



Goldspotted Oak Borer Education and Outreach Program

Janis G. Gonzales, Program Dev. and Outreach Coordinator¹ • Lorin Lilikoi Lima, Staff Research Associate¹ • Thomas A. Scott, Ph.D., Natural Resources Wildlife Specialist² • Kevin W. Turner, RFP, Goldspotted Oak Borer Coordinator³ • James A. Bethke, Floriculture and Nursery Farm Advisor⁴ • Mary Louise Flint, Assoc. Director Urban and Community IPM and Extension Entomologist⁵ • Vincent F. Lazaneo, Urban Horticulture Advisor Emeritus¹ • Cheryl A. Wilen, Ph.D., Area IPM Advisor and UC IPM Advisor Extension Coordinator⁶ • David A. Shaw, Turfgrass, Landscape, Arboriculture and Irrigation Mgmt. Advisor⁴

Introduction

The goldspotted oak borer (*Agrilus auroguttatus*; GSOB) is a non-native, flathead beetle that has been linked to extreme oak tree mortality in areas of San Diego County since 2005 and was found in Riverside County in 2012.

Dead and dying oaks have considerable ecological, economic, cultural, safety and aesthetic impacts across all ownerships: federal, state, county and city public lands; tribal lands; public parks and campgrounds; along roads and highways; private campground, ranches, rural and urban residences.

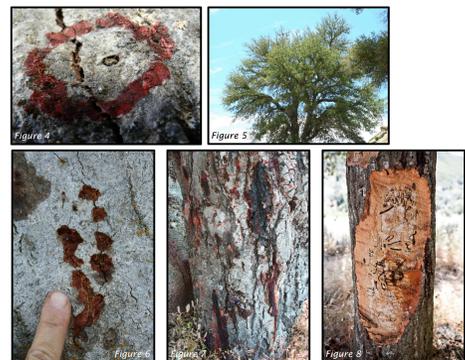
GSOB was described in southeast Arizona in 1905; but, relatively little is known about its ecology in its native range, and nothing was known about how it would affect California oaks when it was found in Descanso in 2008 by Dr. Tom Coleman (USFS). Arizona and southern California have been separated by deserts and the Sea of Cortez for over 5 million years, and its oaks have shown little ability to resist GSOB attack.

ID and Symptoms

The goldspotted oak borer has one life-cycle per year. Larvae bore through the outer bark into the cambium layer and extensively feed on this nutrient-bearing tissue, eventually killing the tree after several years of attack.



Fig. 1. The goldspotted oak borer (*Agrilus auroguttatus*) is often referred to as GSOB. Fig. 2. Adults are 0.4" long and 0.8" wide; bullet-shaped with six gold spots. Fig. 3. Larvae are white, legless and about 0.8" long; C-shaped spiracles and two pincherlike spines on end of abdomen.

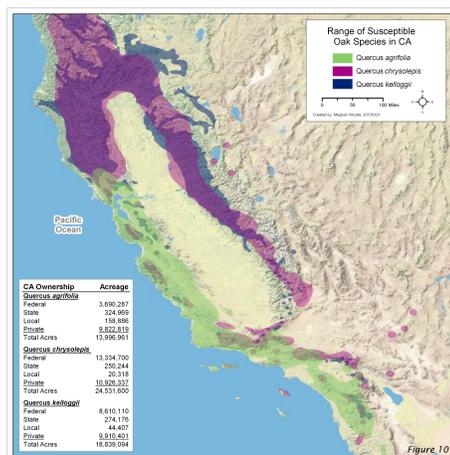


Evidence of GSOB attack: Fig. 4. GSOB exiting a D-shaped exit hole; holes are about 0.15" wide; Fig. 5. crown-thinning; Fig. 6. woodpecker damage on bark; Fig. 7. bark staining or bleeding; Fig. 8. meandering larval galleries under bark.

At Risk

GSOB: a threat to California oaks.

The goldspotted oak borer prefers three red oak species: coast live oak, *Quercus agrifolia*; California black oak, *Quercus kelloggii* and canyon live oak, *Quercus chrysolepis* (Figure 9). The map below (Figure 10) illustrates, these species range from Baja California to southern Oregon across many land ownerships. A higher degree (80%) of GSOB attacks and oak mortality have been found amongst larger trees (18 inches dbh or greater).



"The key management strategy for preventing GSOB spread is to stop the movement of infested oak firewood to non-infested areas. GSOB larvae can live underneath the bark of dead oaks for over a year before exiting the wood as adults."

GSOB Steering Committee, 2012 Goldspotted Oak Borer Issue Paper

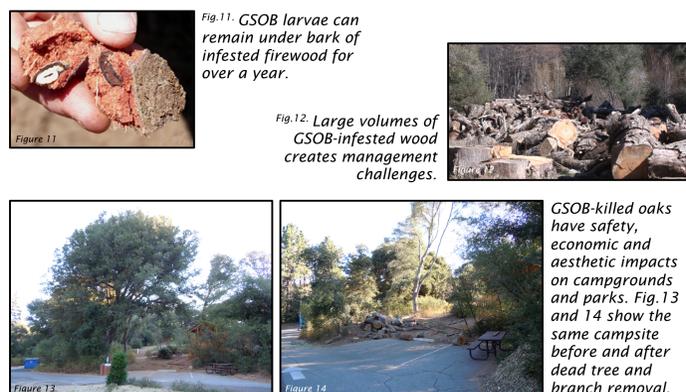


Fig. 11. GSOB larvae can remain under bark of infested firewood for over a year.

Fig. 12. Large volumes of GSOB-infested wood creates management challenges.

GSOB-killed oaks have safety, economic and aesthetic impacts on campgrounds and parks. Fig. 13 and 14 show the same campsite before and after dead tree and branch removal.

Response

Since Spring 2009, UCCE San Diego has worked with University scientists and Extension specialists to develop an education and outreach program utilizing traditional and digital methods to deliver information.

Funding support from federal, state and University partners has provided us the means to be part of a joint-agency effort for GSOB research, education and outreach. Our GSOB program objectives include:

- raise public awareness about the vital role of oak woodlands and the threat of goldspotted oak borer,
- provide information on GSOB impacts and identification,
- deliver current scientific information on the management of infested trees and firewood, and
- encourage the restoration of GSOB impacted areas.

www.GSOB.org



Outreach includes a wide spectrum of print, online and display educational resources. (Left) multiple information and handout materials developed; (center) GSOB website home page; (top right) wallet-sized GSOB ID card with actual size D-shaped exit hole punch; (bottom right) table-top educational display for community and professional events.



Fig. 15. Nine day-long workshops for professional land managers, arborists, educators and other stakeholders have been held. These workshops featured speakers from a cadre of twenty-eight cooperating partner agencies and organizations. Information presented included GSOB history, identification and biology, oak woodlands at risk, management research and options, firewood management and more.



Fig. 16. GSOB identification field training events have been organized to train professionals and volunteers in oak tree monitoring.

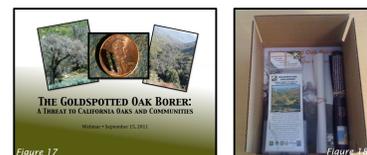
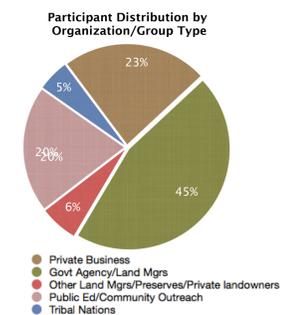


Fig. 17, 18 and 19. Other program efforts include webinar events, GSOB awareness mail campaign and assisting our partners with firewood movement surveys and outreach.

Results

Workshops for professionals were well received.

Seven monthly workshops for professional land managers and other stakeholders were held in six counties in southern California from September 2010 through February 2011. In May 2012, two additional workshops were offered to provide current research findings and resource information. UCCE San Diego partnered with two tribes; federal, regional and county and regional parks; and local organizations to offer these workshops at convenient locations. Altogether there were more than 460 participants.

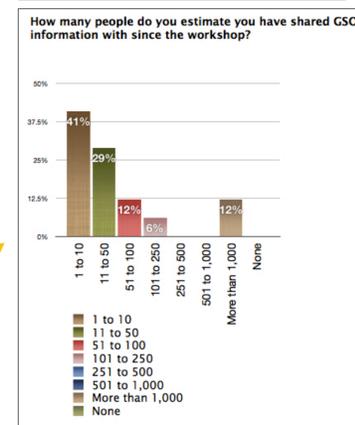
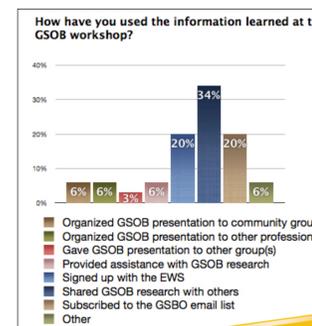
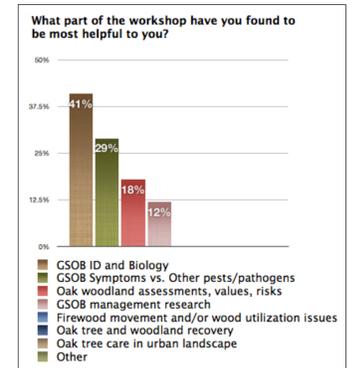
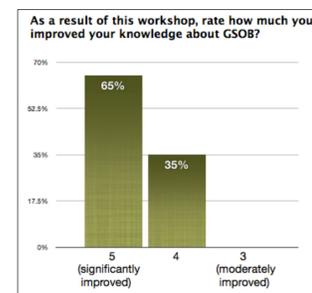


Results from initial workshop evaluations. Response rate: 38%.

- 80% rated the overall workshop 'Excellent.'
- 99% said workshop covered what was expected.
- 82% reported they are 'very likely' to use workshop information.
- 98% responded they are 'likely to share the workshop information with others.'

Six month follow-up evaluation surveys

Follow-up workshop surveys were taken for each of the first seven workshops. Response rate: 10%.



Possible extended reach: **2,770 more people**

Illustrations: Figs. 1 and 8, CISR, UCR, Riverside, CA; Figs. 2-3, 5-6, 9-10, T.W. Coleman, USFS/FHP, San Bernardino, CA; Figs. 7, 12 and 18, L.L. Lima; Figs. 4 and 11, T.A. Scott; Figs. 13-14, R. Covatt, CoSD Parks and Recreation Dept., W. Heise County Park; Fig. 14, R. Krason, UCCE San Diego County, San Diego, CA; Fig. 19, J.M. Alexander, UCCE Marin County/CA Firewood Taskforce; Figs. 17 and 20, J.G. Gonzales.