

BC Coastal Windthrow Likelihood Assessment FORM 2 – Side A (May, 2022)

ADMINISTRATIVE				
Location	Opening ID	Block #	Examiner/Date	Segment/Portion

TOPOGRAPHIC EXPOSURE TO WIND:

DIAGNOSTIC QUESTION 1: Are prevailing peak storm wind speeds accelerated by terrain constrictions, OR is storm wind reduced by sheltering influences?

<p>CONSIDERATIONS – <u>Topo Exposure increases with:</u></p> <ul style="list-style-type: none"> Proximity to ridge crest or upper slope shoulders. Location on valley floor and lower side walls for storm winds parallel to valleys. Valley gaps, constrictions or ridge saddles where storm winds are funnelled. Presence of tree-level indicators – flagging (asymmetry) of tree crowns. 	<p>CONSIDERATIONS – <u>Topo Exposure decreases with:</u></p> <ul style="list-style-type: none"> Proximity to lower slopes and sheltered from storm winds. Shelter from ridges, hills, knobs and other topographic features large enough to deflect storm winds over the stand edge. <p>Note – If a leeward slope off a ridge is steep, damaging turbulent winds may continue down the back side.</p>
---	--

Top. Ex Hazard Class:	<input type="checkbox"/> Very High (highly accelerated)	<input type="checkbox"/> High (significant acceleration)	<input type="checkbox"/> Moderate (neither acceleration nor shelter)	<input type="checkbox"/> Low (significant wind shelter) ¹	<input type="checkbox"/> Very Low (highly sheltered)
------------------------------	---	--	--	--	--

DIAGNOSTIC QUESTION 2: Is this a windy region? If so, increase Topo. Exposure hazard by one class

<p>CONSIDERATIONS – Consider peak regional storm winds and:</p> <ul style="list-style-type: none"> <u>Proximity to large open water</u> - the open ocean, large inlet, strait or lake (if peak storm winds run parallel to the lake, strait or inlet). Consider prevailing peak storm wind direction and sheltering features (question 1) <u>If it is a dominant ridge/peak</u> – well above neighbouring ridges and peaks for kilometres in the direction of prevailing storm winds.

STAND STABILITY

DIAGNOSTIC QUESTION 1. Are trees poorly acclimated to wind loading?

<p>STAND CONSIDERATIONS - Acclimation decreases with the following (the opposite indicates increasing acclimation):</p> <ul style="list-style-type: none"> <u>High stand densities</u> – Individual trees rely on long term shelter of neighbouring trees. <u>Tall stands</u> - on highly productive sites. <u>Most trees are slender</u> - Small live crowns and low degree of taper – ht. to dbh ratio closer to 100 than 50 - with 100 being very slender. <u>High degree of defect/decay</u> – heartrot, stem defect, root disease. NOTE: Tall, slender, dense stands with trees that fall through the canopy to the ground default to 'high'. 	<p>TREE-LEVEL INDICATOR OF ACCLIMATION:</p> <ul style="list-style-type: none"> Relatively thick stems with long (deep) live crowns. High degree of taper – height to diameter ratio -less than 60. Open crowns with sparse foliage or flagging (most foliage on leeward side) Short dense stands where windblown trees lean into the stand but do not fall to the ground.
--	---

Stand Hazard Class:	<input type="checkbox"/> High (No acclimation)	<input type="checkbox"/> Moderate (neutral - balance of acclimated and non-acclimated trees)	<input type="checkbox"/> Low (Acclimated)	<input type="checkbox"/> Very Low (Highly Acclimated and wind modified)
----------------------------	--	---	---	---

¹ Sheltered doesn't mean 'no wind.' It means shelter from the peak force of prevailing storm winds. Anywhere on the landscape, air is going to move during storms.

BC Coastal Windthrow Likelihood Assessment FORM 2 – Side B (May 2022)

SOIL ANCHORAGE			
DIAGNOSTIC QUESTION 1. Is root anchorage weakened by an impeding layer, low strength soil, or poor drainage?			
<p>CONSIDERATIONS - Weakened anchorage contributes to instability with:</p> <ul style="list-style-type: none"> • Poor drainage and soil depth restrict rooting in draws and gullies. • Conspicuous pockets of higher productivity (seepage over basal till or bedrock; saturated or seasonally saturated riparian soils). • Smooth rock outcrops or bedrock that roots cannot penetrate (no cracks and fissures). • Where upturned root balls are shallow, flat and plate-like, rather than deep and bowl-shaped (look at windthrown trees on similar edges or at root systems in road cuts). • Where root systems are asymmetrical along gully sidewalls or on steep slopes. • Low soil strength – pure sands or silts, organics or wet clays with few coarse fragments etc. 			
Soil Hazard Class:	<input type="checkbox"/> High (weak)	<input type="checkbox"/> Moderate (average) ²	<input type="checkbox"/> Low (strongly anchored)

HARVESTING HAZARD					
DIAGNOSTIC QUESTION. Will the proposed harvesting strategy substantially increase windloading and/or reduce support of trees either along the stand edge or retained as dispersed trees in the block?					
NOTE: Consider the interaction of both #1 and #2 – see the windthrow manual.					
<p>1. WIND LOADING CONSIDERATIONS - Post harvest <u>wind loading increases</u> on newly exposed edges with:</p> <ul style="list-style-type: none"> • <u>Exposure of boundary edges to damaging storm winds</u> – moving from lee-facing edges (least exposed), to parallel edges (moderate exposure), to perpendicular wind-facing edges (most exposed). • <u>Fetch length</u> - wind loading increases linearly to 75% of full load at 5 tree lengths with further load increases to 100% of full load due to fetch in openings >10 tree lengths toward prevailing storm winds. • <u>Funnelling due to treed boundary shape</u> – concentrates wind and further increase wind loading. <p>2. ALSO CONSIDER INTER-TREE SUPPORT REDUCTION (between adjacent trees). <u>Hazard increases:</u></p> <ul style="list-style-type: none"> • With increasing <u>tree removal in partial-cutting</u> (dispersed retention or thinned areas). • As <u>reserve strips or patches become narrower or smaller</u> (where wind can blow through them). 					
Harv Haz.Class	<input type="checkbox"/> Very High	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low	<input type="checkbox"/> Very Low

WINDTHROW LIKELIHOOD EVALUATION - score						
<i>Add Topographic, Stand and Soil Hazards to get Biophysical Hazard; then add Harvesting Hazard to Biophysical Hazard to get Windthrow Likelihood. Adjust if similar calibration sites are significantly different.</i>						
	Very High	High	Moderate	Low	Very Low	
Topographic Hazard	4	3	2	1	0	
Stand Hazard		3	2	1	0	
Soil Hazard		2	1	0		
Biophysical Hazard	8+	6-7	4-5	<4	0	
Harvesting Hazard	7	6	4	2	0	
Windthrow Likelihood	14+	12-13	10-11	6-9	<6	
Adjust with calibration						

² Average – Neither weakly anchored, nor strongly anchored.