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The area of concern appears to be primarily a small 'arm' extending westwards at the northern end. In reviewing the forest edge issues, the main factors to consider would be soil moisture regimes, wind patterns, and site aspect (orientation towards the sun).

Creation of the road would not, in my opinion, radically alter the amount of water flowing into the wetland area at the west side. As noted in the memo from Bob Wallwork the land base west of the wetland is very small part of the catchment area feeding water to the wetland. The proposed road is insignificant when compared to the tail water catchment area. I noted that the land to the west is rocky with bluffs and outcrops directly west of the wetland. In my experience mapping watercourses, this type of landform will have pockets of soil in between the rock bluffs, but subsurface water flows could be lateral (north or south) as well as east. As long as the new road does not breach the drainage presently impounding the west end of the wetland, and as long as the foundation of the road is permeable, there ought to be very little hydrological change resulting from creation of the road in its proposed location. On the basis of the hydrology information available to me I conclude that the soil moisture regimes would not get wetter.

That being the case, the main issue will be what affect the opening might have on tree stability and the wetland. Opening up the area will introduce more sunlight along the west boundary of polygon 704. That will create a drier microclimate, which in turn may, at least in theory, affect seral succession of the plants. I noted in the field that the tree cover in the west arm of the wetland is already quite open, and the ground is already exposed to the higher summer sun, so the main effect of the road will be to permit more of the setting sun into the area.

The effect of increased sunlight would primarily be limited to the west end of this 'arm' and would not affect the balance of the area since the forest cover would not be disturbed. This changed microclimate may lower the reduce the local soil moisture regimes and create drought stress for some species. Western hemlock is especially sensitive to drought stress. If soil depths permit, some species will adapt to drought by growing deeper root systems.

The potential for windthrow of trees in this area is acknowledged as an issue. Whenever a forest is opened up a new edge is created. Normally, the adjacent trees grow codominantly - that is their crowns overlap each other, and some degree of stability is attained for individual trees as the neighbouring trees provide shelter and resistance to excessive movement in strong winds. Removal of adjacent trees can introduce a new set of dynamic forces. The remaining trees are able to sway much more when neighbouring support is lost, and in some cases complete uprooting ensues.

My experience in the Lower Mainland is that windthrow can occur from any compass direction on a wide range of site and soil types, slopes, and aspects. It is not always easily predicted. I noted on my field trip that there was one Douglas-fir windthrown from west to east just south of the wetland area, and closer to Larsen Creek, a hemlock windthrown from south to north. I have not yet had time to investigate where other windthrow has occurred in this area, but I would expect to see several incidences reflecting a variety of wind directions. Typically, forests reach a stage in their development when some of the population is removed by poor health, windthrow, structural weakness, or chance. In some cases the space created by a dead tree is sufficient in size to allow passing winds greater access into the remaining trees, and progressive windthrow can result. In other cases, there may be no further disturbance and the surrounding trees grow laterally into the space.

The forest cover along the ridgeline west of the wetland appears to be very variable in age class, and stand density, and the land form varies from relatively flat land to hummocky with rocky bluffs. The forest cover to the east is continuous and would remain so after the road was built. Creation of a road in this area may alter wind influences at the local scale and it is conceivable that some trees may be lost as a result. However, at this stage I am not able to determine whether or not the presence of the road would create windthrow, nor how extensive it might be.

It would require more time to undertake detailed site assessments to delineate forest types, topography, species, age, and tree heights. It would also require a review of past weather patterns, especially wind speeds, wind direction, and rainfall. Even then, windthrow prediction is not a simple matter beyond identification of the most obvious trees that might be clearly considered to be already unstable. In the 'right' circumstances no tree is windfirm and there are no guarantees of continuing stability. Once more detailed information about this site is available, it may be possible to recommend more specific windthrow mitigation options, such as practices like spiral thinning, and feathering of the forest edges. These are very site specific aspects and cannot be determined at the preliminary design stage.