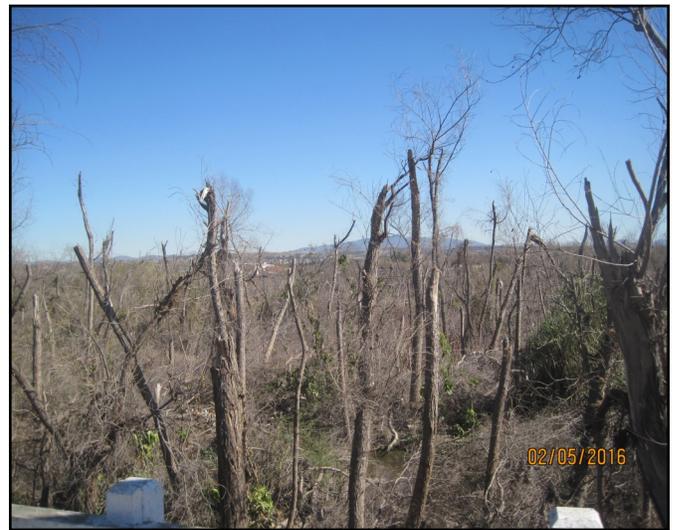


**Urgent Memorandum Regarding:  
The Polyphagous Shot Hole Borer (PSHB)**



**The Tijuana River Valley Preserve, February of 2016**

**To: All Field Staff, Volunteers and Park Associates**  
**From: Roberto Bejar and Allison Palmer, Balboa Park Rangers**  
**Date: February 13, 2016**  
**Re: The Polyphagous Shot Hole Boer (PSHB)**

As many of you perhaps already know, the Polyphagous Shot Hole Borer (PSHB) is creating an ecological disaster on an unparalleled level; within a year, it destroyed all of the native trees in a substantial portion of the Tijuana River Valley, and has yet to be contained. In the interests of helping to share relevant information in a clear and concise manner, with *all* who labor in and love our parks, we have prepared this document.

The cycle begins when the female of the species bores into a tree to lay her eggs. The fungus she secretes in order to nourish her larvae proves fatal to many native riparian species, as well as certain ornamental non-native trees. In the TJRV, oaks, sycamores and willows have been impacted. The scope of the situation is vast and has been well-documented by experts.

In *Pests and Diseases of Southern California Oaks*, researchers of the University of California state that:

The PSHB seems to have originated in South East Asia, possibly Vietnam. At first, researchers identified it as the Tea Shot Hole Borer (*Euwallaecea fornicatus*), which it very closely resembles, but DNA evidence points to it being a new, as yet unnamed species in the same genus. The symbiotic fungus may also be a new unnamed species, in the genus *Fusarium*, which is commonly associated with ambrosia beetles. The PSHB was first found at Whittier Narrows in Los Angeles County in 2003. From 2003-2010 the beetle was found on a few ornamental trees. Then, in 2010, it was the presumptive cause of the death of a large number of box elder trees in Long Beach. In 2012, the beetle was collected from a backyard avocado tree in South Gate, and from several tree species at local botanical gardens. It now appears to be established in Los Angeles, Orange, and Riverside Counties, and is expanding its range in San Diego County. A single beetle was caught in Santa Cruz County in 2014.

As for visible symptoms, "*Fusarium euwallaceae* causes brown to black discoloration in infected wood. Scraping away bark over the entry/exit hole reveals dark staining around the gallery, and cross sections of cut branches show the extent of infection. Advanced infections eventually lead to branch dieback" (ibid). Park rangers have also noticed that infected trees produce discolored foliage, greatly altering the appearance of the canopy.

It should also be noted that the PSHB will live in castor bean plants when no other host is available. With this in mind, it is highly recommended that these plants be targeted and treated as a preventative measure. In addition, please remind all colleagues, patrons and volunteers to avoid cross-contamination; if you have been in the TJRV, please do not expose other parkland to the items you had, and the clothing you wore, while there.

In order to understand fully the speed involved in the destruction of trees, let us consider the reproductive cycle of the beetle. "(The) larvae eat the fungus. The larvae develop into adults in about a month. Many more of the larvae develop into females than males, and the females mate with the males (their brothers) while still in the gallery. The pregnant females then pick up some of the fungus in their mouths, and leave through the entry holes created by their mothers to start the process again" (ibid). Owing to the fact that the PSHB is very small and wind-driven—in addition to being *extremely* fecund—the urgency of the matter cannot be overstated.

Please organize inspection activities at your park as soon as possible. If you find any signs of infestation, please photo document the area, note the latitude and longitude (WGS84) via GPS, and contact Senior Planner **Betsy Miller at [BMiller@sandiego.gov](mailto:BMiller@sandiego.gov) (619) 685-1314**.