November 10, 1981

PACIFIC NORTHWEST FOREST PEST CONDITIONS DURING 1981

Compiled by

USDA Forest Service
Oregon State Department of Forestry
Washington State Department of Natural Resources
Oregon Department of Agriculture

INSECT CONDITIONS - 1981

Insect damage in forests of the Pacific Northwest continued to decline from the peak reached during 1977-78. This decline covered a broad spectrum including all bark beetles.

Mountain pine beetle continued as the major bark beetle pest with tree mortality greatest in lodgepole pine. Damage to sugar and lodgepole pines has decreased in Oregon and increased in lodgepole pine in Washington. Loss to the western pine beetle was about one-fourth that reported in 1980.

Although defoliation from western spruce budworm declined in Washington, new active areas were located on 312,640 acres in eastern Oregon. No tussock moth defoliation was recorded during the aerial sketch-map survey, but many adult moths were trapped by pheromone traps in several locations in both States. A small area of blackheaded budworm defoliation was observed on the Mt. Baker National Forest.

Larch looper-caused defoliation was observed on 60,550 acres in Washington.

TREND OF MAJOR INSECT PESTS IN PACIFIC NORTHWEST 1976-81

Insect	Acres Infested				
	1977	1978	1979	1980	1981
Douglas-fir Beetle	103,140	46,450	37,480	13,650	16,610
Mt. Pine Beetle	1,712,290	1,910,240	1,225,710	1,086,250	715,270
Western Pine Beetle	114,760	241,930	110,800	52,970	23,600
Fir Engraver	21,070	41,410	25,710	18,550	12,680
Flatheaded Borer	520	13,360	1,040	0	0
W. Spruce Budworm	1,194,710	198,950	406,660	132,430	342,690
D-F Tussock Moth	0	10,080	0	0	0

SUMMARY OF 1981 BARK BEETLE INFESTATIONS BY OWNERSHIPS
IN OREGON AND WASHINGTON
(EXCLUDING IPS)

INSECT SPECIES	FOREST SERVICE (COM. FOR. LANDS)		OTHER FEDERAL (BLM & BIA)		DEDICATED LANDS (WILD. & NAT. PARKS)		STATE & PRIVATE LANDS		TOTAL ALL FOREST LANDS	
	ACRES	MBF	ACRES	MBF	ACRES	MBF	ACRES	MBF	ACRES	MBF
Douglas-fir beetle, East Side DF	2620	247	50	14	1550	189	350	25	4570	475
Douglas-fir beetle, West Side DF	3600	1158	450	257	0	0	500	317	4550	1732
Douglas-fir engraver	160	1	0	0	0	0	0	0	160	1
Fir engraver	5400	434	250	19	340	30	1320	91	7310	574
Mtn. pine beetle, ponderosa pine	43120	3356	460	13	210	5	23840	1814	67630	5187
Mtn. pine beetle, sugar pine	740	22	0	0	0	0	120	5	860	28
Mtn. pine beetle, w. white pine	190	32	560	96	0	0	200	40	950	168
Mtn. pine beetle, lodgepole pine	453220	59103	3310	97	10540	1360	55010	6787	522080	67347
Western pine beetle	6160	653	270	57	480	20	880	98	7790	828
Total Oregon	515210	65006	5350	553	13120	1604	82220	9177	615900	76340
Douglas-fir beetle, East Side DF	1660	201	410	76	530	36	3370	749	5970	1061
Douglas-fir beetle, West Side DF	400	120	0	0	0	0	1120	289	1520	409
Douglas-fir engraver	1420	23	0	0	30	12	40	1	1490	36
Engelmann spruce beetle	0	0	0	0	260	27	0	0	260	27
Fir engraver	2240	284	820	61	550	51	1760	197	5370	592
Mtn. pine beetle, ponderosa pine	5300	271	3220	358	0	0	17350	814	25870	1444
Mtn. pine beetle, w. white pine	32160	7321	300	64	21680	7947	3690	797	57830	16130
Mtn. pine beetle, lodgepole pine	36630	6080	1060	465	840	22	1520	52	40050	6619
Western pine beetle	3840	263	2580	134	0	0	9390	917	15810	1314
Total Washington	83650	14563	8390	1158	23890	8095	38240	3816	154170	27632
Total for Region	598860	79569	13740	1711	37010	9699	120460	12993	770070	103972

FOREST PEST CONDITIONS
PACIFIC NORTHWEST
1980-1981

Pest	Acres Infested 1980	1981
Douglas-fir Beetle	13,650	16,610
Douglas-fir Engraver	30	1,650
Fir Engraver	18,550	12,680
Mt. Pine Beetle	1,086,250	715,270
Pine Engraver	32,610	16,150
Western Pine Beetle	52,970	23,600
W. Spruce Budworm	132,430	342,690
Larch Looper	0	60,550
Blackheaded Budworm	840	320
Balsam Woolly Aphid	4,740	1,750
Spruce Aphid	200	2,750
Bear Damage	1,240	4,950
Winter Damage	1,150	0
	1,344,660	1,198,970

TREND OF FOREST PEST CONDITIONS
OREGON
1980-1981

Pest	Acres Infested 1980	1981
D-F Beetle East Side	2,010	4,570
D-F Beetle West Side	4,450	4,550
Douglas-fir Engraver	0	160
Fir Engraver	6,280	7,310
Mt. Pine Beetle (P.P.)	179,860	67,630
Mt. Pine Beetle (S.P.)	1,820	860
Mt. Pine Beetle (W.W.P.)	3,460	950
Mt. Pine Beetle (L.P.P.)	817,100	522,080
Pine Engraver	21,240	15,100
Western Pine Beetle	44,790	7,790
Balsam Woolly Aphid	40	0
Spruce Aphid	0	2,350
Spruce Budworm	5,380	312,640
Bear Damage	80	160
Winter Damage	540	0
	1,087,050	946,150

TREND OF FOREST PEST CONDITIONS
WASHINGTON
1980-1981

Pest	Acres Infested 1980	1981
D-F Beetle East Side	6,700	5,970
D-F Beetle West Side	490	1,520
Douglas-fir Engraver	30	1,490
Fir Engraver	12,270	5,370
Mt. Pine Beetle (P.P.)	29,660	25,870
Mt. Pine Beetle (W.W.P.)	41,390	57,830
Mt. Pine Beetle (L.P.P.)	12,960	40,050
Pine Engraver	5,940	1,050
Western Pine Beetle	8,180	15,810
Balsam Woolly Aphid	3,030	1,750
Spruce Aphid	200	400
Larch Looper	0	60,550
Spruce Budworm	89,440	30,050
Bear Damage	800	4,790
Winter Damage	610	0
	211,700	252,500

East Side Douglas-fir Beetle, *Dendroctonus pseudotsugae* Hopk.

Damage caused by the Douglas-fir beetle east of the Cascade Mountains continued to decline as it has for the past several years, although acres infested increased slightly from the 8,710 mapped in 1980 to 10,540 in 1981. A major portion of this tree mortality occurred on the Umatilla and Wallowa-Whitman National Forests on areas defoliated by the Douglas-fir tussock moth during the 1972-74 outbreak and on western spruce budworm-defoliated areas in north-central Washington.

EXTENT OF DOUGLAS-FIR BEETLE, EAST SIDE DF
IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Deschutes NF	1	40	10	6
Malheur NF	3	70	15	8
Ochoco NF	2	100	30	16
Umatilla NF	38	1790	240	134
Wallowa-Whitman NF	49	2490	545	294
Winema NF	1	30	5	3
Warm Springs IR	2	50	20	14
Total Oregon	96	4570	865	475
Okanogan NF	21	2730	1234	679
Umatilla NF	37	1800	258	143
Wenatchee NF	1	20	5	3
Colville NF	15	580	168	93
Colville IR	9	360	140	70
Yakima IR	1	40	5	3
Northeast WA (State and Private)	6	300	90	49
Glenwood (State and Private)	4	140	38	21
Total Washington	94	5970	1938	1061
Total for Region	190	10540	2803	1536

West Side Douglas-fir Beetle, *Dendroctonus pseudotsugae* Hopk.

Aerial surveys of West Side Douglas-fir beetle recorded an increase in acres infested, but a decrease in volume killed from 2.2 million board feet in 1980 to 2.1 million during 1981. Over 85 percent of the total mortality occurred on the Willamette, Umpqua, and Rogue River National Forests in Oregon and the Olympic National Forest in Washington.

Stands on the Gifford Pinchot National Forest and adjacent State and private timber stands damaged or destroyed by the volcanic action of Mount St. Helens are under observation. Conditions in these stands closely resemble the blow-down and flood damage that have resulted in past Douglas-fir beetle outbreaks. Plans have been made to salvage as much damaged timber as possible before 1983 when developing beetle broods may emerge, attack, and kill healthy green trees surrounding the volcanic area.

EXTENT OF DOUGLAS-FIR BEETLE, WEST SIDE DF
IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Mt. Hood NR	7	160	35	45
Rogue River NF	24	950	441	799
Siskiyou NF	5	240	37	80
Siuslaw NF	1	10	5	12
Umpqua NF	45	2300	372	499
Willamette NF	24	890	191	297
Total Oregon	106	4550	1081	1732
Gifford Pinchot NF	7	390	95	80
Mt. Baker-Snoqualmie NF	16	380	101	99
Olympic NF	12	730	235	228
Southwest WA	1	20	5	2
Total Washington	36	1520	436	409
Total for Region	142	6070	1517	2141

Douglas-fir Engraver, *Scolytus unispinosus* (Lec.)

Activity of the Douglas-fir engraver continued at a low level on the North Cascades National Park and the Okanogan, Olympic, and Mt. Baker-Snoqualmie National Forests in Washington. In Oregon low levels of damage were reported on the Rogue River and Siuslaw National Forests.

EXTENT OF DOUGLAS-FIR ENGRAVER IN 1981
BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Rogue River NF	2	150	17	1
Siuslaw NF	1	10	5	1
Total Oregon	3	160	22	2
Mt. Baker-Snoqualmie NF	7	1320	345	21
Okanogan NF	1	50	50	3
Olympic NF	1	90	10	1
North Cascades NP	1	30	200	12
Total Washington	10	1490	605	37
Total for Region	13	1650	627	39

Fir Engraver, *Scolytus ventralis* (Lec.)

Fir engraver activity decreased in Washington, both in acreage infested and volume lost. A major part of this tree mortality occurred on the east slope of the Cascade Range on the Wenatchee National Forest. However, in Oregon there was a slight increase in acreage but a reduction in volume killed.

EXTENT OF FIR ENGRAVER IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Fremont NF	1	10	5	2
Malheur NF	1	40	10	3
Mt. Hood NF	16	490	124	50
Rogue River NF	32	1850	445	169
Siskiyou NF	3	180	35	7
Umatilla NF	9	400	55	14
Umpqua NF	34	2210	455	173
Wallowa-Whitman NF	7	420	100	19
Willamette NF	29	1330	319	121
Winema NF	4	320	30	11
Central OR (State & Private)	1	30	5	1
Crater Lake NP	1	30	10	4
Total Oregon	138	7310	1593	574
Gifford Pinchot NF	4	40	25	10
Mt. Baker-Snoqualmie NF	3	230	45	18
Okanogan NF	11	490	225	56
Olympic NF	1	10	5	1
Umatilla NF	4	210	23	6
Wenatchee NF	54	2370	1075	323
Colville NF	6	260	120	30
Colville IR	7	270	55	14
Spokane IR	1	40	5	1
Yakima IR	8	510	151	45
Northeast WA (State & Private)	8	300	103	26
Glenwood (State & Private)	5	550	200	50
Olympic NP	3	40	17	5
North Cascades NP	1	50	20	6
Total Washington	116	5370	2069	591
Total for Region	254	12680	3662	1165

Mountain Pine Beetle, *Dendroctonus ponderosae*, Hopk.

Although mountain pine beetle losses continued to decline throughout the Region, this beetle did maintain its current title as the most destructive tree killer in the Pacific Northwest. Tree mortality continued to decline in older areas of the outbreak in northeast Oregon, since the most suitable host material has been killed. Ponderosa, lodgepole, white, and sugar pine mortality totaled in excess of 96 million board feet, with 67 million of this volume in lodgepole pine stands in Oregon. Greatest damage in Washington occurred on the Colville National Forest and the Ross Lake area of the North Cascades National Park. Overall regional mortality declined from 112 million board feet in 1980 to 96.9 million in 1981.

EXTENT OF MTN. PINE BEETLE, LODGEPOLE PINE
IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Deschutes NF	176	152540	251883	17633
Fremont NF	95	59750	140941	9866
Malheur NF	224	75890	84538	5919
Mt. Hood NF	7	710	242	15
Ochoco NF	119	43320	69636	4178
Rogue River NF	25	1810	676	34
Umatilla NF	148	48180	95515	6687
Umpqua NF	17	5790	2360	118
Wallowa-Whitman NF	250	63400	72454	5072
Willamette NF	24	2150	955	67
Winema NF	164	64900	241394	16898
Warm Springs IR	10	660	515	36
Crater Lake NP	8	2980	11745	822
Total Oregon	1267	522080	972854	67345
Gifford Pinchot NF	1	70	35	2
Mt. Baker-Snoqualmie NF	2	60	80	6
Okanogan NF	20	3000	1685	118
Wenatchee NF	7	540	320	22
Colville NF	144	35190	85730	6002
Colville IR	10	1060	6645	465
North Cascades NP	1	130	50	3
Total Washington	185	40050	94545	6618
Total for Region	1452	562130	1067399	73963

EXTENT OF MTN. PINE BEETLE, PONDEROSA PINE
IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Deschutes NF	18	9380	11510	921
Fremont NF	115	12300	8592	687
Malheur NF	106	7800	5430	273
Mt. Hood NF	5	120	35	2
Ochoco NF	29	2130	2345	117
Rogue River NF	5	650	95	6
Siskiyou NF	1	20	5	0
Umatilla NF	163	17430	9090	2000
Umpqua NF	1	40	20	1
Wallowa-Whitman NF	110	8550	3466	799
Winema NF	34	5990	4132	331
Warm Springs IR	2	180	80	6
Central OR (State & Private)	38	2860	810	41
Crater Lake NP	1	180	45	4
Total Oregon	628	67630	45655	5188
Gifford Pinchot NF	2	150	30	2
Okanogan NF	100	10410	15235	764
Umatilla NF	1	30	5	1
Wenatchee NF	98	8680	4215	253
Colville NF	70	2200	916	48
Colville IR	45	2410	6888	346
Spokena IR	6	220	95	5
Yakima IR	15	580	126	8
Northeast WA (State & Private)	17	930	275	14
Glenwood (State & Private)	9	260	72	4
Total Washington	363	25870	27857	1445
Total for Region	991	93500	73512	6633

EXTENT OF MTN. PINE BEETLE, W. WHITE PINE
IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Deschutes NF	3	270	140	56
Mt. Hood NF	3	120	30	16
Warm Springs IR	6	560	240	96
Total Oregon	12	950	410	168
Gifford Pinchot NF	10	170	80	43
Mt. Baker-Snoqualmie NF	28	2120	635	287
Okanogan NF	144	14750	9310	5027
Olympic NF	4	100	35	17
Wenatchee NF	277	23620	13414	6040
Colville NF	19	2470	703	317
Kaniksu NF	23	4240	985	443
Yakima IR	15	300	142	64
Northeast WA (State & Private)	3	270	60	27
Olympic NP	66	2500	1306	522
North Cascades NP	44	7290	7425	3342
Total Washington	633	57830	34095	16129
Total for Region	645	58780	34505	16297

Pine Engraver, *Ips pini* (Say)

Activity of the pine engraver has decreased regionwide from 32,610 acres in 1980 to 16,150 acres in 1981. Most of the activity was centered on the Wallowa-Whitman, Umatilla, and Malheur National Forests in eastern Oregon.

EXTENT OF OREGON PINE IPS IN 1981 BY REPORTING AREA

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DEFOLIATION
Fremont NF	20	570
Malheur NF	42	5130
Rogue River NF	1	240
Umatilla NF	28	3280
Wallowa-Whitman NF	32	4790
Winema NF	5	120
Central OR (State & Private)	14	970
Total Oregon	142	15100
Okanogan NF	12	480
Wenatchee NF	5	240
Colville IR	4	140
Spokane IR	1	110
Northeast WA (State & Private)	2	80
Total Washington	24	1050
Total for Region	166	16150

Western Pine Beetle, *Dendroctonus brevicomis* LeConte

Tree mortality caused by the western pine beetle continued to decline. Infested area dropped from 227,000 acres in 1978 to 110,000 in 1979, followed by a 52 percent reduction to 52,000 acres in 1980 and a 45 percent reduction to 23,600 in 1981. Current damage is greatest on the Fremont, Malheur, and Winema National Forests in Oregon and on the Okanogan and Wenatchee National Forests in Washington. Some activity has occurred on all forests and Indian Reservations east of the mountains.

EXTENT OF WESTERN PINE BEETLE IN 1981 BY REPORTING AREA AND B.F. LOSS

REPORTING AREA	INFESTATION CENTERS		NUMBER OF TREES	VOLUME MBF
	NUMBER	ACRES		
Deschutes NF	1	20	5	4
Fremont NF	29	810	190	151
Malheur NF	14	1280	225	162
Mt. Hood NF	1	30	5	4
Ochoco NF	1	20	5	4
Rogue River NF	10	450	96	63
Umatilla NF	6	500	60	38
Wallowa-Whitman NF	7	390	35	27
Winema NF	40	3730	384	323
Warm Springs IR	3	80	45	31
Crater Lake NP	3	480	25	20
Total Oregon	115	7790	1075	827
Okanogan NF	25	2470	325	179
Wenatchee NF	32	7330	1721	757
Colville NF	19	600	150	81
Colville IR	21	2090	236	121
Yakima IR	3	490	20	13
Northeast WA (State & Private)	2	110	16	9
Glenwood (State & Private)	10	2720	290	154
Total Washington	112	15810	2758	1314
Total for Region	227	23600	3833	2141

Balsam Woolly Aphid, *Adelges piceae* (Ratz)

Number of visible infestation centers decreased from 89 in 1980 to 18 in 1981. All of the 1750 acres mapped in 1981 occurred in Washington. This is a decrease from 3740 acres mapped in 1980 in Washington.

EXTENT OF BALSAM WOOLLY APHID IN 1981
BY REPORTING AREA

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DAMAGE
Mt. Baker-Snoqualmie NF	6	280
Olympic NF	4	680
Wenatchee NF	2	180
Olympic NP	6	610
Total Washington	18	1750
Total for Region	18	1750

Western Spruce Budworm, *Choristoneura occidentalis* Freeman

In Oregon the area of visible defoliation increased from about 6,000 acres in 1980 to over 300,000 acres in 1981. This activity was on the Malheur, Umatilla, and Wallowa-Whitman National Forests and adjacent State, private and Bureau of Land Management property. Ground sampling helped estimate defoliation intensity and extent.

Egg masses sampled from 36 plots in eastern Oregon indicate an increasing population trend with the potential for widespread defoliation in 1982. An environmental analysis of the budworm infestation is being conducted.

Budworm populations appear to be decreasing in Washington with detected defoliation decreasing from 127,000 acres in 1980 to 30,000 in 1981.

EXTENT OF SPRUCE BUDWORM IN 1981 BY
REPORTING AREA AND OWNERSHIP

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DEFOLIATION
Malheur NF	63	116,270
Umatilla NF	50	96,830
Wallowa-Whitman NF	30	25,270
State and Private Lands	115	74,270
Total Oregon	258	312,640
Mt. Baker-Snoqualmie NF	3	570
Okanogan NF	32	15,360
Wenatchee NF	4	1,240
North Cascades NP	14	4,800
State and Private Lands	15	8,080
Total Washington	68	30,050
Total for Region	326	342,690

Spruce Aphid, *Elatobium abietinum* (Walker)

Spruce aphid damage was reported in scattered pockets along the coast of Oregon and Washington. The infested area increased from 200 acres in 1980 to 2750 acres in 1981. Defoliation caused by this insect is sporadic, causes growth loss, but only occasionally causes mortality.

EXTENT OF SPRUCE APHID IN 1981
BY REPORTING AREA

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DEFOLIATION
Siuslaw NF	39	2350
Total Oregon	39	2350
Mt. Baker-Snoqualmie NF	2	110
Olympic NF	2	210
Southwest WA (State & Private)	1	80
Total Washington	5	400
Total for Region	44	2750

Bear damage increased from 1240 acres in 1980 to 4950 acres in 1981. Over 75 percent of the damage was located in Washington on the Olympic and Gifford Pinchot National Forests.

EXTENT OF BEAR DAMAGE IN 1981
BY REPORTING AREA

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DAMAGE
Mt. Hood NF	1	90
Siskiyou NF	1	60
Siuslaw NF	1	10
Total Oregon	3	160
Gifford Pinchot NF	8	1,270
Mt. Baker-Snoqualmie NF	4	730
Olympic NF	23	2,510
Southwest WA (State & Private)	5	280
Total Washington	40	4,790
Total for Region	43	4,950

Larch Looper, *Semiothisa Sexmaculata sexmaculata* (Packard)

The larch looper defoliated 60,550 acres of larch and associated species on the Colville National Forest and adjoining State and private lands. The defoliation occurred in the same general area where defoliation was detected on 44,900 acres in 1979. It is expected that larch looper populations will collapse quickly and should not have a significant lasting impact on the larch.

EXTENT OF LARCH LOOPER IN 1981
BY REPORTING AREA AND OWNERSHIP

REPORTING AREA	NUMBER OF INFESTATION CENTERS	ACRES OF DEFOLIATION
Colville NF	73	46,530
State & Private Lands	84	14,020
Total Washington	157	60,550
Total for Region	157	60,550

Douglas-fir Tussock Moth, *Orgyia pseudotsugata*

Pheromone trap catches are higher than expected throughout the region. Plots averaging 25 or more male moths per trap are an early warning that population increases may be occurring.

Thirteen districts on six National Forests had at least one plot that averaged 25 or more moths per trap. The Forests are the Okanogan and Wenatchee in Washington, and the Wallowa-Whitman, Malheur, Fremont and Winema in Oregon. In addition, the Colville Indian Reservation in Washington had two plots which averaged 25 or more.

While these catches suggest increasing populations, it does not mean there is a tussock moth outbreak. Egg mass surveys on the Wenatchee and Okanogan indicate low egg mass numbers. Spring larval sampling will be conducted on all areas of high trap catches to determine population trend.

Larch Casebearer, *Coleophora laricella* (Hbn.)

Populations levels of larch casebearer varied over the region during 1981. Some serious defoliation occurred in the Central Oregon Cascades. Fall feeding populations are still high in this area and will probably cause heavy defoliation again in 1982. In other larch stands in Oregon, populations were generally lower than last year with light to moderate defoliation. In northeast and northcentral Washington, the population trend is down. Defoliation was generally light with some heavy in local areas. Populations in the Cascade Mountains of Washington showed only local variation from last year.

Success of the imported parasite release program is now becoming evident by reduced numbers of larch casebearer at some of the earliest release sites in the Blue Mountains of Oregon. No new species of exotic parasites were released in 1981. *Chrysocharis laricinella* was released for the first time on the Ochoco National Forest. In a cooperative program between the USDA Forest Service and Oregon State Department of Forestry, *Chrysocharis* was collected at Sherman Pass, Washington and relocated on the Ochoco.

Sawflies

No sawfly activity was recorded in Oregon or Washington during 1981.

Cone and Seed Insects

Douglas-fir cone crops west of the Cascades were light and scattered during 1981; as a result, cone and seed insect impact was heavy. Cones evaluated at three locations in Oregon supported moderate Douglas-fir cone gall midge, *Contarinia oregonensis* Foote, damage. There was sufficient pollen produced at these locations to insure merchantable viable seed production, but the Douglas-fir seed chalcid, *Megastigmus spermotrophus* Wachtl, infesting the filled seed, caused a 97 percent loss.

Because Douglas-fir cones were in short supply outside the Dorena Tree Improvement Center's western white pine seed orchard this season, both fir coneworm, *Dioryctria abietivorella* (Grote) and western conifer seed bug, *Leptoglossus occidentalis* Heideman, populations converged on the second-year

white pine cones, causing significant viable seed loss. Acephate (Orthene) is being evaluated here to determine if it reduces seed loss caused by these two cone and seed insects enough to warrant treatments.

Gypsy Moth, *Lymantria dispar* (L.)

In Washington, adult moths were trapped in Seattle, Vancouver, and on Mercer Island. No signs of defoliation were observed, so no hosts are cited. Eradication by trapping out was tried at Lincoln Park, Ravena Park and Mercer Island.

In Oregon during 1981 gypsy moth pheromone traps caught 3 moths in Lake Oswego where 2 were trapped in 1980; 3 in Albany; 2 near Mt. Scott in Happy Valley where 1 was caught last year; and 1,000 moths in south Salem where 4 were trapped in 1980. During the spring and early summer, trees on 26 residences in South Salem were treated by ground spraying of Orthene 75S. No male moths were trapped in the treated areas.

Forest Diseases

Tree root disease incidence is are becoming more evident in Pacific Northwest Forests. Laminated root rot, Armillaria root rot, annosus root and butt rot, and black stain root disease repeatedly have been found causing damage, especially throughout the mixed conifer types of the Cascade Range from California to Canada.

Laminated root rot is estimated to have removed about 5 percent of the West Side Douglas-fir type from production. The acreage of infestation is probably closer to 10 percent. Damage is also severe in some grand and white fir stands, but damage estimates are lacking.

Fomes annosus has caused small amounts of mortality in several lodgepole pine plantations in central Oregon. This disease will increase as lodgepole stands are harvested to avoid extensive losses to mountain pine beetles. Annosus root and butt rot has been found causing extensive losses in some partially cut white fir stands throughout southern and eastern Oregon.

Armillaria root rot continues to appear throughout the region. The most serious losses to this disease occur on the East Side. Serious losses on the West Side are usually confined to stressed stands, for example, off-site plantings. Plots have been established to monitor the effects of precommercial thinning in Armillaria-infected Douglas-fir stands. Armillaria has also been observed causing sapwood decay on standing dead trees in the Mount St. Helens blast area.

Numerous new findings of black stain root diseases have been made in second-growth Douglas-fir stands. In southwestern Oregon, the disease appears to be especially damaging where mechanical choppers have been used to cut back roadside Douglas-firs. Incidence of damage by black stain will be measured in thinned and unthinned Douglas-fir stands in southwestern Oregon in 1982.

Phytophthora root rot has been implicated in the death of sugar pines in a southern Oregon seed orchard. This is the first report of Phytophthora killing sugar pines in this Region. Phytophthora root rot continues to cause widespread mortality of Port-Orford cedar in southwestern Oregon. The USDA Forest Service is setting up plans to screen Port-Orford cedars for resistence/tolerance to the disease.

Dwarf mistletoes are all too common pathogens in most of the Pacific Northwest. However, as stand management intensifies, losses due to this group of disease-causing organisms are declining. Work was conducted this past summer to help quantify losses in infested lodgepole and grand fir stands in central Oregon.

White pine blister rust continues to be the most important disease of western white and sugar pines. Gains are being made through identification of resistant trees and rating of sites for infection hazard.

Stem decay fungi still consume enormous volumes of wood with the majority of losses occurring in old-growth stands. Significant losses are occurring in younger stands as wounding of residual trees during stand entries creates excellent infection courts.

Larch needle cast caused by the fungus *Meria laricis* occurred throughout practically the entire range of western larch in Oregon and Washington. The damage was most evident along streams. The wet 1981 spring contributed to infection by this fungus. The disease is likely to be present in 1982.

Swiss needle cast caused by *Phaeocryptopus gaumanni* continues to plague Douglas-fir Christmas tree growers in western Oregon and Washington. Many growers are spraying fungicides to prevent infection. The disease is also widespread in Douglas-fir stands dedicated to timber production, but damage is usually inconsequential.

Record high temperatures in early August were responsible for widespread top killing on a number of conifer species. Douglas-fir growing on droughty West Side sites were especially hard hit. Damage is most noticeable along I-5 south of Tacoma.

Dutch elm disease has only been reported in Walla Walla County in Washington. In Oregon, the disease is found in Nyssa, Ontario, and Union.

The incidence of ponderosa pine needle blight caused by *Elytroderma deformans* remains high around Republic, Washington and in the Maury Mountains south of Prineville, Oregon.

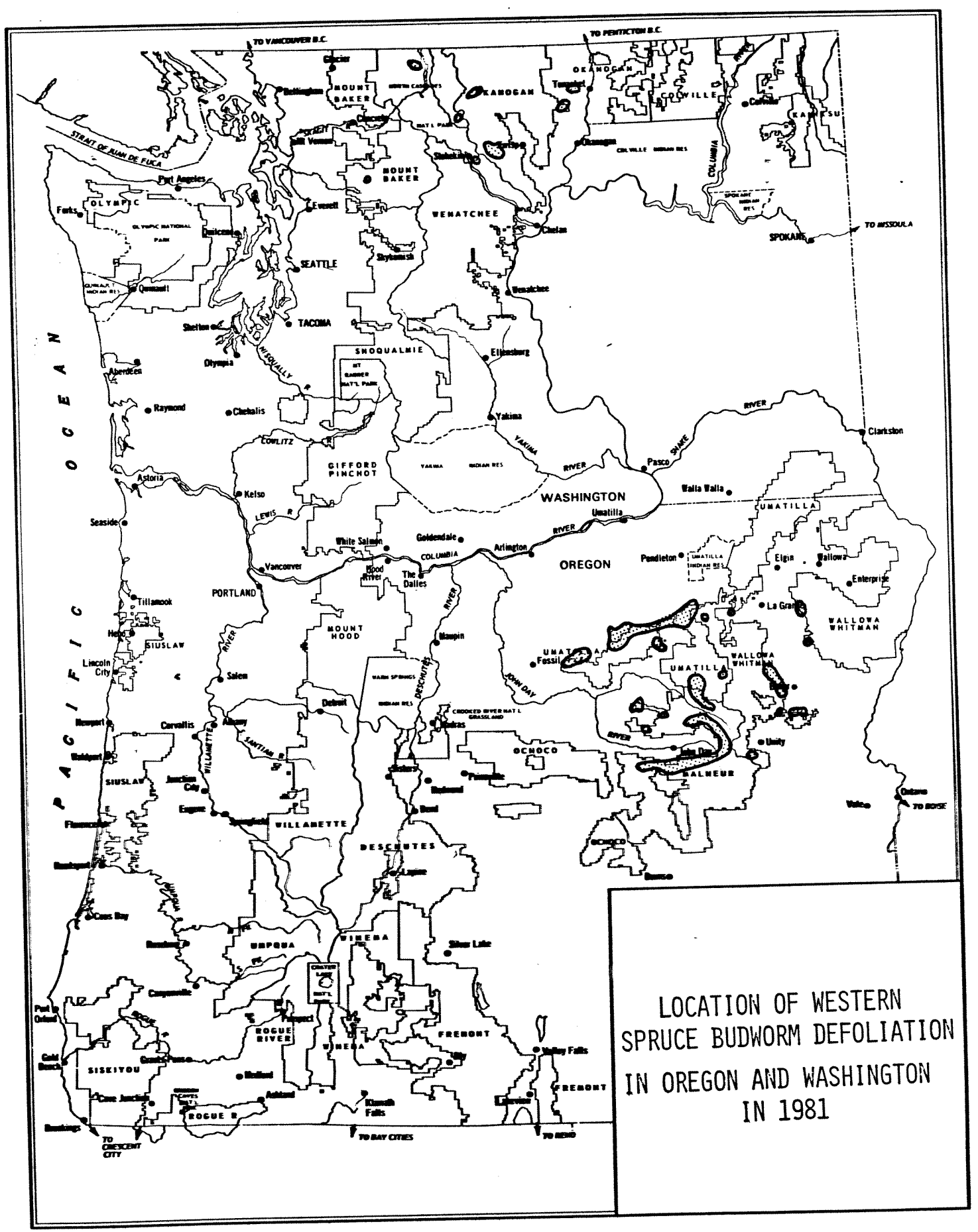
Nursery Diseases

Larch needle cast caused by the fungus *Meria laricis* was present on 2-0 larch seedlings at Wind River Forest Nursery near Carson, Washington. Substantial needle loss occurred, but there was little or no mortality. Fungicide applications, for the most part, did not significantly reduce needlecasting; although applications of benomyl showed some promise. Survival of heavily infected larch 6 months after outplanting was good.

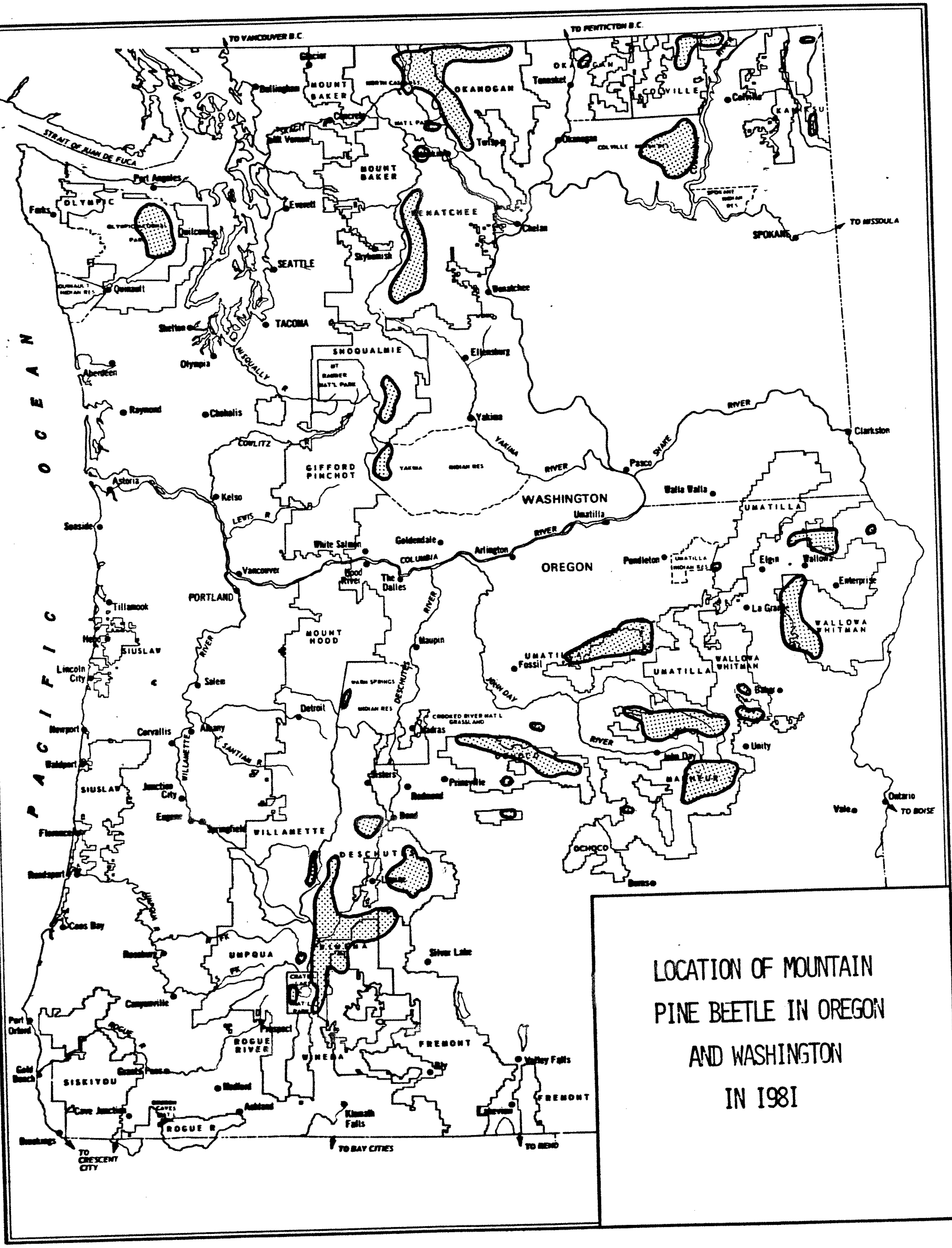
Fusarium root rot, caused by the fungus *Fusarium oxysporum*, continues to cause high mortality in sugar pine seedlings at the Medford Forest Nursery. Losses as high as 34 percent have occurred in some 1-0 sugar pine seed lots. Drenches with the fungicide Banrot have given inconsistent control in 1980 and 1981 trials. Alternative means of control are being sought. Fusarium root rot is the most common conifer seedling disease in Oregon and Washington bare root nurseries.

Grey mold, caused by *Botrytis cinerea*, was common in both container and bareroot nurseries in 1981. Grey mold was present in high density bareroot beds of 2-0 and 3-0 Douglas-fir and on 2-0 true fir seedlings injured by adverse climatic and cultural conditions. High precipitation and cool conditions this year were conducive to development of Botrytis in bareroot nurseries. Grey mold in container greenhouses is adequately controlled by applications of fungicides, sanitation, and good air circulation.

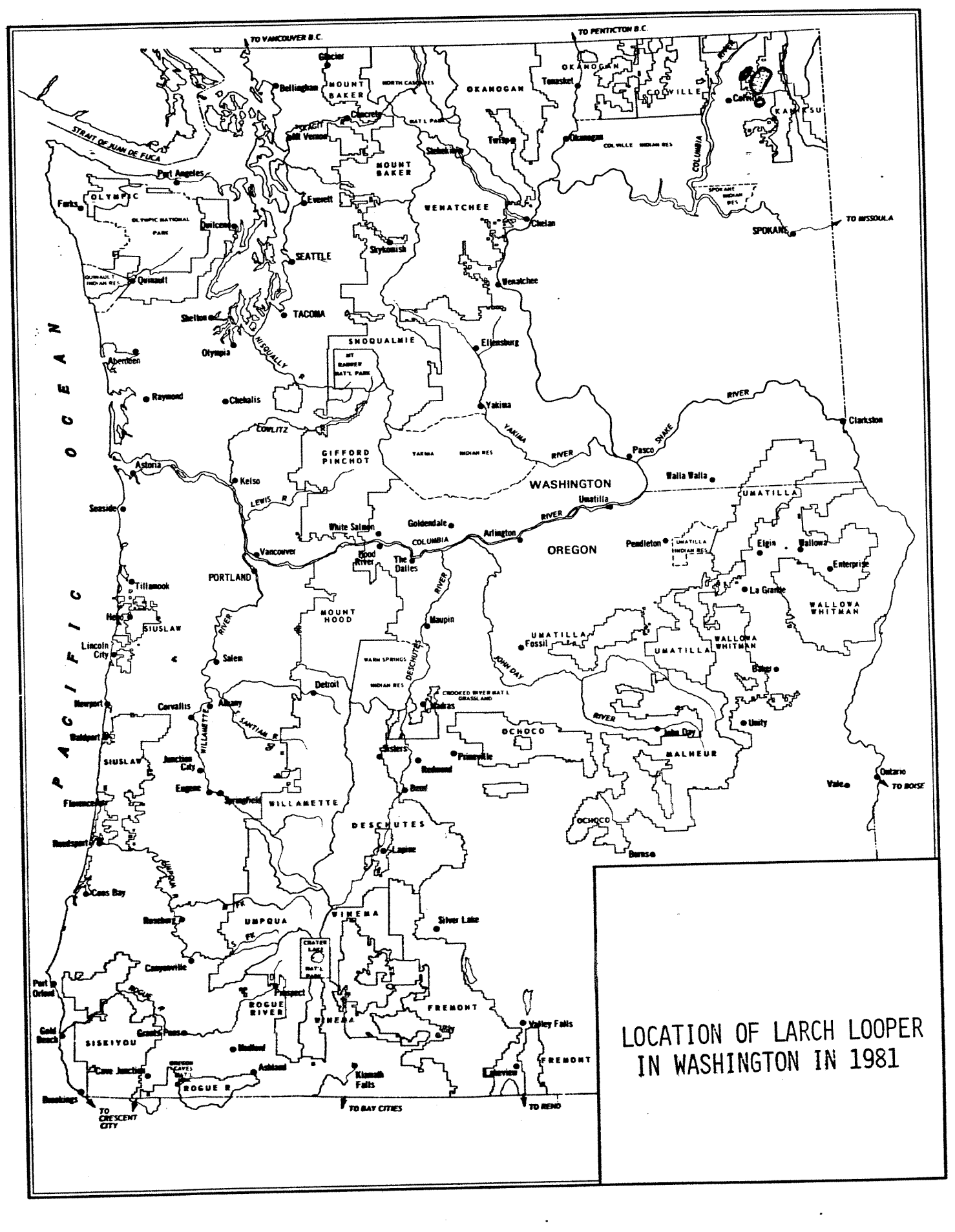
Phytophthora root rot was found to be seriously affecting true fir seedlings in some sections of the Wind River Nursery. Work is underway to develop preventative treatments.



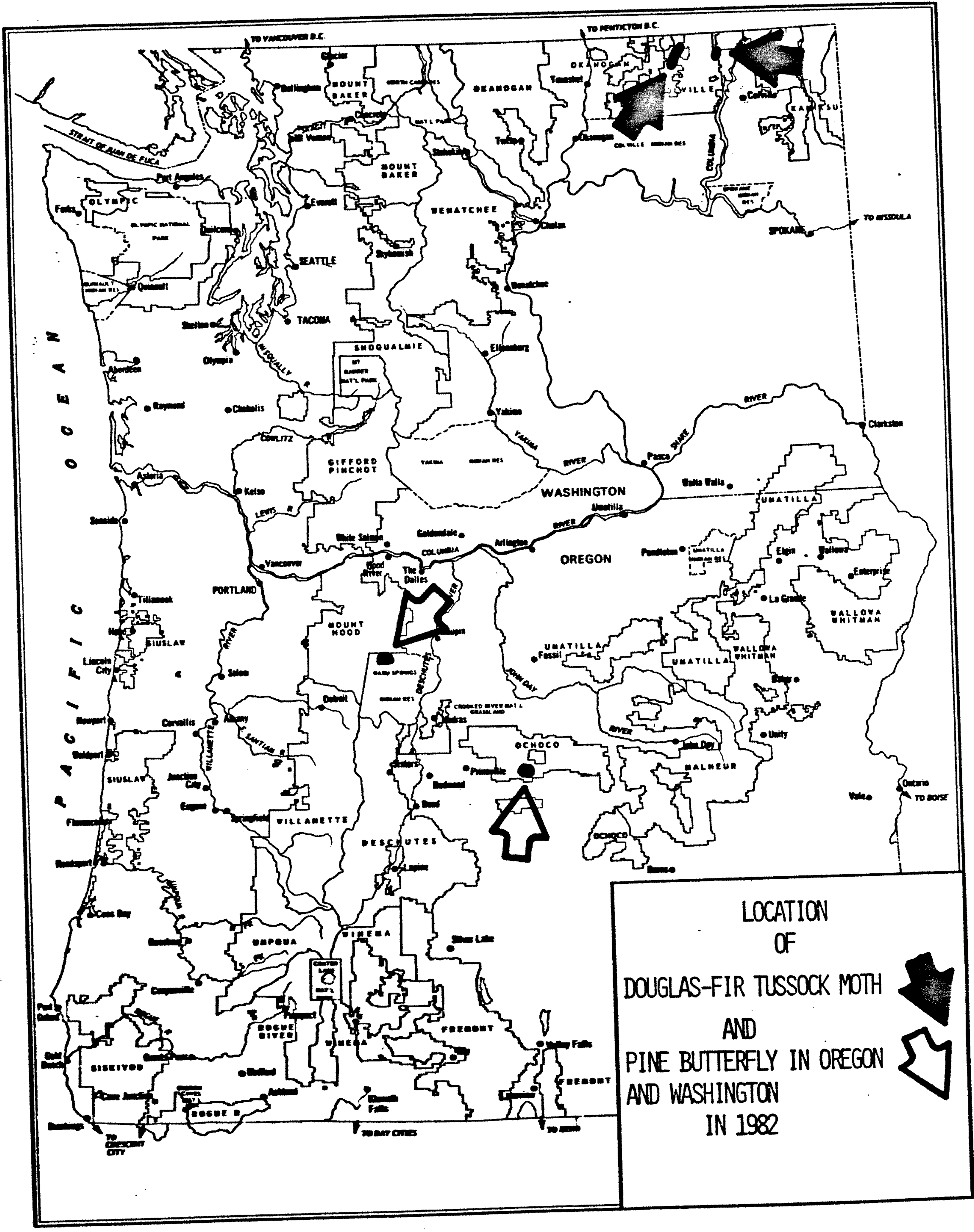
LOCATION OF WESTERN SPRUCE BUDWORM DEFOLIATION IN OREGON AND WASHINGTON IN 1981



LOCATION OF MOUNTAIN PINE BEETLE IN OREGON AND WASHINGTON IN 1981



LOCATION OF LARCH LOOPER IN WASHINGTON IN 1981


PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
TO VANCOUVER B.C.
TO PENTICTON B.C.
TO MISSOULA
TO BOISE
WASHINGTON
OREGON
SEATTLE
TACOMA
PORTLAND
SPOKANE
MOUNT BAKER
OKANOGAN
WENATCHEE
OLYMPIC
SNOQUALMIE
GIFFORD PINCHOT
UMATILLA
WALLOWA WHITMAN
MOUNT HOOD
SIUSLAW
WILLAMETTE
DESCHUTES
OCHOCO
MALHEUR
UMPQUA
WINEMA
ROGUE RIVER
SISKIYOU
FREMONT
COLUMBIA
RIVER
SNAKE
YAKIMA
JOHN DAY
Clarkston
Walla Walla
Pasco
Yakima
Ellensburg
Wenatchee
Chelan
Olympia
Aberdeen
Raymond
Chehalis
Kelso
Astoria
Seaside
Vancouver
Tillamook
Salem
Corvallis
Albany
Newport
Eugene
Springfield
Coos Bay
Pendleton
La Grande
Enterprise
Fossil
Baker
Unity
John Day
Ontario
Vale
Burns
Madras
Redmond
Bend
Prineville
Silver Lake
Medford
Ashland

LOCATION OF DOUGLAS-FIR TUSSOCK MOTH AND PINE BUTTERFLY IN OREGON AND WASHINGTON IN 1982