



Forest Health Protection Pacific Southwest Region



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To: Los Coyotes Tribal Council
Subject: Detection of the goldspotted oak borer (SC-13-01)

Summary

Forest stand surveys were conducted on 31 January 2013 by Tom W. Coleman, Entomologist, Forest Health Protection, and Adrian Ackley, Forester, Bureau of Indian Affairs, on the Los Coyotes Reservation. Follow-up surveys were conducted for the new invasive pest, the goldspotted oak borer, *Agrilus auroguttatus*, after Ackley observed oak injury on the reservation. The new wood borer was detected in the campground and to the north of the campground on the reservation. Tree injury and mortality from the goldspotted oak borer was at low densities.

Introduction

During November and December 2011, forest health surveys were initially conducted on the Los Coyotes Reservation for the goldspotted oak borer (Report # SC-12-02). Presence of goldspotted oak borer was not found during these surveys. During the winter of 2012, Ackley observed declining oaks near the campground (Fig. 1). These most recent surveys in January 2013 were conducted to verify the injury and assess the extent of the population.

The goldspotted oak borer is a new invasive insect to southern California. See the link below (Goldspotted Oak Borer Field Identification Guide and Goldspotted Oak Borer Pest Note)

for additional information about this insect. The goldspotted oak borer is causing elevated levels of tree mortality further south in San Diego Co. The northern extent of the goldspotted oak borer distribution in San Diego County was believed along the northern edge of Vulcan Mountain. The goldspotted oak borer prefers larger diameter coast live oak, *Quercus agrifolia*, and California black oak, *Quercus kelloggii*, but will also attack and kill canyon live oak, *Quercus chrysolepis*. This insect currently represents the most significant insect threat to red oaks in California.



Figure 1. Coast live oak showing significant crown thinning from goldspotted oak borer injury.

Forest stand surveys

We inspected coast live oak and canyon live oak for goldspotted oak borer injury symptoms in and around the Los Coyotes Campground. New tree mortality or trees showing significant tree injury were the focus of these surveys. The lower bole was examined for D-shaped exit holes, bark staining, and woodpecker foraging (See Goldspotted oak borer Field Identification Guide linked below). If a tree was suspected of injury, the bark was peeled to search for goldspotted oak borer larvae and presence of larval galleries on the surface of the wood.

Observations

Larger diameter oaks (>40 trees) were observed closely for goldspotted oak borer injury during the ground surveys. Goldspotted oak borer was found infesting 23% of the trees surveyed, and most trees had very low levels of injury (<10 exit holes on the lower stem) from the goldspotted oak borer. Coast live oak was the primary species injured by the goldspotted oak borer around the campground. Only two canyon live oaks were observed with goldspotted oak borer injury during the surveys and these trees were also showing signs of other insect and disease injury. Two coast live oaks and one canyon live oak were found with high levels of goldspotted oak borer (>100 exit holes on the lower stem) injury during the surveys. These trees will likely succumb to goldspotted oak borer feeding in the next few years. One coast live oak was beginning to die from goldspotted oak borer injury. This tree was sampled to verify populations of the invasive beetle and the presence of larval feeding (Fig. 2). The mean diameter of infested trees was 46" DBH with diameters ranging from 22-86" DBH.



Figure 2. Larval feeding from goldspotted oak borer found under the bark of coast live oak on the Los Coyotes Reservation.

Discussion

The goldspotted oak borer infestation will likely spread to other areas on the reservation, but this may take several years (~3-10 yrs) to manifest. Injury from the goldspotted oak borer was difficult to identify due to the low levels of injury present in the area. Additional surveys should focus on larger diameter coast live oaks and California black oaks in the area. If the tribe would like additional help with this work please contact Forest Health Protection.

Elevated levels of tree injury and mortality may take several years to become apparent, but now is the time to take action to mitigate tree mortality. Tree injury and mortality may be more prevalent in the larger diameter coast live oaks (>18" DBH). Canyon live oak is less susceptible to goldspotted oak borer injury than coast live oak and may not require prevention/suppression treatments. After a decade of injury, infestation levels may approach >90% with tree mortality approaching 50% in the larger diameter size classes (>15" DBH).

Management options for the goldspotted oak borer

No action: If no action is taken to prevent or slow GSOB populations, oak mortality will likely continue on the reservation in larger diameter coast live oaks and California black oaks. Tree mortality will likely be limited in larger diameter canyon live oaks. Oak mortality will occur at elevated levels than what has historically been associated with insects or diseases in these woodlands. Additional oaks will become infested in the future and will likely succumb to beetle feeding in five to nine years. If additional stress either from drought, wildfire, or other insects and diseases impact these oaks, an increase in oak mortality levels will likely be observed. Coast live oak >18" DBH and California black oak >20" DBH are at high risk to GSOB-caused mortality.

Prevention Options: Yearly surveys should be conducted in the campground, around the community, and other high-value sites to monitor the presence of the goldspotted oak borer and for recent tree mortality. Surveys should examine any recent oak mortality and larger diameter red oaks (>20" DBH) for injury symptoms from the goldspotted oak borer. See the Goldspotted Oak Borer Field Identification Guide below for the injury symptoms associated with this new pest. Forest Health Protection can provide training to assist with field surveys and a limited number of traps to assist with following the spread of the infestation. Forest Health Protection can also come back to the reservation and assess any new problems if desired.

A goldspotted oak borer management plan should be developed for the reservation to assist in mitigating this new threat on the reservation. Developing a management plan for the reservation will be essential for assessing the oak resource, identifying high-value sites for management actions, limiting the impact and spread of GSOB populations, monitoring the activity of GSOB populations, and planning restoration efforts. See the attached Goldspotted Oak Borer Management Plan and Goldspotted Oak Borer Pest Note to help limit tree mortality.

Additional education should be passed to the tribe about the threats of moving oak firewood from southern parts of the county to the Los Coyotes Reservation, and moving cut wood off of the reservation to other areas. Additional education and information about moving firewood can be found at the California Firewood Task Force website linked below.

Prevention options for limiting the goldspotted oak borer are outlined in the document "Best Management Practices for Preventing Tree Mortality from the Goldspotted Oak Borer on Public and Tribal Lands." Research shows that topical insecticides are more effective in the lab against GSOB populations than systemic insecticides. Preventive insecticides should be used only on coast live oaks and California black oak in high-value sites that are uninfested or lightly infested (exit hole density of <10, see GSOB Field ID Guide). Topical insecticide treatments should only be applied to coast live oaks >15" DBH and California black oak >20" DBH that are at risk from GSOB injury and in designated high-value sites. Canyon live oak is not preferred by the goldspotted oak borer and should not require extensive treatments. Goldspotted oak borer injury was not observed on California black oak at higher elevations on Hot Springs Mountain. Insecticide treatments should not be conducted on Hot Springs Mountain until populations are detected in this area. Topical treatments should be applied to the lower bole and larger branches. Treating the canopy with topical insecticides may not be required to save the tree, and applying the treatments effectively throughout the crown may not be feasible and incur excessive costs. Topical treatments should be applied in May and re-applied every year until additional data are

available. These topical treatments should limit tree mortality in these species. Tree surveys should be conducted at regular intervals to monitor the health of these treated trees, efficacy of the treatments, and health of other trees in the area.

Suppression Options: Cutting infested trees and properly managing the cut wood can eliminate local populations and may slow tree mortality in the area. Trees with severe injury from goldspotted oak borer populations (crown rating of 3-4 and exit hole rating of 3, see GSOB Field ID Guide) should not be treated with insecticides. These trees contain high densities of GSOB and will likely die in the next few years. Wood from recently killed trees should not be moved from the reservation unless it was felled two years before. Wood can be tarped and ground to prevent the emergence of goldspotted oak borer populations. Grinding (<3" particle size), double tarping during the summer months (May-October), or debarking recently cut wood can eliminate GSOB populations. Wood from recently killed trees (<2 yr) should not be moved to high-value areas near adjacent oaks. The Goldspotted Oak Borer Pest Note linked below also outlines prevention and suppression options and information for detecting this new pest.

Conclusion

Presence of the goldspotted oak borer represents the most significant insect issue surveyed on the Los Coyotes Reservation. This new pest can potentially be a long-term, persistent problem for the reservation and should be managed at high-value sites. I advise the reservation to develop a management plan for managing this new invasive pest and focus preventive treatments in high-value sites (immediately surrounding homes, the campground, and culturally significant sites). Topical application of insecticides is currently the most effective means for impacting GSOB populations. Severely infested trees should not be treated with insecticides and considered for removal. Funding can be submitted to Forest Health Protection for insecticide treatments through the Bureau of Indian Affairs. The Bureau of Indian Affairs also has the ability to assist with insecticide treatments if these are desired (contact A. Ackley). A Goldspotted Oak Borer Management Plan is encouraged prior to conducting prevention and suppression treatments. A management plan will also assist with prioritizing treatment areas.

If there are any questions please contact:

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Additional information referenced in the text:

Goldspotted Oak Borer Field Identification Guide:
http://www.ipm.ucdavis.edu/PDF/MISC/GSOB_field-identification-guide.pdf

Goldspotted Oak Borer Pest Note:

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74163.html>

California Firewood Task Force:

<http://firewood.ca.gov/>