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FERIC

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Field Note No.: Cable Yarding-11

AREA OCCUPIED BY ROADS, LANDINGS, AND BACKSPAR TRAILS FOR CABLE-YARDING SYSTEMS IN COASTAL BRITISH COLUMBIA: SUMMARY FIELD NOTE

BACKGROUND

On the Coast of British Columbia the withdrawal of productive forest land for permanent roads, landings, and trails continues to be a concern to the forestry community. In 1991, the Coastal Timber Harvesting Interpretations Working Subgroup asked The Forest Engineering Research Institute of Canada (FERIC) to conduct a survey of cable-yarded cutblocks to estimate the proportion of area typically affected by haul-road, landing, and backspar-trail construction. The survey objective was to describe and compare how common cable-yarding systems are currently being applied in Coastal British Columbia with respect to access requirements. This Field Note summarizes the survey results. Full results have been published by FERIC in Special Report SR-83, *Area Occupied by Roads, Landings, and Backspar Trails for Cable-Yarding Systems in Coastal British Columbia: Results of Field Surveys*. As FERIC anticipates only regional application for and interest in the results of the study, copies of this final report will be distributed only on request.

METHODS

For the purpose of this study, cable-yarded cutblock systems were assigned to one of four categories: grapple, highlead, grapple/highlead, or skyline. If at least 75% of a cutblock was harvested by grapple yarding or highlead, then the cutblock was assigned to that system. If the primary system accounted for less than 75% of the harvest area, the cutblock was classified as a grapple/highlead site. A cutblock was classified into a skyline category if more than 50% of its area was yarded by skyline systems.

FERIC's study approach consisted of digitizing cutblock maps at a scale of 1:5000 to record haul-road and backspar-trail lengths and the number of landings. Sample cutblocks were selected from six Coastal operating areas to provide a representative sample of yarding systems and operating chances. These cutblocks were all on Crown land, and had been cable yarded within the last three years. Most were field checked to verify the map information.

Haul-road, backspar-trail, and landing dimensions were measured on randomly selected cutblocks. A total of 337 road cross sections on 21 cutblocks were measured to the nearest 0.1 m. Cross sections included cut, ditch, and fill slopes (Figure 1). Also sampled were 21 highlead- and grapple-yarded landings on 16 cutblocks, and 211 backspar-trail cross sections on 12 cutblocks.

The field measurements and digitized map information were combined to calculate occupancy levels for haul roads, backspar trails, and landings.

OBSERVATIONS

A total of 156 cutblocks were sampled during this survey. Of these, 90 cutblocks were classified as grapple, 44 as grapple/highlead, 13 as highlead, and 9 as skyline.

Including sidecast and fill slopes, the total area occupied by haul roads, backspar trails, and landings for grapple, grapple/highlead, highlead, and skyline cutblocks were 11.8, 10.9, 9.3, and 4.5% respectively (Figure 2).

Haul roads accounted for more than 75% of the total site occupancy for all yarding systems in this survey. Overall width of haul roads was found to increase steadily with increasing slope. Ditch widths decreased with increasing slope, but cut and fill widths increased.

From field measurements, the weighted average width of haul roads was 18.1 m. Haul-road densities were 52.1 m/ha for grapple areas, 47.6 m/ha for grapple/highlead areas, 40.7 m/ha for highlead areas, and 19.1 m/ha for skyline areas.

Highlead and grapple/highlead cutblocks had the greatest number of landings, while skyline and grapple cutblocks contained the fewest. The average landing area was found to be 0.12 ha, but the number of landings surveyed was not sufficient to determine whether landing dimension and area differed with yarding system or slope.

Backspar-trail densities were highest in grapple cutblocks, followed by grapple/highlead cutblocks.

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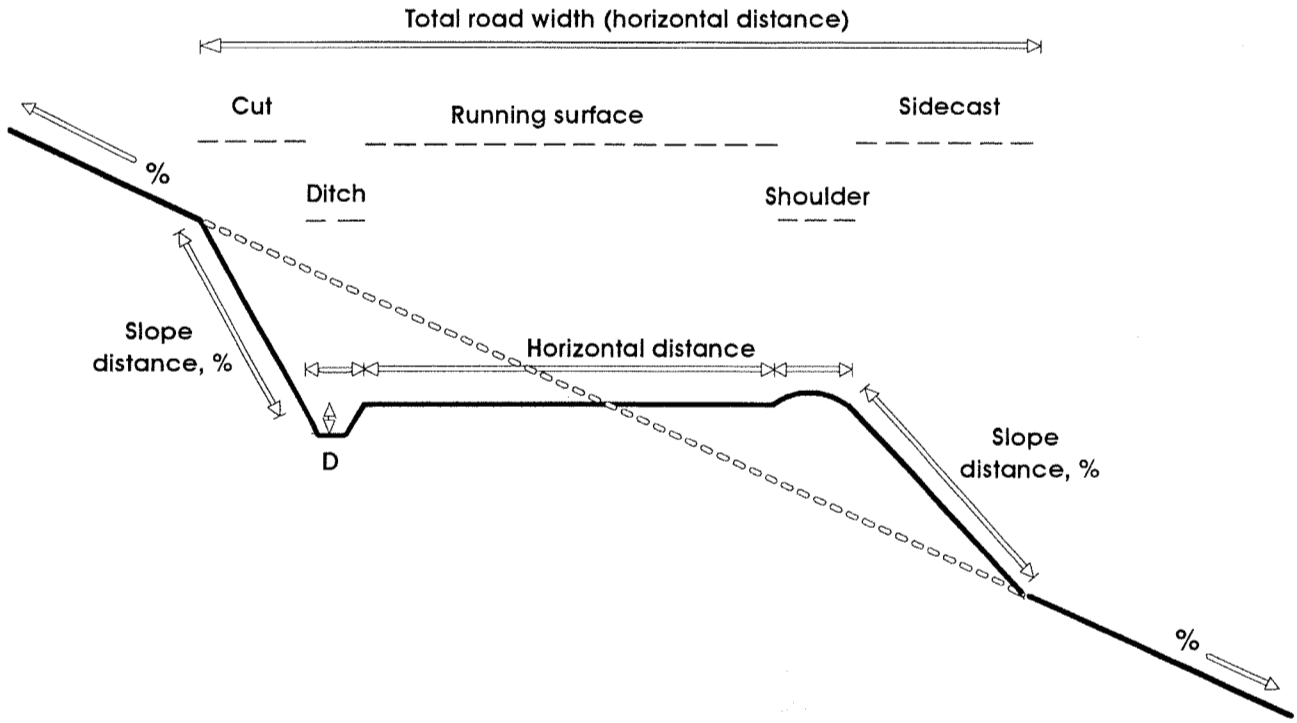

Figure 1. Road cross-section definitions and measurements.

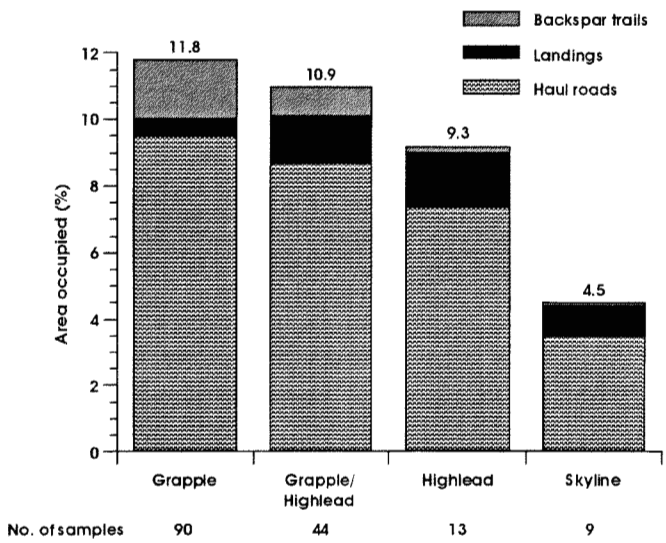

Figure 2. Occupancy levels for haul roads, landings, and backspar trails by yarding system.

Highlead and skyline cutblocks contained minor amounts of backspar trails. Average backspar-trail width was 4.6 m. There was only a slight tendency for backspar-trail width to increase with increasing slope.

CONCLUSIONS

On a block by block basis, haul-road, landing, and backspar-trail densities were extremely variable. Ranges in these values overlap considerably between harvesting systems, and differences in occupancy values are very minor in comparison. Slope and terrain uniformity affect road and landing densities through their influence on area development and cutblock layout, but the actual effects are difficult to measure. Increasing layout options through the practice of engineering cutblocks for two or more yarding systems may tend to offset the importance of slope and terrain.

INFORMATION

The information in this report is based on limited field observations. This report is intended solely to disseminate information to FERIC members. It is not intended as an endorsement or approval by FERIC of any product or service to the exclusion of others that may be suitable. For more information contact Ray Krag or Bruce Henderson at FERIC, or:

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