WHITE PINE — A PROVINCIAL RESOURCE ¹

By MURRAY B. MORISON ²

There is no other tree native to Eastern Canada that has as many **fine** qualities as white pine (*Pinus Strobus*). It has the beauty of an evergreen and the adaptability to grow on almost any site. It will not only grow well on the lighter sandy soils, but reaches excellent height and diameter on the better loams in mixture with tolerant hardwoods such as maple and birch. White pine seeds well and often. Only under extremely unfavorable conditions will it fail to germinate a potential new crop. Although white pine is generally regarded as a light-favoring tree, it will survive under shade and respond to release. It is a fast grower and develops fine, straight timber that is knotty when comparatively young and clear and unblemished as a veteran. It is easy to fell and floats with a minimum of sinkage. In the trade white pine is a leader in **value** because of its many fine qualities, such as:

- (1) the ease of drying;
- (2) evenness of shrinkage;
- (3) lightness;
- (4) strength;
- (5) workability;
- (6) natural beauty;
- (7) adaptability to paints, etc.

White pine is not generally used for pulping owing to its higher **value** as lumber. However, it has many of the qualities of jackpine as a pulpwood and white pine chips, a bi-product of the sawmill, are marketed for the sulphate pulping process.

The most recent inventory estimates a total volume of white pine standing timber in Ontario amounting to two billion five hundred million cubic feet (net merchantable) of which a volume of two billion feet is over nine inches in diameter at breast height. This estimate is in all stands classed as young growth and older. The estimated allowable annual cut (without allowances for other depletion) amounts to approximately twenty three million cubic feet. This is a great reduction from the average cut from 1900 to the present which would be in the neighborhood of eighty million cubic feet. The allowable cut is about one percent of the growing stock, which is an indication of the allowances made for stands that are not yet mature and contain much undersize material, and also where the pine is in mixture with poplar and birch and **uneconomic** to extract alone under current conditions.

Two-thirds of the estimated accessible white pine saw timber in **Canada** is located in Ontario.

White pine comes third in available supply of softwood saw timber in Ontario. It now is a close second to jackpine in sawlog production from **Crown**

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lands (reported production in 1953-54; jackpine, 24 million cubic feet; red and white pine, combined, 27 million cubic feet with white pine probably contributing 21 million; spruce sawlogs come third in production from Crown lands with a cut of 14 million cubic feet).

Historically, white pine saw timber has come first in volume and value production (sawlogs) in Ontario. I believe it still retains its supremacy in value although it appears to be losing its position in volume production largely through a greatly increased use of jackpine. White and red pine logs cut from Crown lands in 1868 totalled 177 million board feet. The cut gradually increased to 300 million board feet in 1880, then rose to a peak of nearly 800 million board feet in 1908, which was the highest cut recorded from Crown lands in Ontario. In recent years the cut has been in the vicinity of 150 million board feet. In fact, in the last twenty years there has been an indication of a general levelling of production around the latter figure.

The question in Ontario is: Can this level of production be maintained?

Based on past experience—which for a long period condoned wasteful practices, which did not provide ample protection from fires, insects and disease, and during which time no program of regeneration or stand improvement existed—the outlook is not good. After a short period of liquidation of virgin stands still in reserve, there probably will be a period of short supply. A period of adjustment is inevitable, but there is a promise of a better future for white pine provided there is a willingness to invest in its future and forego some of the immediate profits and revenues obtainable under the old system of “cut out” and “get out”.

Some suggestions for action are as follows:

1. In certain instances virgin or overmature stands of white pine might be held in reserve for a slightly longer period directly by a reduction in cutting but more likely the same results can be obtained indirectly by: (a) the more complete utilization of defective timber encountered; (b) the operation of isolated patches; (c) the preparation of good operating plans before cutting commences to ensure the extraction of the maximum total value per operating area; and (d) providing adequate supervision on the logging operations to avoid waste.
2. Maximum fire prevention and suppression facilities should be maintained and improved.
3. White pine should be managed primarily for sawlog production.
4. White pine pulpwood or fuelwood should only be produced incidentally to sawlog production. If there is a market for white pine pulpwood, it should only be taken from the unmerchantable parts of sawlog-size trees, mill waste, and from dead or dying smaller trees but not from sound understory trees even though they may not appear to be very good at the time of cutting.
5. In the management of white pine there should be an assessment of insect and disease hazards. *Ribes* eradication, where blister rust is prevalent,

should go hand in hand with the regeneration program and improvement cuttings. More must be learned about the damaging effect of the white pine weevil and the cultural treatments that may improve the form of damaged trees or lessen the effect of the damage as these trees grow older.

6. Plans should be advanced for the conduct of thinning and improvement operations in immature stands containing sawlog sizes capable of producing a substantial operating volume. Such operations are practical under a system of marking where the main purpose is the release of well-formed, thrifty trees from competition and the reservation of unmerchantable size trees for future development.

THINNINGS AND IMPROVEMENT CUTTINGS

Thinning and improvement cuttings are possible in many stands in the neighborhood of sixty years of age. It is in these stands that much can be done to improve white pine production in accessible areas and at a profit.

Cultural treatment properly applied will increase the increment on young timber. By the selection of merchantable trees to be cut for sawlogs, there will be an increase in increment on the well-formed, thrifty trees released and in addition there will be effective increment on most of the suppressed trees released even though they may have rather poor crowns and appear to have no chance of contributing merchantable yields in the future.

Release to be effective in the upper story must provide a space between crowns of adjoining trees. An upper story tree will not respond to the cutting of understory trees. Unless an understory tree is merchantable, it is wasteful to cut it. Furthermore, by the cutting of an understory tree, even though it may be merchantable say for fuel or pulpwood, you are depriving the stand of the future yield of a tree that in many cases would survive and eventually take the place of its suppressor.

In the Ottawa Valley of Ontario and Quebec:

(1) clear cutting of second growth white pine and planting as practiced in parts of the North Eastern States is not necessary nor is it good practice;

(2) thinnings from below in second growth white pine as experimented with in Eastern Canada contribute little to increasing the increment on the residual stand;

(3) openings in the stand of dimensions as great as the height of surrounding timber generally regenerate satisfactorily;

(4) openings of a smaller dimension than those required for free crown space of mature trees should be regarded as being occupied by the adjoining trees and thus not necessarily requiring regeneration.

The type of cutting proposed in the preceding discussion will eventually result in the development of a forest having the attributes that go with all-aged conditions.

In visualizing this kind of cutting and its results, it is not advisable to think in terms of a one-acre unit, the common unit for expressing the results of demonstration and research. Specific results are measured in terms of the release of individual trees while general results are related to an operating area of some size in which there is a conglomeration of conditions that will be found after the first cut, such as:

- (1) the irregular occurrence of openings of a size suitable for regeneration, generally made by the cutting of a group of mature trees.
- (2) patches of pole-size trees that have been treated for spacing.
- (3) patches of untreated trees that have not yet become competitive with each other.
- (4) patches of mixedwood containing pine and hardwoods not economical to operate.
- (5) various combinations of all these.

Residuals which are regarded as reserve trees consist of all sizes and crown classes in the original stands. The larger openings form good seed-beds and generally carry successful regeneration from one to five years after cutting. The reserve trees may be classed further according to quality as there will be thrifty large and small Class 1 trees, merchantable (sawlog) but partly defective Class 2 trees and unmerchantable Class 3 cull trees of no potential value as saw timber and generally not competing to any extent with other growth.

In addition to the pine and other softwoods as classed above, the hardwoods, mainly poplar and white birch, form a part of the remaining stand. Thus it is a cut that has not disturbed the natural conditions seriously, that does not try to sterilize every acre but takes advantage of the growth potentialities of released timber wherever it is possible to do it on a commercial scale.

Evidence of the release of white pine after cutting is clearly illustrated by the measure of diameter increment before and after cutting.

Some examples of release are as follows:

Tree No. 1—A slightly fire-scarred tree 8.4 inches D.B.H. in 1956 grew an average of 0.15 inch per year, six years after a cut, compared to an average of 0.08 inch per year during the previous years.

Tree No. 2—A tree 11.6 inches D.B.H. in 1956 grew an average of 0.30 inch per year, six years after a cut, compared to an average of 0.13 inch per year during the previous six years.

Tree No. 3—A tree 8.0 inches D.B.H. in 1956 grew an average of 0.17 inch per year six years after a cut, compared to an average of 0.08 inch per year over the six years prior to the cut.

Tree No. 1 was the only one of the above that appeared to be completely

released. The nearest living tree, 9.8 inches D.B.H., was 22 feet away. As several trees had been cut around it, it was expected this tree would show more evidence of release until the fire scar was discovered.

Tree No. 2 had four trees cut within 15 feet of it, but there remained a 9.8-inch red pine within 6.5 feet, another 6.0-inch red pine within 5.0 feet and another 6.4-inch red pine within 11.6 feet.

Tree No. 3 had a white pine 17.6 inches on the stump cut within 8 feet and another 12.6 inches cut within 20 feet but there remained a 7.5-inch red pine within 4.0 feet and a 10.0-inch poplar within 15.5 feet.

Recognizing white pine as the most valuable saw timber in Ontario the Government is:

(1) currently conducting research in the growth and regeneration of white pine; (2) white pine is receiving special attention in the tree breeding program with the aim of improving strains resistant to disease; (3) Crown timber regulations have established a diameter limit of eighteen inches; (4) management of white pine provides for the marking of timber to be cut in immature stands; (5) regulation of the cut is planned in all management units; (6) protection from fire is continually improving; (7) a *ribes* eradication program coupled with a stand improvement program is now underway, and (8) aerial spraying by herbicides to destroy brush competing with pine regeneration is in our program under project regeneration.