

University of California Cooperative Extension Agreement

AGREEMENT TO PROVIDE ASSISTANCE TO OC PARKS

THIS AGREEMENT TO PROVIDE ASSISTANCE TO OC PARKS ("AGREEMENT") is made and entered into this _____ day of _____, by and between the County of Orange (hereinafter referred to as "COUNTY"), and The Regents of the University of California on behalf of its UC Cooperative Extension, Orange County (hereinafter referred to as "UNIVERSITY"): which are sometimes referred to herein individually as a "PARTY" or collectively as the "PARTIES".

WITNESSETH

WHEREAS, UNIVERSITY conducts an Agricultural Extension Program to bring agricultural education and research information to the public; and

WHEREAS, in 1990, a Memorandum of Understanding was established between UNIVERSITY and COUNTY to provide funding to UNIVERSITY staff assigned to Orange County to plan and conduct research and educational programs for the benefit of COUNTY residents; and

WHEREAS, COUNTY desires to continue this working relationship with UNIVERSITY in areas related to effectively maintaining landscape vegetation in COUNTY Regional Parks, which are managed by Orange County Parks ("OC PARKS"), a COUNTY department within the COUNTY's OC Community Resources agency; and

WHEREAS, OC PARKS must satisfy State-mandated requirements to reduce water usage for landscape irrigation and to prepare an Integrated Pest Management program; and

WHEREAS, OC PARKS desires to continue the 2010 AGREEMENT with UNIVERSITY; and

WHEREAS, UNIVERSITY has unique expertise to assist OC PARKS in these areas.

NOW, THEREFORE, IT IS AGREED by and between COUNTY and UNIVERSITY hereto as follows:

1. AGREEMENT

UNIVERSITY will provide services to the COUNTY upon the terms and conditions hereinafter specified. UNIVERSITY's project manager ("PROJECT MANAGER") who shall be assigned to manage provision of services is Darren Haver. Any change in PROJECT MANAGER must be approved in writing by the Director of OC PARKS (hereinafter referred to as "DIRECTOR").

2. ADMINISTRATION OF AGREEMENT

The DIRECTOR shall administer this AGREEMENT for COUNTY. The DIRECTOR shall assign a staff representative (hereinafter "STAFF REPRESENTATIVE") to coordinate with UNIVERSITY in implementing this AGREEMENT. STAFF REPRESENTATIVE shall provide direction to UNIVERSITY, review UNIVERSITY's work, and assist UNIVERSITY in dealings with other public agencies and private parties which, in the judgment of DIRECTOR, warrant attention.

3. TERM

The term of this AGREEMENT shall be twelve (12) months from the date first written above, renewable for four (4) additional twelve (12) month periods upon mutual agreement of the PARTIES as memorialized in writing thirty (30) days prior to expiration. DIRECTOR may renew this AGREEMENT, based on prior satisfactory performance, provided that such renewal does not result in the total term of this AGREEMENT exceeding sixty (60) months and provided that all terms and conditions remain unchanged.

4. SERVICES TO BE PROVIDED BY UNIVERSITY

A. UNIVERSITY shall provide experts in the areas of landscape maintenance, water usage management, pest management and weed management to consult with OC PARKS staff.

B. UNIVERSITY shall develop training programs and conduct training for OC Parks staff per the specifications in Exhibit "A – D" attached hereto.

C. UNIVERSITY may conduct applied research within COUNTY regional parks and provide educational programs to OC Parks staff directly related to that research.

D. All work by UNIVERSITY to provide the above SERVICES must be approved in advance, in writing, by the STAFF REPRESENTATIVE or DIRECTOR. The approval must include a scope of work and an estimate of the hours and/or cost involved.

E. On a quarterly basis, UNIVERSITY shall provide to COUNTY an accounting of all costs incurred by UNIVERSITY to provide the COUNTY approved SERVICES under this AGREEMENT. The accounting shall reflect both the subject quarter and the cumulative year-to-date costs and shall be submitted within forty-five (45) days of the end-of-quarter.

F. UNIVERSITY shall be responsible for submitting all work products to COUNTY in a form which has been thoroughly reviewed for completeness, accuracy and consistency by UNIVERSITY's PROJECT MANAGER. Any work product not fulfilling this requirement shall be returned to UNIVERSITY for revision prior to acceptance by COUNTY.

5. SERVICES TO BE PROVIDED BY COUNTY

COUNTY shall waive all COUNTY-issued permit fees associated with UNIVERSITY research on COUNTY property. Permit fees shall be waived only when research conducted benefits COUNTY within the scope of this AGREEMENT.

6. UNIVERSITY RELATIONSHIP

UNIVERSITY is and at all times shall be deemed to be an independent contractor, wholly responsible for the SERVICES performed under terms of this AGREEMENT. COUNTY shall look only to UNIVERSITY for results. Nothing contained herein shall be construed as creating any relationship of employer/employee, principal/agent, master/servant, partners, joint venture or association. UNIVERSITY shall assume full responsibility for the actions of its employees as related to the SERVICES provided under this AGREEMENT.

7. MEETINGS

The STAFF REPRESENTATIVE and PROJECT MANAGER shall meet on a monthly basis to discuss contractual matters or performance and progress under this AGREEMENT.

8. TERMINATION OF AGREEMENT FOR CONVENIENCE

If for any reason COUNTY determines that UNIVERSITY's services, in whole or in part, are no longer required, COUNTY shall notify UNIVERSITY in writing of such termination and UNIVERSITY shall immediately suspend performance of SERVICES approved by DIRECTOR (unless the notification directs otherwise). UNIVERSITY shall within a reasonable period of time, not to exceed sixty (60) days, deliver to COUNTY all work performed by UNIVERSITY and/or anyone working under the supervision of UNIVERSITY pursuant to this AGREEMENT theretofore, said work having been reduced to submittals or other work products, prior to payment of any remaining compensation. UNIVERSITY, in executing this AGREEMENT, shall be deemed to have waived any and all claims for damages in the event of COUNTY termination for convenience. Additionally, in the event of termination under this Section, UNIVERSITY shall refund any unexpended funds paid to UNIVERSITY by COUNTY under this AGREEMENT within sixty (60) days of such notice of termination.

9. PAYMENTS TO UNIVERSITY

A. For performance of work hereunder, COUNTY shall pay UNIVERSITY expenses, direct and indirect costs. Direct costs shall mean costs associated with performing the activities provided in the Scope of Work (as described in Exhibits A-D). Indirect costs shall mean overhead costs which shall be 26% modified total direct costs. In no event shall the totality of all costs exceed Three Hundred and Twenty Thousand Dollars (\$320,000) per AGREEMENT period, unless otherwise changed in accordance with "Article 21, Amendments" of this AGREEMENT.

B. A payment of Three Hundred and Twenty Thousand Dollars (\$320,000) shall be made to the UNIVERSITY within sixty (60) days of approval and full execution of this AGREEMENT.

C. If the term of the AGREEMENT is renewed pursuant to Section 3 above, an additional annual payment of Three Hundred and Twenty Thousand Dollars (\$320,000) shall be made for each year that the term is extended to UNIVERSITY, subject to the limitations described in Section 23 below (Limitation of Obligation Due to Non-Appropriation of Funds). Each annual payment for a renewal period of this AGREEMENT shall be made within sixty (60) days of the commencement of the renewal period.

D. In the event of any unexpended funds during any year of this AGREEMENT, the unexpended funds shall, at the DIRECTOR's discretion, be either 1) carried over to a subsequent AGREEMENT year, 2) carried over as a credit to the next year's payment, or 3) refunded to COUNTY.

10. PUBLICATION

No copies of materials produced pursuant to this AGREEMENT, including sketches or graphs, and graphic art work, are to be released by UNIVERSITY and/or anyone acting on behalf of UNIVERSITY to any person, partnership, company, corporation, or agency, without prior review by COUNTY, except as necessary for the performance of SERVICES. Within two (2) weeks after receipt of proposed publication, COUNTY shall notify UNIVERSITY of any requested changes or additions, such as consistency with program language or acknowledgement of support that they have identified. If UNIVERSITY determines that disclosure of documents described in this section must be disclosed as a matter of law, COUNTY shall be notified as soon as practicable prior to disclosure of these documents. COUNTY and the State of California (but only upon prior written approval of DIRECTOR) shall have a royalty-free, nonexclusive and irrevocable license to publish, copy, translate, or use now and hereafter, all documents, data, films, tapes, and other material delivered under this AGREEMENT, including materials covered by copyright. All press releases referring to COUNTY by name are to be administered only by COUNTY unless otherwise agreed to by both PARTIES.

11. ERRORS AND OMISSIONS

All reports submitted by UNIVERSITY shall be complete and shall be carefully checked by PROJECT MANAGER, prior to submission to COUNTY. UNIVERSITY agrees that COUNTY review is discretionary and UNIVERSITY shall not assume that COUNTY will discover errors and/or omissions. If COUNTY discovers any errors or omissions in reports, the reports will be returned to UNIVERSITY for correction prior to COUNTY accepting UNIVERSITY's report if UNIVERSITY is in agreement with COUNTY's review. Should COUNTY or others discover, after COUNTY acceptance, errors or omissions in reports submitted by UNIVERSITY, said acceptance of reports shall not be used as a defense.

12. SUBCONTRACTOR OF WORK

UNIVERSITY shall not sublet or transfer SERVICES UNIVERSITY agrees to perform by this AGREEMENT. UNIVERSITY may employ special consultants in the performance of SERVICES only if each special consultant and the aggregate money value of its work is submitted to and approved by DIRECTOR prior to employment of said special consultant. No obligation to approve such a substitution in performance of SERVICES is implied. UNIVERSITY's employment of special consultants shall not relieve UNIVERSITY from responsibility for the performance of UNIVERSITY's obligations and duties pursuant to this AGREEMENT. However, all special consultants independently contracting with COUNTY shall be independently liable to COUNTY for the performance of the work pursuant to their agreements, and UNIVERSITY shall have no liability for work by special consultants independently contracting with COUNTY.

13. RECORDS AND AUDIT INSPECTIONS

UNIVERSITY shall keep an accurate record of time expended by UNIVERSITY and/or special consultants employed by UNIVERSITY in the performance of this AGREEMENT. Within ten days of COUNTY's written request, UNIVERSITY shall allow COUNTY or authorized State or Federal agencies or any duly authorized representative to have the right to access, examine, audit, excerpt, copy or transcribe any pertinent transaction, activity, time cards or other records relating to this AGREEMENT. UNIVERSITY shall keep such material, including all pertinent cost accounting, financial records and proprietary data for a period of one year after termination or completion of the AGREEMENT or until resolution of any claim or dispute between the PARTIES, whichever is later. Should UNIVERSITY cease to exist as a legal entity, records pertaining to this AGREEMENT shall be forwarded within a reasonable period of time not to exceed sixty (60) days to its successor in interest or surviving entity in a merger or acquisition, or, in the event of liquidation, to COUNTY.

14. CONFLICT OF INTEREST

UNIVERSITY agrees that no former or current COUNTY employee shall participate in the SERVICES provided by UNIVERSITY to COUNTY, or become a partner, shareholder or otherwise share in the profits of UNIVERSITY for a period of six (6) months from the date such person ceased COUNTY employment.

15. NON-EMPLOYMENT OF COUNTY OF ORANGE PERSONNEL

UNIVERSITY agrees that no full-time, regular employee of the COUNTY who is involved with this AGREEMENT shall be given or offered employment by UNIVERSITY in a moonlighting status during the life of this AGREEMENT regardless of the assignments said employee may be given or the days or hours employee may work. By accepting this AGREEMENT, UNIVERSITY agrees not to knowingly offer employment to any COUNTY full time regular employee employed by COUNTY who is involved in professional classifications of the same skills required for the performance of this AGREEMENT.

16. NONDISCRIMINATION

In the performance of the terms of this AGREEMENT, UNIVERSITY shall not engage in discrimination in the employment of persons because of race, creed, color, religion, national origin, age, physical handicap, marital status or sex. Violation of this provision may result in the imposition of penalties referred to in Labor Code Section 1735 or other applicable State and Federal regulation.

17. LAWS TO BE OBSERVED

UNIVERSITY is assumed to be familiar with and, at all times, shall observe and comply with all federal, state and local laws, ordinances, rules and regulations in any manner affecting the conduct of SERVICES under this AGREEMENT.

18. INDEMNIFICATION AND GENERAL LIABILITY

UNIVERSITY shall defend, indemnify and hold COUNTY harmless from and against any and all liability, loss, expense, attorney's fees, or claims for injury or damages arising out of UNIVERSITY's performance of this AGREEMENT but only in proportion to and to the extent such liability, loss, expense, attorney's fees or claims for injury or damages are caused by or

result from the negligent or intentional acts or omissions of UNIVERSITY, its officers, agents, or employees.

COUNTY shall defend, indemnify and hold UNIVERSITY harmless from and against any and all liability, loss, expense, attorney's fees, or claims for injury or damages arising out of the COUNTY's performance of this AGREEMENT but only in proportion to and to the extent such liability, loss, expense, attorney's fees or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of COUNTY, its officers, agents or employees.

19. INSURANCE PROVISIONS

Prior to the provision of services under this AGREEMENT, the UNIVERSITY agrees to purchase all required insurance or maintain a program of self-insurance at UNIVERSITY's expense, including all endorsements required herein, necessary to satisfy the COUNTY that the insurance provisions of this AGREEMENT have been complied with. UNIVERSITY agrees to keep such insurance coverage, Certificates of Insurance, and endorsements on deposit with the COUNTY during the entire term of this contract. In addition, all subcontractors performing work on behalf of UNIVERSITY pursuant to this contract shall obtain insurance subject to the same terms and conditions as set forth herein for UNIVERSITY.

UNIVERSITY shall ensure that all subcontractors performing work on behalf of UNIVERSITY pursuant to this agreement shall maintain insurance subject to the same terms and conditions as set forth herein for UNIVERSITY. UNIVERSITY shall not allow subcontractors to work if subcontractors have less than the level of coverage required by COUNTY from UNIVERSITY under this AGREEMENT. It is the obligation of UNIVERSITY to provide notice of the insurance requirements to every subcontractor and to receive proof of insurance prior to allowing any subcontractor to begin work. Such proof of insurance must be maintained by UNIVERSITY through the entirety of this AGREEMENT for inspection by COUNTY representative(s) at any reasonable time.

All self-insured retentions (SIRs) and deductibles shall be clearly stated on the Certificate of Insurance. If no SIRs or deductibles apply, indicate this on the Certificate of Insurance with a "0" by the appropriate line of coverage.

If the UNIVERSITY fails to maintain insurance acceptable to the County for the full term of this contract, the COUNTY may terminate this contract.

Qualified Insurer

The policy or policies of insurance must be issued by an insurer with a minimum rating of A- (Secure A.M. Best's Rating) and VIII (Financial Size Category as determined by the most current edition of the Best's Key Rating Guide/Property-Casualty/United States or ambest.com). It is preferred, but not mandatory, that the insurer be licensed to do business in the state of California (California Admitted Carrier).

If the insurance carrier does not have an A.M. Best Rating of A-/VIII, the CEO/Office of Risk Management retains the right to approve or reject a carrier after a review of the company's performance and financial ratings.

The policy or policies of insurance maintained by the UNIVERSITY shall provide the minimum limits and coverage as set forth below:

<u>Coverage</u>	<u>Minimum Limits</u>
Commercial General Liability	\$1,000,000 per occurrence \$2,000,000 aggregate
Automobile Liability including coverage for owned, non-owned and hired vehicles	\$1,000,000 per occurrence
Workers Compensation	Statutory
Employers Liability Insurance	\$1,000,000 per occurrence

Required Coverage Forms

The Commercial General Liability coverage shall be written on Insurance Services Office (ISO) form CG 00 01, or a substitute form providing liability coverage at least as broad.

The Business Auto Liability coverage shall be written on ISO form CA 00 01, CA 00 05, CA 0012, CA 00 20, or a substitute form providing coverage at least as broad.

Required Endorsements

The Commercial General Liability policy shall contain the following endorsements, which shall accompany the Certificate of Insurance:

- 1) An Additional Insured endorsement using ISO form CG 2010 or CG 2033 or a form at least as broad naming the County of Orange and members of the Board of Supervisors, its elected and appointed officials, officers, agents and employees as Additional Insureds.
- 2) A primary non-contributing endorsement evidencing that the Contractor's insurance is primary and any insurance or self-insurance maintained by the County of Orange shall be excess and non-contributing.

UNIVERSITY shall notify COUNTY in writing within thirty (30) days of any policy cancellation and ten (10) days for non-payment of premium and provide a copy of the cancellation notice to COUNTY. Failure to provide written notice of cancellation may constitute

a material breach of the contract, upon which the COUNTY may suspend or terminate this AGREEMENT.

The Commercial General Liability policy shall contain a severability of interests clause also known as a “separation of insureds” clause (standard in the ISO CG 0001 policy).

Insurance certificates should be forwarded to the agency/department address listed on the solicitation.

If the UNIVERSITY fails to provide the insurance certificates and endorsements within seven (7) days of notification by CEO/Purchasing or the agency/department purchasing division, award may be made to the next qualified vendor.

COUNTY expressly retains the right to require UNIVERSITY to increase or decrease insurance of any of the above insurance types throughout the term of this AGREEMENT. Any increase or decrease in insurance will be as deemed by County of Orange Risk Manager as appropriate to adequately protect COUNTY.

COUNTY shall notify UNIVERSITY in writing of changes in the insurance requirements. If UNIVERSITY does not deposit copies of acceptable Certificates of Insurance and endorsements with COUNTY incorporating such changes within thirty (30) days of receipt of such notice, this AGREEMENT may be in breach without further notice to UNIVERSITY, and COUNTY shall be entitled to all legal remedies.

The procuring of such required policy or policies of insurance shall not be construed to limit UNIVERSITY’S liability hereunder nor to fulfill the indemnification provisions and requirements of this AGREEMENT, nor act in any way to reduce the policy coverage and limits available from the insurer.

20. NOTICES

Notices and correspondence in connection with this AGREEMENT shall be addressed as set forth below or as either PARTY may hereinafter designate by written notice to the other.

COUNTY

County of Orange
OC Community Resources/OC Parks
Attention: Director
13042 Old Myford Road
Irvine, CA 92602

UNIVERSITY

University of California
Agriculture and Natural Resources Cooperative Extension
Attention: Darren Haver, County Director
7601 Irvine Boulevard
Irvine, CA 92618

and

University of California
Agriculture and Natural Resources
Office of Contracts & Grants
Attention: Kathleen P. Nolan Director
ANR Office of Contracts & Grants
2801 Second Street
Davis, CA 95618-7774

21. AMENDMENTS

No alteration or variation of the terms of this AGREEMENT shall be valid unless made in writing and signed by the PARTIES hereto, and no oral understanding or agreement not incorporated herein shall be binding on any of the PARTIES hereto.

22. CONSENT TO BREACH NOT WAIVER

No term or provision of this AGREEMENT shall be deemed waived and no breach excused, unless such waiver of consent shall be in writing, signed by the PARTY claimed to have waived or consented. Any consent by any PARTY to, or waiver of, a breach by the other, whether express or implied, shall not constitute a waiver of any other breach of the provision or any other provision of this AGREEMENT. Failure of either PARTY to enforce any provision of this AGREEMENT at any time shall not be construed as a waiver of that provision.

23. LIMITATION OF OBLIGATION DUE TO NON-APPROPRIATION OF FUNDS

The obligation of the COUNTY herein is subject to the availability of funds appropriated for this purpose and nothing contained herein shall be construed as obligating the COUNTY to expend or as involving the COUNTY in any contract or obligation for the future payment of money in excess of appropriations authorized by law. In the event this AGREEMENT extends into succeeding fiscal year periods and the Board of Supervisors does not allocate sufficient funds for the next succeeding fiscal year's payments, this AGREEMENT shall be terminated as of June 30 of the then-current fiscal year. COUNTY shall notify UNIVERSITY in writing of such non-allocation at the earliest possible date.

24. ENTIRETY

This AGREEMENT is the entire AGREEMENT between the PARTIES with respect to the matters herein and there are no restrictions, promises, warranties or undertakings other than those set forth or referred to herein.

25. SEVERABILITY

If any part of this AGREEMENT is held, determined or adjudicated to be illegal, void or unenforceable by a court of competent jurisdiction, the remainder of this AGREEMENT shall be given effect to the fullest extent reasonably possible.

26. GOVERNING LAW AND VENUE

This AGREEMENT has been negotiated and executed in the State of California and shall be governed by and construed under the laws of the State of California. In the event of any legal action to enforce or interpret this AGREEMENT, the sole and exclusive venue shall be a court of competent jurisdiction located in Orange County, California. The PARTIES hereto agree to and do hereby submit to the jurisdiction of such court, notwithstanding Code of Civil Procedure Section 394. The PARTIES specifically agree that by soliciting and entering into and performing SERVICES under this AGREEMENT, the UNIVERSITY shall be deemed to constitute doing business within Orange County from the time of solicitation of work, through the period when all work under this AGREEMENT is completed, and continuing until the expiration of any applicable limitations period. Furthermore, the PARTIES have specifically agreed, as part of the consideration given and received for entering into this AGREEMENT, to waive any and all rights to request that an action be transferred for trial to another county under Code of Civil Procedure Section 394.

27. AUTHORITY

The PARTIES to this AGREEMENT represent and warrant that this AGREEMENT has been duly authorized and executed and constitutes the legally binding obligation of their respective organization or entity, enforceable in accordance with its terms.

28. CALENDAR DAYS

Any reference to the word "day" or "days" herein shall mean calendar day or calendar days, respectively, unless otherwise expressly provided.

29. ATTORNEY'S FEES

In any action or proceeding brought to enforce or interpret any provision of this AGREEMENT, or where any provision hereof is validly asserted as a defense, each PARTY shall bear its own attorney's fees and costs.

30. INTERPRETATION

This AGREEMENT has been negotiated at arm 's length and between persons sophisticated and knowledgeable in the matters dealt with in this AGREEMENT. In addition, each PARTY has been represented by experienced knowledgeable independent legal counsel of their own choosing, or has knowingly declined to seek such counsel despite having the opportunity to do so. Each PARTY further acknowledges that they have not been influenced to any extent whatsoever in executing this AGREEMENT by any other PARTY hereto or by any person representing them, or both. Accordingly, any rule of law (including California Civil Code Section 1654) or legal decision that would require interpretation of any ambiguities in this AGREEMENT against the PARTY that has drafted it is not applicable and is waived. The provisions of this AGREEMENT shall be interpreted in a reasonable manner to affect the purpose of the PARTIES and this AGREEMENT.

31. HEADINGS

The headings in this AGREEMENT are for convenience of reference only and shall not limit or otherwise affect the meaning thereof.

IN WITNESS WHEREOF, the PARTIES hereto have executed this AGREEMENT on the dates opposite their respective signatures:

COUNTY OF ORANGE

Date: _____

By: _____
Chair, Board of Supervisors

Signed and certified that a copy of this document has been delivered to the Chair of the Board per G.C. Sec. 25103, Reso 79-1535

Attest:

Date: _____

Clerk of the Board of Supervisors
County of Orange, California

APPROVED AS TO FORM:
COUNTY COUNSEL

By: Michelle A. Hunt
Deputy

Date: 8/10/15

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Date: 8-7-15

By: Kathleen P. Nolan
Director, Office of Contracts & Grants

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Exhibit A

Polyphagous Shot Hole Borer Survey and Management

Principal Investigators

Darren Haver, Ph.D., OC UC Cooperative Extension

Potential Collaborators

Akif Eskalen, Ph.D., Dept. of Plant Pathology, UC Riverside

Tim Paine, Ph.D., Dept. of Entomology, UC Riverside

Tom Coleman, Ph.D., USDA Forest Service, Forest Health Protection, San Bernardino, CA

Cheryl Wilen, Ph.D., UC IPM Advisor

Project Duration and Budget

Year 1: August 1, 2015 to July 31, 2016

Estimated Budget: \$172,188.25

Est. Indirect Cost: \$44,768.95

Year 2: August 1, 2016 to July 31, 2017

Estimated Budget: \$180,986.68

Est. Indirect Cost: \$47,056.54

Year 3: August 1, 2017 to July 31, 2018

Estimated Budget: \$190,190.07

Est. Indirect Cost: \$49,449.42

Year 4: August 1, 2018 to July 31, 2019

Estimated Budget: \$199,815.98

Est. Indirect Cost: \$51,952.15

Year 5: August 1, 2019 to July 31, 2020

Estimated Budget: \$209,882.73

Est. Indirect Cost: \$54,569.51

OC Parks may reallocate budget from this or other projects based on department need.

Background

OC Parks requires support services for the management of a new insect/disease complex threatening over 100 species of trees in the park system. Staff in the Cooperative Extension Program have extensive experience and expertise in this field and, more importantly, because the University of California Division of Agriculture and Natural Resources and UC Cooperative Extension academics and researchers are leading the current research on this pest/disease complex, they are the source of the most up-to-date information, technology, and methodologies.

The Polyphagous Shot Hole Borer (PSHB), *Euwallacea* sp., a new pest in Southern California, attacks a wide variety of trees common to the urban landscape and natural areas of Orange County. The tiny beetle bores beneath the bark of its hosts, laying eggs in the galleries and infecting susceptible trees with a species of *Fusarium* fungus. The beetle and fungus—determined by DNA analysis to be new unnamed

species—share a symbiotic relationship: the fungus grows and spreads through the galleries, and the hatched larvae eat the fungus. While some trees are able to resist the *Fusarium*, those that are susceptible to infection experience dieback and rapid decline. These true hosts of PSHB include box elder, California sycamore, white alder, avocado, and several species of oak (Coast live, Valley, English), cottonwood (Fremont, Black), and willow (Red, Weeping, Goodding's black).

Under the existing agreement between OC Parks and UC Cooperative Extension of Orange County, PSHB has been observed infesting over 1,500 trees throughout 15 of 30 surveyed facilities.

Benefits to OC Parks

UC Cooperative Extension (UCCE), Orange County shall provide OC Parks with surveys and guidelines for the management of the Fusarium dieback (FD) disease caused by *Fusarium euwallaceae* and its vector, the Polyphagous Shot Hole Borer (PSHB). UCCE will monitor PSHB/FD levels in and adjacent to OC Parks facilities through the establishment of a detection program using chemical lures, surveys of OC Parks property and neighboring areas to determine pest pressure, and the potential use of high-resolution aerial imagery. UCCE will also develop management guidelines based on research conducted by Dr. Tim Paine (UC Riverside) and Dr. Akif Eskalen (UC Riverside). Guidelines will also be provided concerning the application of mulch, chipping, composting, and solarization techniques for infested plant material.

Project Description:

Monitoring and management of Polyphagous Shot Hole Borer/Fusarium Dieback in OC Parks will be achieved through the following UCCE activities:

1. **PSHB/FD surveys and visual monitoring.** UCCE shall continue the visual survey OC Parks trees from February through October, when beetle activity is easier to detect, for the presence of PSHB/FD and map its distribution. Trees that exhibit symptoms of PSHB/FD will be identified and the level of infestation will be assessed. Symptomatic trees that are located in previously PSHB-negative parks or that are non-reproductive hosts will be sampled for DNA analysis to confirm the presence of PSHB/FD. Coordinates will be recorded through either the ArcGIS Collector App for immediate updates to the OC Parks Tree Inventory. Mapping and monitoring the distribution of PSHB within OC Parks will allow us to study the spread of the beetle, progression of symptoms, and to better implement control procedures.
 - Years 1 - 4 – Conduct surveys from February through October of OC Parks facilities (one per week). Update OC Parks tree inventory and provide data to OC Parks using ArcGIS Collector per OC Parks request. Verify new PSHB/FD host infestations through UC Riverside's Eskalen Lab.
 - Year 5 - Summarize findings from irrigated OC Parks, wilderness and surrounding area surveys.

2. **Chemical lure detection program.** In un-infested, lightly infested, and wilderness OC Parks facilities, UCCE will install and monitor lure and trapping systems to more efficiently detect new incidences of PSHB.
 - Year 1 – Identify locations where lure and trap systems will be installed. Once lures become available (projected by manufacturer to be approximately June 2015), monitor lure and trap systems monthly. Collaborate on testing of various lures with UCR and USDA Forest Health to refine deployment of traps, especially in irrigated landscape/wilderness interfaces to augment visual surveys.
 - Years 2 – 4 – Reevaluate trap locations and count beetle numbers in traps (monthly counts). Compare maps of trap locations and numbers over time. Identify trends over time and possible ingress of PSHB into OC Parks.
 - Year 5 – Reevaluate trap locations and count beetle numbers in traps (monthly counts). Compare maps of trap locations and numbers over time. Identify trends over time and possible ingress of PSHB into OC Parks. Summarize findings and integrate into PSHB management guidelines.

3. **Using high-resolution aerial imagery (remote sensing) to detect PSHB/FD infestations.** UCCE will investigate the use of high-resolution aerial imagery as a remote evaluation tool. This method has the potential to a) facilitate the detection of PSHB/FD in isolated areas and b) help researchers observe trends in the distribution and development of this pest complex and replace the need for Vantage Point Reconnaissance.
 - Years 1 – 4 – Use aerial imagery to identify stressed trees in un-surveyed or less accessible areas in OC Parks facilities. Investigate areas with concentrations of stressed trees via PSHB/FD ground surveys. Compare multiple years of aerial imagery in areas with known PSHB/FD infestations in order to identify potential trends in tree canopy health.
 - Year 5 – Continue to compare multiple years of aerial imagery in areas with known PSHB/FD infestations in order to identify potential trends in tree canopy health. Summarize findings on the value of aerial imagery in the detection of PSHB/FD. Determine whether PSHB/FD infestations can be identified by trends in tree canopy health.

4. **PSHB/FD Management Guidelines.** UCCE will develop guidelines for the management of PSHB/FD in OC Parks. Recommendations will be based upon Dr. Akif Eskalen’s (UC Riverside)

insecticide/fungicide research, as well as research by other sas Dr. Tim Paine (UC Riverside). The guidelines will include:

- Tree rating systems
 - Action thresholds
 - Insecticide/fungicide selection recommendations
 - Insecticide/fungicide treatment and delivery (drench, spray, injection, etc.) recommendations/options
 - Removal and disposal of PSHB material
 - Treatment recommendation for pruning cuts
 - Updated lists of non-host, FD-susceptible, and reproductive tree species
 - Trapping systems based on most current research lures and traps
 - Treatment, control strategies, and detection in riparian areas
 - Feasibility of buffer zones, trap crop/trees
 - Develop tree replacement/replanting protocols addressing PSHB
 - PSHB/FD Management Guidelines for OC Parks and Nature Reserve of Orange County programs at Riley Wilderness Park, Caspers Wilderness Park, and O’Neill Regional Park
 - Develop and conduct staff training as needed
 - Consult with OC Parks project manager on other PSHB related issues as needed
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- Years 1 – 4 – Develop and update PSHB/FD Management Guidelines and other outreach materials as new information becomes available.
 - Year 5 – Summarize findings from research studies, OC Parks/area surveys, detection program, and aerial imagery remote sensing evaluation into Management Guidelines.

Exhibit B

Gold-Spotted Oak Borer (GSOB) Monitoring

Principal Investigator:

Darren Haver, Ph.D., OC UC Cooperative Extension

Potential Collaborators:

Tim Paine, Ph.D., Dept. of Entomology, UC Riverside

Tom Coleman, Ph.D., USDA Forest Service, Forest Health Protection

Cheryl Wilen, Ph.D., UC IPM Advisor

Tom Scott, Ph.D., UC Berkeley

Cara Washington, UC Riverside

Project Duration and Budget:

Year 1: Aug 1, 2015 to April 30, 2016

Estimated budget: \$31,800.22

Est. Indirect Cost: \$8,268.06

Year 2: Aug 1, 2016 to April 30, 2017

Estimated budget: \$33,425.14

Est. Indirect Cost: \$8,690.54

Year 3: – Aug 1, 2017 to April 30, 2018

Estimated budget: \$35,124.85

Est. Indirect Cost: \$9,132.46

Year 4: – Aug 1, 2018 to April 30, 2019

Estimated budget: \$36,902.60

Est. Indirect Cost: \$9,594.68

Year 5: – Aug 1, 2019 to April 30, 2020

Estimated budget: \$38,761.75

Est. Indirect Cost: \$10,078.06

OC Parks may reallocate budget from this or other projects based on department need.

Background:

OC Parks requires support services in the monitoring and potential management of the Gold-Spotted Oak Borer (GSOB), *Agrilus auroguttatus*, an insect pest that was recently discovered infesting over sixty Coast live oak in Weir Canyon, Orange County. This infestation resulted in the removal of 16 trees and insecticide treatment of the remaining trees. Staff in the Cooperative Extension Program have extensive experience and expertise in these areas and, more importantly, because the University of California Division of Agriculture and Natural Resources and UC Cooperative Extension academics and researchers

are leading the current research on this pest/disease complex, they are the source of the most up-to-date information, technology, and methodologies.

The Weir Canyon infestation is the second outbreak of GSOB outside of San Diego County, where the beetle has caused extensive oak injury and mortality. GSOB attacks three species of oak: Coast live oak, *Quercus agrifolia*; Canyon live oak, *Quercus chrysolepsis*; and California black oak, *Quercus kelloggii*. The beetle tends to attack older, mature trees but has been observed infesting oaks with trunk diameters as small as 8 to 10 inches. Infested trees exhibit bark staining, woodpecker damage, crown thinning, premature leaf loss, branch dieback, and, following several years of injury, eventually die.

This project is designed to limit the loss of oak woodlands in OC Parks and by extension, surrounding communities. These losses can be calculated in remediation cost, loss of use values and ecosystem services, and loss of amenity value in property. The multiple-year closures of campgrounds in Cuyamaca Rancho State Park in San Diego resulted in a loss of hundreds of thousands of dollars of fees and an even higher value in lost opportunities for recreational use. The loss of property values associated with oak mortality in foothill housing would likely be in the hundreds of millions of dollars.

Project Description:

UNIVERSITY will use a combination of aerial imagery surveys and ground surveys to determine presence or absence of the Gold-Spotted Oak Borer (GSOB), *Agrilus auroguttatus* on OC Parks lands. This activity will include mapping dead oaks and declining oaks across Orange County Parks lands, and prioritizing areas for ground surveys.

UNIVERSITY will provide treatment protocol options for GSOB on OC Parks lands.

UNIVERSITY will provide at least one annual field and classroom GSOB training for OC Parks staff and relevant maintenance contractors.

Deliverables:

1. UNIVERSITY will utilize high-resolution aerial photo imagery, to be provided by OC Parks, to detect suspect oak trees on OC Parks lands. Ground surveys will then be used to determine presence/absence of GSOB where concentrations of stressed oak trees are identified by the imagery surveys. If GSOB is detected on OC Parks land, UNIVERSITY will conduct delimiting surveys to determine the boundaries of the infestation.
2. UNIVERSITY will provide treatment protocol options for GSOB on OC Parks lands. These will include a GSOB management matrix and references to GSOB management plans used by other agencies.
3. UNIVERSITY will provide at least one annual field and classroom training for OC Parks staff and relevant maintenance contractors. Topics to be addressed will include GSOB identification, updates to management protocols, and review of OC Parks-system-wide GSOB situation.

Timeline:

- Within first year of agreement execution:
 - Receive training from UC Riverside experts on the use of aerial imagery in tree canopy monitoring
 - Develop treatment protocol options for GSOB on OC Parks lands
- Annual activities
 - June-September: remote monitoring of OC Parks lands using high-resolution aerial imagery
 - OC Parks aerial photography will be provided to UCCE by early June
 - Imagery surveys will be conducted 1 day per week for 18 weeks
 - Provide imagery survey report
 - October-February: conduct ground surveys of suspect oaks identified in imagery surveys
 - Ground surveys will be conducted 2 days per week for 20 weeks
 - Immediately report positive GSOB detections to OC Parks
 - Conduct delimiting surveys if GSOB is positively detected (assuming that new GSOB sites are identified, delimiting surveys will be conducted for 2-3 weeks)
 - Provide ground survey report
 - Provide at least one annual field and classroom training for OC Parks staff and relevant maintenance contractors
 - Update treatment protocol options for GSOB on OC Parks lands

Exhibit C

Yellowjacket Monitoring and Management at Irvine Regional Park

Principal Investigator

Dong-Hwan Choe Ph.D., UC Riverside

Potential Collaborators

Erin Wilson Ph.D., UC Riverside

Michael Rust Ph.D., UC Riverside

Project Duration

Year 1: May 2015 to October 2015

Estimated budget: \$12,000

Est. Indirect Cost: \$3,120

Year 2: May 2016 to October 2016

Estimated budget: \$12,000

Est. Indirect Cost: \$3,120

Year 3: May 2017 to October 2017

Estimated budget: \$12,000

Est. Indirect Cost: \$3,120

OC Parks may reallocate budget from this or other projects based on department need.

Background

Over a period of years one of the top concerns reported by park patrons at Irvine Regional Park was nuisance and sting from yellowjackets. Treatment by contract exterminators and use of commercially available wasp traps proved of limited value.

A microsatellite analysis was conducted with wasps trapped from three monitoring localities in August 2012 indicated the presence of at least 18 colonies in and around the park. Foragers from as many as 11 colonies were detected at one of the trap sites. Individuals from two colonies were found at all three localities monitored, suggesting the nests of those colonies could be present within the park boundaries. This technique may help identify areas within the park and determine if baiting actually eliminates individual colonies.

Project Description

Existing yellowjacket control measures have proven insufficient. Pesticide application methods also potentially expose the environment to unnecessary pesticide levels. A monitoring and treatment program similar to that used in 2011-2014 will be employed during this project.

UCCE will use information from the yellowjacket project to develop an Integrated Pest Management (IPM) program for yellowjackets. IPM programs combine preventative strategies with monitoring, cultural, physical, and mechanical management methods, biological control, and pesticides. Training

material will be developed for OC Parks Rangers. UCCE will also develop outreach material on how to avoid yellowjacket stings for park visitors.

In the long term, the trapping data and efficacy data will be used to develop the best Integrated Pest Management (IPM) practice. The bait testing that has been conducted since 2011 resulted in a bait manufacturer unsuccessfully pursued registration for one of the tested insecticides in a bait formulation for a yellowjacket control. The Choe Lab at UC Riverside is working with a polymer-based substrate that replaces the chicken and an alternative active ingredient that might be available for registration. Ideally, a minimum of three years of data will be available to validate the IPM strategy.

Deliverables and Timeline

This test will use an experimental method and treatment under a Research Authorization held by UC Riverside researchers Dr. Dong-Hwan Choe and Dr. Michael Rust. The project accumulate data that supports a low cost, effective IPM method of yellowjacket control that eliminates or dramatically reduces yellowjacket complaints by park visitors. This method will also dramatically reduce the amount of insecticide used to control yellowjackets, reduce/mitigate non-target organism exposure to the insecticides used, and reduce/mitigate off-site movement of the insecticides used.

Data accumulated from the monitoring and baiting program will be used to support and encourage the potential registration of a product by a private pesticide company(s).

1. **Yellowjacket trapping/monitoring.** Yellowjacket monitoring will be used to determine population locations, numbers of flying yellowjackets, and when populations reach the threshold for treatment for insecticide baiting. Yellowjacket populations begin peaking at different times each year depending on the weather. This correlation between daily upper and lower air temperature and yellowjacket reproductive capacity emphasizes the importance of using monitoring trap population counts to schedule treatments due to the correlation between daily upper and lower air temperature and yellowjacket reproductive capacity. Monitoring traps are installed around the park perimeter as well as near picnic/eating areas.
 - Years 1 and 2 – Trapping/monitoring program to determine yellowjacket population levels and distribution in the park. Trap service will take place on a biweekly basis replacing lures, collecting trap contents, and counting yellowjacket numbers. Map trap locations and compare high/low population levels to those of previous years.
 - Year 3 – Continue work from previous years and summarize all trapping/monitoring data from.
2. **Yellowjacket baiting.** Biweekly monitoring of the yellowjacket traps will be used to determine when baiting is necessary.
 - Years 1 and 2 – Install yellowjacket bait stations once population levels exceed action threshold, as indicated by monitoring traps. Monitor post-treatment yellowjacket populations and analyze efficacy of bait treatments.

- Year 3 – Continue work from previous years and summarize data on bait efficacy.
3. **Yellowjacket outreach and training material.** UCCE will develop yellowjacket outreach and training material for OC Parks use.
- Year 1 – Develop yellowjacket outreach/training material intended for a) park visitors and b) OC Parks Rangers. Outreach material for park visitors will describe how to avoid stings in yellowjacket encounters. Training material for OC Parks Rangers will include a brief description of the project and IPM methods of yellowjacket control.
 - Years 2 and 3 – Update yellowjacket outreach/training material as needed.
4. **Develop yellowjacket IPM report based on project data.** Summarize project findings. Use project report to encourage companies to register a product that can be used by OC Parks.
- Years 1 and 2 – Summarize monitoring/trapping and baiting efficacy data in project report.
 - Year 3 – Include monitoring/trapping and baiting efficacy data from all years in project report. Use accumulated data to support and encourage registration of a product by a private pesticide company(s).

Exhibit D

Optional Projects and Services

If requested by OC Parks, UNIVERSITY involvement in the following activities and any other additional projects and services may require modification to scopes of work and budgets of existing projects. These and other optional projects and services must be mutually agreed upon by OC Parks and UNIVERSITY.

1. Annual updates of previously produced training, documents, brochures, etc.
2. Management guidelines and/or training for California oaks and sycamores, addressing characteristics, lifecycle, dripline management, circumstances requiring irrigation, soil compaction, maintenance and pruning techniques.
3. Management guidelines and/or training related to irrigation and conservation of potable water.
4. Management guidelines and/or training related to plant pests and diseases.
5. Pest management training for buildings, recreational and natural areas, including diagnostic skills and use of alternate pest control methods.
6. Provide management options, including registered and alternative pesticides, based on most current research information.