

# ***FOREST INSECT AND DISEASE CONDITIONS***

## **Prince Rupert Forest District**

**British Columbia, 1976**

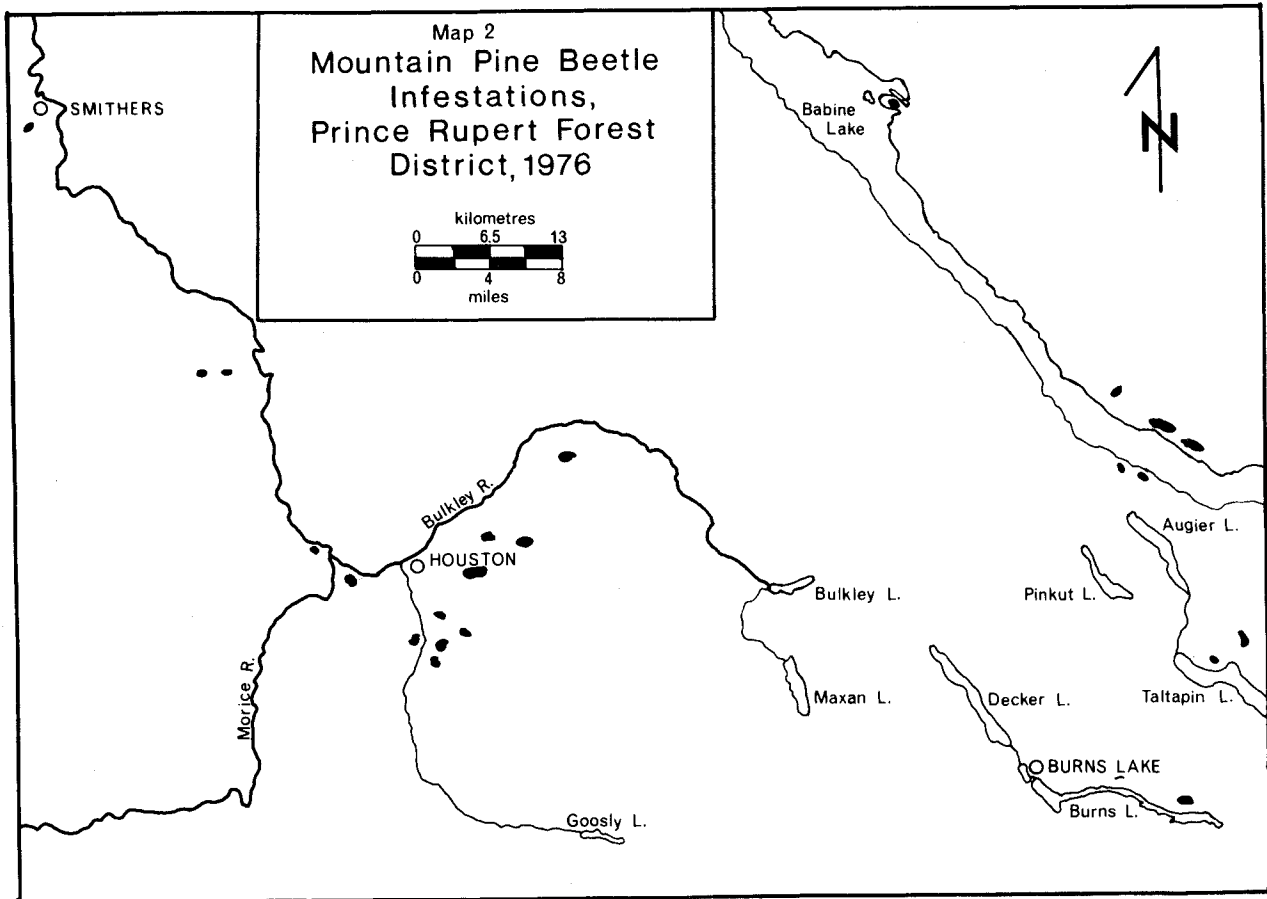
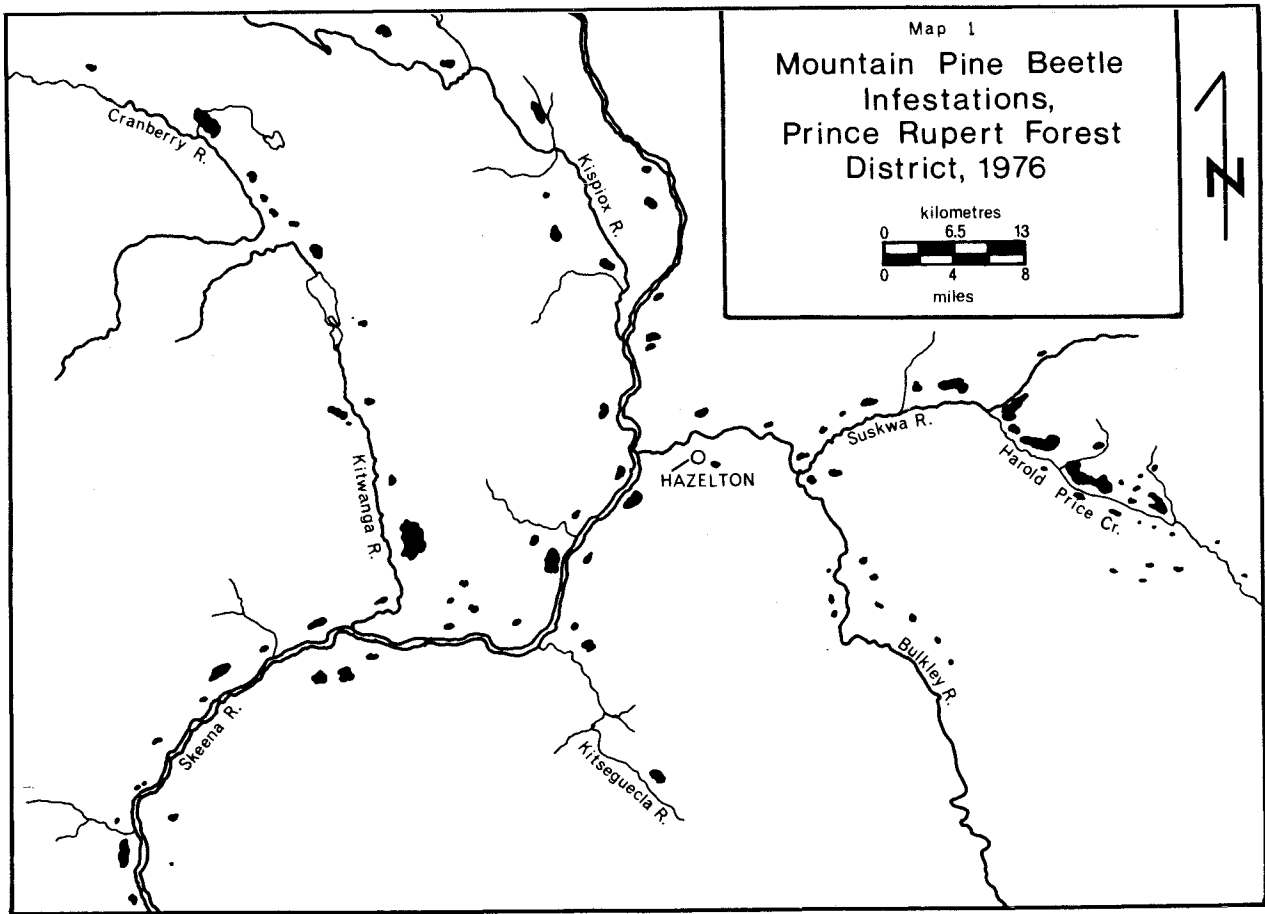
**D.F. Doidge  
H.P. Koot**

Mountain pine beetle continued as the most important tree killer. The pine sawfly again defoliated shore pine on islands near Prince Rupert. Blackheaded budworm caused light defoliation of alpine fir and spruce along the Bell-Irving River. Black army cutworm larvae appeared on a burn near Fulton Lake. Porcupines killed western hemlock along Khutzeymateen Inlet and lodgepole pine between Terrace and Cedardale. Rust was common in cones of spruces, and a foliage disease affected aspen in the Houston - Francois Lake areas.



Fisheries and Environment Canada Pêches et Environnement Canada

Canadian Forestry Service





Mountain pine beetle, larvae and pupae

**MOUNTAIN PINE BEETLE, *Dendroctonus ponderosae***, continues to be the major problem in the District, with about 18,000 beetle-killed lodgepole pine mapped during aerial surveys in 1976 (Maps 1 and 2). Mountain pine beetle has been epidemic since 1969 when the first outbreak appeared at Date Creek; killing about 71,000 trees in the District.

In 1972, the British Columbia Forest Service mounted a salvage and control program, and expanded it in 1973, using methods recommended by Dr. L. Safranyik of the Canadian Forestry Service. The program was considered to be 80% successful in reducing beetle populations in the Smithers - Houston areas. Other areas with a continuing problem are: opposite Donald Landing, 350 red-tops; Smithers - Moricetown along the Bulkley River, 200; Houston, 200, and Donald Landing, 100. The Harold Price Creek infestation continued with an estimated 4,200 red-topped lodgepole pine, along with an additional 1,900 in the nearby Suskwa River. In the Hazelton Ranger District, work is currently concentrated on the main problem area, which is up the Kispiox River drainage and near Hazelton, where

there were an estimated 1,900 red-tops. Just west of Hazelton and north of Kitwanga, the larger infested areas were: Radio Tower Hill, 2,000 red-tops (down from 5,000 counted in 1975); opposite Carnaby, 2,000; Ritchie, 1,000; Seeley Lake, 1,000; Woodcock, 500; Kitwancool, 500; Weegett - Douse creeks, 500 (reduced by logging from 3,000 in 1975); Price Creek, 400; Kitseguecla River, 350; Kitwanga Lake, 250; Kitwanga, 200; south of Kitwanga, 140; Mill Creek, 125; Nash Y, 120; Cedardale, 110, and Cranberry River, 100. In the Bella Coola Ranger District, near the junction of the Dean and Takia rivers, there were 410 red-tops.

The infestation along Harold Price Creek was examined in September and showed sufficient brood to continue the infestation in 1977. The infestation area has sufficient mature lodgepole pine to absorb the 1976 attack and probably part of the 1977 attack. In the upper reaches of the creek, the large areas of susceptible pine will probably be attacked in 1977 as the mature pine in the present infestation is depleted. The main beetle flight into these areas probably will not take place until 1978. These susceptible stands maintain a light beetle population which, along with the maturity of the stand, provide the basis for the prediction of increased beetle attacks in 1978.

A cruise strip was run on Radio Tower Hill to ascertain stand deletion caused by mountain pine beetle in an area where no salvage or control was attempted. On the strip, 24% of the pine were heal-



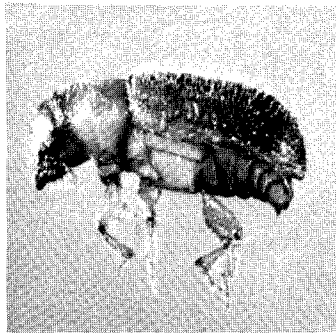
Mountain pine beetle, teneval adults

thy; 3% were currently infested (1976 attack); 10% were red (1975 attack); 5% had been partially attacked, and 58% were gray (dead 3 years or more). That 75% of the lodgepole pine trees have been killed by beetles is substantiated by aerial counts that show the trend: 640 red-tops in 1973; 1,000 in 1974; 5,000 in 1975, and the decline in 1976 to 2,000 red-tops. The population of beetles is declining in this area because of the reduction of susceptible lodgepole pine trees in the stand.

The cool summer of 1976 caused a late beetle flight. In areas examined in September, brood development was retarded, with most of the new generation still in the egg stage; however, the warm fall weather probably enabled the eggs to hatch and the larvae to develop. Mountain pine beetle is expected to be a major problem again in 1977.

**SPRUCE BEETLE, *Dendroctonus rufipennis***, was detected near Smithers Landing and at Otter Lake in the Fulton River drainage. The infestation near Smithers Landing was about 60 ha (150 acres) and the Otter Lake beetle damage was 40 ha (100 acres).

The spruce beetle in the Prince Rupert District normally has a 2-year life cycle, i.e., the insect overwinters twice, and new adults must overwinter before they can attack. The spruce beetles in the area near Smithers Landing were in the larval stage in the spring of 1976; therefore, they will attack in late spring of 1977. The spruce near Otter Lake were not examined on the ground.



Spruce beetle adult

**WESTERN BALSAM BARK BEETLE, *Dryocoetes-Ceratocystis* complex**

In 1976, an estimated 5,200 dead alpine fir trees were detected during aerial surveys in the District. Areas noted included: McKendrick Pass,

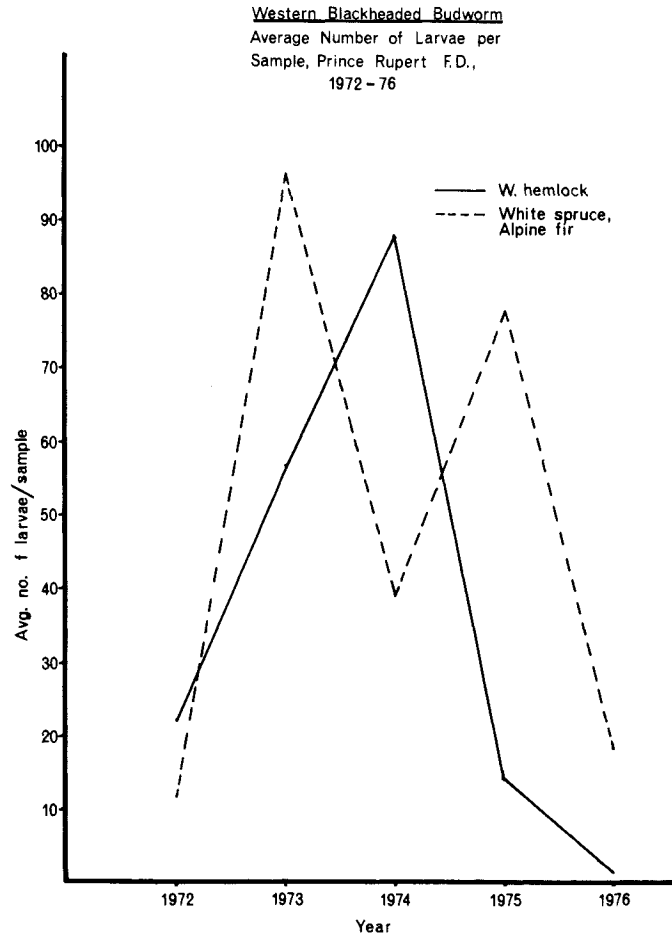


"Totem" - Anthony Island Park

2,000 red-tops; Cumming Creek, 1,000; Astlais Mountain, 400; Miller Creek, 300; Guess Creek, 200; Dome Mountain, 200; Huckleberry Mountain, 180; Pendleton Bay, 120; Morice River, 100; Thautil River, 100; Jonas Creek, 100; Winfield Creek, 100; Meed Creek, 100; Tachek Creek, 60; Mosquito Hills, 50; Elliott Creek, 30, and Sibola Creek, 20.

Prince Rupert Forest District has a history of losses; 546 square kilometers (210 square miles) of alpine fir were killed during 1949-1964, mainly along the Nass, Skeena and Telkwa rivers.

Studies show that 35% of alpine fir mortality is due to direct attack by the beetle, the remainder being attributed to the beetle-introduced lesion-causing fungus *Ceratocystis dryocoetidis*. Initial beetle attacks may be pitched out but subsequent attacks on trees weakened by lesions are often successful; coalesced lesions may kill trees without further beetle activity. Since alpine fir trees killed by the complex may retain their needles for up to 5 years, determination of year of attack must be made on the ground.



Control is not presently feasible except through stand management, by logging overmature spruce-alpine fir stands.

**WESTERN BLACKHEADED BUDWORM, *Acleris gloverana***, populations in the District are at least their lowest level in 6 years. The incidence of larvae collected in beating samples was very low, except along the Bell-Irving River where three samples from alpine fir averaged 50 larvae each, a decrease from the 400 per sample in 1975. Only a trace of defoliation was noticed on the new growth. A further decline is expected in 1977.

Examination of plots on the Queen Charlotte Islands in 1976 showed that severe defoliation of western hemlock in 1973-74 by blackheaded budworm apparently killed 27% of the immature trees on Kwaikans Island and 13% of the mature trees near Deena Creek. Some additional tree mortality can be expected in both areas for several years.

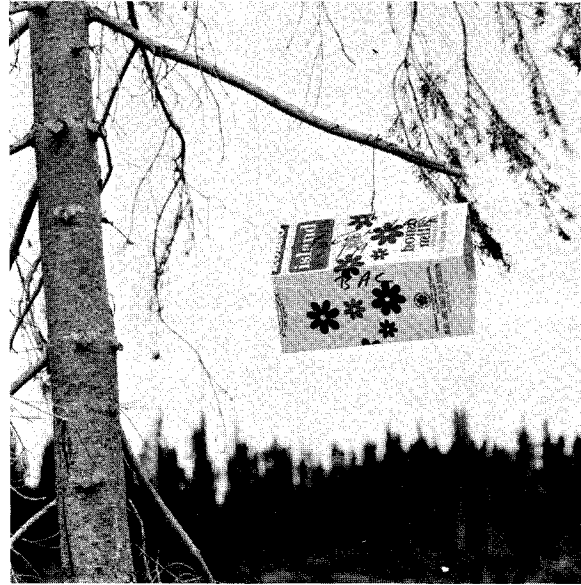
The accompanying figure illustrates the population trend in the Prince Rupert District for the period 1972-76.

**PINE SAWFLY, *Neodiprion* sp.**, infestations on shore pine on the outer islands south of Prince Rupert are continuing and apparently moving northward. An aerial survey was not possible, due to inclement weather, though a limited survey was done during early October from a boat supplied by the British Columbia Forest Service.

Areas examined included Hunts Inlet on Porcher Island, where populations are significant and are expected to cause additional defoliation in 1977. However, disease and parasitism of cocoons may help to reduce the population. Only the current year's foliage (1976) remains on the shore pines. Some mortality is predicted on McCauley Island, but the sawfly population appeared to be low in 1976. Light pine mortality may occur on Pitt Island,



Light trap for black army cutworm



Milk carton trap baited with a sex attractant for black army cutworm

even though there was no further defoliation in 1976. Lewis Island has a moderate sawfly population without much evidence of disease or parasitism; extensive defoliation is predicted there in 1977.

**TWO-YEAR-CYCLE SPRUCE BUDWORM,** *Choristoneura biennis*, populations on white spruce and alpine fir continued at low density levels in most of the District. No significant defoliation has occurred since the termination of the previous outbreak in 1964 along Babine Lake.

Traps to assess adult male budworm populations, baited with a sex attractant, were set out at seven locations in the interior portion of the District. Generally, there was a small increase in numbers of moths trapped in 1976, but only along the Bell-Irving River where numbers significant enough to indicate possible minor defoliation for 1977; light populations are expected elsewhere.

*C. biennis* has a 2-year life cycle, overwintering twice, once as a small, newly hatched larva and again as a half grown larva. The larvae complete their life cycle in the second summer, feeding and developing to full size, pupating and then repeating the cycle. The most obvious damage to trees occurs during the second summer, when the feeding period is longer and the larvae are larger. The vast majority of the 2-year-cycle budworms mature to the adult stage only in even years, e.g. 1974, '76, '78.

**BLACK ARMY CUTWORM, *Actebia fennica*,** were detected in small numbers, feeding on scattered patches of fireweed and other broadleaved vegetation on the higher ridges within an 800 ha (2,000 acre) 1974 prescribed burn, along the north side of Fulton Lake. The area was in the process of being planted with conifers but no seedlings were damaged as there was an abundance of the preferred broadleaved hosts.

Two areas, about 3 kilometers (2 miles) to the east of the infested one, were prescribed burned in the fall of 1975. When checked in the spring of 1976, they were uninfested by the cutworm. This area was planted at the same time as the main infested area. The "burns" are about 60 ha (150 acres). It was anticipated that the areas would attract moths during the flight period in late summer and early fall. To determine if a moth flight would occur in these areas, both "light" and "pheromone" traps were set out in July to gather data in an attempt to predict cutworm populations for 1977. The pheromone traps attracted small numbers of male moths. Although limited success was realized in the traps, the two burns should be checked in the spring.

**GREEN VELVET LOOPERS, *Epirrita autumnata*,** lightly infested mature, mixed hemlock and amabilis fir stands up to 180 meters (600 feet) elevation along the west side of the Kitimat Valley between Kitimat and Lakelse Lake. No defoliation was evident.

This insect has no history of causing severe defoliation in British Columbia, and any small epidemics recorded lasted only 1 or 2 years without causing tree mortality.

**LARGE ASPEN TORTRIX**, Choristoneura conflictana, caused light to moderate defoliation of red alder along the west side of the Kitimat River Valley between Kitimat and Terrace, particularly along the streams. Leaf rolling was pronounced in late June, especially near the Alcan Smelter in Kitimat and along the Wedeene River. Trees had partially recovered by August.

Large aspen tortrix has a 1-year life cycle; eggs hatch during June and July, the larvae feed until late August, overwinter as small larvae at the base of the host tree, then emerge in early May and begin feeding.

Outbreaks are generally characterized by the buildup of large populations that persist for 2 or 3 years and then suddenly collapse; that being the case, at least 1 more year of defoliation can be expected.

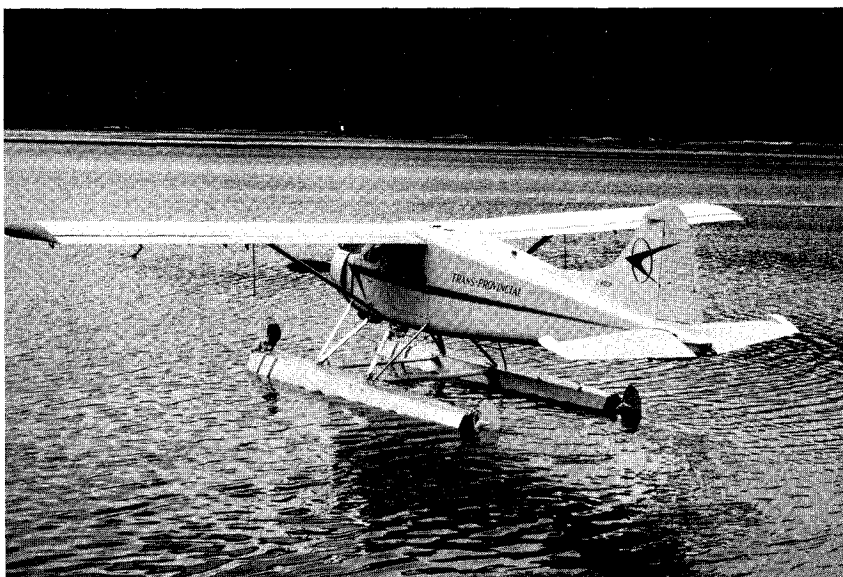
**SPRUCE BUDMOTH**, Zeiraphera sp., was common and caused light to moderate bud damage on Sitka spruce in the western portion of the District. At Deena Creek on Moresby Island, 55 ha (135 acres) of "pre-commercially thinned" Sitka spruce had terminal and lateral bud damage, altering form and height growth on 30% of the trees. This is the second year of damage in this area.

Dead tips were also common along the Skeena River between Terrace and Kitwanga. At Cedarvale, up to 60% of the buds were infested in a localized area of regeneration Sitka spruce. Tree growth was not significantly affected. Previous history indicates that epidemics may last up to 5 years. Continued infestation of young Sitka spruce can be expected in 1977.

Larvae were common in the interior regions of the District on white spruce, but caused no foliage damage.

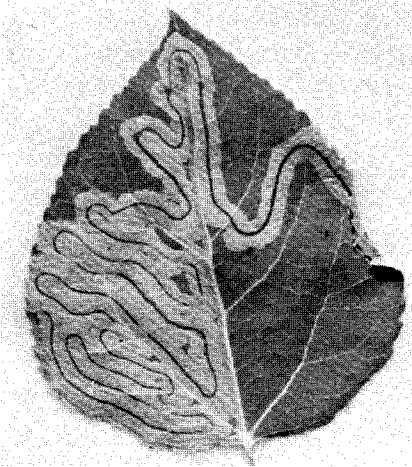
**COOLEY SPRUCE GALL APHID**, Adelges cooleyi, infested Douglas-fir planted on a large burn near Perow about 6 years ago. These Douglas-fir trees are out of their range on a pine-spruce site, providing the insect with the perfect alternate host situation, i.e., Douglas-fir and spruce. Douglas-fir is infested in August by winged females migrating from spruce (out of the unsightly galls on the spruce branches). Eggs laid by these females produce both winged and wingless females; the winged females migrate to spruce and the wingless remain on the Douglas-fir, continuing to reproduce similar progeny. On spruce, the aphids overwinter as nymphs, which become wingless, egg-laying females. Their eggs produce the gall-forming summer generation and develop to adults which fly to Douglas-fir.

It is recommended that the Douglas-fir trees be removed.



"Beaver"





Aspen leaf miner damage: note larva mine and pupal chamber

**ASPEN LEAF MINER**, *Phyllocnistis populiella*, mined the leaves of trembling aspen trees between Hazelton and Smithers, and up the Kispiox Valley, discoloring the trees in July. No obvious permanent damage is expected.

A **WOOLLY APHID**, *Pineus prob similis*, infested plantations of white spruce at Perow and Chapman Lake, and Sitka spruce at Chist Creek. Plots at Perow were 60% infested, with as much as 80% of the branches, in some trees, having galls. White spruce on the Chapman Lake plantations were 38% infested, with 90% of the branches affected in some cases. At Chist Creek, about 10% of an 8-year-old Sitka spruce plantation was heavily infested with woolly aphids. Healthy trees at Chist Creek were up to 10 feet tall and exhibited up to 3 feet of new leader growth, whereas heavily infested trees were only half that size. Besides the apparent growth loss caused by the aphids, the insect galls on the leaders of trees produce a weakened area, making the tree more susceptible to breakage by snow.

A **PINE TERMINAL WEEVIL**, *Pissodes terminalis*, infested leaders on lodgepole pine between miles 30 and 31 on the West Morice Forest Development Road. Examinations revealed 11 attacks. This light level of damage produces no problem in stand development.

**SPRUCE WEEVIL**, *Pissodes strobi*, was common on white and Sitka spruce along both sides of Highway No. 16, between Prince Rupert and Burns Lake.

A **PINE NEEDLE MINER**, *Pulicalvaria* sp., mines bases of needles of lodgepole pine. On an area examined on the Perow burn plantation, 48% of the pine trees were infested, but no significant injury resulted.

## DISEASE SECTION PRINCE RUPERT DISTRICT

### PORCUPINE FEEDING

Bark stripping by porcupines was widespread in the District. In a 25-year-old western hemlock stand, 10 to 20% of the trees were killed over 800 ha (2,000 acres) along both sides of Khutzeymateen Inlet, between McGregor Point and Larch Creek. Between Terrace and Little Oliver Creek, several scattered groups of 25 to 200 trees had been killed; elsewhere small pockets of lodgepole pine were killed at Topley Landing, Fulton Lake and Telkwa River.



Bark stripping by porcupines on lodgepole pine





Dwarf mistletoe on western hemlock

**DWARF MISTLETOE, Arceuthobium tsugense**, infected residuals were found in four of seven areas, naturally regenerated with young western hemlock 10 to 20 years ago. Infected residuals should be removed to reduce infection of the understory. Except near the airport south of Terrace, where 28 of 32 residuals greater than 3 metres (10 feet) tall were severely infected on a representative 1 hectare (2.5 acre) area, infection of the natural regeneration is light. Other areas with one or more infected residuals were Chist Creek, Star Creek and the White-bottom Block. No infection of young, naturally regenerated hemlock was found north of Terrace.

**SNOW BLIGHT, Lophophicidium hyperboreum**, killed numerous branches on the lower portions of 60% of 2- to 4-foot white spruce examined on the Perow burn plantation, and 37% of the spruce on the Chapman Lake plantation suffered similar damage. Elsewhere, this disease has been a major cause of mortality of recently planted seedlings, and causes snow mould and blighting of needles of small trees and lower branches of larger trees. This disease has only recently been recognized in

British Columbia and could be a future problem in plantations.

**BUD NECROSIS, Camarosporium strobilinum**, killed most current shoots on 80% of 5-year-old white spruce on a plantation near Division Lake, Burns Lake Ranger District. If further dieback occurs, some mortality or tree deformation can be expected.

**INLAND SPRUCE CONE RUST, Chrysomyxa pirolata**, which causes destruction of seed and premature cone opening, was prevalent on Sitka and especially white spruce, in the eastern portion of the District, where cone crops were heavy. The range of infection averaged 18%, with the highest incidences on white spruce at: Kispiox Valley, Mile 36 (51%), Kispiox Valley, Mile 20 (42%), Owen Lake (41%), and on Sitka spruce at Kleanza Creek (34%).

**A SHOOT BLIGHT, Sirococcus strobilinum**, affected 50% of the tips of nearly all the juvenile western hemlock on 2 ha (5 acres) at Chist Creek Flats. Initial tip wilting was high, but a sample examined by a Forest Pathologist showed that many of the tips were recovering, which is unusual. This disease is particularly dangerous to seedlings and saplings.

**COMANDRA BLISTER RUST, Cronartium comandrae**, caused stem and branch cankers on 25% of trees in a localized 2-ha (5-acre) area of 1-5 meter (3-15 feet) lodgepole pine at the Dease Lake junction to Telegraph Creek.

**LEAF AND TWIG BLIGHT, Venturia macularis**, was widespread on trembling aspen in eastern regions of the District. The moist spring and summer served to intensify and spread the disease. Severe damage, evidenced by blackened leaves and dead shoots, was evident between Southbank and Grassy Plains, and near Rose Lake. Light to moderate damage occurred from Houston to Burns Lake, Ootsa Landing and Wistaria, and Burns Lake to Pendleton Bay, with scattered pockets along the Perow - Jarman road, Forestdale Canyon, near Owen Lake and between Cedarvale and Hazelton.

Table 1. Other diseases of current significance

Organism	Host(s)	Locality	Remarks
<u>Elytroderma</u> <u>deformans</u> Elytroderma disease of pines	Pine, lodgepole	Lower Post	High infection for 1 mile along road.
Fume damage (fluoride)	Fireweed Fir, amabilis Cottonwood, black Hemlock, western	Kitimat	Marginal necrosis, or needle tip browning typical of chronic fluoride injury; less severe than 1975.
<u>Endocronartium</u> <u>harknessii</u> Western gall rust	Pine, lodgepole	Nadine Lake Bulkley Canyon Kispiox River	Average 66% infection, young roadside stand 5-25 years.
<u>Cronartium</u> <u>coleosporioides</u> Stalactiform rust	Pine, lodgepole	Francois-Morice lakes Bulkley Canyon Owen Lake	Average 25% infection.
Blowdown	Spruce, white Pine, lodgepole	East side Babine Lake	Fringe blowdown adjacent to logging involving 400-600 ha (1,000 - 1,500 acres).

STATUS OF FOREST PESTS IN PACIFIC REGION 1976

PEST	DISTRICTS						
	PRINCE RUPERT	PRINCE GEORGE	VANCOUVER	CARIBOO	KAMLOOPS	NELSON	YUKON
MOUNTAIN PINE BEETLE	infestations, Cedarvale to Babine L	small infestations, Stuart L area	extensive infestation, Klinaklini R	infestations in central and western regions	widespread infestations on lodgepole and white pine	scattered infestations	not found
SPRUCE BEETLE	small infestations, Smithers Landing, Otter L	low populations	not found	low populations	infestations, Yalakom PSYU	small infestation, Kootenay L	low population, Haines Jct to Watson Lake
DOUGLAS-FIR BEETLE	not found	low populations	light attacks, Fraser Canyon - Pemberton - Vancouver Island	low populations	attacks on tussock moth-defoliated trees	low populations	no host
WESTERN SPRUCE BUDWORM (1-YEAR-CYCLE)	trace	low populations	extensive infestations, Fraser Canyon - Pemberton areas	low populations	extensive infestations, Lillooet - Adams and Shuswap lakes	moderate populations, Revelstoke	trace
SPRUCE BUDWORM (2-YEAR-CYCLE)	low populations, Bell-Irving R	defoliation, Holmes R	not found	infestations, Horsefly to Bowron L	infestation, Lempriere Cr	low populations	not found
WESTERN BLACKHEADED BUDWORM	light infestation, Bell-Irving R	low populations	low populations	low populations	infestation, Blue R	low populations	trace
FOREST TENT CATERPILLAR	low populations	severe defoliation, McBride area	not found	not found	infestation north of Barriere	infestations, Golden and Fort Steele	not found
CONIFER SAWFLIES <i>Neodiprion</i> spp.	infestations, islands south of Prince Rupert	infestations east of Prince George	low populations	low to moderate populations	infestations, Vavenby to Avola	moderate populations, Beaton	trace
CONE RUSTS	common on white and Sitka spruce	common on white spruce	not found	light infection	not found	not found	not found

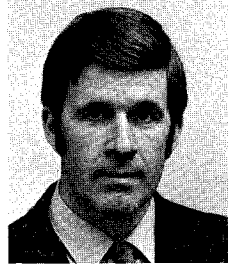
# Forest District Ranger Assignments - 1977

## CARIBOO



Stan Allen

## VANCOUVER

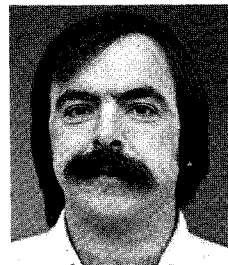


Ernie Morris

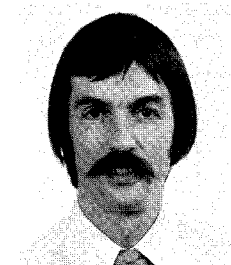
## KAMLOOPS



Dick Andrews



Colin Wood



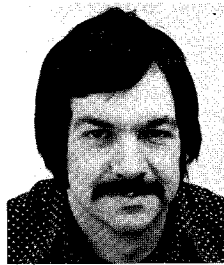
Jack Monts

## PRINCE GEORGE & YUKON TERRITORY



Roly Wood

## PRINCE RUPERT

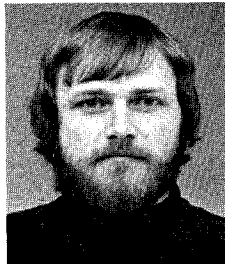


Don Doidge

## NELSON



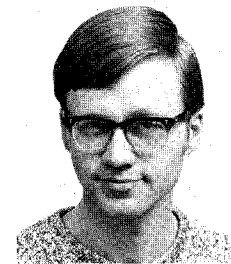
Cliff Cottrell



Leo Unger



Peter Koot



Bob Erickson