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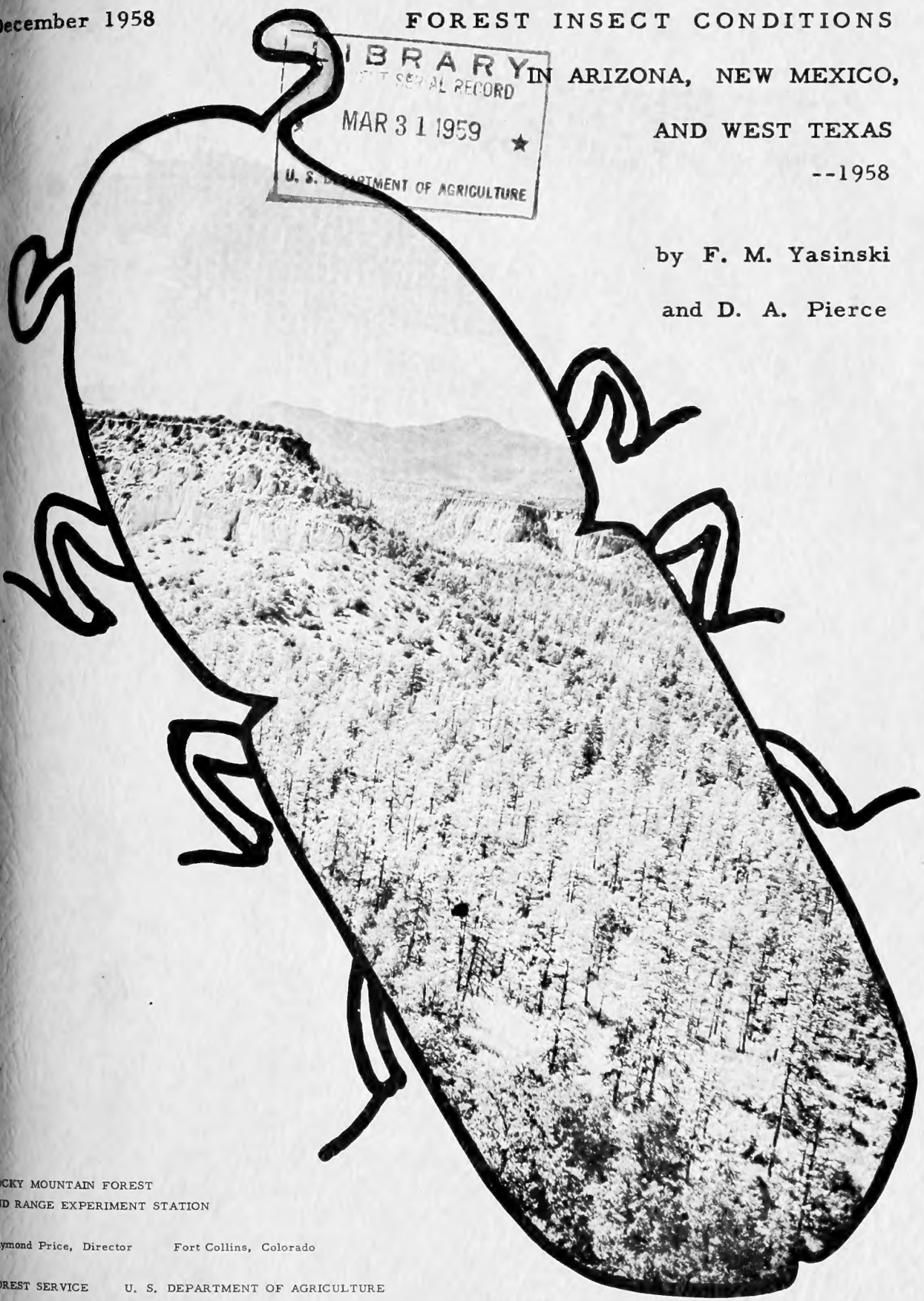
IN ARIZONA, NEW MEXICO,

AND WEST TEXAS

--1958

by F. M. Yasinski

and D. A. Pierce



ROCKY MOUNTAIN FOREST
AND RANGE EXPERIMENT STATION

Raymond Price, Director Fort Collins, Colorado

FOREST SERVICE U. S. DEPARTMENT OF AGRICULTURE

F O R E S T I N S E C T C O N D I T I O N S

I N

A R I Z O N A , N E W M E X I C O , A N D W E S T T E X A S

by

F. M. Yasinski and D. A. Pierce, Entomologists



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SUMMARY

Insect activity decreased sharply throughout Region 3 during 1958. There were only 1,856,000 acres of infestation as compared with 3,251,000 acres in 1957. Losses caused by bark beetles dropped to 288.6 million board-feet, approximately 322.0 million less than reported last year (fig. 1). Spruce budworm damage is increasing, while Great Basin tent caterpillar infestations are decreasing slightly. Two additional areas of tussock moth infestation were found. The infestations of sawfly on ponderosa pine and leaf roller on aspen, reported in 1957, have shown a slight increase. Needle miner defoliation on ponderosa pine has almost disappeared.

MILLION BOARD FEET

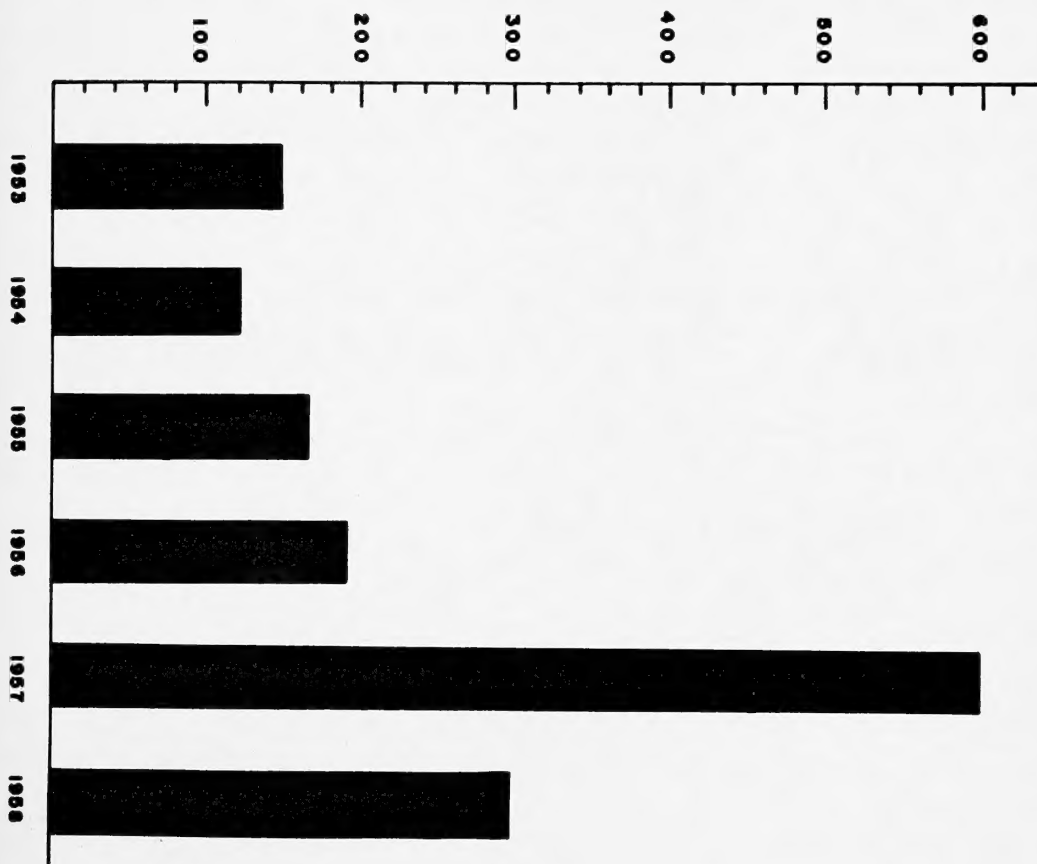


Figure 1. --Sawtimber killed by bark beetles in Arizona-New Mexico, 1953-58.

Survey arrangements in the Southwest remained the same as in 1957. Methods of evaluating forest insect conditions were described in the 1956 report. ^{1/} The annual aerial survey of the 11 million acres of forested land in Region 3 required 144.7 flying hours.

PINE BARK BEETLES

Ips and Dendroctonus spp. ^{2/}

In 1958 an association of Ips and Dendroctonus species killed pine on 534,860 acres in Arizona and New Mexico. This association of insects is the same as described in the 1957 report. ^{3/}

Areas having the highest losses were:

	<u>No. acres infested</u>
Fort Apache Indian Reservation, Arizona	112,640
Coconino National Forest, Arizona	63,920
Cibola National Forest, New Mexico	113,160

Sanitation-salvage logging is continuing in accessible areas.

The number of acres infested by Ips and Dendroctonus spp. in 1958 were:

<u>Class of infestation</u>	<u>Arizona</u> (Acres)	<u>New Mexico</u> (Acres)	<u>Total</u> (Acres)
Light	236,610	187,850	424,460
Moderate	33,200	39,760	72,960
Heavy	11,840	7,040	18,880
Very heavy	18,560	0	18,560
Total	300,210	234,650	534,860

^{1/} Yasinski, F. M., and Pierce, D. A. Forest insect conditions in Arizona and New Mexico -- 1956. U. S. Forest Serv. Rocky Mountain Forest and Range Expt. Sta. Sta. Paper 26, 18 pp., illus., 1957. [Processed.]

^{2/} Arizona five-spined ips associated with southwestern pine beetle and occasionally one or both of these associated with roundheaded pine beetle, Larger Mexican pine beetle, and western six-spined ips.

^{3/} Yasinski, F. M., and Pierce, D. A. Forest insect conditions in Arizona, New Mexico, and West Texas, 1957. U. S. Forest Serv. Rocky Mountain Forest and Range Expt. Sta. Sta. Paper 30, 10 pp., illus., 1958. [Processed.]

Black Hills beetle

The 1957 outbreak of Black Hills beetle (Dendroctonus ponderosae Hopk.) on 19,000 acres of the Carson National Forest, New Mexico, was successfully controlled by treating more than 500 infested trees with a water emulsion of ethylene dibromide. Forest Service personnel will conduct an operational survey in the spring of 1959 to determine the need for further control in the area.

Roundheaded pine beetle

The small 1957 outbreak of roundheaded pine beetle (Dendroctonus convexifrons Hopk.) on Mount Graham, Coronado National Forest, was controlled in August. Twenty-nine trees were treated with a solution of ethylene dibromide in fuel oil. The control area was examined the last week in September, and no new attacks were noted.

Arizona five-spined ips

The population of Arizona five-spined ips (Ips lecontei Sw.), which caused considerable mortality in the pinyon-juniper type throughout the region in 1957, declined to an extremely low level in 1958. Mortality of the overwintering adults was high. The cause of mortality is unknown.

In the Big Bend National Park, Texas, chemical control was required to stop a small but rapidly expanding epidemic of Ips beetles. Infested pinyon, attacked by the second generation of beetles, were cut and sprayed with ethylene dibromide in fuel oil.

FIR AND SPRUCE BEETLES

Douglas-fir beetle

Losses to Douglas-fir noted in 1958 from this bark beetle (Dendroctonus pseudotsugae Hopk.) amounted to 24.5 million board-feet on 670,860 acres. Although this indicates a decrease in damage by this insect compared with the 1957 loss (96 million board-feet on 821,200 acres), the beetle population still remains at a high level and active in the host type of the region. Much of the timber is inaccessible or of low commercial value.

Areas which sustained the greatest losses by this bark beetle were:

	<u>No. acres infested</u>
Cibola National Forest	127, 680
Gila National Forest	127, 540
Santa Fe National Forest	99, 200

A substantial increase in damage since 1956 was recorded on the Kaibab National Forest and the Fort Apache Indian Reservation, Arizona; Gila National Forest and Mescalero Apache Indian Reservation in New Mexico.

The number of acres infested by the Douglas-fir beetle in 1958 were:

<u>Class of infestation</u>	<u>Arizona</u> (Acres)	<u>New Mexico</u> (Acres)	<u>Total</u> (Acres)
Light	66, 320	307, 040	373, 360
Moderate	23, 680	173, 960	197, 640
Heavy	12, 320	62, 420	74, 740
Very heavy	960	24, 160	25, 120
Total	103, 280	567, 580	670, 860

Fir engraver beetle

A fir engraver beetle (Scolytus ventralis Lec.) infestation was discovered on the Lincoln National Forest this year. The heavy outbreak in mature and overmature white fir and Douglas-fir types is on an area of 4, 480 acres. The beetle also continues its depredation of the white fir stand in the Sandia Mountains east of Albuquerque, New Mexico. The area of damage has increased to 10, 000 acres, approximately 2, 000 acres more than last year. Limited salvage of dead and dying trees is in progress in the Sandia Mountains.

Western balsam bark beetle

Acreage infested by the western balsam bark beetle (Dryocoetes confusus Sw.) decreased sharply in 1958, with 65, 440 acres recorded as against 167, 780 acres reported in 1957. Areas on the Santa Fe and Carson National Forests still suffer the greatest losses.

Engelmann spruce beetle

An outbreak of the Engelmann spruce beetle (Dendroctonus engelmanni Hopk.) is present in a 1,250-acre logging area on the Tierra Amarilla Grant, adjacent to the Carson National Forest west of Tres Piedras, New Mexico. Woodpecker feeding, aided by other natural control factors, eliminated a similar outbreak on an adjacent area and is expected to do so here.

The infestation of Engelmann spruce beetle reported in 1957 on the Rancho Del Rio Grande Grant near Taos, New Mexico, remained static in 1958.

DEFOLIATORS

Spruce budworm

Defoliation of the host type by this spruce budworm (Choristoneura fumiferana (Clem.)) throughout the region increased considerably in 1958, with moderate to heavy defoliation on 323,840 acres (fig. 2). The Carson and Santa Fe National Forests experienced the greatest buildup, with 139,960 and 65,160 acres of infestation, respectively. Chemical control may be needed in this area in 1960 or 1961 if the present upward trend continues.

In June 1958 the Forest Service and National Park Service treated 100,000 acres of mixed conifer on the North Kaibab Plateau, Arizona. Treatment was an aerial application of 1 pound of DDT in fuel oil per acre. The budworm population was reduced by 96 percent.

Great Basin tent caterpillar

A slight downward trend in the activity of the Great Basin tent caterpillar (Malacosoma fragile (Stretch)) continued in 1958. Defoliated acreage dropped from 250,690 to 223,620.

Tussock moth

Three separate outbreaks of tussock moth (Hemerocampa sp.) totaling 17,500 acres in white fir were active in 1958. The first, discovered in 1957, is on Pinal Mountain, Tonto National Forest,

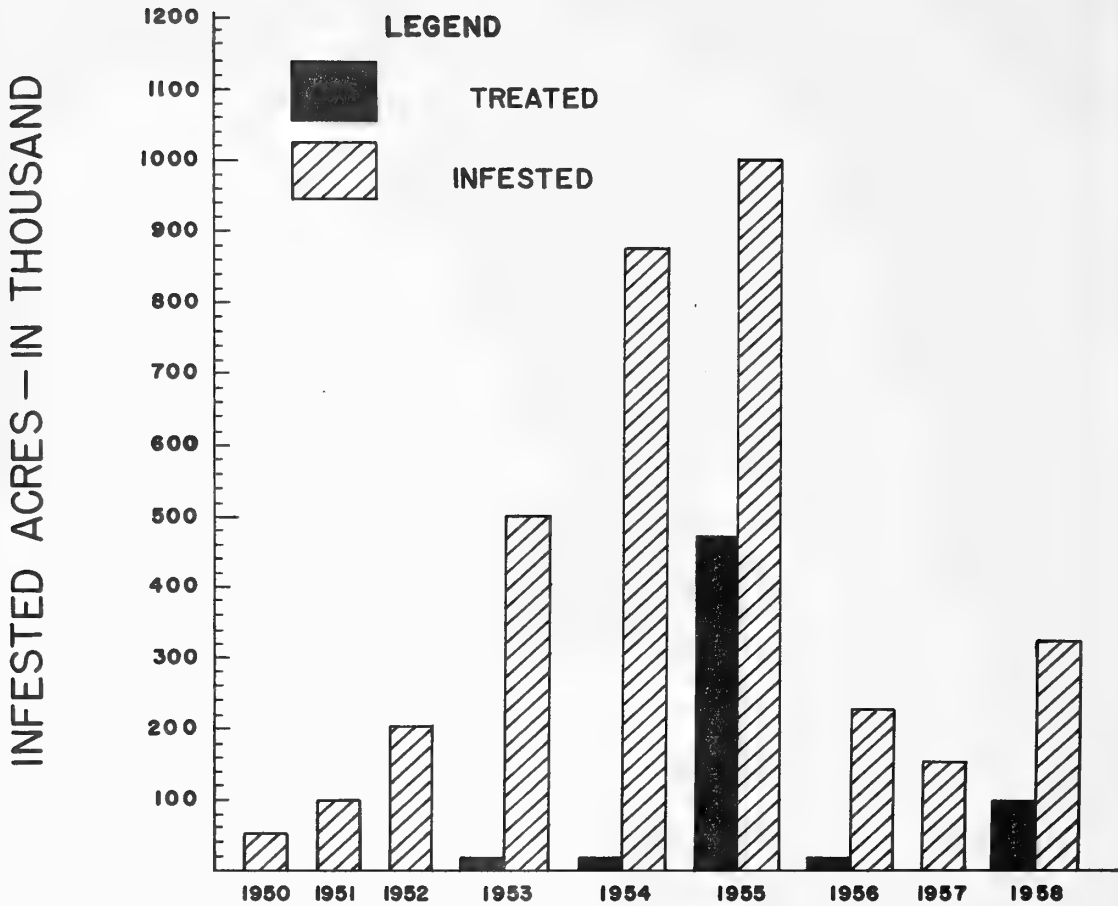


Figure 2. --Spruce budworm infestations in Arizona-New Mexico, 1950-58.

and covers 2,500 acres. In 1958, two new outbreaks were discovered -- one 3,000-acre area on Baker Mountain, Tonto National Forest; the other, a 12,000-acre area on Sandia Mountain, Cibola National Forest. The two outbreaks on the Tonto National Forest are about 40 miles apart with 300 air-miles separating them from the Sandia Mountain outbreak. Defoliation in specific localities in the Pinal Mountain outbreaks is severe; some trees have lost all of their foliage. Feeding intensity in other areas is light to heavy. No tree mortality has resulted.

During June 1958 the Forest Service sprayed about 100 acres of heavily infested white fir on Pinal Mountain. Treatment was by aerial application of 1 pound of DDT in 1 gallon of fuel oil. The effectiveness of the treatment was limited. Moths in the unsprayed

area were extremely abundant, and as a result the insect not only reinfested the control area, but caused serious damage in areas where light or no damage was anticipated.

Aspen leaf roller

Defoliation of aspen by the aspen leaf roller (Archips conflictana (Wlkr.)) has risen from 500 to 1,280 acres on the Tres Piedras District, Carson National Forest.

Needle miner

All outbreaks of this needle miner (Recurvaria sp.) have disappeared. The areas infested in 1956 and 1957 were ground checked and no insects were found.

Sawfly

There was an increase in 1958 from 640 to 1,280 acres of ponderosa pine defoliation caused by an unidentified pine sawfly south of Grants, New Mexico. The infestation is heavy, but no tree mortality has resulted.

MISCELLANEOUS PESTS

Red turpentine beetle

The red turpentine beetle (Dendroctonus valens Lec.) is active in ponderosa pine severely damaged by a July hailstorm on the Mescalero Indian Reservation. Outbreaks, about 1 acre in size, are scattered throughout the hail-damaged pine. Tree killing by the beetle is expected.

Prescott scale

The moderate infestation of the Prescott scale (Matsucoccus vexillorum Morrison) on the North Rim of the Grand Canyon National Park remained static in 1958.

Pinyon needle scale

A pilot control test with three dosage rates of Malathion was conducted against the pinyon needle scale (Matsucoccus acalyptus Herbert) on the South Rim of the Grand Canyon in July 1958. Lack of data on the life history of this scale is considered chiefly responsible for the poor control obtained.

Varying dosages of a systemic insecticide, Systox, were applied to the base of several pinyon trees infested with the scale. Variable but unsatisfactory control was observed. The scale at Grand Canyon is light, but heavy infestations can be found on adjacent national forest land.

Mites

The mite infestation on Douglas-fir near Lost Lodge on the Lincoln National Forest, which began in 1956, is decreasing in intensity.

Fall webworm

Defoliation by the fall webworm (Hyphantria cunea Drury) increased in 1958. Cottonwoods in the Rio Grande Valley north of Santa Fe, New Mexico, and various broadleaved trees along Oak Creek Canyon in the Coconino National Forest were heavily defoliated and damaged.

Walnut caterpillar

An infestation of Datana sp. on Texas black walnut continues to be a problem at Carlsbad Caverns National Park. Frequent spray applications of DDT are greatly minimizing damage, but reinfestation from surrounding areas is hindering control efforts.

Lacebug

The unidentified lacebug that caused leaf injury to sycamore in Montezuma Castle National Monument in 1957 had apparently died out by 1958.

Needle miner

The infestation of an unidentified needle miner on pinyon pine near Tres Piedras, Carson National Forest, reported in 1957, remained static in 1958.

Table 1.--Comparisons of forest insect infestations recorded during the 1957 and 1958 surveys

	Arizona		New Mexico		Both States	
	1957	1958	1957	1958	1957	1958
----- Acres -----						
<u>Pine Bark Beetles</u>						
<i>Ips</i> and <i>Dendroctonus</i> spp. ¹	553, 120	300, 210	1, 162, 120	234, 650	1, 715, 240	534, 860
Black Hills beetle	0	0	19, 380	0	19, 380	0
Roundheaded pine beetle	600	0	0	0	600	0
Subtotal	553, 720	300, 210	1, 181, 500	234, 650	1, 735, 220	534, 860
<u>Fir and Spruce Beetles</u>						
Douglas-fir beetle	68, 590	103, 280	752, 610	567, 580	821, 200	670, 860
Fir engraver beetle	0	0	7, 880	16, 280	7, 880	16, 280
Western balsam bark beetle	4, 580	5, 440	163, 200	60, 000	167, 780	65, 440
Engelmann spruce beetle	0	0	1, 280	1, 250	1, 280	1, 250
Subtotal	73, 170	108, 720	924, 970	645, 110	998, 140	753, 830
<u>Defoliators</u>						
Spruce budworm	74, 030	100, 000	80, 920	223, 840	154, 950	323, 840
Tussock moth (white fir)	100	5, 550	0	12, 000	100	17, 500
Sawfly (<i>ponderosa</i> pine)	0	0	640	1, 280	640	1, 280
Great Basin tent caterpillar	59, 680	22, 500	191, 010	201, 120	250, 690	223, 620
Aspen leaf roller	0	0	500	1, 280	500	1, 280
Needle miner (<i>ponderosa</i> pine)	250	0	110, 820	0	111, 070	0
Subtotal	134, 060	128, 000	383, 890	439, 520	517, 950	567, 520
Total	760, 950	536, 930	2, 490, 360	1, 319, 280	3, 251, 310	1, 856, 210

¹ Arizona five-spined ips associated with southwestern pine beetle and occasionally one or both of these associated with roundheaded pine beetle, Larger Mexican pine beetle, and western six-spined ips.

Table 2.--Forest insect infestations in Arizona by species and intensity of damage, 1958 season

Forested area	Insect	Intensity of infestations					Total
		Light	Moderate	Heavy	Very heavy	Acres	
Apache National Forest and adjacent land	<u>Ips and Dendroctonus spp.</u> ¹	3,520	0	0	0	0	3,520
	Douglas-fir beetle	21,640	3,520	1,280	0	0	26,440
	Subtotal	25,160	3,520	1,280	0	0	29,960
Chiricahua National Monument	<u>Ips and Dendroctonus spp.</u> ¹	160	0	0	0	0	160
	Subtotal	160	0	0	0	0	160
Coconino National Forest	<u>Ips and Dendroctonus spp.</u> ¹	50,720	6,080	480	6,640	0	63,920
	Douglas-fir beetle	1,760	960	640	0	0	3,360
	Western balsam bark beetle	0	640	0	960	0	1,600
	Subtotal	52,480	7,680	1,120	7,600	0	68,880
Coronado National Forest	<u>Ips and Dendroctonus spp.</u> ¹	9,440	4,640	800	0	0	14,880
	Douglas-fir beetle	10,080	9,280	1,120	0	0	20,480
	Subtotal	19,520	13,920	1,920	0	0	35,360
Fort Apache Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹	111,680	960	0	0	0	112,640
	Douglas-fir beetle	23,080	3,520	1,280	0	0	27,880
	Subtotal	134,760	4,480	1,280	0	0	140,520
Gila National Forest	<u>Ips and Dendroctonus spp.</u> ¹	1,690	4,800	0	0	0	6,490
	Subtotal	1,690	4,800	0	0	0	6,490
Grand Canyon National Park	<u>Ips and Dendroctonus spp.</u> ¹	9,120	0	0	0	0	9,120
	Douglas-fir beetle	3,200	800	3,680	0	0	7,680
	Spruce budworm	25,000	0	0	0	0	25,000
	Subtotal	37,320	800	3,680	0	0	41,800

Table 2 (continued)

Kaibab National Forest	<u>Ips and Dendroctonus spp.</u> ¹	5,440	640	960	0	7,040
	Douglas-fir beetle	5,280	5,600	4,160	960	16,000
	Spruce budworm	75,000	0	0	0	75,000
	Western balsam bark beetle	0	800	0	0	800
	Subtotal	85,720	7,040	5,120	960	98,840
Navajo Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹	8,480	0	0	0	8,480
	Douglas-fir beetle	960	0	160	0	1,120
	Western balsam bark beetle	0	1,280	1,280	480	3,040
	Great Basin tent caterpillar	0	6,500	8,000	8,000	22,500
	Subtotal	9,440	7,780	9,440	8,480	35,140
Prescott National Forest and adjacent land	<u>Ips and Dendroctonus spp.</u> ¹	5,280	1,920	8,960	7,360	23,520
	Subtotal	5,280	1,920	8,960	7,360	23,520
Saguaro National Monument	<u>Ips and Dendroctonus spp.</u> ¹	8,160	1,760	0	0	9,920
	Douglas-fir beetle	320	0	0	0	320
	Subtotal	8,480	1,760	0	0	10,240
San Carlos Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹	15,040	3,680	0	1,280	20,000
	Subtotal	15,040	3,680	0	1,280	20,000
Sitgreaves National Forest	<u>Ips and Dendroctonus spp.</u> ¹	5,800	7,200	640	2,880	16,520
	Subtotal	5,800	7,200	640	2,880	16,520
Tonto National Forest	<u>Ips and Dendroctonus spp.</u> ¹	2,080	1,520	0	400	4,000
	Tussock moth	0	3,500	0	2,000	5,500
	Subtotal	2,080	5,020	0	2,400	9,500
Total for Arizona		402,930	69,600	33,440	30,960	536,930

¹ Arizona five-spined ips associated with southwestern pine beetle and occasionally one or both of these associated with roundheaded pine beetle, Larger Mexican pine beetle, and western six-spined ips.

Table 3. -- Forest insect infestations in New Mexico by species and intensity of damage, 1958 season

Forested area	Insect	Intensity of infestations				
		Light	Moderate	Heavy	Very heavy	Total
		----- Acres -----				
Apache National Forest and adjacent land	Ips and Dendroctonus spp. ¹	7, 120	0	0	0	7, 120
	Douglas-fir beetle	22, 960	12, 320	4, 000	0	39, 280
	Great Basin tent caterpillar	0	800	0	0	800
	Subtotal	30, 080	13, 120	4, 000	0	47, 200
Bandelier National Monument	Ips and Dendroctonus spp. ¹	1, 600	0	0	0	1, 600
	Douglas-fir beetle	800	0	0	0	800
	Subtotal	2, 400	0	0	0	2, 400
Carson National Forest and adjacent land	Ips and Dendroctonus spp. ¹	7, 520	800	0	0	8, 320
	Douglas-fir beetle	8, 160	6, 240	640	0	15, 040
	Fir engraver beetle	0	1, 800	0	0	1, 800
	Western balsam bark beetle	5, 280	19, 840	14, 880	4, 320	44, 320
	Engelmann spruce beetle	0	0	1, 250	0	1, 250
	Spruce budworm	31, 200	79, 960	27, 360	1, 440	139, 960
	Great Basin tent caterpillar	0	40, 000	0	70, 000	110, 000
	Aspen leaf roller	0	1, 280	0	0	1, 280
	Subtotal	52, 160	149, 920	44, 130	75, 760	321, 970
Cibola National Forest and adjacent land	Ips and Dendroctonus spp. ¹	86, 440	21, 600	5, 120	0	113, 160
	Douglas-fir beetle	63, 840	25, 280	32, 000	6, 560	127, 680
	Fir engraver beetle	0	0	1, 200	8, 800	10, 000
	Western balsam bark beetle	0	0	1, 440	0	1, 440
	Sawfly (ponderosa pine)	0	1, 280	0	0	1, 280
	Great Basin tent caterpillar	0	2, 200	0	1, 440	3, 640
	Tussock moth	0	12, 000	0	0	12, 000
Subtotal	150, 280	62, 360	39, 760	16, 800	269, 200	
Gila National Forest and adjacent land	Ips and Dendroctonus spp. ¹	25, 650	11, 040	0	0	36, 690
	Douglas-fir beetle	59, 360	50, 880	15, 860	1, 440	127, 540
	Subtotal	85, 010	61, 920	15, 860	1, 440	164, 230

Jicarilla Apache Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Spruce budworm Subtotal	8,960 12,640 0 21,600	0 6,560 3,040 9,600	0 1,600 0 1,600	0 0 0 0	8,960 20,800 3,040 32,800
Lincoln National Forest and adjacent land	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Fir engraver beetle Western balsam bark beetle Great Basin tent caterpillar Subtotal	4,480 24,240 0 0 0 28,720	5,680 21,360 1,120 0 4,460 32,620	0 1,920 0 1,120 0 3,040	0 3,200 3,360 0 300 6,860	10,160 50,720 4,480 1,120 4,760 71,240
Mescalero Apache Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Subtotal	13,600 40,320 53,920	0 18,200 18,200	1,920 0 1,920	0 5,440 5,440	15,520 63,960 79,480
Navajo Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Western balsam bark beetle Spruce budworm Great Basin tent caterpillar Subtotal	19,200 14,880 0 0 0 34,080	0 0 480 15,680 20,000 36,160	0 2,400 800 0 0 3,200	0 0 320 0 25,400 25,720	19,200 17,280 1,600 15,680 45,400 99,160
Santa Clara Indian Reservation	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Subtotal	640 3,040 3,680	0 1,120 1,120	0 0 0	0 1,120 1,120	640 5,280 5,920
Santa Fe National Forest	<u>Ips and Dendroctonus spp.</u> ¹ Douglas-fir beetle Western balsam bark beetle Spruce budworm Great Basin tent caterpillar Subtotal	12,640 56,800 6,240 13,920 0 89,600	640 32,000 5,280 41,640 15,360 94,920	0 4,000 0 2,400 0 6,400	0 6,400 0 7,200 21,160 34,760	13,280 99,200 11,520 65,160 36,520 225,680
Total for New Mexico		551,530	479,940	119,910	167,900	1,319,280

¹ Arizona five-spined ips associated with southwestern pine beetle and occasionally one or both of these associated with roundheaded pine beetle, Larger Mexican pine beetle, and western six-spined ips.

