Planned Use of Water Saves Salmon Fisheries

By JOHN STOKES
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Northern British Columbia's tremendous water supply provided by an interlacing network of streams, lakes and rivers — the source of millions of hydro-electric horsepower—is one of the country's most enticing natural resources which beckon to industrial development.

But at the same time the huge northern B.C. watershed plays a most important role in the life of the Pacific salmon fishery, one of the top and oldest established industries of the province.

And any changes in the original or normal behavior of lakes and rivers to develop hydro without corrective measures being taken may seriously threaten the existence of the salmon fishery.

Because of the conflicting nature of hydro and fisheries, government scientists and conservationists continually study all aspects of problems which might arise from proposed utilization of streams and lakes for hydro development.

In most instances, the two industries can operate side by side, if certain measures are provided.

Streams, Lakes Are Spawning Grounds

The streams and lakes provide the spawning grounds of five species of salmon. Eggs are deposited and fertilized, then buried in the gravel for protection. Once spawning is completed, the adult salmon weaken rapidly and die, but the eggs develop in the gravel and hatch out into alevins during the winter. In the spring they emerge from the gravel as fry.

The fresh water life of salmon fry varies with the species. Pink and Chum fry may only remain for a month, while Sockeye fry might not migrate to sea for three years.

Migration takes place in the spring flood water when the young salmon pass down to the ocean to start their salt water life. Their residence there terminates with maturity, when they return to the streams and lakes of their origin, spawn and die.

Meanwhile, hydro development requires dams and often diversion of an entire water system, changes which could threaten salmon races with extinction.

Damming of the Nechako River in north-central B.C. by the Aluminum Company of Canada to develop the huge power storehouse for its Kitimat smelter, promised to seriously affect the fisheries.

But the company has taken certain actions and followed recommendations suggested by the department of fisheries and the International Pacific Salmon Fisheries Commission, who together performed an extensive study of the possible effect of Alcan's project.

Nechako Dam Created Many Hazards

By damming the Nechako, which drains a big lake system into the Fraser River, and so reversing the flow of the water, the volume of water normally in the river has been reduced in stages from 40 to 95 per cent. If left alone, such diversion would create potential hazards to migrating salmon.

Temperature of the water could rise high enough to be fatal to fish en route to their spawning grounds. In addition, alteration of river channels might easily create points of difficult passage.

Even spawning grounds might be destroyed through stream-bed erosion.

To overcome certain of the hazards, Alcan agreed to make regulated releases of water into the Nechako during spawning season, and in winter to aid incubation of salmon eggs.

As a result of this and other corrective measures, the 1953 spring and sockeye salmon run spawned in the Nechako and tributaries as usual.

Pulp Mill Uses Dam Near Rupert

Near Prince Rupert, a pulp mill is utilizing a watershed of salmon spawning streams and lakes in a different manner. The Kloiyah River, 12 miles from the city, has been dammed by Columbia Cellulose Company Limited to supply water for its mill at Watson Island. Water is transported to the mill through an eight-mile long pipeline built into the base of the dam.

Erection of the dam promised a definite menace to salmon and steelhead trout, but to counteract possible loss of the fisheries the company incorporated two features into its storage dam.

A fish ladder was constructed to pass the adult fish over the dam, and a traveling screen was installed in front of the water intake of the pipeline to prevent young seaward migrants from entering and being destroyed at the mill.

To date, the fish populations of the Kloiyah watershed have not suffered adversely because of the dam, or from any of the conditions brought about by raising of water levels.

Above examples show how watersheds are being utilized successfully by both, industry and the important fisheries. But there is one other threat to water supply facing scientists and industry — pollution of spawning grounds.

So far, however, water pollution is not a serious problem in B.C., but it could be in the future. On the coast, contaminated waters are flushed into the sea and quickly dispersed by the currents and tides. In the interior, or at the head of long coastal inlets, pollution is possible through industrial development and large population increases.

There are several major sources of water pollution:

- Mine mills require water to wash ore and provide a medium for chemicals used in extraction of the metals and minerals. The waste waters are usually very silty and contain many poisonous chemicals. If such waste is returned to a salmon producing river, fish runs could be wiped out.
- Many industrial plants use highly toxic chemicals, discharge of which into rivers and streams could produce the same deleterious effects as mine waste waters.
- Sewage disposal in B.C. streams is concentrated mostly in the southern regions of the province. In many of these regions, sewage is treated before release, thereby reducing or eliminating threat of pollution.
- Forest operations could be the cause of another type of pollution, such as land erosion.

Timbered areas of the province act as a reservoir for rain water. Precipitation is not allowed to escape all at once, but passes slowly into creeks and streams. Complete removal of forests, however, would destroy the natural reservoir, allowing water to rush unchecked down mountain slopes, moving large quantities of rock and debris into streams. Banks are destroyed and what used to be a clear stream becomes a filthy, roaring current.

Solution to all these problems confronting the survival of the commercial salmon populations can be worked out, and fisheries scientists are constantly at work in the laboratories and in the field conducting experiments and collecting information.

Meanwhile, other industry is realizing that by taking advantage of such studies, full utilization of the giant water resource is made possible without disastrous results on one hand, or exclusion of development on the other.

MAJOR COPPER

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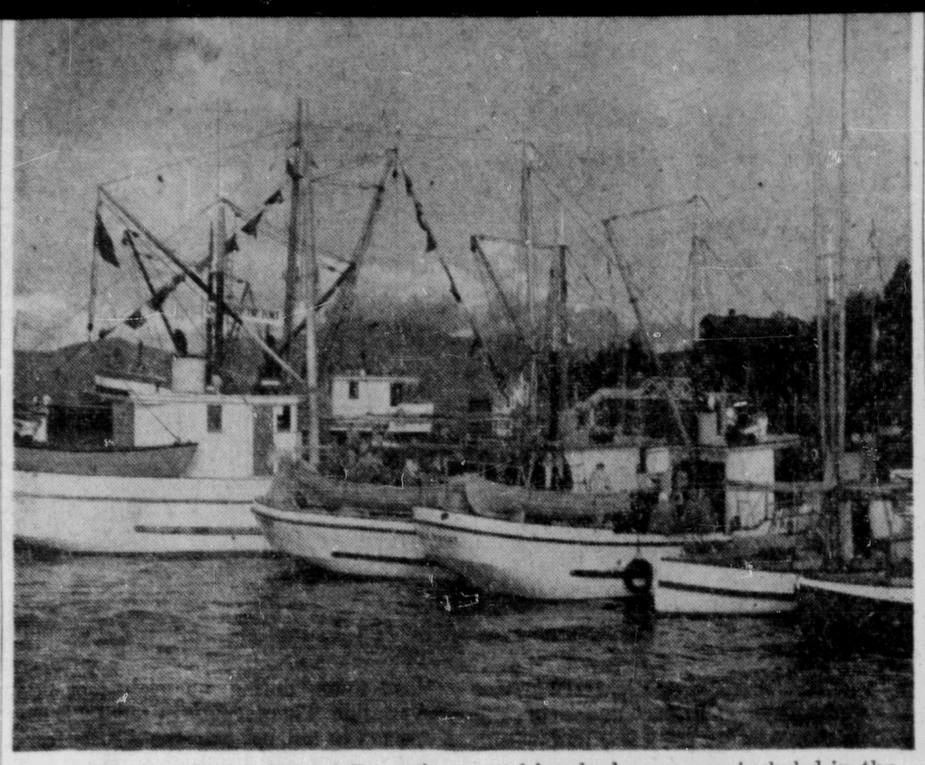
east of Prince Rupert, near the transcontinental railway line. Some 1,100 tons of perlite are quarried here annually from a deposit of almost inexhaustible reserves.

The property is operated by Western Gypsum Products of Calgary. Perlite is a mineral which expands 10 times its original volume when heated and is used in the manufacture of fireproof wallboard.

Meanwhile, an open-pit limestone quarry about 75 miles east of Prince Rupert, produces 60 tons daily. The limestone, considered of excellent quality, and in large reserve, supplies the Columbia Cellulose Co. Ltd. pulp mill.



A FEW BOATS of Prince Rupert's stately fishing fleet are seen here in harbor during an annual fishermen's celebration. The halibut fleet alone boasts over 100 big vessels, while several hundred more are included in the trolling and gillnetting fleets, representing investments totaling several million dollars. Average annual income for fishermen is more than $3,000.

Highest Production in Fishing Centred Around Prince Rupert

The northern fishing district (District No. 2) of which Prince Rupert is the centre produces more than half of the edible fish in the Pacific Northwest, according to production figures released by the department of fisheries.

Total weight of fish taken from northern waters in 1953 was 275,000,000 pounds at a landed value of $16,000,000. The last five-year average has been 270,000,000 pounds valued at $15 million annually.

Total landed value of entire British Columbia fisheries in 1953 was $31,002,000.

Salmon play the biggest part in the northern fisheries which annually supply 44 per cent of the total B.C. catch, or average 80,000,000 pounds annually at a value of $9,300,000.

While not all fish taken from northern waters are landed in Prince Rupert, this city comes in for a fair share of the profits.

HALIBUT CAPITAL

Last year's value of canned salmon, herring, shell fish, fresh and frozen fish processed in Prince Rupert and Port Edward totalled $9,500,000. This figure does not include the millions of pounds of salmon canned in plants along the Skeena River, adjacent to Prince Rupert.

In the halibut fisheries, Prince Rupert landings vastly overshadows the industry's activity anywhere else in the world. Known as the "halibut capital of the world," the city annualy takes 91 percent of the total provincial catch, or 20,000,000 pounds at a value of some $3,300,000.

This compares with 13 million pounds landed each year in Seattle, and seven million in Vancouver.

Herring represents the third main fisheries, and 34 percent of the total catch is taken each year from northern waters, representing a five-year average value of $1,800,000.

In Prince Rupert are located three big cold storage plants of which the B.C. Packers Ltd. plant is the largest in the world. Other huge plants are operated by Atlin Fisheries, a subsidiary of Canadian Fishing Co. Ltd., and the Prince Rupert Fishermen's Co-operative Association.

A smaller, but compact unit is operated by Royal Fisheries Ltd. A plant processing specialty sea-foods is operated by Bacon Fisheries.

In all, five companies operate nine canning or reduction plants in the area. On the Skeena River there are Cassiar Packing Co., North Pacific (A.B.C. Packing Co), and Sunnyside (B.C. Packers Ltd.).

At Port Edward, Nelson Bros. Fisheries Ltd. operate a large cannery and reduction plant.

In Prince Rupert, major cannery operations are carried out by Canadian Fishing Co. Ltd. at Oceanside dock, while B.C. Packers operate a smaller cannery at Seal Cove.

Other operations are located at Klemtu (J. H. Todd & Son); at Namu (B.C. Packers), and at Butedale (Canadian Fishing Co.)

BIG FISHING FLEET

Sharing principally in the $16,000,000 northern fishing industry are some 2,500 fishermen operating a fleet of boats valued at $35,000,000. Another 2,000 are employed each year as fish-workers. These include both men and women who handle and process the fish in the plants.

Although many fishermen rent company-owned boats each season, a good many own their vessels and operate fishing on a sound business basis. Some of the wealthiest residents of Prince Rupert are commercial fishermen.

The Prince Rupert Fishermen's Co-operative Association lays claim to having pioneered a campaign to raise the standards of fishermen. With a membership to date of close to 1,300 who operate a fleet of 70 halibut vessels and 150 trollers, gillnetters and seiners, the Co-op has built its own operations valued at $1,250,000.

CO-OP FLOURISHES

Co-op holdings, all owned by members, include the second largest cold storage plant in the British Empire, numerous fish collecting camps, two big fish packers, a department store and a bakery.

Capacity of the freezing plant is 120,000 pounds daily with storage facilities of 4,500,000. Ice-making capacity is 32 tons daily with storage facilities for 3,000 tons.

Other objectives at the plant located two miles from Prince Rupert city centre, includes filletting of flat-fish and halibut, mild curing and smoking of salmon, freezing and processing fresh fish, extracting liver oil and reduction of fish into vitamin A liver pills, feeding oils, milk food and fertilizers.

SIX TONS OF ICE CREAM HEADED FOR ALASKA

SEATTLE (AP) — You've heard the old wheeze about selling refrigerators to the Eskimos.

And what was there six tons of on a ship heading out of Seattle recently? Ice cream. It's going to the booming Alaska city of Anchorage.

An Alaska Steamship Co. spokesman said it is believed to be the biggest single shipment of the cold stuff to the territory.

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pect of increased trade with the Orient foreshadows the growing importance of the seaport of Prince Rupert, and, if progressive ideas and determination are still the touchstones of success, I do not think it over-optimistic to foresee the establishment of still another ocean outlet for the wealth of British Columbia's northland.

Where departments of the government can give initiative and support to the opening up of this new industrial frontier, by inviting capital investment, by guiding its application, by searching out markets for anticipated production, your elected and appointed officials are broadening the scope of their efforts accordingly.

This is part of the route-mapping of the paths of progress which will lead British Columbia and the Yukon to their long-awaited industrial boom.

The responsibility of citizens and businessmen in this region is simply stated. It is this: You can scarcely do more, but you must not do less, than follow the example set by the enterprisers whose story is told in these pages.

They have shown the way—we must now turn all our efforts in that direction—toward the goal of full economic development for the Northland Empire of British Columbia and the Yukon.

JAPANESE WANT 'REAL' TOTEM POLES FOR PARKS

Japan, which has been manufacturing imitations of British Columbia totem poles, now wants some of the real ones. Vancouver Alderman Jack Cornett, returning from a tour of Japan, said Tokyo, Osaka and Kyoto have asked for three B.C.-made totem poles for their parks.