Lake surveys and fisheries management

The water and fishery resources of Ontario are so great that a simple count of the number of lakes in the province has never been made. Estimates of up to 400,000 lakes have been made, and most of these support, or have the potential of supporting, fisheries resources.

Organized management of this important renewable resource is based on knowledge of the physical, chemical and biological characteristics of the lakes. Efficient collection, accurate analysis and a complete record of these data require a uniform, organized survey. With the successful completion of such surveys, it is possible to use modern data-processing systems in the compilation of the reports.

Following the establishment of a fisheries-resources inventory unit to co-ordinate lake and stream inventory work, lake surveys have become an integral part of fish-management programs. From a lake-survey report it can be determined if a lake is suitable for stocking and what species to stock. Surveys carried out in lakes previously stocked provide important information on the degree of success of stocking and determine if any problems exist.

Normal procedure

A complete lake survey is best carried out during the summer months. The normal procedure is to hire university students engaged in biological studies. Before reporting to their district, students attend a two-week lake-survey training course held at Dorset, Ontario, during the latter part of May. The course is held at this time since it fits in with the end of the university year and the beginning of open water. It consists of one week of classroom work, three days of conducting a lake survey and the rest of the time spent writing up a complete report under supervision. While it is specifically aimed at lake surveys, the training received in record-keeping and the scientific method applies to all phases of fish and wildlife field work.

Before the actual field work is carried out, maps of the lakes are prepared with area and shoreline length calculated and other pertinent data recorded.

Once at the lake to be surveyed, a shoreline cruise is made. Soil and rock types, tree species and aquatic vegetation, are noted, as well as access points and inlet and outlet streams, including the flow in cubic feet a second. Sounding-lines are run to and from recognizable features. All shoals and reefs, including natural spawning sites as well as the bottom types throughout the lake, are recorded. A limnological station is set up at the deepest point to carry out chemical tests for oxygen, pH and total alkalinity, along with a temperature series to find the thermocline. Turbidity, light penetration and colour are also determined at the station. A water sample is taken to find the total dissolved solids – an index to the productivity of the lake.

Any wildlife on the lake, such as deer, moose, beaver, otter, waterfowl and shorebirds, is also noted.

A history of the lake includes commercial fishing, sport fishing, dams, pollution, water-level fluctuations, tourist camps and cottage locations.

Fisheries sampling

When this work is completed, the fisheries are sampled by means of gill-netting or trap-netting. A gang of test nets, with mesh sizes 1½ to 5 inches changing at 50-foot intervals, is set in the most desirable places in the lake. These nets are normally set overnight when the fish are active. When the nets are lifted, the fish are sampled to determine length, weight, sex and maturity, stomach contents and parasites or diseases. Scale samples, to determine the age-classes and growth-rates of the various species, are also taken. A bait-fish sample is collected.

The last step in the field work is to create a permanent bench-mark as a record for future surveys and to monitor water fluctuations.

When all information has been gathered, the report is written and contour maps drawn. These data are then analyzed for management purposes.

In summary, district lakes are being surveyed to determine their present and potential capability to produce fish, wildlife and recreation. An added benefit for the angler is the production of lake contour maps and management information. The maps are lithographed on water-resistant paper and include details of physical data, historical information, lake characteristics, fish species present, angling opportunities, as well as access and facilities.

Families by type

On June 1, 1971, the total number of Canadian families maintaining their own households (i.e., where the head of family is also the head of the household) reached 4,898,290, an increase of 11.3 per cent from the 1966 figure of 4,345,718. Other results of the 1971 census revealed that Quebec and the Prairie Provinces had the highest percentage of families maintaining their own households, while Newfoundland had the lowest.

Also in Newfoundland in 1971, 7.0 per cent of all families were not maintaining their own households but were related to household heads who were. This figure was the highest in Canada, although other Atlantic provinces showed a similar trend. Saskatchewan had the lowest ratio, with 1.4 per cent, which again represented a regional trend. The greatest change in related families not maintaining their own households (over the 1966-1971 period) was seen in the Yukon and Northwest Territories, where they fell from 3.9 per cent of all families in 1966 to 3.1 per cent in 1971.

The largest decreases in lodging families occurred in Ontario, where they fell from 1.6 per cent of all families in 1966 to 1.1 per cent in 1971. Nevertheless, Ontario still ranked second, behind the Yukon and Northwest Territories, which had a ratio of 1:2. Saskatchewan had the lowest ratio of lodging families, a mere 0.4 per cent of all families.

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