

# Informational Memorandum

To: Honorable Mayor and City Council Members  
From: Nasser Abbaszadeh, PW Director/City Engineer  
Date: July 15, 2016  
Subject: Tree Disease (Dieback) Caused By Beetles

As you may know, in the last few months, because of the drought conditions, a beetle known as Polyphagous Shot Hole Borer (PSHB) has killed thousands of trees in California. As an example, the University of California at Irvine has already removed as many as 1,000 trees on its campus (please review the following link as a reference - <https://news.uci.edu/research/regional-beetle-infestation-prompts-removal-of-uci-trees>). *Additional information on PSHB and the disease it inflicts (Dieback) is re-produced at the end of this memorandum.*

Our City has not been immune to PSHB and we have already lost several trees to this disease (some were privately owned) and some of the dead trees have been removed. The most common concern is broken branches falling from the dying trees and causing personal injury or property damage.

Our tree maintenance company, West Coast Arborists (WCA), recently evaluated the trees at Crown Valley Park and Senior Center and filed a report with their findings and recommendations. The report is attached for your information and its summary follows:

<u>Location</u>	<u>No. of Trees To Be Removed</u>	<u>No. of Trees To Be Treated</u>	<u>Total</u>
Crown Valley Park	153	112	265
Senior Center	8	29	27
Cost	\$62,648	\$16,912	\$79,560

About 50 diseased trees at Crown Valley Park were removed two weeks ago as part of Tier 2 project and the additional one hundred diseased will be removed. As the drought conditions persists, more and more trees will be lost. City owned trees in other parks, median islands, and green belts will succumb to this disease overtime. Through WCA, we will examine the rest of

City-owned trees at parks and other locations to assess their viability. Unfortunately, there are no preventive measures that we can take at this point in time. Several universities are working on potential solutions currently.

In recent weeks, we have had reports of broken tree limbs at City parks and private properties. While no injuries have been reported, by proactively removing the infected trees, we will reduce the risk of harm as well as the disease spread.

Staff is in the process of posting information on the City website to inform the public about the disease and how they can examine their trees for signs of distress.

### **Budgetary Impacts**

The budget for the new fiscal year for tree trimming will soon be strained. At mid-year budget review, staff will seek additional funds to replenish the soon-to-be-exhausted tree maintenance funds. The existing contract budget between the City and WCA is \$140,000 per year.

### **Reforestation Plan**

As trees are removed to combat the disease, staff will begin planting trees as of September or October 2016 when it is cooler and potential rainfall will help establish them. The replacement trees will be compatible with the surrounding area and resistant to attacks by the beetles. The new trees will be selected in consultation with WCA. The cost to plant each 24-inch box tree in the WCA contract is \$260. The cost to re-plant the initial 161 trees will add up to \$41,860 (not all the trees at Crown Valley Park need to be re-planted immediately due to construction). The PW Department maintenance accounts will pay for the new trees and we will report on the funding levels at mid-year budget review. Below are a couple of pictures of 24-inch box trees as samples with respect to size:





In the past, the State of California has made grant funds available to replace trees. Staff will examine grant opportunities to take advantage of State or regional funds to support the reforestation plan.

### **Additional Information on PSHB**

**Beetle and Fungal Complex:** The Polyphagous Shot Hole Borer (PSHB), *Euwallacea* sp., is an invasive beetle that vectors a disease called **Fusarium Dieback (FD)**. The disease stops the flow of water and nutrients in over 137 susceptible tree species, which can lead to the death of individual branches or, in severe cases, the entire tree. It is caused by the fungi that the beetle uses as a food source: *Fusarium euwallaceae*, *Graphium euwallaceae*, and *Paracremonium pembeum*. PSHB attacks a wide variety of host species. The beetles bore tunnels (galleries) in which to lay their eggs and grow the fungi. A closely related *Euwallacea* species, the Kuroshio Shot Hole Borer (KSHB), has been detected throughout Orange and San Diego Counties. It is physically identical to PSHB and also spreads a fungal disease caused by other species of *Fusarium* and *Graphium*.

**Description of the pest:** Polyphagous shot hole borer (PSHB) and Kuroshio shot hole borer (KSHB) are genetically different invasive species, but morphologically they are indistinguishable. Females are black and 0.07 to 1.0 inch (1.8–2.5 mm) long. Males are brown and smaller than females at 0.06 inch (1.5 mm) long. The female tunnels into a wide variety of host trees forming galleries, where it lays its eggs. More females are produced than males. Mature siblings mate with each other so that females leaving to start their own galleries are already pregnant. Males do not fly, but stay in the host tree.

Damage: A host tree's visible response to a beetle's attack varies among host species. Staining, sugary exudate (also called a sugar volcano), gumming, and frass may be noticeable before the tiny beetles are found. The beetle's entry and exit holes, which are about 0.03 inch (0.85 mm) in diameter, can be located beneath or near the symptoms. The abdomen of the female beetle can sometimes be seen sticking out of the hole. Advanced fungal infections will eventually lead to branch dieback. Rapid spread of the beetle and fungi throughout various land-use areas is attributed to the diverse range and quantity of suitable hosts in southern California.

Management: Currently there are no control measures for this pest. Early detection of infestations and removal of the infested branches will help reduce beetle numbers and the extent of disease spread.

#### Host Species:

1. Box elder (*Acer negundo*)\*
2. Big leaf maple (*Acer macrophyllum*)\*
3. Evergreen maple (*Acer paxii*)
4. Trident maple (*Acer buergerianum*)
5. Japanese maple (*Acer palmatum*)
6. Castor bean (*Ricinus communis*)
7. California sycamore (*Platanus racemosa*)\*
8. Mexican sycamore (*Platanus mexicana*)
9. Red willow (*Salix laevigata*)\*
10. Avocado (*Persea americana*)
11. Mimosa/Silk tree (*Albizia julibrissin*)
12. English oak (*Quercus robur*)
13. Coast live oak (*Quercus agrifolia*)\*
14. London plane (*Platanus x acerifolia*)
15. Fremont cottonwood (*Populus fremontii*)\*
16. Black cottonwood (*Populus trichocarpa*)\*
17. White alder (*Alnus rhombifolia*)\*
18. Titoki (*Alectryon excelsus*)
19. Engelmann oak (*Quercus engelmannii*)\*
20. Cork oak (*Quercus suber*)
21. Valley oak (*Quercus lobata*)\*
22. Coral tree (*Erythrina corallodendron*)
23. Blue palo verde (*Cercidium floridum*)\*
24. Palo verde (*Parkinsonia aculeata*)
25. Moreton Bay chestnut (*Castanospermum australe*)
26. Brea (*Cercidium sonora*)
27. Mesquite (*Prosopis articulata*)\*

28. Weeping willow (*Salix babylonica*)
29. Chinese holly (*Ilex cornuta*)
30. Camellia (*Camellia semiserrata*)
31. Acacia (*Acacia spp.*)
32. American sweetgum (*Liquidambar styraciflua*)
33. Red flowering gum (*Eucalyptus ficifolia*)
34. Japanese wisteria (*Wisteria floribunda*)
35. Goodding's black willow (*Salix gooddingii*)\*
36. Tree of heaven (*Alianthus altissima*)
37. Kurrajong (*Brachychiton populneus*)
38. Black mission fig (*Ficus carica*)
39. Japanese beech (*Fagus crenata*)
40. Shiny xylosma (*Xylosma congestum*)
41. Mule Fat (*Baccharis salicifolia*)\*

## **Attachments**