

Goldspotted Oak Borer and Oak Mortality

Quarterly Situation Report (plus Sept. 2010)

September 1 through December 31st 2010

Legislation, Coordination and Command

GSOB Coordinator Hire – Tom Scott UC Coop Extension

Kevin Turner was hired as the GSOB Program Coordinator in October 2010 by Dr. Tom Scott at the University of California Cooperative Extension Service located at UC Riverside. The position is funded through the ARRA grant and was created to help coordinate the multi-agency GSOB response and also serves as the San Diego County GSOB Steering Committee Executive Director.

San Diego GSOB Steering Committee – Kevin Turner GSOB Coordinator, Kathleen Edwards CAL FIRE

A Steering Committee conference call occurred on December 6th to brief the SC on the GSOB political action occurring in adjoining Riverside County, discuss relevant information learned at the 2010 annual CPFC meeting and to discuss the 2011 GSOB Incident Action Plan. A face to face Steering Committee meeting is scheduled January 10th to follow up on these items.

Meeting with San Diego County Public Safety Director – Kathleen Edwards CAL FIRE

CAL FIRE Unit Chief Howard Windsor and Unit Forester Kathleen Edwards met with PS Director Ray Fernandez in early December to discuss GSOB and San Diego County's response. Mr. Fernandez suggested that the County Planning Agency should have a lead role (and is not currently involved) and that County CEO should be kept apprised of the situation so he can in turn keep the Board of Supervisors advised.

Riverside County Political Action – Kevin Turner GSOB Coordinator

UC Cooperative Extension personnel Tara Piraneo, Dr. Tom Scott and Kevin Turner were invited to present GSOB information at a community meeting in Idyllwild on November 9th. Riverside County Third District Supervisor Jeff Stone, his staff and Deputy Agricultural Commissioner Robert Mulherin also attended. Supervisor Stone closed the meeting with a call to action by Riverside County, similar to the response the City of Temecula made to protect its wine industry when threatened by Glassy-Winged Sharpshooter and Pierce's Disease. This precipitated a November 22nd meeting with the Supervisor's staff, Riverside County Counsel, Code Enforcement, Agricultural Commissioner, Planning Department and other county staff along with GSOB experts such as Tom Coleman of USFS FHP, Dr. Tom Scott and Kevin Turner of UCCE and Kathleen Edwards and Eric Oldar of CAL FIRE. The County proposed to take a series of action items including a Board of Supervisors workshop with adjoining San Bernardino County, planned enforcement of existing County Vendor and Business License and Zoning ordinances to control the sale of fire wood and to explore new regulations to try and keep GSOB infested wood out of the county. County staff are currently requesting information and supporting documentation from the GSOB "experts".

Regulatory Activities

Discussion of Penal Code 384.5, Weights and Measures laws and other existing ordinances –

Several groups have discussed and are exploring the potential use of several existing laws and ordinances to curb the spread of GSOB-infested wood by “under the radar” firewood sales. These existing laws could discourage this activity if enforcement personnel can be brought to bear. These discussions occurred in separate meetings with the San Diego Steering Committee, the meeting with Riverside County government staff and at a GSOB Research/Education/Outreach Committee meeting. Both San Diego and Riverside Counties are evaluating the use of PC 384.5 (requires proof of ownership, source of wood, species etc.), firewood sales and labeling laws (Weights and Measures), roadside vending ordinances, business license requirements and zoning issues. In addition to evaluating existing laws, additional new ordinances to regulate the sale/movement of firewood are being considered.

Southern California State Park Prohibitions on Imported Firewood– *Nedra Martinez CA State Parks*

Southern California State Park Superintendants have agreed to prohibit park users from bringing in non-local oak firewood to their campgrounds.

California State Board of Forestry

The Resource Protection Committee met on November 2, 2010 and considered a request for action on GSOB but decided to delay any action based upon information from California Department of Food and Agriculture and APHIS in spite of requests for action by retired Forest Supervisor of the Cleveland National Forest Anne S. Fege and others. The County of Riverside has offered to support future requests for declaring a Zone of Infestation and other possible actions as a means to prevent the movement of GSOB into Riverside County.

Survey, Detection, Monitoring

Update on USFS FHP GSOB Survey, Detection, Monitoring – *Tom Coleman USFS FHP*

Distribution traps were collected from San Diego, Riverside, and San Bernardino Cos. No significant trap collections were made out of the current zone of infestation. To see a complete list of trapping locations from 2010 contact Tom Coleman at twcoleman@fs.fed.us. Trapping was conducted by Forest Health Protection, San Diego Co. Ag. And Cal Fire from San Diego Co.

Ground surveys were conducted during October to November to check tree mortality mapped from the GSOB spring flight. Tree mortality was confirmed to the south and south west of the Descanso Ranger District close to the Mexico border. Low levels of oak mortality on Mesa Grande and the Santa Rosa Plateau were not associated with GSOB. Additional areas continue to be ground checked.

The Rate and Pattern of Spread of Goldspotted Oak Borer – *Tom Scott UCCE*



Using sequential aerial imagery to map the rate, pattern and spread of GSOB UCCE GSOB staff have mapped approximately 51,000 oak canopies at 7 of the 15 locations in the study, and have rough estimates of the years when trees began to decline at these. We have described the physiographic conditions (slope, aspect, elevation) for approximately 50% of mapped canopies (c. 28,000 trees).

Oak Tree mortality, susceptibility, and spread of GSOB – *Tom Scott UCCE*

UCCE GSOB staff have collected approximately 1550 cross-sections from oak trees in southern California, and have completed sampling at approximately 50% of sample areas. Trees were collected systematically from 14 study area, and opportunistically collected from an additional 21 locations within the outbreak area and 3 locations on the margin of the study area. We have started collecting samples at 11 more locations out of the 20 more total locations targeted before the end of the study.



Contracted sawyers (**left above**) collect cross sections from GSOB-infested oak trees for analysis in the laboratory at U.C. Riverside. The slabs must be sanded to an extremely fine smooth surface in order to be examined under a microscope (**right above**). Ideally one cross section is collected at the base of the tree and one from higher up the tree. The tree rings reveal the age of the tree, the year it was attacked by GSOB (and other pathogens) and how long it took to die from the attack.

Survey/monitoring and prevention of movement of GSOB-infested firewood –

Larry Swan, Kevin Turner, Matthew Bokach, Katie Palmieri, Tom Scott and Janice Alexander have all contributed to a focused survey and outreach to firewood producers who could be transporting or accepting delivery of GSOB-infested wood. Contact was made with approximately 125 wood producers/wholesalers/-retailers either person, by phone, U.S. mail or email. We discovered that some wood from GSOB infested areas in Descanso has been exported to non-infested areas in San Diego County (on-site observation of GSOB exit holes in bark) and some has been offered and/or shipped outside of San Diego County (info related by wood wholesalers but not physically verified by GSOB staff). We are also working with Kathleen Edwards to meet with owners of large oak woodlands that are under GSOB attack to educate them on how to safely manage GSOB infested-wood.

Science Activities and Findings

Update on USFS FHP Science, Activities and Findings – Tom Coleman USFS FHP

Insecticide trails were implemented in the fall to test the duration of topical insecticides on GSOB populations (FHP, SRS). These treatments are a continuation of work that began in 2009. Additional field and lab insecticide studies will begin in the spring 2011.

Tree health and beetle pressure continues to be monitored on coast live oak throughout the infestation (WETAC, FHP, PSW). This is the second year of this study and will continue through 2011.

A collaborative grinding study was initiated between FHP, Cuyamaca Rancho State Park, Cal Fire, and UCR. The objective of this study is to test the efficacy of different sized screens (1-minus, 3-minus, and 9-minus) for eliminating GSOB populations in cut wood.

The manuscript “Collection history and comparison of the interactions of the Goldspotted oak borer, *Agrilus auroguttatus* Schaeffer (Coleoptera: Buprestidae), with host oaks in southern California and southeastern Arizona” was submitted to the Coleopterist’s Bulletin in November by Tom Coleman and Steve Seybold.

The manuscript “Coast live oak, *Quercus agrifolia*, susceptibility and response to Goldspotted oak borer, *Agrilus auroguttatus*, injury in southern California” was submitted to Forest Ecology and Management in November by Tom Coleman, Nancy Grulke, Miles Daly, Cesar Godinez, Susan L. Schilling, Philip J. Riggan, and Steven J. Seybold.

Two proposals were submitted to the Forest Service to continue developing trapping protocols for GSOB and assess insecticide options for protecting high-value trees. Both proposals are a continuation of work from 2009.

2011 Research Needs Assessment - Julie Lydick, USFS R5 Asst. Director of State & Private Forestry

The U.S. Forest Service, Pacific Southwest Region and Pacific Southwest Research Station are hosting a meeting January 26 at the Cleveland National Forest headquarters to discuss research needs for GSOB. This meeting is by invitation in order to keep the group small. The objective of this meeting is to, Identify research and technology development needs for an integrated pest management program for the Goldspotted Oak Borer (*Agrilus coxalis*) and other factors related to oak health in Southern California. Assess currently available management tools and develop a 3 year prioritized work plan and budget for research and technology development that will lead to the tools and understanding needed to sustain oak forest health in Southern California

Particle Size Study – Kevin Turner GSOB Coordinator

The multi-agency utilization meeting that is discussed in the “Utilization” section of this report presented an opportunity that is being pursued by the meeting participants. Basically, the agencies agreed to cooperatively conduct a study into the treatment efficacy of grinding GSOB-infested oak into various size particles. A similar test was conducted in the past, but only with a very small sample size (only one tree) and with only one particle size (1” minus). Viramontes Express offered to grind the logs into three different size classes (9” minus, 3” minus, 1” minus) of particles at no charge. The problem was to find a suitable grinding site along the route of travel for the tub grinder when it is being transported from its current location at Palomar State Park to its home base in Riverside County. It was impossible to bring the tub grinder to Cuyamaca and we did not want to transport infested logs into Palomar. This necessitated finding a suitable grinding site, moving the infested logs to the grinding site and then hauling the ground particles back to the Cuyamaca test site for observation.

Test results should become available after the early summer 2011 when the adult GSOB emergence from the 3 particle sizes and the control are measured.



Rancho Cuyamaca State Park: Inmate firefighters from La Cima Conservation Camp buck rounds of GSOB-infested oak wood after the selected trees were felled by a CAL FIRE C-faller. Rounds were then randomly selected for 1”, 3” and 9” minus particle sizes along with a control group. USFS Forest Health Protection personnel under Dr. Tom Coleman and State Parks staff made the tree selection and assisted with round sorting. UC Coop Extension is coordinating the effort.

Grinding Study contributing participants include:

- Cuyamaca Rancho State Park – Superintendent Nedra Martinez and staff have provided infested trees from the park for the test, personnel to help with electing/felling/bucking/sorting of the logs and an area within the park to conduct the test.
- USFS Forest Health Protection – Tom Coleman and staff will conduct the study and assisted with the tree selection, felling/bucking/sorting and transportation of logs.
- CAL FIRE – Forester Kathleen Edwards and staff have assisted with obtaining a site where the tub grinder can grind the non-control logs into three various particle sizes (Puerta La Cruz Conservation Camp), arranged for CAL FIRE crews to assist with felling/bucking/sorting of logs and will assist in the decontamination of bins/equipment used for moving infested wood/particles.
- Riverside County Fire Department – Battalion Chief Bill Weiser has provided their “hook-lift” truck system with driver to haul the whole wood to the grinding site and the ground particles back to the test site.
- University of California Cooperative Extension – Dr. Tom Scott has contributed to the design of the study itself while Kevin Turner is providing overall coordination of the various steps and that have to take place to make the study a reality.
- Viramontes Express is providing the tub grinder with the three screen sizes and a loader.

Management and Restoration

USFS Descanso Ranger District – *Maureen Anderson*

Descanso RD collected viable acorns in December and ordered tree shelters, gopher guard etc. for a reforestation project on the Descanso Fire Compound. From 60-100 fully sheltered plantings of coast live oak acorns will be accomplished this January with the help of USFS personnel and Descanso Middle School student volunteers. The fully sheltered acorn plantings last December (Cuyamaca State Park) and January (Camp Oliver, Descanso) so far have an 86% (CSP) and 94% (Camp Oliver) success rate.

Utilization, Sanitation, Disposal

Multi-Agency Utilization Meeting - On October 28, a multi-agency meeting was held at Cuyamaca Rancho State Park (SP) in eastern San Diego County to discuss utilization and disposal issues. Cuyamaca SP has had hundreds of its coast live oak and California black oak trees killed by GSOB and many more are currently under attack and will die. The park has been removing these dead and dying oak trees in its campgrounds and other high-use areas for public safety reasons under a management plan. Park management has limited options for disposing of the infested wood because they do not want to spread GSOB to un-infested areas outside of the park. Burning the massive decks of oak logs is

not an option. Until a solution to the dilemma can be reached, their recreation site parking lots are becoming filled with stored dead wood.

A potential treatment of the infested wood to prevent the spread of GSOB is to grind the materials to a small enough size to make it unsuitable habitat for GSOB, killing any larvae and pupae within the wood. Ground wood particles have utilization potential for several different products besides electrical energy production. Currently ground wood particle products can't compete with fire wood on a straight financial basis due to higher processing costs with less financial return in the market. A scientific study needs to be conducted to determine the maximum size particle allowable that will kill the GSOB in the infested wood but still allow it to be a viable as a wood product. A study would need to be designed to test the efficacy for multiple-sized particle; it is less expensive to grind the infested oak wood to larger-sized particles and certain wood-particle products (bio-filters) utilize the larger particle sizes.

The meeting was coordinated by Larry Swan (USFS) and attendees included Tom Coleman and Matt Bokach (USFS), Nedra Martinez and Ray Lennox (Cuyamaca Rancho SP), Kathleen Edwards (CAL FIRE), Danielle Campbell (San Diego RCD), Tom Scott and Kevin Turner (UC Cooperative Extension). Steve and Gary Viramontes from Viramontes Express (a ground wood products firm based in Corona CA) joined the meeting for the field trip to Green Valley Campground where the group observed a huge pile of oak logs stored in the parking lot. Viramontes Express currently has a contract to grind non-GSOB wood (bark beetle and fire killed pine at Palomar State Park).

It was determined that grinding the park's wood could be a good solution for Cuyamaca. However, bridge and road limits within the park preclude the tub grinder being brought on site to grind the logs. The solution is to haul the logs to the tub grinder. However, proper precautions must be taken to ensure that the infested logs are not hauled to a location where susceptible oak species in close proximity. Hauling infested logs cross country during the GSOB adult emergence period (April-June?) should probably be avoided. Cuyamaca SP and Viramontes are working on a possible contract.

An additional discussion was regarding the release of infested wood for firewood if it was determined to no longer contain the beetles. Tom Coleman suggested that wood that had been dead for more than two years was likely no longer a threat. Unfortunately in the parks pile of logs, some more recently killed oak has been mixed in with the wood from oaks that have been dead for a much longer period of time. A good recommendation for oak woodland owners and managers is to group cut wood in piles based upon when the trees died; somehow delineate for each pile or area the approximate date the trees died or were cut.

Greater San Diego County Resource Conservation District D3 OAK TREE MORTALITY & FUELS REDUCTION PROGRAM - Danielle Campbell Forestry Assistant

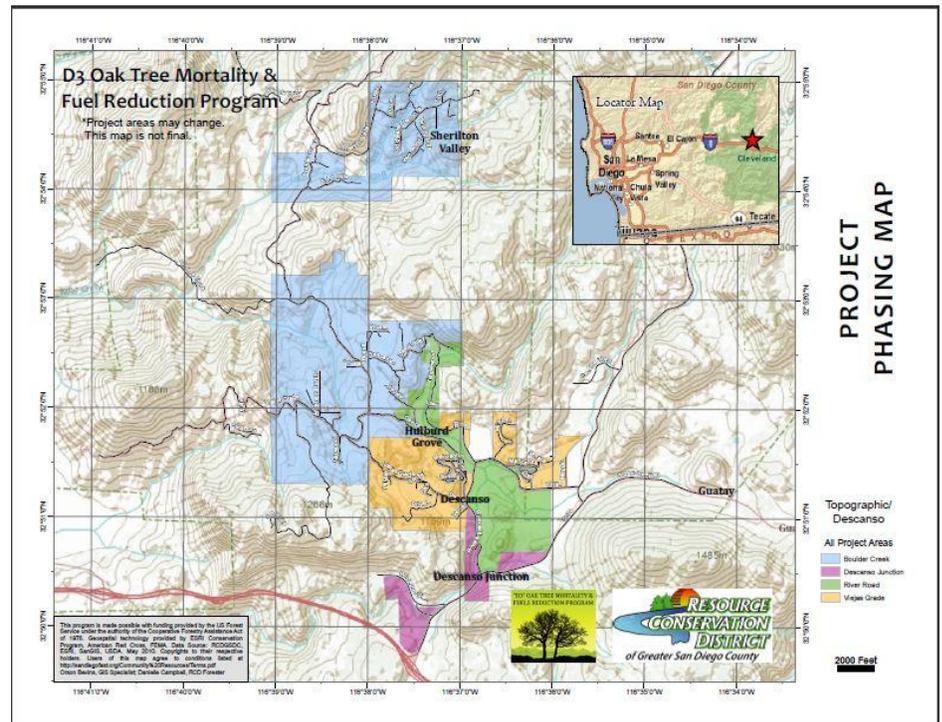
For the D3 Oak Tree Mortality & Fuels reduction Program, landowners with GSOB-infested oaks are contacted and advised of a grant-funded cost share tree removal program. During this reporting period, participation in Descanso area was 302 signed Rights of Entry out of 946 eligible private parcels (~ 32%) contacted for possible participation.

The Boulder Creek Project was completed during the period September 24th – October 24th. The project removed 362 trees and 213.68 tons of oak material on 28 parcels with contractor payment for tree removal/disposal at \$117,800 which is a cost of \$325/tree.

The Viejas Grade, River Road and Descanso Junction Projects are in progress and consist of 883 trees to be removed, on 164 parcels with contractor costs of \$492,170 or \$558/tree. These projects began on Nov. 29th and will take a few months to complete. Special note: As with the first project, the material being removed is being chipped with a whole tree chipper and the chips are being hauled to Imperial Valley Resource Recovery. This time around the contractor is chipping more of the smaller material on site (on the home owner’s properties). Also the buckskin logs are being cut into firewood and specially selected dry logs are being cut into firewood with all the bark removed.



Some of the GSOB-killed oaks removed by the D3 Program require specialized removal techniques and equipment.



Public Outreach, Media Coverage, Technical Assistance

GSOB Workshops – Jan Gonzales UCCE

The following GSOB Workshops targeted towards private and government resource professionals land managers were hosted by UCCE and consisted of presentations by a multi-agency cadre of GSOB and oak woodland experts.

- September 15 at Santa Rosa Plateau in Riverside County
- October 20 Viejas near Alpine in eastern San Diego County
- November 10 University of Redlands in San Bernardino County
- December 9 Irvine in Orange County
- Workshops are scheduled in Ventura County and Los Angeles County January 2011



WWW.GSOB.ORG is a valuable outreach and educational tool that has been established to both share and solicit GSOB information and to advertise workshops and other upcoming events.

Anaheim PAPA Seminar - Kim Camilli of CAL FIRE

Kim presented a GSOB talk to 350 professionals at the Pesticide Applicators Professional Association seminar in Anaheim, CA on December 2. The talk covered identification, biology, impact, management and control options, and current research topics.

GSOB Early Warning System/Citizen Scientist Program Presentations - Tara Piraneo UCCE at UCR

During this reporting period Tara has conducted approximately 23 presentations through site visits, abbreviated 10 minute presentations and 45 minute seminars. So far we have recruited over 120 persons to help us with our early warning system for GSOB in the communities next to the area of infestation.

GSOB Education/Outreach - Katie Palmieri and Janice Alexander

Katie and Janice have participated in multiple firewood-related meetings as firewood is a key issue with GSOB. Katie helped to encourage the California Forest Pest Council to address the firewood issue through the creation of a firewood taskforce. During this reporting period Katie updated the Board of Forestry on GSOB as well as firewood issues and gave two professional group presentations (one to pesticide applicators and one to arborists) that covered both SOD and GSOB. She also produced and distributed a statewide firewood news release which addressed both SOD and GSOB (it received media coverage). Katie is producing a bibliography on all GSOB publications to date and she and Janice have also been making Resource Needs Assessment meeting preparations. Janice partnered with GSOB Coordinator Kevin Turner to develop and distribute letters to approximately 120 firewood dealers in Southern California warning them of the threat of moving GSOB – infested wood and telling them what to do if they have infested wood on hand.

California Forest Pest Council – Julie Lydick, USFS R5 Asst. Director of State & Private Forestry

The California Forest Pest Council took action on 11/17/10 to form a Firewood Task Force of the California Pest Council. Don Owen, Cal Fire, will chair the task force. The resolution states, "...BE IT RESOLVED that all interested and responsible parties establish a task force composed of public, private and non-profit sector members as a forum to discuss firewood/pest movement issues and create seamless strategies across land ownerships and jurisdictions to the extent practical and specifically address the following tasks:

- 1) Engage stakeholders that are concerned with the threat from invasive pests to California forest via firewood movement, and
- 2) Synthesize, evaluate and publicize information related to this threat.
- 3) Work cooperatively to develop and promulgate best management practices related to firewood movement, and to develop appropriate outreach and educational materials for various audiences, and
- 4) Identify and support appropriate research, management, and educational programs related to firewood movement.

The Board of Forestry will be informed at the January board meeting of this action and the resolution will be sent to various land management agencies, regulatory agencies, research and cooperative extension, landowners groups and arborist groups.

While this action is not directly related to suppression of GSOB, it should provide a forum and opportunities that can be applied to that situation.

GSOB/Firewood Training - San Diego County Ag Commissioner/Weights & Measures – Tracy Ellis

Training was provided to Customs and Border Protection officers on October 29, November 19 and December 13th. Firewood was also intercepted at the border during this time. GSOB talk was given at the Annual Horticulture Seminar at the San Diego Wild Animal Park on September 21. Dr. David Kellum of Ag. W. & M. gave GSOB presentations at the Escondido PAPA meeting September 21 and to Sigma Phi Fraternity on September 20th.

USFS Forest Health Protection Outreach and Technical Assistance – Tom Coleman USFS FHP

Forest Health Protection has assisted in the public outreach meetings (Santa Rosa, Viejas, Redlands, and Irvine) held by UC Cooperative Extension.

At the Annual meeting of the Entomological Society of America on December 15th in San Diego a symposium was held that addressed the Goldspotted oak borer. The symposium, Goldspotted oak borer (*Agrilus coxalis*): An indigenous exotic species that threatens California's oak ecosystems, included research talks from several principal investigators working on GSOB. Presenters included Tom Coleman (FHP), Tom Scott (UCB), Mark Hoddle (UCR), Damon Crook (APHIS), Nancy Grulke (WETAC), Robert Venette (NRS), Mary Louise Flint (UCD), and Steve Seybold (PSW). The symposium was organized by Tom Coleman and Steve Seybold. Proceedings from the symposium are being written up for publication. The target date for submission is mid-January.