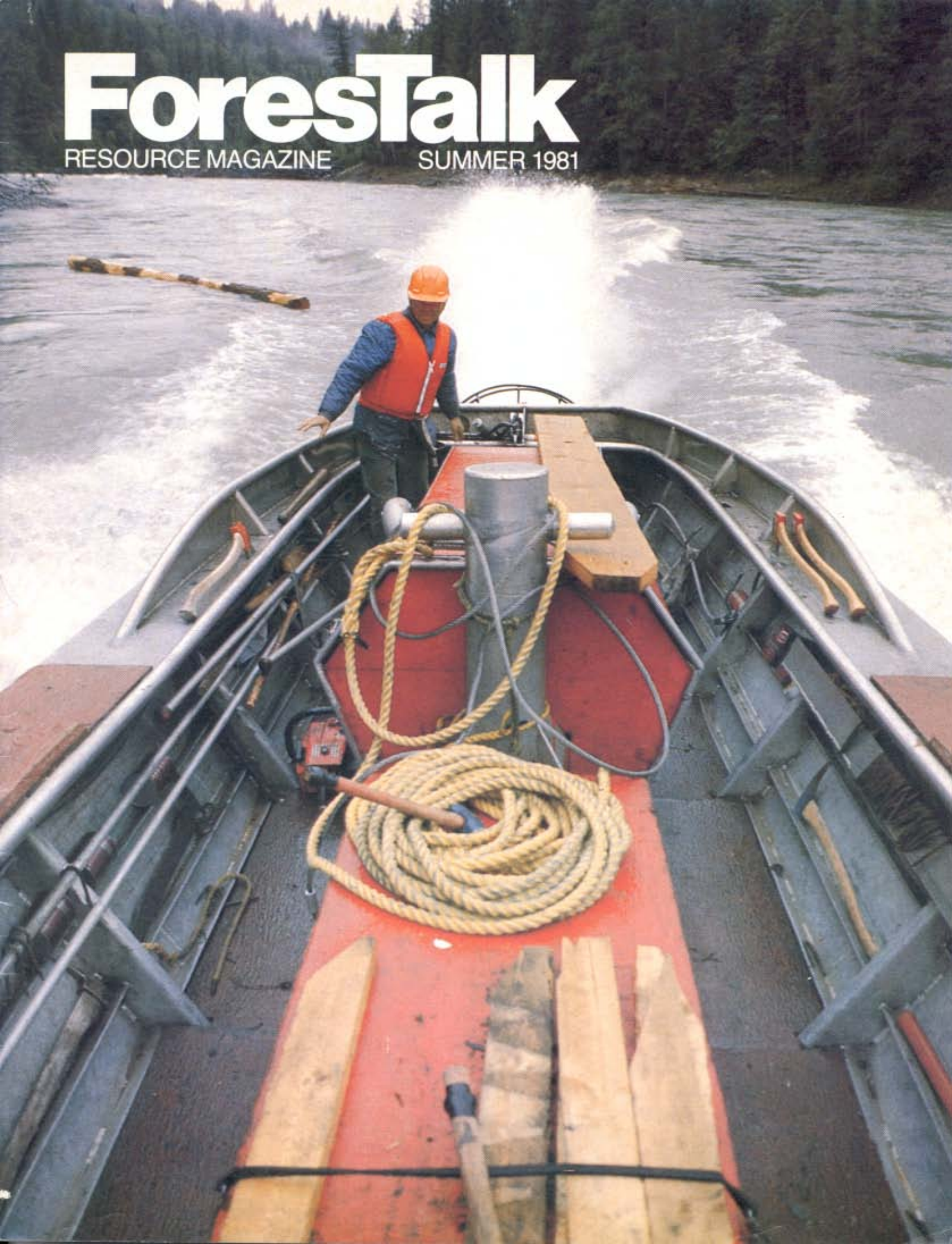
ForesTalk

RESOURCE MAGAZINE SUMMER 1981



ForesTalk

Volume 5 Number 2 Summer 1981

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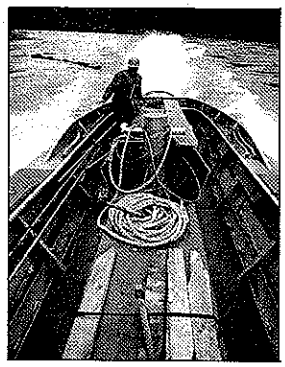

Cover Photo: The time was that when a peevee couldn't move the logs down river, a stick or two of dynamite might do the trick. But modern log drives (which just about come to an end in B.C. with this year's closing down of the Quesnel River drive) rely on high-powered jetboats to break up jams and yank logs off river banks.

This issue's cover photograph of Weldwood jetboat operator Dan Reimer racing down the Quesnel River was taken by freelance writer and photographer Doug Cowell.

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In 1980 a record 75 million seedlings were planted in B.C.; the Ministry of Forests plans to double that figure by 1986. By then the Ministry will be producing approximately 50 million container seedlings and 50 million bare root plantable seedlings annually (10 million more than present capacity). Also, today's Ministry-supported expansion of private tree nurseries in five years should yield another 50 million seedlings. Of the 150 million seedlings to be planted annually by 1986, 40 million will go to reforesting B.C.'s backlog of unrestocked forestland.

Tom Waterland

Hon. Tom Waterland, *Minister of Forests*

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Province of British Columbia Ministry of Forests

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THE GROUP DECIDES

by **Peter Grant**

First there's the obvious reason why the more than 20 members of the Spruce Lake Integrated Resource Management Planning Group drove the dusty roads into Lillooet one Saturday a month for over a year to meet in the Legion Hall basement: each came to speak up on behalf of a particular resource in Spruce Lake's value-crammed landscape. The forty-kilometre stretch of nearby Crown land known as the Spruce Lake area is unusually rich in resources which attract the attention of prospectors, loggers, ranchers and ecologists, while Spruce Lake's scenic alpine environment appeals deeply to lovers of the outdoors. But there's a less obvious reason why these people would choose to sit around a square of plywood tables on their days off: they care deeply about the way the Spruce Lake area will be developed.

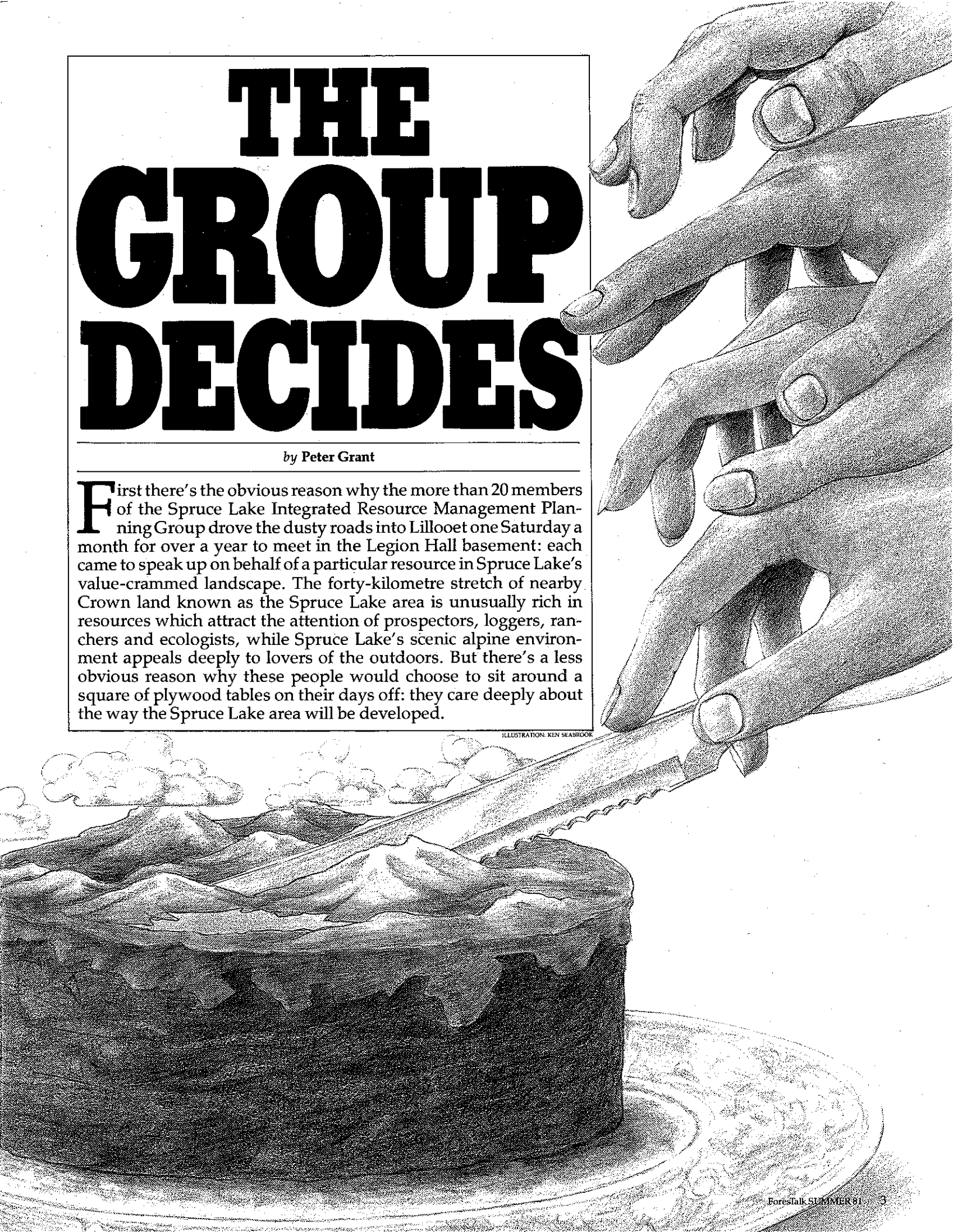


ILLUSTRATION: KEN SEABROOK

Lillooet sits on the banks of the grey-brown Fraser River 320 kilometres upstream from Vancouver — a drybelt town like Kamloops, overshadowed by the rugged eastern edge of the Coast Mountains. To get to the edge of the Spruce Lake area you have to drive another 95 kilometres west on the winding Bridge River road. The snow-capped peaks circling the head of the Bridge River Valley give the country a flavour of Switzerland. Just short of the village of Gold Bridge you turn onto the bumpy road up Tyaughton Creek. Then you walk (or rent some horses and ride) into a dazzling alpine landscape. Standing on a 2500-metre-high ridge in the middle of the planning area gives you the impression of being at the exact edge of the Coast Mountains; on one side the peaks are dark and jagged, but to the north the Chilcotin mountains roll away in gentle red-tinged slopes. So with the vegetation: dark green spruce-balsam forests grow on the shadowed south slopes of Gun and Tyaughton Creeks, but grasslands stretch up the sun-drenched south-facing slopes — at some points almost to 3000 metres, higher than almost anywhere else in B.C. Elsewhere in this varied landscape are clusters of U-shaped alpine valleys that support a profusion of wildlife — everything from rare California bighorn sheep and grizzly bear down to grouse and a summertime profusion of wildflowers and songbirds. The whole area is criss-crossed with horse trails, some originally used by the Chilcotin Indians on raiding or trading missions to as far away as the Pemberton valley.

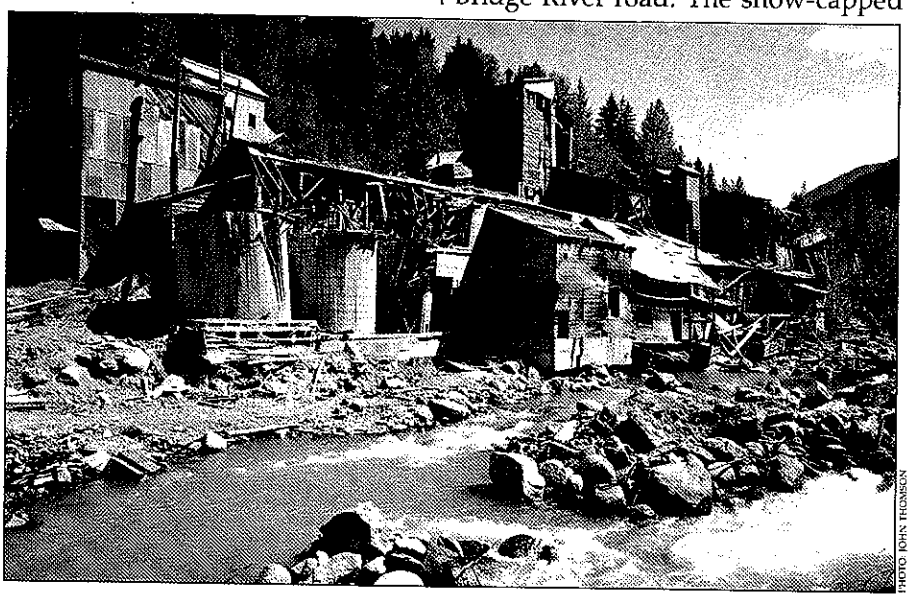
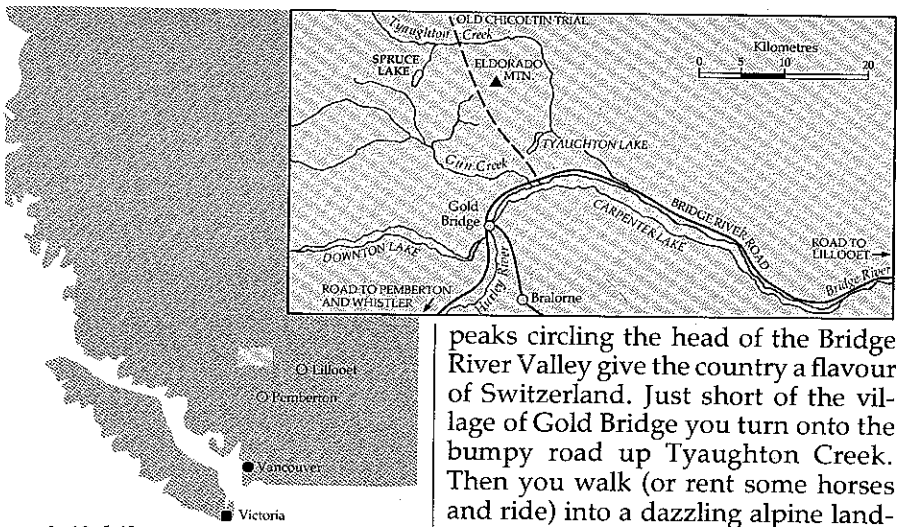


PHOTO: JOHN THOMSON



***A 40-kilometre stretch of Crown land rich in both beauty and natural resources, the Spruce Lake area begins some 95 kilometres west of Lillooet* (map above). *The area's geography includes green spruce-balsam forests and broad expanses of grasslands, and its alpine valleys support a profusion of wildlife. This mineral-rich region experienced a flurry of mining activity in the 1920s and 1930s, with nearby Bralorne – now a virtual ghost town – supporting up to 6,000 people with its two gold mines, Lorne and Pioneer* (top).**

So it's not surprising that the Spruce Lake vicinity was studied as a potential Class A provincial park in the early 1970s, when it was known as the Charlie Cunningham Wilderness Proposal Area. A Parks Branch report described the uplands around the lake as "a superb setting for backcountry hiking and horseback riding" within easy reach of the lower mainland population. But it never became a park. Why? Call it a joke of nature; the land around Spruce Lake is almost certainly rich in minerals — gold, silver, copper, molybdenum and several others — a potential that might make it well worth the trouble of digging big unpark-like holes in the ground.

In the 1920s and 1930s, during the heyday of the two large gold mines in nearby Bralorne, hundreds of claims were staked around the creek beds of the Spruce Lake area. But these claims proved to be uneconomic to develop, and prospecting all but stopped for three decades. Recreational use in the area continued, however, and later several horsepacking outfitters and guides started catering to an international hunting and touring trade. In the last few years the pressures from different users has mounted rapidly: Wilderness travel has become popular with city-dwellers and is becoming an industry unto itself; cattlemen from the Gang and Empire Valley ranches have started grazing their stock in the grasslands near Spruce Lake, as other ranches had done in the 1930s; the skyrocketing value of metals has brought prospectors back, now equipped with Cats and choppers; and the area's major forest firm, Evans Products of Canada, recently added a veneer plant to its Lillooet mill. Spruce Lake country forms part of the Ministry of Forests Lillooet Timber Supply Area (TSA), and as the TSA report published last January points out, every accessible tree in the area is valuable; there is no surplus of merchantable timber. This is especially evident since the mountain pine

beetle started turning forested slopes red with dead trees all over the Bridge River Valley.

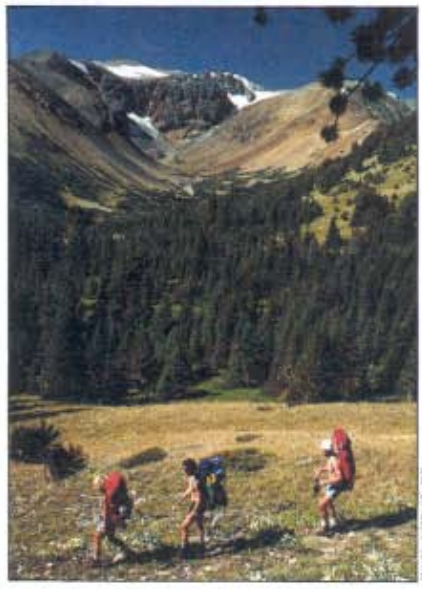
Collisions between timber interests, recreation seekers, mining prospectors and cattle ranchers aren't peculiar to this isolated stretch of country, and throughout the province Ministry of Forests regional offices have been setting up public advisory bodies to help resolve competing land-use claims. Today some 15 locally-started committees are promoting dialogue among government agencies, industries and public interest groups.

The first moves to start a Spruce Lake planning committee followed hard on Evans Products' decision to upgrade its Lillooet mill. "We needed to get a planning process going," recalls Ministry of Forests range officer Jim White. "If the timber around Spruce Lake was to be committed for logging without considering the needs of recreation, we'd end up in a running fight between the recreationists and the loggers — one of those fights where everyone loses." White shared responsibility for managing the area with several other Ministry of Forests people, including Kamloops Forest Region planning officer Dene Ferguson who is now chairman of the Spruce Lake planning team.

Around the same time a long-time resident of the Spruce Lake area, Sally Garrard, had a conversation with Evans Products chief forester Gerry Bierman in which she expressed the feeling that "we should be joining forces. There are a lot of resources coming out of here, but nothing is being spent on things like reforestation." A public meeting called by the Ministry of Forests in Lillooet in March 1980 led to the establishment of the planning team; the first meeting's chairman was Ministry of Forests public involvement consultant Bruce Fraser.

In the words of the planning team's first statement, its goal was to "develop an integrated resource management plan . . . which preserves the rights of individuals and companies to log, mine, graze cattle, recreate, etcetera . . ."

The recreational interests had an ally with political savvy in Sally Garrard, who is the Bridge River valley's director for the Squamish-Lillooet Regional District. Her husband, Pat, is also a committee member, representing big-game hunting around



Spruce Lake **(top)** *sits at the centre of both a park-like setting and a year-long discussion on how to best use the many resources the area provides. One of the region's many attributes is its superb setting as a backcountry hiking area* **(above)** *within relatively easy reach of the lower mainland population.*

PHOTO: JIM WHITE

PHOTO: PETER OLIVER

As part of its commitment to public involvement in land management, the Ministry of Forests set up a special planning group to work out a development strategy for the Spruce Lake area. The group's membership included various government resource managers, ranchers, recreationists, forest industry representatives, guides, mining contractors and concerned members of the public. Sally Garrard **(above; arm raised)**, *a director for the Squamish-Lillooet Regional District, was a strong spokesperson for recreation interests such as horseback riding* **(top)** *along the area's historic trails. Husband Pat Garrard* **(on Sally's left)** *represented the interests of big-game hunting.*

Spruce Lake (he holds the guiding licence for the area). In Sally Garrard's view, "there's a place for logging in the Spruce Lake plan area, and a place for mining and a place for recreation. We all want to exploit it — but recreation isn't going to have that much environmental impact." The main aim of the recreationists has been to keep the most scenic and wildlife-rich parts of Spruce Lake roadless, what John Philip of the Southern Chilcotin Mountains Coalition calls a "wilderness core." Says Sally Garrard: "We're willing to make trade-offs. We'll trade much of what the mining and logging interests want for what we want desperately."

On the logging side, Gerry Bierman of Evans Products admits that "we have different views of how tomorrow should look." Bierman isn't happy at possible restrictions on logging in the Spruce Lake area: "I always get upset when restrictions are placed because we're talking about people's bread and butter." But he found the committee's work "very educational — the exchange of ideas is good for providing a long-term perspective. We have to try to live with one another."

The mining industry seemed less inclined to play a role on the committee. There may be dozens of companies financing the current rash of exploration around Spruce Lake and neighbouring Taseko Lake, but no head office answered the invitation to participate. However, Lillooet mining contractors Bill Cook and the late Paul Polischuk represented the local end of the mining industry on the committee, arguing strongly against restrictive regulations on exploration practices while recognizing the importance of other resource values. The ranching industry's proponent, Tom Hook of the Empire Valley ranch, supported intensive resource management of the area to maintain a "four-way balance" of recreation, timber, mining and ranching, so that "nobody gets blocked out."

Eight of the planning team's 25 members came from five different government resource management departments. Lillooet Ministry of Forests district manager Bill Petty was concerned with maintaining timber supply *and* his district's range and recreation values at the same time; Fish and Wildlife representative Phil Holman and Parks and Outdoor Recreation Division spokesman Bob Scheer spoke strongly for environmental protection and recreational planning.

A wide spread of opinion emerged from the nine Bridge River Valley residents who asked for seats on the planning team. Scott Mackenzie, a homesteader and logging contractor, confesses that he found it hard to decide where his interest lay along the development-environmental protection spectrum. But Susan Anderson of Gold Bridge had a definite interest to get across — maintaining the valley's long-term economic base. Like Sally Garrard, Anderson argued for controlled development to ensure the maximum return of employment and tax benefits from logging, mining, ranching and recreation.

It's not surprising that the interplay of these views resulted in a set of compromise solutions to the three main issues the planning team grappled with: how to manage the grasslands both for grazing and as a thoroughfare for hikers and horsepackers; how to log the timber without losing the scenic charm of some high spots; and how to develop the area's timber and mineral potential without disrupting the area's distinctive wildlife and without causing an unmanageable influx of weekend nature-lovers.

Answers to the first two problems were straightforward. The key to the grasslands issue was not to exclude either hikers or cattle, but to provide sound management for both: for example, by controlling the use of trails by hikers and by providing campsites that channel people around high-use rangeland. (The planning team also supported a request to es-

tablish a 250-hectare ecological reserve to keep these unique grassland ecosystems for scientific study.) Scenery lovers and loggers were able to find a point of compromise through a provision in the timber management proposal whereby a landscape architect such as Peter Rennie, the Kamloops forest region's landscape assistant, will help design less unsightly looking logging shows.

Roads were a much bigger bone of contention between timbermen and recreationists. One bumpy mining road dating from the 1960s already allows four-wheel trucks into the alpine meadows, and tire tracks are starting to show up in the fragile alpine vegetation. More roads, whether for logging or prospecting, will mean the gradual erosion of Spruce Lake's wilderness character and a likely decline in wildlife populations.

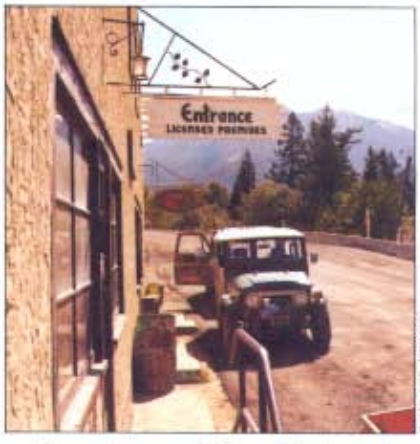
To better study this issue, the planning team divided the area under study into compartments characterized by distinct environmental features. Surprisingly, it found that only 30 percent of the timber is on land that would suffer seriously from road development. To safeguard this territory — at least for the time being — the planning team agreed that any decisions on road development should be delayed for 20 years.

"You could say we're borrowing time," says Kamloops Regional Manager Tony Robinson, to whom the committee reports. "We need more public understanding of the issues before we decide on logging or recreational uses. Ten years or so down the track we'll take another look." In the meantime, no final decision will be made on whether the Spruce Lake planning area should be managed primarily for timber, mining or wilderness values.

There's always a possibility that a full scale mine could be located near Spruce Lake, but for the moment the planning team can only comment on the effects of exploratory work by mining interests. This work includes building roads into claims and digging long lines of trenches. One such trenching line already graces the alpine reaches near Spruce Lake. "If there's a large proven ore reserve," says Sally Garrard, "no one expects to hold back a major mining development. But we want to hold back road-building for preliminary exploration."

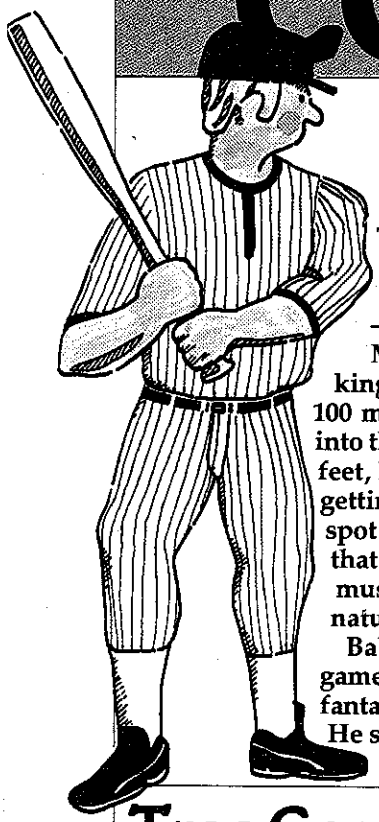
After the Spruce Lake integrated resource management plan has gone the rounds of getting approved and ratified, what next? The responsible government agencies will then have the job of making sure the Spruce Lake area is managed according to the high standards set by the planning team, and the planning team will meet annually to review what's gone on. But there are doubts about the security of the plan given the rapidly intensifying competition for B.C.'s resources.

Sally Garrard sums it up this way: "If the government stands by our plan, then we've worked out a practical, sensible way of making decisions." To Ministry of Forests range officer Jim White, the essence of the whole process is interagency cooperation in conjunction with public involvement. Says White: "It's important that we make the cooperative approach work so that all users will get benefits from the area, and no single user will be allowed to destroy, by his activities, other important resource values. Otherwise we'll return to the old practice of each resource agency making its own decisions independently — a sure way to produce conflicts between resource users."



The mining and forest industries already have designs on the Spruce Lake area, but the tourist industry is putting in its claim as well. The snow-capped peaks which circle the region and give the country a flavour of Switzerland **(top)** *are a sight that so far has been viewed by few British Columbians. Business at the Mines Hotel in Bralorne* **(above)** *is picking up these days as this forgotten mining town slowly takes on a new life as a supply and accommodation centre for outdoor recreationists.*

COLLECTIONS



Good Wood

Take a split or a square of ash, rough out a bottle shape, then turn it on a lathe and polish it up so it fits nicely in your hands. You now have a major league baseball bat — if it makes the grade.

Most of baseball's superstars have been home run kings, hitting a baseball hurled their way (at speeds over 100 miles an hour) so hard that it travels hundreds of feet into the stands or out of the park (the unofficial record is 602 feet, held by Babe Ruth). How do they do it? It's a matter of getting "good wood" on the ball, of hitting it on an exact spot on the barrel of the bat, called the centre of percussion, that packs extra punch. From that point on the batter's muscle and the bat's design make the most of ashwood's natural springiness.

Babe Ruth, master of the home run, used several bats in a game; hundreds in his career. He experimented with a fantastic variety of bat sizes, even the unwieldy 54-ouncer. He settled down to a light 36-ounce bat and started a revolution in hitting style — going for the home run.

FIRE STARTERS

The hot, dry valleys of B.C.'s southern interior are the most fire-prone regions in the province. Of the province's 88 fire zones, the Okanagan valley has the most lively fire record of them all, averaging 19 fires per thousand hectares annually.

Three-quarters of these fires are caused by human carelessness, with smokers, campers and children playing with matches leading the list of culprits. Lightning is a major cause of forest fires in the more remote parts of the southern interior, and lightning strikes are especially common along the western edge of the Purcell Mountains. This one area alone has seen most of the 10,000 lightning-caused forest fires that have occurred in B.C. over the past decade.

Tree Gardens

Even if you can't get out to the forests, B.C. has some woods you can stroll through that are definitely out of the ordinary. Our larger cities are home to various arboreta, or tree gardens, some planted with dozens of exotic trees (species from outside the province, often from other continents).

The Botanical Gardens at the University of British Columbia devote more than a quarter of their 44 hectares to trees and shrubs brought in from Asia. The Asian garden probably is better known than the university's original arboretum, which was started by a botanist named Davidson and planted according to the evolutionary sequence of tree species. Davidson also set up an arboretum on the grounds of what is now the Riverview psychiatric centre in Coquitlam.

Also in the Vancouver area is Queen Elizabeth Park, just a few minutes drive from downtown. In White Rock a naturalist's society recently completed an arboretum in Redwood Park that has conifers from all over North America, including California redwoods.

Visitors to Vancouver Island need no introduction to the Butchart Gardens near Victoria, which has a large collection of exotic species from Asia and Europe. Less well-known are the tree gardens of some of Victoria's original estates — notably Hatley Park (now Royal Roads military college) and Government House, residence of the province's Lieutenant Governor.

The MacMillan Bloedel pulp mill site at Harmac near Nanaimo is an unlikely spot for a park, but since company founder H.R. Macmillan started a 2.5 hectare arboretum there in 1956, it has expanded to include samples of every coniferous species in Canada.

THE Devil, YOU SAY

The following tale from the Quebec north woods has appeared in various forms. This version was told to J.F. Bass by the great grandson of an early Quebec *bucheron.*

Paul Bunyan was really Canadian; French-Canadian, to be exact. He worked for a while in the logging camps of northern Quebec, and it was here that he became mixed up with the devil's *chasse galere*.

The incident started when Paul and some of his friends wanted to go home for Christmas, but couldn't walk out of the logging camp because of the unusually deep snow. Paul just had to see his girl, so he made a deal with the devil: Satan would whisk the loggers home in a flying lumberman's boat or *chasse galere*; in return the loggers would give the devil their souls.

After the deal was made and the boys had enjoyed their holidays, they were none too anxious to carry out their end of the bargain. They turned to Paul for an answer, which he found by sudden inspiration on the flight back to camp. As Paul was steering the devil's magical craft he managed to have it touch the top of the parish church. This had the desired effect of dislodging the influence of the devil, and the *chasse galere* fell gently to earth. Paul had outsmarted the devil and the loggers kept their souls.

Soon every man in the woods of northern Quebec had at least one friend who had made the journey on the *chasse galere*.

The Public Archives of Canada C 17928

PRIEST of NATURE

"Most of the miracles we hear of are infinitely less wonderful than the commonest of natural phenomena, when fairly seen." — John Muir

When the Scottish-born John Muir (1838-1914) first visited California in 1868 he began a career as a priest of nature's wonders, and his preaching is still attracting followers. A slight, bearded man, who was (in his own words) "at best desperately bashful and shy," Muir virtually discovered California's Sierra Nevada mountains. This range is higher than the Rockies and runs parallel to the Pacific coast about 200 kilometres inland from San Francisco. Muir hiked all through the mountains, pioneering the study of their glaciers and spreading the news about Yosemite Valley's gushing waterfalls and dome-like peaks.

After successfully lobbying for the establishment of Yosemite National Park in 1890, Muir joined forces with other conservationists to found the Sierra Club, a wilderness preservation group that now boasts some 150,000 members in the United States and Canada. The Sierra Club's persistence is credited in the U.S. with the creation of the National Parks Service and the National Forest Service, as well as with the creation of the Olympic and Redwood National Parks.

Muir Woods National Monument, a stand of huge redwoods in a deep valley north of San Francisco, honours the name of this priest of the wilderness, as does the Muir glacier in Alaska which he discovered on one of his many wilderness excursions. His published books include *The Mountains of California* (1894) and *John of the Mountains* (1938), in which his journals appear.

Muir had little tolerance for anyone who didn't share his wonder at natural beauty. "It seems strange that visitors to Yosemite should be so little influenced by its novel grandeur, as if their eyes were bandaged and their ears stopped. Most of those I saw yesterday were looking down as if wholly unconscious of anything going on about them, while the sublime rocks were trembling with the tones of the mighty chanting congregation of waters gathered from all the mountains round about, making music that might draw angels out of heaven."

An Idea Whose Time Is Coming

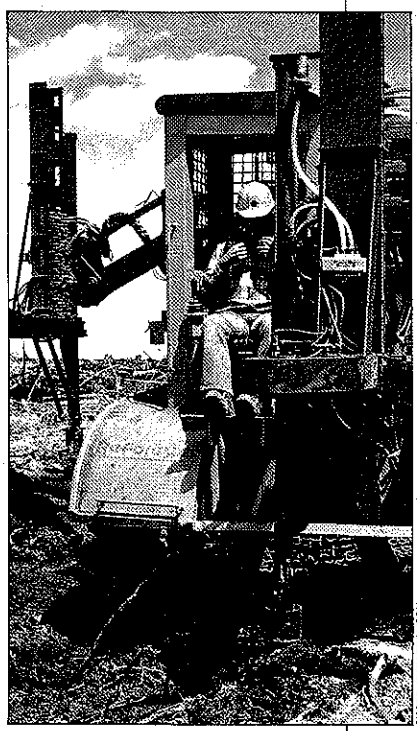


PHOTO: JOHN THOMSON

Tree planting is laborious and time-consuming manual labour, so it is only to be expected that someone should finally come up with a treeplanting machine.

Since 1950 University of British Columbia forestry professor Jack Walters has been working on a machine that injects the ground with "bullets" containing rooted seedlings. Starting out with a hand-held planting "gun," Walters' test designs have progressed to today's tractor-mounted model. His ReForester is a converted military carrier with three planting guns mounted on the back. The bullets are strong enough to be driven into hard ground, yet allow for the seedlings' roots to develop.

Preliminary tests of the ReForester indicate that the machine has the ability to operate on slopes with grades as steep as 30 percent, that it can traverse logging debris typical of logged areas in the north central interior, and that it can simultaneously plant three rows of seedlings at a rate of 20,000 per eight-hour day. Needless to say, the machine has caught the eye of anyone involved in treeplanting.

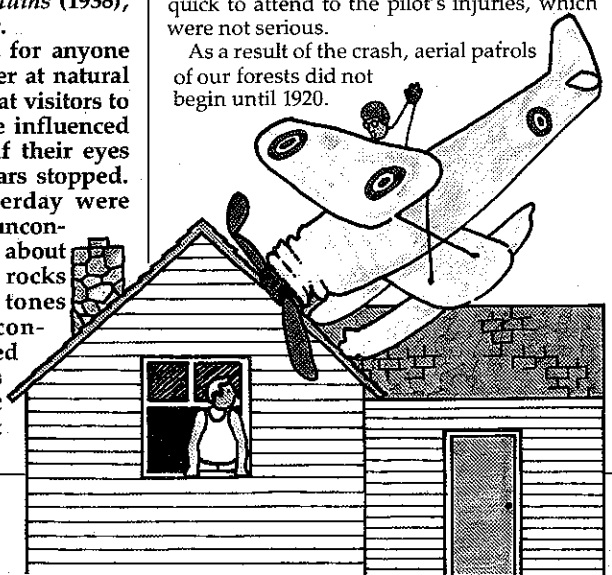
What Goes Up...

In 1918 the British Columbia Forest Branch commissioned the Hoffar Brothers firm of Vancouver to construct a flying boat to be used for patrolling the coastal forests. Designed by the Curtiss Aircraft Company, the plane was built for $8,000.

On September 4 of that year the machine was taken up for flight trials by Lieut. V.A. Bishop, a Vancouver resident on leave from his duties as flight instructor at an R.A.F. base in Southampton, England. Bishop flew over Burrard Inlet for half an hour until, much to the horror of the thousands of spectators, the engine suddenly stopped and the craft plunged to the ground from a height of 1500 feet.

Lieut. Bishop had the relative good fortune to crash into a house in the West End. The roof cushioned the force of the impact and the owner of the house, a Dr. J.C. Farish, was quick to attend to the pilot's injuries, which were not serious.

As a result of the crash, aerial patrols of our forests did not begin until 1920.



AN IPIL A DAY

A tropical South American tree called Ipil-Ipil (pronounced EE-pul-EE-pul) is probably the fastest-growing plant in the western hemisphere; it shoots up about 25 times faster than anything growing in B.C.'s coastal rainforest. The Ipil-Ipil is also resistant to drought. These characteristics explain why it is starting to be grown for fuel in countries in need of inexpensive renewable energy.

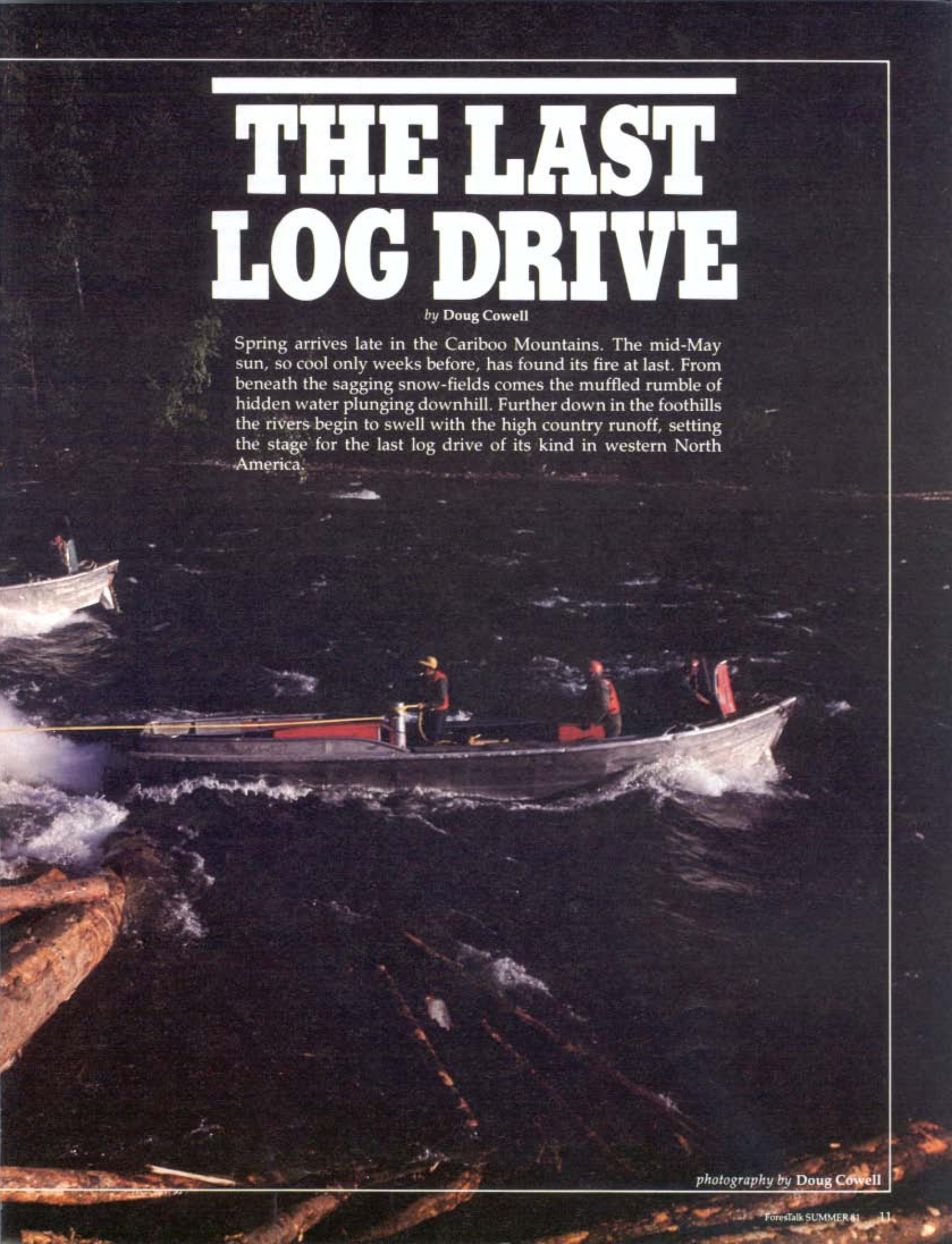
A retired B.C. forester, George Minns, has been working to get Ipil-Ipil plantations established in a dozen third world countries, such as the plantation in the Philippines that supplies Japan's Kawasaki Corporation with charcoal for its steel mills. In less than three years a planted hectare can produce 150 cubic metres of Ipil-Ipil, and the whole tree can then be harvested and used for fuel.

Do you know any interesting facts about forests? Mail submissions to: ForesTalk — Collections, Information Services Branch, Ministry of Forests, 1450 Government St., Victoria, B.C. V8W 3E7. Information should be brief, accurate, and sources included where possible.

THE LAST LOG DRIVE

by **Doug Cowell**

Spring arrives late in the Cariboo Mountains. The mid-May sun, so cool only weeks before, has found its fire at last. From beneath the sagging snow-fields comes the muffled rumble of hidden water plunging downhill. Further down in the foothills the rivers begin to swell with the high country runoff, setting the stage for the last log drive of its kind in western North America.



photography by **Doug Cowell**

Since 1963 about ten percent of all logs arriving each year at the Weldwood sawmill in Quesnel have come down the Quesnel River **(below)**. *These are logs that every winter are stockpiled along the banks of the Cariboo River and are dumped into the Cariboo-Quesnel river system once the rivers rise in the spring.*

Guiding the logs on their journey are experienced jetboat operators, like the crews **(pages 10-11)** *working on a tangle of logs at Murderer's Gulch on the Cariboo.*

On the Cariboo River, and further downstream on the Quesnel River, men in long, narrow jetboats are hard at work laying out booms — long floating lines of logs chained end to end. Anchored onshore at one end, the booms trail off downstream in graceful sweeping curves, protecting sidechannels, gravel bars and river banks from the mass of logs soon to be streaming downriver on their way to the mill.

The logs that Weldwood of Canada harvested during the past year in the upper Cariboo and Quesnel river drainages are stockpiled along the banks of the Cariboo to await the spring floods. When the water level is high enough they will be dumped into the river to begin their 112-kilometre trip (70 miles) down the Cariboo to the Quesnel River, on to the Fraser, and then to the Weldwood mill at Quesnel.

Log drives are as old as logging, an historical free ride. When Europeans first began taking spar timbers from the east coast forests of North America, they used rivers to get the logs to salt water. As population and industry spread across the country, so did log drives.

Old time loggers, the famous shantymen, trudged off to the forests each winter, stacking their logs along the river banks. River drivers stayed behind in spring to run the logs down to the mills and shipping yards. Legends abound of their daring and skill at breaking jams and dancing, pike-pole in hand, over floating logs.

As the timber adjacent to free-running rivers was cut down, and as increasing population produced competition for river use, log drives gradually died out. A few pulpwood log drives in eastern Canada are still around, but when the final log was ushered into the Quesnel mill catchment pond this past May, the last big timber, fast-water drive — once so characteristic of Western Canadian log drives — had come to an end.

Weldwood employs about 700 people in their plywood plant and sawmill at Quesnel, producing 70 million board feet of lumber and 220 million square feet of plywood sheathing and veneer annually. Their harvest is made up of spruce and Douglas fir, and about ten percent of the annual cut used to come down the Quesnel.

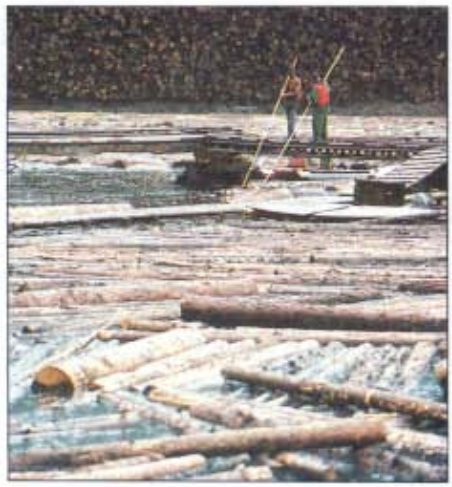
The company began driving logs in 1958 on a wide, slow-moving 72-kilometre stretch of the Fraser River, an easy section to run logs through. This drive still goes on each year, carrying almost 15 percent of Weldwood's yearly harvest to its Quesnel mill.

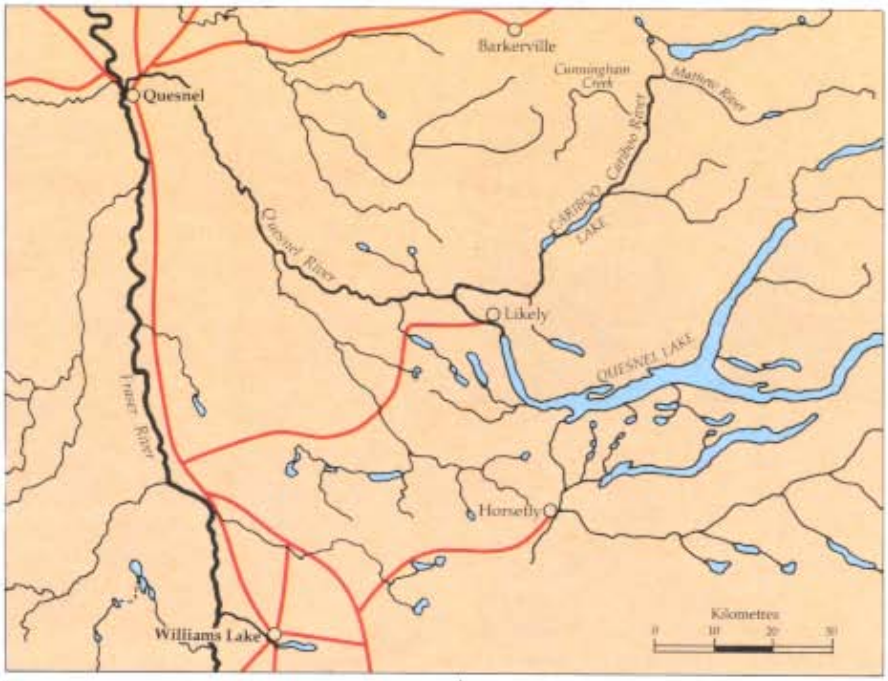
One of the river crew remembers the early, rather relaxed methods of driving the Fraser and dealing with logs that had washed up on islands in the river. "Two men would be dropped off on an island in the morning and, using peevees, they would roll all the beached logs into the river. When the first island was cleaned they would stick their peevees in their belts, hang their boots around their necks and swim to the next island.

They worked that way all day until the tender boat picked them up at quitting time."

In 1963, when the company decided to set up a second drive on the Quesnel River and its tributary the Cariboo, all that changed. The Quesnel is a wild river, the wildest ever driven in B.C. It runs through two raging canyons and over countless sets of rapids. To navigate these waterways new, more powerful boats had to be found. Once Weldwood acquired six 10-metre flat-bottomed aluminum jetboats, these became the key to the Quesnel log drive. Heavy and powerful enough to break up jams and yank logs off the bank, they can skim up the winding river at 55 kilometres an hour, drawing barely 15 centimetres of water when they are really moving.

As most of the work on the drive is done from these boats, to be a river driver is to be a boatman. The 14 men on the Quesnel drive, the last river crew in the west, are old hands at the job. Some of them began on the original Fraser drive; even the so-called rookies have three or four years experience. Their intimate knowledge of the river and teamwork is what makes the whole operation work. In the future they will still get to drive the Fraser (which they always did each year prior to heading over to the Quesnel), but this spring was the last time they had a chance to show what they could do with the Quesnel River's raging canyons and white water rapids.





Assembling from their winter jobs, they begin work as soon as the ice is gone from the rivers. The jetboats, freshly overhauled, are taken out of storage; debris is cleaned out of the river; finbooms are set. All is made ready for the day when spring floods finally raise the water to an acceptable level as set by the federal Department of Fisheries and Oceans.

The Quesnel is a salmon river. Each year a large run of sockeye salmon passes through it on the way to the Horsefly River to spawn. The offspring then spend a year in Quesnel Lake before heading back to the Pacific. Chinooks also pass through Quesnel River on the way to the upper Cariboo, and chinooks and pinks spawn in the Quesnel itself. The drive is timed so that young sockeye migrating to the ocean have left the river before the logs are dumped into it; the log drive has to be over before the adult salmon start their swim up the river from the ocean to spawn. That leaves a three-week interval in which the company has to get its logs down the river.

Floyd Houston is the general foreman on the log drive, and for those three weeks he is a whirlwind of activity. "You've got to have crews, boats, cranes, everything in the right place at the right time. Everything over the full 112 kilometres of river has to be coordinated so that all the logs get to the mill. But you can't have so many moving at one time that the boys at the mill catchment pond are overloaded."

River chargehand Ron Wilkins explains some of the appeal of the job one morning as he and his partner Dan Reimer ready their boat for work one last time: "There's no job like

The 112-kilometre trip from the headwaters of the Cariboo and Quesnel rivers **(map above)** *to Weldwood's sawmill at Quesnel on the Fraser River covers some of the roughest water in B.C. ever to carry logs. At journey's end the logs wind up at the sawmill catchment pond where they are maneuvered into position with pike poles* **(top right)** *to be picked up by cranes and stored by the water's edge* **(top left).**

Jetboat operator Ron Wilkins (above) works on a finboom, a long, floating line of logs with one end anchored onshore. Finbooms protect sidechannels, gravel bars and river banks from the full force of the logs as they head downriver. The Quesnel is a salmon river, and there is a bare three-week interval between outward and inward salmon migrations in which to get the logs moved. That three-week period is established by the federal department of Fisheries and Oceans. Critics of the log drive claim it has damaged fish habitat and lowered fish population levels in the river.

river driving. It gets in a man's blood. You're out there on the river and there's no one telling you how to do your job. Every day is different; you never know what's happening next. Sometimes you're cold and working in the rain and the next day you're working with your shirt off."

The boat engine coughs to life. Wilkens and Reimer guide it into the current and are off for a day on the river. First they check their section for trouble spots and then tend to their finbooms. Logs and debris can damage the booms, and if enough of it piles up the entire boom can be ripped away. With the booms in shape they shoot down river to a jam piling up on an island. Wilkens rams the boat into the midst of the logs. Then Reimer, leaning over the side, drives a seven kilogram hook called a dog into the closest log. Wilkens flips on the thrust reverser and backs the log out into the current.

They go back again and again, taking out one or two logs at a time, tearing a hole in the side of the jam. When a log gets stubborn they hook onto it with a steel-cable choker tied to a 25-millimetre thick polypropylene rope. When 3000 kilograms of boat driven by a 400 horsepower jet hits the end of 30 metres of slack line, logs fly. Soon hundreds of logs are calving off at a time, herded into the mainstream by the jetboat.

The crew know the river's every gravel bar, every hidden rock. Each landmark has a name: the Lower Canyon, Murderer's Gulch, Big Hats; and each has its own tale.

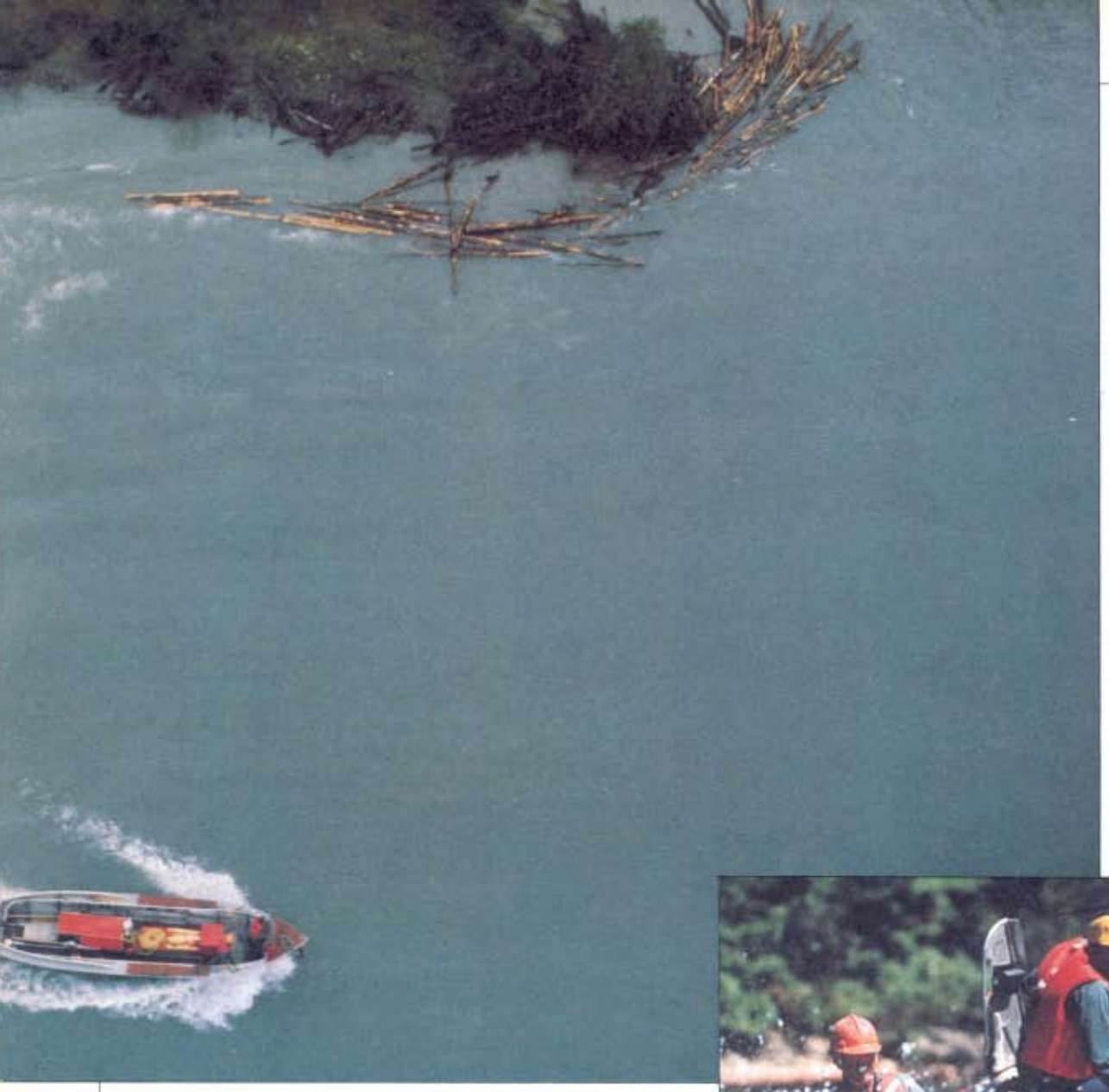
Wilkins ties up at one of his favorite lunch spots, sheltered under a big fir tree. Sitting around a fire after lunch and cradling a steaming mug of coffee in his hand, he tells of the potential dangers involved in his work: "Sometimes an outsider just sees the fun part of this job and doesn't realize the risks involved. In the early days we didn't know how to use the boats as well as we do now and it wasn't unusual to sink three in a season. Now we haven't had one go down for three years, but the danger is always there. An engine can fail on you, leaving you drifting helplessly toward a canyon. You bail out. Or you hit the end of a rope at just the wrong angle and you're over the side in a flash.

"The biggest danger is getting hypothermia from being in the cold water too long. I fell in the Fraser one spring and it took my breath away. I

was all seized up. Most of the guys on the crew have gone for a swim more than once over the years, but we've never lost a man."

Every crew member is a dedicated worker, but for years the men have known that a combination of circumstances would finally cause the Quesnel drive to be shut down.

"There's no doubt that the drive was having an impact on the fish in the river system," says Mike Flynn of the federal Department of Fisheries and Oceans, "but it was a difficult and expensive thing to quantify. It's hard to find a dead fish in the river and then prove it was caused by the drive. But we know that contamination of spawning beds and rearing habitat with silt or bark is detrimental to salmon. We also know that bark, reduced to fibre, can clog the gills of young fish. Through negotiations we



To loosen a log jam a jetboat operator will go back to the pile again and again **(top left and right)**, *taking out a log or two at a time, forcing a hole in the side of the jam. When a log gets stubborn a boatman will hook onto it with cables and rope; when 3000 kilograms of boat driven by a 400 horsepower jet hits the end of 30 metres of slack line* **(left)**, *logs fly.*

The river crew has long known that a combination of circumstances finally would close down the Quesnel log drive, the last of its kind in North America. Sure enough, in the spring of this year it was announced that 1981 would be the drive's last year of operation. The men will still have a quiet Fraser run to do every year, but for river chargehand Ron Wilkins (far right) *and partner Dan Reimer, along with the rest of the log drive crew, it just won't be the same.*

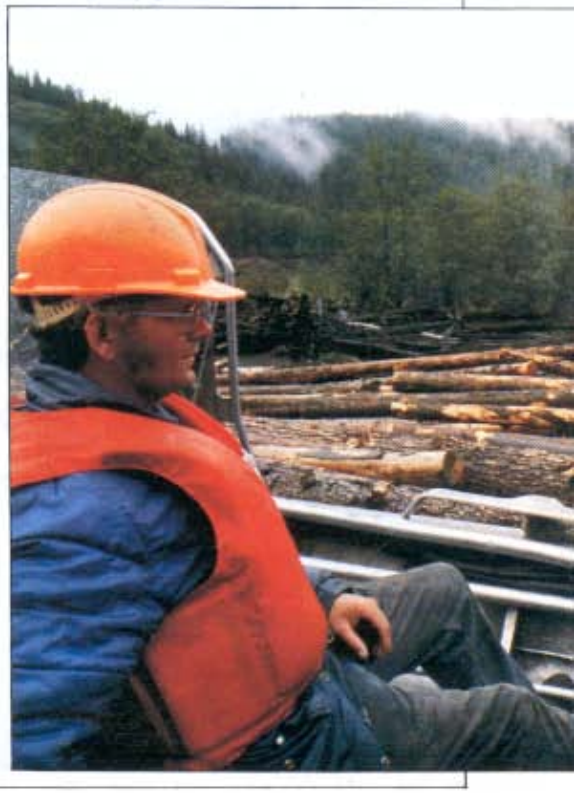
had been working for the gradual phase-out of the drive."

Zeke Withler is area regional manager for the environment ministry's Fish and Wildlife Branch. He is responsible for the resident fish in the river, mostly rainbow trout and Dolly Varden. His concerns were much the same as Flynn's, and he, too, had been dealing with the company and the Ministry of Forests to effect a phase-out of the drive. "Back in 1963 when the Quesnel drive began, we gave our full approval to the company. I think that may have been a mistake. Since then we've had a chance to see what the drive looks like. The river has been changed considerably. Bulldozers worked in the river to redefine the channel so that logs would move freely. A large amount of bark was deposited on potential spawning gravels, and logs also scoured the river bottom. These sorts of things typically harm fish, and we think the fish in this system have been hurt. We were also concerned about bark getting down into the Fraser and possibly harming fish from other systems."

The Quesnel Rod and Gun Club was another body that persistently had called for an end to the drive. Dennis Youchezin, club president, explains: "It irritated me that they kept asking us to prove our case. To have scientific proof that the drive has reduced fish populations we would need baseline information — tests taken before the drive was begun. But there weren't any tests done then. All we have is the reports of oldtimers who say that there used to be good fishing in the river."

Another factor that helped shut down the drive was the very economics of it. Because the log drive only happened once a year, Weldwood was forced to harvest and stockpile its wood supply a year in advance of getting it to the mill. All the costs of obtaining that wood — wages, machinery costs, stumpage — had to be carried by the company for the whole year. With interest rates the way they are, the company had to ask itself if the drive was worth the added expense.

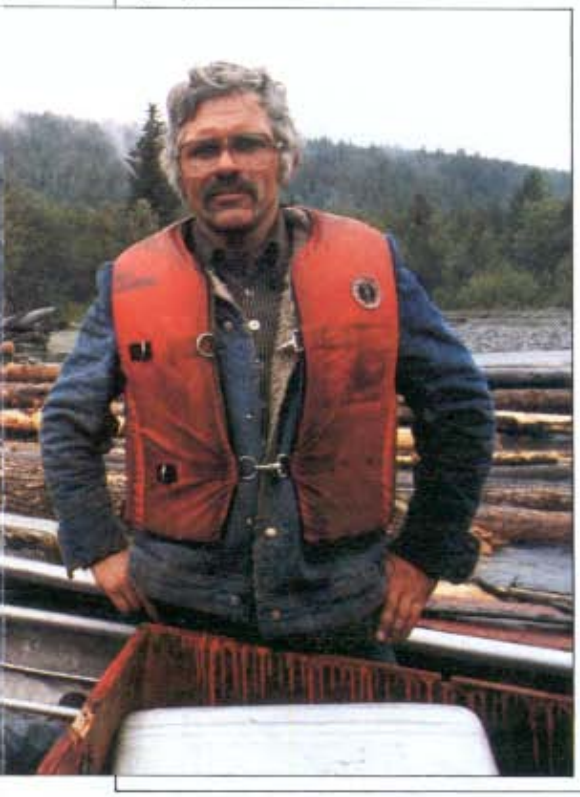
In the final analysis, however, the major factor affecting the life of the log drive was the issue of timber supply; if the drive were shut down the Weldwood mill at Quesnel would need to get additional timber from somewhere else. Martin McLeod is general manager of Weldwood's Quesnel operation and was involved in on-going discussions about the



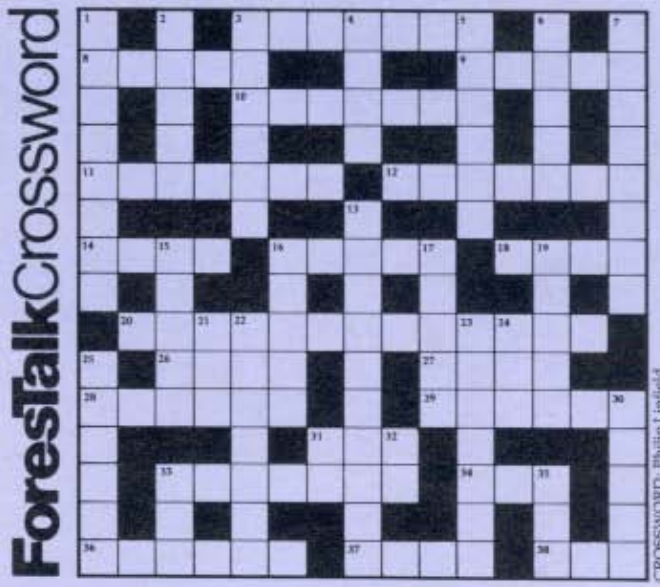
future of the drive with all parties concerned: "In 1973 we proposed to phase the drive out over four years if some arrangement could be made with the Ministry of Forests to insure us a continued supply of wood. Closing down the drive means the transfer of timber rights and the building of roads to move the logs by truck. Large expenditures are involved."

Denny McDonald, Ministry of Forests Regional Manager for the Cariboo, is the person with the final authority over the fate of the log drive. He explains how the Ministry solved the timber supply question by coming up with what amounts to a timber swap. "Our recently completed timber supply analysis for the area recommends that the wood from the upper Quesnel River area, which now goes downriver to Quesnel, be rerouted overland to Williams Lake instead. New land access to the area now makes that possible. And timber that traditionally was hauled to William's Lake from the upper Mathew drainage will now be trucked to Quesnel through Cunningham pass."

When these new timber allocations go into effect next year there will be no more need for the Quesnel River log drive. Come spring runoff the crew will be back, not to take long shifts driving logs on white water, but to do a final clean-up of the riverbanks. They will still drive the Fraser every spring, but it won't be the same.



ForesTalk Crossword



CROSSWORD: Philip Linfield

CLUES ACROSS

3 Arrangements of flowers or leaves (7)

8 Compartment for housing an individual animal, such as a horse or cow (5)

9 To trim branches from tree, done in forestry to eliminate knots and improve tree quality (5)

10 Name of Washington state capital (7)

11 Making the best use possible out of each log going through a mill is achieving _____ recovery (7)

12 The last major log drive in North America takes place mainly on this river in the Cariboo (7)

14 Two-wheeled carriage drawn by a horse (don't get caught in one!) (4)

16 A plant into which a graft is inserted; or something that often comes with a lock and a barrel (5)

18 It often showers down in April (4)

20 Seedlings are planted as soon as possible after an area is logged, perhaps 100 - 175 per hectare, as part of the reclaiming process of _____ (13)

26 High in the tallest mountains of B.C. the air is this way, though not scarce (4)

27 Enclosure for sheep (4)

28 A sometimes stormy seabird (6)

29 Small objects often carved from wood and exchanged in earlier times in place of money, or to indicate friendship (6)

31 The frozen part of Canada (abbrev.) (3)

33 The steam-driven heart of B.C.'s early sawmills (7)

34 Short for business (3)

36 Strong band of connecting tissue between muscles (6)

37 A number of workmen on a project; or a kind of saw (4)

38 Further west than 31 across (abbrev.) (3)

Answers page 27

In response to popular demand the ForesTalk Crossword is back. Starting with this issue it will appear regularly in every second issue of ForesTalk.

CLUES DOWN

1 Alder, aspen and other hardwoods account for 2.6% of B.C.'s total forest resource (85% of the province's 14 million cubic metres of hardwood are found in northern B.C.), according to a recent _____ (8)

2 Milky sap from some trees, especially rubber (5)

3 In Spring many a flower does this (6)

4 When a logging site is too far from town the company will ask the loggers to stay in it (4)

5 When young forests have reached a certain age the poorer-growing trees are cut down to leave the remainder well _____ so they have more room to grow (6)

6 Spruce and lodgepole pine are the principal species logged in the _____ to the north of B.C. (5)

7 By 1985 Silviculture Branch and forest industry tree nurseries expect to provide B.C. with 150 million of these annually (8) (singular)

13 The selecting and separating of timber prior to entry into the mills, once done mainly in bays and inlets by dozer boats, now more and more on dry land, and sometimes controlled by computer (3, 7)

15 Care in the forests can help to _____ fires (5)

16 Male fallow deer in third year (5)

17 Kind of smooth brown paper having nothing to do with cheese spread or mayonnaise (5)

19 Dwelling place (5)

21 A long way off (3)

22 Herb used as medicine in ancient Rome — good with tomatoes, cheese and pizza (7)

23 A soft container in which to carry work implements (4, 3)

24 Firs, pines and spruces are all of the same ___ (3)

25 To pull a tree out of the ground (6)

30 Same clue as 36 across (5)

31 The opposite of 21 down (abbrev.) (2)

32 Hectogram (abbrev.) (2)

33 Female domestic fowl (3)

35 Along with chlorophyl, a most vital factor in photosynthesis (3)

The Great Ponderosa Pine

by **Gary & Judy Green**

Ponderosa country — a land of valley bottoms and rolling hills clothed in golden bunch grass, fragrant sage and prickly cactus. Here the widely-spaced great pines which dominate B.C.'s southern dry belt reach heights of up to 30 metres.

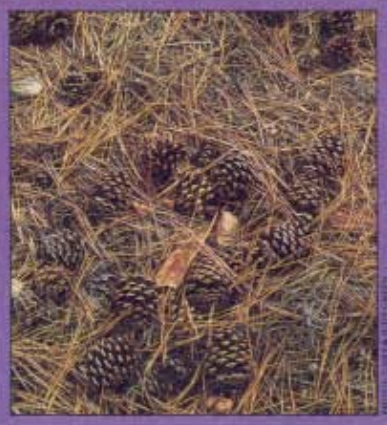
The ponderosa forest is silent and tranquil as the breezes of summer ripple through the tree tops, barely rustling the needles overhead. In these high branches an old pine stores new life in large cylindrical, spiked cones. Browned by the hot sun, needles float slowly to earth to join the carpet of cones and needles at the base of the tree.

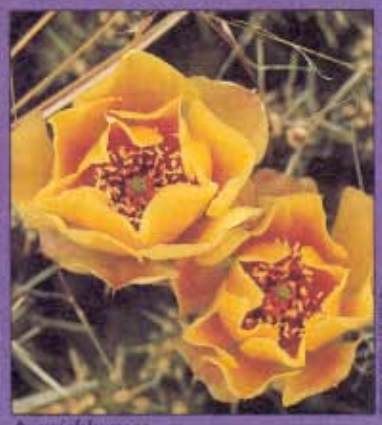
Although the ponderosa pine does not stand comparison with the towering fir and spruce of the Pacific coast, in this arid region of humble plant growth the pine is a formidable sight. Bare of branches for most of its length, the time-ravaged pine is a testimony to survival.

Armour-like bark comprised of contoured, elongated plates have protected the tree from drought, infestation, and fire for countless seasons.

In early summer the open parklands of the ponderosa forest are full of the brilliant yellow blooms of sagebrush, buttercup and balsam root, and the rose-pink flowers of bitter root. The forest silence is often broken by the squawk of Steller's jays playing in the tree tops, or by the croaking of ravens in the distance.

As the sun hovers in the western sky before finally setting, the bark of the ponderosa glows red, reflecting the last rays of day.





△ *prickly pear*

▽ *bitter root*

Bob Nixon of the Sierra Club

by **Peter Grant**

In Wilderness is Preservation of the World, *is the title of a book of stunning photographs of nature's wild places. The title also sums up the philosophy of the Sierra Club. With groups in several British Columbia communities and a lobbying force in Victoria, this now international environmental organization has become highly critical of forest management and related issues in B.C. over the past decade.*

Sierra Club press releases are familiar to many B.C. newspaper readers: ". . . Sierra Club spokesman Bob Nixon said recently that . . ." The media is one of many ways the club spreads its message; Nixon, the Sierra Club's Western Canada Conservation Chairman, lobbies relentlessly to inform and hopefully influence politicians and public servants. Nixon travelled across the continent and across the spectrum of environmental views before arriving at his present job as political gadfly for the Sierra Club. He forsook a career as a nuclear engineer on U.S. Navy submarines to study (and briefly practise) forestry. He brings an international perspective to B.C. forest issues, and his concerns range far beyond wilderness preservation to the Ministry of Forests' whole approach to resource management and B.C.'s forest industry. While criticizing what he sees as a short-range forest management vision, Nixon concedes that the government has taken some steps in the right direction with its 1978 forest and range legislation.

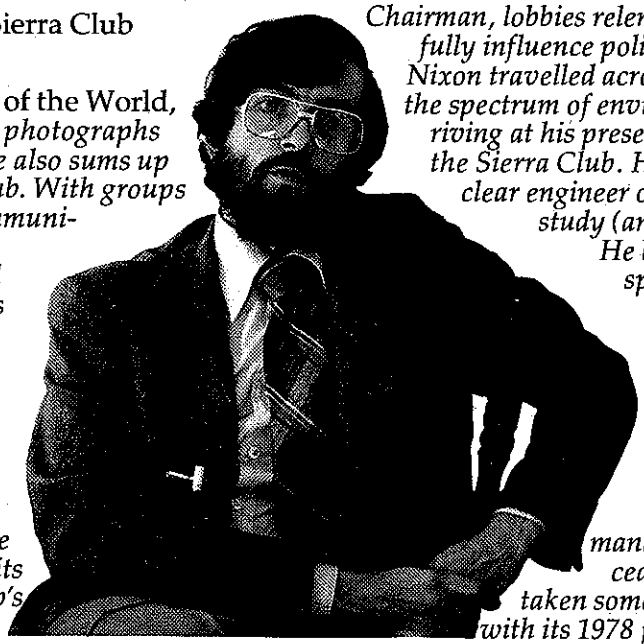


PHOTO: JOHN THOMSON

FORESTALK: There's a common view that the Sierra Club stands for wilderness preservation, period. Is that true?

NIXON: Hardly. We believe we must have a wilderness system in B.C., and we spend 50 percent of our time on forest issues like that. The other 50 percent is on health and safety, energy, pesticides and herbicides outside the forest environment.

FORESTALK: Who's "we"?

NIXON: Close to a thousand indivuals in five groups, the working units of the club in B.C. There are groups in Victoria, Vancouver, Campbell River, the Kootenays and the Okanagan.

FORESTALK: Who belongs to the Sierra Club?

NIXON: I think there's a cross-section of the population — everyone from fishermen, mill workers, deckhands to engineers, foresters, ecologists.

FORESTALK: How strong are your ties with the American Sierra Club?

NIXON: We're separate from the U.S. club, but we have common goals and policies about parks, hazardous wastes, whales and other resource issues. The U.S. club has a body of knowledge and expertise on which we draw to address issues.

FORESTALK: How do you decide which issues to address?

NIXON: It's a grass-roots organization. The groups decide what's important to them at their meetings and bring their concerns to the attention of the regional body, the Sierra Club of Western Canada. We give them professional or technical assistance.

FORESTALK: What's involved in your job with the regional body?

NIXON: The geographic diversity of B.C. creates a great problem of isolation.

"Yet a company forester speaking on behalf of the industry said that the industry has no responsibility for wildlife in the forests. So we obviously can't rely on the industry to take the broader view of forest management."

It's difficult to communicate effectively where it counts — with the senior public servants who formulate policy and legislative initiatives, under the direction of their ministers. My job is to give people a clear and continuing voice in Victoria. We're seeking to break down what is perceived as a distinction between urban and hinterland populations.

FORESTALK: How much do you actually use the wilderness you're trying to preserve?

NIXON: One of the club's strongest aspects is its outings program, taking people to back areas to give them a sense of the values that are there. A lot of Sierra Club membership derives from those trips. That was the idea Muir had when he started the trips into Yosemite: take people to see what a heritage the wilderness represents, and you'll have defenders of wilderness.

FORESTALK: Who's Muir?

NIXON: John Muir, an American naturalist of some renown. He started the Sierra club in 1892, in California.

FORESTALK: Do you advertise your outings?

NIXON: Groups or regional chapters organize outings throughout the year, and we advertise these annually in our bimonthly publication entitled *Sierra*. There's a core of outings leaders in Western Canada. I and several others lead trips in the Rockies and to Pacific Rim National Park; we've also gone to the Broken Group of Islands in Pacific Rim, to Kluane National Park, the Valhallas and into the Rainbow Range.

FORESTALK: What makes the Sierra Club different from other environmental groups?

NIXON: Two things. First, it's a policy-oriented, advocacy-type organization, dealing largely with government and related industries. That's also called lobbying; we provide the best possible information on a subject, say a land-use

situation, and point to the policy we believe ought to be followed.

Second, the Sierra Club is committed to looking at the whole picture of environmental issues, which means the economics and social and labour aspects.

FORESTALK: What do economics and labour have to do with wilderness preservation?

NIXON: You have to have a base in economics to analyze whether or not the resources are being best utilized. The Canadian Forestry Service says we waste approximately 25 percent of the fibre removed from the forests; yet some companies say: "You really ought to let us log in parks." These companies seem to feel they have some favoured position that permits them to be slothful and inefficient. To deal with the (at best) shallow economics on which the system works, environmental organizations need to understand economics.

FORESTALK: What gives you the authority to be so outspoken about the way the province's forest industry is run?

NIXON: What seems to be outspokenness is perhaps an awareness of the options for policy. George Nagle was commissioned by the federal government to develop a draft of forest policy for Canada. One of his important points is that we must make decisions on the best evidence to be found. That means looking at how people in other jurisdictions have organized their resources.

FORESTALK: What do you see when you compare B.C. resource management policies with those in other areas?

NIXON: A wilderness system is virtually non-existent in British Columbia, although the Ministry of Forests has begun to acknowledge a role for wilderness areas within the commercial forestland base. In the United States the Forest Service has a legal responsibility to manage the National Forests for the full range of forest resources — including wilderness. In each National Forest — which are something like B.C.'s Timber Supply Areas — they have to identify and put out for public debate how much wilderness should be set aside.

FORESTALK: Why the need to preserve wilderness?

NIXON: The quality of human life depends on the quality and diversity of the environment. Then there's a selfish reason: our survival may depend on the survival of diverse natural ecosystems. Man has already destroyed through ignorance many species of plants and animals and habitats.

FORESTALK: Do you support the government's policy of promoting multiple use of forestlands?

NIXON: There isn't a true policy of multiple-use for our forestlands, nor has there ever been one; we have been managing our forests for single-use.

Forestry should cover the whole gamut of the forests' resources. Yet a company forester, speaking recently on behalf of the industry about wildlife in a managed forest, said that the industry has no responsibility for wildlife in the forests. So we obviously can't rely on the industry to take the broader view of forest management.

FORESTALK: Doesn't the public involvement process the Ministry of Forests has been promoting indicate that the Ministry is committed to multiple use?

NIXON: A public involvement process cannot be a substitute for specific multiple-use legislation. The Ministry of Forests does not have a legal responsibility for implementing multiple-use beyond the phrase "consultation."

I'm familiar with the Greystokes public advisory committee because the Sierra Club participates in it. The Sierra Club was the one to raise the issue of ecological limits to forestry in the subalpine area; the Ministry seemed to view the subalpine only as a source of timber to fulfil quotas, not as a place to practise multiple-use forestry.

"If we put a higher value on our timber, to better reflect its final value as products, that would provide us with dollars to restock forestland and put people to work. Maybe we won't be able to fell as many trees, but we can create some secondary industry."

If I were in the Ministry of Forests' place, I would feel that it was my responsibility to be up-front with the public with the best scientific knowledge about what can and cannot be done with the forests. The suspicion that develops when we start hearing about such issues from other sources is that the Ministry simply has a commitment to supply fibre to the industry, come heaven or low water. I believe that rational, multiple-use legislation could resolve most conflicts before they occur.

FORESTALK: Speaking of the economic and social aspects of forestry, what's your feeling about the future of the forest industry, in view of predictions about future timber shortages?

NIXON: The critical question is whether the government is going to let the forest industry rapidly remove the remaining old growth timber under the present system of allocations.

Some people in the industry want permission to increase their cut of the remaining old growth *now*. (In return they're promising tremendous increases in *future* timber supplies derived from improved forestry practices like thinning and fertilizing.)

If this happens, the timber supply crisis will deepen. Then we'll all lose — people committed to wildlife, to wild rivers, to clean water. Forestry will go the way of an extinct species as the mainstay of our economy, because the economic value derived from second-growth forests will be far less than from the old growth. Old growth is money in the bank. How we apportion it should be key to the debate.

FORESTALK: What debate?

NIXON: How to make the transition from an old-growth economy to a second-growth economy with some continuity.

The U.S. northwest has been in a similar situation to B.C. in terms of its wood supply. There the question has been a matter of public debate, led by government agencies. These agencies had an obligation to explore all the costs and benefits of various options in planning for the transition from an old growth to a second growth forest economy. In B.C. we haven't done that, because the Ministry of Forests doesn't have that kind of mandate.

FORESTALK: How should the Ministry prepare for the change from an old growth to a second growth forest economy?

NIXON: If we put a higher value on our timber, to better reflect its final value as products, that would provide us with dollars to restock forestland and put people to work. Maybe we won't be able to fell as many trees, but we can create some secondary industry. In the U.S. northwest, for example, a number of log home industries have grown up, using beetle-killed pine.

FORESTALK: So where do we go from here?

NIXON: Before the 1978 forest legislation the Ministry of Forests had no firm responsibility to provide comprehensive forestland management; the Ministry's 1980 Five Year Program just scratched the surface. It's well in advance of what was done before, but not in terms of what needs to be done.

I firmly believe we require additional legislation to enable us to identify our broadly-based economic opportunities. Until the mandate is there, there can be no grappling with the forest management issues raised in the Ministry's Five Year Program.

FIRE
ECOLOGY

A NEW LOOK AT FIRE

It's been difficult teaching the old bear new tricks, but now that Smokey is a fire ecologist he'll be the first to tell you that not all forest fires are bad.

by **Diane Swanson**

PHOTO: MARIEL MITCHELL

Like a bold laser, the orange light traced the dark horizon and severed it from the night sky. More than 65 kilometres to the northeast, residents of Fort Nelson watched the spectacle safely from hilltop homes. A fast-running crown fire was roaring through the forest, flames leaping well into the sky above the treetops.

The TSAC fire of May, 1980 razed 121 hectares before forest managers even discovered it. Fanned by high winds, it burned uncontrolled for 15 days. In the end, nearly 6,300 hectares of black spruce and lodgepole pine were destroyed.

In late August, a Bell 204 helicopter touched down in the centre of the burnt site. Eight men from the Ministry of Forests and the Canadian Forestry Service climbed out to take a look at nature's response to a lightning fire — one totally unchecked by man.

The immediate scene was stark; remnants of 120-year-old trees were black pillars stripped bare of most branches and all foliage. The stillness was broken only by the sound of wood-boring beetles chewing away on the forest remains. Scattered mounds of thick sphagnum moss, yellow-white from the fire's heat, dotted the expanse of black, burnt moss covering the ground. There were no clouds of ash as the men moved about, but the burnt moss gave easily to their weight, marking each step with a deep footprint as the group divided and looked about for any signs of revegetation.

Fire ecologist John Parminter of the Ministry of Forests' Protection Branch had been here twice before. The first time, barely three weeks after the fire, had been a brief exploratory trip. Then in July he had checked the site for the odd island of living vegetation skipped over by the fire, recording the numbers, sizes and species of trees that had once made up the forest. Along with the others on this third trip, Parminter quickly discovered blueberry bushes, lush green against the blackened surface, and several shrubs sprouting up from the roots of dead parent plants. Some of the willows were already a metre high.

Brad Hawkes, fire ecologist for the Canadian Forestry Service, poked around the bases of several burnt trees. Fuelled by thick layers of needles piled close to the trunks, the fire had burned very deeply, exposing rich mineral soil. Hawkes was surprised to discover several tiny black spruce seedlings. Not that he didn't expect the trees to regenerate; in fact, the heat from fire releases the seeds that are stored in black spruce cones. But seedlings usually don't develop until the year following a fire. These had taken only three months.

"Perhaps the heavy rains during the summer caused the early germination," says Hawkes. "But it definitely shows how quickly trees can come back after a fire."

ILLUSTRATION: KEN SEARCOCK

Historically, fire management in B.C. has emphasized the prevention and fighting of forest fires. Although the policy still is to fight any fire that threatens human life and property, fire managers reject the conventional notion that all fires, everywhere, are bad. They recognize that fire can turn a log into nutrients for the soil, stimulate the growth of tree and forage plants for animal life, and check the spread of tree insects and disease.
Smokey the Bear, while not for a moment letting up on his concern over fire prevention, recently has been giving more attention to the principles of fire ecology.

He and Parminter have been studying the natural role of fire and the effects it has on forests. Together, they have examined a wide range of sites in northern B.C., from the recently-burnt to some that haven't had a fire in centuries. "What we've seen doesn't fit in with general theories that say fire sets back plant succession," says Parminter. "There seems to be more of a natural recycling process going on."

The studies by Parminter and Hawkes are part of a broader, more scientific approach to fire management that is developing in B.C. Don Owen, former director of the Ministry of Forests' Protection Branch, says: "In the past, we didn't go back to see what impact a fire had had. But we will be doing more and more of this. Then we will have better information to give our district managers about the effects of fire in their areas." And that's especially important in northern B.C. where fire fighting costs are high and the value of most timber is quite low.

Although the policy in B.C. is to fight any fire that threatens human life and property, fire managers reject the conventional notion that all fires, everywhere, are bad. They recognize fire as a basic element of nature, like air or water — something that is normal and necessary. Fire can turn a log into ash (soluble nutrients for the soil); it can open up a crowded forest, stimulating the growth of trees and forage plants for deer, black bears and songbirds; it can check the spread of tree insects and disease; and it can prevent a major conflagration by regularly cleaning the forest floors of dead branches and foliage.

Historically, fire management in B.C. has emphasized the prevention and fighting of forest fires. The first fire prevention legislation in B.C. was the Bush Fire Act of 1874, which allowed for fines up to $100.00 to be levied against people responsible for forest fires. Along with the establishment of the Forest Service in 1912 came a strong commitment to fight all wildfires in the province, and the government established a special Forest Protection Fund tax. The efforts of the Ministry of Forests to educate both industry and the public on the dangers of fire, together with refinements in fire-fighting techniques and equipment, have continued to reduce the area of land lost to wildfires each year. Today just 0.15 per cent of all B.C. forestland — an area roughly equal in size to Manning Park — falls victim to fire in an average year.

In most of B.C., timber needs are so great that forest managers can't risk losing any of it to fire. But in some locations land managers are actually using fire to help them meet their land management objectives.

"There's been a gradual shift of emphasis," says Owen. "We're taking a closer look at the good features of fire and becoming more discriminating in the use of fire. Even so, we are moving very cautiously, and always under the premise that we will only allow fire where we can control it." Not only does this mean letting a wildfire burn when there is a good reason to do so, it also means setting a fire to achieve certain effects — prescribed burning.

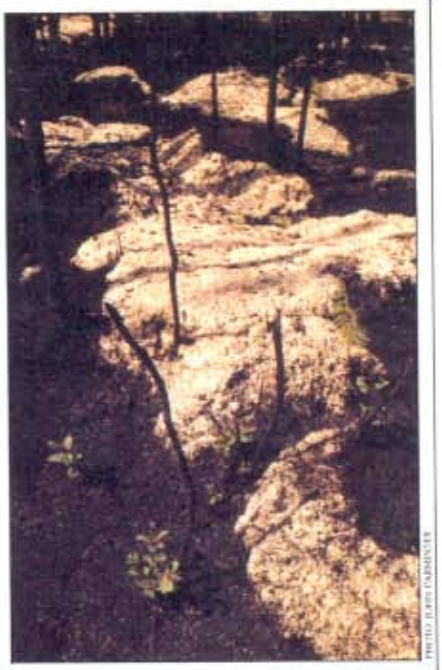
Burning the slash left behind from logging operations has been going on in B.C. for more than 70 years. By eliminating the mounds of dead

branches and small trees before they are accidentally set on fire, a controlled clean-up fire reduces the likelihood of a major fire ever getting started. Today, however, no more than 14 per cent of the prescribed burns in the province are aimed at eliminating logging slash; the greatest number are done to help prepare a logging site for reforestation or to improve range and wildlife habitat.

The Ministry of Forests and the environment ministry's Fish and Wildlife Branch have recently worked out a set of guidelines for using fire to meet wildlife management objectives. Ray Halladay, Chief of Wildlife Management for the Fish and Wildlife Branch comments: "In areas that we have identified as having a history of frequent natural fires, we would like to see fire used to maintain good wildlife habitat."

In the foothills of the northern Rockies for example, guides and outfitters have been burning low-value spruce-aspen forests. As a result the grasses and shrubs have flourished, and so have the elk — their herds have quadrupled in size. Moose have also benefited from the improved browse, and stone sheep have made direct use of the ash, eating it as a mineral source. The Ministry of Forests is now attempting to manage these fires, and has established a program to burn 12,000 to 15,000 hectares each year in the headwaters of the major river drainages in the North Peace. The program has reduced the forest fire hazard and increased wildlife browse — without causing major wildfires.

In the Nelson region the Ministry is burning 4,000 to 8,000 hectares annually to improve low-elevation winter range for wild ungulates such as deer and elk. As well, a total of 11,000 to 15,000 hectares of open rangelands and forested range in the Nelson area are burned annually to improve the quality of forage for domestic cattle. Still, agrologists feel this is only a part of the land area that could be burned for this purpose.



The TSAC fire of May, 1980 razed 6,300 hectares of black spruce and lodgepole pine in an area southwest of Fort Nelson. Closely monitored by Ministry of Forests fire ecologist John Parminter, the land is sprouting new growth much more quickly than expected **(left; above; top).** *"What we've seen doesn't fit in with general theories that say fire sets back plant succession," says Parminter. "There seems to be more of a natural recycling process going on." The results from this and similar studies will help the Ministry of Forests make more informed fire-related forest management decisions.*

"Fire is a tool," says Dr. Roy Strang of the University of British Columbia Faculty of Forestry. "It has capabilities and it has limitations. What we need is more information so we can define just what each of these is."

Since 1978, Strang and U.B.C. colleague Arlen Johnson have been travelling to a spot near Kamloops to run studies on the seasonal effects of fire on rangelands. Creating a checkerboard of test plots, they have been doing experimental burning of the grasses growing on the floor of ponderosa pine and Douglas fir forests. They study each plot intensively both before and after a fire, and while the

A carefully controlled fire can be an effective and inexpensive forest management tool, and prescribed burning of logging slash has long been a part of the B.C. forest management scene. In the past, however, escaped slash burns have generated considerable public concern. One way to keep strict control of a prescribed burn is to use a helicopter to set the fire **(right)**. *Other controls include access to better weather reports and the use of infra-red scanning equipment to detect hot spots. And through the study of fire as a useful forest management tool, Smokey has become a more discriminating bear.*

surface-creeping fire is actually in progress, they measure its rate of burning along with a whole range of weather variables.

Funded by both the provincial and federal governments, the research will continue for several more years to determine the responses of vegetation to fire. But an interim report indicates that bluebunch wheatgrass and fescues, both good cattle forage, recover very well after fire. On the other hand rabbitbrush, a nuisance to cattle, suffers considerably.

One of the most practical results from the study should be a set of guidelines governing prescribed fires that will enable Kamloops area land managers to use fire to achieve specified results. "Then controlled burning will become prescribed burning in the truest sense," says Strang.

But will the public accept an increased use of fire? A 30-year dose of Smokey the Bear has created a public attitude that ranks fire right up there with war as a truly undesirable event. What was commonly used as a tool by early man has become an object of fear. "You've done too good a job of selling Smokey," Don Charlton of the B.C. Wildlife Federation told Canadian and American foresters at a recent conference. "For years you've implied that all fire is bad. Now you have to educate people to the values of prescribed burning."

One major public concern over the use of fire is the possibility of it running out of control, and fires caused by escaped slash burns have escalated this concern. In 1973, residents of Salmon Arm expressed considerable fear following the "Eden Fire" — one of the most serious escape fires the province has had in recent times. Many wanted to ban slash burning completely. But the fault was not in the tool, it was in the way it was used. Prescribed burning should only take place under carefully controlled conditions.

"Although we're keen to see fire play a more natural role in B.C.," says Hawkes, "we're not advocating that people run around starting fires. We need to control the use of fire — not only to prevent escapes, but to make sure it relates to the fire history and multiple-use resource objectives for an area." Obviously fires can't be set to improve wildlife habitat if they are going to ruin the surrounding timber. "Careful joint planning is the answer," says Fish and Wildlife's Halladay. "Then appropriate burning can benefit a variety of interests."

Does all this plunge Smokey and his fire prevention message into retirement? Not at all. He's just becoming a more discriminating bear. Today we are beginning to appreciate how fire can be used to our advantage, but we can't forget the destruction that the careless handling of fire has brought — and can still bring — to our forests.

LETTERS

Wood That We Could . . .

With regard to your timely article in the Fall 1980 issue, "What's Ahead For B.C. Hardwoods," of which the conclusion was, virtually nothing, I would like to make the following point: In the article R.M. Carl of West Coast Hardwood says with regards to a stable supply of alder, "The system (of protecting the local sawmiller) is easily overcome . . . The logs then go to Washington and come back to haunt us as finished lumber."

The problem is, as your article points out, that Washington pulp mills are equipped for, and are willing to pay, good money for alder pulp. If Carl could sell his non-lumber-recoverable alder for pulp, he would have a good supply of saw logs.

I cannot understand why, when we export our long-fibred softwood pulp to the U.S., Japan and other countries, as well as back East to Ontario and Quebec for the mixing of it with their short-fibred hardwood pulp for producing fine paper, why we cannot use our hardwood for fine paper making ourselves.

Every year we slash, windrow and burn millions of cubic metres of alder, birch and aspen that could produce wealth instead of cost. Surely our forest industry is not being sincere in its promises to use our forest wealth to our province's best interests.

It might make sense to an economist, but it sure don't make sense to me.

Jack Miller
Port Clements, B.C.

Give the Fallers A Hand

I read with enthusiasm the Winter 1980 ForesTalk article entitled "In the Hands of the Faller." An uninformed and irresponsible work force can render the best of plans utterly useless. Informed and involved workers, on the other hand, are not only in the best position to insure that a plan is carried out and with careful attention to detail and circumstances — workers can also take a lot off the shoulders of the bureaucracy, and surely feel a boost in their own morale as well.

I am definitely in favour of selective logging and would like to see it become more general policy as rapidly as possible, both for protection of the environment and to insure long-term availability of our forest resources. It seems to me that this article points the way to a very realistic means for implementing such a policy.

Ms. Jimmi Mead
Fauquier, B.C.

Selective logging does not work in every situation. It certainly is well suited to the dry Douglas fir forests where trees of various sizes and ages are present. Partial logging of the forest canopy, carefully done, leaves an adequate number of trees to reseed these harsh dry areas and to provide the shade necessary for seedling survival and growth. In mature spruce-balsam forests however, selective logging could cause havoc as shallow-rooted spruce trees – left unprotected – are easily toppled by the wind. Clearcutting is the preferred harvesting method here. Also, clearcutting lodgepole pine best promotes the regeneration of a new pine forest.

Lofty Logging Idea

I have worked in and watched logging from the 1920s until the late 1970s. I believe it is time to change our logging methods. We have the technology to start now if we will apply ourselves to the problem.

Five years ago I looked at drawing board plans of a large helium gas-filled balloon. It was shaped like two dinner plates put together, and it had rotor blades like a helicopter which rotated around the edge. These blades had jet pods at the ends for power. The engineers said this machine could lift and carry six hundred tons.

I propose making small machines filled with helium gas to pick up one tree at a time, bring it to a central location where it would be limbed and put through a barker. The limbs and bark would be put through grinders. This mulch would be carried back and spread by the machines on their way back to pick up more trees. The Ministry of Forests would send men in to select trees of the right age to be harvested and put up a small balloon as a marker. The machine would float in from above, put a loop over the top of the tree and the faller at the bottom of the tree would then cut it. The machine would lift it in a standing position, or the tree could be felled and then lifted. It would then be picked up and taken to a central location where a large machine would pick up a bundle of trees and take them on the long haul to the processing center. One large machine could keep many little machines busy. If the helium gas-filled machine got into trouble it would just trip its load and float around until taken in tow by another machine.

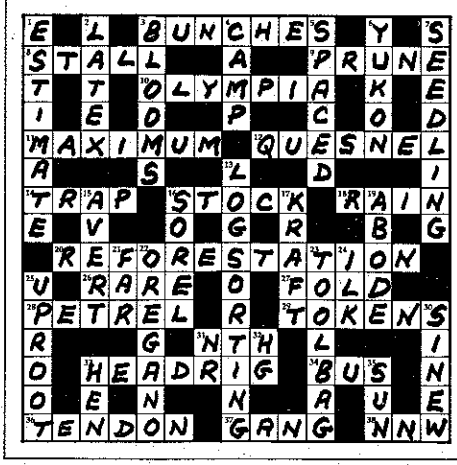
With this kind of logging there would be no roads, our forest would always look like a park, our young trees would continue to grow, and our side hills would not be washed away as the young trees would hold the soil together. We would no longer tear our forests apart with yarders and bulldozers, we would be able to harvest more timber, and yet the forest would renew itself faster.

Budge Crick
Riondel, B.C.

Budge Crick has spent a lifetime figuring out how to move logs. Some of his exploits are covered in this issue in the "People" department and in the "The Last Log Drive."

Letters to the editor provide an opportunity for our readers to discuss topics arising out of ForesTalk. Letters for publication must carry the sender's name and address. Views published are not necessarily endorsed editorially. ForesTalk reserves the right to edit for publication.

Answers for Forestalk Crossword
(see page 17)



INTERNATIONAL RECOGNITION

ForesTalk was awarded the Gold Quill Award of Merit by the International Association of Business Communicators (IABC) at the association's 1981 convention held in Washington, D.C. in early June.

In recognition of "superior communications achievements," the IABC Gold Quill judges issued one Award of Excellence and one Award of Merit in each of 76 competition categories. ForesTalk's entry — the Summer, Fall and Winter 1980 issues — received the Award of Merit in the category of colour magazines produced by governments, associations and not-for-profit organizations.

The professional association for over 7000 writers, editors, audio-visual specialists and others working in organizational communication, IABC has over 100 chapters in Canada, the United States and the United Kingdom, with affiliates in a dozen other countries.

To add your name — or that of a friend or relative — to the mailing list of ForesTalk, contact: ForesTalk, Ministry of Forests Information Services Branch, 1450 Government St. Victoria B.C. V8W 3E7, tel. 387-5985. A change of address request should include the old mailing label.

People

Budge Crick

by **Doug Cowell**

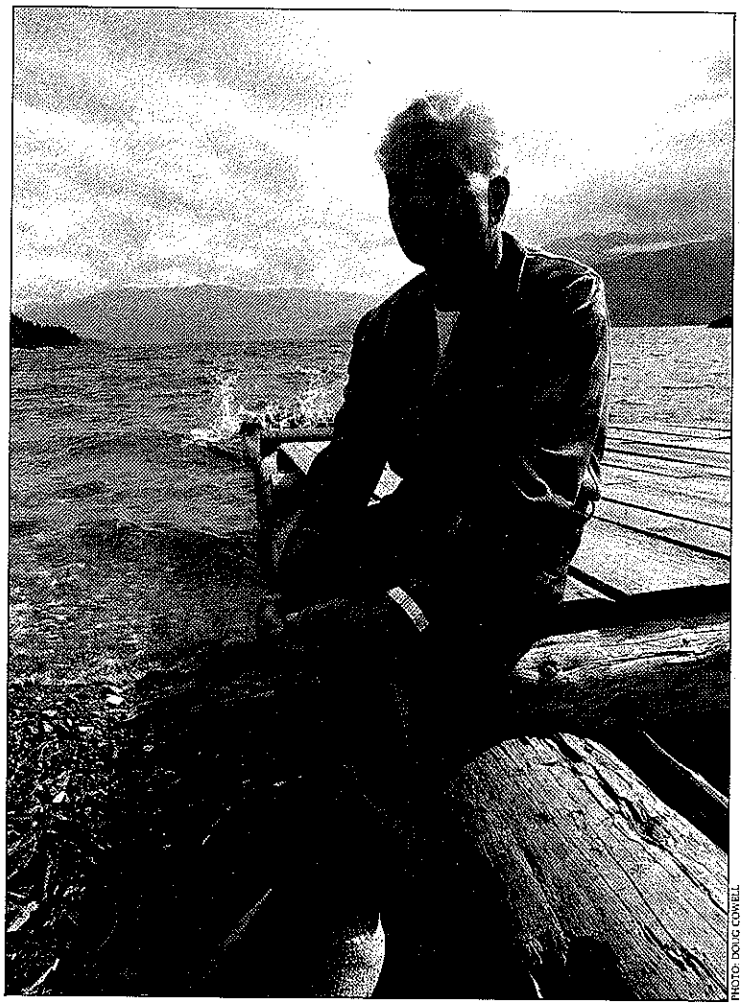


PHOTO: DOUG COWELL

Tales of sure-footed shanty-men nimbly hopping across rolling logs to break up dangerous jams are integral to the lore of logging. One of the best at the log driving trade was Budge Crick. Not only did he work the old time river drives that hadn't changed much in over a hundred years, he also virtually invented the modern log drive in B.C.

Crick began his life in the bush in a trapper's cabin on the Athabaska River a hundred miles north of Edmonton. "My six brothers and I all learned to trap. When I was ten and my older brother was twelve we went out in winter and literally ran the trapline, trying to keep ahead of the Indians who were our competition. We travelled light: no sleeping bags or food. We huddled around the fire at night and ate muskrat. Then in about ten days, when we had diarrhea from eating only meat, we went back home."

Trapping was winter work, so it was natural that in spring and summer, when the rivers were swollen with runoff, the Crick boys worked on Chisolm Sawmill's log drive on the Athabaska River. "We'd log in the winter and deck the logs behind a stump on the river bank. Then in spring, after the ice went out, we'd blow the stump and most of the logs would roll into the river and float down to the mill. Some of the logs would get left behind, and whenever they needed more logs at the mill they'd send us upriver to roll the stranded logs into the river and to clear up log jams.

"We had long, thin boats called pointers. Three or four guys would walk the bank with a rope, slogging through mud and mosquitoes, pulling the boat upstream. Another man would ride the bow with a pike pole, keeping the pointer away from the bank. We'd travel upriver like this for maybe a hundred miles.

"Then we'd begin working our way downriver, rolling logs into the river with peevees, sometimes wading in water up to our armpits, and pushing logs out of side channels and backwaters. At night we just slept in our wet clothes on the river bank.

"We didn't have much money (we got two dollars a day), but we knew how to watch out for each other and make life a little easier. I was always the youngest in the group, and I didn't drink, so my job was to tend a still at the top of the boom. When we'd go upriver there were trappers who ran their own little stills and would give the guys moonshine. We'd give them each a ten-pound bag of sugar, and they'd have another batch ready next time we came through.

"Log driving was a dangerous job back then. You were expected to be nimble enough to keep on top of those little black spruce and jackpine logs. After falling in the river a few times you either learned how to do it right or

you got off the river.

"Great tangles of logs caught on a rock or gravel bar would sometimes threaten to dam the whole river. We'd go out and roll logs until the whole thing began moving, then everyone made for shore over the churning logs as best he could. If you didn't make it you might run for the front of the drive, hop on one log, hook into another with your pike pole for balance, and try to ride it out.

"There was no Workers' Compensation, no hardhats, and if a guy showed up wearing a lifejacket he'd be laughed off the job.

"In late summer we'd do the final clean down. Up at the top we'd build wanigans, which were big rafts steered by 20-foot or 30-foot oars cut out of logs. The wanigans had tents on them for the cookshack and bunkhouse. If it was a bad drive we'd take horses, and there would be a wanigan for the horses too."

Through the Hungry Thirties Budge Crick kept on trapping in winter and working the log drives in the spring and summer. As his skills improved, he was made foreman for the top half of the river. Also at this time he met and married Mickey, a local girl. They set up camp and began raising a family on the banks of the Athabaska, 18 miles from their closest neighbour.

"River drives seemed to die out about that time," Crick recalls, "so in 1937 we went down to the B.C. coast and I began felling timber. I loved that job. It was all done by hand, and we worked on springboards wedged into the trunk. In that way you could go as high up as you had to in order to get past the flared-out bell on the bottom of the tree. Sometimes we'd be working 20 feet in the air.

"We took just the best trees, mostly fir. Sometimes on the big 15 and 20-foot diameter cedars — they'd all be hollow in the centre — we'd have one man cutting from the inside of the tree and the other from the outside. There's not much of that good wood left these days. We took it all; wasted it. All the hemlock and most of the cedar we cut down and left behind. We filled canyons with it and then just burned it. Now people are crying for it. That just shows how far ahead we looked in those days."

When chainsaws came on the scene, Crick gave up the job of faller. "I couldn't stand the noise. They were just too loud for me. So I went back into supervising, running logging shows and mills around Quesnel."

In 1957 the Western Plywood company in Quesnel (later to become Weldwood) decided to drive logs on the Fraser River and asked Crick if he'd set up the drive and run it. He agreed, and with the help of 75-year-old Stan McNutt, his foreman on that first Athabaska drive, he was soon training men, setting up a finboom system and building a holding pond at the mill.

By 1963 the company had its eye on the west flank of the Rockies in the area around Likely, where there's huge fir, tall and straight and 200 feet high. But the Quesnel mill was 70 miles away and there was no available road system. "Engineers told them they couldn't drive the logs down the Quesnel River," Crick remembers, "so I asked how many rivers their engineers had driven. Of course they hadn't driven any. 'Well, I've driven a few and I say it will work,' I told the company. So they decided to have a go at it." With its 70 miles of almost continuous whitewater, the Quesnel is the roughest river ever driven in B.C. But good jetboats, a trained crew and miles of finbooms finally tamed it.

In 1967 the Celanese Corporation (later to be bought out by Cancel) phoned Crick for help. They had begun to drive logs on the Nass River north of Terrace, using an inexperienced crew, and within three years they had it plugged almost tight with logs. "It looked so terrible that at first I refused to touch it. But about four a.m. one morning I finally decided to take on one more river. I had some ideas I wanted to try out." And for the next nine years he drove logs on the Nass.

In spite of having little formal education, Crick is a creative, intellectually acute man. New ideas, new ways of doing things have always fascinated him. "I decided that a better way of moving logs would be with a pipeline. You'd hook it up at the top of your river so it would fill with water; then you'd just feed logs into it. Once it was set up it would run 24 hours a day with very little maintenance. I got some pipeline people up from down east. They said it would work and they could build it for the cost of a good road." But Cancel couldn't be convinced to go along with the idea, so for three and a half years Crick and his river crew worked year round to clean up the log jams on the Nass and to set up the drive properly.

The Nass drive began a hundred miles upriver from the Pacific. The logs ran down to the salt water, then through 12 miles of tidewater to Iceberg Bay where they were sorted and bundled. Finally, they travelled 90 miles down the coast in booms to the pulp mill in Prince Rupert. Handling individual logs for that 200-mile trip seemed inefficient to Crick, so he devised a system whereby the logs were converted into chips right in the woods, and the chips floated downriver in huge neoprene bags. When they reached salt water they would be tied into big rafts and towed to Prince Rupert. The system was successfully tested, but before it could be implemented the drive was shut down while the mill was being overhauled. The drive never started up again.

Crick was 65 then and decided to retire, ending a 50-year career in the forests of B.C. Budge and Mickey now live well in retirement in Riondel, a quiet little village on Kootenay Lake. "We've lived in the bush all our lives and this is about as close to civilization as we want to come," he says.

Ever active, the 69-year-old Crick defines retirement as just a new set of projects. The new house has to be improved and remodelled, a patio put in. Occasionally he is called in as a consultant on any project involving logs in water. And finally he has time to catch up on his reading in philosophy, history and political science. He is deeply concerned with the threat of nuclear war, and throughout his life he has kept up with the writings of most of the world's best thinkers. Through his own writings and by correspondence with key people, he is trying to do what he can to influence the course of history.

"Man is by nature an aggressive animal. If he hasn't got a challenging environment to channel his aggression into, he turns that aggression towards himself. That's why we need to move off the planet and take on the challenge of settling space, to buy time until we evolve further."

You can tell that Crick, ever the pioneer and innovator, would just love to be among those first space settlers.

Catching Up & Moving Ahead

BACKLOG REFORESTATION

"This place is a sea of snags."

Doug Brewis of the Ministry of Forests' Silviculture Branch surveys the landscape: 8000 hectares (31 square miles) of burnt-out forest southwest of Houston in central British Columbia, the legacy of the Paul Fire that roared through here one summer's day in 1961, destroying prime stands of lodgepole pine and white spruce.

If the seared trees had been in a more accessible location they might have been harvested immediately, before they began to deteriorate; then at least their value as timber would have been salvaged. Salvage logging also would have helped prepare the ground for a new crop of trees to grow back. But the economics of the day dictated that the trees be left to dry out, to rot, to topple and fall, leaving the bleached, barkless snags to pierce the skyline.

NOT SATISFACTORY

About one-half of all B.C. forestland logged or destroyed by fire and insects each year reforests itself relatively quickly from the seed of logged or dying trees, or from standing trees nearby. The remaining one-half may take a very long time to restock itself, or it may grow back in brush or commercially unimportant deciduous trees.

This land is what the Silviculture Branch classifies as Not Satisfactorily Restocked (NSR). In order for it to grow a commercial forest again it has to be planted. Until this planting takes places it stays "on the books" as NSR land.

Of the 1.8 million hectares of NSR land in the province, almost three-quarters of it — about 1.3 million hectares — has been that way for some time; the result of past wildfires, insect epidemics, or the unwise logging practices of men who thought that the forest would always restore itself.

In the case of the Paul Fire site the white spruce never grew back. Today that land is barren; a full 6000 hectares is part of the province's inventory of NSR.

The lodgepole pine, however, suffered quite a different fate. Lodgepole pine cones have the faculty of releasing their seeds under intense heat, providing a sort of automatic reseeding program triggered by fire. So the lodgepole stands wiped out by the Paul Fire are on the way to regenerating themselves. In fact, many of the new pine stands today are so dense that tree-spacing programs are needed to cut down the poorer growth and give the better-looking pines more room to grow.

CATCHING UP

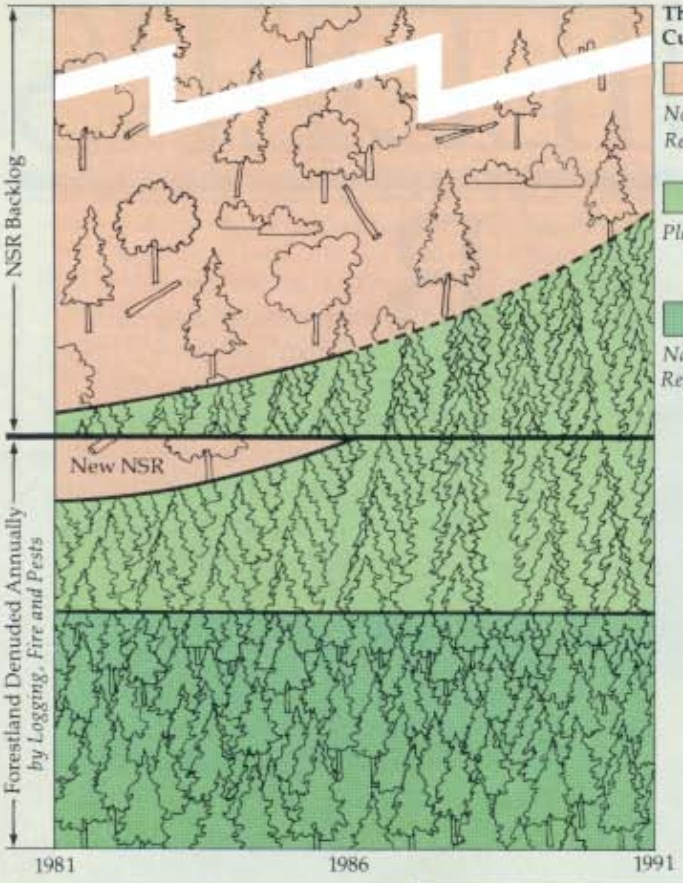
Although most logged or burnt-over forestland, either regenerates naturally or is planted with seedlings, each year some land in need of planting gets added to the province's backlog of unrestocked forestland — but only for the time being.

The goal for 1986, as stated in the Ministry of Forests 1981 Five-Year Forest and Range Resource Program, is to be planting about 43 percent of all forest areas logged or burnt each year; the remainder is planned for natural restocking. Once this point of equilibrium is reached, the NSR total will stop accumulating.

"The reforestation of recently-logged areas is our highest priority," says Doug Brewis, whose prime interest as a forester is B.C.'s NSR land. To meet this reforestation need, the Ministry and private forest companies are expanding their tree nurseries considerably.

"We are already reforesting some of the long-standing backlog as well," Brewis adds. "And once the rate of reforestation in the province catches up with the rate of logging and the loss of timber to wildfires, then we will increase our emphasis on reforesting those hardcore backlog areas. By 1986 we should be planting 41,000 hectares of backlog annually; that's about 40 million trees."

The 1961 Paul Fire in central B.C. destroyed 8000 hectares of lodgepole pine and white spruce (right), and much of that area is now classified as Not Satisfactorily Restocked (NSR). Today the Ministry of Forests' backlog reforestation program is working to make the land productive once again.



GETTING THE JOB STARTED

An added impetus to getting on with the job of reforesting B.C.'s accumulated backlog of unrestocked forestlands was provided by the Canada-British Columbia Subsidiary Agreement for intensive forest management. Between 1979 and 1984 the two governments will share equally in a $50 million silvicultural program which includes $11.5 million for backlog reforestation.

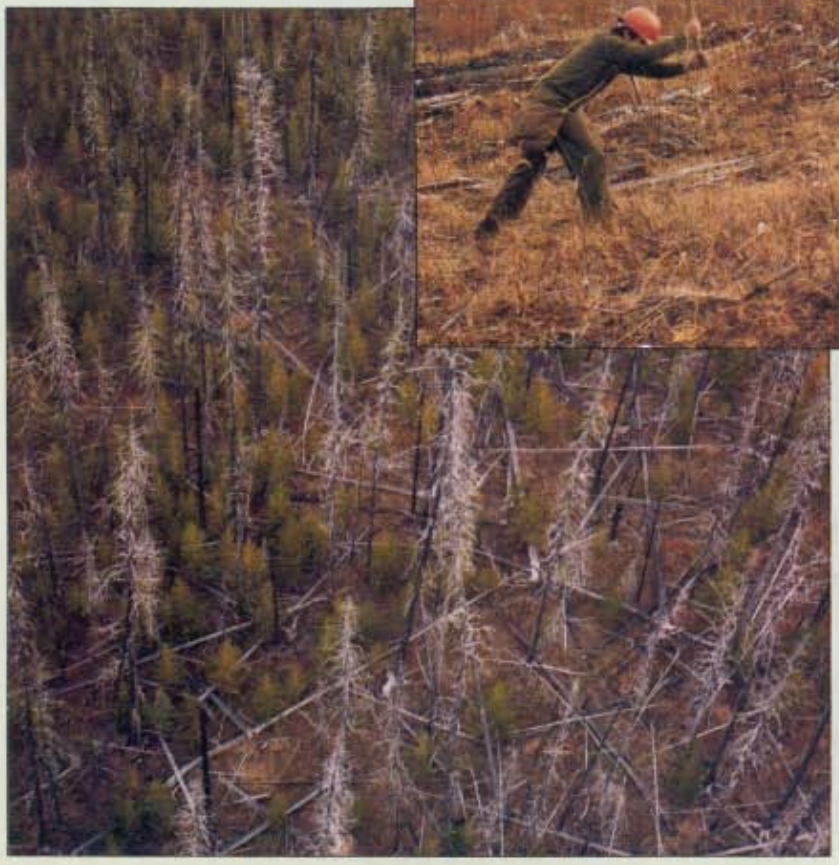
But much NSR land will need a lot of work before it is in a condition to be planted. Brush may have taken over; there may be snags or piles of wood debris; roads may have to be built. At the Paul fire site, some standing snags, weakened by rot, weather, and insects, are a hazard: a strong wind could topple one onto a work crew.

So the Ministry is carrying out operations to prepare the site for planting. A bulldozer fitted with a special brush plow is pushing over the snags and bulldozing them, along with the debris, into huge piles to be burned. Then the treeplanters can move in.

About 57 percent of B.C. forestland denuded by logging, fire or pests regenerates naturally (see diagram); the remainder needs to be planted. Currently a small percentage of land which should be planted each year instead gets added to the province's NSR total. At the same time, treeplanters are reforesting some of the long-standing NSR land. By 1986 the province will be meeting its annual planting requirements and more effort will then go into planting the NSR backlog.

Before the treeplanters (left) could move into the Paul Fire site the snags had to be cleared away by bulldozers to ensure they wouldn't blow over onto the workers.

Unlike the white spruce, the lodgepole pine regenerated vigorously following the Paul Fire (below left). Today many of the young pine stands are so dense that tree-spacing programs are required to cut out the poorer growth and give the better-looking trees more growing room.



The Ministry is also using the Paul Fire site to test new techniques and equipment, including an experimental planting machine. ("Hand-planting is still the best all-around way to go," says Brewis.)

Land like the Paul Fire site is a challenge; it will be some time before white spruce and well-spaced pine stands once again cover these 8000 hectares. But the job has begun.

A fifteen minute film on backlog reforestation is available from the Ministry of Forests. For further information write: Reforestation: Catching Up, *Information Services Branch, Ministry of Forests, 1450 Government St., Victoria, B.C. V8W 3E7.*

NEST BUILDERS

FOREST HABITAT

by **Enid K. Lemon**

Birds: descended 140 million years ago from reptilian stock similar to that which produced the dinosaurs, today they can be found in every conceivable niche in every continent in the world. Equally far ranging are the styles of nests birds develop to suit their particular needs. B.C. birds' nests styles vary from floating to colonial cup, from pouches to nests made of mud, and from nests in holes and burrows to no nests at all.

American robins

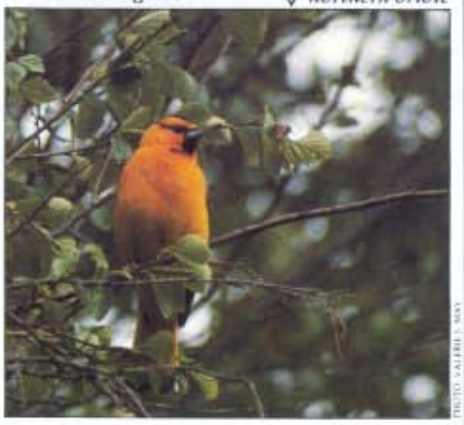
By contrast, Emperor penguins in the frozen Antarctic don't dare leave their eggs exposed to the elements. The female lays a single egg, and the male immediately gathers it onto his feet and belly and forms a protective mantle for it with the feathers of his belly. And not all birds use the heat of their bodies to incubate their eggs. The mallee fowl of Australia builds a mound of vegetation up to ten feet high around its egg chamber. The male bird is responsible for keeping the temperature at a constant 92°F. He does this by opening up the mound or adding more sand to it. Although the birds of British Columbia cannot lay claim to nesting activities as bizarre as those of the penguins or mallee fowl, they nonetheless produce a wonderful variety of nests.

△ *red-necked grebe*

Many secluded lakes within our forests are home to the red-necked grebe, which belongs to a primitive order of birds little changed over 80 million years. In May the waters will resound with its eerie call, which is rather like the whinnying of horses. Once a pair of grebes has concluded its courtship, the birds settle down to building their nest. This is a floating platform built of rotted vegetation and attached to the fringe of emergent plants. The nest will rise and fall with the water. When alarmed, the grebe sitting on the nest will cover the eggs with nesting material before flying off. This camouflages the eggs and also helps to keep the nest at a constant temperature.

One of B.C.'s most beautiful birds, the northern oriole, migrates from Mexico to the Okanagan. In the spring, the hen, a superb artisan, builds a hanging nest about six or seven inches deep. This bird (if a yearling), although never having seen a nest built, will go about building its new home as if it had graduated from a school of oriole nest engineering. The hen spends much of her time upside down as she twines strips of plant fibre around the supporting twigs, pushing and pulling in rapid succession to weave the dangling mass together. When the sides are finished she picks up the looser ends of the hanging strands and weaves them into the base.

▽ *northern oriole*



The framework is complete in about three days, and the hen then starts to work on the interior. The end result is an exquisitely built nest of plant fibres lined with hair, wool and fine grasses. She builds so skillfully that her nest may survive the winds and storms of several winters.

Another master of the hanging nest is the bushtit, a bird whose range is confined to the lower mainland and Vancouver Island (it didn't make it across the water until the mid-1940s). These little grey ghosts of the forest use mosses and lichens interwoven with spider webs, and any other light pieces of vegetation, to fashion their seven-inch to 12-inch nests. Built not more than 15 feet from the ground, these nests are found in various trees and shrubs. Ocean Spray (*Holodiscus discolor*) is a favourite shrub of the bushtit, no doubt because the old flower sprays hang on the bush all winter long and aid in camouflaging the building of the nest.

△ *bushtit*

The bushtit begins its nest building by making a small sack. The bird then disappears inside the sack and the whole affair shakes violently and bulges out in various places as the bushtit extends and stretches the shell to fill in the weak spots. The hood and nesting hole are the last portions of the nest to be built. As the nest nears completion, the bushtit lays down a lining of spider's webs, down or feathers on the passage way and on the bowl where the five to seven eggs will be laid. The bowl of

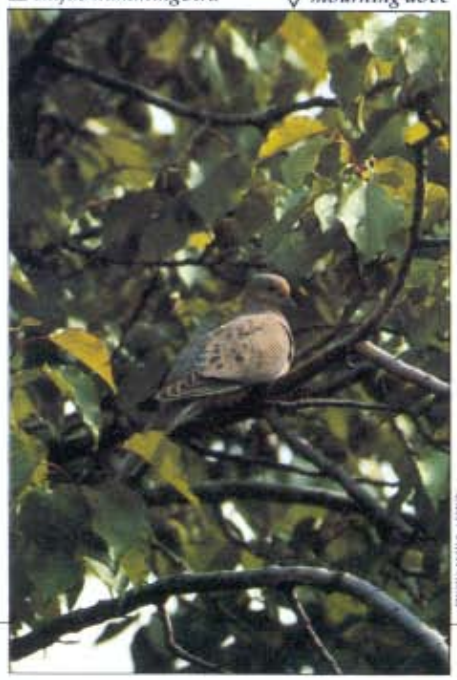
the nest is thickened, no doubt to provide extra insulation.

Apart from the hummingbirds, the bushtits are the smallest birds to be found in the province, yet of all B.C. birds they build one of the most elaborate nests. These incredible feats of avian architecture can be built in as few as 13 days. The eggs are incubated for 12 days; in another 14 to 15 days the young are ready to leave the nest. After this short period of being fed by their parents, the young bushtits are on their own, searching every nook and cranny of the trees and shrubs for insects. In winter you may see flocks of 30 or more smokey grey birds flitting from bush to bush.

deposited his chew on the mantle piece."

As the clusters of swallows' nests begin to grow from their vertical bases, there is much bickering and stealing of mud from neighbour's nests. Before a pair even builds the roof to their home, the four or five brown-spotted white eggs are laid in the nest chamber which is lined sparingly with grasses, hair and feathers. The nest takes about two weeks to complete, growing at an average rate of an inch per day. It has been estimated that 1,200 mud-carrying trips are made before the nest is complete; an amazing feat for birds which are only six inches long from bill to tail tip.

△ *Rufus hummingbird* ▽ *mourning dove*



Some species of birds do not adapt well to changes in their environment, but others may even increase their numbers as conditions around them alter. Cliff swallows, for example, which used to nest almost exclusively under the overhangs of cliffs, have taken full advantage of the overhangs of bridges, barns, and many other man-made structures to build their homes. Each spring some of these master masons come north to build their gourd-shaped nests. Their wants are simple: a good supply of damp mud. Elliott Coues, a pioneer ornithologist, observed that each bird rolls a gob of mud, which is mixed with saliva, and sticks the pellet against the last one "as careful as even a sailor, about to spin a yarn,

△ *marsh hawk* ▽ *cowbirds and friend*

The American robin's nest is typical of the familiar cup-shaped nest. It is made up of grasses lined with mud and is usually located in the crotch of a tree or shrub. Like all cup nests, it is most important that it fit the shape of the bird so as to hold in the body heat of the female while she sits on her eggs. So the robin moves round and round in the damp mud, smoothing it out to make sure of a snug fit. The nest is completed with a lining of soft grass on which three or four beautiful pale

▽ *American robins*

greenish blue eggs are laid.

B.C.'s smallest hummingbird, the Calliope hummingbird, migrates to the southern interior from Mexico; a long distance for a bird measuring a mere three inches and weighing about one-tenth of an ounce. Its beautiful cup nest, built entirely by the female, is made of plant down, lichens, and mosses and is laced together with spider's webs. The nest is saddled on a branch, often beneath another branch. This gives it protection and helps to conceal it from predators.

The nesting season is a critical time, not only for the brood, but also for the parent birds, as this is the time when they have cause to fear the attacks of their enemies. This also explains why so many nests of smaller birds are so well hidden.

Some birds' nests are simple twig affairs, such as the one built by the mourning dove. Its nest may consist of just a few twigs on a branch of a tree or on the top of an old stump. Here, two eggs will be laid and the chicks which hatch will be one of each sex, hence the expression "pigeon pair."

△ *cliff swallow*

Some birds do not construct a nest, but lay their eggs on the bare ground. The common nighthawk, which belongs to the goatsucker family (so named because in ancient times it was thought that with their big mouths they sucked the milk from goats), lays its two eggs on the rocky knolls in the forests. The colours of the surroundings match those of the protective colouring of both the bird and its eggs.

The brown-headed cowbird builds no nest of its own. It is a parasite, laying its eggs in the nests of other birds; records indicate that it has made use of the nests of over 200 different species of birds. One of the first recorded observations in British Columbia of this behaviour was in 1911 in the Okanagan, when a chipping sparrow's nest was found to contain a cowbird egg. The cowbird's range expands in relation to the development of agricultural lands, and it made its way to the farmlands of Vancouver Island by the late 1940s.

The brown-headed cowbird is aptly named *Molothrus ater*, which means "dark greedy beggar." The cowbird also lives up to its common name. Flocks of glossy black, brown-headed males and grey females throng around herds of cattle, snatching the insects stirred up by the animals' hoofs. They also alight right on the animals' backs to pick off ticks and other pests.

But for most birds, building a nest for the summer breeding season is the most important job they ever do. Take a walk through the forest with birds' nests in mind and you will be amazed at the number you find.

Province of British Columbia
Ministry of Forests
HONOURABLE TOM WATERLAND, MINISTER

Know the code

This sign provides a general indication of how easily fire can start in the area where you are. Make a note of it. Depending on the area, restrictions on campfires and activity in the forest may be in force: check with the local Forest Officer or look for announcements in the newspaper or over radio and television.

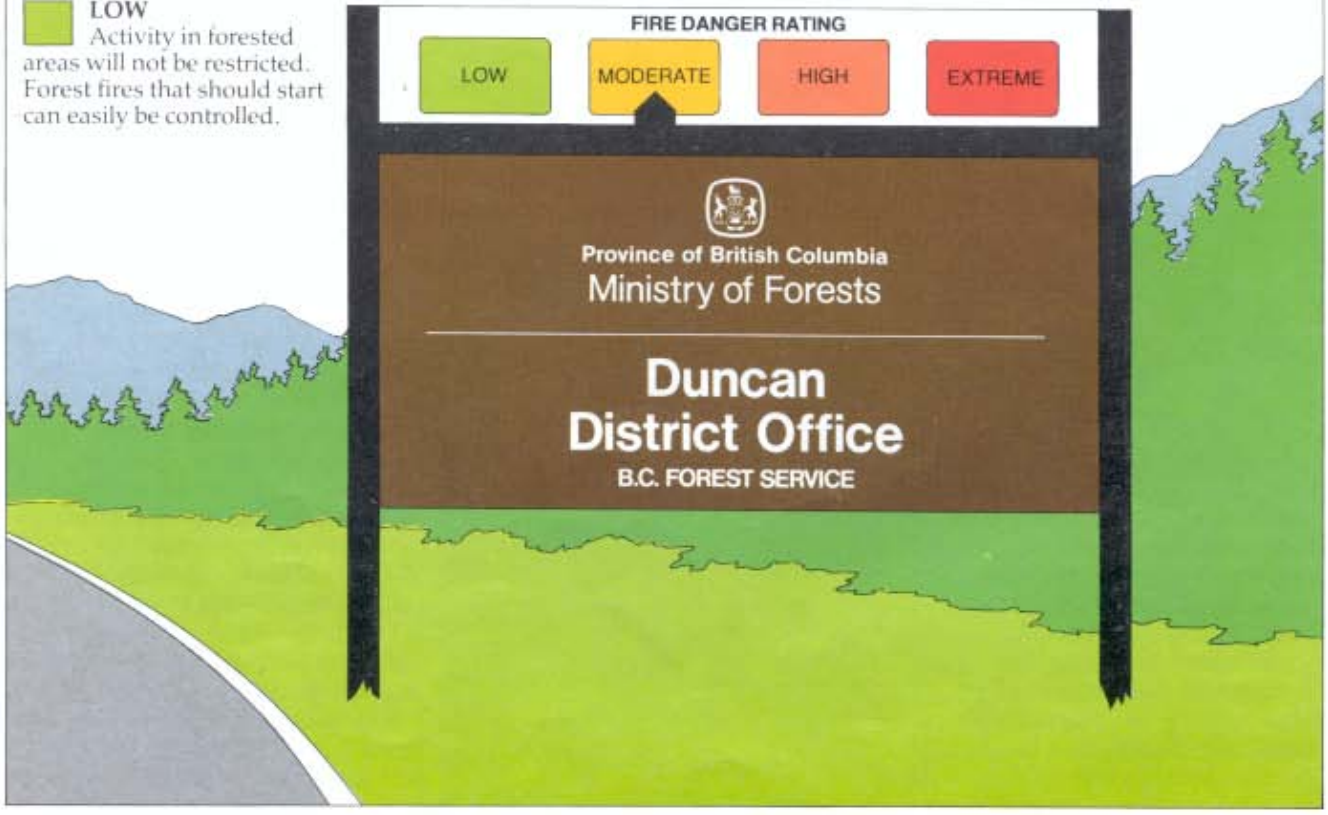
LOW
Activity in forested areas will not be restricted. Forest fires that should start can easily be controlled.

MODERATE
Activity in forests will normally be unrestricted. Forest fires that should start can be controlled fairly easily.

Extra caution should be taken around areas of logging slash and natural forest debris such as trees blown down by wind, because this material is starting to dry out.

HIGH
The forests are generally dry. Fires break out easily and are difficult to control. Light brush and forest debris can catch fire after only a few days sunshine.

EXTREME
The forests are very dry. Fires break out very easily and spread so quickly that they may be difficult to control. Most forest fires under these conditions can be extinguished only by a change in the weather.



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