Nine Nova Scotia Rivers

Acid rain has already caused the extinction of Atlantic salmon in some Nova Scotia rivers.

During spring thaws pH levels in such rivers have dropped from six to four in a few days, and such an abrupt drop can kill the salmon eggs and larvae. The effect on the water is temporary — the pH may rise as rapidly as it falls — but the effect on the fish is permanent.

Dr. Walton D. Watt of the Canadian Department of Fisheries and Oceans reported on nine rivers in late 1980.

All have pH measurements below 4.7. Since there is angling data from the past hundred years, scientists have a clear idea of when the salmon became extinct. Until the 1950s the annual catch in some of these small rivers was 100 to 200 fish. By 1960 it was only half as many, and a decade later not a fish was landed. Rainfall chemistry data from the 1950s show that the acidity in the rainfall has increased tenfold during the period. Eleven other Nova Scotia rivers are considered threatened, and, given the current rate of acidification, Watt expects these salmon runs to be gone in twenty years. He says air trajectory studies show two-thirds of the pollution is coming from U.S. sources in Ohio and Pennsylvania, while one-third originates in the Canadian Maritimes.

Solutions

Short-Term

New York State, the Province of Ontario and Sweden are attempting to rehabilitate lakes by pouring lime into them.

The process is expensive—Sweden is spending (Cdn) $4 million a year on a pilot project—and to remain effective the treatment must be repeated periodically.

In Canada, with tens of thousands of susceptible remote lakes, the task would be overwhelming.

Professor Dwight Webster of Cornell is trying to develop new strains of brook trout with a high tolerance of acidity, and several strains of acid-resistant fish have been identified in northern California. These efforts have obvious limitations: no fish can live in a lake with a pH below four or one in which necessary nutrient-producing vegetation has been destroyed or toxic metals released.

Permanent

The only permanent solution to the acid rain problem is to keep the acid levels low.

Scientists agree that the only practical way to do this is to change energy use patterns—through conservation or the use of non-polluting sources—and to stop emissions at the source. Those from coal-burning plants can be controlled with varying degrees of success by using low-sulphur fuels, by removing the sulphur from the fuel before it is burned, or by "scrubbing" the gases in the smokestacks.

There are several methods for controlling emissions from non-ferrous smelters, where the ores may contain as much as seventy-five per cent pyrrhotite.

Scientists believe that effective controls can be applied now and that they should be. According to Hans Martin of Canada's Department of the Environment, it is "not practical to simply wait until the scientific program is complete," and Eville Gorham of the University of Minnesota says, "We already know that sulphur and nitrogen oxides are causing real damage. I think there's no doubt about that. They say we need more studies but if we wait for the last 'i' to be dotted and the last 't' to be crossed, more lakes will be lost."

The Great Lakes Agreements

In 1972 the future of the Great Lakes was hazy and dim.

That year the United States and Canada signed the Great Lakes Water Quality Agreement. The difficulties were enormous: phosphorus from laundry detergents, sewage wastes and fertilizers was feeding the algae, and in Lake Erie the spreading algae were consuming virtually all the oxygen in the bottom water in the summer and overwhelming the fish. Industrial discharges and toxic-organic contaminants from industry and from farm run-offs were affecting Lake Ontario.

The other lakes were also showing signs of deterioration.

The coordinated efforts of the two countries, supported by stringent regulations, had positive results. By the summer of 1975 the two most endangered lakes, Erie and Ontario, were showing clear signs of improvement, and Erie's swimming beaches were doing a brisk business. In 1978, when the chemical problems were more fully understood, a new Water Quality Agreement was signed calling for more precise efforts. Much remains to be done, but there are now grounds for some satisfaction. Water quality has been improved and fish resources are being restored. According to the International Joint Commission's 1980 annual report, the words "chaotic, perilous and disgraceful" that once described conditions in the lakes no longer apply.