

H41B-01 0900H

Using Landslide Risk analysis to Protect Fish Habitat

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The protection of anadromous fish habitat is an important water quality concern in the Pacific Northwest. Sediment from logging-related debris avalanches can cause habitat degradation. Research on conditions associated with the sites where debris avalanches originate has resulted in a risk assessment methodology based on linear discriminant analysis. The probability of causing a debris avalanche by clearcutting can be coupled with an appraisal of the resulting costs and benefits to estimate the risk threshold which maximizes the forest manager's value system.

Public and private forest managers were polled concerning their evaluation of the benefits and costs associated with: (A) correctly identifying a stable site and harvesting its timber, (B) failing to harvest a stable site due to incorrectly classifying it as unstable, (C) causing a debris avalanche by logging an unstable site, and (D) correctly identifying an unstable site and taking appropriate mitigation.

The results of the polls and the distributions of the variables in the discriminant function were used in a Monte Carlo procedure to display the likely spectrum of risk thresholds and their effect on timber harvesting and logging-related debris avalanches.