

cutty-grass (*Gahnia*), &c., and pulping it into a condition in which it soon decomposes for humus formation, the caterpillars, by means of their ready mobility, result in a greater number of extraction tracks than under older methods and consequently a greater and better-distributed area ready for seed-fall. Observations made to date indicate that kauri regeneration will occur in ample quantity on much of the soil disturbed by caterpillar manœuvring.

In Whirinaki managed forest in Rotorua Conservancy, from which over 950,000 cubic feet of podocarp logs were removed by the Service and sold during the year, germination of seed in the logged areas was good, but most seedlings succumbed in the hot summer season. Kahikatea regeneration persists mainly where mineral soil had been exposed during logging. During the year matai seed germinated freely, though it is too early to forecast its survival. The total area under regeneration is 300 acres.

Three beech (*Nothofagus*) stands in Nelson Conservancy were opened up for regeneration by girdling, removal of underscrub, and occasional thinning, the total area treated amounting to 105 acres. Owing to staff shortage due to enlistments, no soil preparation for seed-fall was carried out, but the regeneration secured during the previous year under this method has survived in quantity sufficient for restocking under the object of management—namely, a pole stand for production of mine-props.

In the forests of the south-eastern portion of Auckland Conservancy, kauri and beech grow well in close association, and kauri regenerates well under beech, while beech regenerates freely along tracks and in other openings. Around the clearer forest margins, *Pinus radiata* regenerates so well that it was decided during the year to bring the largest State forest in the locality under preliminary management and, later, working-plan control.

As for natural regeneration in State exotic forests, the main areas concerned are in Whakarewarewa and Waiotapu State Forests, in Rotorua Conservancy, where 126 acres of *Pinus radiata* were clear-felled during the past year. Though regeneration has occurred in sufficient quantity, its survival is not yet assured due to the presence of the pine-bark beetle, *Hylastes ater*.

SECTION C.—ARTIFICIAL REGENERATION.

35. *Interplanting Indigenous Forests*.—In rimu and other podocarp stands, natural regeneration is, generally speaking, very sparse excepting in Westland forests, and in the North Island in consequence the experimental planting of shade-tolerant exotic trees has been resorted to in gaps caused by felled trees. Two hundred and thirty-two acres of cut-over indigenous forests were interplanted 228 acres chiefly with the exotics *Thuya plicata* and *Cryptomeria japonica*, and 4 acres with the indigenous podocarps totara and tanekaha. Good strikes resulted. Eighty acres previously interplanted were blanked up.

36. *Afforestation*.—Apart from the above-mentioned 232 acres of planting in unburnt cut-over forest, 4,223 acres of open lands were afforested with exotic tree species, all of it on grass, fern, or scrub lands with the exception of 320 acres of heavily-burned cut-over indigenous forest. Mixed tree crops were formed on 1,071 acres, some entirely in the past year, and the remainder by introducing a second species into earlier plantings or by planting one species for completion later with the second species. (See Appendix III.)

Unthrifty, windthrown, and otherwise damaged areas were replanted over 2,626 acres, while blanking operations occupied 3,238 acres.

Tree seeds collected and extracted totalled 1,456 lb., including 34 lb. of indigenous-tree seeds.

37. *Nursery Operations*.—A total of 2,960 lb. of tree seed were sown, yielding 17,600,000 seedlings as at 15th March, 1941; 92 lb. of indigenous-tree seed are included. Trees lifted for planting, transfer, &c., totalled 9,860,000, and 3,930,000 seedlings were lined out. Tree stocks in all nurseries at the close of the year amounted to 26,000,000.