

MAJOR INSECTS ATTACKING MAIN STEM OF CALIFORNIA FOREST TREES

Tree	:	Major Evidence	:	Additional Points Identified From Closer Examination				
Species	:	Insects	:					
Attacked	:	From A	:					
	:	Distance	:	Egg Galleries:	Larval Brood	Frass	Pitch Tubes	Other
PONDEROSA	:	1. Western	:	Woodpecker	:	Meandering	:	Promptly bores:
PINE	:	pine beetle	:	work, exposes	:	shape. In	:	out into bark,
AND	:	(<i>Dendroctonus</i>	:	red inner bark	:	cambium.	:	as they in-
COULTER	:	<u><i>brevicomis</i></u>)	:	on large	:		:	crease in
PINE	:		:	sections of	:		:	size. (Larvae
	:		:	stem. Entire	:		:	do not stay
	:		:	crown fading.	:		:	in cambium
	:		:		:		:	to pupate.)
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MAJOR INSECTS ATTACKING MAIN STEM OF CALIFORNIA FOREST TREES - CONT'D

Tree	:	Major Evidence	:	Additional Points Identified From Closer Examination					
Species	:	Insects	:	From A	:		:		
Attacked	:	Making Attack	:	Distance	:	Egg Galleries:	Larval Brood	: Frass : Pitch Tubes : Other	
PONDEROSA	:	3. Flatheads	:	Individual	:	None. Eggs	:	Tunnels in : None. : Pupate in outer	
PINE	:	(<u>Melanophila</u>	:	large limbs in	:	laid in bark	:	cambium : bark, 1/8-1/4"	
AND	:	<u>californica</u>)	:	crown, dying	:	crevice.	:	packed with : under surface.	
COULTER	:		:	or dead, or en-	:		:	Single larva, : frass in :	
PINE	:		:	tire crown	:		:	shaped like : concentric :	
(CONT'D)	:		:	fading. Wood-	:		:	horse-shoe : circles. :	
	:		:	peckers make	:		:	nail. Flat : Wood scarce-:	
	:		:	individual	:		:	head and : ly scored. :	
	:		:	holes into	:		:	sharp tail. : Incipient :	
	:		:	cambium.	:		:	In cambium or : galleries :	
	:		:		:		:	bark. : appear in :	
	:		:		:		:	live trees : :	
	:		:		:		:	as fine : :	
	:		:		:		:	brown line : :	
	:		:		:		:	on wood sur-: :	
	:		:		:		:	face. : :	
	:		:		:		:		:
	:	4. Mt. pine	:	Entire crown	:	Vertical	:	Broods in cam- : Packed : Common. Often :	
	:	beetle	:	fading.	:	and J-shap-	:	bium. If : with frass. : in patches half:	
	:	(<u>Dendroctonus</u>	:		:	ed. 12 to	:	bark pried off, : (If no : way up bole, :	
	:	<u>monticolae</u>)	:	Woodpeckers	:	24" long.	:	larvae fall : frass, it : like shot-gun :	
	:		:	make individ-	:		:	out on ground : may be <u>Ips</u> : wound. Color :	
	:		:	ual 3/8" round	:		:	like rice. : <u>emarginatus</u> , : of tubes shows :	
	:		:	holes into	:		:	p. 4. : attack: :	
	:		:	cambium.	:		:		: Unsuccessful :
	:		:		:		:		: White to yel- :
	:		:		:		:		: low color of :
	:		:		:		:		: tubes. :
	:		:		:		:		: Successful :
	:		:		:		:		: Reddish brown :
	:		:		:		:		: color of tubes. :

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Species	:	Insects	:	From A	:									
Attacked	:	Making Attack	:	Distance	:	Egg Galleries:	Larval Brood :	Frass	:	Pitch Tubes	:	Other		
PONDEROSA	:	5. Red tur-	:	Mostly a basal	:	Vertical.	:	Work in cam-	:	Larvae feed	:	White to yel-	:	Largest of the
PINE	:	pentine beetle	:	feeder or at	:	Lots of	:	bium.	:	together in	:	low unsuccess-	:	<u>Dendroctonus</u>
AND	:	(<u>D. valens</u>)	:	root collar.	:	pitch.	:		:	cambium,	:	ful. Reddish	:	beetles, reddish
COULTER	:		:	Rarely up to	:		:		:	cutting out	:	brown is	:	brown color. Can
PINE	:		:	eye height.	:		:		:	walls be-	:	successful.	:	survive in much
(CONT'D)	:		:		:		:		:	tween tun-	:		:	fresh pitch.
	:		:		:		:		:	nels.	:		:	
(Not in	:	6. Reproduc-	:	Fading crown	:	None.	:	Larva in pith,	:	Round holes	:	None.	:	Black spots on
Coulter	:	tion weevil	:	in reprod. 1-	:		:	wood or under	:	size of pen-	:		:	needles from
Pine)	:	(<u>Cylindrocop-</u>	:	4' tall.	:		:	bark.	:	cil lead.	:		:	feeding.
	:	turus eatoni)	:		:		:		:		:		:	
JEFFREY	:	1. Jeffrey	:	Entire crown	:	<u>D. jeffreyi</u> and <u>D. monticolae</u> are	:		:		:		:	
PINE	:	pine beetle	:	fading.	:	identical in egg galleries and larval	:		:		:		:	
	:	(<u>D. jeffreyi</u>)	:		:	work. (<u>D. jeffreyi</u> is larger than <u>D.</u>	:		:		:		:	
	:		:		:	<u>brevicomis</u> , and smaller than <u>D. valens</u>	:		:		:		:	
	:		:		:	beetle.)	:		:		:		:	
	:		:	Woodpeckers	:		:		:		:		:	
	:		:	make individ-	:	Vertical	:		:		:	Common. See	:	<u>D. jeffreyi</u>
	:		:	ual 3/8" round	:	and J-shap-	:		:		:	<u>D. monticolae</u>	:	beetle works
	:		:	holes into	:	ed, 12 to	:	Broods in	:	Packed	:	description	:	only in
	:		:	cambium.	:	48" long.	:	cambium.	:	with frass.	:	above.	:	Jeffrey pine.

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Tree Species	Insects	Major Evidence	Additional Points Identified From Closer Examination				
Attacked	Making Attack	From A Distance	Egg Galleries	Larval Brood	Frass	Pitch Tubes	Other
JEFFREY PINE (CONT'D)	2. <u>Ips oregoni</u> in top 1/3	:Original at- tack in top 1/3 of crown. (<u>D. jeffreyi</u> often fill in below.)	:	:	:	:	:
	3. <u>Emarginate</u> <u>Ips</u>	:Woodpeckers expose patches of white wood in top of poles seeking <u>Ips</u> in cambium.	:2-4' long, straight, vertical and parallel. No frass packed in galleries like <u>D.m.</u>	: (<u>Ips emarginatus</u> never attacks green slash or logs except lodgepole logs. Such attack is by either <u>I. oregoni</u> or <u>I. confusus</u> .) (No control action recommended against <u>Emarginatus</u> alone, in tree or logs.)			:
					:Free of frass and has nuptial chamber-- otherwise identical to: <u>D.m. tunnels</u> .	:Rarely found.	:Beetle's rear end concave with 3 big spines on each side of it. Beetle same size as <u>D. jeffreyi</u> . Is largest of the <u>Ips</u> beetles.
	4. Flatheads (<u>Melanophila</u> <u>californica</u>)	:Large limbs in crown dying or dead. Also complete fade. Woodpeckers make individ- ual holes into cambium.	:None. Eggs laid in bark crevice.	:Single larvae, shaped like horse-shoe nail. Flat- head and sharp- tail. In cam- bium or bark.	:Concentric, tightly packed frass: Tunnels 1/8-1/4" wide. In- cipient galleries appear in live trees as fine brown line on wood sur- face.	:None.	:Pupate in outer bark, 1/8-1/4" under surface.

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			Egg Galleries:	Larval Brood :	Frass :	Pitch Tubes :	Other
JEFFREY PINE (CONT'D)	5. Red turpentine beetle (<u>Dendroctonus valens</u>)	Mostly a basal feeder or at root collar. Rarely up to eye height.	Vertical. Lots of pitch.	Work in cambium.	Larvae feed together in cambium, cutting out walls between their tunnels.	White to yellow is unsuccessful. Reddish brown is successful.	Largest of the <u>Dendroctonus</u> beetles. Reddish brown color. Can survive in much fresh pitch.
	6. Reproduction weevil. (<u>Cylindrocopturus eatoni</u>)	Fading crown in reprod. 1-4' tall.	None.	Larvae in pith, wood or under bark.	Round holes size of pencil lead.	None.	Black spots on needles from feeding.
	1. Mt. pine beetle. (<u>Dendroctonus monticolae</u>)						
SUGAR PINE			(Same description as under PONDEROSA PINE, item #4.)				
	2. Red turpentine beetle (<u>D. valens</u>)						
			(Same description as under PONDEROSA PINE, item #5.)				

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			Egg Galleries	Larval Brood	Frass	Pitch Tubes	Other
SUGAR PINE (CONT'D)	3. Ips (<i>Ips confusus</i>) (<i>I. emarginatus</i>) (<i>I. oregoni</i>)		(All 3 attack top of sugar pine trees) (See description under PONDEROSA PINE) (See description under JEFFREY PINE) (Smallest size of these 3 Ips is <i>oregoni</i> found in areas like Cannell Mds. on Sequoia N.F.; Laguna on Cleveland N.F.; Alamo Mt. on Los Padres N.F.)				
LODGEPOLE PINE	1. Mt. pine beetle (<i>D. monticolae</i>)						
			(Same description as under PONDEROSA PINE, item #4.)				
	2. Red turpentine beetle (<i>D. valens</i>)						
			(Same description as under PONDEROSA PINE, item #5.)				
	3. Ips (<i>Ips confusus</i>) (<i>I. emarginatus</i>) (<i>I. oregoni</i>)		Minor importance in lodgepole pine. All 3 attack blowdown and fresh logs of L.P. None attack green standing lodgepole, so do not treat Ips in lodgepole logs or slash. (See description under SUGAR PINE, item #3 above.)				
WHITE FIR AND RED FIR	1. Fir engraver beetle (<i>Scolytus ventralis</i>)	Top 10 to 20' fading or spike top. In saplings, may attack entire stem.	3 to 6" long, horizontal and straight. Larval tunnels vertical.	Single brood each year. Stays in cambium.	Tunnels go straight up or down, from horizontal gallery.	No pitch tubes.	Small shot-holes in bark. Beetles size of <i>Dendroctonus brevicornis</i> . Rear end of beetle undercut.
			Both gallery and larval tunnels engrave the wood and bark.				

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			Egg Galleries	Larval Brood	Frass	Pitch Tubes	Other
WHITE FIR AND RED FIR (CONT'D)	2. Round-headed fir borer (<i>Tetropium abietis</i>)	-	Feed in lower bole of tree. Often fill in below <i>Scolytus</i> .	-	Loosely packed with frass. Half in sapwood, half in bark.	None.	-
DOUGLAS-FIR	1. Douglas-fir bark beetle (<i>D. pseudo-tsugae</i>)	Often in group kills. Watch for fluffy white boring dust in green or fading crowns. If needles are dropping, tree is abandoned.	In inner bark, slightly etches wood. Sinuous with the grain, about 12" long. Eggs in groups along side of gallery.	1 brood per year. Overwintering adults emerge in spring. Broods emerge May through September.	In cambium. Larvae tunnels "fan-out" from egg niches on sides of galleries.	None.	Beetles reddish color, 1/5" long. Long hairs.
	2. Douglas-fir engraver (<i>S. unispinosus</i>)	Attack weakened or recently killed trees.	1 to 3" straight and vertical.	Over-winter as larvae. Two broods. April to July emergence.	At right angle to gallery and then spread.	None.	Adults have single spine at rear and rear end undercut.

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DOUGLAS-FIR (CONT'D)	3. Flatheaded fir borer (<u>Melanophila drummondi</u>)	Attacks either weakened trees or thrifty ones.	None. Eggs laid in bark crevice.	Larvae shaped like horse-shoe nail. Flathead and sharp tail.	Tunnels in cambium packed with frass in concentric circles.	None.	Adults 3/8-1/2" long. Very similar to <u>M. californica</u> in pine.
DIGGER PINE	1. Flatheaded borer (<u>M. californica</u>)	(Same as above)					
	2. Ips (<u>Ips confusus</u>)	Original attack in top 1/3 of crown. Flat-headed borer may fill in below. (Not <u>D. brevicornis</u> .)	Tuning fork shape.	Works in cambium.	Free of frass.	Rarely found.	Beetle's rear end concave.

Prepared by J. L. Averell and John Pierce, with help from Pacific Southwest Forest & Range Exp. Station.

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