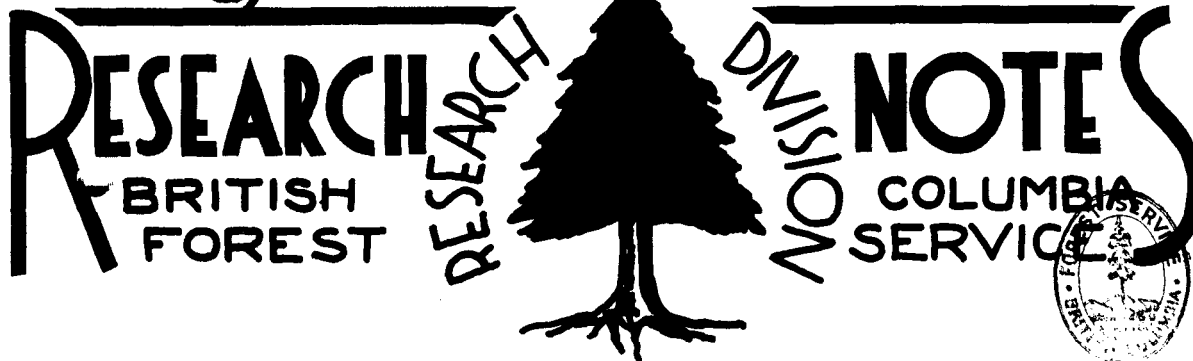


~~13/21~~ M/21
3

MA 13637
634.9753
m.152
c.2



No. 10

Victoria, B. C., April 19, 1943

An Outline of the Minimum Requirements
for Management of Douglas Fir

by

F. S. McKimmon



The natural regeneration of Douglas fir is a complicated phenomenon and there is no simple rule-of-thumb which can be applied to the regeneration problems which we encounter in our everyday work. It is not possible to set up an all-inclusive formula for the management of these forests and each locality must be treated in the light of its own peculiarities. However, there are certain things which, for the most part are true of all stands and this note attempts to outline briefly the main factors affecting the regeneration of Douglas fir on the Lower Coast of British Columbia. In other words this is a statement of the minimum requirements for the management of Douglas fir based on our own findings and those of other organizations working with similar forest conditions.

Slash Fires

1. The burning of slash is usually necessary as a protective measure or as a means of removing the accumulation of debris resulting from logging. In many instances it is easy to decide to burn; however there are cases where the relative merits of protection and regeneration have to be considered. In the past we have been inclined to favour immediate protection at the expense of long-time regeneration. Sound management includes the acceptance of a higher slash risk over a short period to allow the young stand to grow up and cover the ground.
2. One answer to the question "does slash burning favour reproduction" is found in the summaries of the E. and N. Survey of 1937. This survey showed that after allowing ten years for restocking to take place regeneration was satisfactory

on 42 per cent of the lands logged only and on 45 per cent of lands logged and burned. Another answer is given by a history map study of selected logging operations on the Lower Coast. In this case the unburned areas restocked much better than those burned; however, the relatively small area of unburned slash tends to discount definite conclusions. These results fail to indicate any particular advantage to either treatment and strengthen our contention that slash disposal recommendations depend upon conditions on the ground. It should also be pointed out that these conclusions are not applicable to hemlock-fir, or hemlock-cedar-fir types where advance hemlock and cedar reproduction are a significant factor.

3. Slash fires must be planned well in advance and executed in such manner that seed trees and marginal timber are not damaged. Particular attention should be directed to preventing slash fires spreading into young stands and in most cases this will require construction of fire guards.
4. Seed trees should be protected from the slash fire by clearing away the debris around them to a distance of 25 feet.
5. Plan slash burns to take place as early in the fall as weather conditions will permit so that a minimum of the early seed-fall will be destroyed.

Seed Supply

In the course of our daily work we have all seen cutover areas which caused us to speculate on the reason for the slow rate of restocking. In some cases the reason may be traced to severe conditions of exposure which cause a very high mortality among the young seedlings. However, in the majority of cases the lack of regeneration is the result of inadequacy or even complete lack of seed supply. In general it can be said that a good seed supply will produce good restocking no matter what is the source. There must be seed and the first step in the silviculture of Douglas fir is to modify cutting practice so as to provide a seed supply. The problem consists of deciding on the type of seed supply best suited to the conditions at hand and these as we know vary from one operation to another.

Seed Blocks

1. The most practical way to secure natural reproduction is to leave blocks of mature timber standing until at least one good crop of seed has been disseminated over the adjacent logged land. On the average this will mean that the timber must stand for a minimum of five years.
2. The block of timber must be properly located with reference to the direction of the prevailing wind and under average conditions

satisfactory stocking can be expected up to 1/4 of a mile. Beyond that distance seeding will not be sufficient to produce satisfactory stocking and other seed source must be provided.

3. The leaving of blocks of seed trees means logging by alternate settings and this is feasible only on the larger operations. Particularly adaptable are truck shows where permanent roads are built. The smaller operators will have to rely on groups of seed trees for natural reproduction.
4. In a good seed year an acre of mature forest will produce 10 pounds of seed. This compares with only one pound of seed produced by a 100-year old stand under the same conditions. In other words, a mature stand is ten times as good a seed source as second-growth.
5. The sooner seed is disseminated following logging and burning the more effective are the results; however, the periodicity of seed crops may postpone seeding for several years. This delay still further extends the period of regeneration as the young seedlings then have to compete with heavy vegetation.

Groups of Seed Trees

1. Groups or patches of seed trees are the second most practical source of seed. This does not mean the scrubby growth left on rock knolls but good thrifty trees representative of the timber logged.
2. These groups must be located strategically with reference to the cut-over area so that seed may be disseminated uniformly over the entire cutting. Frequently long corners are left or patches over a hill that are too hard to reach; unfortunately these groups of seed trees are apt to be poorly located with reference to the prevailing wind and little if any seed from them reaches the main cutting.
3. The number of trees in the group or the number of groups is not necessarily fixed but good practice requires about 5 per cent of the original volume be left in groups of not less than four seed trees per group.
4. As a rule more trees are required on south than on north slopes due to the greater mortality among the new germinates. Also it should be kept in mind that trees on dry sites are more windfirm than those on wet ground, and trees on ridge tops are more windfirm than those just below a ridge.

Scattered Seed Trees

1. A satisfactory Douglas fir seed tree is one with a large crown, preferably one the upper part of which is tapered. The branches

are thrifty, the needles are a healthy colour, and the upper part of the tree alive, not spike-topped. The growth is good, bark thick, and root system deep. Trees answering this description will seldom be less than 30 inches d.b.h.

2. Good seed crops occur at intervals of from three to six years. When the crop is small it is of no help in obtaining restocking as the seed produced is destroyed by squirrels and mice.
3. There are instances where two seed trees per acre have restocked an area satisfactorily but conditions vary widely and to be safe four seed trees per acre should be left. Our observations show that 70 per cent of the seed trees are lost within ten years, hence the need for leaving an adequate number after logging. It sometimes takes ten years for an area to seed in.
4. The seed trees should be well distributed over the entire cutting and not be left off in one corner of the setting. A good distribution of seed trees results in more uniform restocking than by the other systems.
5. In a normal season the cones ripen and begin to scatter the seed about September first. By the end of October, 70 to 90 per cent of the crop has been disseminated, hence the urgency for early slash burns.
6. Seed will remain viable in green cones even though the tree itself has been killed by fire. In this way a burned area may obtain one final crop of seed and if it occurs in a good seed year adequate stocking results. Portions of the Bloedel fire in 1938 restocked satisfactorily in this way.

For those who wish to deal with these problems in more detail, it is suggested that the following publications would be of interest:

- (a) Slash disposal and forest management after clear cutting in the Douglas fir region; by T. T. Munger and D. N. Mathews. Circular 586, U. S. Dept. of Agriculture. 1941.
- (b) Factors affecting the establishment of Douglas fir seedlings; by L. A. Isaac, 1938. Circular 486, U. S. Dept. of Agriculture.
- (c) Douglas Fir--A summary of its life history; by G. S. Allen, 1942. B. C. Forest Service.
- (d) Theory and Practice of Silviculture; by G. S. Baker, 1934. McGraw-Hill Book Co., New York.