

## 9. ECOLOGY AND SILVICULTURE.

No new projects were undertaken during the year, but the accumulated data with respect to certain aspects of forest-management as recorded in previous reports were added to by routine observation, &c. It goes without saying that, as these investigations are long-time studies, the reports of annual progress must necessarily be meagre, particularly in the early stages.

The most important forest types under investigation are the kauri in North Auckland, the silver-pine at Erua (Main Trunk line), the rimu in Westland, and the silver-beech in Southland, and, although these studies have been all of short duration, the results to date are sufficiently promising to warrant a continuance of the work.

The periodical measurement of sample plots in the exotic forests to secure annual-increment data will be continued as opportunity permits.

Further attention has been given to the possibility of the establishment of exotics in cut-over indigenous forest areas, and plots are under observation at Mamaku, Erua, Golden Downs, and in Westland.

## CHAPTER II.—PROTECTION.

## 1. FIRES AND FIRE DISTRICTS.

A fairly dangerous fire season obtained throughout the Dominion, and in parts of the North Island and in Nelson and Canterbury the spring and early summer months were very dry; and the fire hazard for that period gave rise to some anxiety. During the Christmas season and in early January, when camping in State forests is usually at its peak, heavy rain fell in most parts, and all fire danger was removed.

The material losses by fire were small. In all, six fires were reported from Auckland Region; two were settlers' fires, which encroached on State forests, doing no damage; one occurred in old sawmill workings; one got out of hand while burning to clear firebreaks at Waipoua, but was put out without damage, and similar success attended another small fire at Puhipuhi Plantation. A settler's fire spread into Tairua Plantation and destroyed 20 acres of young trees. In Rotorua Region no fires entered either the exotic or the indigenous forests.

In Wellington Region eight fires were reported, six of which were in the Main Trunk district. The most serious one was, it is suspected, caused by a spark from a railway locomotive, and spread into Karioi Plantation, burning 59 acres of poorly growing *P. radiata* trees. The scorched trees were cut out and the block replanted with *P. ponderosa* and *P. Murrayana*.

In parts of Nelson Region the fire danger was fairly acute for several months, and although numerous settlers' fires were reported, only five minor outbreaks at Golden Downs Plantation concerned the State; no damage was done. There fires occurred in private plantations.

Much the same position obtained in Canterbury Region; no plantation fires took place, but two were reported in indigenous forests, doing negligible damage.

Three private plantations suffered by fire—in two instances serious loss resulted; 400 acres of growing trees were destroyed, valued at £7,250.

The only fire in Southland Region was not serious from the Service viewpoint, although the saw-miller in whose cut-over area it occurred lost 25 chains of tramway thereby.

In all regions fire patrols were on duty during the dry months of the year, and fire lookout stations were maintained at the principal plantations.

In this connection it may be interesting to record that in Westland Region a growing rimu-tree has been used to provide a look-out post, 82 ft. high, from which practically all parts of the plantation may be clearly seen.

*Fire Districts.*

Forty-four fire districts have been constituted under the Forests Act; of these, thirty-five concern State forests, the other nine being private fire districts. One new district of 9,950 acres, to embrace Pebbly Hills Plantation, Southland Region, was gazetted during the year. The value of fire districts as a means of regulating and controlling settlers' "burning-off" fires, &c., and preventing indiscriminate burning generally, cannot be overestimated.

## 2. FOREST PARASITE BIOLOGY.

It has already been recorded in a previous paragraph that climatically the past season was an exceptional one, inducing a high degree of fire hazard in most districts. The Nelson district records "one of the most prolonged dry spells experienced for many years"; and there is no doubt that this and other climatic abnormalities were reflected in the pathology of the forests. The increase in the numbers of dead saplings in young exotic forests of the pole stage in the drought-stricken district was most marked—probably due to increased severity of *Diplodia* killing on drought-weakened stock in dense stands. This affected State forests but little, as there are few State-owned stands of this age in the area in question. This loss, moreover, was probably more than offset by other features similarly traceable to climatic aberrancies. The October–November late frosts, which are deemed to be the principal inducing cause of the *Phomopsis* attacks of the past two seasons, were almost absent; but were replaced by a series of frosts of exceptional severity experienced during December and January. Unfortunately, the areas on the southern end of the Kaingaroa Plateau, which were affected by a very exceptional late January frost, are not provided with thermometers. The intensity of the