Forest Research Notes

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HOW MUCH SCARIFICATION FROM SUMMER LOGGING?

Scarification of the soil creates seedbeds that are favorable for the establishment of both paper birch and yellow birch. Logging in the summer often has been recommended as a method of obtaining these seedbeds. However, our observations on experimental logging jobs have shown that logging alone does not provide scarification over enough of the area to assure reasonably uniform distribution of birch regeneration.

In a recent cutting treatment in an old-growth northern hardwood stand on the Bartlett Experimental Forest in New Hampshire, eight rectangular patches, each 4.0 by 1.7 chains (2/3 acre), were logged during August. The merchantable material was skidded tree-length, using an HD-5 tractor and arch. All other trees down to 2 inches d.b.h. were cut and left on the ground.

Immediately after logging, a survey was made to determine the amount and pattern of soil disturbance. A map was made of each patch, showing the locations and dimensions of skid roads and trails, large piles of slash, and rock-covered areas. The areas of skid roads where mineral soil was exposed were planimetered. The remaining patch area was then sampled for seedbed condition and classified as:

1. Mineral soil.
2. Humus--where leaf litter had been removed down to the humus layer but not deep enough to expose mineral soil.
3. Natural--areas not disturbed by logging; they still were covered by heavy leaf litter.
4. Other--areas covered by large rocks or boulders.

For the sampling, a series of lines 24 feet apart was run across the width of each patch. At intervals of 12 feet along each line an area of 1 square foot was classified according to its seedbed condition.

Results

The average area of exposed mineral soil was less than 10 percent. By combining mineral soil and humus seedbeds, we found that slightly less than one-third of the patch area was disturbed by logging. This one-third was not distributed evenly over the patch, but was concentrated in and around the skid roads. Some portions of the skid roads received heavy traffic, and were almost entirely of mineral soil. Many portions, however, had not received sufficient traffic to expose mineral soil; most of the humus seedbeds were located on these portions.

In addition to leaf litter, heavy slash was found in most patches on portions of the natural seedbeds. This slash, in piles 4 feet or more in height, covered an average of 13 percent of the total patch area.

The area in each of the various seedbed conditions is shown in table 1. Figure 1 is a composite sketch of the eight patches studied, showing a typical distribution of the various seedbed conditions.

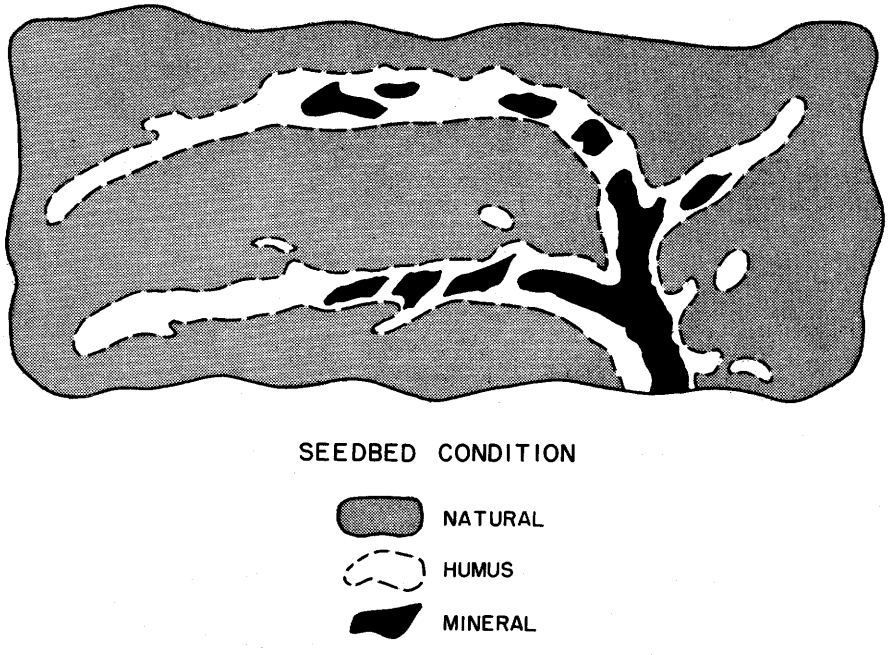

Figure 1.--*Typical distribution of seedbed conditions.*

Table 1.--Percentage of area in various seedbed conditions

Item	Mineral	Humus	Natural	Other
Average	9	23	65	3
Range	5-17	13-30	58-74	0-9

Discussion

Mineral soil provides optimum conditions for the establishment of the birches: it provides a stable moisture supply and allows the rootlets to penetrate to this moisture source immediately. Other types of seedbeds sometimes act as a physical barrier and are subject to higher temperatures and to rapid drying. In spite of this, some birch will germinate and survive on humus and even on natural seedbeds. If moisture, light, and other factors are right, enough may survive to produce a well-stocked stand. But these conditions seldom occur, and additional scarification to provide a greater exposure of mineral soil almost always will increase the amount of birch.

If regeneration of birch is the management objective, a special effort should be made to scarify a much larger proportion of cutting areas than the scant one-third found to have been scarified on our surveyed patches.

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