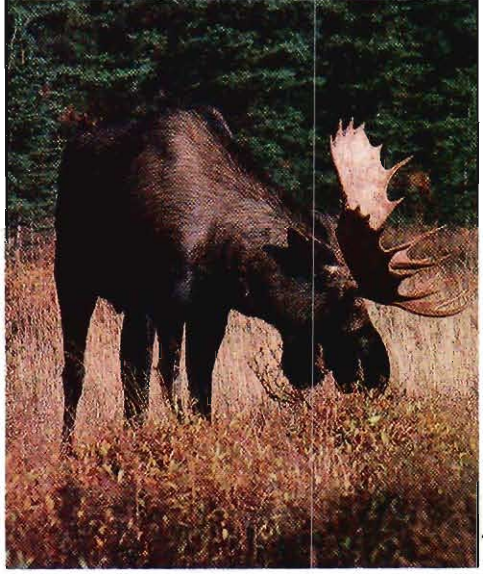


J. Hyde

Moose & Power

The effects of proposed development on Stikine River moose

by E. L. Young, R. D. Boertje, and F. L. Craighead

Alaska and Canada share a common heritage—gold rushes, oil booms, development, mineral exploration, and dependence on Pacific fisheries. In addition, the two countries share rivers which have been used as routes to interior lands. One of these rivers, the Stikine, originates in British Columbia and flows over 300 miles to empty into the Stikine Straits near Wrangell, Alaska. While this river is presently wild and unchecked for its entire length, it may one day be harnessed to provide energy for the British Columbia Hydro and Power Authority (B.C. Hydro). The Alaska portion of the river is presently unroaded, but roading along the river is a distinct possibility as well.

B.C. Hydro plans to build a series of dams on the Stikine and some of its tributaries to provide power for mining and community use. The steep rock walls of the Grand Canyon of the Stikine near Telegraph Creek appear ideal for dam construction, and it is there that the two largest dams will be constructed. Three other dams are planned for a tributary, the Iskut River. While the dams will most directly influence the resources used by Canadians living in the bush, these structures will also affect the fish and wildlife of the lower Stikine River in Alaska.

Because of public concern about damming expressed to the Alaska State Legislature, ADF&G biologists began studying the fish and wildlife resources of the Stikine basin and delta in 1982. Other agencies were concerned about the Stikine's natural resources as well. The U.S. Fish and Wildlife Service and National Marine Fisheries began research on Stikine fish and wildlife, while the U.S. Forest Service and the U.S. Geological Survey increased hydrologic data collection on the river. All of the projects were designed to assess what will happen to the natural resources of the Stikine-LeConte Wilderness if the proposed dams are built. A task force was formed that included state and federal agencies interested in the river's resources. (See *Alaska Fish Tales and Game Trails,* Fall 1983.)

While hydrologists can measure and make predictions about changes in the speed of the current, the volume of water flow, and the average river level at a given point, predicting changes in wildlife habitat and populations is much more difficult. State biologists chose moose as a study species because of its importance as a game animal and because study techniques and comparison population data have been well established in herds throughout Alaska.

To help locate the animals in the dense vegetation of southeastern Alaska, ADF&G biologists collared 24 moose in 1982 and 1983. During periods of deep snow, moose were shot with tranquilizer darts fired from a helicopter. A skilled pilot can approach to within 50 feet of the animal to be darted, and pilot Jack McKernan of Temsco Helicopters in Petersburg was adept at placing the shooter directly over the targeted moose, while at the same time avoiding tall trees and snags along the river.

U.S. Dept. of Agriculture, Forest Service

High winds and blowing snow made flying a real challenge for both the pilot and marksman.

The excitement did not end with the helicopter ride. During one capture, biologist Chuck Schwartz had some exciting moments when the drugged moose he was straddling suddenly leaped to its feet and lumbered away with Chuck as an unwilling passenger. The moose was soon slowed by deep snow and a second dose of tranquilizer put it down.

Each tranquilized moose was fitted with a radio collar that transmitted a distinctive signal. The radios were equipped with a "mortality switch" that caused a change in the signal if the animal died. Blood samples, body measurements, hair samples, and a tooth were taken from each moose. Blood analysis provided information on the condition of the moose, while hair analysis can reveal the content of trace elements, and teeth were used to learn the moose's age.

After the moose had been thoroughly measured, collared, and subjected to other indignities, it was injected with an "antagonist," or a drug to counteract the effects of the tranquilizing drug. The antagonist was injected directly into the jugular vein and the effect was dramatic in every instance. In a matter of a few minutes or less, the moose could stand and move away from the handlers. Without the antagonist, moose would be in a helpless state for a long period.

Although high winds funneling through the Stikine valley often reach gale force, biologists managed to fly the area in fixed-wing aircraft at two week intervals to locate the favorite areas of moose. Biologists used a radio receiver to locate the collared animals and noted the habitat in which the animal was found. These aerial surveys were followed by winter investigations on the ground, including snow depth surveys, moose bed counts, and track counts.

Many hunters in Alaska and probably all those in Canada have suspected that the moose killed in Alaska are merely migrants from upstream in Canada. Our study showed a resident Stikine population in Alaska of at least 300 animals. About a quarter of the tagged moose moved into nearby Alaskan drainages in the summer but returned to the Stikine to spend the winter. There was no major movement of collared moose from Alaska into Canada or from Canada to Alaska during the study.

The home ranges of cows varied widely. One cow stayed in an area of about two square miles, while the largest range exhibited by one of our collared moose was about 19 square miles. Four bulls were tagged in the study and their home range size varied from almost seven square miles to about 18 square miles. Marked moose were always found at less than 2,000′ elevation and 60 percent of the animals were found below 100′.

The study indicated that the most important moose habitat is within two miles of the Stikine River. On the Stikine, moose preferred to winter in alder-willow stands near stands of old-growth spruce. Moose sought shelter under mature spruce stands during periods of heavy rain, snow, and wind. We were impressed at the ability of moose to thrive in areas of deep snow, often in excess of six feet. Snow depth surveys showed that snow accumulation under mature spruce was less than in any other type of vegetation.

We were able to learn a lot about moose and how they use the Stikine River system, but our information must be compared with the expected changes in flow and river level that would be brought about by hydroelectric development. Hydrologists provided estimates of these changes so that we could make predictions. The effect of the dams on vegetation in the preferred moose habitat is the key to predicting the changes in moose numbers and habits.

During the winter, the most critical period for Stikine moose, our browse surveys showed that Stikine moose preferred willow and red-osier dogwood over all other food plants. Habitat with more than a fourth of the area occupied by these two plant species was favored by moose. Based on our study, the Stikine still has room for more moose and the population appears to be increasing. The moose are not using all of the available habitat and the browse is healthy and plentiful.

Cottonwood stands were also used by moose, but the use of cottonwood habitats decreased and the use of the mature spruce stands increased in late winter. This is not surprising since cottonwoods lose their leaves while spruce needles persist, intercepting snow. Many studies have shown that moose mobility is hindered by snow depths exceeding 30″, and the least snow was found under the spruce canopy.

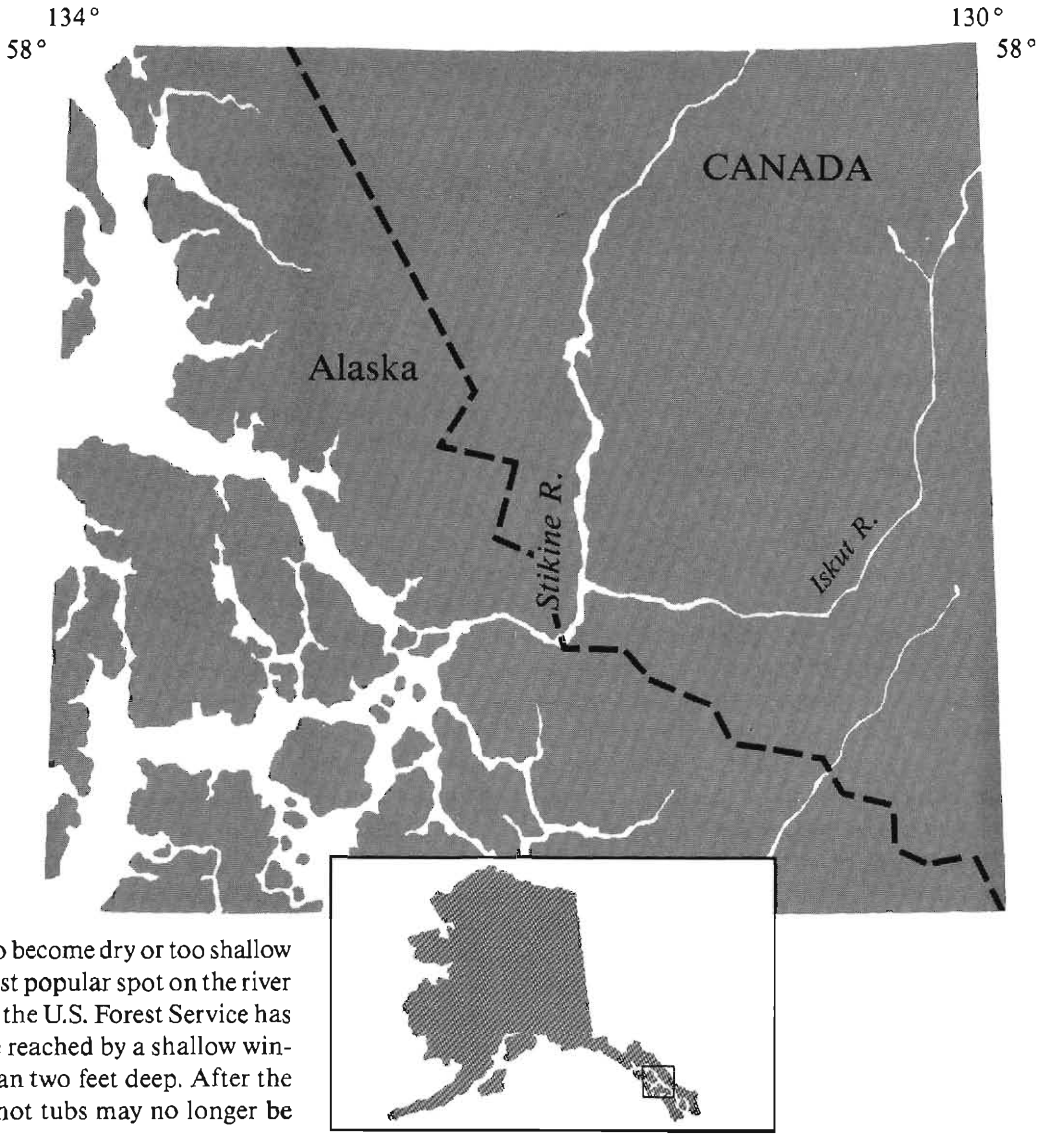
The average snow depth on the Stikine in 1982-83 (a mild winter) was 63″. The snow was usually wet and heavy and often a thick crust formed that could support moose. The crust and the spruce stands that moose use as bedding areas and travel corridors permit moose to survive on the Stikine in unfavorable winter conditions.

If the dams are built, the flow of water will change and this will, in turn, cause changes in the vegetation. Habitat on the Stikine has developed under seasonal flooding and drying of the lowland areas. Some of the area now flooded seasonally will no longer be affected because of the decreased flow. A predicted drop of 30″ in the spring river level will result in the colonization of these previously flooded areas by willow, alder, and cottonwood. These plant species will eventually be replaced by spruce as the area dries out and becomes stable.

The moose population will initially benefit from this new growth and may even increase for a time. As the stands begin to be dominated by spruce, however, the number of moose the area will support will decrease. Moose will probably increase for about 10 years; after that, the population will decline.

Some of the areas that are now good moose habitat may not be affected by the lowering of the river level. These are areas where a high water table is associated with melting glaciers and standing water from local rainfall. After the river is dammed, there may be enough moose to support hunting for years even though the habitat quality will decline, but there will not be as many moose as there are now.

Dam construction in northern climes also affects downstream river temperatures. Power is normally generated throughout the winter because it is a time of high consumer demand. During the winter, warmer water under the lake ice will pass through the generators and will cause the river to be



ice-free for some distance. As an example, the Peace River dam in British Columbia created ice-free conditions in winter for 68 miles downstream. B.C. Hydro predicts an increase in water temperatures of about 2°F on the lower Stikine. While we do not expect the open water in winter to affect moose directly, it could cause an increase in use by winter recreationists. Although the icebound river is now used only by snow machines and an occasional dog sled, an ice-free Stikine would likely attract boaters.

The effect of increased recreation and the subsequent disturbance on moose cannot be predicted, although they may move to areas farther from the river. Alternative choices for moose are limited by the narrow nature of the valley.

The Stikine has a number of sloughs and side channels that are used by hunters, canoeists, fishermen, and kayakers. The drop in water level will cause some of these to become dry or too shallow to be navigated with a skiff. The most popular spot on the river is Chief Shakes Hot Springs, where the U.S. Forest Service has installed two hot tubs. The tubs are reached by a shallow winding slough that is seldom more than two feet deep. After the dams are built, boat access to the hot tubs may no longer be possible.

Hunting camps on the lower Stikine are now dispersed because of numerous sloughs that are accessible to boats. It is likely that many of these sloughs will be inaccessible after dam construction. Camping sites would then be restricted to the bank of the main channel and to the deepest sloughs and creeks. This change in access alone will probably reduce the annual harvest of moose along the Stikine.

The sluggish economy in Canada has provided a temporary reprieve for the Stikine. B.C. Hydro recently announced that plans for the dam construction will be delayed until near the turn of the century. Much of the preliminary test drilling and modeling has been completed and the project has assumed lower priority because of more conservative energy demand forecasts associated with the slow-down of the Canadian economy.

An increase in hunting success can be expected in the first 10 years after the dams are built, but later, a steady decline in hunting success will occur. Even though the Stikine herd is small by Alaskan standards, it is the largest in southeast Alaska outside of the Yakutat area. Hunters normally take 30-40 bulls during the season with a success rate of over 20 percent, but the harvest will decrease with lower moose populations and reduced hunter access to good moose habitat.

Currently there is a move by environmentalists in Canada to place the Stikine River in a wilderness or "wild river" category to block further logging, roading, and dam construction. While the Alaska portion of the Stikine is in the Stikine-LeConte Wilderness established by the U. S. Congress, Congress reserved the option of permitting a road to be constructed up the river to provide Canada with access to the ocean.

The U.S. Forest Service has conducted public hearings to determine the demand for the road and will make a recommendation to Congress as to the need for access. Many citizens of Wrangell see the road as a way to boost the flagging economic fortunes of that community.

More attention is being given the Stikine River now than at any time since the gold rush days when it served as a transportation route to the interior of the continent. Let us hope that the planning for the great river includes consideration for the wildlife that depends on it. Otherwise, our generation may be the last to know the moose of the wild Stikine.

E. L. Young is a Game Biologist with ADF&G, Petersburg. R. D. Boertje is a Game Biologist with the department in Fairbanks, and F. L. Craighead is a former employee of ADF&G.

Alaska Fish & Game

November-December 1986 $2.00