J. M. WENZ

FOREST PEST CONDITIONS IN CALIFORNIA-1974

A PUBLICATION OF
THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL

THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL was founded in 1951. Its membership is open to public and private forest managers, foresters, entomologists, pathologists, zoologists, and others interested in the protection of forests from damage caused by animals, insects, and diseases. Its objective is to establish, maintain, and improve communication among individuals -- managers, administrators, and researchers -- who are concerned with these problems. This objective is accomplished by four actions:

1. Coordination of detection reporting and compilation of pest damage information.

2. Evaluation of pest conditions.

3. Pest control recommendations made to forest managing agencies and owners.

4. Review of policy, legal, and research aspects of forest pest control, and submission of recommendations thereon to appropriate authorities.

The State Board of Forestry recognizes the Council as an advisory body in forest pest protection. The Council is a participating member in the Western Forest Pest Committee of the Western Forestry and Conservation Association.

THIS REPORT, FOREST PEST CONDITIONS IN CALIFORNIA - 1974, is compiled for public and private forest land managers to keep them informed of pest conditions on forested land in California, and as an historical record of pest trends and occurrences. The report is based largely on information provided by the Statewide Cooperative Forest Pest Detection Survey; in 1974, 226 reports were received: 132 for insect pests, 72 for diseases, and 22 for animal pests.

The report was prepared by the Forest Service in cooperation with other member organizations of the Council. It was duplicated and distributed by the California Division of Forestry.

THE COVER PHOTO: Several monitoring studies were conducted as part of the 1974 pilot test of Dylox for Modoc budworm control. A technician is shown collecting duff samples for later analysis to determine the effects of Dylox on non-target terrestrial insects; in the background is a drop cloth for collecting budworm larvae as they fall from the trees (Snell Springs near Manzanita Mountain, Modoc County).

Sacramento January 1975

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HIGHLIGHTS OF PEST CONDITIONS — 1974

STATUS OF INSECT PESTS. The Modoc budworm infestation -- the largest forest defoliator outbreak ever recorded in California -- enlarged in gross area from 148,000 to 354,000 acres; 90,000 acres of this expansion was in the Warner Mountains of southern Oregon. Fall egg-mass surveys indicated that budworm populations will be greatly reduced in 1975, and a corresponding decline in tree damage is expected.

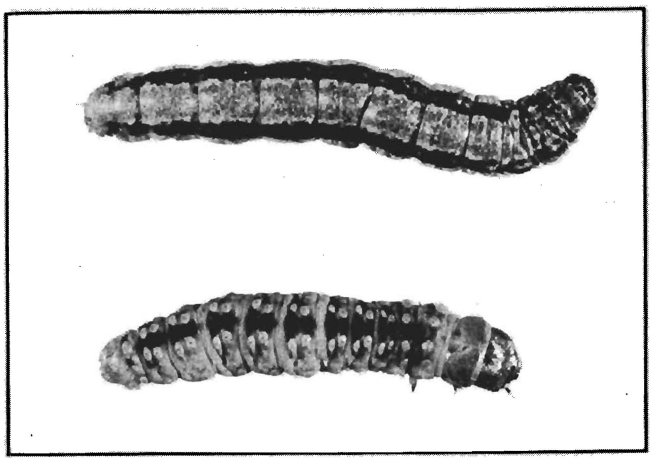
Other defoliators were active also: white fir sawflies continued widespread feeding on the Tahoe, Plumas, and Eldorado National Forests, an outbreak of pine needle miners increased in the San Bernardino Mountains of southern California, and black pine needle-scale insects damaged trees near Glenburn and Lake City in northern California.

Tree killing by bark beetles was generally unchanged throughout the State, despite increased activity in some locations. Fir flatheaded borers were reported to have killed many Douglas-firs in the Klamath National Forest.

STATUS OF DISEASES. A Forest Service crew detected widespread smog damage in the Sierra, Sequoia, Los Padres, and Cleveland National Forests, and in Sequoia and Kings Canyon National Parks. This was the first report of extensive smog damage to forests outside the Los Angeles air basin.

Further reports were received of root diseases infecting eastside pines and north coastal Douglas-firs, and of salt damage to roadside conifers in the Lake Tahoe Basin.

STATUS OF ANIMAL PESTS. Pocket gopher damage was reported to be the major animal damage problem in forest regeneration, particularly in the inland and high-elevation forests. Porcupine damage increased, and deer browsing damage was generally static throughout the State.



MODOC BUDWORM OUTBREAK. Shown are two of the insect larvae involved in the complex defoliating white firs in Modoc Co. Lower: the Modoc budworm, Choristoneura viridis (pale green, spotted), the principal defoliator. Upper: a Dioryctria sp. (pale reddish brown), a secondary member of the complex. (3x life size).

STATUS AND CONTROL OF INSECT PESTS

BUDWORMS, Choristoneura spp. The outbreak of budworms in Modoc County spread and intensified as predicted last year. The principal pests were the Modoc budworm (C. viridis) on white fir, and the sugar pine tortrix (C. lambertiana) on lodgepole and western white pines. The outbreak affected a gross area of about 354,000 acres, including the entire Warner Mountain range from northern Lassen County to southern Oregon and a large area at Manzanita Mountain east of Adin in Modoc County. As observed by aerial surveys, the net area of defoliated trees was 248,485 acres, divided as follows:

MODOC BUDWORM DEFOLIATION (acres)

	Slight	Moderate	Severe	Total
California	53,295	70,520	19,220	143,035
Oregon	70,080	12,370	5,160	87,610

SUGAR PINE TORTRIX DEFOLIATION (acres)

California	—	—	—	17,080
Oregon	—	—	—	760
			TOTAL	248,485

Budworms were detected on the Plumas and Eldorado National Forests also; these populations were judged to be endemic.

Several studies were carried out in 1974 to investigate the budworm conditions in California, including a pilot test of the insecticide Dylox for Modoc budworm control. Although not yet completed, the pilot insecticide test is providing encouraging results. Studies of the taxonomy and biology of the insects and of damage to infested forests are continuing.

WHITE FIR SAWFLY, Neodiprion abietis. White fir sawflies caused defoliation in several locations. Damage was reported at Bucks Lake, Grizzly Ridge, Mount Etna, McRae Ridge, and Grigsby Canyon in Plumas County; at Jackson Meadows in Nevada County; at Big Nose Ridge, Ina Coolbrith, and Verdi Sale in Sierra County; at Mt. Mildred, Cedars, and Steamboat Mountain in Placer County; and, at Alder Creek in El Dorado County. The causes of these continued sawfly outbreaks are unknown.

GYPSY MOTH, Porthetria dispar. Despite the continued introduction of immature gypsy moths into California -- primarily as egg masses attached to recreational vehicles -- no established infestation has been detected. Pheromone traps yielded one male moth in Berkeley in 1973 and one additional male in Yosemite National Park in September 1974. Follow-up surveys by the California Department of Food and Agriculture quarantine teams have produced negative results, indicating the absence of adult moths capable of reproduction.

NEEDLE MINERS, Coleotechnites spp. The lodgepole needle miner, C. milleri, continued to defoliate lodgepole pines in the long-established infestation in Yosemite National Park. Because of the unusually cold winter in 1972-73, the current population was reduced to the level of 1970.

Another Coleotechnites sp. expanded the area of damage to Jeffrey pines at Snow Valley, Big Bear, and Santa Ana River in San Bernardino County. The defoliation in the Santa Ana River was an extension of this outbreak into a new area. A third Coleotechnites sp. was reported defoliating pinyon pines at Santa Rosa Mountain in Riverside County.

Fir needle miners, Epinotia meritana and E. hopkinsana, were part of the complex of insects involved in the budworm outbreak in Modoc County.

BLACK PINE LEAF-SCALE, Nuculaspis californica. Severe outbreaks of black pine leaf-scale insects affected ponderosa pines in three locations. Two localized outbreaks developed near Lake City in Modoc County, and an older infestation continued to weaken trees near Glenburn in Shasta County. At Glenburn, scale-weakened trees fell prey to western pine beetles also.

The widespread infestations of black pine leaf-scale insects in sugar pines have largely declined in the last two years. Aerial surveys revealed localized scale damage to sugar pines north of Fort Jones in Siskiyou County, north of Stirling City in Butte County, and south of Burney in Shasta County.

PRIMARY FLATHEADED BORERS, Melanophila spp. Fir flatheaded borers, M. drummondi, killed an estimated three million board feet of Douglas-fir timber in northwestern California. Losses were most pronounced on the Klamath National Forest in the Salmon River drainage between Forks of the Salmon and Cecilville in Siskiyou County, where 450,000 board feet of infested trees were scheduled for salvage. The infestation was believed to be a temporary condition resulting from a period of drought during the winter of 1972-73. Tree killing was reported near Hayfork in Trinity County also.

California flatheaded borers, M. californica, continued to kill Jeffrey pines in southern California. The borers were suppressed by treating

felled trees at Wrightwood in San Bernardino County and in the Laguna Mountains in San Diego County. On private lands at Garner Valley in Riverside County, indirect control by sanitation salvage provided encouraging results.

MOUNTAIN PINE BEETLE, Dendroctonus ponderosae. Infestations in recreation forests declined; however, increased activity was detected in commercial forests in the fall. Death of lodgepole pines caused by mountain pine beetles increased greatly in the Warner Mountains of Modoc County. In addition, extensive damage in mixed fir and lodgepole pine stands was detected by aerial survey. Ground inspections were scheduled to determine the cause of this condition.

PINE ENGRAVER BEETLES, Ips spp. Numerous reports of typical ips activity were received during 1974. The most significant conditions were late summer infestations killing crop trees in thinned stands on the Lassen National Forest.

WESTERN PINE BEETLE, Dendroctonus brevicomis. Tree losses attributed to the western pine beetle were restricted to normal levels in most locations. Direct chemical control continued in the recreation forests of southern California, and salvage logging was carried out elsewhere. Trees continued to be killed in the persistent infestation at McCloud Flats. The most serious increase in tree killing occurred in the Glenburn area of Shasta County, where about 1,500 infested trees were removed by landowners through salvage logging during the winter. A serious black pine leaf-scale infestation was believed to be partly responsible for this bark beetle outbreak.

Fruit Growers Supply Company salvaged infested trees southwest of Highway 89 near Hat Creek in Shasta County.

DOUGLAS-FIR BEETLE, Dendroctonus pseudotsugae. Previously reported Douglas-fir beetle infestations persisted in Plumas County and efforts were made to curtail losses by salvage logging.

JEFFREY PINE BEETLE, Dendroctonus jeffreyi. Increased tree killing was noticeable in Lassen Volcanic National Park and in Lassen National Forest north and east of Lassen Peak (Shasta and Lassen Counties), and near Fallen Leaf Lake in El Dorado County.

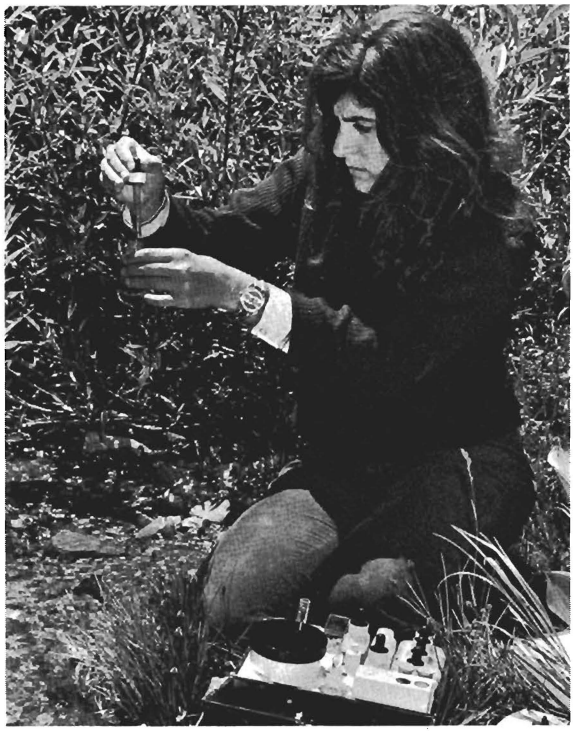
INSECTS DAMAGING PLANTATIONS AND YOUNG TREES. Pine resin midges, Cecidomyia piniiopis, were detected killing branch tips in several pine plantations at widely scattered locations in northern California.

Needle sheath miners, Zelleria haimbachi, were active also, most notably

SPRAY ASSESSMENT. The Dylox pilot test was a cooperative project involving Federal, State, and private participants. Six test blocks of 1000 acres each were sprayed with either 0.75 or 1.0 pounds of Dylox in 1 gallon of fuel oil per acre. The right-hand photo shows that, after spraying, dying budworms covered the firs with silken threads which they spun as they dropped to the ground.

MODOC BUDWORM: The Pilot Test of Dylox

MONITORING. Several studies were carried out to determine the effects of Dylox on the environment. Shown below are a forester(left) collecting the foliage of browse shrubs for residue analysis, and a technician (right) analysing stream water for Dylox residues after spraying was completed.



in a pine plantation adjacent to Highway 89 near Mt. Shasta City in Siskiyou County; the pests defoliated an estimated 1,000 acres of planted pines.

Grasshopper infestations declined and were damaging in a few locations only. Douglas-fir gall midges, Contarinia pseudotsugae, caused slight damage to trees in the Seiad Valley and at Frog Pond in Siskiyou County; this was the first report of activity by this pest in several years.

The imported Nantucket pine tip moth, Rhyacionia frustrana, continued severe tip-killing of Monterey pine landscape trees in San Diego County. Observations suggest that the area of infestation was limited, offering some hope for containment or eradication of this threatening pest.

MODOC BUDWORM OUTBREAK. Although most of the damage in the Warner Mountains was caused by Modoc budworms defoliating white firs, related budworms attacked other conifers as well. Left, a lodgepole pine defoliated by the sugar pine tortrix, Choristoneura lambertiana.

TABLE I

INSECT CONTROL ACTIONS RECOMMENDED BY THE COUNCIL - 1974

NORTHERN CALIFORNIA COMMERCIAL AND RECREATIONAL FORESTS

INFESTATION AREA	ACREAGE (EST.)	COUNTY	INSECT	HOST	RECOMMENDED ACTION
BARK BEETLES					
Fall River Mills	3,500	Shasta	Db, Nc	PP	Evaluate and salvage
McCloud Flats	7,000	Siskiyou	Db	PP	Salvage, thin, and research
Plumas	1,000	Plumas	Dp	DF	Salvage
Salmon River	10,000	Siskiyou	Md	DF	Salvage
Warner Mts.	1,000	Modoc	Dm	LP	Evaluate and salvage
Whaleback Mtn. and Squaw Peak	2,000	Siskiyou	Unknown	WF, LP	Evaluate
DEFOLIATORS					
Highway 89	1,000	Siskiyou	Zh	PP	Evaluate
Modoc	350,000	Modoc	Bw	WF, LP	Evaluate
Northern California	unknown	Northern California	Na	WF, RF	Surveillance
Statewide	--	--	Gm	O	Surveillance
PLANTATIONS AND EXPERIMENTAL AREAS					
East Side Plantation	unknown	Northern California	Eu	PP	Survey and research
Established Seed Orchards	100	Northern California	Da, Rz, Zh	PP	Spray grafted trees five times a year
Plantations	--	Statewide	Rf, Cp, Gh	Hard pines	Surveillance and research
STATE AND NATIONAL PARKS					
Lassen Volcanic National Park	3,000	Shasta and Lassen	Dj, Db, Dm	JP, PP, SP, LP	Surveillance
Sequoia and Kings Canyon Natl. Parks	2,500	Fresno, Tulare	Db, Dm, Dj	PP, SP, JP, LP	Maintenance control*
Yosemite National Park	1,200	Mariposa and Tuolumne	Db, Dm, Dj	PP, SP, JP, LP	Maintenance control
Yosemite National Park	100,000	Tuolumne	Cm	LP	Surveillance and research
SOUTHERN CALIFORNIA RECREATION FORESTS					
Arrowhead-Crestline	47,000	San Bernardino	Dm, Db, Ips, Dj	PP, CP, JP	Sanitation and maintenance control
Arroyo-Seco District	3,000	Los Angeles	Db, Ips, Mc	PP, CP, JP	Sanitation and maintenance control
Big Bear Valley	8,800	San Bernardino	Dj, Ips, Mc, Sv	JP, WF	Sanitation and maintenance control
Idyllwild-San Jacinto	37,000	Riverside	Mc, Db, Ips, Dm	PP, CP, JP	Sanitation and maintenance control
Laguna Mtn.	9,700	San Diego	Db, Mc	CP, JP	Maintenance control
Lost Valley	4,000	San Diego	Db, Ips	CP	Maintenance control
Mt. Baldy District	1,500	Los Angeles	Ips, Dj, Dm, Mc	PP, JP, CP	Sanitation and maintenance control
Mt. Pinos District	24,000	Ventura	Ma	Pe	Surveillance
Mt. Pinos District	7,900	Ventura and Kern	Mc, Ips	JP	Sanitation and maintenance control
Ranger Peak-Figueroa Mtn.	700	Santa Barbara	Db, Ips, Dv	PP, CP	Maintenance control
San Gorgonio District	25,000	San Bernardino	Db, Dj, Ips	PP, JP, CP	Sanitation and maintenance control
Snow Valley-Big Bear-Santa Ana	3,000	San Bernardino	C sp.	JP	Surveillance and research
Valyermo District	14,600	Los Angeles	Mc, Ips	JP	Sanitation and maintenance control
Wrightwood	2,000	San Bernardino	Mc, Ips	JP	Maintenance control

ABBREVIATIONS

INSECTS

Bw - Budworms	Dm - Mountain pine beetle	Md - Fir flatheaded borer
C sp. - Jeffrey pine needle miner	Dp - Douglas-fir beetle	Na - White fir sawfly
Cm - Lodgepole needle miner	Eu - Eucosma	Nc - Black pine leaf scale
Cp - Pine resin midge	Gm - Gypsy moth	Rf - Nantucket pine tip moth
Da - Fir coneworm	Gp - Grasshoppers	Rz - Ponderosa pine tip moth
Db - Western pine beetle	Ips - Pine ips	Sv - Fir engraver
Dj - Jeffrey pine beetle	Mc - California flatheaded borer	Zh - Needle-sheath miner

HOST

CP - Coulter pine	Pe - Pinyon pine
DF - Douglas-fir	PP - Ponderosa pine
JP - Jeffrey pine	RF - Red fir
LP - Lodgepole pine	SP - Sugar pine
O - Oaks	WF - White fir

* Maintenance control is defined as suppression measures applied continually or annually (seasonally) in an effort to keep tree losses at a tolerable level. Suppression measures may include logging, wood cutting, felling and burning or insecticide application on infested trees. Based on the Council's 1971 resolution, it is recommended that chemicals be used only when non-insecticidal alternatives of suppression are not suitable.

STATUS AND CONTROL OF DISEASES

CONDITIONS

SMOG DAMAGE. The Forest Service began a comprehensive evaluation of smog damage in California forests in 1974, and reported widespread smog damage to ponderosa pines in the southern Sierra Nevada. Slight and scattered damage had been reported earlier in these locations, and damaging oxidant levels were recorded in 1974.

The Forest Service survey crew found heightened smog-damage levels in all of the National Forests in southern California, and reported smog damage at a number of locations previously thought to be free of this disease.

WEATHER DAMAGE. Snow breakage was a problem in the San Bernardino National Forest in San Bernardino County, and in the Santa Cruz Mountains in Monterey County. On the Arrowhead Ranger District of the San Bernardino National Forest, trees were killed or damaged on 2,000 acres.

SMOG DAMAGE SURVEY. During 1974 a Forest Service crew established trend plots in the southern Sierra Nevada in order to monitor changes in ozone concentrations and damage to pines. Two forestry technicians examine the needles of a damaged pine on McKenzie Ridge in Sequoia National Forest.

NEEDLE DISEASES. A wet spring in 1974 contributed to an increase of foliage diseases on conifers and hardwoods. Sycamore anthracnose and Ascochyta leaf spot were prevalent in the foothills and in coastal forests.

The observable incidence of the needle blight fungus, Elytroderma deformans, increased significantly. The fungus was reported in Shasta, Siskiyou, Lassen, Butte, El Dorado, Fresno, and San Diego Counties.

ROOT DISEASES. There were continued reports of root diseases -- Fomes annosus on ponderosa and Jeffrey pines in the eastside pine type, and Verticicladiella wagenerii infecting Douglas-firs on the north coast.

HIGHWAY DEICING SALT. Conifers continued to be damaged and killed near highways deiced with salt in the Lake Tahoe Basin (El Dorado and Placer Counties). Further information about salt damage may be found in the Forest Service report describing the 1973 evaluation of salt damage to roadside conifers at Lake Tahoe. The symptoms of salt damage to conifers are described in the "Know Your Forest Diseases" section.

STEM CANKERS. A basal trunk canker of western sycamore, Platanus racemosa, was observed in plantings in the Mile Square Park, Fountain Valley, Los Angeles County. Isolations from the margins of the necrotic tissue of the cankered areas yielded Phytophthora cinnamomi.

NURSERY DISEASES. Botrytis cinerea was a problem again in the coast redwoods at the Louisiana-Pacific containerized nursery in Humboldt County. Because some of the B. cinerea was resistant to Benomyl, a combination of Botran, Daconil 2787, and Benlate was used to suppress the disease. B. cinerea was found in the Forest Service Humboldt Nursery also, but it caused little damage.

Coast redwoods in the Humboldt Nursery were stunted by mycorrhizal deficiency. The roots of healthy seedlings were colonized by Endogone spp., but none was found in the roots of stunted seedlings.

Other diseases found in the Humboldt Nursery were Sirrococcus strobilinus on Jeffrey pines, and Roselina herpetrichoides on 2-0 Douglas-firs.

THE PEST DAMAGE INVENTORY

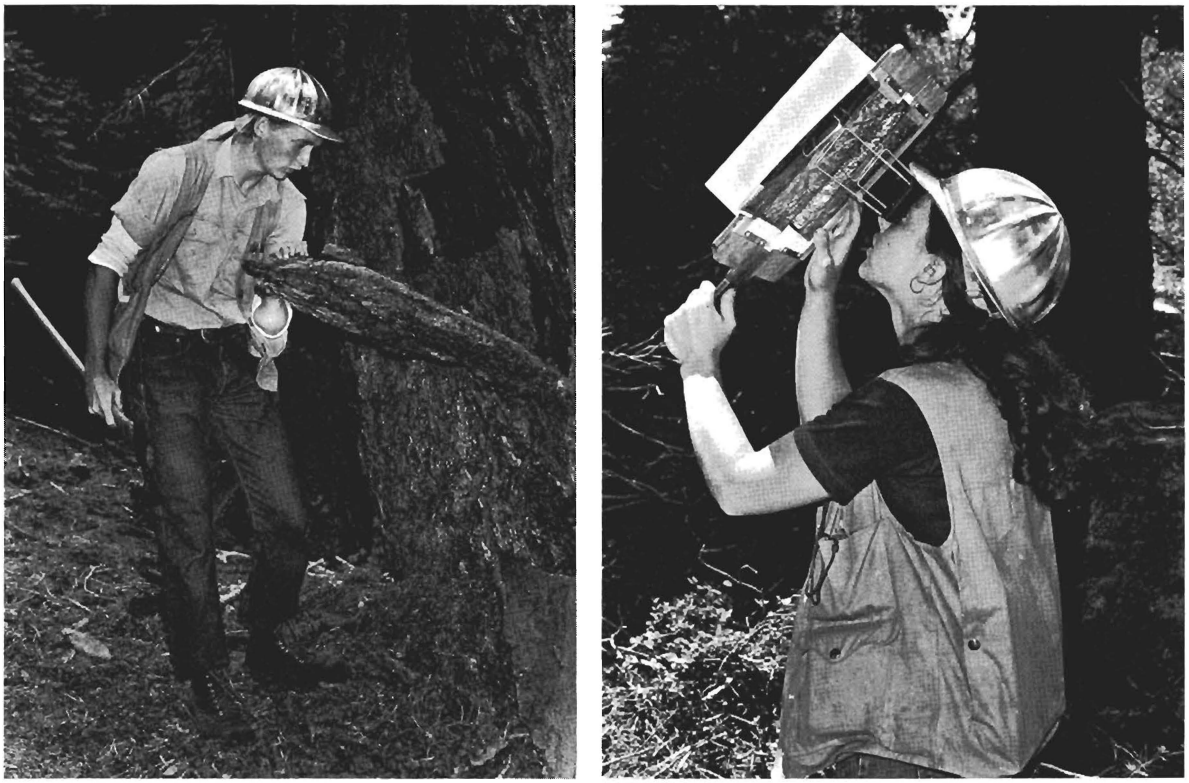
The Forest Pest Control Staff of the Forest Service began a survey in 1972 to measure pest-caused damage to timber-producing forests. Field crews surveyed 9,736 acres of the Stanislaus National Forest in 1972, 86,982 acres of the Eldorado National Forest in 1973, and all of the commercial timber-producing portion of the Stanislaus National Forest in 1974.

Basic data summaries and analyses for the 1973 survey are now complete. An estimated 9,568 ± 1,189 trees (about 0.11 trees per acre) died within the 1973 Eldorado survey area; the volume loss for the survey was 198,789 cubic feet, or 2.4 cubic feet per acre. An estimated 1,363 ± 177 trees (0.14 trees per acre) died within the 1972 Stanislaus survey area. Tree mortality at both locations was judged to be endemic.

Of the trees killed on the Eldorado National Forest, an estimated 3,918 ± 927 were ponderosa pines; 2,334 ± 323 were white firs; 2,309 ± 741 were red firs; 306 ± 134 were Jeffrey pines; and, a small number were sugar pines.

Almost all the dead trees were infested by one or more bark beetles. Fir engraver beetles (Scolytus ventralis) attacked nearly all of the red and white firs. Western pine beetles (Dendroctonus brevicomis) were the most common killers of ponderosa pines, followed in numbers by mountain pine beetles (D. ponderosae) and Ips spp. Jeffrey pine beetles (D. jeffreyi) infested most of the dead Jeffrey pines.

In most cases, bark beetles alone did not kill the trees -- a high proportion of the beetle-infested trees were severely affected by one or more



PEST DAMAGE INVENTORY. Forestry technicians inspect a dead tree plot on the Stanislaus National Forest -- right, using a stereo-viewing board and stereoscope to identify the mortality group from color aerial transparencies; left, searching for bark beetles in one of the dead trees.

diseases. Approximately one-third of the ponderosa and Jeffrey pines were killed by bark beetle/pathogen complexes -- the pathogens most commonly associated with bark beetles in pines were Armillaria root rot (Armillaria mellea) and dwarf mistletoe (Arceuthobium campylopodum). About one-third of the pines were killed by the combined effects of bark beetles and drought.

Four-fifths of the red and white firs were killed by insect-pathogen complexes. The F. annosus/S. ventralis complex accounted for nearly one-half of all fir deaths. The dwarf mistletoes (A. abietinum f.s. concoloris and f.s. magnificae) and Armillaria root rot were also commonly associated with S. ventralis on the dead firs.

A more complete summary of the Eldorado survey results and their application will be published early in 1975. Data collection for the 1974 Stanislaus survey was completed in November, and basic summaries and analyses will be published in 1975.

OTHER SURVEYS

BLISTER RUST SCOUTING. A two-week survey of stream-side sugar pines and ribes in the southern Sierra Nevada revealed that white pine blister rust continues to spread and intensify. New pine infections were found on Oak Flat and Bear Meadow Creeks on the Kings River Ranger District of the Sierra National Forest (Fresno County); known infection centers at Oriole Lake and Redwood Canyon in Sequoia and Kings Canyon National Parks (Tulare County) had enlarged and intensified. Cankers of 1972 and 1973 origin were found in all surveyed infection centers.

DWARF MISTLETOE EVALUATION. In 1974 a Forest Service crew finished marking plots for a survey to determine the longevity of dwarf mistletoe-infected pines in campgrounds. They completed a 1600-tree Jeffrey pine plot at Nevada Beach Campground in the Lake Tahoe Basin Management Unit, and tagged, rated, and mapped 600 trees at Merrill, Cave, and Bridge Campgrounds in the Lassen National Forest.

Whenever plot trees die, the Districts or Units where the plots are located will report to the Forest Pest Control Staff the date and cause of death and the age of each dead tree. At the end of the study, specialists will use the survey results to assess the impact of dwarf mistletoe in campgrounds.

On the 1000-tree plot established in 1973 at Laguna Campground in the Cleveland National Forest (San Diego County), ten Jeffrey pines died early in 1974. Of these ten trees, nine were infected with dwarf mistletoe, and five were infected over one-half or more of the crown.

TABLE II

FOREST DISEASES REPORTED - 1974

CAUSAL AGENT	HOST	COUNTY
RUSTS		
Melampsora occidentalis	BC	Siskiyou (2)
Needle rust	RF	Lassen
Peridermium harknessii	JP	Lassen
	JP	Plumas
	LP	Fresno
	LP	Modoc
	PP	Plumas
Peridermium stalactiforme	JP	Kern
	JP	Lassen
	JP	San Bernardino
	JP	Ventura
STEM DISEASES		
Colletotricum gleosporioides	CL	Santa Cruz
Cytospora abietis	RF	Eldorado
	RF	Siskiyou (2)
Dothichiza pithyophila	SP	Siskiyou
Exobasidium vaccinii-uliginosi	Rho	Del Norte
Neofuckelia pinicola	SP	Siskiyou
Sydowia polyspora	WF	Modoc (3)
Unknown	CRw	Trinity
	DC	Trinity
	WF	Siskiyou
FOLIAGE DISEASES		
Ascochyta sp.	Mad	Glenn
Elytroderma deformans	JP	Plumas
	JP	San Diego
	PP	Fresno
	PP	Lassen
Gnomonia veneta	Syc	Monterey
Hypoderma robustum	WF	Modoc (2)
Leptostroma sp.	FP	Siskiyou
Lophodermella arcuata	SP	Tuolumne
Lophodermium sp.	BF	Monterey
Lophomerum sp.	FP	Siskiyou
Neopeckia sp.	LP	Fresno

Note: The numbers beside the county names indicate the number of reports received from that location.

CAUSAL AGENT	HOST	COUNTY
MISTLETOES		
Dwarf mistletoe	PP	Plumas
	RF	Siskiyou (2)
HEART ROTS		
Fomes pini	DF	Marin
	DF	Siskiyou
Polyporus leucospongia	FP	Siskiyou
ROOT DISEASES		
Armillaria mellea	AC	Santa Cruz
	DF	Humboldt
	DF	Santa Cruz
	Mad	Santa Cruz
Fomes annosus	DF	Trinity
	JP	San Diego
	JP	Ventura
	PP	Lassen
	PP	Plumas
	PP	Trinity
Verticicladiella wagenerii	DF	Mendocino
NURSERY DISEASES		
Botrytis cinerea	CRw	Humboldt (2)
Mycorrhizal deficiency	CRw	Humboldt
	Seq	Santa Cruz
Rosellinia herpotrichoides	DF	Humboldt
Sirrococcus strobilinus	JP	Humboldt
MISCELLANEOUS		
Chemical	AP	Glenn
	CP	Los Angeles (2)
	KP	Los Angeles
Frost	WF	Placer
Hail	SP	Tuolumne
Salt	IC, JP, WF	Eldorado
	IC, JP, WF	Placer
Smog	BcDF	Los Angeles
	KP	Orange
	KP	Riverside
Snow	PP	San Bernardino
Winter injury	JP	Modoc

HOST ABBREVIATIONS

AC	Atlantic cedar	CRw	Coast redwood	JP	Jeffrey pine	Rho	Rhododendron
AP	Allepo pine	DC	Deodar cedar	KP	Knobcone pine	RF	Red fir
BC	Black cottonwood	DF	Douglas-fir	LP	Lodgepole pine	Seq	Giant sequoia
BcDF	Big-cone Douglas-fir	FP	Foxtail pine	Mad	Madrone	SP	Sugar pine
CL	California laurel	IC	Incense-cedar	PP	Ponderosa pine	Syc	Sycamore
CP	Coulter pine					WF	White fir

KNOW YOUR FOREST DISEASES

SALT DAMAGE TO ROADSIDE CONIFERS

There have been many studies of the effects of highway deicing salt on roadside trees; most of these studies, however, were conducted in the eastern United States and in Europe.

The first study of salt damage to roadside conifers in California was initiated during the winter of 1972-73, when foresters observed that trees along the highways in the Lake Tahoe Basin were declining and dying. Forest Service scientists from San Francisco and Berkeley conducted a biological evaluation of the condition, and determined that highway deicing salt was causing the decline and death of these trees.

HOSTS AND DISTRIBUTION. Salt affects many woody trees and shrubs wherever it is used to maintain ice- and snow-free roads during the winter. In the Lake Tahoe Basin, salt has been found to damage Jeffrey pines (Pinus jeffreyi), sugar pines (P. lambertiana), white firs (Abies concolor), and incense-cedars (Calocedrus decurrens).

The distribution of salt damage in California, while not definitely established, probably follows the patterns of highway deicing salt use throughout the State.

DISEASE PROCESSES. Salt is absorbed through the roots of trees, accumulates to toxic levels in the foliage, and kills the needles, thereby reducing the tree's capacity to produce food. If enough needles are killed, the tree will die.

SYMPTOMS. The following are descriptions of the symptoms of salt damage to the major conifers in the Lake Tahoe Basin. Salt-damaged conifers of the same species elsewhere in California will exhibit similar symptoms.

The Pines. Symptoms are essentially the same for all pine species in the Basin (Jeffrey pine, lodgepole pine, and sugar pine). Tip dieback (or tip burning) of the youngest foliage is the most conspicuous and distinctive symptom of damage. The precise time of year when this dieback begins on new foliage is not known; however, the current year's foliage may show conspicuous dieback before the buds break in the spring. Dieback progresses with time, and is uniform along all the needles on a single branch. The margin between dead and living tissue is very distinct, resulting in branches and trees that exhibit a "halo" of dead foliage tips when the damaged branches are observed frontally. Needle banding may be observed on the brown por-

SALT DAMAGE TO CONIFERS AT LAKE TAHOE. Left, a salt-damaged sugar pine beside Highway 89 near Emerald Bay appears pale in contrast to nearby, healthy trees; right, salt-damaged Jeffrey pines near El Dorado Beach at South Lake Tahoe have thin, fading foliage.

tions of damaged needles in late summer and fall. One to several dark bands are often found on the dead portions of needles.

Salt damage may be scattered or continuous throughout a tree. Many trees of all sizes show symptoms throughout the crown; in other cases the tops or the lower portions of the crowns are affected. The reasons for differences in the extent of damage and in the locations of symptom development are not fully understood; these differences are probably associated with the pattern and extent of salt uptake by the root system, as well as by absorption of salts through foliar contact.

The advanced symptoms of salt damage may be a complete browning of the foliage, and subsequent death of the tree. Field diagnosis of salt damage at this stage is questionable, and the symptoms may be confused with other causes of tree death. Laboratory diagnosis is needed to confirm salt damage at this stage.

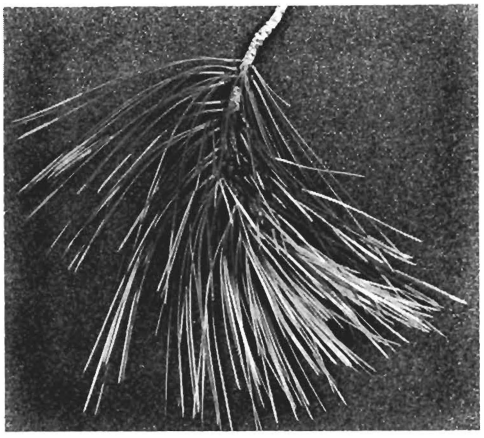
White Firs. Tip dieback of the needles of white fir is the primary symptom of salt damage. Because the needles are short and oriented on the branch in a nearly flat plane, and because they normally persist and function on branches for many years, the circular "halo" effect of damaged foliage is not observed on firs as it is on pines. From a distance, salt-damaged firs show various degrees of foliar browning.

Firs, more than any of the other species, exhibit an irregular pattern of damage within the crown. Some trees are damaged throughout the crown, some have top damage, others show lower crown damage, and others show only scattered crown damage. In the 1973 Tahoe survey, one variation in the type of damage to firs was vividly illustrated by several trees which had a definite spiral pattern of damage. The most plausible explanation for this pattern is that damaging levels of salt were taken up through one portion of the root system only and translocated upward through the trunk in a spiral manner, causing foliar damage only to the branches using the water and salts in this translocation stream. Thus, uptake of salts by portions of a root system and differing translocation patterns within trees may account for scattered and variable patterns of salt damage within the crowns of firs, and possibly of other conifer species.

True firs with advanced symptoms of salt damage have little foliage and thin crowns. Dead trees, or trees with all brown foliage, should be analysed in the laboratory to determine if salt contributed to the death of the tree.

Incense-cedar. Symptoms of salt damage to incense-cedars appear different from those observed on pines and firs because of the growth characteristics of the foliage. Incense-cedars, unlike pines and firs, have a fan-like pattern of foliage and branch growth, and small, scale-like leaves that are not readily distinguishable from the stem segments. Because of these growth differences, tip dieback of the foliage of incense-cedars is not easily recognized from a distance; rather, damaged trees have sparse foliage and exhibit a brownish cast as a result of extensive foliage dieback. However, close observation often reveals distinct tip dieback.

DAMAGE. Damage is known to have occurred at two locations in California. In the Lake Tahoe Basin, some 3000 trees were damaged or killed at 321 sites in 1973, and trees are continuing to die. Similar but less extensive damage has been observed near Mammoth Lakes in Mono County.



SALT DAMAGE SYMPTOMS. The dead needle tips of this salt-damaged Jeffrey pine appear pale in contrast to the darker, healthy portions of the foliage. The margins between dead and living tissue are distinct, and the salt-damaged branches exhibit a 'halo' of dead tips when observed from the front.

STATUS AND CONTROL OF ANIMAL PESTS

POCKET GOPHERS. Pocket gophers were the number one animal pest in 1974; damage was reported to be increasing everywhere but in the north coastal forests and in southern California. Several thousands of acres of plantations on the Klamath, Shasta-Trinity, and Tahoe National Forests were in danger of being lost to gophers if immediate effective control measures were not taken. All species of commercial conifers were damaged.

Baiting with the forest-land burrow builder on an annual basis was reported to be effective in reducing damage to an acceptable level. Where the machine was not used, or could not be used because of topography, soil texture, soil moisture, or obstructions, damage increased. Research efforts are being directed toward habitat modification.

PORCUPINES. Damage was general throughout the major forests in the State, and it was reported to be increasing in Siskiyou, Modoc, Lassen, Plumas, Sierra, Nevada, Placer, and Tuolumne Counties. Serious damage was inflicted upon wild stands and plantations alike. In several locations damage has been reduced to acceptable levels.

DEER. Deer browsing of seedlings and saplings of most coniferous species was reported from throughout the State. Damage was static to increasing in northern California, and static to decreasing in southern California.

MINOR PESTS. The animals listed below caused minor damage in the counties noted. Damage was severe in some locations, but it was localized and not widespread.

SPECIES	COUNTY
Rabbits	Los Angeles, Mendocino, Lake, Placer
Squirrels	Los Angeles, Mendocino
Domestic Livestock	El Dorado, Modoc

RESOLUTIONS OF THE COUNCIL, NOVEMBER 13, 1974

RESOLUTION NO. 1 -- To the Chairman, Animal Damage Committee, urging a review of the current procedures in reporting and evaluating animal damage.

Whereas the matter of reporting damage caused by animals to forest stands and regeneration is becoming increasingly complex and important in California, and

Whereas it is imperative that the annual Conditions Report prepared by the California Forest Pest Control Action Council accurately reflect problems in the State, and

Whereas it has been determined that there may be some current difficulties in accurately reporting trends in animal activity on private and public land,

Therefore be it resolved, that the Animal Damage Committee designate a sub-committee for the purpose of reviewing current procedures in reporting and evaluating animal damage and to make recommendations for the development of an improved system if necessary.

RESOLUTION NO. 2 -- To the State Board of Forestry, the Chief of the Forest Service, and the Western Forestry and Conservation Association, urging the Forest Service to restore adequate support for research on the pressing forest disease problems of California.

As available timber land is reduced by increasing pressures for recreational facilities, parks, water storage, and similar uses of forest land, protecting these special-use lands and increasing timber production on remaining lands becomes ever more important. Under intensive management of the forests, Verticicladiella disease is spreading with new centers of infection reported each year. Fomes annosus enters stumps from harvesting and thinning operations and is spreading. Seedling diseases, including several new ones, are assuming greater importance with increased reforestation programs required under the new California Forest Practices Act.

A plant pathologist, who is a specialist in these diseases, will soon be transferred out of the California Region due to lack of financial support.

At one time (1961) there were as many as eight full-time plant pathologists at the Pacific Southwest Forest and Range Experiment Station. There are now four plant pathologists, only three of which are working on California forest disease problems. Of these three, only two are fully supported by Forest Service research funds.

To insure that California forests are adequately protected and productivity is maintained at the highest possible level, we urge the Forest Service to halt the attrition of the forest disease research program and to restore adequate support for research on the pressing disease problems in the forests of California.

RESOLUTION NO. 3 -- To the California Board of Forestry, the Regional Forester (Forest Service, R-5), the California State Forester, the Director of the California Department of Food and Agriculture, the Director of the California Agricultural Experiment Station, and the Chief of the Animal and Plant Health Inspection Service, calling for a task force of personnel from various agencies to reevaluate the Nantucket pine tip moth infestations in San Diego and Kern Counties.

Whereas the Nantucket pine tip moth, Rhyacionia frustrana, has been introduced into California, and

Whereas this insect is a potential threat to the productivity of California forests, and

Whereas the original evaluation of the potential problem was based, in part, on misidentified insects,

The California Forest Pest Control Action Council recommends that a task force consisting of personnel from the Forest Service, the California Division of Forestry, the California Department of Food and Agriculture, the University of California, and the Animal and Plant Health Inspection Service be established to reevaluate the Nantucket pine tip moth infestations in San Diego and Kern Counties, and make recommendations as to what actions should be taken in regard to this insect.

RESOLUTION NO. 4 -- To the California Air Resources Board, the various Regional Air Resources Boards, and the mayors of all major urban centers in California, urging them to begin development of positive programs to reduce air pollution.

Due to the severity and the increasing extent of oxidant-induced air pollution damage to coniferous forest species in southern California and in the southern and central Sierra Nevada Mountains, let the California Forest Pest Control Action Council urge the mayors of all major urban centers in the State to ask their citizenry to use mass transportation systems and other means available within their jurisdiction, and to begin development of such systems in positive programs to reduce air pollution.

THE COOPERATIVE FOREST PEST DETECTION SURVEY is sponsored by the California Forest Pest Control Action Council. Detection of damage due to insects, diseases, animals, weather, chemicals, and air pollution should be reported on the Forest Pest Detection Report, form R5-5200-33, or by card or letter. The Pest Action Council encourages Federal, State, and private land managers and individuals to contribute to the Detection Survey by submitting damage reports and samples in the following manner.

Forest Service Personnel: send detection reports through channels and mail all samples to the Regional Office -- U.S.D.A., Forest Service, Forest Pest Control Staff, 630 Sansome Street, San Francisco, California 94111.

State Personnel: send all detection reports through channels; submit insect reports and damage samples to the CDF Headquarters -- California Division of Forestry, Department of Conservation, 1416-9th Street, Sacramento, California 95814 -- and mail all other reports and samples to the Forest Service Regional Office.

Private Foresters and Individuals: send insect detection reports and damage samples to the CDF Headquarters, and all other reports and samples to the Forest Service Regional Office.

Please submit adequate damage samples illustrating the problem with each detection report. Keep samples cool and ship them immediately after collection; send samples in a screw-top mailing tube or in other suitable container.

All detection reports will be acknowledged and evaluated by specialists concerned with damage caused by forests pests.

Additional copies of the Forest Pest Detection Report form are available from local offices of the Forest Service and the California Division of Forestry.

YOUR COOPERATION WITH THE CALIFORNIA FOREST PEST CONTROL ACTION COUNCIL IN ASSISTING WITH THE COOPERATIVE FOREST PEST DETECTION SURVEY IS GREATLY NEEDED AND APPRECIATED.