

and National Resources conducts research in forest economics, silviculture, management, forest inventory methods, forest fire protection, and in forest products. An extensive program of research is under way on the experiment stations and on other lands, where an increasing proportion of the total effort is being expended in co-operation with provincial authorities and industry.

Forest Research.—Research in silviculture and management has been concentrated since World War II upon problems of regeneration, growth and stand development, and harvest cutting methods. A regeneration survey extending from the Rocky Mountains to the Atlantic Coast has provided information on the status of regeneration on cut-over and burned lands. This has been followed by intensive work of a more fundamental nature to assess the factors responsible for the success or failure of regeneration and, by empirical tests of practical cutting methods, seed-bed treatments, and seeding and planting methods, to obtain reproduction. Studies are made of the growth, yield and successional changes in the most important forest types. Systems of classifying forest sites so as to assess their effective growth, development and long-term productivity are being devised. Research in tree breeding is also carried on for artificial propagation by selection and development of superior strains. Research in forest management is concerned with the application of silviculture, regulation of cut, and protection so as to maintain forests at their highest production levels. Many of the research studies in silviculture and forest management are conducted co-operatively with provincial forest services and wood-using industries.

Forest fire protection in Canada is a vital problem and is therefore a major concern of federal and provincial forest authorities. Forest fire protection of Crown lands is the responsibility of provincial forest services but federally owned forest lands, such as the National Parks, the Forest Experiment Stations, and lands in the Yukon and Northwest Territories, are the responsibility of the Federal Government. Other organizations responsible for forest fire protection within their respective territories are the forest protective associations in Quebec and company organizations dealing with privately owned forest land in Nova Scotia and British Columbia. In forest fire research, the Federal Forestry Branch is working towards full co-operation with the provincial forest services in achieving the best methods of forest fire protection. The leading contributions of the Branch have been in the field of fire-hazard research and in the development of equipment and techniques for fire fighting. Increasing attention is being given to research relating to such fields as fire-control planning, visible area mapping, detection and communications equipment, and the development of fuel-type classification methods and mapping techniques. A number of provincial forest-protection services are also engaged in research activities. Notable advances have been made in several provinces in the development of forest communications equipment, the dropping of supplies to fire fighters by parachute, and the design of mechanical fire-fighting equipment.

Research in forest inventory methods is of increasing importance because of the greatly expanded inventory programs being conducted in most provinces. Data from air photographs are correlated with field work to develop new techniques of timber estimating, which is being facilitated by the use of stand-volume tables. Various methods of field sampling are being investigated and compared. Research is being continued in methods for measuring tree images and tree shadows to determine heights, crown widths, canopy density and other data from photographs taken in different seasons of the year under various conditions. The use of large-scale