COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET - 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD (831) 454-2123

TOM BURNS, PLANNING DIRECTOR

October 1,2004

AGENDA DATE: OCTOBER 13,2004

Planning Commission
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

SUBJECT: Proposal to amend Permit 99-0538, a Subdivision to create eleven single family parcels, to remove an existing, diseased pine tree that was originally proposed to be retained.

Members of the Commission:

The purpose of this item is to recommend approval of Application 04-0378, a proposal to amend Subdivision Permit 99-0538, which created eleven single-family residential parcels. The applicant requests approval to remove an existing, diseased, 36" Monterey pine tree which was originally proposed to be retained as part of the development plans for the subdivision. The subject property is located in Live Oak, on the east side of Seventh Avenue, directly south of the railroad right-of-way. A location map is included as Attachment 2.

Background

On May 22,2002, your commission approved Application 99-0538, a subdivision creating eleven single-family lots. Construction of subdivision improvements is currently underway, and building permit applications for the new homes on the parcels have also been submitted. The original approval included retention of a large Monterey pine tree ***(Pinus radiata)***, located adjacent to the railroad right-of-way on the north parcel boundary. At the time the tree was first evaluated in May, 2000, it was noted that the tree was infested with Turpentine Beetles, but the infestation was moderate and localized on the tree **trunk.** Generally, the tree appeared to be in acceptable health, and it was incorporated into the landscape and improvement plans for the subdivision.

In the four years since the tree was initially evaluated, the beetle infestation has spread and the health of the tree has deteriorated. The canopy of the tree has thinned, one of the main stems has died, and another stem is dying. To assess the overall health of the tree the applicant retained the original arborist, David Chambers. His evaluation, including photographs of the tree, is included as Attachment 3.

Analysis

The arborist recommends the removal and replacement of the 36" Monterey pine tree, since there are no measures available that will assure the continued health and safety of the tree. The applicant's landscape architect, Gregory Lewis, has prepared a revised landscape plan, included as Attachment 1, that recommends two, 24-inch box replacement trees, located on Lot 4 and Lot 11. The recommended trees are a flowering plum (*Prunus krauter vesuvious*) and a strawberry tree *(Arbutus marina)*, which are species included in the street trees for the cul-de-sac. Because the existing pine proposed to be removed is a specimen tree of significant height and canopy, the proposed replacement trees would not adequately mitigate its loss. Staff has proposed a condition of approval that would require a revised landscape plan, prior to building permit approval on Lots 2, **3** and 4, that includes two, 24" box replacement trees of a tall species appropriate to the microclimate on site. Ideally, these trees would be located on the rear of Lots 2 and **3,** in proximity to the tree proposed to be removed. Conditions of approval reflecting this requirement are included as Attachment ***5.*** Because the tree proposed to be removed is a significant tree, as defined by County Code Section 16.34.030, findings for removal are included as Attachment 4. No modifications are necessary to the original Coastal Development Permit Findings as they state that "(m)ature trees which meet the definition of significant trees have been retained where possible," and it is no longer possible to retain this tree. We have received one letter from a neighboring property owner (Attachment 6) expressing concern that the tree could fall, resulting in damage to his property and possible injury to his tenant.

Conclusion/Recommendation

Although the original plans called for retaining the 36" Monterey pine, it appears that the tree is in declining health. Measures required to attempt to save the tree would result in an unsightly appearance, and it is likely the tree would continue to decline. Because of the existing dead and dying limbs, the tree poses a potential hazard to homes and other improvements in the area.

It is therefore recommended that your commission take the following actions:

1. Certify that the proposal is exempt from further Environmental Review under the California Environmental Quality Act, per the Negative Declaration approved by your Commission on May 22,2002.

2. **APPROVE** Application Number **04-0378,** based on the attached findings and conditions.

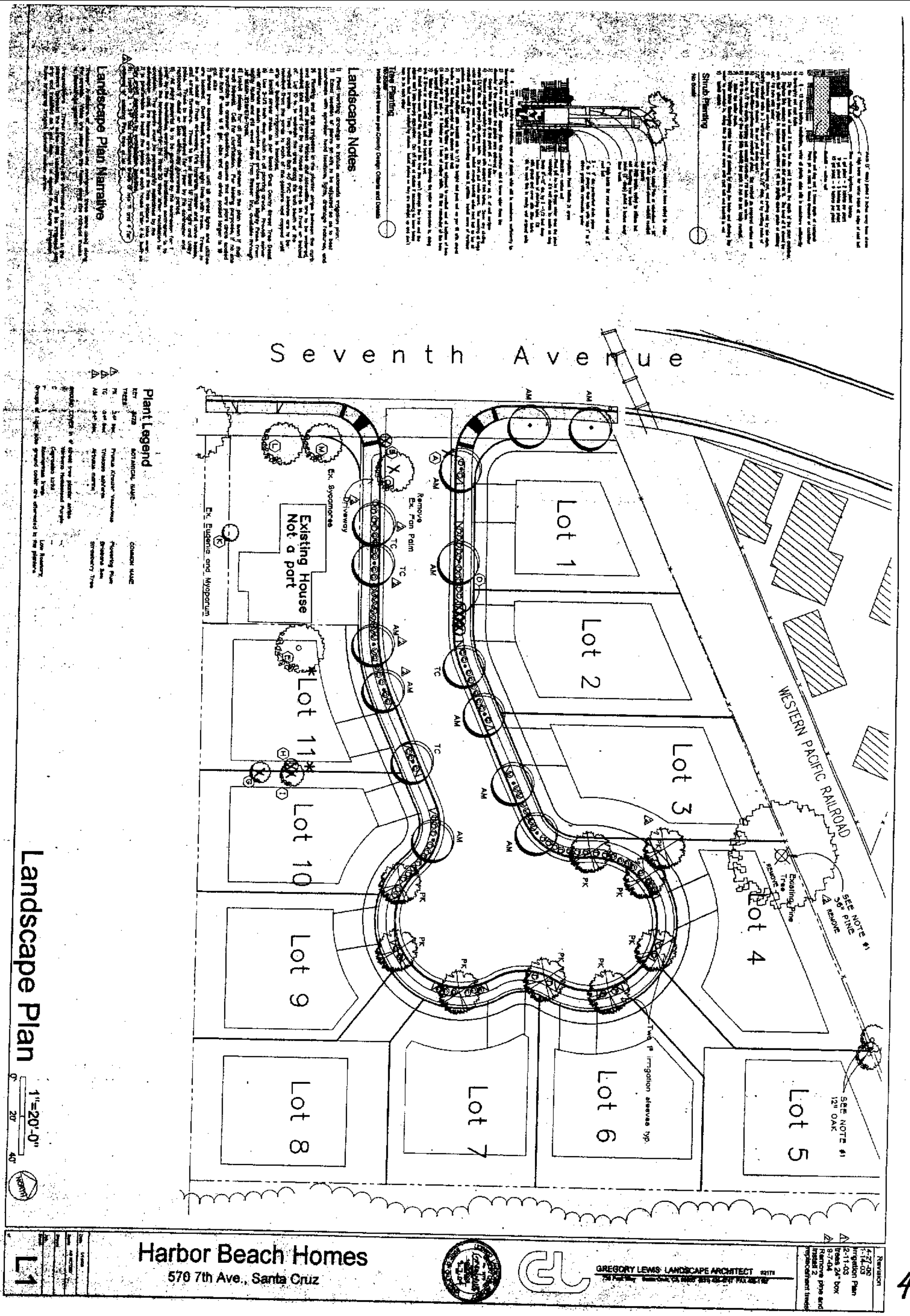
Sincerely,

Cathy Graves
Principal Planner
Development Review

Reviewed By:
Mark Deming
Assistant Planning Director

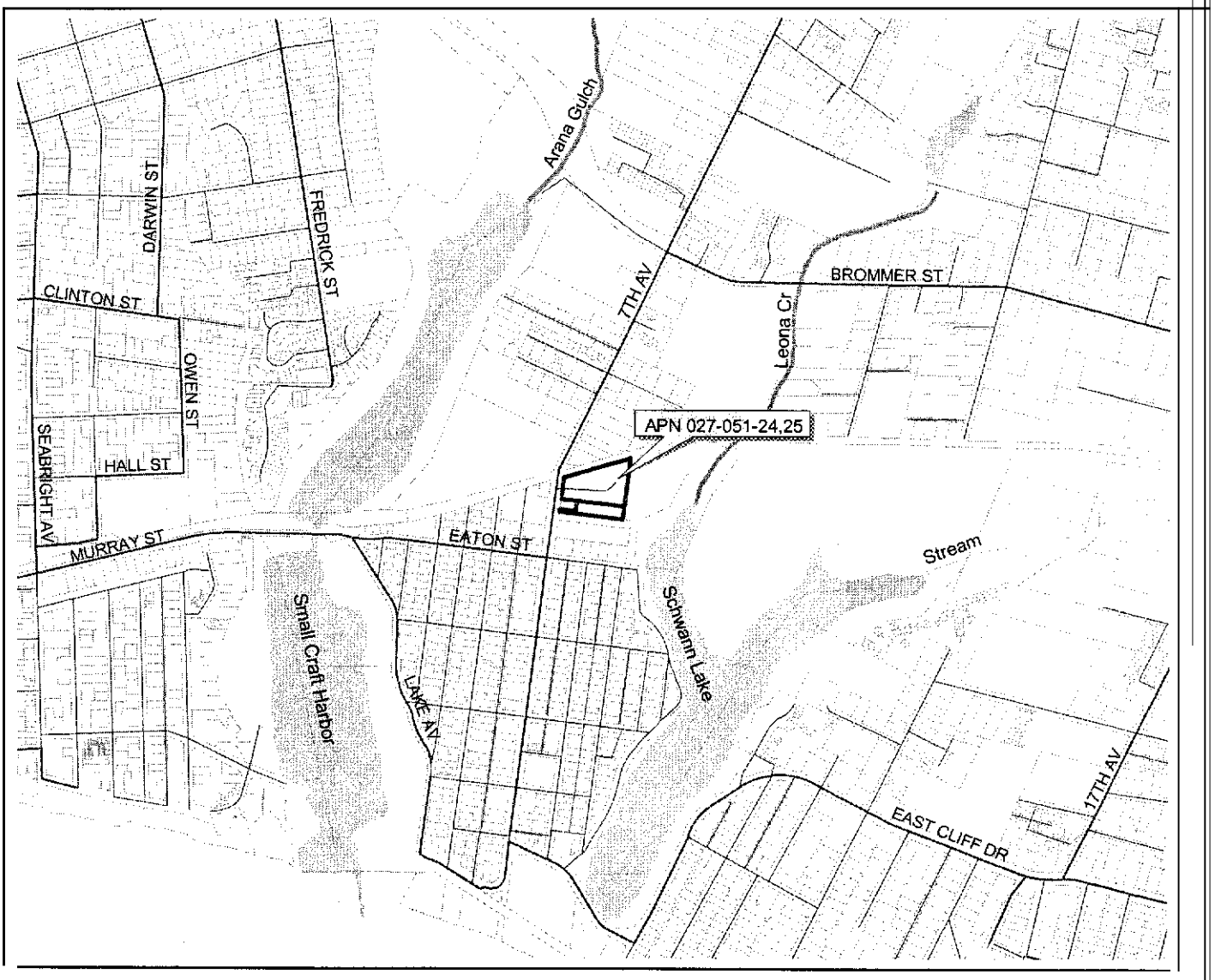
Attachments:

1. Landscape Plans by Gregory Lewis, Landscape Architect, dated September 7,2004
2. Location map
3. Tree evaluation by David L. Chambers, Certified Arborist, dated July 28,2004
4. Significant Tree Removal Permit Findings
5. Conditions of Approval
6. Letter of Joseph S. Ward, dated September 27,2004



Seventh Avenue
WESTERN PACIFIC RAILROAD
Lot 1
Lot 2
Lot 3
Lot 4
Lot 5
Lot 6
Lot 7
Lot 8
Lot 9
Lot 10
Lot 11
Existing House Not a part
Driveway
Ex. Sycamores
Remove Ex. Fan Palm
Ex. Eugenia and Myoporum
SEE NOTE #1 36" PINE REMOVE
Existing Pine Tree REMOVE
SEE NOTE #1 12" OAK
Two 1" irrigation sleeves typ.
AM
TC
PK
Landscape Notes
Landscape Plan Narrative
Shrub Planting
Tree Planting
Plant Legend
Landscape Plan
1"=20'-0"
0' 20' 40'
NORTH
Harbor Beach Homes
570 7th Ave., Santa Cruz
GREGORY LEWIS LANDSCAPE ARCHITECT
L1
Revision
4-27-00
1-14-03
Irrigation Plan
2-11-03
trees 24" box
9-7-04
Remove pine and install 2 replacement trees
ATTACHMENT 1

Location Map



Map created by Santa Cruz County
Planning Department:
August 2004

ATTACHMENT 2

David L. Chambers
ISA CERTIFIED ARBORIST WE-4298A
8901 East Zayante Road
Felton, CA 95018
(831) 335-1480

Date: 07/28/04

To: Michael Duggin
Scott Beck Construction Co
(831) 227-6701
700 River Street
Santa Cruz CA, 95060

From: David Chambers,
ISA Certified Arborist #WE-4298A
8901 East Zayante Road
Felton, CA 95018
(831) 335-1480 ph
(831) 206-1009 cell

Re: Monterey Pine on Harbor Beach Project Site, 546-547 Seventh Avenue, Santa Cruz County APN# 027-051-24 & 25.

Michael.

This memo is to follow-up on our discussion during the site visit to the Harbor Beach Project site on 07/26/04 to inspect the large Monterey Pine, ***Pinus*** *radiata*, on the site. As was noted in my review of this project dated 05/10/00 (see attached copy), The trunk of the large Monterey pine on the site was infested with Turpentine Beetles, ***Dendroctonus*** *valens*, that are boring into this tree to reproduce (figure 3 from 5/10/00 report). At the time of this 05/10/00 site visit, the infestation was moderate and localized on the tree trunk. The canopy of the tree was full, and foliar color was good (see figure 1 from 05/10/00). It should also be noted that the root zone of this tree had been repeatedly disturbed by the annual discing of the soil with a tractor for weed control.

ATTACHMENT 3

In the four years since my last site visit, the beetle infestation of this tree has persisted and significantly worsened. There are numerous fresh pitch tubes indicating recent attacks, and these entry points are distributed over the majority of the circumference of the tree trunk (see figure **A.** from current site visit).
The canopy of this tree has **thinned** dramatically since my previous visit, one of the main stems has died, and another is dying (Figure B.) Dieback of some upper portions of the tree may be associated with attacks by another beetle(s),(ie, Ips ssp.), but aerial inspection of the damaged areas would be required to determine the specific cause of this dieback.

Discussion:

Although these trees can tolerate mild infestations of Turpentine beetles without dying, the boring of the developing larvae destroys the cambium/phloem layer of tissues, and extensive infestations can severely stress or even girdle and kill trees. These beetles, and others, generally prefer to attack stressed trees. **As** noted above, this tree has suffered repeated root damage from weed control activities on the site. Drought stress is another factor that may have predisposed this tree to beetle attack. Pruning wounds also can attract these beetles.

Treatment options are limited, as once the beetles have entered the tree, insecticide treatments are ineffective at controlling the larvae (Please refer to the attached copy of University of California Pest Notes Publication 7421, "Bark Beetles" for a discussion of the pest life cycle, damage, and treatment options). Once a tree has been attacked, chemical cues are released that help other adult beetles locate the tree. Prophylactic treatments of permethrin based insecticides (Astro® or Dragnet®) applied to the bark may be used to prevent further attack by adults (see attached Pest Notes). This will not prevent damage from larvae already within the tree. These beetles can have up to three generations per year, and this tree appears to have been repeatedly attacked for at least the last four years. Damage **has** now become extensive enough that the health and safety of this tree have been compromised.

Recommendations:

Note: Recommendations for Tree Protection during construction are included in the 05/10/00 plan review (see attached copy).

Although this tree may appear to have healthy foliage from a distance, on closer inspection the extensive dieback and infestation on the trunk are apparent and are cause for concern, considering the potential targets in the form of the railroad right-of-way, and the nearby existing residence. As we discussed, root damage that has also occurred to this tree may exacerbate other factors leading to the continued decline of this tree.

As this tree cannot repair the damage done over the years by the Turpentine beetles, and the damage from these (and possibly other) beetles has already caused significant damage and dieback to the tree, and since no remedial treatments or measures are currently available that will ensure the continued health and safety of this tree, the removal and replacement of this tree is recommended.

If this tree is retained, I then recommend that:

- The lower trunk of the tree be treated with Astro® at the recommended label rate and intervals by a licensed pesticide applicator to reduce or prevent new attacks.
- All dead/infested trunks and limbs be removed by a Certified Arborist.
- Additional pruning as necessary for safety be performed by a Certified Arborist.
- Supplemental deep irrigation be applied around the dripline of the tree with a soaker-type hose several times over the remainder of this dry season as necessary to relieve drought stress.

The substantial amount of pruning required to remove dead/infested material would result in an unsightly appearing tree that most likely will continue to rapidly decline as a result of past and ongoing damage.

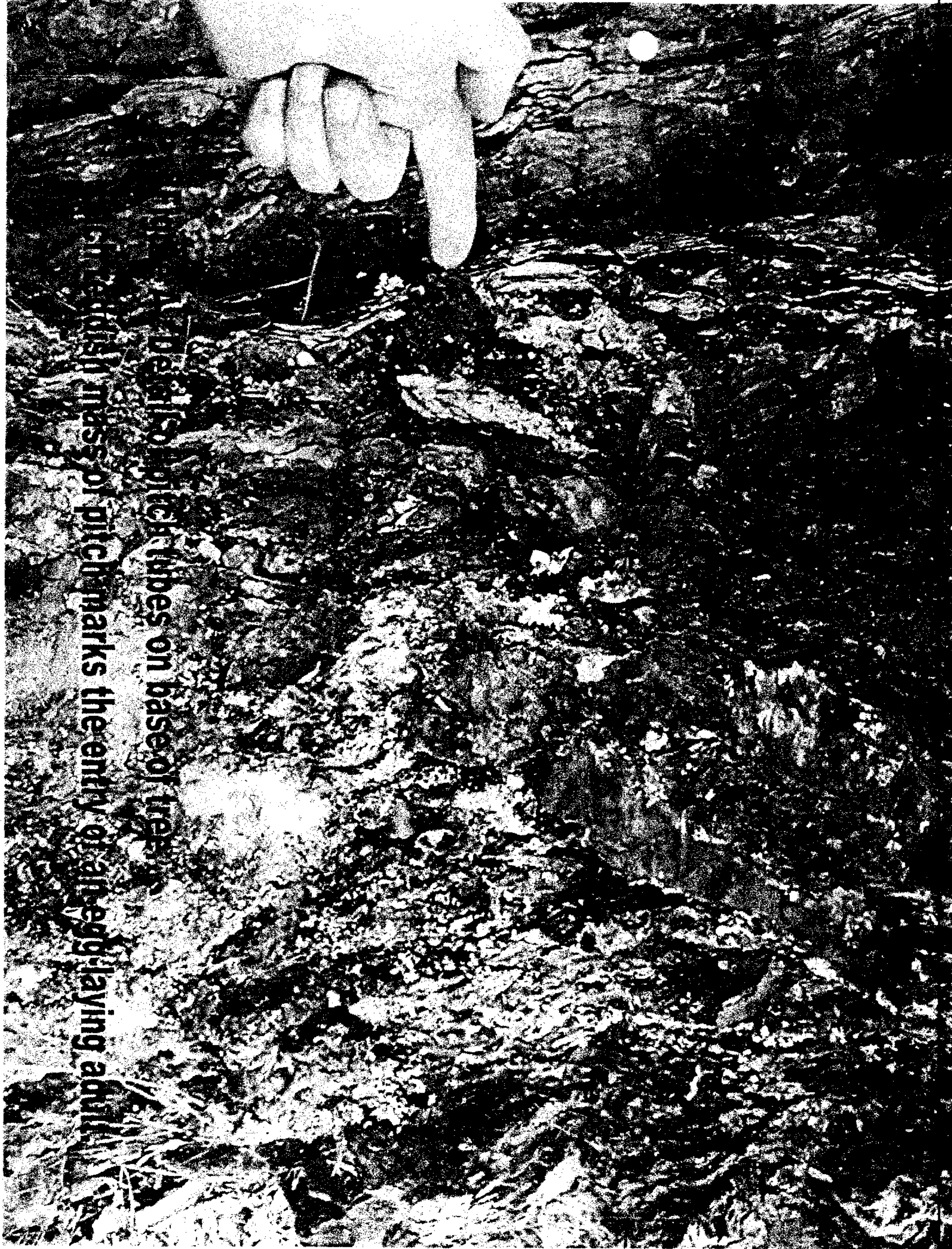
Please contact me if you have any questions or require further information.

David Chambers

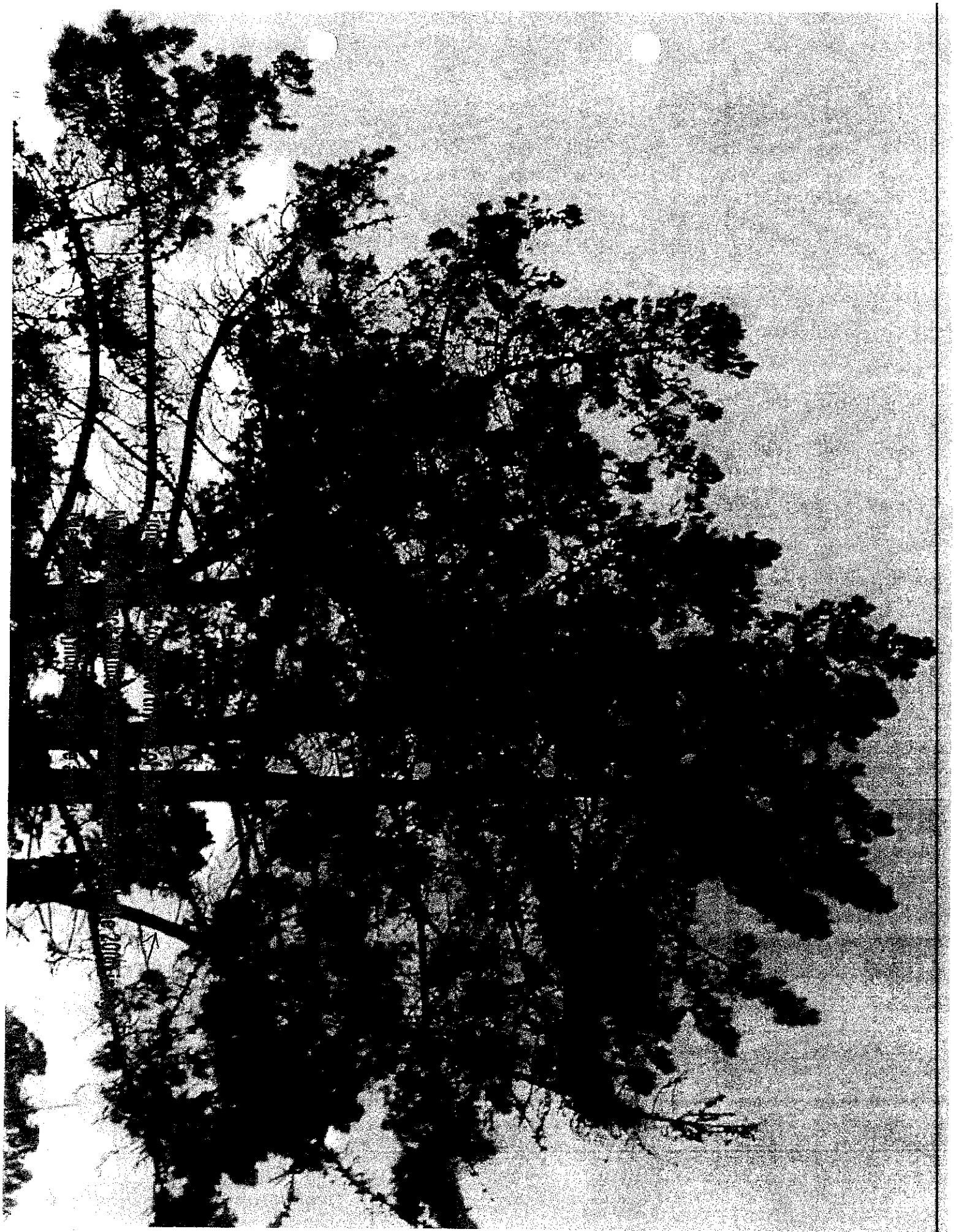
David Chambers,

Arborist #WE-4298A

(831) 335-1480



... Detail of pitch tubes on base of tree. ...
... reddish mass of pitch marks the entry of an egg-laying adult.



COPY

Dave Allen's Tree Services
" A Professional Arborist Service"

Date: 5-10-2000

To: John Swift A.I.C.P.
Hamilton Swift Land Use & Development Consultants
1509 Seabright Ave., Suite A1
Santa Cruz, CA 95062
(831) 459-9992

From': David Chambers Arborist # WC-4298
Dave Allen's Tree Services
P.O. Box 7022
Santa Cruz, CA 95061
(831) 425-5325

Subject: Review of tentative map for the proposed , located at 570 7th Avenue.
Santa Cruz CA.
APN 027-051-24, -25.

John.

Regarding the proposed 7th Ave "Harbor Beach Homes" development:

I have reviewed the revised tentative map dated 2-10-00 and the updated view of Lots 4-7 showing the proposed building footprints that you faxed to me on 5-10-00. I have also made a second site visit on 4-14-00 to conduct an inspection of the trees on the property. As requested, I have evaluated the potential impacts on these trees from construction of the proposed soundwall . Photo documentation was also taken at this time.

This revised plan retains the existing large native trees on the property, specifically, the large Monterey pine, *Pinus radiata*, and the two coast live *oaks*, *Quercus agrifolia*, growing along the Western Pacific Railroad right-of-way as well as another 14" diameter at breast height (DBH) coast live *oak* and several other trees. The majority of the remainder of the existing trees on the property are small ornamentals, several of which are in very poor condition and would have to be removed to allow for the proposed new construction.

Noted during the site visit:

Monterey Pine:

The Monterey pine (Figure 1) is infested with Red Turpentine Beetles, *Dendroctonus valens*, these beetles are attracted to the terpenes in the pitch of wounded *or* diseased trees, and may have attacked this tree following the recent removal of some large limbs (Figure 2). Their presence is evidenced by the several "pitch tubes" (masses of pitch and frass with an entry hole for the adult beetles) that surround the base of the tree (Figure 3), as well as the discovery of a live adult beetle near the tree.

These beetles *bore* galleries beneath the bark and as a result, destroy areas of the cambium, the thin layer of dividing cells which give rise to the annual rings of photosynthate (sugars) conducting phloem and the water conducting xylem that we call "wood". While these beetles **may** not kill vigorous trees if the infestation is minor, stressed trees, especially Monterey pines, are more vulnerable (University of California, 1994).

Though the foliage currently appears healthy, this tree may decline over time as a result of the beetle infestation or become weakened and subsequently infected with pitch pine canker, *Fusarium subglutinans*. The potential for this tree to serve as the brood chamber for future generations of these beetles that could then infest nearby trees should also be taken into account.

In addition. the field adjacent to this tree has been plowed under the dripline to within feet of the trunk annually. Significant damage to the root system may have occurred as a result, and could contribute to the decline of this tree.

Walnut tree

While several of the ornamental trees on the property are in too poor of health or structural condition to warrant retention in the proposed development, one, a 10" DBH walnut, *Jugulans* ssp., that is shown as being removed (designated **as** " Gon the tentative map) is in fair to good condition and could be retained if desired. This tree is on the proposed fence line between Lots 10 and 11 and would not have its dripline encroached on. Walnut trees are very sensitive to disturbance however, and some can also be hosts to aphids. The aphids are messy in that they excrete copious "honeydew" and walnut trees should therefore not be planted where branches will be over patios *or* parking places. **At** least one species, Black walnut, *Jugulans nigra*, also produces Juglone, a growth inhibitor that may make gardening or landscaping difficult underneath the tree (Harris, R, W. *1999).*

Recommendations:

Regarding the construction of the sound wall along the railroad right-of-way: Excavation of a continuous footing through the root zones of the Monterey pine and the two *oak* trees within feet of the trunks would result in unacceptable levels of root damage to these trees. As per our conversation, alternative construction methods that would reduce the impact of construction include the use of a system of piers and grade beams to support the wall where it encroaches upon the driplines of the trees. The preliminary grading plan (see attached copy) shows the wall being routed around the

trunks of the *oaks* and the Monterey pine. This is a good solution for the two *oaks*, as the rerouted wall encompasses almost the entire dripline of the tree that would be affected most by construction.

The construction of the wall around the trunk of the Monterey pine as shown would require that several footings for piers be excavated within the dripline of this tree. The siting of the piers should be done in the field under the supervision of a certified arborist. This will allow the precise locations of the individual excavations to be shifted somewhat should any major roots be encountered. The same care should be taken in the excavations for the footings for the building proposed for Lot **4.** While the proposed building footprint has been placed far from the tree to avoid unduly impacting its health, a corner of the building does encroach on the dripline (highlighted on attached fax copy). This encroachment is minor in extent, comprising only a few square feet, and should not adversely affect the tree to any significant degree. This area of the root zone has been plowed annually for many years, and it is unlikely that any significant roots will be found in this region, at least in the upper 12-18" of the soil. Continuous foundation footings could be dug until they approach the tree's dripline, and then continued under the supervision of a certified arborist. If the excavation does encounter significant roots (> ½ - 1" in diameter), then this portion of the foundation could be supported with piers and grade beams to minimize disturbance.

Standard tree protection measures should be in place before grading begins. These should include fencing around the driplines of all the trees to be retained with appropriate signage cautioning "Tree root zone: No Disturbance".

References:

Harris. Richard **W.,** Clark, James R, Matheny, Nelda P. 3" edition. 1999
*Arboriculture: **Integrated** Management **of** Landscape **Trees, Shrubs, and Vines***
Page 55. Published by Prentice Hall, Upper Saddle River, New Jersey, 07458

University of California, 1994, Steve H. Dreistadt Editor,
*Pests **of** Landscape **Trees and Shrubs: An Integrated Pest Management Guide***
Page 153. Publication 3359. Published **by** the University of California, Division of Agriculture and Natural Resources, Oakland California 94608-1239

Please contact me if you have any questions or require further information.

David Chambers
Arborist #WC-4298

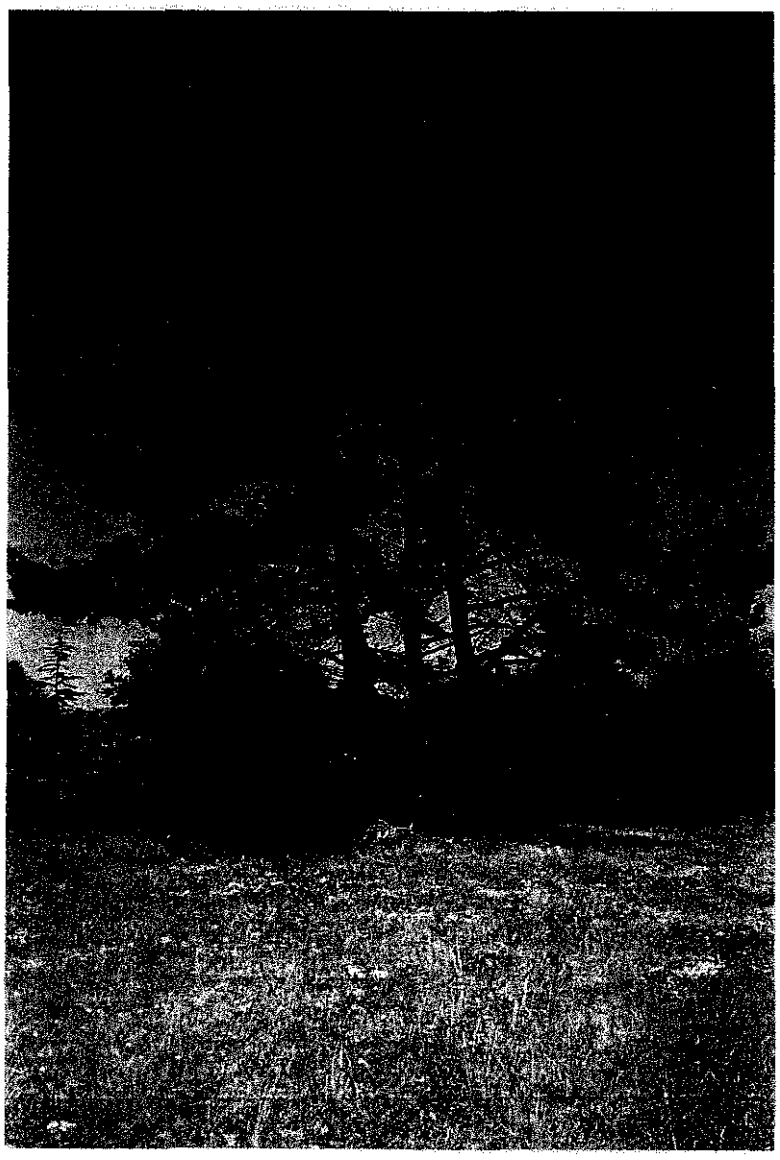


Figure I) Monterey pine, ***Pinus*** *radiata.* The **area** in the foreground **has** been plowed up to the farm implement just visible in the background near the tree's base.

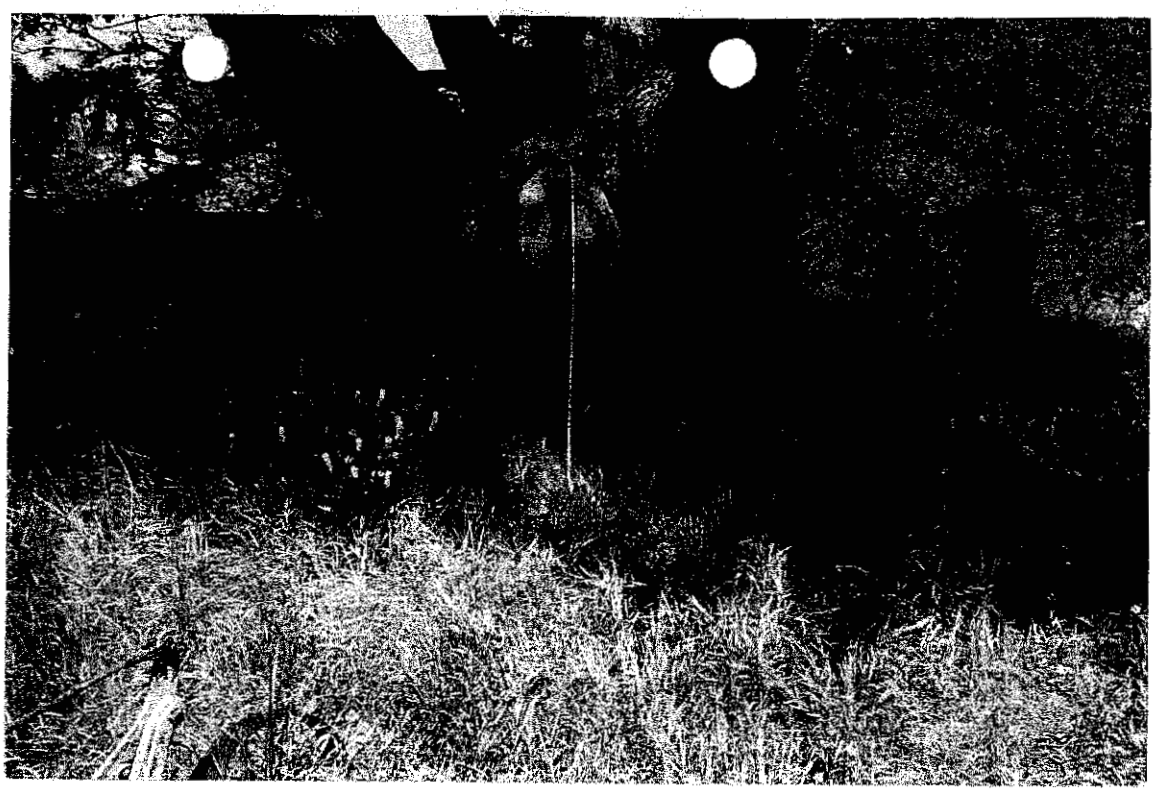


Figure 2) Detail of tree base showing one of the large pruning wounds (~18" Across).

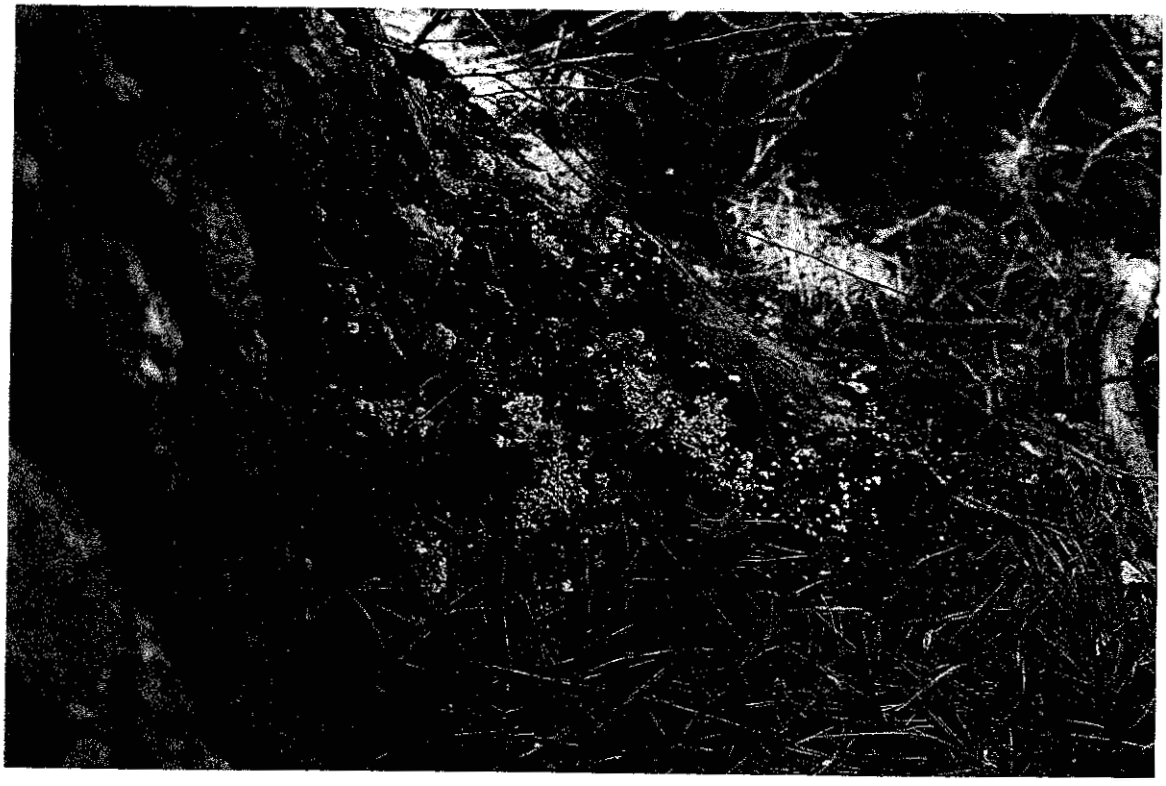
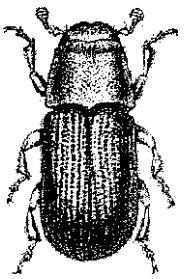


Figure 3) Closeup of Red Turpentine beetle, *Dendroctonus valens*, pitch tubes at the northern base of the tree. Fresh tubes are visible as red clumps of pitch in the left center of this view. White material is older pitch and frass.

BARK BEETLES

Integrated Pest Management for Home Gardeners and Landscape Professionals

Bark beetles, family Scolytidae, are common pests of conifers and some attack broadleaf trees. Several hundred species occur in the United States. The most common speaes infesting pines in California are the western pine beetle (Dendroctonus *brevicomis*) (Fig. 1), engraver beetles (*Ips* spp.), and the red turpentine beetle (***Dendroctonus valens***). Cedar and cypress bark beetles (*Phloeosinus* spp.) attack arborvitae, *Chamaecyparis*, cypress, and redwoods. Oak ambrosia beetles (*Monarthrum* spp.) and oak bark beetles (*Pseudopityophthorus* spp.) attack oaks and certain other broadleaves including California buckeye and tanbark oak. Shothole borer (*Scolytus rugulosus*) attacks damaged trunks of many broadleaved tree species, including English laurel, fruit trees, and hawthorn. The European elm bark beetle (*Scolytus multistriatus*) feeds only on elms and vectors the Dutch elm disease fungus. Other common wood-boring pests in landscapes include clearwing moths (family Sesiidae) (for more information, see *Pest* Notes: *Clearwing* Moths, listed in Suggested Reading), longhorned borers (Cerambycidae), and roundheaded borers (Buprestidae).



I (actual sire)

Figure 1. Adult western pine beetle.

IDENTIFICATION

Adults are small, cylindrical, hard-bodied beetles about the size of a grain of rice. Most species are dark red, brown, or black Their antennae are elbowed and the outer segments are enlarged and clublike. When viewed from above, the head is partly or completely hidden by the thorax. They have strong, scooplike jaws (mandibles) for chewing. A buckshot pattern of holes is apparent on infested branches or on the trunks where the new adults have emerged. Larvae of most speaes are

Table 1. Bark Beetles Common in Landscapes.

Species	Trees affected	Generations per year	Comments
Red turpentine beetle (*Dendroctonus valens*)	larch, pines, spruce, and white fir	0.5 to 3	attacks lowest 2-8 ft of trunk and large roots; pitch tubes appear On bark; overwinters as adults and larvae; rarely kills tree
Western pine beetle (Dendmctonus *brevicomis*)	Couiter and Pondemsa pines	2 to 4	attacks midtrunk, then spreads up and down; larva feeds on inner bark, completes development in outer bark; attacks in conjunction with other pests
Engraver beetles (ips *emarginatus, I. mexicanus, I. paraconfusus, I. pini,* and *I. plastographus*)	pines	1 to 5	overwinters as adult; often makes wishbone-shaped tunnels: attacks pines near top
Cedar and cypress beetles (*Phloeosinus* spp.)	arborvitae, Chamaecypans, cypress, and redwoods	1 to 2	tunnels resembie centipede on inner and outer bark: adult feeds on twigs, causing discolored and dead tips; egg-laying female attracted to trunk of dead or dying trees
Oak ambrosia beetles (*Monarthrum* spp.) Oak bark beetles (*Pseudopityophthorus* spp.)	oaks; also California buckeye and tanbark oak	2 or more	Overwinters beneath bark; bieeding, frothy, bubbling holes with boring dust indicate damage; attacks stressed trees
Shothole borer (*Scolytus rugulosus*)	English laurel. fruit trees, hawthorn. and other woody plants	2 or more	infestation indicated by gumming of woody parts. appearance of boring dust, or twig dieback remove and destroy infested parts
European elm bark beetle (*Scolytus multistriatus*)	elms	2	Overwinters as fully grown larva in bark: shotholes in bark indicate damage: lays eggs in iimbs and trunk of injured, weakened, or recendy cut elms; vectors Dutch elm disease fungus

PEST NOTES **Publication 7421**

University of California
Agriculture and Natural Resources

Revised April 2004

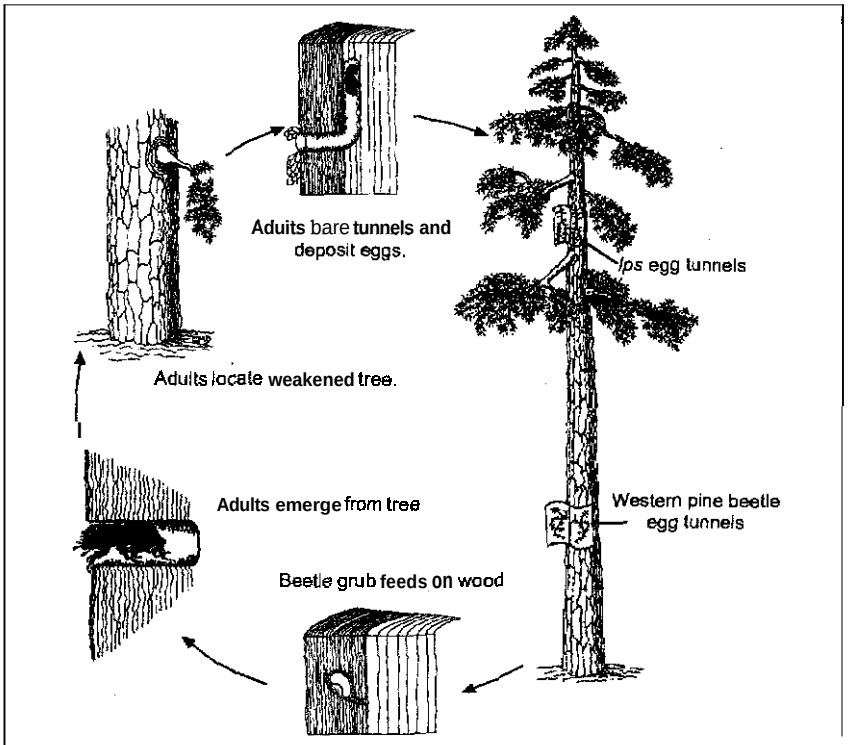


Figure 2. Life cycle of a bark beetle

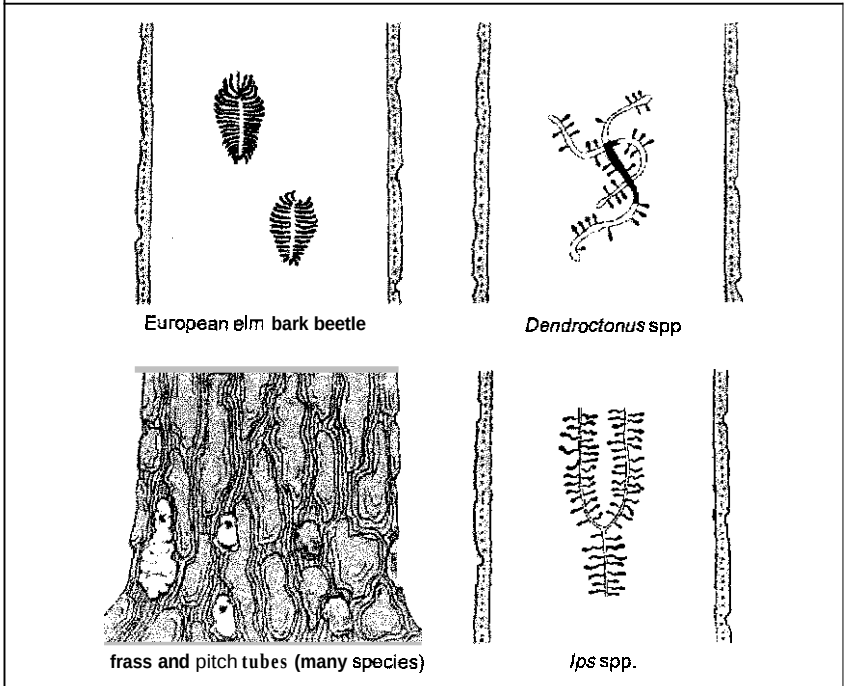


Figure 3. Comparison of bark beetle galleries. Tunnels filled with frass (excrement) are shown in black, while open portions of galleries are white.

off-white, robust, grublike, and may have a dark head.

The species of tree attacked and the location of damage on the bark help in identifying the bark beetle species present (Table 1). On pines, for example, engraver beetles usually attack trees near the top, while red turpentine beetles attack pine trunks near the ground as well as below ground on the large roots. Engraver beetles are dark brown, cylindrical, and have a scooplike depression lined with stout spines at the end of the abdomen. Red turpentine beetles are larger than engraver beetles and reddish brown; their presence is indicated by large, pinkish brown to white pitch tubes, a mixture of pine sap and beetle boring dust that appears on the lower trunk.

Peeling off a portion of infested bark to reveal beetle galleries is also helpful in identifying the beetle species present. Red turpentine beetle and western pine beetle adults usually pack about 60% of their egg-laying galleries with boring dust while engraver beetles maintain clean, open adult galleries. Larval galleries of all species are packed with sawdustlike boring dust called "frass" and most radiate out perpendicularly to the parent tunnels.

LIFE CYCLE

Females lay small, oval, whitish eggs at the interface of the bark and wood (Fig. 2). After eggs hatch the tiny larvae mine galleries that branch out from the egg-laying gallery. At first the larval mines are very small, but they gradually increase in diameter as the larvae grow. The winding pattern of these galleries is helpful in identifying a bark beetle infestation and in distinguishing among the different species (Fig. 3). Pupation occurs in enlarged chambers at the ends of the larval tunnels or in the outer bark, Pupae are usually whitish and occur within or beneath bark. Adults can emerge at any time of year, weather permitting, but emergence is most common in late spring and again in late summer to early fall. After emergence, adults generally disperse to attack susceptible trees elsewhere. Mast bark beetle species have two or more generations a year in California, de-

pending on temperature. At wanner locations, the season of attack is usually longer and beetles have more generations per year in comparison with cooler locations.

DAMAGE

The important pest species of bark beetles mine the inner bark (the phloem-cambial region) on **twigs,** branches, or trunks of trees and shrubs. This activity often starts a flow of tree pitch in conifers and is accompanied by a sawdustlike material (frass). Frass accumulates in bark crevices or may drop and be visible on the ground or in spider webs. Small emergence holes in the bark with sap weeping out of the holes are a good indication that bark beetles have been present. Bark beetles commonly attack trees weakened or predisposed to infestation by drought, disease, injuries, or other factors that may stress the tree. Beetles can contribute to the decline and eventual death of trees but with a few exceptions usually are not the initial cause.

In addition to attacking larger limbs, cedar and cypress bark beetles feed by mining twigs up to 6 inches back from their tips, resulting in dead tips or "flags" hanging on the tree. The adult European elm bark beetle also feeds on twig bark before laying eggs. If the adult has emerged from infected elm wood, its body will be contaminated with Dutch elm disease spores. The beetle then infects healthy elms with the Dutch elm disease fungus during feeding; it is during this pre-ovipositional (before egg laying) feeding, which **usu**ally takes place in limb crotches, that the fungus is transmitted. **Elms** showing yellowing or wilting in spring are suspect and should be reported to the county agricultural commissioner.

MANAGEMENT

Except for general cultural practices that improve tree vigor, Little can be done to control most bark beetles beneath bark once trees have been attacked. Prune and dispose of bark beetle-infested **limbs.** Promptly remove the entire tree if its main trunk is extensively attacked by bark beetles. Unless infested trees are quickly removed, large numbers of beetles can emerge and kill nearby host trees if they are weakened or predisposed by other factors. The exception is when pines are attacked by a few red turpentine beetles. Trees can often survive low-density attacks by this species. Valuable, uninfested host trees near infested trees may be protected from bark beetles by spraying the trunk with a persistent insecticide in spring; however, do not substitute preventive sprays for proper cultural care.

Plant only species properly adapted to the area. Learn the cultural requirements of trees, and provide proper care to keep them growing vigorously. Healthy trees are less likely to be attacked and are better able to survive the damage from a few bark beetles. Rapid, vigorous growth encourages host resistance.

Pay particular attention to old, slow-growing trees, crowded groups of trees, and newly planted trees in the landscape. Large nursery stock or transplanted trees, notably oaks and pines, can become highly susceptible to bark beetles after replanting. Transplanting success depends on the tree species and its condition, appropriate tree and site selection, characteristics of the planting site, the season of the year, the transplanting method, and follow-up care. Stresses placed on a tree caused by poor planting or planting at the wrong time of year, lack of proper care afterwards, or the planting of an inappropriate species for the site will increase the tree's susceptibility to bark beetle invasion.

Biological Control

Woodpeckers, several predaceous beetles such as the blackbellied derid (*Enoclerus lecontei*) and trogossitid beetles (especially *Temnochila chlorodia*), a predaceous fly (*Medetera aldrichii*), and parasitic wasps are natural enemies of the western pine beetle, but rarely control it. Predators are more important in regulating bark beetle populations than parasites. When bark beetles attack and kill some trees, natural enemies are attracted and may eventually limit the infestation.

Cultural Control

Prevention is the most effective method of managing wood-boring insects; in most instances it is the only available control. Avoid injuries to roots and trunks, and protect trees from sunscald and other abiotic disorders. Irrigation may be important during dry summer months in drought years, especially with tree species that are native to regions where summer rain is common. Also, dense stands of susceptible trees should be thinned to increase their vigor and ability to withstand an attack

Irrigate when appropriate around the outer canopy, not near the trunk. Avoid the frequent, shallow type of watering that is often used for lawns. The specific amount and frequency of water needed varies greatly depending on the site and tree species (i.e., whether trees are adapted to summer drought or regular rainfall).

Properly pmne infested limbs, and remove and dispose of dying trees so that wood-boring insects do not emerge and attack other nearby frees. Timing of pruning is important; avoid creating fresh pruning wounds during the adult beetles' flight season. Do not prune elm trees from March to September or pines during February to mid-October. Do not pile unseasoned, freshly cut wood near woody landscape plants. Freshly cut wood and trees that are dying or have recently died provide an abundant breeding source for some wood-boring beetles. Tightly seal firewood beneath clear plastic in a sunny location for several months to exclude attacking beetles, and **kill** any beetles already infesting the wood.

Plant resistant species where bark beetles have been a problem. For instance, engraver beetles and red turpentine beetles do not attack redwoods or atlas cedars.

Chemical *Control*

Unless trees are monitored regularly so that borer attack can be detected early, any spraying is likely to be too late and ineffective. No insecticide kills larvae **tunneling** beneath the bark. Treatment must target **the** adults by spraying the

bark so that they are killed when they land on trees and attempt to bore into the bark to lay eggs. If the tree was attacked during a previous year and no longer contains beetles because they have completed development and flownaway, spraying that tree will provide no benefit and could kill beneficial insects, Seriously infested trees, or trees that are dead or dying due to previous beetle attacks, cannot be saved with insecticide treatments and should be removed. Systemic insecticides implanted or injected through the bark or applied to soil beneath trees do not control or prevent attack by bark beetles.

Healthy specimen or high-value trees may be protected with an insecticide if they are stressed or near infested trees that are a source of beetles. Because each bark beetle species attacks only certain tree species (for example, pine bark beetles do not attack oaks and oak bark beetles do not attack pines) spray only healthy trees that are susceptible to the beetle species attacking nearby trees. It is not clear if products available to home gardeners can adequately prevent bark beetle attack. Most home gardeners also lack the high-pressure spray equipment and experience to effectively treat large *trees*. When hiring a professional applicator, discuss the specific pesticide to be applied.

Thoroughly drenching the main *trunk* with a pyrethroid (e.g., Astro or Dragnet) or the carbamate carbaryl can prevent new bark beetle infestations if applied when adults are flying. Be sure to use a product labeled for trunk applications and apply it at the proper rate for trunk treatments. Label rates for foliage treatments will not be effective. Effective products mav not be available to home users, but are'available to licensed Desticide applicators. Regardless of the insecticide used, mix only what you need. Apply the entire mix according to the label to avoid leftover insecticide, which should never be poured down a sink or storm drain. Take special care to keep pesticides from running off-site and into drains or waterways.

Remember that treatments must be applied to kill adults before they lay eggs. Treatment at any other time will not be effective. Spray the bark in spring when beetles begin to emerge, which is in early spring in warm areas of the state and late spring in cooler and high elevation areas. Depending on local conditions and the pesticide used, a second application may be needed several months later to provide season-long control.

The red turpenhne beetle can have as many as three generations a year and engraver beetles can have up to five generations a year; apply the first spray for them about mid-February. Sprays made later will protect only against attack of later generations.

Insecticide sprays are not recommended against shothole borer and cedar or cypress bark beetles

SUGGESTED READING

Dreistadt, S. H., J. K. Clark, and M. L. Flint. 2004. *Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide.* 2nd ed. Oakland Univ. Calif. Agric. Nat. Res. Publ. 3359.

Dreistadt, S. H., and E. J. Perry. April 2004. Pest Notes: *Clearwing* Moths. Oakland: Univ. Calif. Agric. Nat. Res. Publ. 7477.

Koehler, C. S. 1987. *Insect Pest Management Guidelines for California Landscape Ornamentals.* Oakland: Univ. Calif. Agric. Nat. Res. Publ. 3317.

Marer, P. J., and M. Grimes. 1995. *Forest and Right-of-Way Pest* Control. Oakland Univ. Calif. Agric. Nat. Res. Publ. *3336.*

For more information contact the University of California Cooperative Extension or agricultural commissioner's office in your county. See your phone boom for addresses and phone numbers.

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This Pest Note is available on the World Wide Web (http://www.ipm.ucdavis.edu)

This publication has been anonymously peer reviewed for technical accuracy by University of California scientists and other qualified professionals. This review process was managed by the ANR Associate Editor for Pest Management.

To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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Significant Tree Removal Permit Findings

1. That the removal is necessary to protect health, safety, and welfare.

This finding can be made, in that the 36" Monterey pine tree *(Pinus radiata)* has been examined by a certified arborist who determined that the tree is in declining health. In the four years since the tree was initially evaluated as part of Subdivision Permit 99-0538, an infestation of Turpentine Beetles has spread and the health of the tree has deteriorated. The canopy of the tree has thinned, one of the main stems has died, and another stem is dying. No remedial measures are available that will ensure the continued health and safety of the tree. Because of the proximity of the tree to existing residential development, the railroad right-of-way and future development on the subject property, the decline of the tree represents an unacceptable risk to property and safety of nearby residents.

All other Findings for Permit **99-0538** remain in effect and are incorporated herein **by** reference

Conditions of Approval

I. This permit authorizes an amendment to Permit 99-0538 to allow the removal of an existing, diseased 36" Monterey pine tree, which was originally proposed to be removed. All other conditions of approval for Permit 99-0538 remain in effect and are incorporated herein by reference. Prior to exercising any rights granted by the permit including, without limitation, any occupancy, construction or site disturbance, the applicant/owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

II. Prior to issuance of the Building Permits on Lots 2, 3 and 4 the applicant/owner shall:

A. Submit a Final Landscape Plan for review and approval by the County's Urban Designer. The landscape plan shall include the installation of two, **24"** box sized trees of a tall species appropriate to the microclimate of the site. The trees must be located on the rear of Lots 2, 3 and/or 4 in proximity to the tree to be removed.

B. Submit a revised Imgation Plan that includes adequate irrigation measures for the two replacement trees required by ILA.

III. All landscape improvements shall be installed according to the approved Landscape Plans. Prior to the final building inspection clearance on Lots 2, 3 and **4,** the following conditions must be met:

A. All landscape improvements shown on the landscape plans shall be installed, including all irrigation facilities for the two replacement trees required by II.A

IV. Operational Conditions

A. In the event that future County inspections of the subject property disclose noncompliance with any conditions of the Approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

In accordance with Chapter 18.10 of the County Code, minor variations to **this** permit which do not affect the overall concept, intensity, or density may be approved by the Planning Director at the request of the applicant or staff.

Please note: This permit expires two years from the effective date unless you obtain the required permits and commence construction.

Approval Date: _____

Effective Date: _____

Expiration date: _____

ATTACHMENT 5

September 27, 2004

Planning Commission
County Government Center
701 Ocean Street, Room 400
Santa Cruz, **CA.** 95060

Re: Proposal to amend Permit 99-0538

To Whom It May Concern:

I am the owner, landlord, and a resident of the property at 620, 622, 624 and 626 7'' Avenue. One of my dwellings sit directly across the tracks and under the shadow of the large pine tree whose removal is proposed. Over the years I have become concerned that the tree may die and possibly fall during a storm hitting the dwelling and injuring the tenant.

I therefore **would not** be opposed to seeing the removal of the tree.

Sincerely

Joseph S. Ward

ATTACHMENT 6