Environment Canada
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Environment Update

Vol. 4 no. 2 July 1983

Featuring: Forestry

Budgeting for Forest Needs

Timber Production Agreements

Ice Tracking Aircraft

CL-215 Water Bombers

Parks

Canada

Environment Update

Over the years Environment Canada has become increasingly aware of its responsibility towards its diverse publics. The aim of *Environment Update* is to inform interested people about the programs & activities of our department. We recognize the value of working cooperatively with Canadian citizens & our colleagues outside of government. We are in fact, creating links. These links will allow us to meet our objective along with those who share our concern for a better Environment.

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Contents

Budgeting for Forest Needs ____ 3

Researching Acid Rain ____ 5

Strip Cutting Advocated ____ 6

Biological Control of Insects and Pests ____ 8

Aircraft for Ice Tracking ____ 10

Pukaskwa New National Park ____ 13

Information Access Legislated ____ 15

Agreement Saves the Skagit ____ 18

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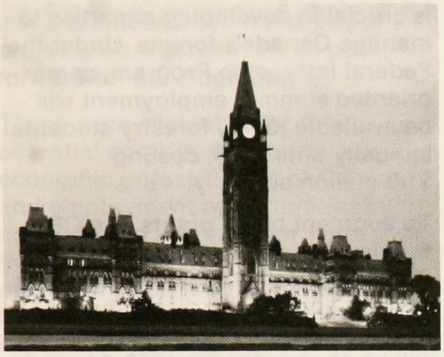
Minister's Message:

Moving to Save our Forests



A century ago Sir John A. MacDonald warned the Canadian people, "We are recklessly destroying the timber of Canada." If he were alive today, he might well express the same concern.

When I took on the Environment portfolio just a few years ago, I was struck by the remorse and recrimination I heard from all quarters about the terrible state of Canadian forestry.

There was considerable exaggeration, emotion and rhetoric in this, but a good deal of truth as well — enough to make it plain that something needed to be done quickly, to ensure Canadians a sustained flow of benefits from the industrial and social use of our forests. In a relatively short time, we have made significant progress in this direction. In 1980, the elevation of the Canadian Forestry Service to full service status recognized this organization as the principal source of federal expertise in Canadian forestry.

Under new and stronger leadership, the CFS undertook a major policy review which led to the publication, in October 1981, of a discussion paper entitled *A Forest Sector Strategy for Canada*. This paved the way for concrete action to address the key forestry issues facing Canada: timber supply, the development of human resources for the forest sector, research and development, and market development.

In 1979, the Canadian Council of Resource and Environment Ministers set supply targets for increasing the timber harvest by 40 percent by the year 2000. Along with my provincial colleagues, I believe we can achieve this through forest renewal, better protection of existing and new forests, and more efficient use of currently available timber supplies.

Our forest renewal policy, *A Framework for Forest Renewal*, published in September 1982, set forth a five-year game plan to work towards this objective. This calls for a combined spending program by governments and industry that would grow from $240 million in the first year to about $650 million annually by 1987. In line with this program, we have obtained approval in principle to increase direct federal support for provincial and private-sector forest renewal efforts up to $130 million annually by 1987 — an increase of nearly 300 percent compared with 1982 expenditures of some $50 million.

This federal forest renewal policy will give rise to a new generation of federal-provincial agreements to revitalize Canada's forest resource. I signed a Forest Resource Development Agreement with Nova Scotia in August 1982, and I expect to sign another shortly with Prince Edward Island. Discussions and negotiations are under way with the other provinces, and I expect new agreements to be in place across Canada by 1985.

Under these agreements, federal funds will go toward intensive forest management activities such as spacing young stands, rehabilitation of idle, productive forest land, incentives to small private woodlot owners and effective management of federal forest lands. The provincial governments and other large landowners will be expected to meet the direct costs of prompt regeneration after each timber harvest.

Success in meeting the forestry challenge in Canada will also depend on the number and quality of foresters that Canada's six forestry schools can produce. To help forestry schools enhance the quality of postgraduate training and research, we recently obtained Cabinet approval for multi-year grants amounting to $15.5 million through 1987. We expect provincial governments and industry will supplement these initiatives.

Programs to establish new forests and increase the productivity of existing ones will not yield expected results unless we can protect the resource. To enhance forest fire protection, the federal government

John Roberts Minister

has supported the establishment of a Canadian Interagency Forest Fire Centre in Winnipeg to improve operational communications among Canada's fire control agencies; currently we are assuming one third of the centre's operating costs.

Moreover, to reduce losses of valuable timber in all provinces, the federal government has announced plans to spend up to $147 million to constitute a national fleet of CL-215 fire bombers, under the terms of a federal-provincial cooperative supply agreement.

Implementation of the forest sector

(Continued on Page 7)

Training Future Foresters

A special effort to assist in training people for forestry work is under way by the Canadian Forestry Service.

A Forest Sector Strategy for Canada, a policy paper released by Environment Minister John Roberts in 1981, identified Canada's dwindling wood supply as a major problem. It also concluded that Canada's research in forestry and forest products was inadequate, and predicted a severe shortage of professional and scientific manpower in forestry.

Canada's six forestry schools would have to produce about 800 graduate and 150 post-graduate students annually for the next 10 years. These numbers, needed to implement the forest sector strategy, are twice current annual totals.

Although the Canadian Forestry Service (CFS) has been providing financial support to the forestry schools for several years, it was evident they would not be able to meet these objectives without additional help.

On March 14, 1982, Mr. Roberts announced that Environment Canada would provide $15.5 million to support, until 1986, four major elements of the strategy's human resources component. These included increased block grants to forestry schools, increased funding for university contract research, career-oriented summer employment for forestry students, and funding of a Canadian Forestry Scholars program.

Block grants to forestry schools were increased last year to $1 million, from $289 000 in 1981-82. In the 1985-86 fiscal year, funding will increase to $2 million. This will significantly boost the forestry schools' capability to provide aid to graduate students, finance research projects and purchase scientific equipment. Block grants will also support programs for visiting professors and research associates, to improve the quality of graduate training.

Research and development contracts with universities will enable the entire Canadian university community to undertake research in forestry and forestry-related areas. One million dollars have been allocated for 1983-84, increasing to $1.8 million in 1985-86. Projects under this program complement research in CFS regional establishments across the country. It will allow universities to compete in such fields as biotechnology, economics, ergonomics and occupational safety and health.

Exposure to students to work practices and research methodology is crucial in developing expertise to manage Canada's forests. Under the Federal Internship Program, career-oriented summer employment will be available to 300 forestry students annually until 1986, costing $1.2 million annually.

To augment block grants, the CFS will develop scholarships to assist Canadian post-graduate students in forestry and related disciplines. About 30 Canada Forestry Scholars will be chosen for the 1983-84 academic year — perhaps increasing to 50 by 1985-86.

Besides making forestry more prominent within the universities it will encourage increased funding for forestry education from the provinces and industry.

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Economic Trends in Forestry

One of Canada's leading industries and employers is the forest products industry. For years, it has played a major role in the nation's economic development and export trade. It is still the economic mainstay of hundreds of communities across Canada. For the past two years, however, this key sector of our economy suffered unprecedented hardship as world recession reduced demand for all grades of Canadian forest products.

In dollar value, newsprint is Canada's leading export commodity in the forest sector. But the recession depressed business in the United States, the United Kingdom, western Europe and Latin America, where Canada sells over 90 percent of its newsprint exports. Demand fell, moreover, as capacity increased. Consequently, Canadian newsprint mills now operate at only 82 percent of capacity compared to 94 percent in 1981. No significant recovery is expected before 1984.

Wood pulp is Canada's second most important commodity, with the United States, Europe, Japan and other Asian countries accounting for some 92 percent of our exports. Weakened business conditions in those markets resulted in a 12 percent decline in production at Canadian pulp mills in 1982.

Operating rates fell as low as 75 percent in 1982, and this year are expected to fluctuate between 83 and 87 percent.

As reduced demand increased competition, prices for newsprint and pulp fell by as much as $150 U.S. per tonne. The situation was made even worse for Canadian producers, as some overseas competitors devalued their currency with respect to the Canadian dollar.

Lumber markets reflected reduced consumer spending, particularly in the United States. There housing

(Continued on Page 18)

Budgeting for Forest Needs

Major benefits to Environment Canada's forestry program are included in the $2.4 billion special recovery capital projects (SRCP) program announced in the April 19 budget speech. The process started last December when hundreds of projects were screened and put forward for consideration.

These were evaluated for their potential contribution to the economic infrastructure of Canada and employment opportunities in construction and supplier firms over the next two to four years. Over 100 capital projects were selected from all areas of government and from all regions of Canada.

SRCP funds are being used to accelerate the projects, being undertaken now when they can contribute to economic recovery by providing job opportunities. Facilities now being set in place will help our industries to be more productive and competitive over the rest of the decade and beyond — particularly in the areas of construction, shipbuilding, fisheries and forest products, which are currently weak.

$1.7 billion is an injection of new money. Some $700 million had previously been budgeted for these projects in department operating plans. The projects focus on six key areas: transportation, research and training facilities, resource development, vessel procurement, land and tourism development, and high-technology development.

Forestry is a major beneficiary. The $290 million to construct research and training facilities covers additions to forestry research centres in Ste. Foy, Québec, $10 million; in Sault Ste. Marie, Ontario, $13 million; and Victoria, B.C., $14 million; and construction of a new facility in Fredericton, N.B., $22 million.

"Expansion of these research facilities represents a significant step to implement its Forest Sector Strategy for Canada," said Environment Minister John Roberts. "It is a major step in launching an aggressive policy of research and development in forestry to support forest renewal and management."

Further support by the SRCP program to forestry-related concerns includes $15 million for construction of a new pulp and paper research facility at Vancouver and $2 million for an addition to the facility at Pointe Claire, P.Q.

The program is making $147 million available to purchase four CL-215 water bombers for fighting forest fires in the territories and up to 16 of these aircraft on a one-to-one matching basis with the provinces for their own use. Negotiations are currently under way with the provinces, and the extent of their participation in this purchase program should be determined soon.

Canadian-built CL-215 water bomber.

The area of timber lost to forest fires in Canada regularly exceeds the area harvested. During the record 1980 season, the burnt-out area was equivalent to 6 km wide strip from coast to coast. Annual timber losses are about $53 million.

The Canadian-built CL-215 is the only aircraft designed specifically for fighting forest fires. Its high wing, short body and large tail enable it to turn on a dime, and it takes about 10 seconds scooping through the water to fill its tanks with 4 350 litres of water. Environment Canada's ice reconnaissance program also received a substantial boost from the SRCP program, as did the department's efforts directed toward for parks, tourism and environmental quality.

The government has also offered a contribution of $10 million toward construction of an institute for toxicology at Guelph planned as an important Canadian research centre. As part of a larger effort across the country, the institute will study effects of toxic substances on health and the environment. It should help the Canadian chemical industry to branch into other areas of chemistry and make better use of our petrochemical resources.

In the Niagara area, where toxic chemicals have caused pollution on the United States side of the river, the government has offered $3 million to help the regional municipality of Niagara install second-stage sewage treatment. This will use a biological process on the 59 million litres of waste water handled each day.

A $37 million allocation will go for the purchase of the DASH-7 Ranger aircraft for use along Canada's east coast. This will enable the department, for the first time, to provide an iceberg surveillance and

(Continued on Page 9)

Agreements to Increase Timber Production

Canada's timber supply will likely increase as a result of new federal-provincial agreements.

The first five-year Forest Resource Development Agreement was signed with Nova Scotia last August. Similar agreements with other provinces, still being negotiated, are expected to take effect before April, 1985.

The Nova Scotia agreement will cost an estimated $53.4 million, including a federal contribution of $27.8 million. It provides for a program of forest resource enhancement on private lands. Until January 1982, Forest Subsidiary Agreements were administered by the Department of Regional Economic Expansion (DREE), providing a wide range of assistance to the provinces. This responsibility then was transferred to the Canadian Forestry Service, which previously played a supporting role. The new agreements will be consistent with the CFS Forest Sector Strategy for Canada, and the guidelines set forth in its *Framework for Forest Renewal*.

Under these guidelines, provinces are required to develop long-term forest management plans. The agreements will call for intensive forestry, particularly regeneration and stand improvement. They will place increased emphasis on the management of private woodlots — especially important in eastern provinces, where much forest land is privately owned. Besides increasing timber production, federal initiatives are aimed at providing more jobs in the forestry sector. In May of last year, unemployment in forestry reached record levels, prompting the government to direct $140 million of unemployment insurance funds into job creation in that sector.

In June 1982, the Canadian Forestry Service was allocated $34.5 million to cover overhead and other costs of administering this program.

The initial goal was to create 10 000 short-term jobs over a two-year period, until the end of March 1984. By the end of last April, 793 projects had been approved, providing jobs for slightly more than 10 000 persons, some 166 000 weeks of work. *The Forest Sector Strategy for Canada* identified renewal and management as the key issue in forestry. Federal programs have impressed its importance on owners of private woodlots, on forest employees and on hundreds of Canadian communities.

Research is also focused on improved management, with projects on such topics as tree seed development, biological control of pests, improved wood utilization, harvesting and obtaining energy from biomass. Other studies are concerned with the environmental effect of major development projects, the long-range transport of acid rain and effects of toxic chemicals on soils and vegetation.

Research is still a major concern of CFS as it was for the old Forestry Branch established 83 years ago as part of the Department of the Interior. Today CFS maintains six regional research centres and two national forestry institutes, which have won worldwide recognition for excellence in research and development.

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Woodlot Accords Signed

Eight associations of Nova Scotia woodlot owners, representing nearly 600 small holdings throughout the province, have signed forestry improvement agreements with the federal and provincial governments. Signatories included federal Environment Minister John Roberts and Nova Scotia Lands and Forest Minister George Henley.

The agreements are part of a program aimed at doubling normal woodlot growth rates. They call for planting seedlings, cleaning out overly dense stands, thinning stands to provide more room for trees to grow, and improving the quality and capacity of previously harvested sites.

The woodlot agreements were made under a broader five-year accord signed last August by the federal and Nova Scotia governments. This was the first of a series of similar federal-provincial agreements, aimed at boosting timber production. Under the Nova Scotia accord, the federal government is contributing $27.8 million in forest renewal incentives to woodlot owners. The province has committed $21 million for better forest management on Crown land, including land licensed to forest products companies.

Nova Scotia is contributing another $3 million toward the operating costs of group forest management and marketing ventures, to make better use of smaller parcels of land. It is also providing up to $500 000 for improving mill productivity and the efficiency of forest industry processing.

The federal and provincial governments will jointly contribute $1 million for related education, information and evaluation programs.

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Researching Acid Rain

The two Atlantic Region forest research centres are hotbeds of research on the effect of acid rain on forests. Both are operated by Canadian Forestry Service.

Kevin Percy, of the Maritimes Forestry Research Centre, has attracted international attention with his laboratory research showing that acid rain detrimentally affects tree seed germination, seedling root development and needle growth.

Mr. Percy has been experimenting since 1979. He constructed acid rain chambers in his laboratory, in which he subjects a variety of hardwood and softwood tree species to various chemistries and concentrations of acid rain like those occurring naturally. To date he has discovered that the acidity inhibits germination in some species, and subsequently affects the development of shoots and needles in some species. Acid rain also affects the production of secondary meristems (formative plant tissue) and the size of terminal buds.

He plans to extend his studies to a plantation setting, to determine if any additional signs of damage will show up as tree development progresses.

The Newfoundland Forest Research Centre in St. John's has opened a sophisticated acid rain research chamber as one of four components of its new research greenhouse. The acid rain chamber is designed to simulate natural conditions, to enable the study of the long-term effects of acid rain on soil nutrients and plant growth. Experiments will be conducted over a 10-year period, with assessments scheduled at the end of the first, second, fifth and tenth years.

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The Newfoundland Forest Research Centre greenhouse was officially opened by, left, Boyde Case, NeFRC; C. Power, department of forest resources and lands; Les Reed, ADM, Canadian Forestry Service; Dr. Joe Carroll, regional director, NeFRC; Dr. John Hudak, NeFRC.

Forestry Display Travels

Our commercial timber supply is disappearing - fast! Unthinkable; but true.

The once-forested land across Canada that needs to be renewed is equal to an area half the size of Alberta.

These are two of the hard-hitting messages people see as they wander through the Canadian Crisis forestry exhibit, designed and constructed at the Petawawa National Forestry Institute for the Canadian Forestry Service. This year it will be seen in eastern Canada.

Throughout 1982, the exhibit was viewed extensively in western Canada. It was part of the Pacific National Exhibition in Vancouver, Buffalo Days in Regina, the Canadian Nature Federation annual meeting in Calgary, and an interpretation workshop in Banff. It was also on display in Victoria and Edmonton and parts of Ontario — in Toronto, Sault Ste. Marie, Kingston and Lindsay.

The display consists of a backdrop and large cardboard fabric-covered "sonatubes" some 7 feet high and 3 feet in diameter, complete with graphics and gadgets. It is extremely flexible to fit the space available — ranging from 20′ × 20′ to 50′ × 40′.

Here are just a few other points made by the exhibit:

- Usable and accessible timber is in short supply
- Large areas of forest land have never been renewed
- We must give nature a helping hand with forest renewal if we are to meet increasing demands for forest products
- The removal of forest cover from an area changes the land.

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Strip Cutting Advocated

The use of clearcutting in alternate strips to obtain natural regeneration is the objective of a cooperative research project now under way. Taking part are Environment Canada's Great Lakes Forest Research Centre, the Ontario Ministry of Natural Resources and Domtar Forest Products.

Because of its superior pulping qualities, black spruce is the most important tree species in Ontario. It accounts for some 40 percent of the volume and value cut from Crown land in the province.

The most widely practised method of harvesting is clearcutting, but currently a sizable proportion of the cutover forest is not satisfactorily regenerated. Upland sites with very little soil over bedrock are particularly susceptible to damage from mechanical logging equipment, and these sites are also difficult to regenerate owing to too little soil, or too great exposure to wind and high temperatures.

First cut strips are regenerated by seed from the adjacent residual strips, which also serve to protect the regeneration from excessive drying.

The prescription for strip cutting includes mechanical site preparation to prepare receptive seedbeds. Seedling-seedbed relationships have been studied in detail to determine which seedbed conditions are best, and how much preparation is required.

The system produces satisfactory spruce regeneration in the first cut strips. However, if trembling aspen or white birch are present in the precut forest, there may be considerable regeneration of hardwoods competing with the spruce.

Strip cutting has also been applied successfully in black spruce forests on peatlands. These are also fragile sites, because of their susceptibility to skidder damage when logging is carried out in the summer.

Studies of blowdown are being done to determine how much timber is lost along the edges of residual strips between the time of the first cutting and the harvesting of the leave strips. Meanwhile studies of soil and hydrology are being conducted, and an assessment of the costs of the method over and above those of clearcutting has been completed.

A number of approaches are being tried to determine the most efficient way to regenerate the second cut strips. These are cut only a few years after the first cuts to minimize blowdown.

Current management strategy in Ontario emphasizes the planting of clearcut areas that are the most fertile and closest to the mill. Although there are a number of problems to be overcome, strip cutting may provide a less expensive alternative for regenerating those sites that are poorer and farther from access roads or the mill.

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Clearcutting in alternate strips.

Battling the Mountain Beetle

Infestations by the mountain pine beetle have developed to crisis proportions in parts of British Columbia and Alberta. The Canadian Forestry Service and Parks Canada are working with other agencies to control it in western Canada.

In B.C., heavy mortality of mature pines now occurs on over 290 000 ha of forest, and another several million hectares are threatened. In Alberta, the beetle-infested forest extend over more than 11 000 ha, with well over a million trees killed. Pine stands in Waterton Lakes, Kootenay and Yoho national parks and in Cypress Hills provincial parks in Alberta and Saskatchewan have also sustained losses.

Because of the severity of this problem, and the likelihood that the beetle would spread further north and east, federal and provincial officials in early 1981 established the Interagency Committee on the Mountain Pine Beetle. Represented on the committee are the B.C. Ministry of Forests, the Alberta Forest Service, Parks Canada and the Canadian Forestry Service.

The committee's mandate was to develop a coordinated strategy aimed at reducing the spread of the beetle within the Rocky Mountain region along the B.C. — Alberta border. As a result, a control program has been implemented that involves felling and treating beetle-attacked trees where the potential for beetle spread is greatest.

The control program is based on the policies and land-use objectives of the agencies concerned. It is limited to felling and disposing of beetle-infested trees in areas of new or recent spot infestations involving small numbers of trees. Sanitation felling of large blocks of infested timber may also be carried out on provincial lands in accord with forest protection, salvage and other management requirements.

An intensive sanitation control program has been under way in the southwestern corner of Alberta since the spring of 1980. This has so far successfully contained the spread of the mountain pine beetle northward from the Porcupine Hills and the adjacent slopes of the Livingstone Range.

Parks Canada considers forest insect outbreaks within national parks to be natural events, so control action in the parks has been limited to treating a few hundred beetle-attacked trees where adjacent provincial lands were threatened. In Kootenay National Park, critical infestation spots have been identifed, and the infested trees have been tagged, felled and burned. Control treatments within the parks are strictly supervised by Parks Canada staff to ensure they follow its land-use policy guidelines. The felling of infested trees is unlikely to involve large blocks of timber.

The Canadian Forestry Service is providing technical advice on the mountain pine beetle, and is coordinating the implementation and monitoring of the control program. Success of the program will be evaluated by the interagency committee, which will continue to promote further cooperation and exchange of information between the participating agencies.

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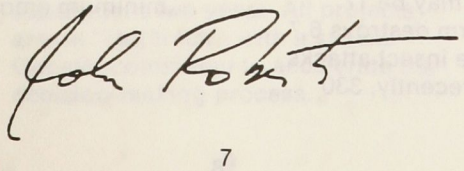
Minister's Message *(Continued from Page 1)*

strategy will require a re-evaluation of forest research and development objectives. The Canadian Forestry Service has already moved in this direction, and has been allocated $5.5 million to this end in the current fiscal year. I will be requesting multi-year funding from Cabinet to launch a major research and development program in forestry. The Special Recovery Capital Projects program announced in the last budget provides for substantial upgrading and expansion of CFS research facilities.

Finally, to enhance the productivity of forest research and development — and also to avoid duplication I have signed agreements with five provinces for the coordination of forest research, and expect to sign a sixth shortly. Moreover, a special Forestry Research Advisory Council of Canada is being formed, which will include industry representation, to coordinate forestry research priorities on a national basis.

These achievements reflects the federal government's commitment to assure the continued viability of the Canada's forest resource.

Forestry is a continuing priority which I propose to address vigorously.



Regulatory Agenda

Interested organizations and individuals may now receive early notice of proposed changes in federal regulatory activities. Each spring and fall, major federal regulating departments and agencies will publish regulatory agendas listing possible regulatory actions.

Copies of the first issue of the Environment Canada regulatory agenda (May 1983) are available from the department's inquiry centre and at regional information offices.

Biological Control of Forest Insects and Pests

Our planet's green mantle is essential to our existence, since it is the storehouse of accumulated solar energy on earth. It creates and purifies the earth's air by absorbing carbon dioxide and giving off the oxygen we breathe, while supplying us with food and energy. In fact, 96 percent of the energy we consume for food and comfort comes in one way or another from photosynthesis. Forests are therefore extremely important, especially since they also preserve soil and water.

A forest produces more than just logs. It is also a source of paper, clothing, cellophane, alcohol and various other products. It will also be a source of food — of steaks and candy. Moreover, it is impossible to assess in monetary terms its role in protecting our environment. Without taking into account the green mass, which will be put to use in the near future, the value of one hectare of mature forest is $2 000. From one cubic metre of wood, which usually weighs one tonne, it is possible to produce 60 litres of methyl alcohol, 6 000 square metres of cellophane, 200 kilograms of glucose and 1 500 metres of viscose. Therefore it is essential to protect our forests.

Noxious Insects

Periodically, certain species of harmful insects, especially defoliating insects, invade our forests and cause vast devastation. We must therefore use all possible methods to protect our forest resource. We can effectively control these pests by using microorganisms that cause disease in insects — notably the spores of the bacterium *Bacillus thuringiensis* 3a3b, and insect viruses such as nuclear polyhedroses. There have been many successes with biological control of forest insects. Here are two examples:

A. SPRUCE BUDWORM

The spruce budworm is the most serious pest in fir and spruce forests in eastern North America. Since the beginning of the century, there have been three waves of major invasions which began around 1909, 1940 and 1967. These epidemics usually followed a dry warm spring, favorable to development of the insect when a forest has reached maturity. Budworms drift with the wind in clouds up to 200 kilometres long, whose movements can be followed with radar. When the moths emerge in late July and early August, each female lays 14 to 60 eggs. The larvae hatch 10 to 12 days later, and roll up immediately in hibernation shelters — without eating — to spend the severe northern winter.

During an epidemic, an average tree branch has 35 larvae per 45 cm. That means about 10 000 caterpillars on each fir — 0.5 kg of larvae which, placed end to end, would measure 300 metres. On one hectare there may be 17 million insects. In a single year, the budworm destroys 6.7 tonnes of new foliage per hectare; when the insect attacks 50 million hectares of forest, as happened recently, 330 million tonnes of new foliage are lost.

Attempts to control this insect have been carried out for several years, including the aerial spraying of tonnes of chemical insecticides. However, because of certain problems with chemical control, intensive research has been done to find effective alternatives. One of them, the biological method using *B. thuringiensis*, is especially promising when the overall control strategy takes into account the vulnerability of the forest stands and the state of the budworm population.

(1) Endemic Situation

When the budworm population is stable, parasites, predators and microorganisms are extremely important in maintaining the equilibrium of the forest system. The most modern techniques must then be used to constantly monitor the forest ecosystems. If there are signs that the equilibrium is threatened, massive numbers of parasitic insects, as well as predators such as ants, mice, shrews and birds, must be introduced to re-establish the equilibrium.

(2) Equilibrium Disturbed

A budworm epidemic can result from an imbalance in various factors such as fertility, dryness, parasites, predators and insect diseases, taken as a whole. Then predators, parasites and diseases lose their special controlling function.

In this kind of situation, control methods involving the introduction of massive quantities of predatory or parasitic insects cannot be used. Instead we must use microbiological control methods, since these are specific and do not aggravate the imbalance caused by the budworm epidemic. Unlike chemical insecticides, the use of disease-causing microorganisms does not completely eliminate budworm parasites and predators. At present the most acceptable, most radical and most economical biological method for controlling the budworm is the use of *B. thuringiensis*.

(3) Outbreaks

For the past several years there has been a widespread budworm epidemic affecting a large part of the forests in eastern North America. In this situation, all suggestions regarding the use of parasites, predators, pheromones, attractants, repellants and so forth are totally unrealistic. Instead the use of *Bacillus thuringiensis* seems absolutely necessary to save our forests, even if only to preserve a minimum amount of foliage and to keep the trees alive.

Bascillus thuringiensis: B.t.

This bacterium specifically attacks the larvae of butterflies and moths. In some species, it produces toxemia; in others, particularly budworms, its spores produce a kind of septicemia.

However, this bacterium does not affect plants, other insects, human beings or any other animals. Because it is exceptionally safe, *B. thuringiensis* has already been used for several years as a biological, non-polluting insecticide to protect agricultural plants and to preserve stores of grain. It is produced industrially in various countries for this purpose, particularly in the United States and France. The technology for obtaining it through fermentation has thus already been developed.

The basic and applied research done in the past 10 years, especially that conducted by the Insect Pathology Section of the Laurentian Forest Research Centre (LFRC), has shown that the use of this bacillus is essential to effective and economical control of the spruce budworm. LFRC has developed a compact and concentrated suspension of the spores, making it possible to spray the required dosage (20 billion I.U./ha) in a low volume of suspension (2.5 l/ha). Experimental aerial spraying has shown that this preparation is effective and economical for controlling the budworm.

B. SWAINE JACK PINE SAWFLY

Stands of jack pine in North America used for lumber and paper production periodically suffer severe infestations of the Swaine jack pine sawfly. A viral infection detected in this insect killed only a small proportion of them until its virulence was increased through scientific selection. Then the death rate from this virus among the sawfly larvae reached 95 percent.

Further studies showed that the virus could be used economically to control the Swaine jack pine sawfly. Thus aerial spraying of an aqueous suspension of the virus at 2 million polyhedra/ml in 4.7 l/ha killed more than 95 percent of the insects. Moreover, spraying when the larvae were at an advanced stage caused 70 percent mortality, ensuring the continued presence of the viral infection in the sawfly population through transmission to subsequent generations. Introduction of the virus introduced thus effectively controlled invasions of the insect and protected the forest for 15 years.

Biological control

Biological methods have also proved successful in controlling other forest insects. Besides the spruce budworm, *Bacillus thurigiensis* is used against other budworms, the tussock moth, hoopers, tent caterpillars, the fall webworm and other pests.

The Insect Pathology Section of the Laurentian Forest Research Centre has discovered more than 20 new viruses that attack insects. They have been closely studied to determine how they affect their insect hosts, and how they might be used in forests. Bacteriological control is safe.

Entomopaphogenic micro-organisms that can be operationally used against insect pests are the object of sophisticated tests to evaluate their safety. It was clearly shown that *B. thurengiensis* 3a 3b is absolutely safe for the environment (0 tolerance). Also the tests made with nuclear polyhedrosis viruses are very specific and have no effect on the environment.

Further information:
Dr. W.A. Smirnoff
(418) 694-3944

Budgeting for Forestry Needs *(Continued from Page 3)*

forecasting service, extending the total area of ocean ice surveillance by 500 000 square kilometres.

The advanced sensing equipment in the DASH-7 will be developed and manufactured in Canada. It will provide the capability to spot icebergs in any weather conditions.

This aircraft will benefit oil companies and drill operators working in the "iceberg alley" from northern Labrador to the Grand Banks. It will also demonstrate to potential foreign buyers Canadian competence and technology in coastal surveillance and aerial mapping.

In support of the Parks Canada program, SRCP is providing $5.5 million to fund projects at Pacific Rim National Park — especially to accelerate reconstruction of Highway 4 which runs through the park. This will mean a safer highway and easier access for visitors to the park's facilities and such beauty spots as Long Beach.

In Pukaskwa National Park, along the north shore of Lake Superior, $2 million will speed construction of marine facilities. Pukaskwa is a wilderness park, with road access limited to the northwest corner. The rest can be explored only on foot or by boat, and marine facilities are essential if visitors are to appreciate the park's remote, rugged beauty. In Banff National Park, $31.5 million is provided for Phase II of the twinning of the Trans-Canada Highway.

Seventy percent of the funds committed to SRCP are to be spent within two years, the rest in the subsequent two years. All projects are on "fast track", with a special Cabinet committee to accelerate the decision-making process.

The SRCP board will work with all departments to monitor progress and expedite approval processes. Tendering and contracting times are being shortened, and key groups in the private sector will be asked for their support in accelerating projects at all stages.

Tom Dunbar, in Environment Canada's financial services directorate, will monitor department projects. Treasury Board and the Department of Supply and Services have already agreed to a special 10-day turn-around on contract approvals, and have delegated to Environment Canada special authorities for contracting. Some of these accelerated procedures may become standard operating procedure.

Aircraft for Ice Tracking

Purchase of an extended-range Dash-7 Ranger aircraft and advanced sensing equipment for ice reconnaissance has been announced by Environment Minister John Roberts. This will allow Environment Canada's ice service to initiate iceberg surveillance and forecasting service for Canada's east coast in late 1984.

The $37 million project will provide some 185 person years of employment at de Havilland's Toronto plant and another 160 person years in various Canadian high technology companies in British Columbia, Saskatchewan, Ontario and Quebec.

The purchase is part of the $2.4 billion special recovery projects program announced in the April 19 budget speech. All projects in the program have dual benefits, contributing to economic recovery and employment over the next four years, and also putting in place key facilities, equipment or services that will enhance economic and regional development opportunities for the private sector in this decade and beyond.

The range of the Dash-7R will be 2 200 kilometres, twice the range of the normal, 50-passenger Dash-7 commuter airliner. The aircraft will be designed to carry extra fuel tanks and observation equipment. Bubbles in the fuselage will provide a good vantage point for ice observers.

The Dash-7R will join the two Lockheed Electras currently being used by Environment Canada's ice service to monitor pack ice in the Arctic, the Great Lakes and the Gulf of St.Lawrence, and along the east coast. This third aircraft will increase current coverge by approximately 500 000 square kilometres.

The purchase also includes new Canadian-built sensing equipment, which will be installed in all three aircraft. This will enable the aircraft to measure the contours of ice formations, locate ice in shipping lanes and drilling areas, produce photographic maps and maintain a data link system with ships. These sensors and sideways-looking airborne radar (SLAR) are also designed to provide an all-weather and night time capability for observing icebergs and sea ice.

Federal regulations control the activities of offshore drilling companies. The new iceberg service will assist this regulatory role.

Minister's Award

An international environment leadership award was received by Environment Minister John Roberts from the National Resources Defence Council in New York. He was particularly praised for his efforts to increase awareness of the acid rain problem. The council is a non-profit organization with 45 000 members dedicated to protecting natural resources and improving the environment.

Forestry in Focus

The little northern Alberta community of Smoky Lake and District has been selected by the Canadian Forestry Association as this year's forestry capital of Canada.

The association chooses a capital each year from among communities where forestry or the forest industry has a vital impact on people's lives.

Environment Canada's Northern Forest Research Centre, Edmonton, joined with the Alberta Forest Service, the University of Alberta, Alberta Forest Products Association and the Alberta Forestry Association in sponsoring a number of events in Smoky Lake during this year's National Forestry Week.

Opening ceremonies were attended by the lieutenant governor of Alberta and various federal, provincial, municipal government and industry representatives. Then followed logging shows, water bombing demonstrations, a film festival, tree planting ceremonies and organized tours of the Pine Ridge Nursery in Smoky Lake.

Other events in the region included special ceremonies and logging competitions in Grande Prairie, and the distribution of 14 000 blue spruce seedlings in two Edmonton shopping malls. Grocery store shopping bags, milk cartons and restaurant tray liners also publicized Forestry Week.

(Continued on Page 11)

Forest Sites Classified

Forestry experts are developing a new classification system for forest sites in the Great Clay Belt of northern Ontario. Working on this Forest Ecosystem Classification (FEC) program are researchers and forest managers from Agriculture Canada, Environment Canada's Canadian Forestry Service and Lands Directorate and the Ontario Ministry of Natural Resources.

Forest site classifications have been developed in various parts of Canada to serve as bases for forest inventory, planning and silviculture. In the Clay Belt of northeastern Ontario, several such classifications were devised. No single classification, however, was found suitable for widespread use in forestry.

Past forest management in the Clay Belt was based largely on the forest resource inventory, which uses forest cover types and an index of relative growth rate called a site index. It has long been realized, though, that a forest stand is an ecosystem with soil, site factors and other vegetation interacting with the trees.

The FEC program had three objectives:

- to develop an ecological classification of forest ecosystems — disturbed and undisturbed — with an emphasis on the commercial forest
- to provide an initial interpretation and evaluation of ecosystem types for forest land management
- to develop practical aids to identifying, recognizing and mapping the ecosystem types, both on the ground and on large-scale aerial photographs.

On the basis of computer-assisted data summaries and analyses, 14 major classes or "operational groups" (OGs) have been defined as vegetation-soil combinants. These represent the range forest site conditions in the Clay Belt.

Hierarchical keys allow a trained observer in the field to assign a forest site to an OG class quickly and accurately. All the OGs have been described in a field manual in terms of soils, vegetation and site. Thanks partly to a rigorous program of technology transfer, including training sessions and field workshops, the FEC system is now being tested operationally by foresters throughout the Clay Belt.

Meanwhile some conclusions regarding ecology, and silvicultural and management objectives for the OGs, are being further developed and tested. Photo-interpretation keys for the OGs have been produced and are being refined.

A second FEC project is under way in the Ontario Ministry of Natural Resources North Central Region, north and northwest of Lake Superior. Investigators from the Canadian Forestry Service and Environment Canada's Lands Directorate expect to develop a first approximation FEC for a pilot study area southwest of Lake Nipigon over the next several months.

Further information:
Connie Plexman
(705) 949-9461

Films Win U.S. Awards

The controversial film, *Acid Rain: Requiem or Recovery*, has won yet another top award in the United States. Produced for Environment Canada by Crawley Films (Ottawa), on commission from the National Film Board, it took first prize at the annual film festival of the Society of American Foresters in Cincinnati.

Second prize went to another NFB production, *The Forest in Crisis*. This was produced with assistance from the Canadian Forestry Service and the Forest Resources Branch of the Ontario Ministry of Natural Resources.

This film dispels the myth that Canada has an inexhaustible supply of harvestable wood. It sounds an anxious alarm for the protection and renewal of our forests.

Forestry in Focus

(Continued from Page 10)

Elsewhere across the country, the Canadian Forestry Service took part in other activities. CFS Pacific Region produced a poster which was displayed in schools, libraries, churches, shopping centres and other places, with the cooperation of the Canadian Forestry Association of B.C.

In Sault Ste. Marie, a tree-planting ceremony at the arboretum of the Forest Research Centre was attended by children from two elementary schools; and a display on forest renewal was set up in a local shopping centre.

In St. John's, Nfld., a CFS forestry exhibit was opened in a shopping mall by provincial Forest Resources and Lands Minister Charles Power; and a scholarship was presented on behalf of the Newfoundland Forest Protection Association to Robert Scott, a first year student of the Forestry Department College of Trades and Technology.

In Fredericton, more than 4 000 people visited a new public information trailer in the Fredericton Shopping Mall.

Environment Update's Rainbow

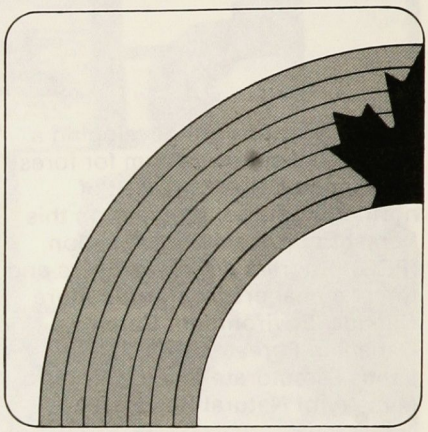
Have you ever seen a dirty or polluted rainbow? Or an ugly one? Neither has anyone else. That's why Environment Update has chosen a rainbow for its design.

Like a rainbow, the unspoiled environment is naturally beautiful. With its colorful diversity, it's a source of inspiration and refreshment. Too often, though, the ravages of human abuse and carelessness corrupt and spoil the scene.

The rainbow is also a symbol of promise and hope — of the good life that can be ours if we are wise and careful stewards of our natural heritage. A creature of water, air and sunlight, it reminds us of our own dependence on these elements and our other natural resources.

Everyone knows about the legendary pot of gold at the end of the rainbow.

However, if we mismanage our resources, the pot could vanish along with the rainbow.



Classification for Western Parks

After six years of data collection and nearly three years of analysis, the Canadian Forestry Service's ecological land classification team has published the results of its first major ecological inventory. The *Ecological (biophysical) land classification of Banff and Jasper Natinal Parks*, volumes with a map supplement, has a total of 1 983 pages.

Land classification in the mountain national parks began in 1971 with single discipline inventories such as the soil survey of Waterton Lakes National Park. In 1974 the methodology was broadened to produce a more holistic, ecologically oriented inventory which includes information on land-forms, soils, vegetation and wildlife, referenced to a single map. Landscape distinctions are based on climatic geological, pedological (soil), and biological (mainly vegetational) differences. Wildlife ratings and descriptions are attached to each mapping unit.

The first major ecological inventory project, in 1974-80, dealt with Banff and Jasper national parks. Projects on Kootenay, Glacier and Mount Revelstoke national parks are scheduled for completion in December 1983.

Major responsibility for application of the baseline resource information now rests with Parks Canada's land managers, who receive some advice from members of the inventory team. Additional research is required in many areas to better assess the effect and suitability of various kinds of park use, and the limitations imposed by the parks' resources. Available information is already being used by park planners and wardens.

A computerized resource data bank has been developed by the Canada Soil Information System (CANSIS), of the Land Resource Research Institute in Ottawa. This is being used through computer terminals in national park offices.

Further information:
Garth Norris
(403) 420-2545

Bruce Park Advance

The results of the first phase of public consultation on the proposal to establish a national park on Ontario's Bruce Peninsula are positive.

The favorable response from the local residents means that a national park on the Bruce Peninsula is closer at hand. In December 1981, Environment Minister John Roberts announced a proposal to establish a national park on the Bruce. The councils of Lindsay and St. Edmunds townships formed a joint committee to study local opinion, and in early October 1982 they reported local support for the national park. The councils' decision to support the proposal followed more than nine months of work, including 12 open-house meetings and responses to more than 700 comment sheets. More than 2000 enquiries were received. In August 1982, the committee conducted an independent survey of approximately 4200 voters in the two townships. Most of the respondents favored the proposal, although many qualified their support. The township councils adopted many of these qualifications in their report to the minister. These included a guarantee there would be no expropriation and that private landowner rights in and adjacent to the park would be maintained.

Further information:
Robert Day
(705) 756-2415

Pukaskwa New National Park

Pukaskwa National Park, a new national park on the north shore of Lake Superior, officially opens this month. Set in the rocky Canadian Shield between Sault Ste. Marie and Thunder Bay, Pukaskwa is the largest national park in Ontario. It joins three other national parks in the province: St. Lawrence Islands, Georgian Bay Islands and Point Pelee.

Pukaskwa's most impressive natural feature is the Lake Superior coastline. Massive exposed headlands protect quiet bays filled with small islands, shoals and countless sand and boulder beaches.

The terrain is rugged, with shallow soil and many rock-rimmed lakes. Hills rise steeply from lake-level; Tip Top Mountain, the highest, reaches over 600 m. Most rivers are short and swift and can only be negotiated by experienced canoers.

Pukaskwa National Park is on the southern edge of Canada's boreal forest region. Black spruce, jack pine and white birch abound. Dwarf trees and a variety of arctic-alpine plants dot the shoreline of the lake.

Moose, wolf, black bears, woodland caribou and a host of smaller animals live in Pukaskwa. Ravens nest in the granite cliffs. The occasional hawk scans the landscape for the many smaller birds: kinglets, nuthatches, chickadees and warblers. A wide variety of fish can be found in the White River, Lake Superior and the park's many inland lakes and streams. Ancient pit-like structures dating from 2000 years ago stand watch on some boulder beaches. Standing alone or in groups, these famous "Pukaskwa Pits" were probably built by early Indians.

When Europeans came, the Pukaskwa region served as a gateway to the fur-rich northwest. Railways and highways linking eastern and western Canada came later. Logging was an important industry earlier this century; in the park, one building still stands from the logging camp at Imogene Cove.

"Pukaskwa's wilderness experience is unique," said Environment Minister John Roberts, describing the new park. "This wild terrain serves as a reminder to us all of the power of the land from which our country has been carved."

Visitors to Pukaskwa National Park this summer will be able to follow a number of hiking trails and take advantage of wilderness camping. A semi-serviced campground at Hattie's Cove provides showers, toilets, drinking water and firewood. A small day-use area for swimming and picnicking is located near the visitor reception centre which introduces visitors to the park and its splendors.

The entrance to Pukaskwa National Park is a 15-minute drive from the Trans-Canada Highway, midway between Sault Ste. Marie and Thunder Bay.

Information:
Wayne Scott
(819) 994-2595

Preserving Heritage Buildings

A Federal Heritage Buildings Review 0ffice has been established to identify and evaluate federally owned heritage buildings and to give direction for the protection and conservation of these buildings for the future. The review office will be supported by staff and other Parks Canada resources.

All buildings owned by the federal government, 40 years old or older, will be evaluated for their heritage value. Those having the highest heritage significance will be designated as either CLASSIFIED or RECOGNIZED federal heritage buildings.

The Government of Canada is the largest single owner of heritage buildings in the country. A new federal policy to promote the conservation of these important architectural and historic resources was announced in October at the annual conference of the Heritage Canada Foundation.

The policy is a commitment by the Government of Canada to renovation, restoration, and recycling and makes the conservation and protection of federally owned heritage buildings a government objective.

The policy recognizes local, regional, and provincial attitudes and allows for public input and independent assessment whenever there is disagreement or controversy regarding a building's designation or preservation requirements.

For a copy of *Policy on Federal Heritage Buildings* write to Federal Heritage Buildings Review Office, Parks Canada, Ottawa, Ontario K1A 1G2.

Concern for Southbound Birds

Cooperation with wildlife agencies in Latin America and the Caribbean, where many of our birds spend the winter is being stepped up by the Canadian Wildlife Service. This is being done through the CWS Latin American Program (LAP), launched in 1980. The CWS previously concentrated its conservation efforts on waterfowl, most of which winter in the United States. However, of some 500 other species breeding in Canada, about 225 migrate to Mexico, Central America, the Caribbean islands and South America. To protect them it therefore makes sense to work with the appropriate agencies in those distant lands.

The migrants include 33 species of shorebirds which breed in Canada and winter as far south as the southern tip of South America. They also include the peregrine falcon, the common tern and various warblers, flycatchers and native Canadian sparrows.

In Canada the shorebirds are widely dispersed, but during migration and on their wintering grounds they congregate in large numbers. This makes them especially vulnerable to any disruption or disturbance of their habitat. The first major LAP project in South America was a survey of the continent's northern and eastern coastline to identify shorebird concentration areas and make a preliminary assessment of the habitat.

The governments of Argentina, Brazil, Guyana, French Guiana, Surinam, Trinidad and Venezuela cooperated in this survey, providing military aircraft in some places. About 95 percent of the Atlantic and Caribbean coast believed to contain suitable habitat has now been surveyed; important wintering areas have been located, and more than a million shorebirds counted and identified.

CWS and local scientists are also trying to measure the harvest of shorebirds killed for food and recreation. Other studies are focused on chemical contamination from agricultural, industrial and mining wastes ingested by the birds. Such studies may help to explain the high levels of organochlorines still found in peregrine falcons and their eggs, despite restrictions on the use of DDT in Canada and the United States. Peregrines prey heavily on shorebirds, and often travel with them.

Another major concern is the loss of habitat, which may be Latin America's most serious bird conservation problem. Tropical forests are shrinking at an alarming rate, especially in Central America and parts of Colombia, Ecuador and Brazil. This will almost certainly imperil the 100 or so species of forest-dwelling birds — warblers, flycatchers, sparrows and others — that breed in Canada and migrate to the tropics.

Other threatened habitats are wetlands. About 100 birds that breed in Canada and winter in Latin America depend on freshwater or brackish lakes and wetlands, or on coastal and inland beaches. Industrial societies everywhere tend to use wetlands as waste disposal sites, or drain them for agriculture, housing, plant construction or other purposes.

An international effort is being made to preserve these valuable habitats, through a program of wetland mapping organized by the International Waterfowl Research Bureau and the International Council for Bird Preservation. Meanwhile scientists from the Organization of American States (OAS) are trying to revitalize the 1940 Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere.

Besides supporting far-ranging programs of this sort, the Canadian Wildlife Service is giving specialized training to biologists from Latin American and Caribbean countries. Biologists from Trinidad, Surinam and Venezuela spent a month in Canada learning the theory and practice of bird banding, which they returned to apply in their own countries. The CWS is also sponsoring, along with several other government and private conservation groups, production of a Spanish version of *Wildlife Management Techniques*. This Wildlife Society manual is the most widely used wildlife management reference book in North America.

Further information:
Iola Price
(819) 997-1379

AES Publication

The Canadian Climate Centre of Environment Canada has remodelled *Climatic Perspectives*, its weekly climate information publication.

The main change is the addition of a new monthly supplement providing more detailed, longer-term summaries of weather events across Canada.The new publication combines Climatic Perspectives and the monthly *Canadian Weather Review*.

Further information:
Amir Shabbar
(416) 667-4711

Parks Publishes

A major new work on the Québec city fortifications titled: *Québec the Fortified City: From the 17th to the 19th Century*, has been published by Parks Canada.

Authors Yvon Desloges, André Charbonneau and Marc Lafrance, describe the construction of the defences and the resulting influence on the urban and social development of Québec. *Québec the Fortified City* is available in bookstores and from Supply and Services Canada for $45.

Information Access Legislated

To make the operations of government as open as possible to the people it serves — that is the basic principle behind the Access to Information Act of Canada.The act will come into effect July 1, 1983.

In this same spirit of openness, Environment Canada introduced its Public Consultation and Information Availability policy in 1980. We noted at the time that the provisions for information availability would be made compatible with the Access to Information Act (ATI) once it became law. This process is under way, and the department plans to publish a revised policy later this year.

While the fundamental principle of openness is common to both, the Access to Information Act is much more complex than the department policy, reflecting the breadth of operations it must cover. Considerations of national security, confidences of other governments, industrial trade secrets and other sensitive matters have given rise to a number of exemptions. Because much of the act is taken up with these, it is easy to lose sight of the basic change that has taken place in government.

Previously there was no legal right to information held by government. Some particular piece of information sought might be withheld, for any number of reasons considered valid by the government of the day. Once the act is proclaimed, however, the government must prove that its decision to withhold information accords with the provisions of the act. Any such decision can be appealed to the Information Commissioner, and still further to the Federal Court. If you are seeking information from this department, you should try first to obtain it in the normal, informal way. Perhaps the information is already available in one of our publications, or in our libraries. Send us a letter, or call the appropriate office. Our handbook, the *Citizen's Guide to Environment Canada*, can help you locate the right source.

It is most important to be as precise as possible. A request for "all the information you have on the environment" is much too tall an order.

If you try these usual avenues and fail to get what you want, then you may take the further step of applying under the Access to Information Act. The Access Register and Access Request forms are available at public libraries and government information offices, including our own, as well as some 2 000 postal stations in rural areas.

Environment Canada has Access Coordinators in each regional office and in Service headquarters in the national capital area, to help you identify the records you wish to see. An application fee must accompany your request, and you will also be charged for processing costs for time in excess of five hours, as well as for copying and computer time.

Producing information about the environment is a major part of our business, and we want people to use it. This was made clear when we published our Public Consultation and Information Availability policy three years ago. The Access to Information Act hasn't changed this, but it does provide an additional procedure you may use, if the usual avenues fail. We hope there will be few occasions when we can't meet your needs in the normal way.

Further information:
John Cameron
(819) 997-6555

Regulations 'A Last Resort'

Regulations are no substitute for sound environmental planning and advance impact studies, the Seventh Canadian National Energy Forum was told in Halifax.

"Regulation is very much a last resort," said Jacques Gérin, deputy minister of Environment Canada.

"Most governments in Canada, including the federal government, have developed systematic processes for environmental assessment and review," Mr. Gérin noted. But their effectiveness has been limited, he said, because these procedures have been applied as a late response to specific project proposals.

"Recently we have all begun to understand," said Mr. Gérin, "the advantages of extending this process to broader and earlier consideration of energy developments, to contribute to overall planning."

He stressed the value of public consultation in developing environmental policies and programs. Last year's public consultation meetings had shown that nuclear energy was still an environmental concern, but that "a fair and reasonable dialogue" was possible on its environmental aspects.

Referring to his recent appointment as deputy minister, Mr. Gérin said there would be continuity in Environment Canada's objectives and orientation. However, he added, "we shall accelerate the tempo of our changes to reach them."

The department's energy objective, he said, was "an energy future in which demand for energy does not become destructive, that avoids boom-and-bust developments, and in which energy development becomes a real motor for our general welfare . . ." However, he added, "we shall accelerate the tempo of our changes to reach them."

Snow Affects Water Level

Changes in Great Lakes levels are major concerns of people living around them, because of their social and economic impact. And snow falling around Lake Superior can affect water levels throughout the entire Great Lakes system. That's why hydrologists with Environment Canada and the U.S. Army Corps of Engineers take melting snow into account when forecasting water levels in lakes. Variations in snowfall across the region, as well as the problems of gathering timely data, make the task a challenging one for researchers. This year Canadian and U.S. agencies conducted trial airborne snow surveys to refine the methods by which hydrologists predict Great Lakes water supplies.

The data gathered will help researchers improve their water supply forecasting procedures, and judge the potential for flooding in sensitive areas.

While flying over the Lake Superior drainage basin, scientists use gamma ray spectrometers to "read" the amount of water in the snow cover. This saves the cost of expensive ground surveys of such a vast, remote area. A final report on the overall study will be completed jointly by Environment Canada and the U.S. Army Corps of Engineers, along with the Geological Survey of Canada and the U.S. National Weather Service. Public release is expected in August 1983.

Further information:
Maureen Martinuk
(416) 966-6406

Prize Nominations Sought

Nominations are invited for the 1984 Tyler Prize — the world's biggest award for achievement in the field of energy and ecology. Endorsed by the United Nations Environment Program, the prize is awarded by the John and Alice Tyler Energy/Ecology Fund in California.

Individuals and organizations around the world are asked to submit nominations by October 15, 1983, to the fund's executive director, care of the University of Southern California, University Park, Los Angeles 90089-4019, U.S.A. Related credentials, supporting material and letters of reference must be received no later than November 1.

Prizes are awarded for any of the following achievements:

- the protection, maintenance, improvement and understanding of ecological conditions anywhere in the world
- the discovery, further development, improvement or understanding of known or new sources of energy.

Since 1973, the Tyler Prize has gone to 11 environmental laureates for outstanding achievements benefiting mankind. Prizes totaling over $1 million have been awarded, ranging from $150 000 to $200 000 annually.

Former winners have been honored for pioneering water purification and water quality standards, for discovering the chemical nature of smog, for landmark work in animal ecology, for new perspectives on the interaction between the environment and the human body, and for world leadership regarding the human environment and wildlife protection.

Probability of Precipitation

0%	No precipitation even though it may be cloudy. 10% Dry weather with only one chance in ten of snow or rain falling.
20%	Dry weather still expected.
30%	Go ahead with your picnic, boating or ski plans but you may have to take shelter.
40%	An umbrella is recommended. Make alternate plans for outdoor activities that are conducive to rain. Not a good day to pave the driveway. Keep your fingers crossed!
50%	It's even Steven on whether it snows or not. Be prepared for all eventualities.
60%	Want to water your lawn? The odds are favorable that Mother Nature might give you some help.
70%	Suggest cancellation of outside events. The chances for dry weather have shrunk to three in ten.
80%	Wet weather likely. Make appropriate plans.
90%	The occurence of precipitation is a near certainty. Venture out if you enjoy walking in the rain or playing in the snow.
100%	Precipitation is a certainty.

(Taken from the fact sheet produced by the Weather Services Division, Field Services Directorate)

PCB Survey

An inventory and assessment of PCB use in British Columbia and the Yukon has been completed by the Environmental Protectection Service.

The study was to determine the extent of use and quantities of PCBs requiring ultimate disposal.

PCBs — polychlorinated biphenyls — have caused serious concern over the past decade as environmental polluters and a potential human health hazard.

The study found that PCBs are widely used in electrical equipment, especially capacitors. But most are used in large industrial facilities.

British Columbia and the Yukon Territories have some 12 percent of the total Canadian PCB inventory, which is or will eventually become hazardous waste. The study urges the establishment of special disposal facilities to help phase out PCBs within a reasonable time.

Some equipment using PCBs was removed from the region between 1978 and 1980 to U.S. disposal facilities — available until 1980 — and to a secure storage facility for PCB wastes established in Alberta. However, PCBs removed from B.C. and Yukon facilities are only a small fraction of the total amount in use. This suggests the phase-out period will be lengthy.

Only a few pieces of electrical equipment were leaking or could potentially contaminate the environment or food products. Some of this equipment was considered a risk because it was located over food products or bodies of water; this was removed from service and replaced with other equipment which does not use PCBs.

The Canadian government has taken two approaches to control PCBs: developing regulations to ensure the phase-out of PCB-filled equipment, and developing guidelines on waste management and housekeeping practices for owners of this equipment.

All PCB uses will eventually be prohibited. However, the phasing-out process may be slow because of the time required to construct appropriate disposal facilities and produce equipment using a different substance.

Further information:
Paul Mitchell
(604) 666-6058

EARP for the Record

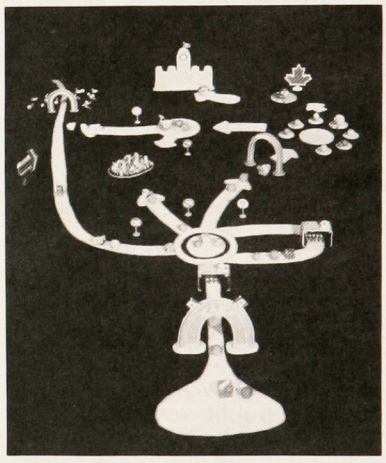
The federal Environmental Assessment and Review Process (EARP) is now on videotape. Produced by Memorial University, St.John's, a new tape shows what happens from the time a development project is proposed to the final decision by the Federal Environmental Assessment Review Board.

A development proponent (James in English, Maurice in French), is guided through EARP by a government department representative. The two travel through the various stages of the process, depicted by a combination of live footage and animation. The panel review part is illustrated by sequences from actual panel meetings.

Available on either half-inch or three quarter inch cassette, the videotape is an aid to potential participants in the review process — from the public, government and industry. Besides giving the basic outline of the process, it is intended to stimulate discussion.

Cassettes are available on loan from the Federal Environmental Assessment Review Office, 13th floor, Fontaine Building, Hull, Quebec.

Further information:
Douglas Parkinson
(819) 997-2725



Destroying PCBs

A comprehensive review of all current acceptable methods of treating or destroying PCB wastes in North America has been published by Environment Canada. *The 81-page Bulletin for Destruction Technologies for Polychlorinated Biphenyls (PCBs)*, presents data on over 40 current technologies under four categories: conventional incineration, novel incineration, chemical processes and physical-chemical processes. Technological advances have produced more than 80 processes to deal safely with PCBs. But PCBs and PCB-containing wastes are currently being stockpiled in ever increasing quantities in Canada, rather than being destroyed.

The review is intended to help the reader assess the present situation, to determine acceptable cost-efficient ways to destroy PCBs.

Further information:
H.P. Dibbs
(819) 997-3405

Agreement Saves the Skagit

After 40 years of debate, an end is finally in sight to the Skagit valley/Ross Dam controversy.

In mid-April, details of a framework agreement between British Columbia and the City of Seattle were announced by B.C. Environment Minister Stephen Rogers and Seattle Mayor Charles Royer.

Seattle has abandoned the plan to raise the level of the city-owned Ross Dam by 37 metres, which would have flooded the 2 023 hectare Skagit valley wilderness area. Instead, the city will pay B.C. $21 848 000 (U.S.) per year for 35 years — the equivalent of what it would have paid to raise the dam had it borrowed money in December 1982.

In return, B.C. will supply Seattle with the power the higher dam would have generated — as much as 300 megawatts during peak use. B.C. will also pay the cost of transmitting the power from Blaine to Seattle.

The agreement also creates a $5 million environment endowment fund — $4 million from Seattle and $1 million from B.C. — to groom the scenic Skagit valley/Ross Dam area and facilitate public access to it.

Fifty percent of the additional power called for under the agreement will come from raising B.C.'s Seven Mile Dam on the Pend d'Oreille River near Trail by five metres. This will result in the flooding of 57 hectares of "unremarkable" land in B.C. and 24 hectares in Washington State. The B.C. land is in a narrow canyon and will not require any expropriation. Escape clauses allow either party to terminate the agreement after 1996, and provide penalties should either fail to meet its responsibilities.

The framework agreement was completed February 5 but not officially announced until April. It is the result of 10 months of negotiations conducted by a consultative board made up of representatives of the International Joint Commission, British Columbia, the City of Seattle, the Department of External Affairs and the U.S. State Department. This board was established following an order made by the International Joint Commission in April 1982 for a one-year moratorium on the raising of Ross Dam, to allow the two parties to reach a new agreement.

The settlement must gain formal approval from the B.C Cabinet and Seattle before a treaty agreement is submitted to the Canadian Parliament and the U.S. Senate. Public hearings before the Seattle city council started on May 18. The treaty is expected to be in place by the end of this year.

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Economic Trends in Forestry

(Continued from Page 2)

starts in 1982 were just over a million, compared to two million in 1978. The same year, in Canada, housing starts peaked at 128 860 — a decline of 29 percent over the previous year, and the lowest level of activity in 20 years.

In recent months, however, increased demand for housing in Canada and the U.S. has provided a long-awaited measure of relief in an industry where unemployment levels had reached unprecedented high levels. Most analysts expect the trend to continue as business conditions improve slowly and interest rates return to more acceptable levels. The United States National Association of Home Builders has predicted a 30 percent jump in U.S. housing starts in 1983.

Recovery in the pulp and paper sector is expected to be slower. Full recovery in the forest products industry is not expected until 1984. In every sector, the industry has learned much from one of the longest and most painful recessions ever experienced. Canadian companies will likely emerge as leaner and more aggressive competitors, better prepared to meet the challenge of world markets.

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Public Consultation

Atlantic regional meetings are scheduled as follows:
September 13 — Charlottetown
September 19 — Halifax
October 4 — St. John's, Nfld.
October 12 — Fredericton
Schedules of meetings in other regions will be published in future issues of *Environment Update*.