10/6/03

Lisa McShane
Northwest Ecosystem Alliance
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Dear Lisa,

At your request I have reviewed portions of the Draft E.I.S. for the Lake Whatcom Landscape Plan that address slope stability. I have paid particular attention to evaluating differences in the way that the 3 alternatives would influence the potential for mass wasting.

In reading the Draft E.I.S. I considered implications for evaluating the potential for each of the Alternatives to meet the stated objective to "*ensure no significant risk … from forest management related mass wasting events*".

The Preferred Alternative continues to provide weak assurance of no significant risk, and provides assurance of no significant elevation of landslide risk from forest management. The alternatives provide substantial leeway for risk taking upon "*on-site evaluation by a DNR specialist*". The degree to which this may prove effective at ensuring no significant risk depends not only upon the training and talent of the DNR specialist(s) but also on the institutional definition of acceptable risk that guides their interpretations and assessments. The assurance that risky actions such as "*harvest and road construction upon potentially unstable slopes*" shall be "*carefully regulated*" should provide little solace to a family living at the base of a potentially unstable slope. Although the draft E.I.S. indicates that under the Preferred Alternative the risk of landsliding associated with forest practices would be substantially mitigated by adhering to current forest practice rules, those rules were not designed to protect public safety, they were designed to accommodate timber harvest to the extent possible while mitigating potential adverse impacts on salmonids. Risk is the product of hazard (the chance of occurrence) and the impacts that result from such occurrences. Hence, one cannot help but conclude that the bar is higher for assessing no significant risk when public safety is at issue.

Precluding road construction and timber harvesting on "unstable" slopes in the Preferred Alternative removes the potential for patently risky actions, but it does nothing to address the fundamental problem of increased risk of landsliding resulting from harvest or road construction on potentially unstable slopes. And yet it is the latter problem that is generally of interest in terms of forecasting the effects of a management regime on public safety. Identifying the existing active landslides and restricting actions on them should not be difficult to do (at least not from a technical perspective). In contrast, the identification of future landslide sites among those considered to be potentially unstable is notoriously difficult, and so it is in the management of the potentially unstable slopes that the major differences in the alternatives play out. The Preferred Alternative allows harvesting and road construction on potentially unstable slopes upon consideration of

"*inter-jurisdictional committee and specialists recommendations*". Such consideration provides no guarantee that decisions would in fact "*ensure no significant risk*".

Alternative 3 provides for a 140' buffer around the unstable ARS's 1,2, 3 and 4, which encompasses ancient and dormant landslides, and incised stream channels and would preclude almost all roads on potentially unstable slopes. In addition, Alternative 3 would allow up to 50% harvesting on potentially unstable slopes. This prescription for potentially unstable slopes is experimental. I know of no studies that have demonstrated that a 50% partial cut on potentially unstable slopes (such as hollows, headwalls, and slopes steeper than 70% as they are defined in the Draft E.I.S.) would "*ensure no significant risk"* of landsliding from timber harvest. To the contrary, an analysis of the effect of root reinforcement on slope stability recently published in the Canadian Geotechnical Journal (Schmidt et al., 2001; a study which I was a co-author on), found that spatial variability in root strength—such as one might anticipate would result from a partial cut—was associated with those potentially unstable sites that generated rapidly moving, highly destructive debris flows in the Oregon Coast Range. In other words, the partial cut alternative for managing potentially unstable slopes is an experiment that carries with it an unknown element of risk, a risk that recent research suggests may not be minimal. Therefore, I cannot conclude that even Alternative 3 would meet the objective of not signifcantly elevating the risk of management-related landsliding.

Sincerely,

David R. Montgomery
Professor of Geomorphology and Licensed Geologist # 520 (State of Washington).

*References Cited:*

Schmidt, K. M., Roering, J. R., Stock, J. D., Dietrich, W. E., Montgomery, D. R., and Schaub, T., Root cohesion variability and shallow landslide susceptibility in the Oregon Coast Range, Canadian Geotechnical Journal, v. 38, p. 995-1024, 2001.