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- Soil Compaction

- Soil Erosion

-Ground Skidding System

Cut-to-length or assortment logging method

Tree length logging method

Pinard and *etal*

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-Reduced-impact logging techniques

-Logging damages

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-Stone and Coulter

-Nyland

- Planned Logging Operations and Unplanned or  
Conventional logging Operations

Doglass fir Hemlock

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- The point-transect method
  - The line- intercept technique
  - Aerial photographs and planimetry
  - Ground traverse method

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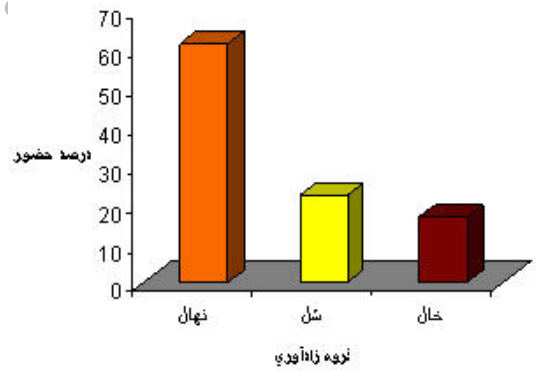
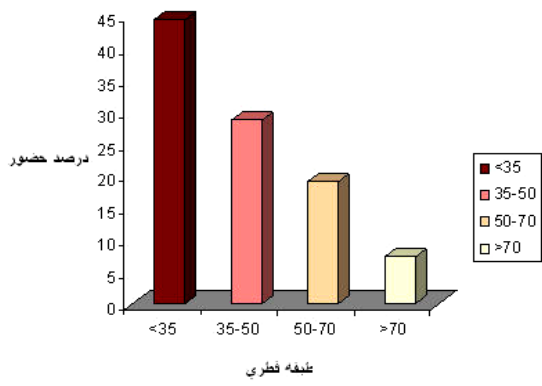
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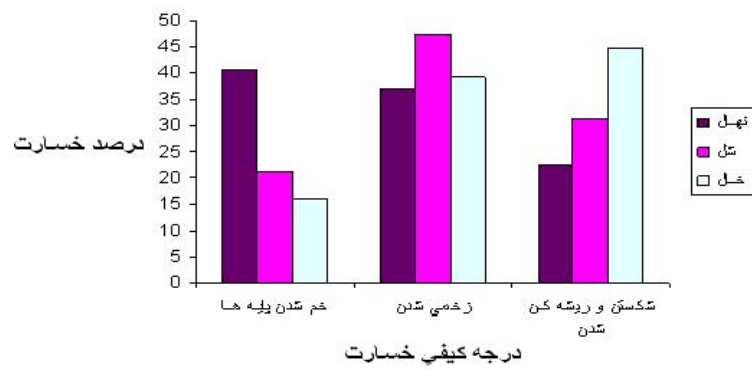
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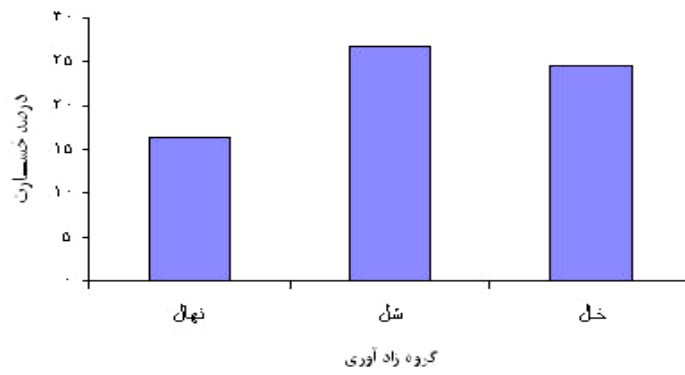
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- Nyland

- Lamson and *etal*

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## Evaluation of Assortment Logging Method with Respect to Residual Damage in Shefarood Forest (North of Iran)

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### Abstract

In order to find an efficient and careful way of selective logging system, the assortment logging method in a ground skidding system was studied with respect to damage caused to the residual stand. In this research stand damage was determined in three stages:

1 – Measuring stand in felling areas (plots) gaps before felling operation

2 – Measuring damages after felling operation

3 – Measuring winching and skidding damages in primary transportation (from stump to landing).

To investigate the effect of damages on residual trees and regeneration in felling areas, winching strips and skid trials, 100% inventory method was employed. Considering the results of felling areas in 27 sample plots showed that 21.77% of trees have been damaged because of felling operation. 84% of damaged trees were Beech, 8.9% Hornbeam and 7.1% other species like Acer, Oak and Alder. Trees with less than 35 cm (d.b.h) diameter suffered damages to the greatest extent. This study showed that the damages to saplings are less serious as compared to other regeneration groups. Evaluation of quality of scars on the trunk of tree stand in winching strips and skid ways with regards to position of scars showed that most scars were present at heights below 1 meter and were mostly deep scars (bark removed and damage to cambium observed). The analyses of damages of regeneration and residual stand across the sides of skidding routes showed that the amount of damages depends on planning of the routes. There were fewer damages in the routes that were better planned. This study showed that designing and specifying skidding routes properly before beginning harvest operations allows planned felling. Tthe evaluation of damage of residual stand was carried out in two type of winching strips. The results showed that damages to the stand in the direction of felling towards skid way is less than the direction of felling opposite the skid way.

**Key words:** Assortment logging method, Ground skidding system, felling gap, winching strip, Iran