Proceedings

56th Southern Forest Insect Work Conference

July 22 – 25, 2014
Francis Marion Hotel
Charleston, South Carolina

Charleston, South Carolina
PROCEEDINGS
56th Annual
SOUTHERN FOREST INSECT WORK CONFERENCE

Francis Marion Hotel
Charleston, South Carolina
22–25 July 2014

Kamal Gandhi and Jiri Hulcr, Program Chairs

Laurie Reid, Local Arrangements

Officers: 2013–2014
Chairman.................................................................................................. Don Grosman (2012–2014)
Secretary-Treasurer.................................................................................. Will Shepherd
Counselors................................................................................................. Jason Moan (2010–2014)
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Registration List, 56th SFIWC, Charleston, South Carolina

* = student, † = retired

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24 students, 5 retirees, and 82 professional members = 111 registered participants
Figure 1
Front Row (left to right): Rima Lucardi, Jessica Hartshorn, Matt Ethington, Yanzhuo Zhang, Carol Scott, Dana Stone
Back Row (left to right): Chris Crowe, Scott Horn, Don Grosman, Scott Salom, Lynne Rieske-Kinney, Andy Boone, Luke Dodd
Figure 2
Front Row (left to right): Brian Sullivan, Kier Klepzig, Robert Jetton, David Bednar, Jake Bodart, David Coyle
Back Row (left to right): Robert Coulson, Ben Smith, Jim Hanula, Fred Stephen, Bud Mayfield
Figure 3
Front Row (left to right): Chip Bates, Dave Moorhead, Sara Thompson, Wayne Langston, Allen Smith, Melissa Fischer
Back Row (left to right): Robert Farris, Robert Trickel, Doug Akin, James Johnson, Randy Chapin, Gene Kodama
Figure 4
Front Row (left to right): Jeffrey Eickwort, Kamal Gandhi, Tim Schowalter, Rabiu Olatinwo, Ron Billings
Back Row (left to right): Jim Ellenwood, Frank Sapio, Marla Downing, Paul Merten, John Taylor
Figure 5
Front Row (left to right): Richard Fink, Holly Wantuch, Katlin Mooneyham, Molly Darr, Pat Parkman, Michelle Frank
Back Row (left to right): Anna Greis, James “JT” Vogt, Wes Nettleton, Jerome Grant, Will Shepherd
Figure 6
Front Row (left to right): Bob Rabaglia, Greg Wiggins, Elizabeth Benton, Christiane Helbig, Ashley Schulz, Ansley Silva
Back Row (left to right): John Riggins, John Formby, Kevin Chase, Chris Asaro, John Nowak

**56th Annual Southern Forest Insect Work Conference**  
**July 22-25, 2014**  
**Charleston, South Carolina**

**PROGRAM**

**Tuesday, July 22nd**

1:00 - 2:45 PM  
*Southern Pine Beetle (SPB) Working Group (Organizer: John Nowak, USDA-FS-FHP) - Calhoun Room*

Jim Meeker, USDA-FS-FHP - Update on current SPB activity on the National Forests in Mississippi

Bill Oldland, USDA-FS-FHP - SPB in New Jersey update

Chisolm Beckham, South Carolina Forestry Commission - Review of SC’s SPB Program- “keep it simple”

**Abstract:** SC’s SPB Program’s guidelines were created to efficiently direct funds where they are most needed, areas with historical pine loss to SPB and poor pulpwood markets. Getting to those guidelines has been a continual process from the beginning of the program’s implementation. SC’s Piedmont region typically has smaller stands, unhealthy pulpwood markets, and greater historical pine loss to SPB. Increasing pine merchantability within the Piedmont region quickly became more of a priority of the Program, and pine stands within this region that contain more chipnsaw-sized trees at the time of the first thinning are usually considered more merchantable. To ensure more chipnsaw-sized trees and healthy crown ratios at the first thinning, one should plant fewer, high-quality seedlings and thin at a later age, 18-20 years, or precommercial thin over-dense stands between years 4-9. The guidelines of the SPB Program ensure more chipnsaw-sized trees at the first thinning by restricting loblolly planting to 435 pines per acre and longleaf planting to 545 pines per acre and the residual pine density after precommercial thinning to 545 pines per acre. Thus, demand for the program is maintained in areas with historical pine loss to SPB and poor pulpwood markets, and demand for these practices are less in healthy pulpwood markets and areas with less historical pine loss to SPB. Demand for planting longleaf is increased over loblolly within the coastal plain since applicants are allowed to plant 545 longleaf per acre. SC’s Guidelines have fulfilled a portion of the prioritization requirement of the National Guidelines by prioritizing areas with more historical pine loss over areas with less and prioritizing longleaf planting over loblolly planting. SC’s SPB Program will continue to create and maintain guidelines that efficiently prioritize areas with historical loss to SPB.

John Reeve, Southern Illinois University - SPB dispersal and synchrony across regions

**Abstract:** Dispersal likely has an important role in SPB population dynamics, and knowledge of dispersal behavior could improve the management of outbreaks. While SPB dispersal has been quantified within forests, no studies have examined their response to edges between landscape elements. We used transects of baited traps to observe the spatial distribution of SPB and clerids at the pine-clearing edge for three sites in the Homochitto NF. A discontinuity in beetle density at the pine-clearing boundary would provide evidence for edge behavior. None was observed for SPB, while clerid densities were higher within pine, suggesting they avoid the clearing. Additional replicates of these transects are planned at other sites. A second study looked for evidence of synchrony among SPB populations at the state level, which could result from large-scale dispersal of SPB, or forcing by weather events that affect multiple states. We used a long-term data set (1960-2004) on SPB-killed timber volume by state as a proxy for SPB density. A time series cross-correlation analysis showed
The compound endo-brevicomin is one of three components in the aggregation attractant for the southern pine beetle (along with frontalin and pine monoterpenes) which are employed together in a highly attractive trapping lure for this species. The effects of endo-brevicomin on SPB behavior are not entirely understood, and a thorough knowledge of its properties should help insure its efficacious use in SPB management. One curious property of endo-brevicomin is that it alternately can reduce or enhance attraction to the remainder of the attractant blend depending upon whether traps are deployed inside or outside of active SPB infestations, respectively. We hypothesized that preexisting background of endo-brevicomin inside active infestations might itself cause the apparent activity reversal, and we therefore performed tests in which we contrasted the effects of endo-brevicomin releasers in the presence/absence of a localized, artificially-created background of endo-brevicomin. In support of our hypothesis, we observed that addition of endo-brevicomin releasers to traps reduced catches when background was present but enhanced it when background was absent. We believe that the mechanism driving this effect could be SPB’s dose response to endo-brevicomin, which was found to be “multifunctional” in field trapping trials; that is, it increased trap catches up to a release rate of ~0.2 mg/d and then caused lesser enhancement and finally inhibition as the rate was increased to 30 mg/day. It is possible that preexisting background of endo-brevicomin may produce the same catch-enhancing effect as low rates of release from the trap itself (i.e., by creating a relatively low concentration of endo-brevicomin at the trap or in its immediate vicinity). Further addition of endo-brevicomin might reduce catches, even though the net effect of the presence of endo-brevicomin from all sources would still be attraction enhancement.

Published data indicate that tree-killing bark beetles in the Central American region previously identified as SPB actually consist of two distinct species. The as-yet undescribed species (which we expect to be named “Dendroctonus mayanensis”) differs from SPB in morphology, behavior, and number of chromosomes. These species attack trees simultaneously, but despite evidence that interspecific pairings can be induced in the laboratory and produce larval brood, no interspecific pairings have ever been found in naturally-infested trees. We therefore investigated the role that pheromones may play in reproductive isolation between these species. Studies in a walking olfactometer indicated that males readily distinguished the odors of conspecific females. Chemical and electrophysiological analyses of these odors indicated that females of the undescribed species produced two compounds, endo-brevicomin and ipsdienol, that were absent from SPB females but sensed by antennae of males of both species. Further olfactometer bioassays indicated that these two compounds were necessary for attraction of males of the undescribed species whereas they inhibited response of SPB males. Thus the two compounds endo-brevicomin and ipsdienol appear to mediate species discrimination by mate-seeking males of both species at least when walking (e.g., when searching the bark surface for female entrances). Responses by males in these laboratory assays differed from responses to baited traps in the field insofar as males of both species were more attracted to logs infested with females of the undescribed species than to logs infested with female SPB. In tests with artificial lures, ipsdienol reduced attraction of SPB (as it had in the laboratory) whereas endo-brevicomin acted as an attractant synergist. Catches of the undescribed species in traps baited with any synthetic lure combination were too low to allow statistical discrimination of the effects of components, and the very poor performance of synthetic lures with the undescribed species is a continuing topic of investigation.

Steve Clarke, USDA-FS-FHP - Short and long range dispersal of SPB: Conclusions from the SPB transect project

3:00 - 7:00 PM
Meeting Registration (Organizer: Will Shepherd, USDA-FS-SRS) - Upper Lobby
4:30 - 5:00 PM
Executive Team Meeting (Organizer: Don Grosman, Arborjet Inc.) - Middleton Room

5:00 - 5:30 PM
A.D. Hopkins Award Committee Meeting (Organizer: Kier Klepzig, USDA-FS-SRS) - Middleton Room

5:30 - 6:00 PM
Roger F. Anderson Award Meeting (Organizer: Scott Salom, Virginia Tech) - Calhoun Room

6:00 - 8:00 PM
Poster Set-up (Organizers: Molly Darr and Katlin Mooneyham, Virginia Tech) - Gold Room

6:00 - 8:00 PM
Mixer and Reception - Colonial Room
Wednesday, July 23rd

Breakfast on your own

8:00 - onwards
Meeting Registration (Organizer: Will Shepherd, USDA-FS-SRS) - Upper Lobby

8:00 - 8:15 AM
Welcome Address to Southern Forest Insect Work Conference - Colonial Room
Kamal Gandhi, University of Georgia and Jiri Hulcr, University of Florida

Welcome Address to South Carolina - Colonial Room
Henry E. “Gene” Kodama, State Forester, South Carolina Forestry Commission

8:15 - 8:45 AM
Opening Business Meeting – Colonial Room
Don Grosman, Arborjet Inc.

8:45 - 9:15 AM
Keynote Presentation (Organizer: Chip Bates, Georgia Forestry Commission) - Colonial Room
Robert Farris, Director of the Georgia Forestry Commission - Together we stand, divided we fall

9:15 - 10:15 AM
Plenary Session I – Pathways to Forest Health (Organizer: Kamal Gandhi, University of Georgia) - Colonial Room
Stephen Switzer, U.S. Customs and Border Protection - U.S. Customs and Border Protection’s agriculture mission: Port of Charleston

10:15 - 10:45 AM
Break
Group Photos (Organizer: Ron Billings, Texas Forest Service)
10:45 - 12:15 PM
Plenary Session II – Emerging Technologies in Forest Health (Organizer: Don Grosman, Arborjet Inc.) - Colonial Room


Rima Lucardi, Yanzhuo Zhang, and Travis D. Marsico, USDS-FS-SRS, University of Georgia, and Arkansas State University - Interdisciplinary approaches to detecting and predicting potential forest pest insects

[Abstract: Increasing global connectivity has been related to significant increases in global biological invasions by undesirable organisms, negatively impacting the ecology and economy of forest systems. Few, if any, generalizable characteristics can be drawn from invasion processes to aid in the prediction and early detection of significant invaders prior to becoming substantial problems. Significant invaders are those that may cause local extirpation or functional extinction of important forest trees such as the American chestnut (Castanea dentata), eastern and Carolina hemlock (Tsuga spp.), ash (Fraxinus spp.), and several more in the eastern United States. Narrowing our interest to better detect and predict forest pest insects, we find that the major pests affecting eastern forest trees are high-impact, herbivorous, and genus-specialist insects. Today, no single discipline of research can fully answer applied questions posed by these kinds of problems; we are advocating for multi-disciplinary teams to better address emerging problems. Together, the fields of population and community ecology, entomology, biological control, invasive species biology, and population genetics will more effectively approach growing problems associated with invasive forest pest insects, and incorporate more complex hypotheses, such as invasion meltdown, to achieve results. We advocate the inclusion of basic and applied research to develop the tools desperately needed by the field to effectively conduct early detection and rapid response (EDRR). Furthermore, interdisciplinary teams are needed to develop models to predict potential high-impact invaders so that prevention is possible, precluding the need for EDRR.]

David Moorhead, C.T. Bargeron, and G.K. Douce, University of Georgia Center for Invasive Species and Ecosystem Health - Bugwood Apps – New tools for identification and reporting of forest pests

12:15 - 1:30 PM
Lunch on your own

1:30 - 3:00 PM
Graduate Student Session (Organizer: Robert Jetton, North Carolina State University) - Colonial Room

Jackson Audley, University of Tennessee and Ignazio Graziosi, University of Kentucky, Moderators

Jeff Lombardo and Matt Ayres, Dartmouth College - Populations at the limits of their geographic distribution: climate change, range expansion, and forest insect pests
Abstract: In eastern North America many important pest species are shifting their geographic range northward in response to climate change. As range shifts occur, species are exposed to habitats that differ from their traditional range. This includes differences in forest community composition, physical structure of the habitat, and environmental seasonality. Determining how these factors will impact pest population dynamics is an important component to protecting forests from the threat of insect pests in the face of climate change. Here I examine the influence of seasonality on pest insect populations using one of the most destructive pests, the southern pine beetle, as a model system. In the last 10 years the southern pine beetle has caused major damage to pine forests as far north as New Jersey. Populations at these latitudes however, experience a far different seasonality than those in the traditional range in the Southeast. Using both experimental data and models of southern pine beetle development rates we demonstrate the effect of extended cold seasons on population size, stage structure (egg, larvae, pupae, adult) and growth rate ($r$). Because this insect lacks diapause, and because of important differences in temperature – development thresholds of the different life stages, overwintering populations at higher latitudes pool-up at late larval / pre-pupa stage, resulting in a highly synchronized emergence of new adults the following spring. Given the strong positive density dependent effects of mass-attacking insects such as southern pine beetle, this synchrony can have important demographic consequences, potentially resulting in increased frequency and magnitude of outbreaks in northern regions.

Carissa F. Aoki, Carla S. Pimentel, Nina K. Lany, and Matthew P. Ayres, Dartmouth College
Modeling southern pine beetle outbreak dynamics using zero-inflated models

Ignazio Graziosi and Lynne Rieske-Kinney, University of Kentucky - Can modulating fecundity increase invasiveness?

Abstract: Fecundity is a key factor modulating population growth rate, and is of particular significance when considering the invasiveness of introduced species. In insects fecundity is affected by body size, age and nutrition. We investigated the potential fecundity of the invasive Asian chestnut gall wasp Dryocosmus kuriphilus Yasumatsu (Hymenoptera: Cynipidae), an introduced parthenogenetic gall former of Asian origin impacting chestnut trees (Castanea spp.) globally, in order to better understand its invasiveness. We compared ovarian, egg, and body metrics of adult wasps of different age. We evaluated insect weight, body length, mesosomal and metasomal lengths and widths, hind femur length, number of eggs, and size of eggs in wasps from four age cohorts. Egg load decreased with wasp age, and egg size initially increased before decreasing. Adult weight and metasomal width were positively correlated with number of eggs. Our findings suggest that adult D. kuriphilus, previously reported as proovigenic, may be resorping eggs in the absence of suitable hosts, and reallocating nutritive resources for body maintenance and egg quality to increase fitness, implicating a plasticity in its reproductive strategy. Dryocosmus kuriphilus may be able to vary its potential fecundity in response to nutrition and host availability, thus increasing its invasiveness.

Holly Wantuch, Scott Salom, and Thomas P. Kuhar, Virginia Tech - Phenology of pine bark adelgid, Pineus strobi (Hemiptera: Adelgidae), in Virginia

David Bednar, Allen Cohen, Fred Hain, North Carolina State University - The role of trophically related enzymes present in the balsam woolly adelgid in symptoms observed in Fraser fir

Christiane E. Helbig, David R. Coyle, Kier D. Klepzig, John T. Nowak, and Kamal J.K. Gandhi, University of Georgia, USDA-FS-SRS, USDA-FS-FHP - Rhizophagous weevils - primary or secondary pests on loblolly pines?

Ashley N. Schulz, Chris Asaro, David R. Coyle, Michelle M. Cram, Rima Lucardi, Angela M. Mech, and Kamal J.K. Gandhi, University of Georgia, Virginia Dept. of Forestry, USDA-FS-FHP, USDA-FS-SRS - Severity and extent of white pine dieback in the Chattahoochee National Forest in Georgia
Eastern white pine (*Pinus strobus*) is an ecologically and economically important conifer tree present in the eastern region of North America. Since the mid-2000s, white pine trees in the southeastern U.S. started showing signs of dieback with multiple canker formations and pitching. Upon closer investigation, a scale insect, *Matsucoccus macrocicatrices*, was detected under lichen and epiphytic mats or in branch crotches and cankers on white pine stems. Since white pine dieback has become more prevalent, it is critical to assess its relative health in the southeastern U.S. Our research objectives are to: 1) determine the range and severity of dieback in symptomatic white pine trees located in the southern Appalachians; and 2) assess if white pine tree health is associated with varying site conditions.

To determine the range of dieback in the southeastern U.S., we established 40 sites (three, 10 meter radius plots per site) across six states (Georgia, North Carolina, South Carolina, Tennessee, Virginia and West Virginia). Within each plot, we documented basal area, topographic features, and assessed the overall health of white pine trees in all diameter classes. Further, we collected white pine saplings to determine relationships between white pine dieback and the presence of the scale insect and cankers for each site.

Preliminary results from eight sites in Georgia indicated that the average health rating for the mature white pine trees was 2.96 (on a scale of 1-5, where 1 is a healthy and 5 is a dead tree). Average sapling dieback ranged from 4% to 40% in the eight sites. A logistic regression analysis revealed that sapling dieback was more associated with cankers than the scale insect, but that the scale insect is still associated with the cankers, especially with *Caliciopsis pinea* cankers. We intend to continue collection in South Carolina, Tennessee, North Carolina, Virginia, and West Virginia to complete regional-level analyses of the white pine dieback phenomenon in the southeastern United States.

**Abstract:** Redbay (*Lauraceae: Persea borbonia* (L.) Spreng.) is a broadleaf evergreen tree found only in the coastal plains of the southeastern United States. A little more than a decade ago, redbay was commonly found in dense numbers across many coastal forests and neighborhoods. Currently, the once abundant and widespread tree has been largely eliminated from the landscape by a virulent non-native disease complex. This disease complex is known as laurel wilt disease (LWD). The causal agent of LWD, *Raffaelea lauricola*, is spread by the highly mobile, cryptic, and invasive redbay ambrosia beetle (*Xyleborus glabratus* Eichhoff). Redbay ambrosia beetles are also remarkably effective at colonizing populations of redbay in a brief time period. For example, within 2 years of the initial detection of a beetle within an uninfected stand, mortality of mature redbay can exceed 90%. Unfortunately, this rapid mortality and elimination of redbay from the landscape could have many negative effects on the ecosystem. One insect that may be directly affected by LWD is the palamedes swallowtail butterfly (*Papilio palamedes* Drury). The palamedes has a strong oviposition preference for redbay leaves and the larvae have greater survivorship on redbay than other laurel species within the butterfly’s range. Therefore, LWD-induced morality of redbay may have a negative effect on the reproduction and abundance of the butterfly. To determine if mortality of redbay is impacting the abundance of the palamedes, ~400 meter (1/4 mile) modified “Pollard transects” were walked and butterflies within 15 meters on each side of the observer were tallied. Three transects were walked per treatment type (i.e. infected and uninfected stands). Stands selected for the infected treatment type occur where LWD has been present for 3 years. Stands initially selected for the uninfected treatment type had no visible signs of infection, however, several stands currently have LWD-killed trees. To date, transects have been performed in Mississippi (3 years) and North Carolina (2 years) with data collection continuing for a minimum of 3 years in each state. Weather conditions (wind speed, temperature, % cloud cover, and relative humidity) were recorded at the beginning of each transect. Results from Mississippi indicate a significant (p < .0001) 3 fold decrease in palamedes
abundance in infected stands, and in North Carolina, palamedes abundance has also significantly (p < .0001) decreased 3 fold in infected stands. These results indicate that LWD-induced mortality of redbay is leading to a significant decrease in palamedes abundance and extinction or long term decline of redbay may lead to the loss of the palamedes swallowtail throughout much of its range. Other multi-trophic cascade effects may also become evident as LWD continues to alter the ecosystem. These results indicate the need for focused conservation efforts aimed at protecting crucial palamedes habitat and planting or management of refugia. These results also indicate the need to monitor the mortality of sassafras, another laurel species impacted by LWD, and its possible effect on spicebush swallowtail (Papilio troilus L.) abundance.

Elizabeth P. Benton, R. Jesse Webster, Carla I. Coots, Richard Cowles, Anthony Lagalante, and Jerome F. Grant, University of Tennessee - Assessment of olefin concentrations in eastern hemlock four to seven years after imidacloprid treatments for management of hemlock woolly adelgid

[Abstract: Imidacloprid, a neonicotinoid pesticide, has been widely used on eastern hemlock, Tsuga canadensis (L.) Carrière, for suppression of hemlock woolly adelgid (HWA), Adelges tsugae (Annand) (Hemiptera: Adelgidae). Olefin, a metabolite of imidacloprid, is persistent in hemlock foliage and is more toxic to HWA than imidacloprid. To determine the longevity and efficacy of imidacloprid treatments against HWA, focusing on the persistence of olefin, in eastern hemlock, a retrospective study was conducted in collaboration with Great Smoky Mountains National Park (GRSM).

Basal drench imidacloprid treatments were applied to eastern hemlock at three sites in GRSM. Sites were treated four to seven years before sampling was initiated. Hemlocks were given either high (1.6 gai/2.54 cm dbh) or low (0.8 gai/2.54 cm dbh) dose treatments, depending on their size. During the winters of 2012 and 2013, nine branchlet samples (0.5 m long) were collected from the upper, middle, and lower canopy strata of 102 hemlock trees. HWA were counted on each branchlet to assess level of suppression. Imidacloprid and olefin concentrations (parts per billion) in foliage were determined by liquid chromatography-mass spectrometry.

Both imidacloprid and olefin are present in hemlock tissue four to seven years after a single imidacloprid treatment, and HWA populations continue to be suppressed. Average olefin concentrations are greater than 6 ppb four years after treatment, which is greater than the LC_{50} (i.e., the lethal concentration to kill 50% of the population) for HWA. However, five, six and seven years after treatment olefin concentrations are below the LC_{50}. The observed HWA suppression could be due to a combined effect of the concentrations of imidacloprid and olefin present in hemlock tissue both of which are present in concentrations below the LC_{50} for HWA. Thus, additional imidacloprid treatments should be considered five years after initial treatment. Improved understanding of how imidacloprid and olefin persist in hemlock foliage can enhance GRSM’s control program by giving guidance on when to consider retreating hemlocks. Treating hemlocks less often would reduce the pesticide input into the ecosystem, which would minimize potential non-target impacts. Reducing imidacloprid application frequency would also have financial benefits for an IPM program, enabling more hemlocks to be treated.]

Jackson Audley, Albert "Bud" Mayfield, Scott Myers, and Adam Taylor, University of Tennessee, USDA-FS-SRS - Effects of phytosanitation treatment on walnut twig beetle colonization of black walnut logs

William Davidson, and Lynne Rieske-Kinney, University of Kentucky - Saving our ash: A sustainable approach to emerald ash borer management

[Abstract: The emerald ash borer, Agrilus planipennis (EAB), is an exotic wood boring buprestid native to Asia which has spread through much of the eastern United States. Ecological concerns, application constraints, and the high costs of conventional insecticides prohibit their widespread use for ash protection in forests and ongoing classical biocontrol attempts have been unsuccessful at preserving standing ash due to rapid tree mortality. My study combines insecticide applications with releases of the exotic Tetrastichus planipennis (Hymenoptera: Eulophidae) in order to slow ash mortality and allow natural enemy establishment, thereby preserving ash resources in Kentucky. In 2013 and 2014 60 forested plots across five sites with varying EAB infestation history were assigned to one of four treatments: 1) imidacloprid applied at label rates, 2) biological
control releases, 3) a dual treatment of imidacloprid applied at reduced rates coupled with biological control releases, and 4) untreated controls. The aim of the dual treatment is to suppress EAB populations, slow ash decline and facilitate establishment of parasitoid populations. Adult EAB populations were monitored, and Malaise and pan traps were deployed to evaluate insect communities. In winter 2014 infested ash were felled, cut into 60cm sections, and either debarked or stored in rearing enclosures to evaluate EAB larval density and presence and abundance of both native and exotic parasitoids across treatments. Larval densities in biological control plots were higher than those in insecticide and dual treatment plots (P<0.05). Accompanying this reduction in treated trees, we see signs of successful establishment of biological control agents and recruitment of native natural enemies over a relatively short time period. This research will aid in developing improved, sustainable approaches for managing EAB which will contribute to preservation of our ash resources, and may be applicable to future forest invaders.]

Katlin Mooneyham, Scott Salom, and Donald Mullins, Virginia Tech - Release-recovery in the field and reproductive success in the lab of *Laricobius osakensis*, a predatory beetle of the hemlock woolly adelgid (*Adelges tsugae*)

Molly Darr, Scott M. Salom, Loke T. Kok, and Tom McAvoy, Virginia Tech - Development and fecundity of *Scymnus (Pullus) coniferarum*, a potential BC agent for hemlock woolly adelgid

6:00 - 8:00 PM
*Poster Session and Reception (Organizers: Molly Darr and Katlin Mooneyham, Virginia Tech) - Gold Room*
**Thursday, July 24th**

Breakfast on your own

8:00 - 8:45 AM  
**A.D. Hopkins Address (Organizer: Kier Klepzig, USDA-FS-SRS) - Colonial Room**  
John Taylor, USDA-FS-FHP, Retired - Musings after 40 years of Federal Service

8:45 - 10:15 AM  
**Concurrent Session I**

**A. Emerald Ash Borer Marching South: Session 1 - Research and Technology Development (Organizer: Scott Salom, Virginia Tech) - Colonial Room**

Jim Ellenwood, USDA-FS-FHTET - Pixels, probability and pestilence, modeling emerald ash borer and thousand canker disease host density and distribution in the South

Marla Downing, USDA-FS-FHTET - The development of the 2014 risk based sample design and results from 2013 field season

*Abstract:* Timely detections of new emerald ash borer (EAB) infestations beyond the known infested area has proven challenging. To improve land managers capability of detecting EAB closer to the date of introduction the Forest Service’s Forest Health Technology Enterprise Team has worked with APHIS PPQ staff members and their state collaborators to develop annual statistically based risk models and associated sample designs to direct the placement of EAB traps. Methods used are documented and repeatable and therefore also provide an objective and transparent process for quantifying the risk of an EAB infestation.

This adaptive modeling process builds on information gained in all previous years and uses historical program data, and expert knowledge (presence and absence data, targeted high-risk areas, pest pathways, scientific literature, etc.), as well as several statistically significant independent input variables associated with the presence of *Agrilus planipennis* to select locations for deploying traps.

Results have improved each year. For example, where 67% of new detections fell into the Moderate, Moderate High and High risk classes in 2012, 67% of the new detections fell into only the High Category in 2013. Although it is too early to report results for the 2014 survey effort, Arkansas, which had not reported any infestations of EAB found four new detections from traps place in locations recommended using the FHTET sample design. Arkansas personnel also reported that the detections were in locations where they would not have expected to first find EAB infestations in their state.

Don Grosman, Arborjet, Inc. - Effective tools for managing EAB on individual trees


*Abstract:* Following the detection of the emerald ash borer (EAB), *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae), in North America (U.S. and Canada) in 2002, a classical biological control program was initiated by the United States Department of Agriculture (USDA) against this invasive pest (Bauer et al. 2008). Foreign exploration for natural enemies of EAB in its native range Northeast Asia (China, Japan, Mongolia, South Korea and the Russian Far East) resulted in the discovery, identification, and/or description of several hymenopteran parasitoids associated with EAB eggs and larvae infesting both North American ash (e.g.,
Fraxinuspennsylvanica and F. velutina) and Oriental ash (e.g., F. mandschurica and F. chinensis). These Asiatic parasitoids include the egg parasitoid Oobius agrili Zhang & Huang (Encyrtidae) and larval parasitoids Spathius agrili Yang (Braconidae), Tetrastichus planipennisi Yang (Eulophidae) and Sclerodermus pupariae Yang (Bethylidae) from northeast China (Zhang et al. 2005, Yang et al. 2006, Liu et al. 2007), and two additional species of braconid parasitoids from the Russian Far East and South Korea: Spathius galiniae Belokobylskij & Strazanan and Ananycolus nigriventris Vojnovska-J-Krieger (Belokobylskij et al. 2012, Duan et al. 2012).

After being tested against non-target insects and found unlikely to cause significant harm to native North American insects, three of the exotic parasitoid species from China (O. agrili, T. planipennisi and S. agrili) were approved in 2007 for field release against EAB in the United States (Federal Register 2007). Release of large numbers of these agents in many locations was not possible until 2010 when methods for rearing EAB in artificially infested logs were developed (Duan et al. 2011, 2013). As of 2014, tens of thousands of both egg and larval parasitoids are being produced annually with EAB hosts reared with freshly cut foliage and logs of evergreen, green or white ash at the USDA APHIS PPQ EAB Biocontrol Facility in Brighton, Michigan. As of spring 2014, several hundred thousands of O. agrili, T. planipennisi and S. agrili have been released at over 300 locations in 16 EAB-infested states across Midwestern, Mid-Atlantic and Northeast U.S. states, and Ontario, Canada (www.mapBioControl.org). While the braconid wasp S. agrili was established (i.e., recovered two or more years after release) in less than 5% of the sampled release sites, O. agrili and T. planipennisi appear to have established stable populations in more than 50% of the sampled release sites. In some of the earlier release areas (e.g., Michigan), parasitism by both O. agrili and T. planipennisi have steadily increased from <1% in the first year of releases (2008) to around 30% by 2013, five years after field release (Duan et al. 2013, Abell et al. 2014). Long-term field studies are needed to determine whether these established parasitoids will result in levels of EAB egg and/or larval parasitism that are high enough to reduce EAB population growth, density, and spread (e.g., Duan et al. 2014).

Because S. agrili does not appear to be establishing and T. planipennisi has a short ovipositor and is limited to parasitizing EAB in smaller, thin-barked trees or branches, a petition to release S. galiniae from the Russian Far East was submitted. The petition has been reviewed by the North American Plant Protection Organization Biocontrol Committee and the committee unanimously recommended approval for environmental release (Gould and Duan 2013). Spathius galiniae has a much larger body size and longer ovipositor than T. planipennisi and may be more effective in attacking EAB larvae in larger ash trees. In addition, the Russian Far East region where S. galiniae originates has a much better climatic matching index (>-0.75) with the northeastern United States than does the native range of the introduced S. agrili. Thus, S. galiniae has a higher potential to establish in northeastern and north central North America and complement the existing parasitoids (T. planipennisi and O. agrili) introduced from China (Gould and Duan 2013; Duan et al. 2014). It is expected that S. galiniae will be approved by USDA APHIS PPQ for environmental releases against EAB in the U.S. in 2015.

References


Eric Wiseman, Virginia Tech - Education tools to increase capacity for EAB monitoring by citizens and resource professionals

**B. Interactions Between Insects and Disturbances (Organizers: Jessica Hartshorn, University of Arkansas and John Riggins, Mississippi State University) - Gold Room**

Timothy D. Schowalter, Louisiana State University - Forest insect responses to disturbances

[Abstract: In comparison to environmental fluctuations or changes, disturbances are relatively abrupt events that dramatically alter habitat conditions and resource distribution for populations and communities in forested ecosystems. Forests are subject to multiple disturbance events that can be characterized by type (fire, storm, drought, etc.), magnitude (intensity and severity of effects), frequency (number of comparable events per century or average interval between events) and scale (area affected). Insect species tolerances to extreme conditions during disturbance or to altered habitat and resource conditions following disturbances determine responses to disturbance. Intolerant species may become locally extinct, whereas tolerant species or those adapted to colonized disturbed sites respond positively to the creation of new habitat or resource conditions. Outbreaks of herbivorous species often are triggered by abundant stressed hosts or pioneer host species and/or relaxation of predation following disturbances. Disturbances can initiate long term legacies, as responses to a particular disturbance determine the range of possible responses to subsequent disturbances, for at least as long as 60 years. Consequently, disturbances and insect responses are important features that control forest dynamics.]

Christopher J. Strohm and Lynne K. Rieske-Kinney, University of Kentucky - Changing litter resources associated with hemlock woolly adelgid invasion affect benthic communities in headwater streams
James R. Meeker and John Nowak, USDA-FS-FHP - Disturbance and SPB: some old and some new perspectives from recent events on the National Forests in Mississippi

C. Forest Insect Movement (Organizers: Brian Strom, USDA-FS-SRS, Fred Stephen, University of Arkansas, and Robert Coulson, Texas A&M University) - Middleton Room

Brian Aukema, University of Minnesota - Dispersal of forest insects: Lessons from a 10 year journey

Nathan Siegert, USDA-FS - Reconstructing the invasion of a difficult-to-detect insect: Establishment and early spread of emerald ash borer

Harold Thistle, USDA-FS - Physical considerations in semiochemical strategies

Robert Coulson, Brian Strom, and Fred Stephen, Texas A&M University, USDA-FS-FHP, University of Arkansas - Maintenance movement and dispersal of the southern pine beetle

10:15 - 10:45 AM
Break

10:45 - 12:15 PM
Concurrent Session II

A. Emerald Ash Borer Marching South: Session 2 - Status of EAB presence, activities, and response in the South (Organizer: Scott Salom, Virginia Tech) - Colonial Room

Kentucky – Lynne Rieske-Kinney, University of Kentucky
Virginia – Chris Asaro, Virginia Dept. of Forestry
Tennessee – Heather Slayton, Tennessee Dept. of Agriculture
North Carolina – Rob Trickett, North Carolina Forest Service
Georgia – Chip Bates, Georgia Forestry Commission
South Carolina – Laurie Reid, South Carolina Forestry Commission
Alabama – Dana Stone, Alabama Forestry Commission
Texas – Ron Billings, Texas A&M Forest Service
Arkansas – Doug Akin, Arkansas Forestry Commission
Mississippi – Randy Chapin, Mississippi Forestry Commission
B. Open Session I (Organizer: David Coyle, University of Georgia) - Middleton Room


[Abstract: Recent studies have suggested that various pine trees in the Southeast are experiencing mortality that may be linked to the incidence of root weevils and their associated fungi. However, these studies rarely consider abiotic factors that may weaken trees and increase their susceptibility to secondary pests. We are investigating pine health issues in Georgia and Alabama, with a holistic focus on both abiotic and biotic factors. Specifically, we aim to determine the role of root feeding beetles as primary or secondary colonizers of southern pines, assess the extent of pine health issues in the Southeast, and determine the relative contributions of predisposing, inciting, and contributing factors to southern pine health. Preliminary studies indicated that root-feeding weevils were not attracted to healthy trees, but were collected in significantly greater numbers to mechanically-stressed trees or those with chemical attractants. These data strongly suggest that root-feeding weevils were not primary tree colonizers in our studies. An examination of FIA data did not indicate any relationships between slope and aspect and rates of pine mortality, and there is a lack of clear regional patterns in terms of pine mortality. This suggests that if there are areas of declining pine health, these areas are small and locally distributed, and that multiple agents may be operating on the landscape. Few pine health patterns emerged when examining abiotic data (e.g. soil texture and nutrient content, slope, aspect) on a fine scale. Rather, high basal area was consistently found in stands with poor health. Presence of Leptographium spp. and Heterobasidion irregulare were ubiquitous across both unhealthy and healthy sites. We suggested areas of future research that may help elucidate the nature, extent, severity, and associated insects and diseases related to pine health issues in the Southeast.]

M. Sedonia Steininger, Andrea Lucky, and Jiri Hulcr, University of Florida - Backyard bark beetles: large scale monitoring of bark and ambrosia beetles (Curculionidae: Scolytinae and Platypodinae) using citizen science

[Abstract: Backyard Bark Beetles is a citizen science project aimed at 1) large scale collection of bark and ambrosia beetles for the purposes of monitoring new introductions, creating species distribution maps, and for use in phylogenetic studies, and 2) educating and informing the public about these significant forest pests. A simple, inexpensive trapping protocol is utilized and is disseminated via a website and social media. This protocol employs a simple, one-window soda bottle trap baited with ethanol-based hand sanitizer, which is also used for short term storage of specimens for shipment, allowing everyday citizens to effectively collect and contribute high quality insect specimens for research. In turn, participants receive feedback via emails and an interactive map on the website showing species captured. The project is therefore more than just a means for data collection, but is also a means for communicating information about participants’ contributions to the research. They can see, in real time, the creation of distribution maps and engage in science in a real and meaningful way.]

Robert Jetton, Jorge Martinez Haedo-Pons, Demian Gomez, and Gonzalo Martinez, North Carolina State University, Weyerhaeuser, Tacuarembo, Uruguay, Instituto Nacional Investigacion Agropecuaria, Tacuarembo, Uruguay - Evaluating the impacts of the eucalyptus bronze bug, Thaumastocoris peregrinus, on the productivity of eucalyptus plantations in Uruguay

Natalie Clay, Richard Lehrter, and Michael Kaspari, Mississippi State University, University of Oklahoma - Sodium limitation and the biogeography of omnivory: ants increase prey consumption in sodium-poor environments
12:15 - 1:30 PM
Lunch on your own

1:30 - 5:00 PM
Afternoon Activities
Forest Health Field Trip (Organizer: Laurie Reid)

Frontalis Cup (Organizer: Robert Coulson)

Frustrana Cup (Organizer: Steve Clarke)

7:00 - 9:00 PM
Banquet - Colonial Room
Insect Photo Salon - Colonial Room
Graduate Student Presentation Awards and Roger F. Anderson Award - Colonial Room
Breakfast on your own

8:00 - 9:30 AM
Concurrent Session III

A. Restoration as a Pathway to Forest Health (Organizers: Luke Dodd and Lynne Rieske-Kinney, University of Kentucky) - Colonial Room

Lynne K. Rieske-Kinney, University of Kentucky - Threats to the Bluegrass Savannah

Luke E. Dodd, University of Kentucky - Assessing and managing for diversity of Lepidoptera in fragmented and urban landscapes

Tom Saielli, American Chestnut Foundation - Restoring the American chestnut: genetic breeding for resistance to two pathogens

[Abstract: Before chestnut blight, American chestnut (Castanea dentata) was a dominant component of eastern United States (U.S.) forests ranging from Maine to Georgia and west to the Ohio River valley, covering more than 800,000 km². Within its native range the species was considered a prominent foundation species and in the Appalachian Mountains American chestnut represented up to 25% of the forest canopy. American chestnut is fast-growing compared to many of its competitors (diameter growth as great as 2.5 cm/yr.), and could achieve diameters of 1.5 m and heights of 37 m. It also provided rot resistant, straight-grained wood that was useful for construction, woodworking, furniture, railroad ties, telephone poles, mine timbers, and musical instruments. Furthermore, the species annually provided abundant crops of nutritious nuts that were an important food source for wildlife, domestic animals and humans alike.

Approximately one century ago, American chestnut was rapidly removed as an overstory tree by the fungal pathogen chestnut blight (Cryphonectria parasitica). The highly virulent blight fungus was accidentally introduced in the early part of the 20th century on ornamental Japanese chestnuts. The fungus spread fast, decimating the species in about fifty years. The disease caused by blight fungus results in girdling cankers, which kill the tree in two to ten years. Many approaches to control chestnut blight and restore the species to its former prominence have been attempted. However, the one tactic that has shown significant potential of providing blight-resistant trees is the hybridization and backcrossing of American chestnut trees with blight-resistant Chinese chestnut.

In 1983, Charles R. Burnham proposed that the hybridization of American and Asian chestnut followed by several generations of backcrossing with pure American chestnut stock, followed by further backcrossing of those progeny, would allow for the selection of trees that have the desired timber and nut quality, combined with resistance to blight. The American Chestnut Foundation (TACF) has aggressively pursued a hybrid breeding program throughout the eastern United States and is very close to making blight-resistant hybrids available for population-level reintroduction of the American chestnut. However, there is an additional hurdle to restoration in the southeastern United States, the virulent soil pathogen Phytophthora cinnamomi.

TACF is now pursuing a breeding program that incorporates genetic resistance to P. cinnamomi by crossing regional sources of American chestnut with Asian sources that are resistant to both pathogens. The key to this strategy involves pre-screening potentially resistant seedlings with P. cinnamomi prior to transplanting in orchards for eventual blight resistance screening. The benefit of this methodology is that pre-screening in a greenhouse allows for many more seedlings to be screened than would be possible if all seedlings were planted directly in an orchard, saving space and resources. Additionally, because containerized seedlings can be screened for P. cinnamomi during their first year, selections can be made quickly and easily. Through this process, TACF will continue with the goal of restoring American chestnut throughout its full range.]
Fred P. Hain, B.C. Smith, M.E. Talley, R.M. Jetton, and J.L. Frampton, Alliance to Save Threatened Forests - The role of the Alliance for Saving Threatened Forests in Hemlock and Fir Restoration

[Abstract: The Alliance for Saving Threatened Forests (ASTF) was founded in 2007 during a conference in Raleigh, NC. Since then two additional symposia have been held in Waynesville, NC (2011) and Asheville, NC (2013). ASTF was organized to enhance research collaboration and funding on host resistance to adelgids. Funding sources have been grant proposals to government agencies and grassroots support from private donors. ASTF is modeled after The American Chestnut Foundation; its collaborators include the US Forest Service, NC State University, Camcore, University of Rhode Island, University of Georgia, University of Kentucky, National Arboretum, Unique Places, and NC Agricultural Foundation. The ultimate goal of ASTF is to contribute to the development of an Integrated Pest Management system for hemlock woolly adelgid and balsam woolly adelgid. Components of the IPM system will include site selection, silvicultural techniques, host resistance/tolerance, biological control, and chemical control. Short-term goals are to screen and breed fir and hemlock for adelgid resistance, and to understand the biological bases for resistance (mechanisms and genetic control). The long-term goals are to deploy fir and hemlock with resistance to adelgids to restore natural stands and to aid the Christmas tree and landscape industries.

A breeding and selection approach will be employed to develop resistant planting stock and accelerate natural selection in restoring fir and hemlock. If resistance is found in native species then a series of regional clonal seed orchards grafted from trees with verified resistance will be established to provide locally adapted resistant seed. Camcore has been active in conserving the gene pool of Carolina and eastern hemlocks. The NC Christmas Tree Program has actively conserved the genes of many fir species. If no resistance is found in native species then a long-term hybridization/backcrossing program will be required; or modern biotechnological techniques will be employed.

ASTF currently has 6,048 cuttings from 72 potentially resistant hemlocks that are being rooted. When ready, some of these seedlings will be tested for resistance in a screening facility, while others will be tested in common garden plantations. 2,074 of these cuttings came from 30 hemlocks in a single stand in Wilkes County, NC (Lee stand). While infested, the hemlocks appear healthy. Many other hemlocks in this county have been infested for years and are either dead or declining, but the Lee stand shows no sign of death or decline.

We are also creating interspecific hybrids. The National Arboretum has been working to breed hybrids since the early 1990s and has had success hybridizing Carolina hemlock with several Asian species that are resistant/tolerant. The hybrids also show resistance/tolerance. The University of Georgia is using somatic embryogenesis to accelerate propagation and perhaps create additional hybrids.]

David Findley, South Carolina NRCS - The Longleaf Pine Initiative in South Carolina

B. State Cooperators Perspective (Organizer: Rima Lucardi, USDA-FS-SRS) - Pickney Room

Jeff Eickwort, Florida Forest Service - Benefits and challenges of a partnership approach to forest health in Florida

Chip Bates, Georgia Forestry Commission - Communication, education, and cooperation- Together we stand, divided we fall

Rob Trickel, North Carolina Forest Service - Building a forest health program for the 21st century

Laurie Reid, South Carolina Forestry Commission - Collaboration for effective forest protection
C. Exotic Insects: New and Old Pests (Organizer: David Coyle, University of Georgia) - Laurens Room

David R. Coyle, E. Louise Loudermilk, Robert J. Rabaglia, and Kamal J.K. Gandhi, University of Georgia, USDA-FS-SRS, USDA-FS-FHP - Impact of exotic species on community diversity: is there an ecological tipping point?

Caroline Storer and Jiri Hulcr, University of Florida - Incredible invaders: inferring invasion scenarios of both the beetle and the fungus symbionts simultaneously using high-throughput sequencing

Greg Wiggins, Jerome Grant, Rusty Rhea, Abdul Hakeem, Pat Parkman, and Paris Lambdin, University of Tennessee, USDA-FS-FHP, and Texas A&M AgriLife Research - Biological control of hemlock woolly adelgid in Tennessee: twelve years later...

[Abstract: Since 2002, eastern hemlock, Tsuga canadensis, in the Great Smoky Mountains National Park (GRSM) has declined due to hemlock woolly adelgid (HWA), Adelges tsugae. To reduce the spread and effect of this invasive pest and preserve hemlock in its native range, releases of the introduced predators Sasajiscymnus tsugae and Laricobius nigrinus have been conducted throughout the Park. These two predators have been recovered from several areas of release. Several significant findings have resulted from research on these predators of HWA in the Park. In areas where S. tsugae has been recovered, regression analysis indicated that recovery of S. tsugae was associated with elevation of the release sites and average maximum temperature seven days following release, and normalized difference vegetation index values were higher in S. tsugae recovery sites than non-recovery sites which indicates that hemlocks are healthier in S. tsugae recovery sites than non-recovery sites. Additionally, relatively higher hemlock mortality was observed in non-recovery sites than recovery sites, and percent crown transparency, percent live crown, and percent branch dieback were also significant with presence of S. tsugae. Populations of L. nigrinus at a release site that was monitored weekly for three years have been steadily increasing. Also, a method for identifying numbers of L. nigrinus per tree based on emergence was identified and showed strong population densities over time. Finally, these two predatory species have been observed to coexist in some field release sites, and this coexistence may enhance their impact on adelgid populations by providing prolonged feeding. These findings, in conjunction with persistence of hemlocks in several areas of GRSM, indicate management efforts against A. tsugae can protect eastern hemlock.]

Lynne Rieske-Kinney, University of Kentucky - Chestnut persists through successive invasions

9:30 - 10:00 AM
Break

10:00 - 11:30 AM
Concurrent Session IV

A. New and Emerging Pests (Organizer: Melissa Fischer, Forest Pest Management Cooperative) - Colonial Room

Melissa Fischer, Forest Pest Management Cooperative - Outbreak of Phloeosinus dentatus in Central Texas
Jerome Grant, Paris Lambdin, Mark Windham, Greg Wiggins, Denita Hadžiabdić Guerry, and Paul Merten, University of Tennessee, USDA-FS-FHP - In a nutshell: Thousand cankers disease and black walnut

[Abstract: Black walnut provides tremendous benefits to consumers and endusers for both its wood and nut production. In eastern Tennessee in 2010, black walnuts were found to be affected by thousand cankers disease (TCD), which is caused primarily by a fungus (Geosmithia morbida) and its insect vector (the walnut twig beetle, Pityophthorus juglandis). Although this important disease (and fungus:insect vector relationship) had been present in the western U.S. for several years, this eastern discovery was the first time that this disease was found on black walnut in its native range. Since its initial discovery in Knox County in Tennessee, TCD has since been documented in nine counties in Tennessee. TCD also has now been confirmed in North Carolina, Ohio, Pennsylvania, and Virginia, while walnut twig beetles have been found in Maryland. State quarantines have been enacted in all affected states to curtail the spread and impact of this deadly disease. Adult beetles carry the fungus on their bodies; the fungus is introduced into the tree when beetles feed or bore into the bark. Females lay eggs, and larvae form galleries, where the fungus proliferates. Small cankers are formed, and these small cankers coalesce to form many cankers (i.e., thousand cankers disease), which disrupt cambial and phloem function. After the formation of cankers and galleries over many years, infected trees weaken and die. Symptoms of TCD resemble drought stress, which cause this disease to often go undetected. Other early symptoms include flagging (yellow foliage), canopy thinning, and leaf/branch wilting. Later symptoms include limb and/or canopy dieback and development of epicormic shoots. Because trees may not be symptomatic for several years, trapping of walnut twig beetles is essential as an initial step to determine presence of TCD in other areas. Management programs are focused on adherence to state quarantines and education. The fungus and the beetle can spread through movement of infected/infested wood; thus, it is imperative to limit movement of firewood or other wood products. If you observe declining black walnuts in your area, contact your county agent, state forester, or state department of agriculture. Early detection is key to limiting the spread of TCD.]

Craig C. Bateman, Jiri Hulcr, Adam Black, and Wang Bo, University of Florida, Chinese Academy of Sciences - Protecting American pine forests: an assessment of potentially invasive beetle-fungus pathogens in Asia

[Abstract: Fungus-vectoring wood boring beetles are some of the most important forest pests worldwide. Invasive species are particularly problematic, because they introduce their fungi into naïve hosts in the invaded regions, which is several recent cases triggered massive die-offs of the impacted tree species. It is not known whether exotic beetle-fungus combination that occur in Asia can impact American pines. To test the hypothesis that Asian wood borers are safe and do not harbor fungi pathogenic to American pines, we have collected three common pine-specific scolytine beetles in Southern China and Thailand with high probability of eventual introduction to the US: Xyleborus pinicola, Tomicus minor, and Ips chinensis. We isolated their fungal symbionts, transported them to a quarantine greenhouse in the US, and tested their effect on small loblolly pine (P. taeda) and slash pine (P. elliottii) trees. Of the symbionts tested, none is a virulent pathogen of the tested pines. Most did not affect the trees at all, only Ophiostoma ips and Ophiostoma sp. (the associates of Ips chinensis) caused cankers and resinosis in both pine species, but did not cause death. We conclude that, in the event of an accidental introduction of some of these three beetle species in the US, they do not possess immediate threat to the US pine ecosystems and industry, but they still need to be carefully monitored.]

John Riggins, Jason Smith, Anthony Cognato, John Formby, Marc Hughes, and Kelly Oten, Mississippi State University, University of Florida, Michigan State University, North Carolina Forest Service - Status of laurel wilt disease in the USA
B. Open Session II (Organizers: Jiri Hulcr and Caroline Storer, University of Florida) - Pickney Room

James Vogt, David Gartner, and John Coulston, USDA-FS-SRS - Simulation modeling of forest disturbance in the southeastern U.S. due to Dendrolimus sibiricus Tschetverikov (Lepidoptera: Lasiocampidae), a potential invasive pest: Implications of moving from a 5-year to 10-year cycle in the Forest Inventory and Analysis program

Kevin D. Chase, Dave Kelly, Andrew M. Liebhold, and Eckehard G. Brockerhoff, University of Canterbury, USDA-FS, New Zealand Forest Research Institute (SCION) - Not all who wander are lost: bark beetle dispersal and colonization in New Zealand and the United States

David Bednar, North Carolina Department of Agriculture and Consumer Services - Rearing Sasajiscymnus tsugae: density dependence in prey and predator

Yanzhuo Zhang, Cera Jones, James Hanula, Rima Lucardi, Scott Horn, and Rusty Rhea, University of Georgia, USDA-FS-SRS, USDA-FS-FHP - Efficacy of Laricobius nigrinus egg releases for establishing this hemlock woolly adelgid predator in North Georgia

[Abstract: The invasive hemlock woolly adelgid (HWA), Adelges tsugae Annand has caused extensive mortality of eastern (Tsuga Canadensis (L.) Carr.) and Carolina hemlock (Tsuga caroliniana Engelm). Laricobius nigrinus Fender (Ln), a predator of HWA from the Pacific Northwest and Canada, has been mass reared and released as a biocontrol agent in the eastern United States since 2003. Mass rearing Ln from eggs to adults in the laboratory continues to be plagued by high levels of mortality and large requirements for space, time and labor. In addition, high quality food for rearing Ln is becoming more difficult to locate and obtain. In an effort to conquer those difficulties, Ln egg releases were conducted as an alternative release method. Hemlock foliage infested with HWA was provided to Ln adults for a week, then foliage containing Ln eggs was released into the field with the hope that Ln larvae would be able to complete their life cycle in the field so the we could determine how efficient Ln egg releases are. Seven hemlock trees with medium HWA densities were selected for Ln egg releases in the Chattahoochee National Forest in North Georgia, where Laricobius rubidus LeConte (Lr) also exists and primarily feeds on pine bark adelgid, Pineus strobe Hartig. Large funnel drop traps constructed of fine mesh were utilized for this study. The drop trap was supported on a 104 * 104 cm square PVC pipe frame, and was 90 cm deep with the bottom opening being 6 cm in diameter. Each tree received three treatments: 1) control traps that received no predator egg releases; 2) larvae collection traps beneath branches where 15 Ln eggs were attached; both control traps and larvae collection traps were attached with bottles at the bottom to collect any dropping insects; 3) larvae drop traps, beneath branches where 15 Ln eggs were attached, with the bottom opening funneled into the ground so that beetles had easy access to the soil. Traps were set up for one month from 4/18/14 to 5/17/14 allowing Ln eggs to hatch and reach maturity. Locations of larvae drop traps were marked and eventually replaced with insect emergence traps in October and November to collect potential Laricobius adults when they emerged. We collected a total of 239 Laricobius larvae, indicating the modified drop traps are efficient at collecting Laricobius larvae, and they could be used in the future for Laricobius recovery work. There was no significant difference of larvae numbers between control traps and larvae collection traps, possibly due to existing Lr already present in the area. Thirteen Laricobius adults were collected from emergence traps. We are presently using the microsatellite analysis method to determine if these adult beetles are Ln or Lr. By the end of this study, we hope to have a better understanding of what percentage of Ln eggs placed in the field actually develop into mature larvae and what the survival rate of eggs to adults is in the field.]

11:30 – 12:15 PM
Closing Business Meeting (Organizer: Don Grosman, Arborjet Inc.) - Colonial Room


3. **Effects of long-term fire exclusion on subcortical insect assemblages in longleaf pine (Pinus palustris) stands in Southwest Georgia.** Courtney L. Brissey, Kamal J.K. Gandhi, and Lindsay R. Boring. Warnell School of Forestry and Natural Resources, University of Georgia, J. W. Jones Ecological Research Center, Newton, Georgia

4. **Post hemlock woolly adelgid damage: hemlock assessment in the southeastern United States.** LayLa W Burgess and Joseph D Culin. School of Agricultural, Forest and Environmental Sciences-SAFES- Clemson University

5. **Simulating the effects of Southern Pine Beetle on Tall Timbers Research Station.** David A. Cambron, Taylor Seamon, Jeremy Snyder, John D. Waldron, and Kevin Robertson. The University of West Florida, Tall Timbers Research Station, Florida

   **[Abstract]:** Forests in the southeastern United States are subject to a variety of disturbances such as wildfire, timber harvest, storm damage, and biological disturbances. Southern Pine Beetle (Dendroctonus frontalis Zimm.) is cryptic in nature due to its characteristic as a bark burrowing insect, and is difficult to monitor as a result prior to host tree mortality. Modeling is frequently used to simulate landscape level changes that would otherwise be difficult to predict or accurately quantify due to large spatial and temporal resolution. The focus of this research is to determine the interaction between disturbance from the southern pine beetle and landscape succession using LANDIS ii (Scheller et al. 2007) in Tall Timbers Research Station (TTRS), Tallahassee, Florida, USA. Site Selection is critical for the model input to be effective at replicating a larger area. Tall Timbers Research Station has detailed and extensive vegetation records and burn records, making parameter input possible for the high level of detail required from LANDIS ii. This model has been used in several regions throughout the world, but has not been used to predict southern pine beetle disturbance in northern Florida to date. The goal of the model run is to determine disturbance frequency and changes in landscape succession following southern pine beetle outbreaks, and ultimately demonstrate the utility of LANDIS ii for use in the Coastal Plains.

6. **Inducing attack by Monochamus beetles on healthy shortleaf pines.** Matthew Ethington, Larry Galligan, David Wakarchuk, and Fred M. Stephen. University of Arkansas

   **[Abstract]:** Beetles in the genus Monochamus are large wood-boring beetles known to develop in and feed on conifers, primarily pines. In the southeast Monochamus titillator and Monochamus carolinensis are the predominant Monochamus species. These beetles have been traditionally classified as secondary insects which colonize pines only after trees are dead or dying. Recent studies
have shown that *Monochamus* can be a primary tree killer in jack pine. Our objective is to determine if *Monochamus* can colonize healthy shortleaf pines in the southeastern United States and thereby become the proximate cause of tree death.

A total of twenty healthy shortleaf pine trees were selected within the Ozark-St. Francis National Forest. Each tree was treated by placing a commercially available attractant or combination of attractants on the tree bole at approximately 7 m. The treatments were (1) Monochamol + low-release ethanol, (2) Monochamol + ethanol + Ipsenol, (3) Ipsenol, or (4) no treatment (control). Each tree was checked every two weeks for *Monochamus* oviposition pits by climbing the tree and marking each pit with a map pin.

Results demonstrated that *Monochamus* were not highly attracted to Monochamol (*Monochamus* sex pheromone) but showed high attraction to Ipsenol, especially the Ipsenol only lures. The experiment will be duplicated during late summer 2014. Trees will be destructively sampled in order to check for *Monochamus* larval development. If larval development is seen *Monochamus* can successfully colonize healthy shortleaf pines.


[Abstract: The pine shoot beetle, *Tomicus piniperda*, is a forest pest that was detected in the United States in 1992. This resulted in a regulatory program for at-risk pine commodities to slow its spread. *Tomicus piniperda* subsequently spread throughout the North East and North Central United States but has caused negligible damage. However, there is concern that *T. piniperda* could be a forest pest in the Southeast and West. To help characterize this risk we constructed a probabilistic simulation model estimating *T. piniperda*’s annual spread and timber mortality damage with and without a slow-the-spread program regulating timber movement. A planned timber damage analysis using the model is discussed.]


[Abstract: Black walnut is an important tree, both economically and culturally, and it is widely grown and valued for its wood and its nuts. Thousand cankers disease (TCD), caused primarily by the fungus *Geosmithia morbida* vectored by the walnut twig beetle, *Pityophthorus juglandis*, was discovered in the native range (eastern Tennessee) of black walnut in 2010. TCD is a devastating threat to black walnut and has the potential to lead to the extinction of this important tree species if effective management plans are not developed and implemented quickly. TCD has been documented in nine counties in Tennessee, and this disease was found in Pennsylvania and Virginia in 2011. Since then, it has been found in North Carolina and Ohio, with walnut twig beetles found in Maryland. Quarantines are underway in all confirmed states to slow the spread and impact of TCD. Unfortunately, the general public is not very aware of the problem, its potential impact, or mitigation efforts. The goal of this Regional Outreach Plan (WALNUT ALERT) is to develop and distribute various outreach tools and
programs (web-based materials, educational displays, pamphlets, posters, fact sheets, technical papers and presentations, workshops, field days, news media outlets, etc.) to inform growers, industry, scientists, regulators, and the general public of the issues surrounding TCD in the native range of black walnut, as well as to train students to be more knowledgeable in the workforce. Outreach is an important part of helping the public to understand the problem, the importance and magnitude of the problem, and the mitigation efforts necessary to curtail the problem. Thus, it is essential to continue to modify, improve, expand, and publicize an effective and efficient Regional Outreach Plan— one that addresses this new threat by educating the general public, stakeholders, and endusers, as well as training students, to make them better prepared to modify behavior and attitudes to participate in mitigation efforts necessary to reduce the spread and impact of this disease on black walnut benefiting everyone who has a link to black walnut.


[Abstract: The European wood wasp, *Sirex noctilio* F. (Hymenoptera: Siricidae), has been accidentally introduced into several countries in the Southern Hemisphere where it has caused widespread mortality to exotic pine plantations. It was discovered in New York in 2004 and has the potential to cause severe economic and ecological losses upon its likely spread and establishment into the southeastern United States. Contrary to areas of previous introduction, there are native pine-inhabiting wood wasps in eastern North America (*S. nigricornis* in Arkansas). There are also several native species of natural enemies that attack these wood wasps, some of which have been successfully introduced for the control of *S. noctilio* in other countries. These natural enemies include parasitic wasps in the families Braconidae and Ibaliiidae, as well as parasitic nematodes in the genus *Deladenus* which can infect *Sirex* eggs and sterilize females. We believe that these natural enemies will be important factors in limiting spread and establishment of *S. noctilio* in the Southeast. We are currently investigating genetic diversity of *Deladenus* nematodes infecting native female wood wasps, and individual and combined effects of parasitoids on survival and development of *S. nigricornis*. Results from these studies will provide valuable insight into potential future *S. noctilio* biological control efforts and allow us to make more precise management recommendations for natural and commercial pine stands.]

11. **Native parasitoids and recovery of Spathius agrili from areas of release against emerald ash borer in eastern Tennessee.** Nicholas A. Hooie, Paris L. Lambdin, Jerome F. Grant, Gregory J. Wiggins, Steve Powell, and Jonathan P. Lelito. Department of Entomology and Plant Pathology, University of Tennessee, Tennessee Department of Agriculture, Ellington Agricultural Center, Emerald Ash Borer Biocontrol Rearing Facility, USDA AHPIS PPQ

[Abstract: The emerald ash borer (EAB), *Agrilus planipennis*, is an invasive bark borer species native to eastern Asia whose primary habitat and food source are trees of the genus *Fraxinus*. Initially discovered near Detroit, MI, in 2002, EAB has become a major pest of *Fraxinus* species native to North America and is responsible for mortality of millions of trees in 22 U.S. states and 2 Canadian providences. Biological control is a favored option for management of EAB. The parasitoid *Spathius agrili*, introduced in the U.S. to suppress populations of EAB was recovered from an overwintering population at a release site for the first time in eastern Tennessee after a single year of releases. Three other native parasitoids, *Spathius floridanus*, an undetermined species of *Spathius*, and *Atanycolus cappaerti*, also known to be associated with EAB, were recovered. These recoveries represent the first documentation of these four species, including the introduced *S. agrili*, associated with EAB in the southern U.S. Although the native species collected are not host-specific to EAB, the augmentation of their populations, in combination with releases of *S. agrili* and other introduced parasitoids, could help to suppress EAB populations in localized areas. Methods for mass rearing of native parasitoids, especially native *Spathius* species, may be developed, so that they can be incorporated into releases in select areas infested with EAB. Further study of these insects and their interactions with EAB in
Tennessee are planned. The incorporation of native parasitoids with releases of *S. agrili* may ultimately reduce the threat of EAB to forest and urban systems.

12. **Establishment, hybridization and impact of *Laricobius* predators on insecticide-treated hemlocks: exploring integrated management of the hemlock woolly adelgid.** Albert E. Mayfield III, Barbara C. Reynolds, Carla I. Coots, Nathan P. Havill, Cavell Brownie, Andrew R. Tait, James L. Hanula, Shimat V. Joseph, and Ashley B. Galloway. USDA Forest Service, Southern Research Station, University of North Carolina Asheville, University of Tennessee, USDA Forest Service, Northern Research Station, North Carolina State University, University of Georgia


14. **Variation in effects of conophthorin on attraction of ambrosia beetles to ethanol-baited traps.** D.R. Miller, C.M. Crowe, K.J. Dodds, E.R. Hoebeke, T.M. Poland, R.J. Rabaglia, and E.A. Willhite. USDA Forest Service, Southern Research Station, USDA Forest Service, Forest Health Protection, Cornell University, USDA Forest Service, Northern Research Station, USDA Forest Service, Pacific Northwest Region

15. **Attraction of non-cerambycids to hardwood cerambycid pheromones in southeastern USA.** D.R. Miller, C.M. Crowe, J.D. Sweeney, P. Mayo, and P.J. Silk. USDA Forest Service, Southern Research Station, Canadian Forest Service

16. **Non-surgical method for identifying *Amylostereum* symbionts in *Sirex* mycangia.** Rabiu Olatinwo, Douglas Streett, and Christopher Carlton. Department of Entomology, Louisiana State University, USDA Forest Service Southern Research Station

**Abstract:** Identification of fungal symbionts associated with *Sirex* species is an important step in understanding symbiont diversity and host-symbiont interactions. Such identification requires extraction of spores from *Sirex* adult mycangia. However, existing methods of extraction require destructive sampling of specimens through mycangium dissection. The objective of this study was to develop a non-surgical method for examination of fungal symbionts of *Sirex* without mycangial dissection (non-destructive sampling). We used live samples of *Sirex nigricornis* Fabricius (Hymenoptera: Siricidae), a woodwasp native to North America, from locations in central Louisiana. Spores of fungal symbionts were extracted using the new non-surgical procedure. Live samples of *Sirex nigricornis* Fabricius (Hymenoptera: Siricidae), a woodwasp native to North America, were collected between late October and early November, 2013 in Grant Parish, Louisiana. The fungal spores release was stimulated in a glass vial by submerging the tip of the ovipositor into sterile water. Direct amplifications of DNA from spores were conducted with polymerase chain reaction (PCR) using *Amylostereum* species-specific primers. Verification of symbiont identities was conducted based on sequencing of PCR products and identification of isolates on artificial media based on morphology. Our results showed successful identification of *Amylostereum areolatum* (Chailliet ex Fr.) Boidin and *Amylostereum chailletii* (Pers.) Boidin symbionts without dissection of the mycangium. The method
may facilitate repeated sampling of live specimens for other uses including oviposition studies where the use of live specimens may be critical.]


18. **Effects of chemical contamination on invertebrate scavenging communities.** Ansley Silva, David R. Coyle, Erin Abernethy, Kelsey Turner, James Beasley, and Kamal J.K. Gandhi. Warnell School of Forestry and Natural Resources, Savannah River Ecology Laboratory, University of Georgia


20. **Simple soda bottle trap for monitoring bark & ambrosia beetles.** M. Sedonia Steininger, Andrea Lucky, and Jiri Hulcr. School of Forest Resources and Conservation, Department of Entomology, University of Florida


[**Abstract:** Thousand cankers disease (TCD) is an insect-mediated disease of walnut trees (*Juglans* spp.) involving walnut twig beetle, *Pityophthorus juglandis*, and a fungal pathogen, *Geosmithia morbida*. TCD was first documented on walnut species in the western U.S. However, TCD was first found in the native range of black walnut, *J. nigra*, in Knoxville, Tennessee in 2010 and is now found on black walnut in five states in the eastern U.S. Most collections of *P. juglandis* or *G. morbida* are from trees in agriculturally- or residentially-developed landscapes. In 2013, 16 pheromone-baited funnel traps were deployed in or near black walnuts in forested conditions to assess the risk of infestation of forested trees by *P. juglandis*. Four of the 16 funnel traps collected adult *P. juglandis* from three forested areas (one in North Carolina and two in Tennessee). These collections, while in forested settings, may still be strongly influenced by human activities. The greatest number of *P. juglandis* (*n = 338*) was collected from a forested location in an urbanized area near a known TCD-positive tree. The other two forested locations where *P. juglandis* (*n = 3*) was collected were in areas where camping is common, and infested firewood may have introduced *P. juglandis* unintentionally into the area. Future studies to assess *P. juglandis* on more forested walnuts are planned.]

22. **Establishment of a hemlock woolly adelgid biological control demonstration site in the Great Smoky Mountains National Park.** Greg Wiggins, Jerome Grant, Rusty Rhea, Pat Parkman, Jesse Webster, Elizabeth Benton, and Paris Lambdin. Department of Entomology and Plant Pathology, University of Tennessee, USDA Forest Service, Forest Health Protection, Great Smoky Mountains National Park, National Park Service
Abstract: Biological control has been an important component of management of hemlock woolly adelgid (HWA), *Adelges tsugae*, in the Great Smoky Mountains National Park (GRSM) since HWA was first discovered in GRSM in 2002. Although *Sasajiscymnus tsugae* was the sole biological control species used in initial releases in 2002, *Laricobius nigrinus* was included in the program beginning in 2004. Either *L. nigrinus* or *S. tsugae* have been released in over 200 sites throughout GRSM, and both species have been recovered from ca. 20% of release sites sampled between 2008 and 2012. Hemlocks are persisting in some of these recovery sites. Additionally, both *L. nigrinus* and *S. tsugae* have been observed occurring on the same trees in some sites, suggesting that these species can coexist and possibly provide a compounding impact on HWA populations. To highlight biological control of HWA in the GRSM, a site where 300 adult *L. nigrinus* were released in February 2007 and recovered in 2009 and 2010 was selected and designated as the HWA Biological Control Demonstration Site. At the Site, three other predators of HWA, *Laricobius osakensis*, *S. tsugae*, and *Scymnus sinuanodulus*, were released in 2013 and 2014, and a species native to the eastern U.S., *Laricobius rubidus*, also occurs there. Large cages were installed on four trees, and initial releases of HWA predators were conducted on these trees. Cages were removed from the two *Laricobius* release trees but remain on *S. tsugae* and *S. sinuanodulus* trees. The Site has been monitored periodically since predator releases using both beat-sheet sampling and emergence trapping. From October 2013 through January 2014, *L. nigrinus* (*n* = 74), *L. osakensis* (*n* = 2), *L. rubidus* (*n* = 9), and *S. tsugae* (*n* = 1) were collected. No *S. sinuanodulus* were collected during this period. Monitoring will continue at the Site, and populations of predators will continue to be assessed. This Site is intended to serve as an educational and technical resource to land managers interested in incorporating biological controls into their management of HWA, as well as to illustrate the benefits of utilizing multiple species of natural enemies to manage this invasive forest pest.
Minutes of the SFIWC Opening Business Meeting  
Wednesday, July 23, 2014  
Francis Marion Hotel  
Charleston, South Carolina

Chairman Don Grosman called the 56th meeting of the Southern Forest Insect Work Conference to order at 8:14 AM. He welcomed everyone to the meeting and thanked Will Shepherd, Laurie Reid, Kamal Gandhi, and Jiri Hulcr for organizing the event. Local Arrangements Chair Laurie Reid welcomed everyone to Charleston and provided some brief information about restaurants and points of interest in the downtown area. Chairman Grosman asked first-time attendees to stand and introduce themselves. Program Co-Chair Kamal Gandhi stated that there were no schedule changes from the printed program. The group then paused for a moment of silence in remembrance of SFIWC charter member, Lloyd Warren, who passed away since the last meeting. Chairman Grosman announced that the SFIWC Executive Committee decided to donate $100.00 to the Lloyd and Ruby Warren Endowed Scholarship Fund at the University of Arkansas in Lloyd’s memory. Members were invited to share announcements of professional transitions or retirements (there were none).

Reports  
Secretary-Treasurer Will Shepherd reported that minutes of the 2013 meeting in New Orleans, Louisiana are available in the Proceedings on the SFIWC website. Financially, SFIWC had a checking account balance of $4772.83 on 12/31/13. Income for the New Orleans meeting exceeded expenses by $1082.57.

Ron Billings read the Historian’s Report (see attached) with highlights of the three meetings previously held in South Carolina.

Common Names – Alex Mangini (not present) submitted a report stating that no proposed names had been submitted since the last meeting (see attached).

Photo Salon – Laurie Reid asked that anyone who has not yet submitted their pictures for the Photo Salon give them to her. She also called for 2-3 volunteers to be judges.

Resolutions – Fred Hain reported that there are no resolutions pending at this time. He said that anyone wishing to submit a resolution should see him during the meeting. Fred asked the Executive Committee to find a replacement for him as Chair of the Resolutions Committee. It was agreed that a replacement would be named prior to the 2015 meeting.

Website – Keith Douce not present.

Theses and Dissertations – Dave Kulhavy not present.

Steve Clarke asked everyone to visit the registration table to donate non-perishable food items or money for SFIWC’s annual food drive. All donations will be sent to the Lowcountry Food Bank in Charleston on Friday.
Bob Coulson gave a brief summary of plans for the Frontalis Cup golf outing to be held on Thursday at the Wild Dunes Links Course. He invited anyone to join the current seven participants.

Steve Clarke gave details on the Frustrana Cup ping-pong tournament to be held on Thursday afternoon at HoM.

Laurie Reid invited everyone on an urban tree walk field trip on Thursday, beginning at 12:30 PM.

Old Business

None.

New Business

Nominations – A new Counselor is needed to replace Jason Moan for a three-year term on the Executive Committee. Voting on nominees will be held during the closing business meeting. Contact Robert Jetton if you wish to submit a nomination.

Chairman Grosman announced that the 2015 SFIWC will be held in Fayetteville, Arkansas, with Fred Stephen as the Local Arrangements Chair. He asked attendees to consider volunteering for 2015 Program Chair(s).

Scott Salom announced that the 2016 North American Forest Insect Work Conference will be held May 31-June 3, 2016 in Washington, D.C. Scott said that Bob Rabaglia, Kier Klepzig, Dan Herms, and Don Duerr are helping with organization and planning.

Chairman Grosman asked that anyone with suggestions for the 2017 meeting location see Laurie Reid.

Steve Clarke discussed his proposed “History of Southern Forest Entomology” project, which would consist of filming interviews with retired forest entomologists. Although money eventually will be needed for the project, Steve will start the interviews now. He asked for volunteers with technical expertise or ideas for end products. Steve suggested the formation of a SFIWC committee to oversee the project. Chairman Grosman announced that further discussion would be held during the closing business meeting.

Roger F. Anderson Award – Scott Salom, Chair, thanked committee members Chris Asaro, Bob Coulson, Robert Jetton, and Ligia Cota Vieira. He announced that Jessica Hartshorn, a Ph.D. student of Fred Stephen at University of Arkansas, received the award. Jessica accepted a check for $250.00. She will receive a personalized award plaque in a few weeks.

A.D. Hopkins Award – Kier Klepzig, Chair, thanked this year’s nominators, as well as committee members Chris Asaro, Don Duerr, Jim Hanula, and Jiri Hulcr. He reported that Lynne Rieske-Kinney was awarded this year’s A.D. Hopkins Award. Kier presented Lynne with the A.D. Hopkins framed picture and letter. A personalized award plaque will be presented to Lynne at the 2015 SFIWC.
Announcements – Ron Billings told everyone that group pictures would be taken during the morning break.

Chairman Grosman asked the membership to support the graduate student session to be held later on Wednesday and thanked Graduate Student Session Chair, Robert Jetton, and judges Paul Merten, Leslie Newton, Fred Stephen, and Greg Wiggins. He also encouraged everyone to attend the poster session from 6:00-8:00 pm.

There being no further business, the meeting adjourned at 8:48 am.

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Minutes of the Awards Banquet
Thursday, July 24, 2014
Francis Marion Hotel
Charleston, South Carolina

Photo Salon – Laurie Reid announced the 1st, 2nd, and 3rd Place winners in each category and thanked the judges (see attached). Laurie said that 89 photos from 9 photographers were submitted this year. The pictures will be forwarded to the Bugwood website.

Graduate Student Presentation Awards – Robert Jetton, Graduate Student Session Chair, presented the Runner-Up award and $50 to Christiane Helbig, an international scholar and Ph.D. candidate working with Kamal Gandhi at University of Georgia. The 1st Place award and $100 were presented to John Formby, a Ph.D. student of John Riggins at Mississippi State University.

Kamal Gandhi thanked Laurie and Robert for their contributions to this year’s meeting.

Steve Clarke again asked attendees to give generously to the food drive.

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Minutes of the SFIWC Closing Business Meeting  
Friday, July 25, 2014  
Francis Marion Hotel  
Charleston, South Carolina

Chairman Don Grosman called the meeting to order at 11:31 am.

Old Business

Election of Counselor – Heather Slayton and Lynne Rieske-Kinney were submitted as candidates for Counselor, 2014-2018. The members voted, and Lynne Rieske-Kinney was elected Counselor.

Program Chairs for 2015 – Kamal Gandhi announced that Bob Coulson and John Riggins have agreed to be Program Chairs for the 57th SFIWC in Fayetteville. Jerome Grant and JT Vogt withdrew their names from nomination.

Meeting site for 2015 – Fred Stephen, Local Arrangements Chair (2015), invited everyone to next year’s 57th SFIWC in Fayetteville, Arkansas. He briefly discussed the great food, museums, and outdoor activities available in and around Fayetteville.

Laurie Reid listed all the 2014 Photo Salon winners. Since Laurie will not be able to attend SFIWC 2015, Ron Billings has agreed to act as the Photo Salon organizer.

Some ideas for meeting locations for SFIWC 2017 were briefly discussed. These included Gainesville, Florida (Jiri Hulcr) and Savannah, Georgia (Chip Bates, Kamal Gandhi).

Frontalis Cup – Fred Stephen announced that six people participated in the 2014 Frontalis Cup golf outing, and he was the winner.

Frustrana Cup – Steve Clarke reported that 13 teams played in the ping-pong tournament on Thursday afternoon and that the team of Jerome Grant and Guoqiung Wu won the event.

SFIWC Food Drive – Steve Clarke thanked everyone for their donations, which totaled multiple canned goods and $566.00.

Steve Clarke reiterated his call for input and expertise for the “History of Southern Forest Entomology” project. Kier Klepzig asked for a proposal to be sent to the SFIWC membership for further review. Steve agreed to work on this and move forward with planning the initial interviews. Ron Billings agreed to provide assistance with the project.

New Business

Will Shepherd reminded everyone to pick up their posters from the Gold Room, or they will be thrown away after the meeting.
Steve Clarke suggested that the A.D. Hopkins Award be presented to the current year’s recipient immediately following the former recipient’s Hopkins Award address. There was general agreement among the membership.

Steve Clarke suggested that the Roger F. Anderson Award be presented during the Awards Banquet. There was general agreement among the membership.

Scott Salom suggested that the A.D. Hopkins Award address be given during the Awards Banquet. The Executive Committee will discuss this idea as needed, based on each year’s banquet venue and program.

There being no further business, Chairman Grosman thanked this year’s officers, organizers, moderators, and presenters who contributed to the 56th SFIWC.

Kier Klepzig thanked Chairman Grosman for his work on organizing and running the 56th SFIWC and introduced himself as the new Chair (2014-2017).

Meeting adjourned at 11:57 am.

Respectfully submitted,

William P. Shepherd, Secretary-Treasurer
Financial Report, CY 2014

SFIWC Income & Expenditures
January 1, 2014 – December 31, 2014

Balance on hand, 1/1/14 $4,772.83

Income
   Registration and Banquet fees $23,245.32
   Available Funds $28,018.15

Expenses
   2014 Meeting $20,920.30
   Awards & Administration $764.00
   Total Expenses $21,684.30

Balance on hand, 12/31/14 $6,333.85
Historian’s Report
56th SFIWC
Charleston, South Carolina

This is only our fourth visit to the State of South Carolina since the Southern Forest Insect Work Conference began in 1956. Our 15th and 29th meetings also were held in Charleston in 1970 and 1984, respectively, while the most recent meeting was held at nearby Folly Beach in 1997.

In 1970, the meeting was held at the Sheraton-Fort Sumpter Hotel on the Battery (since converted into private condominiums). Our chairman for that meeting was R.C. Fox of Clemson University. The Conference theme that year was pesticides. This was the first time that pesticides were addressed as the major conference theme. Historical milestones during this meeting were distribution of the publication entitled Control of Forest Insects in the South, presentation of the first conference-sponsored slide series of 150 slides of forest insects and damage, the first committee report on losses caused by forest insects, and the first conference attempt at lobbying. This latter effort involved drafting and sending a letter to W.D. Ruckelshaus, then the Director of the Environmental Protection Agency, voicing concern over the dwindling list of pesticides registered for use in forestry.

The 29th conference in 1984 was held at the Sheraton Charleston Hotel. Chairman was Ron Billings and Secretary/Treasurer was Garland Mason. The focus of this conference was the gypsy moth, which was rapidly encroaching on the South from the Northeastern states. Don Dahlsten from the University of California gave the keynote address “Gypsy Moth -- The California Experience,” while invited speaker William Walner gave a talk on “The Gypsy Moth in the Northeast: Status and Current Research.” Concurrent workshops covered the major pests of the period: southern pine beetle, pine regeneration insects, and seed orchard insects. At the initial business meeting, Harry Yates introduced a proposal to document the history of forest entomology in the U.S., as many of the early entomologists were reaching an advanced age (and this was 30 years ago). A motion was introduced and passed to prepare such a document in close cooperation with the Western and Northeastern Conferences, with Harry as coordinator. (What, if anything, became of this project is unknown, since Harry retired in the interim, but interest in this topic has resurfaced in 2014.) No A.D. Hopkins Award was given in 1984.

One highlight of the 1984 meeting was a tour of Charleston Harbor aboard the General Beauregard, including a visit to the aircraft carrier Yorktown, arranged by our local host, Mike Remion. During this year’s conference, several worthy candidates vied for the Ethical Practices Award (no longer available), including Doug Loh, Mike Saunders, Scott Cameron, and Ron Billings. For reasons long lost to history, yours truly was unjustly declared the winner of this dubious honor.

The 41st conference was held at Folly Beach in 1997 at the Holiday Inn - Charleston on the Beach. Rich Goyer (LSU) was chairman, John Foltz (University of Florida) was Secretary/Treasurer, and Counselors were Lynne Thompson (University of Arkansas at Monticello), Ken Swain (US Forest Service), and Andy Boone (South Carolina Forestry Commission). Mike Remion (South Carolina Forestry Commission) and his staff again handled local arrangements, while Bob Coulson (Texas A&M University) served as program chairman. Fred Hain, the 1996 winner, gave the A.D. Hopkins address which he titled “Are forest
entomologists foresters? Are foresters biologists?” a question still relevant today. R. Scott Cameron with Union Camp (previously Texas Forest Service) was the 1997 recipient of the A.D. Hopkins Award. At the initial business meeting, Coleman Doggett (North Carolina Forest Service) stated that he was preparing a file on forest entomologists and the history of forest entomology in the South. Concurrent workshops included sessions on non-indigenous pest species, ecosystem management, fiber farming, ethics, and landscape effects on forest insect populations.

Respectfully submitted,

Ronald F. Billings
Historian
Common Names Committee Report

There were no common name applications submitted to the Committee since our last meeting in 2013 at New Orleans, LA. The Committee is always happy to answer any questions concerning common name submissions and procedures. If anyone has a potential common name for a Southern forest insect or mite, please feel free to contact the Chairman, Alex Mangini, at the address below.

Alex Mangini, PhD  
Entomologist  
USDA Forest Service  
Forest Health Protection  
2500 Shreveport Highway  
Pineville, LA 71360  
318-473-7296 office  
318-613-4395 cell  
amangini@fs.fed.us

Respectfully submitted to SFIWC members on 23 July 2014.

/s/ Alex Mangini  
Chair, SFIWC Common Names Committee
**Photo Salon Awards**  
*2014 SFIWC – Charleston, South Carolina*  
*Laurie Reid, Organizer*

**Forest Insects**

<table>
<thead>
<tr>
<th>Place</th>
<th>Winner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Ron Billings</td>
<td><em>Agrilis</em> mating</td>
</tr>
<tr>
<td>2nd</td>
<td>Ron Billings</td>
<td>Buprestid on wildflower</td>
</tr>
<tr>
<td>3rd</td>
<td>Matt Savage</td>
<td>Silk trail</td>
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</tbody>
</table>

**Forest Insect Damage**

<table>
<thead>
<tr>
<th>Place</th>
<th>Winner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Ron Billings</td>
<td>Leaf skeletonizer</td>
</tr>
<tr>
<td>2nd</td>
<td>Chris Asaro</td>
<td>Emerald ash borer gallery</td>
</tr>
<tr>
<td>3rd</td>
<td>Chris Asaro</td>
<td>Woodpecker damage</td>
</tr>
<tr>
<td>Hon. Men.</td>
<td>Andy Boone</td>
<td>Laurel oak with wisteria</td>
</tr>
</tbody>
</table>

**Other**

<table>
<thead>
<tr>
<th>Place</th>
<th>Winner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Christiane Helbig</td>
<td>Monster from Mars</td>
</tr>
<tr>
<td>2nd</td>
<td>Matt Savage</td>
<td>Mini sunset</td>
</tr>
<tr>
<td>3rd</td>
<td>Christiane Helbig</td>
<td>Third wheel</td>
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</tbody>
</table>

**Series**

<table>
<thead>
<tr>
<th>Place</th>
<th>Winner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Ron Billings</td>
<td>Cynipid gall on post oak</td>
</tr>
<tr>
<td>2nd</td>
<td>Melissa Fischer</td>
<td>Mantid in shade</td>
</tr>
<tr>
<td>3rd</td>
<td>Chris Asaro</td>
<td>After-effects of beech bark disease</td>
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</tbody>
</table>

**Humor**

<table>
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<tr>
<th>Place</th>
<th>Winner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>Andy Boone</td>
<td>Bradford pear pollarding</td>
</tr>
<tr>
<td>2nd</td>
<td>Andy Boone</td>
<td>Grasshoppers and scale</td>
</tr>
<tr>
<td>3rd</td>
<td>Andy Boone</td>
<td>Trees Were Us</td>
</tr>
</tbody>
</table>

**Judges:** Andy Boone, Ignazio Graziosi, and Bud Mayfield

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Officers and Committees – 2014–2015

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