DEPARTMENT OF PUBLIC WORKS

CITY TREES (CITY PROPERTY AND RIGHT-OF-WAY) MAINTENANCE ACTIVITIES PERFORMED SINCE PRIOR REPORT AND PENDING

DECEMBER 2012

ADDRESS	TYPE OF TREE	DIAMETER	ALTERED (TRIM)	REMOVED	COMMENTS
ROW at 254 Glen Drive	Pittosporum Quercus	37.7-in CBH	Decision: View Claims Valid 31JAN12 Decision appealed 9FEB12 23FEB12		TRP 11-174 (Pittosporum) & TRP 11-394 (Quercus) received. View claim found valid. Decision appealed. Appeal pending. Active litigation. Trimming postponed.
ROW at 42 & ½ Caledonia	2) Indian Laurel Fig	8'5" CBH (only one tree measured)		Pending	Large tear in main trunk where limb has failed. Pending removal by City following approval of replacement plan. Replacement plan developed – to request budget for FY13/14.
ROW at 83 Woodward Ave	1) Monterey Pine 1) Acacia 1) Coast Live Oak	18" DBH 24" DBH 24" DBH		Pending	Tree view claim submitted 9/5 states that the 3 trees in the row obscure the harbor and partially obscure Richardson Bay and Belvedere Island. The 3 trees also contain deadwood and hazardous branches that should be removed. Claimant

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					submitted arborist's report (SEP12). City Arborist report prepared. City Arborist's decision appealed. Appelant to submit arborist's report.
ROW at 38 Woodward Ave	1) Coast Live Oak	97" CBH		Completed 11-27-12	Emergency removal of Dedicated tree by Elite Tree. 80% of trunk circumference infested with S.O.D. rising to 5 feet up the trunk. Infestation of bark beetle also present increasing hazardous situation to property with failure imminent. Arborist report.
ROW at 93 Cazneau Ave	1) Monterey Pine		Completed 12-10-12		Limb trimming due to view issue performed by Artistry in Trees.

ITEM NO. CMM PAGE 2

DEPARTMENT OF PUBLIC WORKS

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DECEMBER 2012

ADDRESS	TYPE OF TREE	DIAMETER	ALTERED (TRIM)	REMOVED	COMMENTS
ROW at 80 Rodeo Ave	1) Monterey Pine	10' CBH		Pending	Bark beetle infestation in lower trunk and heavy amount of Pine Pitch Canker present within the cavity. Root system restricted by retaining wall. When tree fails, it will target residences of 80, 82, 86, and 88 Rodeo Ave and drag utility lines with it. Pending date for emergency removal. Arborist report.

ITEM NO. (WW PAGE 3

Ed Gurka, Consulting Arborist
Member, American Society of Consulting Arborists

Member, International Society of Arboriculture
Certified Arborist, Western Chapter, # 0418

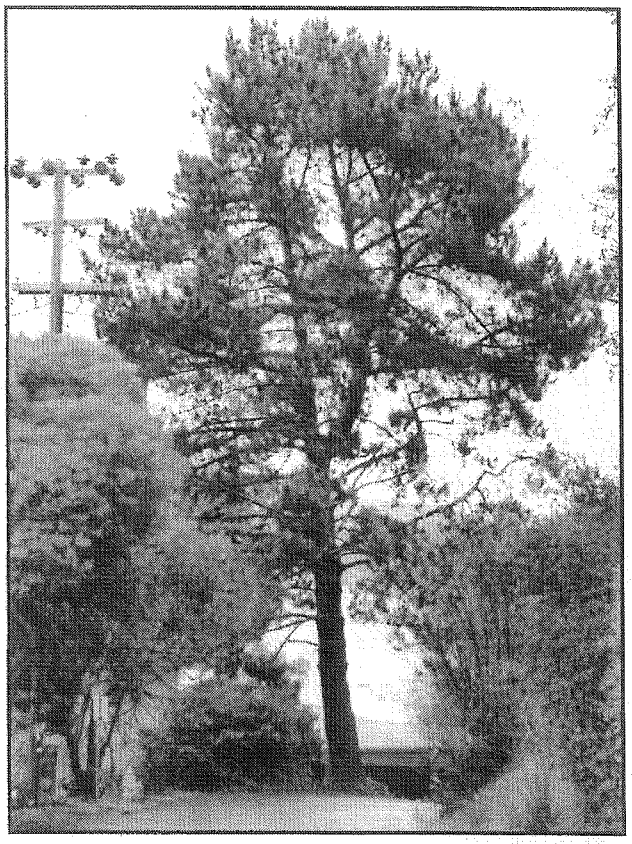
November 23, 2012

ASSIGNMENT:

I received a request to prepare an Arborist Report for James Moushegian at 80 Rodeo Ave, Sausalito, California. A mature tree on the public right of way in front of his residence concerned him because of the tree's condition and close proximity to his residence. This report will provide information based on a site inspection and is specific to the tree species.

OBSERVATIONS and DISCUSSIONS:

On November 20, 2012, I arrived for a scheduled appointment and met with Mr. Moushegian. The tree is located on the roadside of Rodeo Avenue. It is between the roadside and driveway, on a 15-foot wide berm that divides Rodeo Avenue and the passageway for 80, 82, 84, 86 and 88 Rodeo Avenue addresses.



The tree specifications are as follows, the species is *Pinus radiata,* Monterey Pine. The Circumference at Breast Height (CBH) is 10 feet; tree height is 75 feet with a spread of 55-60 feet. The Sausalito Tree Ordinance defines this tree as an "undesirable tree"; however, it is located on public right of way and therefore, requires public noticing and review before alterations or removal.

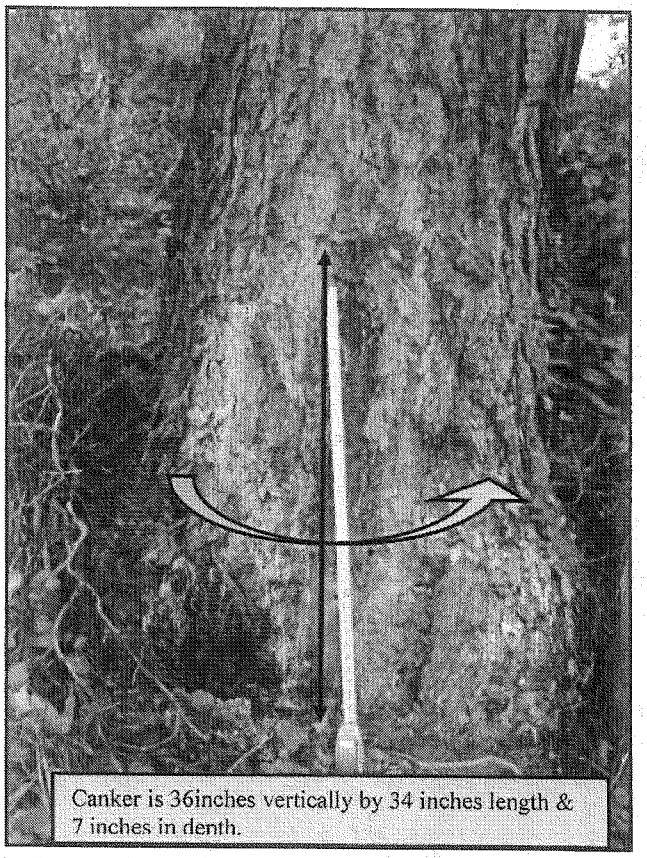
There are noticeable risk factors that were identified during the site inspection. The Monterey Pine has a 10-degree lean to the north towards the 80-88 Rodeo structures. Lean factors are possible risks because they determine the direction of failure and targets if a tree fails.

There are multiple utility services that pass within close proximity on either side and directly through the tree canopy. Electrical utilities are a concern because they can energize a tree when they encounter it, cause fires when heat is created and become hazardous when a tree falls and drags the utility line down.

One of the main concerns based on discussions with Mr. Moushegian was the tree's stability. A factor of a tree's stability can be estimated by evaluating its condition. The criteria used are based on Arboriculture industry standard established by The International Society of Arboriculture Publication, Best Management Practices, Tree Risk Assessment, (The Companion publication to ANSI A300 Part 9, Tree Structure Assessment). The Publication's Risk Assessment classification applied in this instance is the **Level 2 Basic Assessment**, which includes evaluating the site,

buttress roots, trunk, and tree limbs. Simple tools were used for this inspection. A hammer was used to perform sound tests that can expose defects in the lower section of the trunk area. A retractable tape was used to measure any defects and compare this to other sections of the tree.

The lower trunk inspection required ground cover removal to expose the trunk's radial base. On the north side of the trunk, a sunken area was discovered. Loose trunk bark was removed to expose a cavity. A heavy amount of Pine Pitch Canker was present within the cavity. The pitch flows were examined and determined to have been introduced from a suspected and repeated infestation attacks in separate locations on the lower trunk. The pitch flows are the signs of the Red Turpentine Beetle, a troublesome insect that is destroying Monterey Pine trees throughout the western regions of the United States. This beetle is attracted to Pine trees that are weakened by environmental and climatic events. The beetles bore into the lower trunk and roots where they introduce a fungal pathogen that plugs the pathways in the cambial layer that restrict nutrient and moisture passageways that results in the tree's demise. In heavier repeated infestations, the decline increases rapidly and the pine tree quickly dies. The method of destruction is that, Pine Pitch Canker advances by girdling the trunk the to the point that it cannot sustain the existing canopy or new growth ceases resulting in a noticeable decline and eventual death. The size of the canker pictured at right is 34 inches vertically and 36 inches in width. The estimated area infected is 40-50 percent of the radial area. The depth of the canker is 7 inches. This is a very large canker infecting the lower trunk area. The extent of the Pine Pitch canker can be seen in the photograph on this page. The overall appearance is the canopy is very thin with tip dieback at the terminal growth points.



Canker is 36inches vertically by 34 inches length & 7 inches in denth.

RECOMMENDATIONS:

There is no remedy for Pine Pitch Canker. Once established it continues to consume live healthy tissue until the tree completely dies. The dieback of branch tips will continue and become more obvious. As the Canker advances, more beetle borers will attack the tree. At the time of the site visit, there were visible signs of beetle attacks surrounding the lower trunk and separate from the large canker. The root system appears to be restricted by the retaining wall that was constructed for the driveway and compacted on the Rodeo Avenue side. The direction growth of the roots system is confined to the planter strip estimated at 15 feet wide. There are several utility lines that pass close to the tree canopy, and some of which are high-voltage transmission lines. When this tree fails, it will target the residences of 80, 82, 86, and 88 Rodeo Avenue. It will drag the utility lines with it and create a very dangerous condition and very likely cause personal injury or property damage. The Monterey Pine and Pitch Canker fungal disease is advancing and will progress more rapidly as the fungal pathogens consume healthier tissue. The exact time of a tree failure cannot be predicted but it is certain that it will occur as Pine Pitch canker advances.

The Tree must be removed as soon as possible to avoid an injury or property damage when the tree fails.

An attachment to this report describes Pine Pitch Canker Disease and supports information presented in this report.

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BARK BEETLES

Integrated Pest Management for Landscape Professionals and Home Gardeners

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 species 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 or cypress bark beetles (*Phloeosinus* spp.) attack arborvitae, *Chamaecyparis*, cypress, and redwoods. Oak bark beetles (*Pseudopityophthorus* spp.) attack oaks and California buckeye. Shothole borer (*Scolytus rugulosus*) attacks damaged trunks of many 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.

IDENTIFICATION

Adults are small, cylindrical, hard-bodied beetles about the size of rice grains. 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 species are off-white, robust, grublike, and may have a dark head.

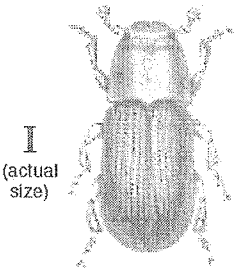

Figure 1. Adult western pine beetle.

Table 1. Bark Beetles Common to Garden and Landscape.

Species	Trees affected	Generations per year	Comments
Red turpentine beetle (*Dendroctonus valens*)	pines; only ponderosa and Coulter in So. Calif.	0.5 to 3	attacks lowest 2–8 ft.; pitch tubes appear; overwinters as adults and larvae; rarely kills tree
Western pine beetle (*Dendroctonus brevicomis*)	pines	2 to 4	attacks midtrunk, then spreads up and down; larva feeds on inner bark, completes development on 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	overwinter as adult; often makes wishbone-shaped tunnels; attack pines near the top
Cedar/cypress beetles (*Phloeosinus* spp.)	arborvitae, cypress, redwood, and *Chamaecyparis*	1 to 2	tunnels resemble centipede on inner and outer bark; adult feeds on twigs, causing flags; egg-laying female attracted to trunk of dead or dying trees
Oak ambrosia beetles (*Monarthrum* spp.) Oak bark beetles (*Pseudopityophthorus* spp.)	oaks, buckeye, and tanbark oak	2 or more	overwinter beneath bark; bleeding, frothy, bubbling holes with boring dust indicate damage; attack stressed trees
Shothole borer (*Scolytus rugulosus*)	fruit trees, English laurel, 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 limbs and trunk of injured, weakened, or recently cut elms; vectors Dutch elm disease fungus

PEST NOTES Publication 7421

University of California
Division of Agriculture and Natural Resources

Revised June 2000

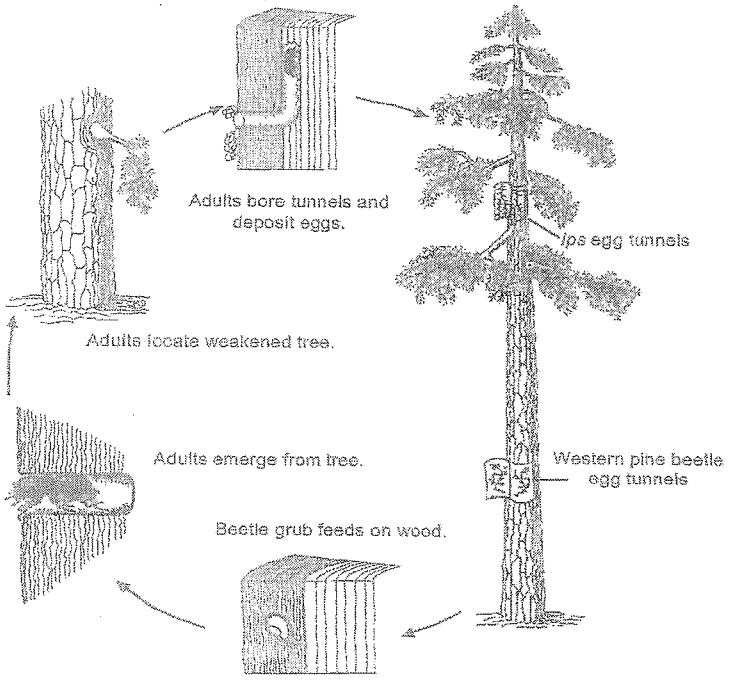

Figure 2. Life cycle of a bark beetle.

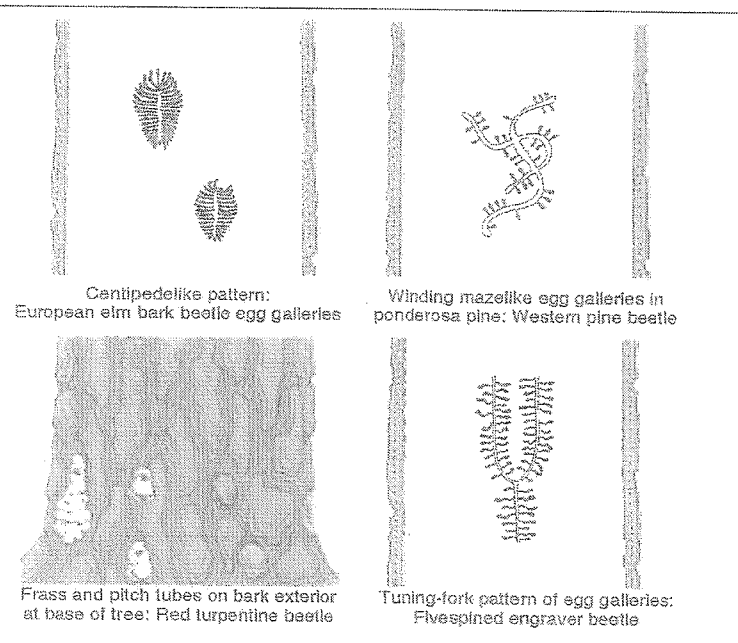

Figure 3. Bark beetle gallery comparison.

The species of tree attacked and the location of damage on the bark helps 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. Engraver beetles are dark brown, cylindrical, and have a scooplike depression 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 pitch and beetle boring dust, that appear 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 between 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. Most bark beetle species have two or more generations a year in California, depending on temperature. The season of attack is usually longer for species occurring in warmer locations, and they have more generations per year.

DAMAGE

The bark beetles of economic importance 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 sawdust-like 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 usually 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 susceptibility to bark beetle invasion.

Biological Control

Woodpeckers, several predaceous beetles such as the blackbellied clerid (*Enoclerus lecontei*) and a trogositid beetle (*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 prune infested limbs and remove and dispose of dying trees so that wood-boring insects do not emerge and attack other nearby trees. Timing of pruning is important. 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 recently have 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. Sprays will not kill larvae tunneling beneath the bark and must be directed at the adults as they bore into the trunk to lay eggs. If the tree was attacked during a previous year and no longer contains beetles because they have completed development and flown away, spraying that tree will provide no benefit and could kill beneficials. 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 injected through the

bark do not control or prevent attack by bark beetles or other wood borers.

Healthy specimen or high-value trees may be protected with an insecticide if they are 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., Dragnet) or the carbamate carbaryl (Sevin-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. Avoid organophosphates such as chlorpyrifos (Dursban) and diazinon whenever possible. These have been found in urban surface water systems at levels that warrant concern. 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 the sink or storm drain.

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 turpentine beetle can have as many as three generations a year and engraver beetles can have up to four generations a year; apply sprays 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.

REFERENCES

Dreistadt, S. H., J. K. Clark, and M. L. Flint. 1994. *Pests of Landscape Trees and Shrubs: An Integrated Pest Management Guide.* Oakland: Univ. Calif. Agric. Nat. Res. Publ. 3359.

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 book for addresses and phone numbers.

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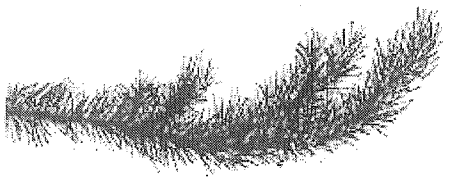
ARTISTRY IN TREES



P.O. BOX 2358, MILL VALLEY, CA 94942
459-4399

November 15, 2012

Kent Basso
City of Sausalito
420 Litho Street
Sausalito, CA 94965

Tree Evaluation

Assignment – Inspect declining Oak Tree at 38 Woodward Ave, Sausalito.

Observations – *Quercus agrifolia* Coast Live Oak measuring 97 inches CBH.
The canopy is declining with very little live foliage with heavy moss infestation.
Approximately 80 percent of the trunk circumference is infested with what appears to be Phytophthora ramorum the pathogen associated with Sudden Oak Death. This infestation rises to approximately five feet up the trunk.
There is an infestation of Bark Beetle and fruiting bodies of Hypoxylon thourarsianum and Ganoderma applanatum.
There is also a busy street and residents within striking distance of the tree.

Conclusion – This tree has succumbed to the Phytophthora ramorum infestation and is now a favorable host to bark beetles and the fruiting bodies. The ganoderma is accelerating the deterioration of the heartwood creating a hazardous situation. Failure is eminent.

Recommendations – Remove the tree to ground level ASAP.

Randy Harris, Arborist