary (use BCTS calibration Form 1), then compare expected damage for the estimated Windthrow Likelihood class with the observed damage and adjust the component Biophysical Hazard classes if necessary.
6. i) Assess Harvest Hazard for boundary segments of interest (due to potential windthrow risk).
   ii) Assess Biophysical Hazard components for boundary segments of interest.
   iii) Integrate Biophysical Hazard components using the Field Form #2 Matrix.
   iv) Integrate Biophysical Hazard with Harvesting Hazard to estimate Windthrow Likelihood.
7. Consider the consequences for boundary segments of interest, set windthrow tolerance levels, and compare to the level of damage expected for the Windthrow Likelihood class you have estimated.
8. If the level of expected damage and consequences exceed the tolerance, prescribe actions.
9. Set up a feedback loop where damage, assessment predictions, and actions are monitored to enable improved windthrow prediction and management in your area.
10. Pay particular attention to which boundaries are damaged and damage orientations as this will help you develop maps of local damaging wind orientations.

Windthrow Likelihood Class	Expected Damage Caused by Endemic Winds
Very Low	Little or no damage along recent cutblock edges or in recent partial cuts.
Low	Less than 10% of trees uprooted or snapped along recent cutblock edges. Less than 5% in recent partial cuts.
Moderate	Partial damage along recent cutblock edges. Between 10 and 70 percent of the trees are uprooted or snapped within the first tree length in from the edge. Between 5 and 30% of trees damaged within recent partial cuts.
High	Heavy damage along recent cutblock edges. More than 70% of the trees within the first tree length damaged. Between 30 and 70% of trees damaged within recent partial cuts.
Very high	Very severe damage along recent cutblock edges. More than 70% of the trees damaged in both the first and second tree lengths into the edge. More than 70% of trees damaged in recent partial cuts.

Notes on Field Cards

The field cards can be filled out for each clearcut edge segment or partial cut portion, or simply use these cards as a checklist .

- In the boxes for assessing Topography, Soil, and Stand exposure hazard, the focus is on considerations relating to key diagnostic questions. The relationship between indicators and hazard class will vary from place to place so common sense and local experience (brought together by the Diagnostic Questions) should be used in estimating the component Biophysical Hazards.
- The calibration step is important in refining the Biophysical Hazard classification. The logic underlying the assessment framework is as follows. Where site conditions and management actions in an area proposed for treatment are similar to those of an area treated in the past, a similar pattern of damage is expected.
- A more detailed discussion of the assessment framework can be found in '*The Coastal Windthrow Manual (2022)*.

Topographic Terms