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Forest Insect and Disease Conditions

Prince Rupert Forest Region 1981

L.S. Unger and N. Humphreys

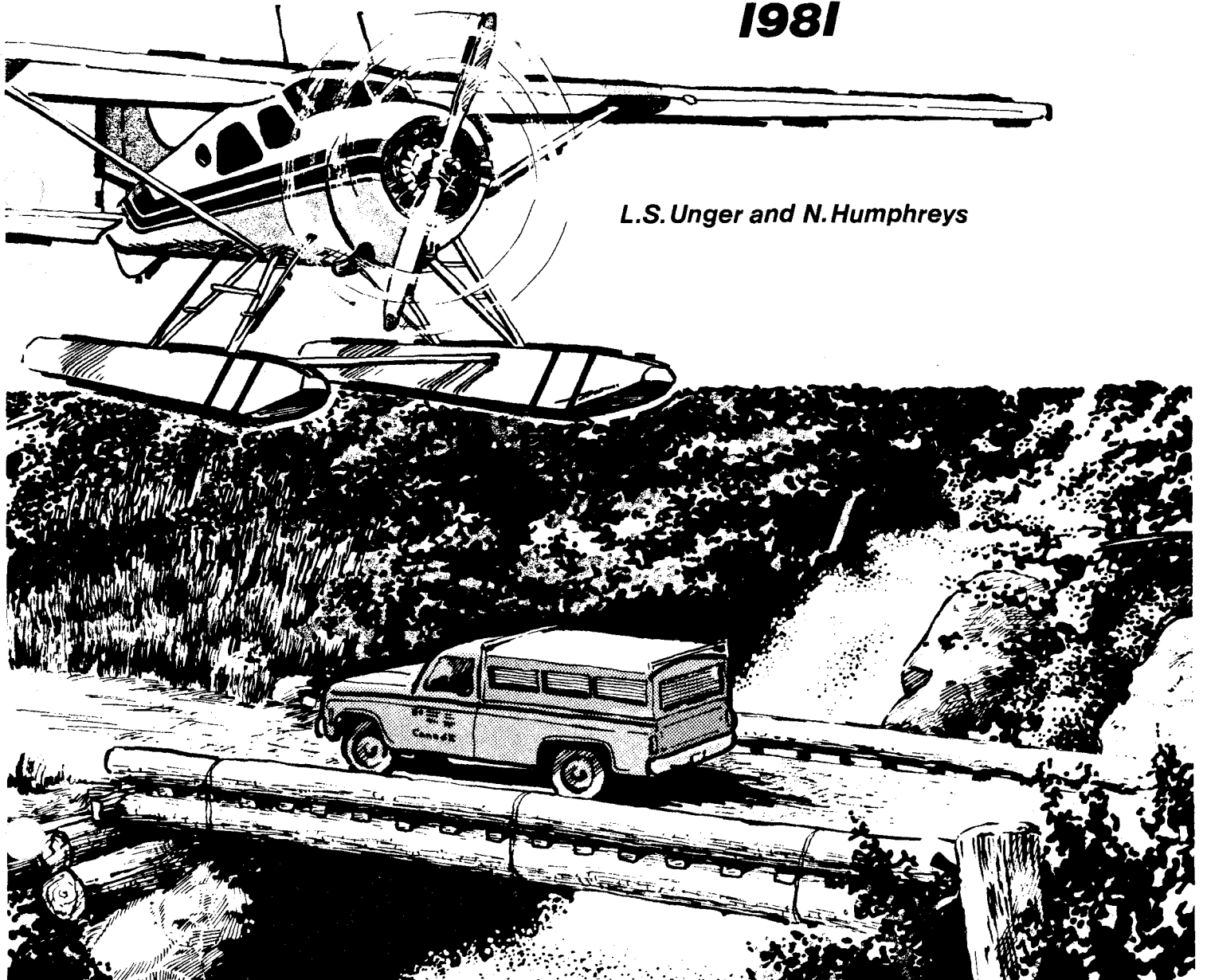


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SUMMARY

This report outlines the status of forest pests in the Prince Rupert Forest Region in 1981, and attempts to forecast pest population trends. Pests are listed by host in order of importance.

Spruce beetle destroyed an estimated 160 000 m³ of mature white spruce on 6 200 ha, with an increased attack in 1981. Spruce budworm defoliated 39 000 ha of spruce and alpine fir stands, mainly in the Meziadin Lake area. Sitka spruce was severely defoliated over 5 000 ha on coastal Queen Charlotte Islands and near Prince Rupert by spruce aphid. A seedling weevil killed up to 50% of the Sitka spruce seedlings in plantations on Moresby Island.

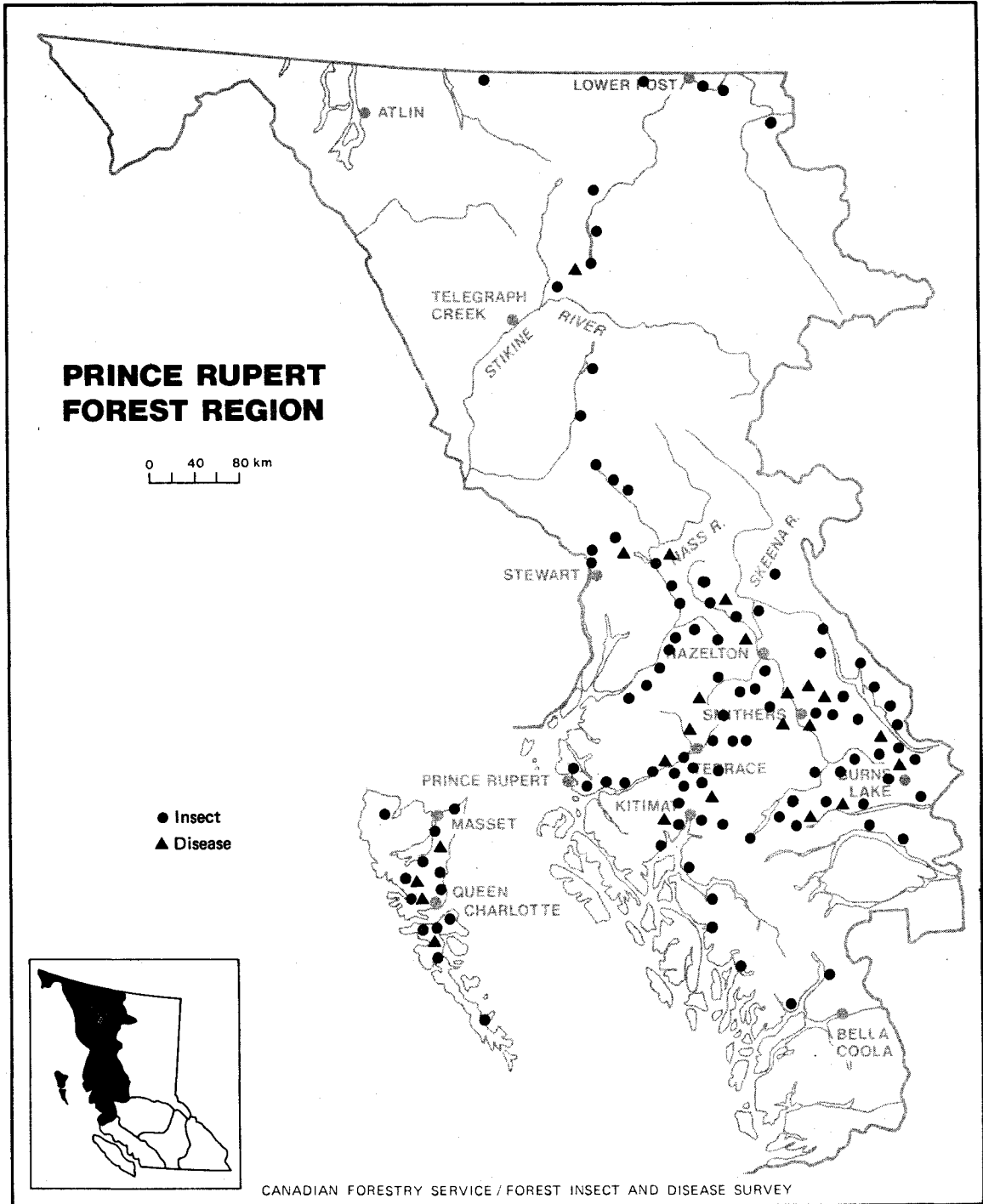
An estimated 190,000 lodgepole pine were killed by mountain pine beetle over 5 700 hectares, with a threefold increase of 1981 attacked green trees compared to 1980. Pine engraver beetle killed groups of up to 5 lodgepole pine near Francois Lake. At Onion Lake there was light defoliation of lodgepole pine by sawfly. Lodgepole pine needle miner lightly defoliated over 600 ha of pine in the interior of the Region. Thirteen percent of the trees, in 20 young pine stands examined, had pest problems.

Western balsam bark beetle infestations continued, with 20,000 alpine fir killed over 2 450 ha. Light defoliation of alpine fir and white spruce was caused by blackheaded budworm over 670 ha near Houston. The number of trees killed by Douglas-fir beetle remained unchanged in the Atnarko River area, at 80 trees. Diaporthe lokoyae killed up to 10% of the terminals on a young 80 ha Douglas-fir plantation near Hagensborg.

Poplar shoot blight caused moderate to severe defoliation of trembling aspen over 22 600 ha, with the most extensive area near the Stikine River. Extensive defoliation was also recorded on black cottonwood stands over 650 ha in the Bella Coola Valley.

The Forest Insect and Disease Survey field season was between June 1 and October 2, during which time a total of 292 insect and disease collections were made (Map 1). A further 38 collections were submitted by Provincial agencies, industry, and private sources.

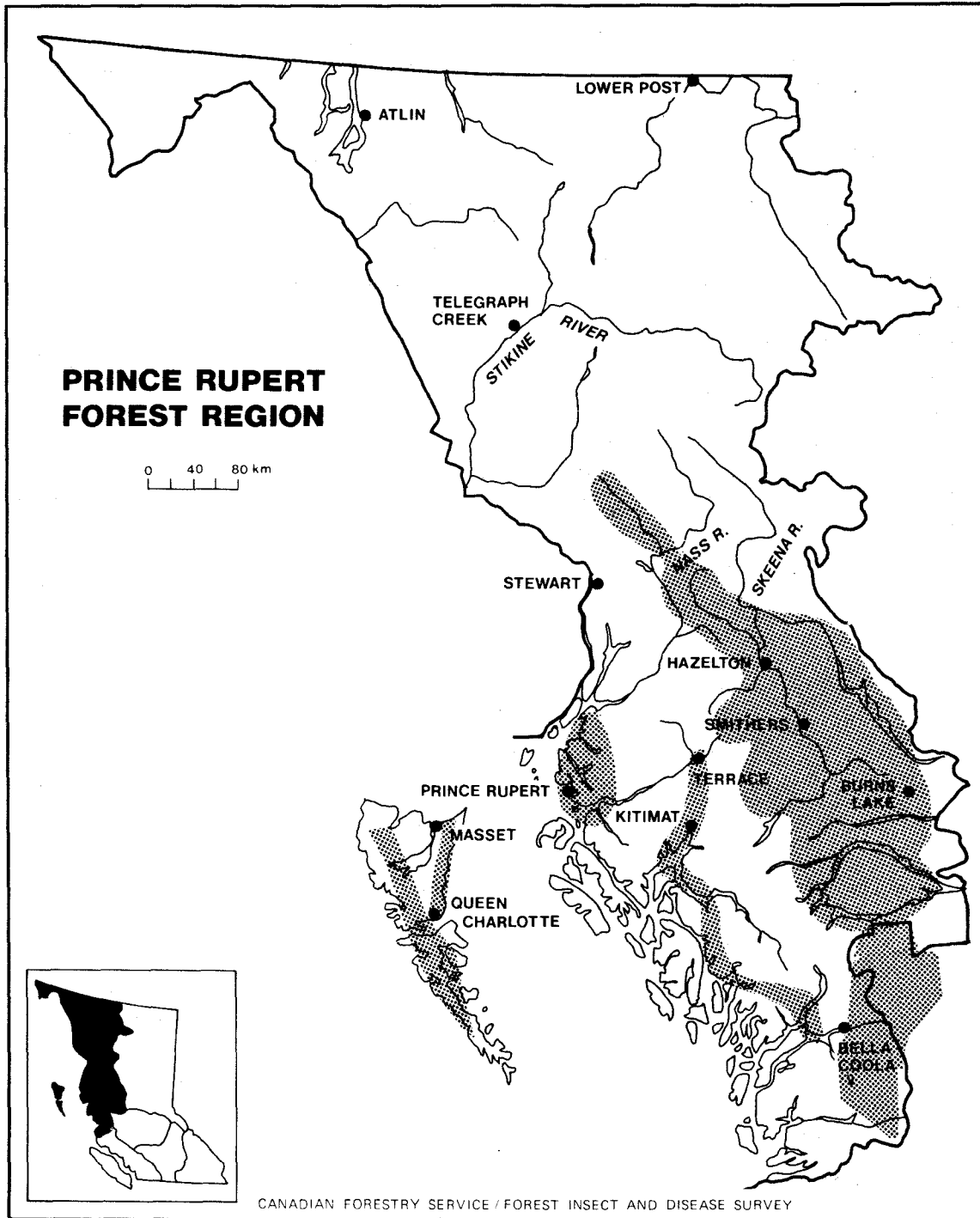
A total of 26.5 hours of flying time was provided by the B.C. Ministry of Forests, Smithers, Protection Branch, for aerial detection of bark beetle outbreaks and defoliated stands. A further 11 hours were used during coastal sampling on the Queen Charlotte Islands and the south coast (Map 2).



Map 1

**Collection Locations
1981**

Locations Where One or More Insect or Disease Samples Were Collected



Map 2

Aerial Surveys
1981

Area Covered By Aerial Surveys

SPRUCE PESTS

Spruce beetle, Dendroctonus rufipennis

Spruce beetle infestations were distributed over 6 200 ha, or 5% of the mature white spruce in the interior Prince Rupert Forest Region in 1981, with an estimated volume loss of 160 000 m³. These figures indicate an intensification of attack rather than spread from 1980 results of 180 000 m³ killed on 11 800 ha. Because some of the 1980 attacked trees had not yet discolored at the time of aerial mapping during the latter half of July, the 1981 figures are conservative.

In the Morice Timber Supply Area, the beetle killed an estimated 63 400 m³ over 2 060 ha. The major areas were in the Morice R., Poplar L., Parrott L., and Walcott area (1 900 ha) and to the east of Babine Lake in the Hautete Creek area (150 ha). The volume killed is approximately 3% of the current demand for all species in the T.S.A.

In the Bulkley T.S.A. 5 600 m³ of wood was killed. Infestations continued in the McDonell Lake (55 ha), Trout Creek (65 ha), Reisetser Creek (30 ha), and the Goathorn-Coffin lakes (30 ha) areas.

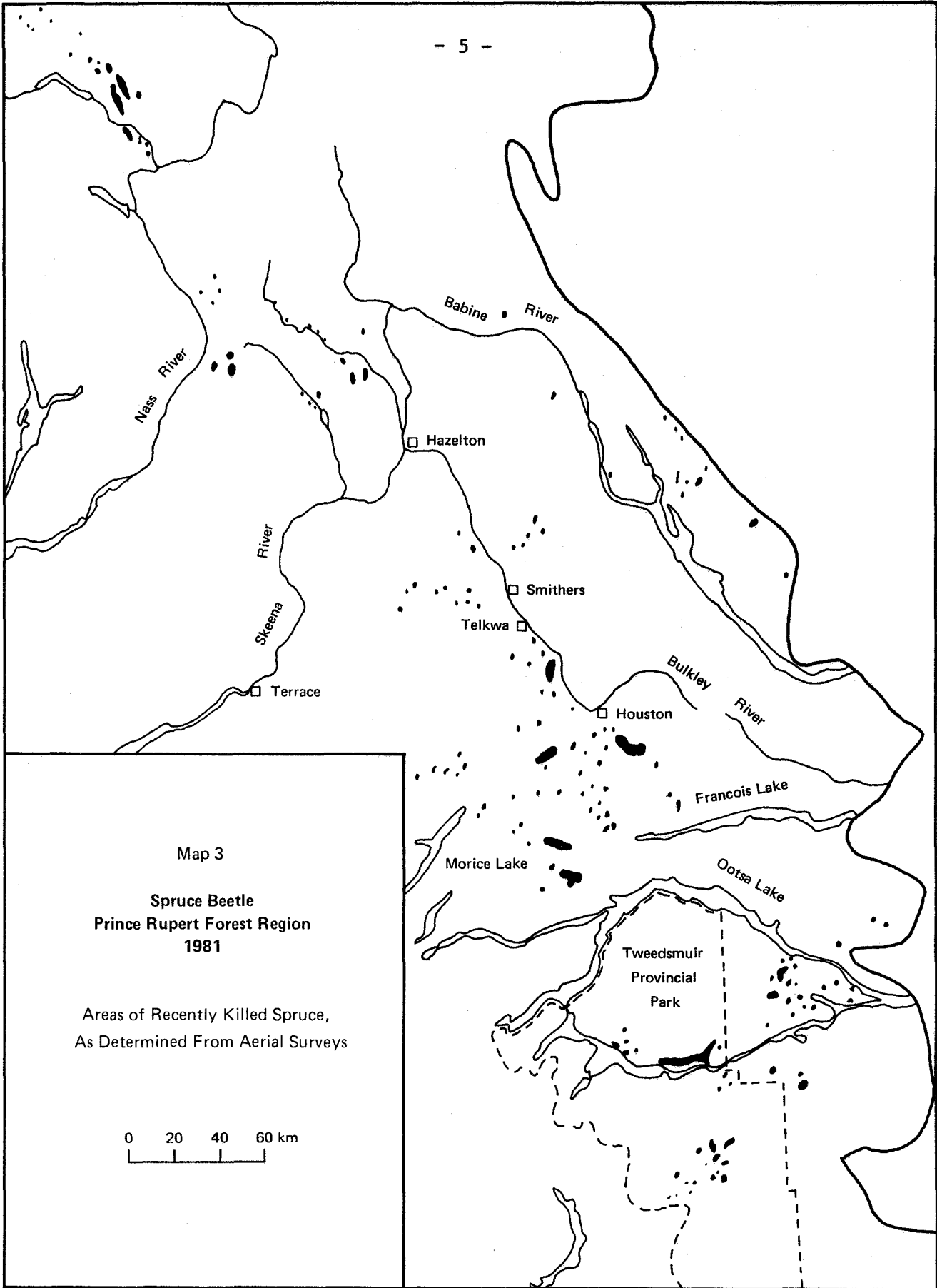
The major area of beetle-killed stands and current attack in the Lakes T.S.A. are spruce stands between Ootsa Lake and Tetachuck Lake, where more than 41 000 m³ of timber has been killed over 1 300 ha by the 1979-80 attack.

In the Kispiox T.S.A., patches of less than 5 hectares of recent beetle-killed trees were evident, primarily in the Kispiox River valley and near Kitwanga Lake, extending over approximately 100 ha.

In the Kalum T.S.A. and T.F.L. 1 (B.C. Timber) beetle activity continued at low to moderate levels destroying 11 000 m³ over 1 500 ha. The main increase in the 1979-80 killed trees being along the Bell-Irving River in the form of small patches near creeks and rivers where the spruce component increases.

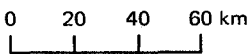
In the northern part of Tweedsmuir Park, infestations continued in the Eutsuk and Sigutlat lake areas and destroyed an estimated 37 000 m³ of spruce on 1 100 ha.

Ground inspections at five areas, Pimperial Cr., Walcott, Sweetin R., Spruce Cr., and Derrick L. showed that the incidence of 1981 attack of green standing trees was double that of 1980 (Table 1). The major areas of persistent beetle activity, at Walcott and along the Morice River, had the greatest increase in attack from 17% to 35%. Examination of broods indicated that 50% of the 1981 brood should mature in one year, resulting in a large flight in 1982, precluding any overwintering impact. The beetle-killed trees in the Kispiox were largely in scattered pockets of less than 5 hectares, this was partly due to localized host distribution and also to the early development stage of the infestation. These initial outbreak areas have intensified from 1% attack in 1980 to



Map 3
Spruce Beetle
Prince Rupert Forest Region
1981

Areas of Recently Killed Spruce,
As Determined From Aerial Surveys



12% in 1981, and further expansion is expected.

Beetle activity in the Cranberry-Derrick Lake area appears to have declined, with a decrease in attack to 2% in 1981 from 8% in 1980. A trap tree program in 1980 by B.C. Timber in this area appears to have contributed to the reduction of the beetle hazard temporarily.

In the more northern area along the Bell-Irving River incidence of 1981 attacked trees remained relatively constant at 15% compared with 1980. Brood examinations indicate slightly lower levels of attack can be expected in 1982.

Root rots, primarily Polyporus tomentosus, were associated with 90% of the small pockets of beetle attack, especially in the Kispiox River area, where early stages of infection occur. This root rot was also associated with bark beetle attacks at Kitsequecla Lake, McDonell Lake, Morice River, and at Smithers Landing. At the latter location an extensive trap tree program effectively reduced populations, from initial outbreak to endemic status, however, beetles were still evident in pockets of root rot infected trees and recent windfall. Strong winds in August resulted in further fringe blowdown, which should be suitable host material for attack by the beetle in early 1982.

Table 1. Status of white spruce in stands infested by spruce beetle, Prince Rupert Forest Region, September, 1981.

Location	<u>Percentage of stems</u>				Healthy
	1981 attack	1981 partial	1980 attack	prior to 1980	
Pimpernal Cr.	24	6	13	8	49
Walcott (A)	45	5	9	5	33
Walcott (B)	37	0	28	21	14
Sweetin R.	12	4	1	7	72
Spruce Cr.	15	0	12	8	65
Derrick L.	2	6	8	25	59

Spruce budworm, Choristoneura biennis

A total of 39 000 ha of light to moderately defoliated spruce and alpine fir stands were mapped during aerial surveys in 1981. The major area of defoliation (34 570 ha) was between Vandyke and Bowser Lake, with moderate defoliation on 17 400 ha between Vandyke and Meziadin Lake and light defoliation over the remainder of the area. Lightly defoliated stands were recorded over 4 060 ha along the Babine River between Shedon and Thomlinson creeks, and also in the Kispiox River valley were 350 ha near Footsore Lake was visible from the air.

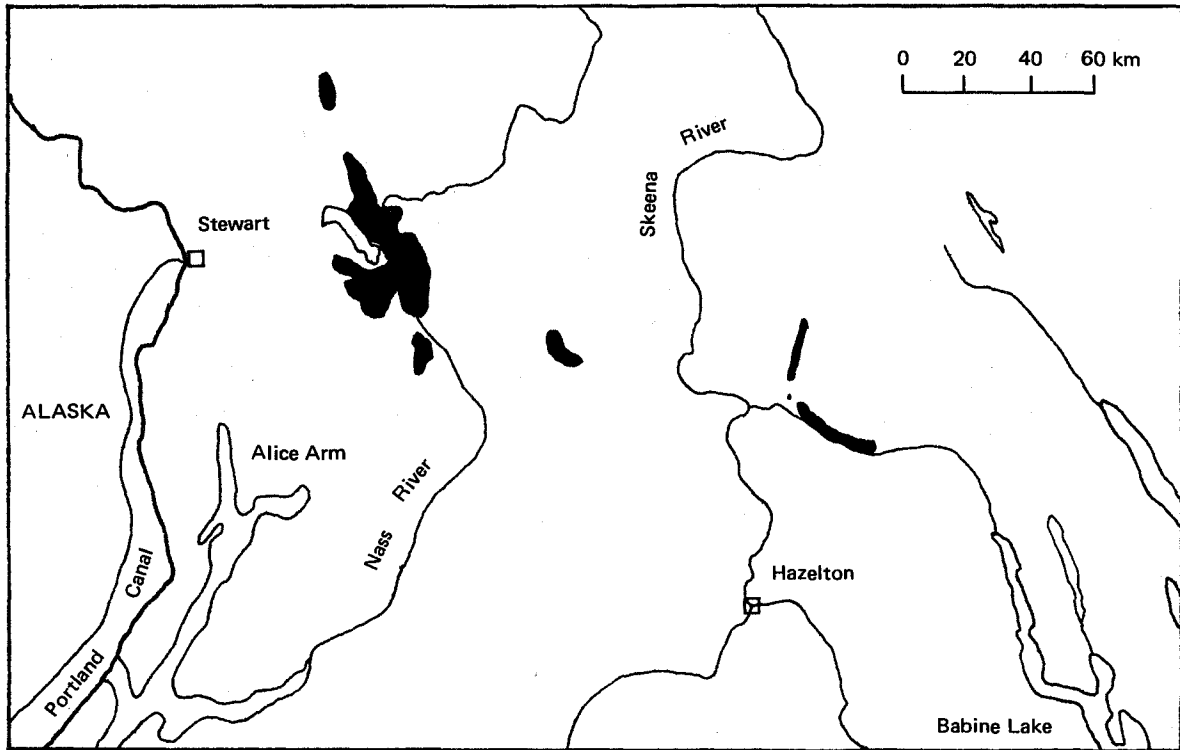
Increases in larval populations were first reported in 1979 when light defoliation was visible from the ground in the Kispiox River valley. This increased in 1980 with light defoliation also showing up in the Nass, Bell-Irving rivers area. Larval samples along the Nass River in the spring of 1981 yielded up to 300 larvae and 170 in the Kispiox River valley, indicating that some defoliation would occur.

Egg mass samples from two branches from each of five trees along the Kispiox River produced 160 egg masses per 10 m² of foliage, indicating that moderate to severe defoliation (150 masses/sample) could occur in 1982 if larvae mature by spring, 1982. If larvae develop over two years, only light defoliation should be expected in 1982 with moderate defoliation in 1983. There is a lack of information required to determine whether this is a one-year-cycle budworm, or whether part of the population is an off phase two-year-cycle budworm. In the Nass River area, egg samples indicated that the population had decreased drastically between the larval and adult stage with only 14 egg masses per 10 m², which indicates a very light population. Single dead larvae infected with a parasitic fungus, Beauveria bassiana were collected from samples in the area and may have been a major factor for the population decline. Infection appears to decrease larval populations most effectively during cool-wet seasons, which occurred during most of the 1981 budworm larval period.

Spruce aphid, Elatobium abietinum

Moderate to severe defoliation of coastal Sitka spruce was recorded on 5 020 ha (Map 5). Feeding was most evident on open growing mature spruce along much of the east, north and to a lesser extent the west coastline of the Queen Charlotte Islands, and from the mouth of the Skeena River north to Portland Canal. There was 5 to 10% mortality on 320 ha between Queen Charlotte City and Tlell and at Gray Bay. Further mortality may occur in 1982 if high population levels persist, as many of these trees have only a portion of the 1981 foliage remaining.


Damage to coastal fringe spruce has been evident for the past five years but was noted up to ten kilometers inland for the first time in 1981 near Juskatla, where exposed trees in a plantation had up to 60% of 1980 and previous years foliage fed on.

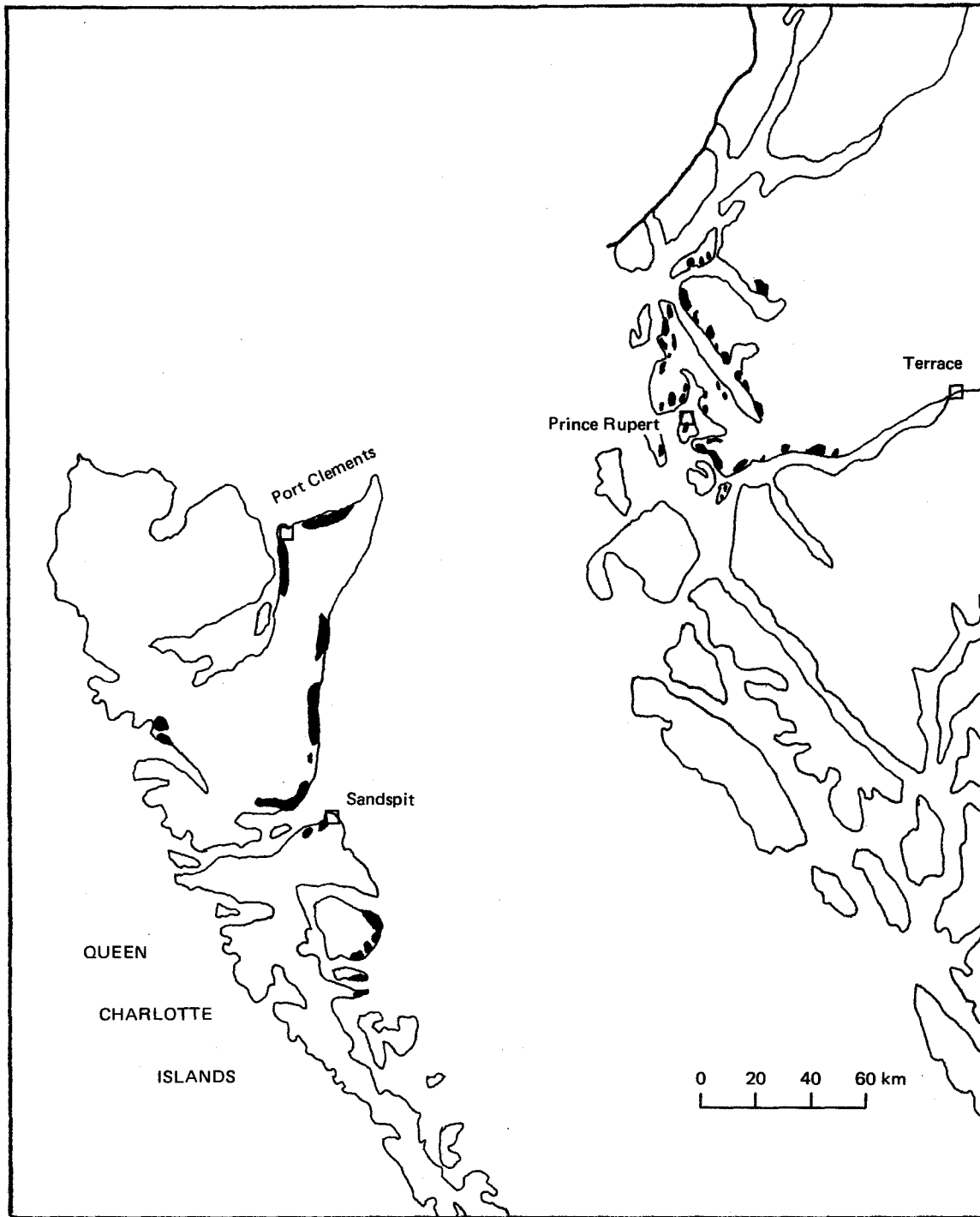


Map 4

**Two-Year Cycle Spruce Budworm
Prince Rupert Forest Region
1981**

Areas of Defoliated White Spruce and Alpine Fir Stands
As Determined From Aerial Surveys

 light to moderate defoliation



Map 5

**Spruce Aphid
Prince Rupert Forest Region
1981**

Areas of Defoliated Sitka Spruce, As Determined From Aerial Surveys

A seedling weevil, Steremnius carcinatus

This seedling weevil killed up to 50% of the Sitka spruce seedlings, planted during the late winter, 1981, near Alliford Bay and South Bay on northern Moresby Island. In three of four plantations examined, on the Island 20, 30, and 50% of the seedlings were killed respectively, with the highest incidence adjacent to landings and spruce stumps in which the weevils had been feeding. The damage free plantation was on a rocky and more exposed site, less conducive to weevil activity. Feeding is generally most damaging to 1-0 stock planted early in the season or the fall, in areas where weevil populations were high.

Spruce weevil, Pissodes strobi

Of fifteen, young (8 to 30 yrs.) Sitka spruce stands, in which 100 trees per site were examined for spruce weevil damage in the Kitimat-Terrace-Prince Rupert area, six had an average of 23% of the leaders attacked. Damage to leaders ranged from 14% at Nelson Creek to 30% at Onion Lake. Other areas were Andesite Creek, 27%, Kitimat River and Exchamsiks River at 21%. The highest incidence of terminal mortality is evident in the more widely spaced stands of 8 to 30 years.

Spruce gall aphid, Adelges cooleyi

This insect is a pest of spruce and Douglas-fir wherever the two species grow together. Adjacent to a 12 year old Douglas-fir plantation in the Perow Burn, the shoots on two branches from each of 25 white spruce trees were examined for galls. An average of 48% of the shoots were infested. Trees with more than 50% of the shoots infested were 32% shorter, and 18% smaller at breast height, than trees with less than 50% infection. Tree form was affected in 4% of the trees examined due to gall formation on the terminals, however the last two years of height growth was usually uninfested, indicating the preference for lower lateral shoots. This is certainly a pest to consider in any attempt to establish Douglas-fir in this region.

A gall aphid, Pineus sp.

This aphid infested up to 90% of the shoots on 40% of the white spruce in a ten year old plantation near Kludo Creek. Several successive years of damage gave the trees a stunted and deformed appearance.

Lighter damage is common with young spruce, as typified in a seven year old spruce plantation in the Fulton River area, where an average of 7% of the shoots were infested.

Climatic injury

Late spring frost killed 1981 shoots at varying degrees in most young inland spruce plantations as well as new alpine fir growth. In a ten year old plantation near Sweetin River, 81% of the trees had an average

of 21% (5-90%) of the 1981 growth damaged. Near Fulton Lake on a large spruce plantation 40% of the trees had 10% of the 1981 flush damaged. In plantations in the Kludo Creek and Telkwa River areas 15% of the shoots were killed.

In an 11 year old spruce plantation along Natlin Creek, a combination of spring rain and frost killed buds or damaged growth tissue, resulting in deformed growth on 22% of the terminals examined.

Red root and butt rot, Polyporus tomentosus

Root rot infection centers ranging in size from a few trees to 20 ha were commonly encountered in spruce stands in the Nass River, Kispiox River, Smithers Landing, Kitseguella Lake, McDonnell Lake, and the Morice River areas. Root rot infection, in addition to killing trees, and growth loss, results in increased susceptibility to blowdown which often creates suitable host material for spruce beetle populations to develop. The root rot was evident in 90% of the small groups of beetle attacked spruce examined in the above areas.

Cone and seed pests

The white spruce cone crops were basically very light (few cones on less than 25% of the trees) at elevations above 750 metres with moderate crops (many cones on 25 to 50% of the trees) at widespread locations in the Bulkley and Kispiox river valleys. One third of the potentially infested seeds sampled were infested, primarily by the spruce seedworm, Cyclia youngana and the spiral cone borer, Hylema anthracina, which were present in 9 of 10 collections. Other insects causing minor damage were: spruce seed Chalcid, Megastigma piceae; spruce cone axis midge, Dasineura rachiphaga; spruce seed midge, Mageliola carpophaga; spruce budworm, Choristoneura biennis; fir coneworm, Diorcytria abietivorella, and spruce cone gall midge, Dasineura canadensis. The latter insect was found in high numbers in the Kispiox River collection, however it has little effect on seed production.

The inland spruce cone rust, Chrysomyxa pirolata infection was very light (less than 10% of the cones infested) in most areas, with slightly higher incidence in the areas with larger cone crops. The infection rate of the alternate host, Pyrola sp., examined in spring corresponded closely to the percentage of cone infection. An average intensity of 30% infection was present on Sitka spruce between Shames and Exstew rivers.

Seed production was further disrupted by cool wet climatic conditions during the cone development period in spring and up to 20% of the cones failed to produce mature seeds.

Pest Damaged Cones

Prince Rupert Forest Region, 1981

Location	Total seed per slice	Good seed per slice	Percent seed destroyed	Percent of cones attacked	Percent cone with rust	Cone crop size
Smithers Ldg.	12.1	6.4	47	70	2	VL
Natlin Cr.	17.3	0.3	98	100	1	VL
Pinkut L.	16.5	0.3	98	100	3	VL
Skins L.	11.1	1.9	83	100	2	VL
Erickson L.	13.6	0.5	96	100	1	VL
Telkwa R.	12.6	6.3	50	75	13	
Skunsnat L.	6.6	5.0	25	20	20	
Nilkitkwa L.	11.3	6.6	41	50	0	VL
Morice R.	10.1	5.5	45	70	12	L
Aldrich L.	9.2	1.2	87	80	15	VL

PINE PESTS

Mountain pine beetle, Dendroctonus ponderosae

Mountain pine beetle killed an estimated 190,000 mature lodgepole pine over 5 700 hectares in 1981, compared to 50,000 in 1980 on 13 000 ha.

In the Bulkley TSA, 103,000 trees were recently killed on 1 730 ha, most of which was in the Harold Price Creek area. This infestation greatly intensified and new spot areas have developed on the eastern edge of the infestation. Patches of up to 20 ha of newly killed trees persist in the Goathorn Cr.-Telkwa area and in the Kitseguella Lake area.

The 56,000 trees killed over 1 930 ha in the Kispiox TSA and TFL 1 are mainly scattered in 5 to 20 ha patches along the Kispiox River, east along the Suskwa River and southwest along the Skeena River. The size and pattern of attack is largely determined by host distribution in the area. In patches of pine along the Cranberry and Nass rivers, north to Vandyke in TFL 1 over 12,000 lodgepole pine were killed on 860 ha and a further 2,000 pine were killed along the Babine River.

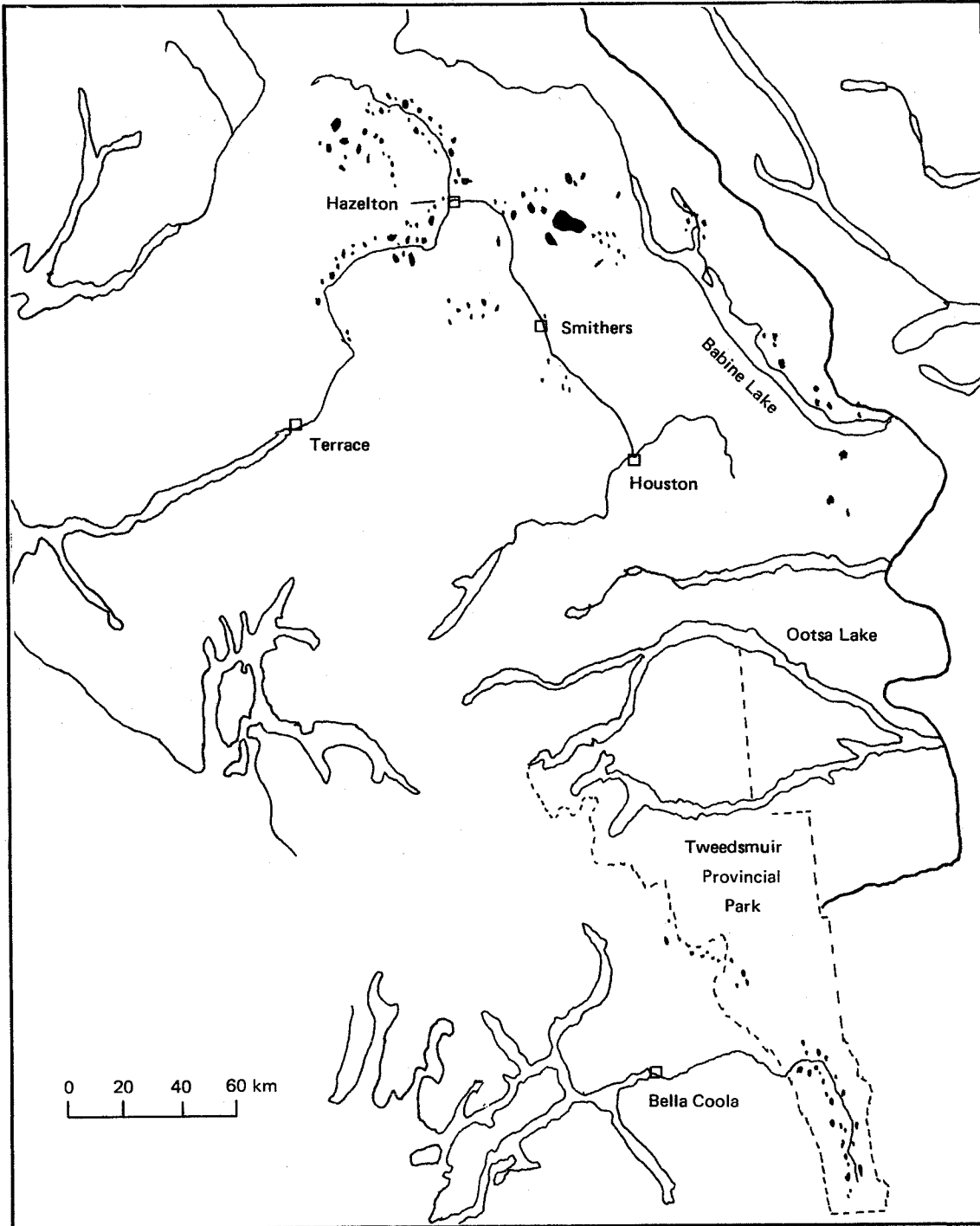
In the Morice and Lakes TSA's infestations continue, primarily on south facing slopes along Babine Lake where 6,400 trees were killed on 180 ha. The main concentration is near Hearne Hill, with patches up to 150 trees scattered to the south end of the lake.

There has been a considerable extension of the beetle infestation in the Atnarko River area of Tweedsmuir Park where an estimated 23,000 trees were killed over 900 ha. Areas of recently killed trees were evident from Young Creek to the southern park boundary. The 75 ha Dean River infestation continued to spread as spot outbreaks into the Takia River drainage and west along the Dean River into the Mid Coast TSA, where a total of 300 trees were recorded.

Cruise strips, run in five general areas during the fall to determine the status of trees in and adjacent to outbreak areas, indicated an increase in the number of attacked green trees in 1981 to 38% from 13% in 1980. Only one location, at Woodcock, had lower attack in 1981 than in 1980. In this area much of the larger diameter pine has been killed in previous years. A semi-permanent strip in this area, established in 1979 and re-examined in 1981 has 95% of the pine killed, with nearby younger stands resisting attack.

In the Harold Price Creek area, two strips were run in stands relatively free of previous attack. The current attack increase to 38% from 2% in 1980 indicates the potential for intensification and spread of this infestation in 1982. Extensive logging plans in this area, directed at currently attacked trees should contribute in slowing the spread rate.

Pure pine stands in the Kispiox River valley and the Cranberry-



Map 6

**Mountain Pine Beetle
Prince Rupert Forest Region
1981**

Areas of Recently Killed Lodgepole Pine, As Determined From Aerial Surveys

Nass river valleys are scattered on the drier slopes and ridges. However, it is in these areas particularly that beetle populations are increasing rapidly, and dispersing into the more mixed stands where the broods are less productive.

Condition of pine trees in mountain pine beetle infestation areas as determined by ground cruises

Prince Rupert Forest Region, 1981

Location	1981 attack	1981 partial attack	1980 attack	Prior to 1980 attack	Healthy
Vandyke	48	0	17	30	5
Woodcock	2	3	10	2	83
Kispiox R.	58	2	19	2	19
Harold Price Cr.(A)	40	0	3	14	31
Harold Price Cr.(B)	36	2	1	0	61
Telkwa	45	0	28	2	18

Progeny examined in 15 x 15 cm bark samples from 1981 attacked standing trees during the fall indicated a wide range in brood development, with an average of 60% going through the winter in the late larval stage, which is the most winter hardy. Five to ten percent had developed to the adult stage, with the potential to emerge and attack in the spring, 1982, precluding any adverse overwintering conditions, and a warm spring. In past years some 2-year cycling has occurred but brood development was accelerated this year due to warm dry summer weather, thereby increasing 1981 attacks.

The 1982 attack is expected to continue at levels similar to 1981 where large diameter host trees remain, near or adjacent to severe 1981 infested stands, in most outbreak areas.

Pine engraver beetle, Ips pini

The pine engraver beetle, and to a lesser extent the lodgepole pine beetle, Dendroctonus murrayana killed scattered immature and mature roadside and fringe lodgepole pine for 10 km along the Francois Lake Main near the Nadina Main. Groups of up to 5 trees were attacked and killed by late summer, and second attacks in late summer were very light. This is a newly developed logging area and previously endemic populations of engraver beetle built up in slash in 1980, then attacked recently exposed vulnerable fringe trees in 1981. Trees killed by the engraver

beetle in this region in previous years has been very limited, and the current activity is expected to decline unless dry summers predispose trees to attack in 1982.

A pine sawfly, Neodiprion spp.

Sawfly larvae caused ten percent defoliation on lodgepole pine at Onion Lake, where 120 larvae were collected from a three-tree beating sample. The most recent infestation on lodgepole pine near Prince Rupert in 1975-76 caused significant growth loss, stunting and some tree mortality. The numbers of larvae collected from other conifers were low, with the highest, 75 larvae collected from Sitka spruce at Emsley Cove south of Kitimat.

Atropellis canker, Atropellis piniphila

This is a very common stem canker, especially in densely stocked lodgepole pine stands. Cankers continue to grow in size and reduce log quality and suitability as sawlogs. Natural 40 year old pine stands at Owen Lake and Ootsa Lake had 12% infection incidence. In adjacent spaced stands, 2 and 14% of the trees were infected, respectively. However, conditions are less suitable for spread of infection in the spaced areas.

Lodgepole pine needle miners, Coleotechnites spp. and Zellaria haimbachi

These two pests lightly defoliated 600 ha of immature lodgepole pine near Granisle and a number of 5 - 10 ha patches between Ootsa Lake and Grassy Plains. In the upper crown of the trees 80 to 90% of the 1981 needles were fed on and declined to 10 - 20% of the needles in the lower portion of the crown.

Trace needle mining was noted in most young lodgepole pine stands in the Bulkley, Morice and Lakes TSA's. Typical feeding ranged from 5% of the needles on 10% of the trees in a plantation at McKillegan Creek to 10% of the needles on 80% of the trees near the Nadina River. In the Perow Burn, near Houston, where 90% of the trees had 10% of the needles mined; 15 Coleotechnites sp. and 3 Zellaria haimbachi pupae were found per 100 fascicles. These numbers indicate more severe feeding could occur in 1982. However, populations of both these species fluctuate dramatically and may decline without warning.

Red band needle blight, Scirrhia pini

This common disease of lodgepole pine moderately discolored foliage at a number of locations in the eastern portion of the Region. At Hicks Hill 25% of the foliage was infected on 80% of the trees over 500 ha, and successive years of infection have reduced foliage to primarily the 1981 needles. At Owen Creek, 65% of the foliage on 90% of the trees on 5 ha was infected. Patches of 5 to 20 ha of light infection were common in the Smithers, Morice and Lakes TSAs.

Northern pitch twig moth, Petrova albicapitana

This pest of young pine was recorded at the Paul Fire and Chapman Lake, during the examination of young pine stands. In both locations, 2% of the pine were attacked. Attack often results in deformed and weakened stems which are subject to wind or snow breakage.

Commandra blister rust, Cronartium commandra

Of twenty young lodgepole pine stands examined, eleven were infected, with an average of 6% infection by this stem canker. In a ten year old lodgepole pine plantation at Division Lake, 47% of the trees were infected, and of these 85% had stem cankers. Although the growth rate currently was similar between the infected and non-infected trees, at 1.9 metres, growth loss and mortality of 1 to 5% is expected to occur over the next 2 - 5 years.

Root collar weevil, Hylobius warrenii

An average of two percent of the trees were killed by this weevil in four of 20 young lodgepole pine stands examined. This pest annually attacks the root collar of healthy trees adjacent to ones which it has killed previously, resulting in localized openings which expand each year. This is of importance especially in plantations and young spaced pine stands.

Browsing

Browsing by deer destroyed 12% of the terminals in an eight year old lodgepole pine plantation in the Suskwa River valley. The highest incidence of damage occurred beside a small creek which ran through the plantation.

Orange stalactiform blister rust, Cronartium coleosporioides

Of twenty-one young interior pine stands examined, 38% were infected with this rust canker. Of five spaced stands, four had an average of 8% stem infection; whereas two out of four natural adjacent stands had an average of 1% infection. Of 12 plantations examined only 2 had stem infections, however the incidence of infection averaged 5%.

Cankers also persisted in older stands; 3% of the stems were infected in a semi-mature stand near Priestly, which resulted in significant stem deformity.

Lodgepole terminal weevil, Pissodes terminalis

Lodgepole pine terminal weevil was observed in ten of the twenty young stands examined in the Region. An average of 3% of the terminals were attacked, with the highest incidence of 7% recorded in an 18 year old plantation along the Telkwa River.

Western gall rust, Endocronartium harknessii

Eleven of 20 young lodgepole pine stands examined were infected by the branch and stem rust with an average incidence of stem infection of 7%. The highest incidence of 13% was in the 40 year old stands. Infection in three plantations averaged 5%, with the lowest incidence, 1%, in immature fire origin stands. In spaced stands the incidence varied little from the adjacent natural stands.

Sixty-five percent of the shore pine were infected with gall rust at Diana Lake, near Prince Rupert.

Climatic injury

Ten year old lodgepole pine planted in depressions, stagnated in 1981, with an estimated 5 to 10% mortality in the Ootsa and Morice lakes area. Severe frost deeply penetrated the soil in the fall of 1980 which was followed by record rainfall in the spring of 1981 before the ground had completely thawed, leaving the young trees submerged for an extended period in early 1981. The root systems were killed on an estimated 5% of these trees with extensive root damage on most of the remaining 95% of the trees. Although the root damaged trees presently survive with very limited development, they are subject to other pests such as root rots, and Pithyophorus sp., which had already killed several of the weakened trees. In addition, Coleotechnites sp. and Zellaria haimbachi destroyed up to 75% of the 1981 foliage, which further weakened the trees.

ALPINE AND AMABILIS FIR PESTS

Western balsam bark beetle, Dryocoetes confusus

This beetle killed an estimated 20,000 overmature alpine fir on 2 450 ha, primarily in the McKendrick Pass, Dome Mountain, in the Telkwa River drainage and in the White Pass area.

Alpine fir trees killed by beetle retain their foliage for 3 - 5 years which results in an impression of greater annual mortality than actually recorded. However, annual tree mortality seldom exceeds 1% of the alpine fir component. Root rots such as Polyporus tomentosus and Armellaria mellea are common in overmature stands and contribute to mortality, combined with beetle attacks of disease weakened trees. The accumulative mortality estimated as high as 30% of the stand.

Of 30-40 beetle killed trees examined the average age was 266 years (200 - 340 yrs) and twenty percent of the trees examined were infected by the heart rots, Fomes pini and Echinodontium tinctorium.

Blackheaded budworm, Acleris gloverana

Alpine fir and white spruce were trace to lightly defoliated

by the budworm over 400 ha near Byman Creek. From 20% to 70% of the 1981 foliage was defoliated and combined with a foliage rust, Pucciniastrum epilobii, which infected up to 90% of the needles, destroyed most of the 1981 foliage.

Light defoliation (1 - 10%) of the current year's needles of alpine fir and white spruce was also recorded on 150 ha near Km 57 of the West Morice FDR and on 120 ha near Rainbow Lake.

Blackheaded budworm does not have a history of causing serious damage in the interior districts of the Region. However, when defoliation is combined with severe foliage rust, as at Byman Creek, some annual increment loss results.

A spruce budworm, Choristoneura orae

This budworm lightly defoliated amabilis fir in the Kitimat Valley in 1980, however very few larvae were found and no defoliation was evident this year, probably because the majority of the larval population were in a second diapause thus maturing in a two year cycle. Extensive pheromone trapping, using 5 different pheromones, isolated the most effective components and may prove a useful tool for population predictive purposes.

Balsam twig aphid, Mindarus abietinus

Light damage caused by this aphid was common on young amabilis fir stands, with the severest damage recorded at Kitsumkalum Lake Provincial Park where 10% of the crown was damaged on 40% of the trees. Less intensive damage was also recorded at Kitimat River, Exchamsiks River, Ansburg Creek, and Little Wedenne River. The initial damage was to the current year's foliage, however as populations increase annually, bud and tip kill can result.

Longhorned beetles, Cerambycidae

These woodborers attacked and killed 20 green standing amabilis fir near Kitimat, where a similar number of trees were killed by the same pest in 1980. These attacked trees were under stress from occasional high water levels and exposure to sulphur dioxide fumes.

Browse damage

Deer browsing of amabilis fir plantations at Exchamsiks River and Kitsumkalum Lake Provincial Parks destroyed the terminals and 1981 growth of 25 and 15 percent of the trees in each area, respectively.

Fume damage

Sulphur dioxide fumes continue to damage foliage of young amabilis fir, deciduous trees and herbaceous plants in the Kitimat area. Periods of exposure between 10 to 15 years has produced chlorotic and non-vigorous trees which are susceptible to woodborers and other pests.

Fir-fireweed rust, Pucciniastrum epilobii

This foliage rust of Abies spp. severely infects the current year's foliage of stands where the rust's alternate host fireweed, Epilobium spp. is abundant in adjacent areas such as recently burned logging slash.

Near Byman Creek, 50% of the 1981 foliage was severely infected along the edges of previously logged openings and along roadsides. Infection of young amabilis fir occurred at Exchamsiks River Park where 20% of the foliage was infected in an old logged area.

Fir-polypody rust, Milesina laeviuscula

This needle rust of Abies spp. severely infected 5 to 10% of the current year's foliage of young amabilis fir stands along the Exchamsiks River and at Kitsumkalum Lake Park.

DOUGLAS-FIR PESTS

Douglas-fir beetle, Dendroctonus pseudotsugae

Douglas-fir beetle killed an estimated 50 trees in 8 patches along the Atnarko River near Young Creek, in Tweedsmuir Park in 1981. The number killed is similar to 1980 when 40 trees were observed, however two patches examined indicated a threefold increase in the 1981 attack compared to 1980.

A shoot miner, Dioryctria sp.

Two to three percent of the terminals in a young Douglas-fir plantation near Hagensborg were mined by the insect. And in combination with a disease, Diaporthe lokoyae, and an unknown caused terminal mortality, 35% of the leaders were damaged in 1981 and resulted in reduced terminal development, with potentially inhibiting affects.

Diaporthe canker of Douglas-fir, Diaporthe lokoyae

This canker of young Douglas-fir caused 10% topkill and less than 1% branch mortality in a 80 ha plantation in the Bella Coola River Valley.

Conifer-cottonwood rust, Melampsora occidentalis

Infection of between 20 to 30% of the foliage was recorded on immature Douglas-fir in the Bella Coola Valley and in a plantation north of Houston.

Flagging of Douglas-fir

Flagging of Douglas-fir twigs was light and scattered in the Bella Coola Valley. The cause is unknown but could be attributed to adult cicadas, which cut slits into the twigs for oviposition, or feeding by adult longhorned beetle, Monochamus sp.

Unknown terminal mortality

Twenty-two percent of the terminals, of a young Douglas-fir stand in the Bella Coola Valley, were "clipped" by causes unknown. Terminals were severed after growth developed in spring, however no disease or insect damage was identified with the cause attributed to some biotic factor, or bird feeding of terminal buds.

HEMLOCK PESTS

Fomes root and butt rot, Fomes annosus

The root and butt rot is common, especially in coastal hemlock, and was reported at low levels (2%) in immature spaced stands near Juskatla on the Queen Charlotte Islands. This pathogen can develop into a serious problem in spaced stands, since infection is largely spread by spore invasion of scarred tissue and root contact.

Green striped forest looper, Melanolophia imitata

Larval populations of this looper decreased from 40% positive three tree beating samples to 10% in 1981, after three successive years of increases.

DECIDUOUS TREE PESTS

Poplar shoot blight, Venturia macularis

This foliage disease of trembling aspen continued to cause moderate to severe discoloration and foliage loss on 22 600 ha. Severely infected stands were located along Highway 37 between the Stikine River and Kinaskin Lake, where up to 100% of the foliage was infected on 15 000 ha. Areas of primarily moderate infection were near Houston,

Telkwa, Old Fort on Babine Lake, and along Francois Lake near Colleymount. Light infection was common along the Bulkley and Kispiox river valleys. Infection was often localized in clones where leaf development was at a susceptible stage when disease inoculum was abundant.

Poplar shoot blight, Venturia populina

This foliage and shoot blight extensively discolored 80% of the foliage on 650 ha of black cottonwood in the Bella Coola Valley. Moderate to severe discoloration (90% of the foliage) occurred between Atnarko River and Firvale over 600 ha. Infection decreased to moderate and light between Firvale and Hagensborg and to light from Hagensborg to Bella Coola. And very light discoloration was recorded along Babine Lake in the Granisle-Topley Landing area.

Forest tent caterpillar, Malacosoma disstria

Light defoliation of deciduous trees occurred on 22 ha near Meziadin Lake. Cocoon counts during the late summer indicated increased populations and probable increases in intensity, and area of defoliation for 1982.

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