

trout and smallmouth bass are in progress and management techniques are being tested against the background of a creel census which has been continuous since 1936. Studies of speckled trout have been re-instituted after a five-year break in continuity.

A selective breeding experiment concerning the hybrid between lake trout and speckled trout is progressing favourably. The deep-swimming character of the lake trout and the character of maturity at early age of the speckled trout are those being selected for combination in the hybrid.

Co-operation by Ontario in the field of gear development is being extended through the Federal-Provincial Committee for Ontario Fisheries and in the field of sea lamprey control through the Great Lakes Fishery Commission.

**Manitoba.**—Manitoba's freshwater fishery resources continue to occupy an important position in the economy of the province and will expand as new lake areas are opened for development through the extension of railway lines and road construction into virgin areas. Total production of commercial fish in 1961 was 31,900,000 lb., the marketed value being \$6,500,000; the primary industry provided full- or part-time employment for some 5,279 fishermen and other related industries, such as fish processing, transportation and boatbuilding, provided employment for at least 6,000 persons.

Manitoba's lakes and streams produce 15 varieties of commercial fish, the most important being whitefish, pickerel, sauger and northern pike. Some 2,500 commercial fishing boats are in operation, varying in size from large lake freighters to skiffs powered by outboard motors. The value of these boats together with nets and other equipment is estimated to be \$3,095,000. The value of cold storage and processing plants represents a further investment in the industry of some \$3,500,000, making a total capital investment of approximately \$6,600,000.

The Department of Mines and Natural Resources of Manitoba, in supervising commercial fishing operations and enforcing fishery regulations, operates a fleet of modern diesel-powered patrol boats during the open-water season and uses bombardier snowmobiles and light trucks in winter. All patrol units are equipped with two-way radio providing ship-to-shore communications.

The management and development of commercial and sport fishery resources of the province includes the operation of fish hatcheries. During 1961, the Whiteshell Trout Hatchery reared and distributed 70,000 yearling trout of various species and more than 563,000 fingerlings were raised and planted. Selected lakes and streams were stocked with trout to improve and diversify sport-fishing opportunities. The Department also operates seasonal hatcheries at Duck Bay and Swan Creek, both designated as pickerel hatcheries. The Dauphin River Hatchery provides eyed whitefish eggs and fry which are planted mainly in commercial waters; limited plantings of this species are also made in sport-fishing waters.

Biological studies and investigations involve pollution, sampling of catch to determine fish growth and past spawning success, yield in terms of a lake's potential, analysis of fishing gear success, productivity and catch quotas, movements and fishing mortality as traced by tagging, and general population dynamics. Lake surveys provide information for administration of the fish harvest and a basis for special fish management and cultural operations. Ecological requirements for fish production have been under study, with special attention given to important commercial and game varieties. Tests of water quality have been related to natural abnormalities, as well as to industrial and domestic wastes. Research is both local and short-term as well as fundamental and extensive and its objective is to provide facts for use in the management and administration of the fisheries resource.