PROCEEDINGS
52nd Annual
SOUTHERN FOREST INSECT WORK CONFERENCE

Courtyard by Marriott Gulfport Beachfront
Gulfport, Mississippi
28–31 July 2009

John Nowak, Program Chairman
Andy Londo and John Riggins, Local Arrangements

Officers: 2008–2009
Chairman ...................................................................................... Scott Salom (2007–2009)
Secretary-Treasurer ........................................................................................ Will Shepherd
Counselors..................................................................................... Laurie Reid (2005–2009)
....................................................................................... Andy Londo (2008–2012)
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### Registration List, 52nd SFIWC, Gulfport, Mississippi

* = student, † = retired

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<td>Josh Adkins*</td>
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<td>Jeremy Allison</td>
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<td>Andrew Birt</td>
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<td>Crawford “Wood” Johnson</td>
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<td>Michelle S Frank</td>
<td>John Moser†</td>
<td>David Wakarchuk</td>
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<td>Larry Galligan</td>
<td>T Evan Nebeker‡</td>
<td>Kimberly Wallin</td>
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<td>Kamal J K Gandhi</td>
<td>Wesley A Nettleton</td>
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<td>Leslie Newton</td>
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<td>James L Northum</td>
<td>Michele Wiesner*</td>
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<td>Donald M Grosman</td>
<td>Forrest L Oliveria</td>
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17 students, 2 retirees, and 84 regular members = 103 registered participants
SFIWC 2009 Group Pictures

Figure 1

**Front Row (left to right):** Alex Mangini, Jacob Hudson, Chris Steiner, Carolyn Scott, Larry Galligan, Ryann Campbell, Forrest Oliveria  
**Back Row (left to right):** David Wakarchuk, Kevin Dodds, Jim Meeker, Wes Nettleton, John Riggins, Jason Moan, Todd Edgerton, Wood Johnson, Rob Trickel, Dan Miller, James Floyd
Figure 2

Front Row (left to right): Heather Story, Michelle Frank, Michele Wiesner, Scott Griffin, Danielle Keeler, Laurel Haavik, Don Grosman, John Moser, Valli Peacher

Back Row (left to right): Tony Courter, Frank Sapio, Chip Bates, Rusty Rhea, Danny Lee, James Johnson, Scott Horn, Chris Crowe, John Taylor, Josh Jones, Fred Stephen, Evan Nebeker
Figure 3
Front Row (left to right): Denny Ward, Amy Snyder, Ligia Cota Vieira, Carla Dilling, Chris Asaro, Kamal Gandhi, Mary Ellen Dix, Jody Thompson, David Kulhavy
Back Row (left to right): Fred Hain, Peter de Groot, Jim Hanula, Kelly Felderhoff, Jerome Grant, Bud Mayfield, Keith Douce, Tim Schowalter, Will Shepherd, Kier Klepzig, Ferenc Lakatos
Figure 4

Front Row (left to right): Tim Haley, Micah Gardner, John Strider, Paul Merten, Leslie Newton, Robert Jetton, Heather Spaulding, Luke Dodd, Peter Rattray

Back Row (left to right): Bob Coulson, Lynne Rieske-Kinney, Scott Salom, Doug Streett, Carlton Cobb, Allen Cohen, Joe Pase, Josh Adkins, Brian Strom, Andy Londo

Attendees not pictured: Jeremy Allison, Matt Ayres, Butch Bailey, Andrew Birt, Pierluigi (Enrico) Bonello, LayLa Burgess, Steve Clarke, Mark Dalusky, Aleksandar Dozic, Don Duerr, Britton Hatcher, Derek Johnson, Frank Krist, Jessica McKenney, Dana McReynolds, Roger Menard, Jim Northum, John Nowak, Pat Parkman, Carla Pimentel, Dale Starkey, Brian Sullivan, Bill Upton, Kimberly Wallin, Geoff Wang
Tuesday, July 28th

1:00-2:30 PM  SPB Working Group (Organizer: Stephen Clarke) – Harbor Room

   It’s your Thing – Tony Courter
   SPBIS – Valli Peacher
   Insecticides for SPB – John Taylor
   The rise of fall SPB trapping – James Meeker
   SPB encyclopedia update – Robert Coulson
   SPB Internet Control Center – Scott Salom
   Plane talk: the availability of aerial detection aircraft – Chris Steiner
   Pheromone database – Brian Strom
   SPB novel control screening committee – Brian Strom
   Operational use of semiochemicals in a mixed WPB/MPB infestation – Dave Wakerchuk
   SPB prevention program – John Nowak

2:30-3:30 PM  Forest Health Task Force (Organizer: James Johnson, GFC) – Harbor Room

3:00-5:00 PM  State Cooperators Meeting (Organizer: Wes Nettleton, FHP) – Harbor Room

3:00-5:00 PM  Poster Set Up (Organizer: Lígia Cota Vieira, VT) – pre-function Ballroom

3:00-7:00 PM  Meeting Registration – pre-function Ballroom

5:00-5:45 PM  AD Hopkins Award Committee Meeting – Harbor Room

5:15-6:00 PM  SFIWC Executive Team Meeting - Boardroom

6:30-8:30 PM  Mixer and Reception – Coastal Ballroom
Wednesday, July 29th (all events in Coastal 2&3)

6:00-10:00 AM  Breakfast (Courtyard Cafe)

8:00-12:00 PM  Registration

8:30-8:45 AM  Welcome – Scott Salom, Chairman

8:45-9:15 AM  Hurricane Katrina: Impacts and Recovery
Glenn Hughes, Extension Professor, MS State University

9:15-10:00 AM  Opening Business Meeting

10:00-10:30 AM  Break and Group Photos

10:30-12:00 PM  Plenary Session
Biomass, Bioenergy and Forest Health

Woody biomass feedstock availability, production costs and implications for bioenergy conversion in Mississippi
Donald Grebner, Mississippi State University

Options for biomass recovery
Dana Mitchell, Southern Research Station, USDA Forest Service

The future role of wood for energy: Traditional wood industry perspective
Montgomery Simpson, Public Affairs, Eastern U.S. Region, Weyerhaeuser

12:00-1:30 PM  Lunch – on your own

1:30-2:30 PM  A.D. Hopkins Address: SFIWC and Me – A Road Less Traveled
Jim Hanula, Southern Research Station, USDA Forest Service

2:30-5:15 PM  Graduate Student Session
Carla Dilling, University of Tennessee, and Kelly Felderhoff, North Carolina State University, Moderators

Distribution of imidacloprid in eastern hemlock, *Tsuga canadensis* (L.) Carrière, in the southern Appalachians
Carla I. Dilling¹, P. L. Lambdin¹, J. F. Grant¹, and R. Rhea²
¹Department of Entomology and Plant Pathology, University of Tennessee,
²USDA Forest Service, Forest Health Protection

Population dynamics of red oak borer in the Ozark and Ouachita Mountains
Laurel J. Haavik and Fred M. Stephen
University of Arkansas

[Abstract:  Hardwood borer population dynamics are not well known in the literature. In association with an oak decline event a native wood borer, red oak borer, recently experienced an unexpected outbreak within Arkansas, Missouri and Oklahoma upland oak-dominant forests. This outbreak was unique in that]
this insect has never before been linked to oak decline and densities were greater than any previously reported. We used dendrochronological techniques to date over 2500 individual scars associated with larval galleries in 67 northern red oaks from five study sites located throughout the Ozark and Ouachita National Forests in Arkansas. These data indicate that borer infestation varied geographically during the outbreak, where sites were either of low, moderate, or high infestation. The outbreak’s peak occurred during the 2001 emergence of adults at most sites. The rise in populations from endemic levels to outbreak levels varied by site, though occurred during the 1980s or early 1990s. The decline in borer numbers was most evident between the 2003 and 2005 emergence of adults, though only two further generations have occurred since, and it remains unclear whether populations have returned to endemic levels. Endemic populations exhibited a negative relationship with the prior year’s June Palmer Drought Severity Index, indicating that dry periods are associated with increases in borer numbers. Future studies of stand and tree characteristics may reveal why some areas were more heavily infested than others during the outbreak.

Can an herbivore of the invasive tree of heaven carry a plant pathogenic fungus from tree to tree?

Amy L. Snyder1, Scott M. Salom1, Loke T. Kok1, Gary J. Griffin1, Donald D. Davis2
1Virginia Tech, Department of Entomology
2Pennsylvania State University, Department of Plant Pathology

[Abstract: Significant wilting and mortality of tree of heaven (TOH) in Pennsylvania was observed in 2002 by plant pathologists from Penn State and determined to be Verticillium albo-atrum, a vascular wilt fungi. Ongoing research suggests this pathogen may be a suitable biological control agent for the TOH however the natural spread of this pathogen appears to be restricted. The purpose of our research is to incorporate and determine if Eucryptorrhynchus brandti (Harold), an herbivore weevil imported from China, can carry V. albo-atrum from tree to tree. Studies are proposed and the work is ongoing.]

3:15-3:45 PM

Break

Examining the Impact of Hemlock Woolly Adelgid Invasions on Headwater Streams: Preliminary Findings
Joshua K. Adkins and Lynne K. Rieske-Kinney
University of Kentucky, Department of Entomology

Barcoding Forest Lepidoptera in Central Appalachia: Development and Application of a Sequence Library
University of Kentucky, Dept. of Entomology

Scanning electron images of Adelges tsugae
Kelly Felderhoff
North Carolina State University

Host range testing of Laricobius osakensis (proposed) Montgomery and Shiyake (Coleoptera: Derodontidae), a new predator for hemlock woolly adelgid, Adelges tsugae Annand (Homoptera: Adelgidae)
Lígia Cota Vieira, Scott M. Salom and Loke T. Kok
Virginia Tech

**Future forests: Predicting outcomes of invasion by hemlock woolly adelgid and sudden oak death in the southern Appalachians**
H. L. Spaulding and L. K. Rieske-Kinney
University of Kentucky, Department of Entomology

**Competitive interactions among three congeneric species of Laricobius: Predators of hemlock woolly adelgid part II**
Heather Story, Scott M. Salom, and L. Kok
Virginia Tech

6:30-9:30 PM

**Banquet; Pool (Inclement weather location – Coastal Ballroom)**

**Insect Photo Salon – Ballroom**
Thursday, July 30th

6:00-10:00 AM  Breakfast (Courtyard Cafe)

8:30-10:00 AM  Concurrent Session 1

A. Forest Insect and Pest Risk Assessment in the South: Current (and Future) State of the Art
Steve Clarke and Kier Klepzig, Moderators – Bay Room

  Prediction of forest threats – Frank Koch, NCSU; Bill Hargrove or Danny Lee, Eastern Forest Environmental Threat Assessment Center, USDA Forest Service
  National insect and disease risk map – Frank Krist or Frank Sapio, Forest Health Technology Enterprise Team, USDA Forest Service
  Forest insect models – Andrew Birt, Knowledge Engineering Lab, Texas A&M University

Agenda: Each panelist (only one per organization) will provide a brief overview of their responsibilities and recent accomplishments in the area of insect pest risk assessment, hazard rating, modeling, etc. (5-10 min. each).

Open discussion with audience questions directed to the panelists. (45-60 min.)

Session wrap-up directed toward meeting session objectives. (15 min.)

Session objectives:

1. Discuss current NF insect pest risk map efforts and decide:
   Insects to be included, host layers to be used, and models to be utilized to predict mortality.
2. Invasive insect pest hazard and risk map development needs.
3. Improved coordination between agencies and universities.

B. Host Interactions with Non-native Invasive Pests
Fred Hain and Brian Strom, Moderators – Harbor Room

Format: Workshop format that encourages audience participation at any time.

  Sirex, Tomicus, and theory – Matt Ayers, Dartmouth College
  Emerald Ash Borer – Pierluigi Bonello, Ohio State University
  Hemlock Woolly Adepig (w/some additional comments by Fred Hain on Balsam Woolly Adelgid) – Kelly Felderhoff, North Carolina State University
  Gene conservation program for hemlock, (and the Partnership for Saving Threatened Forest) – Robert Jetton, Camcore, North Carolina State University (and Fred Hain)
Abstract: Camcore is a forestry research cooperative program that has been in operation at N.C. State University for 29 years and specializes in the applied conservation and domestication of forest genetic resources utilizing an ex situ approach. Working with 30 industrial, federal, and state organizations worldwide, Camcore has been a leader in the conservation of more than 40 tropical and subtropical tree species in the genera *Pinus*, *Eucalyptus*, *Gmelina*, and *Tectona*, among others. In 2003, Camcore began a three-phase, multi-year Cooperative Agreement with the USDA Forest Service Forest Health Protection to utilize the ex situ approach to preserve seeds of eastern (*Tsuga canadensis* Carr.) and Carolina (*T. caroliniana* Engelm.) hemlocks threatened by the hemlock woolly adelgid (*Adelges tsugae* Annand) in the eastern U.S. Phase 1 (2003-2005) focused on the conservation of Carolina hemlock in the Southern Appalachian Mountains, Phase 2 (2003-2009) the conservation of eastern hemlock in the southeastern U.S., and Phase 3 (2009-2012) will involve the conservation of eastern hemlock in the northeastern and Midwestern regions of the U.S. The objectives of this agreement are to (1) develop a framework plan for hemlock gene conservation, (2) describe patterns of hemlock genetic diversity across the species’ native ranges, (3) collect seeds from hemlock populations distributed across the species’ native ranges, (4) preserve hemlock seeds in long-term seed banks (cold storage), and (5) establish national and international hemlock conservation seed orchards. The overall goal is to maintain viable and genetically diverse hemlock populations and seed reserves so that these ecologically important species can be maintained in perpetuity and utilized to restore forests decimated by the hemlock woolly adelgid.

Through the first six years of this project Camcore and the US Forest Service have made steady progress towards accomplishing our objectives. The framework plan for hemlock gene conservation has been written and submitted for review and comment, and we have published the first thorough treatment of Carolina hemlock silvics (Jetton et al. 2008, For. Ecol. Mgmt. 255: 3212-3221). We have completed an AFLP (amplified fragment length polymorphism) genetic diversity analysis for Carolina hemlock (Potter et al. in preparation), an allozyme diversity analysis of eastern hemlock in the southeastern U.S. (Potter et al. 2008, New Forests 35: 131-145), and are currently in the process of conducting a microsatellite (SSR) diversity analysis of eastern hemlock across its entire North American range. As of July 2009 (when this presentation was given) seed had been collected from 97 mother trees in 13 populations of Carolina hemlock and 195 mother trees in 26 populations of eastern hemlock. Portions of this seed have been used to successfully establish conservation seed orchards for Carolina hemlock in North Carolina and Chile as well as eastern and Carolina hemlock seedlings at forest nurseries in Arkansas and Brazil that will eventually be out-planted for conservation.

Gene conservation will play a critical role in future efforts to breed for hemlock host resistance to the hemlock woolly adelgid and restore hemlock forests throughout the eastern U.S. If current efforts to manage the adelgid with silvicultural, chemical, and biological controls are successful, then gene conservation will provide a source of regionally adapted hemlock germplasm for reforestation, either from seed stock maintained in cold storage or seeds collected from national and international conservation seed orchards. If adelgid management remains elusive, then our efforts in gene conservation will provide a broadly adapted genetic base from which to breed for resistance through tradition selection and breeding within the pure species or inter-specific hybridization and backcrossing between eastern and Carolina hemlocks and putatively resistant hemlock species native to Asia and the Pacific Northwest. However, if resistance breeding is to be successful research is needed on techniques to accelerate the hemlock breeding cycle and reliable methods to screen putatively resistant hemlock genotypes.]
C. Hardwood Defoliators from Bull Run to the Bayou
Chris Asaro, Moderators – Coastal 1

Using **landsat imagery to detect gypsy moth defoliation** – Chris Asaro, Todd Edgerton and Jim Pugh, Virginia Dept of Forestry

**[Abstract:** Gypsy moth defoliation has had a widespread impact on Virginia's forest landscape since the mid-1980s. State forest health specialists in Virginia carry out aerial detection surveys annually to document defoliation due to gypsy moth. During outbreak years, this can be a daunting task due to limited resources, logistical concerns and small windows of opportunity for optimum flying conditions. Therefore, there has been increasing interest in utilizing satellite imagery to detect defoliation to augment aerial survey operations. Landsat 5 imagery, which became available to the public free of charge during 2008, provides updated imagery at two-week intervals. Provided the imagery is relatively clear of clouds and haze, it can be very useful for detecting significant defoliation. We compared polygons of gypsy moth defoliation mapped during various aerial surveys with imagery of the same areas obtained after the flights. In many instances, particularly areas impacted by heavy defoliation over multiple years, there was significant overlap between drawn polygons and areas identified as defoliation via the imagery. It was concluded that Landsat 5 imagery could be a valuable tool to augment defoliation data obtained from aerial survey efforts.]

**Fall cankerworm - the 'worm' that ate Charlotte** – Rob Trickel, North Carolina Division of Forest Resources

**[Abstract:** Fall Cankerworm (FCW) is a native defoliator found throughout eastern North America from Canada to Texas. In the fall, wingless females crawl to upper twigs and branches of trees to lay their eggs. Over-wintering eggs hatch in early spring as buds are swelling and larvae feed on foliage for about four weeks. Repeated defoliation jeopardizes tree canopy and the cost of removal of dying trees is very high. In forested areas, predators including ground beetles and an egg parasitoid wasp (**Telenomus alsophilae**) are major factors in maintaining FCW populations at low levels for long periods. In Charlotte, these natural predators are not found in adequate numbers to control the cankerworm, probably due to the lack of natural understory.

Charlotte has a large and well-established urban forest with an abundance of oaks. Very large populations of fall cankerworm (**Alsophila pometaria**) have annually defoliated oaks in Charlotte/Mecklenburg County over the past 20 years. In the past few years, populations have increased to damaging levels within the City of Charlotte. Nearly 73,000 acres of oaks, primarily willow oaks, were defoliated in 2007 and some mortality was reported in the city. In the spring of 2008, about 63,000 acres were sprayed with **Bacillus thuringiensis** (**Bt**). The USDA Forest Service, Region 8, Forest Health Protection unit provided technical and financial assistance for the spray project.

Spraying insecticides over an urban area with congested airspace associated with a major airport provides unique challenges. An effective communication plan was implemented to educate and inform the citizens of the area about control of the pest and logistics of the spray program. City staff visited and spoke to every available homeowner, civic and environmental group, and media events, letter campaigns, internet updates and other communication efforts were employed to make sure information was accessible and transparent. The city also utilized the services of a retired FAA controller to help with
permits, clearances and communications with Charlotte Douglas International Airport.

The spray program was completed in two days utilizing 5 fixed-wing aircraft, including 56 flight hours.]

Hijacking the hijackers: how plant signaling compounds affect galling by the Asian chestnut gall wasp – Lynne Rieske-Kinney, University of Kentucky

Propagation of synchrony through trophic interactions in the gypsy moth – Kyle J. Haynes, Andrew M. Liebhold, and Derek M. Johnson Dept. of Biology, University of Louisiana

Defoliators and Louisiana’s coastal wetland forests – Jeremy Allison, Lousiana State University

10:00-10:30 AM  Break
10:30-12:00 PM  Concurrent Session 2

A. International Activities of SFIWC Members
Keith Douce, Moderator – Bay Room

10:30 – 10:32: Opening Comments – G. K. Douce, University of Georgia


[Abstract: A sentinel tree project is under development by Forest Health Protection. The purpose is to identify potential invasive insect pests of North American (NA) tree species. The project initially will concentrate on China, as several economically important insects in North American forests have come from southeast Asia. A visit to botanical gardens in China revealed that NA trees generally were spatially rare and often heavily managed, indicating these areas may not be desirable for detecting potential insect infestations. The proposed approach is 1) a review of literature and anecdotal evidence concerning insect problems on NA tree species planted in China; 2) systematic surveys for insect damage in outplantings of NA trees in China; and 3) cataloging insects on NA trees using whole tree insecticide sprays.]

10:44 – 10:56: Fortune Cookie says you will have great success in China and Japan, and meet a monkey too – Scott M. Salom, Virginia Tech

10:56 – 11:08: Evaluation of Mortality in Natural Stands of Pinus oocarpa and P. caribaea in Nicaragua – Roger Menard, James Ward, Lori Eckhardt, and A. Sediles. USDA Forest Service, FHP, Pineville, LA; USDA Forest Service, FHP, Atlanta, GA; School of Forestry and Wildlife Sciences, Auburn University; University of Managua, NICARAGUA

11:08 - 11:20: (Very) short course in North American forest entomology: teaching in the Viennese Mountain Master of Forestry Program – Fred Stephen, University of Arkansas
11:20 – 11:32: Genetic tools and invasive species (what we know/can do, and what we don’t know/can – Ferenc Lakatos, University of West-Hungary, Institute of Sylviculture and Forest Protection Sopron, HUNGARY

11:32 – 11:44: Expanding Bugwood Technology Systems to Central Europe: Building a Global System – G. Keith Douce, Center for Invasive Species and Ecosystem Health, University of Georgia

11:44 – 12:00: Questions and discussion and other comments

B. What We Thought We Knew (and Think We Know) About SPB: Things Learned During the Writing of the Southern Pine Beetle Encyclopedia
Brian Sullivan, Moderator – Harbor Room

The Southern Pine Beetle Encyclopedia project – updating the SPB ‘bible’ – Bob Coulson, K.E.L., Texas A&M University

SPB II: Return of the Fungi – Kier Klepzig, Southern Research Station, USDA Forest Service

[Abstract: Bark beetles are consistently associated in complex symbioses with fungi. Despite this, little is known of the net impacts of the fungi on their vectors, and mites are often completely overlooked. In this talk, we describe interactions involving the southern pine beetle (SPB), with mites, fungi, and other microbes. The SPB consistently carries three main fungi and numerous mites into the trees it attacks. One fungus, Ophiostoma minus, is carried phoretically on the SPB exoskeleton and by phoretic mites. The mycangium of each female SPB may contain a pure culture of either Ceratocystiopsis ranaculosus or Entomocorticium sp. A. The mycangial fungi are, by definition, transferred in a specific fashion. The SPB possesses two types of gland cells associated with the mycangium. The role of these cells and their products remains unknown. Preliminary studies have observed yeast-like fungal spores in the mycangium and several surrounding tubes that carry secreted chemicals from gland cells (or bacteria) to the mycangium. In particular, we have discovered a novel antibiotic with selectively inhibitory effects. The results of these interactions can have significant impacts on their beetle and mite hosts, and ultimately on the population dynamics of this destructive pest.]

Semiochemical Management of SPB – Brian Strom, Southern Research Station, USDA Forest Service

SPB Behavior and Host Interactions – Brian Sullivan, Southern Research Station, USDA Forest Service

Group discussion

C. Damage to trees in forest and urban areas following major storms
Joe Pase, Moderator – Coastal 1

Damage in thinned and unthinned pine stands in East Texas following Hurricane Ike – Aleksandar Dozic, Texas Forest Service
Abstract: Hurricane Ike, the third most destructive hurricane to ever make landfall in the United States, struck the Texas coast at Galveston on September 13, 2008 as a Category 2 hurricane with winds of 110 mph. To address the issue of whether thinned stands suffered substantially more damage from hurricane-force winds than did unthinned stands, a questionnaire was prepared and mailed to a group of landowners in East Texas who had recently thinned their young pine stands and to another group that had stands in which thinning was scheduled, but was still pending when Hurricane Ike struck. In summary, thinned pine stands suffered damage from Hurricane Ike, but damage levels were only slightly greater than those suffered by unthinned pine stands of similar age. This survey provides useful insight into the impacts of hurricane-force winds on 10-20 year old loblolly pine stands resulting from Hurricane Ike in East Texas. Results suggest that thinning, per se, does not substantially increase the risk of wind-caused damage. Factors such as exposure to open areas and clearcuts, geographical location (i.e., maximum wind speed), and orientation of rows appeared to have a greater influence than stand density. Survey results were confirmed performing ground check.

The Arkansas Ice Storm of 2009 – James Northum, Arkansas Forestry Commission

Abstract: A severe and dramatic ice storm covered much of northern Arkansas (as well as parts of OK and KY) on 26-27 Jan 2009. The area was aerially mapped 5 Feb 2009 using digital sketchmapping technology. The ice storm impacted slightly over 10 million acres of which 4.9 million acres were forested. Based on FIA data, pulpwood and sawtimber losses to pine were estimated at 1.178 million tons and hardwood losses were 9.27 million tons. The value of this timber was estimated to be $164 million based on 3rd Quarter 2008 Forest2Market Arkansas Timber Report for North Arkansas. In addition to the timber damage, 30,000 utility poles were broken and 11 deaths were attributed to storm. Ice accumulations ranged from .5 to 2.5 inches, depending on elevation. Damage to residual trees will be present for many years as broken limbs provide entry courts for various decay fungi. Future degrade will be extensive. In spite of the damage, Northum stated, “If one had the least shred of the soul of an artist, it was a beautiful sight. However, it made one heck of a mess.”

Observations and experiences with post-hurricane effects on trees in Florida – Bud Mayfield, Florida Division of Forestry

Abstract: This talk briefly presented some of the work of Mary L. Duryea, Eliana Kampf, and Ramon C. Littell (University of Florida-Institute of Food and Agricultural Sciences) associated with the Urban Forest Recovery Program (UFRP), which was created after the devastating 2004-2005 hurricane seasons in Florida. The UFRP is aimed at citizens and communities seeking to re-establish a more wind resistant, post-hurricane urban forest and set better management practices so that future storms are less damaging. The program maintains a website [http://treesandhurricanes.ifas.ufl.edu/] with excellent resources on a number of topics including post-storm clean-up, assessing and restoring damaged trees, pruning guidelines, urban forest design, and species selection for wind resistance. A summary of the following published research article was also presented:

Several hurricanes struck Florida, U.S. in 2004 and 2005 causing widespread damage to urban and rural areas. We measured the impacts of five of these hurricanes on the urban forest and combined these results with four other hurricanes to present an assessment of wind resistance for southeastern United States coastal plain tree species. Urban forest loss was positively correlated with wind speed. Tree species demonstrating the highest survival in winds were sand live oak (*Quercus geminata*), American holly (*Ilex opaca*), southern magnolia (*Magnolia grandiflora*), live oak (*Quercus virginiana*), wax myrtle (*Myrica cerifera*), sweetgum (*Liquidambar styraciflua*), crapemyrtle (*Lagerstroemia indica*), dogwood (*Cornus florida*), and sabal palm (*Sabal palmetto*). In a statistical comparison of sand live oak, live oak, and laurel oak (*Quercus laurifolia*) survival after four panhandle hurricanes, laurel oak had significantly poorer survival than both live oak and sand live oak. Among all species, larger trees lost more branches than medium and smaller trees. Leaf loss had a positive relationship with survival; losing leaves during the hurricane meant higher survival. Trees growing in groups or clusters had greater survival than those growing as individual trees. Tree species with higher wood density had greater survival. Tree species categorized as having dense crowns lost more branches than those with moderate and open crowns; however, contrary to the literature, dense-crowned species survived best. A survey of arborists, scientists, and urban foresters ranked species for their wind resistance. Using our results from hurricane measurements and incorporating results from the survey and the scientific literature, we have developed lists of relative wind resistance for tree species in the southeastern coastal plain. These lists should be used with caution with the knowledge that no species and no tree is completely windproof. In addition, local considerations such as soil, cultural practices, tree age and health, and other urban forest conditions need to be taken into account.

**Post Hurricane Assessment and Management on the De Soto National Forest** – Jim Meeker, Forest Health Protection, USDA Forest Service

[Hurricane Katrina made landfall on August 29, 2005 as a Category 3 storm, and maintained a northward track just west of the De Soto National Forest in south MS, exhibiting winds in excess of 100 mph across the entire forest. Initial assessments indicated over 300,000 acres of moderate to heavy levels of tree damage throughout the forest. Fifty-eight, 1/10 ac plots were installed and individual tree damages assessed across 18 different stands in early October, in support of conducting an expedited environmental assessment (EA) under the authorities of the Healthy Forest Restoration Act of 2003 (HFRA), in order to implement recovery measures. Tree damage was highly variable and appeared more dependent upon location than stand type, age, size, stocking density, or other pre-existing conditions. Overall, only 30% of the 584 trees > 4.5” dbh appeared undamaged, while nearly 40% exhibited damage that was lethal or likely to be in the short term (1-3 yrs). Sawtimber salvage operations commenced in December 2005 and continued through June of 2006, during which severe growing season drought likely magnified increasing secondary pest populations and associated tree mortality, which was evident on a statewide basis. Salvage operations were conducted on 25% of the entire forest and represented ca. 14 years of average annual harvest volume offered, but also left tens of thousands of acres of damaged poletimber stands untreated and no valid work plans for future forest management. Hence, another HFRA EA was prepared and signed in May of 2008; authorizing a project that would “enhance protection from catastrophic wildland fire for T&E species or their habitats and that maintain or restore such habitats.” The District-wide project placed 178,000 acres of thinnings and 39,000 acres of longleaf restoration (conversion of existing off-site pine stands) on the shelf as approved plans for ecosystem...}
restoration for gopher tortoise and red-cockaded woodpecker habitat. Utilizing GIS overlays of the prioritized areas for thinning and longleaf restoration, in addition to current forest cover type maps, and 30-m resolution SPB hazard maps, has enabled the Forest to make meaningful strides towards truly implementing collaborative, integrated and prioritized ecosystem restoration. Annual follow up assessments on residual plot trees revealed substantial mortality in the year following the storm that has consistently declined to negligible levels three years following the storm. Interestingly, only half of those trees which were root-sprung and leaning more than 45 degrees from vertical have died; whereas nearly 40% of those trees leaning <20 degrees have perished three years following the storm.

**Crown Condition of Declining and Healthy Urban Live Oaks in Gulfport, MS Pre- and Post-Hurricane Katrina – Dale Starkey, Forest Health Protection, USDA Forest Service**

[Abstract: An evaluation of urban live oaks was done along the streets of the older sections of Gulfport, MS in October 2003 to determine the reasons (if any) for decline in some trees. Streets were driven and each live oak with decline symptoms was selected as a sample tree along with the nearest similar healthy tree. Twenty-five pairs of trees were identified. Three primary crown condition variables were estimated for each tree: (1) crown density, (2) crown dieback and (3) foliage transparency. Procedures used were developed for the Forest Health Monitoring Program and also are used in the Urban Forest Effects Model. Briefly, crown density is the amount of skylight being blocked by foliage, twigs, branches and reproductive structures, expressed as a percentage. Denser crowns are generally considered more vigorous and healthy. Densities on healthy live oaks range from 45-75% depending on local conditions. Crown dieback is the amount of fine twigs visibly dead as a percentage of the cross-sectional area of crown. Most healthy live oaks have 0-5% dieback. Foliage transparency is the amount of skylight visible through the foliated portions of the crown. This variable measures the amount of damage visible to foliage. On healthy trees foliage transparency ranges from about 10-25%. Each sample tree was photographed. Healthy and declining sample populations differed in their condition with the healthy group having greater densities (55 vs 38%), lower diebacks 2 vs 18%), and lower foliage transparencies (21 vs 37%). We concluded from these and other data collected that the live oak population was generally healthy with some trees experiencing moderate decline due to common environmental and biological stresses. Hurricane Katrina battered the sample trees rather severely in August of 2005 presenting us with the opportunity to evaluate damage and recovery from the storm. A few trees were killed by the storm and some were cut down immediately afterward for safety and clean-up purposes; therefore we could not make an accurate estimate of storm-related mortality. We re-evaluated only the surviving trees in 2006 and 2009, 1 and 4 years after the storm. Both healthy and declining sample groups reacted similarly. By 2003 density declined, dieback increased and foliage transparency changed little or improved (actually due to dense re-sprouting along branches). By 2009, both sample groups had approximately recovered their pre-storm crown conditions—100% of the healthy group improved and 93% of the declining group; only 17% (3 trees) of the declining group declined further after the storm. Live oaks are tough, resilient trees and only the very most-exposed trees along the Gulf Coast were permanently damaged or killed.]

**Assessment of urban tree damage in Galveston, TX following Hurricane Ike – Joe Pase, Texas Forest Service**

12:30-4:30 PM  Lunch and Afternoon Activities
1:30–5:00 PM Frontalis Cup: Shell Landing Golf Course

1:30–3:00 PM Field Trip: Hurricane Damage and Recovery in an Urban Setting

3:30–5:30 PM Frustrana Cup: Badminton Tournament on the beach

4:30–6:00 PM Poster Session – pre-function Ballroom

Detecting Forest Canopy Change using NDWI: A Historical Look at the Red Oak Borer Outbreak, Joshua Jones, Jason Tulalis, and Fred Stephen

Forestry-related pathways for the movement of exotic insect pests into and within the Greater Caribbean Region, L. Newton, H. Meissner, and A. Lemay

Abstract: Forests of the Greater Caribbean Region (GCR) have immense ecological and economic importance. These unique ecosystems are under increasing pressure from exotic pests, which may cause extensive environmental damage and cost billions of dollars in control programs, lost production, and forest restoration. Forests may act as a source of exotic species introduction when wood or non-wood forest products are exported. In the introduced range, these pests may impact both forests and agricultural production. Additionally, forests are at risk not only from pests introduced with forest products but also from pests introduced through other pathways. Propagative materials, such as seeds or trees for planting, may serve as a pathway for pests and may also become pests themselves if they become invasive. Our objectives were to outline important forestry-related pathways of pest movement and to offer suggestions for improved safeguarding. The pathways discussed are: wood products, non-wood forest products, and trees for planting. The work presented here was carried out in the framework of the CISWG Caribbean Pathway Analysis. The full report is available at: http://caribbean-doc.ncsu.edu/index.htm.

Wood packaging material as a pathway for the movement of exotic insect pests into and within the Greater Caribbean Region, H. Meissner, T. Culliney, A. Lemay, L. Newton, and C. Bertone

Abstract: Pallets, crates, and dunnage made of wood are commonly used packaging materials in international trade. Our objective was to utilize data collected by the United States Department of Agriculture to discuss the current role of wood packaging material (WPM) in the movement of pest species into and within the Greater Caribbean Region (GCR). For both maritime and air cargo, significant differences were found between countries of origin in terms of the percentage of shipments that contain WPM. A review of United States interception data reveals that, although many countries have adopted the standard ISPM 15 (which requires WPM to be treated prior to import), bark- and wood-boring beetles and other organisms of phytosanitary significance are still being intercepted on WPM.

Phoretic mite and nematode associates of the spruce bark beetle, Ips typographus (Coleoptera: Scolytidae) in Georgia, John C. Moser, Medea S. Burjanadze, Pavel Klimov, and Lynn K. Carta

Abstract: At least 10 species of mites were located with Ips typographus in Georgia. A total of 520 specimens of Ips typographus and Dendroctonus micans were taken from the inner and outer bark of Picea orientalis that were felled and sampled in 2005 and 2007. Of the 520 collected beetles, only two were D. micans, which were from the Tcagveri District and carried no mites. Of the 518 Ips typographus, only 159 (30.7%) hosted mites.


Abstract: Root feeding bark beetles of the genus Hylastes Erichson (Curculionidae, Scolytinae) are known to vector ophiostomatoid fungi including some important pathogens. In this study, pitfall traps baited with 95% ethanol and turpentine were placed in longleaf pine stands at Fort Benning, Georgia to attract Hylastes spp and other root-feeding beetles. Traps were visited weekly for 62 weeks, and ophiostomatoid fungi isolated by rolling on selective and non-selective media. Hylastes tenuis Eichhoff, H. salebrosus Eichhoff, and H. porculus Erichson were collected, in order of their relative abundance. Among the ophiostomatoid fungi isolated from
these insects were *Grosmannia huntii* (Robinson-Jeffrey & Grinchenko) Zipfel, de Beer & Wingfield (syn *Leptographium huntii*), *L. procerum* (Kendrick) Wingfield, *L. terebrantis* Barras & Perry, and *L. serpens* (Goid.) Siem. *Grosmannia huntii* and *L. serpens* have only recently been found in southeastern pines, but are known from Europe and other regions where the fungus is known to be introduced. *Hylastes* spp were found to be present throughout most of the year with population peaks in spring and fall, and to be vectoring ophiostomatoid fungi including potential exotic species.]

Root feeding bark beetle populations in association with stand health, biomass removal and standard silvicultural practices, J. A. Thompson, L. G. Eckhardt, and R.D. Menard

[Abstract: Forest managers have long attempted to improve the health of their stands through management actions such as thinning, prescribed burns and biomass extraction. These actions are intended to reduce overcrowding of stands and increase resistance of trees to pests, but few have studied impacts of forest management practices on bark beetles inhabiting the roots and lower bole. These species have potential to weaken trees and may be responsible for widespread premature death of regenerating loblolly pine (*Pinus taeda* L.).

*Leptographium terebrantis* Barras and Perry, *L. procerum* Kendrick and *L. serpens* (Goid.) Wingfield are known plant pathogenic fungi vectored through movement of *Hylastes* bark beetles (Eckhardt, et al, 2007). Southern pine regeneration efforts throughout the South would benefit from a more complete understanding of the impact of management practices on pathogen-vectoring bark beetles. This project will collect and compare insect populations among stands under various management regimes that include biomass extraction, conventional thinning and no treatment. Tree vigor and management site characteristics will both be related to changes in insect populations.

Insects will be collected from traps at mixed loblolly pine stands in Talladega National Forest in west-central Alabama. Pitfall traps, panel traps and flight intercept traps will be used at all subplots to collect as representative a sample of insects as possible. Collection will occur continuously over two years at both treatment and control stands (one year pre- and post- treatment). Tree vigor assessments also will be taken to compare tree health before and after treatment.

Works Cited -

Bark beetle population responses to harvest and thin treatments in loblolly pine stands in decline-impacted central piedmont regions, Kathryn R. Booker and Lori G. Eckhardt

[Abstract: Annually, bark beetles cause extensive destruction in industrial pine plantations in the southeastern United States. Elevated bark beetle populations induce stress resulting in degraded crown conditions and therefore contribute to pine decline mortalities. Stands characterized by pre-disposing factors of decline appear to have greater risk and damage susceptibility to bark beetle outbreaks. Effective silvicultural prescriptions are needed to control beetle populations in order to minimize economic loss. However, consequences of treatments should be well-understood prior to implementation. This study was developed to determine fluctuations in pathogen-vectoring beetle populations as a response to harvest and thinning disturbances and the interrelatedness of trends among beetle species. Research plots were established throughout industrial timberlands in the central piedmont regions of Alabama and Georgia to monitor population trends one year pre- and post-silvicultural treatments. Each plot contains one of each trap type: a pitfall, panel, and flight-intercept. Beetles caught in each trap will be collected, identified, and enumerated bi-weekly. Additionally, crown conditions will be observed to provide insight into stand health. Knowledge of bark beetle population trends and population level responses to common silvicultural disturbances proves vital to forest managers in making educated management decisions to prevent further economic losses.]

Premature pine mortality, root-inhabiting bark beetles and their associated blue-stain fungi, George Matusick, Lori G. Eckhardt, and Roger D. Menard

[Abstract: Premature mortality in loblolly pine has recently been observed on many southeastern industrial lands. In May 2008, a large tract of thirty year-old loblolly pine dying at an exorbitant rate on forest industry land was investigated. Mortality was scattered and continuous throughout the early spring. Six trees total were
examined further to determine the cause of mortality. Initially, intense insect damage was clearly evident below the soil line in one tree exhibiting largely chlorotic foliage. On a subsequent visit, five trees representing three crude crown classes were excavated with two roots removed for further investigation. Two trees exhibiting the severe crown condition had extremely deteriorated roots with strong evidence of previous but no current bark beetle breeding activity. Two trees exhibiting an intermediate crown condition, with some chlorotic foliage, had the highest level of current bark beetle breeding activity with numerous adult and juvenile beetles occupying many defined galleries. One tree exhibiting a healthy crown condition had minimal evidence of bark beetle activity. Five common root-inhabiting blue-stain species were also found associated within bark beetle galleries as well as adult bark beetle vectors. Observations suggest root inhabiting bark beetles coupled with their pathogenic blue-stain associates were involved in the observed premature mortality.

Genetic Conservation of Table Mountain Pine (Pinus pungens Lamb.) in the Southern Appalachian Mountains by Camcore and the USDA Forest Service, Robert Jetton, Barbara Crane, Bill Dvorak, Valerie Hipkins, and Andrew Whittier

[Abstract: Table Mountain Pine (TMP), Pinus pungens Lamb., is endemic to the Appalachian Mountains where it’s native range extends from southern Pennsylvania south to northern Georgia. In the Southern Appalachian Mountains TMP populations are declining due to wild-fire suppression programs and periodic outbreaks of the Southern Pine Beetle, Dendroctonus frontalis Zimm. As of 1998, U.S. Forest Service inventory data indicated less than 12,000 hectares of the Table Mountain Pine–Pitch Pine forest type surviving in the region. In the absence of consistently reliable methods for regenerating declining stands, an effort should be made to conserve those TMP genetic resources that remain before additional populations are lost. Camcore (tree conservation and domestication program at N.C. State University) and the U.S. Forest Service National Forest System are proposing to do this for surviving TMP populations located on national forest lands in Georgia, Tennessee, Virginia, West Virginia, Maryland, Pennsylvania, and North and South Carolina. We will utilize an ex situ germplasm conservation approach similar to what Camcore has used to conserve numerous threatened pine species native to Central America and Mexico since 1980 and declining populations of Eastern and Carolina hemlock in the southeastern U.S. since 2003.

The primary objectives of this project will be to (1) conduct population explorations and seed (germplasm) collections from surviving TMP stands located on national forests in the Southern Appalachian Mountains for the purposes of gene conservation, and (2) to develop an up-to-date range map of surviving TMP populations in the Southern Appalachian Mountains and amend inventory data to reflect the current amount of this forest type remaining in the region. A portion of the collected seeds will be germinated and established in seedling seed orchards and conservation banks, and the remaining seed will be placed in long-term cold storage at multiple locations. Secondary objectives will be to evaluate optimal conditions for cold storage of TMP seeds for maintenance of viability in the long-term, evaluate pre-germination and stratification treatments that offer high rates of uniform germination of TMP seeds, evaluate variation in germination among TMP seeds from annually opening versus serotinous cones, evaluate greenhouse and nursery protocols that are best suited for producing healthy TMP seedlings that will perform well when out-planted into a seed orchard environment, utilize FloraMap™ or other climate modeling software to determine the best areas for conservation seed orchard establishment and predict how climate change might impact the natural distribution of TMP in the future, use isozymes or molecular markers to evaluate the effective population size represented by TMP seeds from annually opening versus serotinous cones and assess which best represents the populations we are attempting to conserve, use isozymes or molecular markers to develop a reasonable evolutionary scenario to explain the current trends in genetic diversity and population structure of TMP, and conduct a number of biological and chemical assays to determine the level of susceptibility of TMP populations to infestation by the Southern Pine Beetle and compare to similar trends that have been previously evaluated for other pine species native to the southeastern US.]

Survivorship of saproxylic beetles in prescribed-burned loblolly pine stands in Georgia, Mike D. Ulyshen, Scott Horn, and Kamal J.K. Gandhi

[Abstract: Research on the ecology, distribution, and status of saproxylic beetles in burned forests is needed to prioritize their conservation measures in the southeastern United States. The extent to which saproxylic beetles need to re-colonize forests after fires remains unknown, however, some species may survive fires, thereby obviating the need to re-colonize burned areas. Our objective is to compare the survivorship of saproxylic beetles in logs of two diameter sizes and decay classes in prescribed burned forests. During the spring of 2009,
Responses of soil microarthropods to invasion by exotic earthworms in hardwood-dominated stands of New York, Jordan Burke, Joe R. Milanovich, John C. Maerz, and Kamal J.K. Gandhi

Abstract: Exotic earthworms native to Europe and Asia are rapidly altering biotic populations and communities in invaded habitats of North America. As earthworms change the physical and chemical properties of soil through intermixing of horizons, the impacts of earthworms are expected to be relatively high on native soil microarthropod species, especially those that have specific microhabitat requirements. We studied the effects of exotic earthworms on communities of soil microarthropods, specifically oribatid mites, in deciduous forests of central New York. During 2008-2009, all soil mites were extracted from two 1 m² plots in the following forest stands: 1) with no earthworms (control); 2) with epigaeic and endogaeic earthworms, but anecic earthworms such as Lumbricus terrestris, a deep soil-dwelling species, were absent; and 3) with all the three guilds of earthworms. Soil samples were collected in the spring and fall of each year, and all soil mites were extracted with Berlese funnels. At present, 20 oribatid species have been identified and verified. Preliminary results suggest that greater numbers of oribatid mites (>150 times) were collected in plots without earthworms than in plots with earthworms. In 2008, twice as many mites were collected in October than in May indicating seasonal variation in mite populations. Similar to density, species richness of oribatid mites was greater in plots without earthworms than in plots with earthworms, especially the ones with the anecic earthworms. As we continue our species identifications, we hope to provide a better understanding of the direct and indirect ecological cascading impacts of exotic earthworm on native biotic communities in northern hardwood forest stands.

Responses of the European woodwasp to southern pine species, Kamal J.K. Gandhi, John J. Riggins, and Vic Mastro

Abstract: The Eurasian woodwasp, Sirex noctilio Fabricius, is a serious woodboring exotic pest of conifer trees in North America. Sirex noctilio has a wide host range in >25 species of commercially important pine species. Many more species are expected to be suitable hosts in North America with potentially ecological and economic consequences. We are assessing the oviposition and colonization preferences of S. noctilio on conifer species that are present in varying degrees in southern forests. We will use these data to create hazard maps for southern forests to predict which areas are most susceptible to invasion by S. noctilio. Two species of commercially important southern pines (loblolly and Virginia pine) were used for the bioassay study in 2009. Seven trees were felled in Georgia in late May. All trees were cut into 1 m long logs in two diameter classes: 10-15 and 20-25 cm. Logs were transported to Syracuse within five days of cutting, where three Scots pines (control species) were also cut into logs of two diameter classes. For the host choice experiment, four logs each of the three pine species (loblolly, Virginia, and Scots) in two diameter classes (small and large) were placed in random locations within a 4 m² arena. Forty one each of males and females of S. noctilio were released within the arena. Observations of the activity of adult S. noctilio on logs (e.g., ovipositing, sitting or walking) were taken every hour (three times) for three days. Logs were then individually enclosed in mesh sleeves. Next summer, we will record the number and size of emerged adults, the number of round exit holes, and length of larval galleries. For the host choice study, two large diameter class logs of each of the three pine species were individually enclosed in mesh sleeves. Two male and female S. noctilio were introduced into each sleeve. Observations on the activity of adult S. noctilio on logs were taken once a day for three days. Logs will be processed next summer as described above for the choice experiment. Preliminary results indicate that in the host choice experiment, significantly more males and females of S. noctilio were observed on Virginia than on Scots or loblolly pines. Female S. noctilio were observed drilling with their ovipositor in the southern pine logs,
especially on Virginia pine, indicating that they may be laying eggs. More adults of *S. noctilio* were found on larger than smaller diameter pine logs. Next year, we will conduct host choice and no-choice experiments with 8-10 species of southern pines, and assess antennal responses of female *S. noctilio* to bark volatiles from southern pines species. Overall, we intend to geospatially reference these biological data with existing host density, type, and condition maps to provide recommendations for relative susceptibility of southern pine stands to potential invasion by *S. noctilio* in these landscapes.


**Abstract:** Eastern hemlock, *Tsuga canadensis*, is an important ecological, environmental, historical, and aesthetic component of southern Appalachian forest ecosystems. In the Great Smoky Mountains National Park (GRSM), eastern hemlock occupies ca. 1,500 ha, and some trees are more than 400 years old. In the last two decades, eastern hemlock has been threatened by a small aphid-like insect (hemlock woolly adelgid [HWA], *Adelges tsugae*), which was introduced from Asia into the eastern U.S. in 1951. Because traditional management tools, especially insecticides, are limited in a forest setting due to high cost, inaccessibility, etc., introduced biological control agents have been integrated into management programs for hemlock woolly adelgid on eastern hemlock. About 400,000 exotic lady beetles, *Sasajiscymnus tsugae* (introduced from Asia), were released against HWA at 166 sites in GRSM from 2002-2008. In 2008, a study was initiated to document presence and establishment of *S. tsugae* at release sites in GRSM.

Sampling was conducted at 15 sites from May to July 2008 and at 29 sites from March to June 2009. Four sites (Anthony Creek, Laurel Falls 1, Laurel Falls 2, and Laurel Falls 3) were sampled each year, and all 40 remaining sites were sampled once in 2008 or 2009. GPS coordinates for all sites were provided by personnel of GRSM, and sites were located using a Garmin GPS map 60 CS x 6 GPS unit. On each sampling date, beat-sheet sampling was conducted for four-man hours at each site. Suspected adults and larvae of *S. tsugae* were taken to the laboratory and identified (larvae were reared to adulthood). Identifications were confirmed by Dr. James Parkman, Lindsay Young Beneficial Insects Laboratory, The University of Tennessee.

During 2008 and 2009, 44 sites where *S. tsugae* had been released were sampled. Adults (n=78) and larvae (n=145) were recovered from seven of the 44 release sites. The greatest numbers of adults were recovered from Buckthorn Gap (*S. tsugae* released in 2002), and the lowest numbers of adults (n=1) were recovered from Ramsey Cascades (*S. tsugae* released in 2007). The greatest numbers of larvae were recovered from Laurel Falls 2 (*S. tsugae* released in 2002). Relatively higher numbers of *S. tsugae* adults and larvae were recovered from releases made in 2002 and 2003, while the least number of adults and larvae were recovered from 2006 and 2007 release sites.

This ongoing study provides documentation of the presence of *S. tsugae* at seven release sites in the GRSM. Populations of this introduced predator are considered to be established (present 6+ years after release and adults and larvae recovered) at five sites. These establishment confirmations are encouraging; however, population densities of *S. tsugae* are low and their impact on HWA populations is unclear. Additional release sites will be sampled in 2010 to further assess establishment and spread of *S. tsugae*. In addition, research will focus on environmental factors that may contribute to the successful establishment of *S. tsugae* on eastern hemlock.

*Xyleborus octiesdentatus* Muryama: New Ambrosia Beetle in North America. Wood Johnson, Valli Peacher, Saul Petty, Billy Bruce, Chris Steiner, Jacob Hudson and Bob Rabaglia


Effects of lure composition and release rate on catch of EDRR target species and other forest Coleoptera. B. L. Strom, S. L. Smith, J. R. Meeker and R. J. Rabaglia

Dosage and residual effects of systemic emamectin benzoate against the southern pine beetle in a small bolt assay, B. L. Strom and L. M. Roton

Sytemic insecticides for preventing tree mortality from the exotic goldspotted oak borer, *Agrilus coxalis*, in southern California, Tom W. Coleman, Brian Strom and Sheri Smith
Seasonal thinning effects on *Ips* beetle use of slash in Mississippi Loblolly pine stands, J. D. Floyd, A. J. Londo, J. R. Riggins, and T. E. Nebeker

Resources to support information exchange and education on invasive forest insects: cooperation between CISEH (Center for Invasive Species and Ecosystem Health) and UWH-FF (University of West-Hungary, Faculty of Forestry), Ferenc Lakatos and Keith Douce

Forest insect alphabet book from A to Z, David L. Kulhavy and Charles D. Jones

Lacewings as adelgid predators, Allen C. Cohen, F. P. Hain, J. Strider, Sara Normark, and Will Blankenship
Friday, July 31st

6:00-10:00 AM  Breakfast (Courtyard Cafe)

8:30-10:00 AM  Concurrent Session 3

A. Population Dynamics of the Southern Pine Beetle: Where have all the bark beetles gone?
Robert Coulson and Fred Stephen, Moderators – Bay Room

Mountain Pine Beetle Populations - from endemic to epidemic cycles –
Allan Carroll, University of British Columbia

Regional Populations Dynamics – when do outbreaks occur? – Andrew Birt et al., Knowledge Engineering Laboratory, Texas A&M University

Latent tendencies of the SPB – Stephen Clarke, Forest Health Protection, USDA Forest Service

[Abstract: The southern pine beetle (SPB) has three population phases: outbreak, intermediate, and latent. Suppression, prevention, environmental factors, and competition all may drive populations into the latent phase. During the initial stages or years of the latent phase, SPB may be present but in numbers too low to detect during normal spring or fall trapping. Often the latent phase quickly transitions to the intermediate phase through the influx of SPB from nearby intermediate populations or the import of infested materials. During extended periods of the latent phase, SPB populations may become locally or regionally extinct, requiring long-range movement of SPB or infested material to reintroduce beetles.]

Are there regime shifts in southern pine beetle population dynamics? – Matthew Ayres, Dartmouth College

Within-tree precursors of change population change leading to outbreaks – Frederick Stephen, University of Arkansas and Robert Coulson, Knowledge Engineering Laboratory, Texas A&M University

Session Agenda: examine how populations of the southern pine beetle transitions from enzootic to epizootic levels and to speculate on the current state of declined populations throughout the South.

B. State of Sirex
Kevin Dodds, Moderator – Harbor Room

Sirex noctilio: Biology 101, 102, and 103 – Peter de Groot, Canadian Forest Service

Stand level impacts of Sirex noctilio in northeastern U.S. and southern Ontario – Kevin Dodds, USDA Forest Service, Forest Health Protection

What's in store for Sirex noctilio in the southeastern U.S. – James Meeker, USDA Forest Service
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Minutes of the Opening Business Meeting  
Wednesday, July 29, 2009  
Courtyard by Marriott Gulfport Beachfront  
Gulfport, Mississippi

Chairman Scott Salom called the 52nd meeting of the Southern Forest Insect Work Conference to order at 8:32 AM. He welcomed everyone to the meeting and thanked John Nowak, John Riggins, Andy Londo, and Will Shepherd for organizing the event. John Nowak, Program Chair, thanked Andy and John Riggins for all of their help and expressed gratitude to all of the moderators, speakers, and poster presenters for their contributions to the program. Dr. Glenn Hughes, Extension Professor at Mississippi State University, gave an informative presentation on the devastation along the Mississippi Gulf Coast caused by Hurricane Katrina, with an emphasis on the impacts to forestland. Marking the opening of the formal business meeting, Chairman Salom asked first-time attendees to stand and introduce themselves. After John Riggins, Local Arrangements Co-Chair, provided information on the hotel and nearby restaurants, Jim Meeker provided details on the Thursday afternoon field trip to observe Hurricane Katrina’s impacts on live oaks. Fred Stephen told the group to see Bob Coulson for details on the Frontalis Cup, and Steve Clarke invited anyone who was interested to meet at 3:30 pm on the beach in front of the hotel for the Frustrana Cup badminton tournament. No SFIWC member passings were reported. When Chairman Salom requested information on retirements or transitions, Dr. Doug Streett was introduced as the new Project Leader for U.S. Forest Service SRS-4552: Insects, Diseases, and Invasive Plants. Dr. Kier Klepzig announced his new position as Assistant Director for Research at the U.S. Forest Service Southern Research Station in Asheville, North Carolina.

Reports
Secretary-Treasurer Will Shepherd reported that minutes of the 2008 meeting in Chattanooga, Tennessee are available in the Proceedings on the SFIWC website. Extra copies of the Proceedings from the 2007 SFIWC are at the registration table. Financially, expenses for the Chattanooga meeting exceeded income by $91.93, leaving a balance of $3,342.95 in the checking account on 12/31/08.

Joe Pase read the Historian’s Report (see attached), prepared by Historian Ron Billings (not present) with highlights of the five meetings previously held in Mississippi.

Alex Mangini, Chairman of the Common Names Committee, reported no submissions over the last two years. Alex asked anyone with future common name submissions to contact him at their convenience to discuss proper procedures.

History Committee – No report.

Photo Salon – Robert Trickel, filling in for Laurie Reid (not present), announced that the slide presentation will run continuously in the ballroom Wednesday evening during the Banquet. He asked that anyone who has not yet submitted their pictures for the Photo Salon get them to him before the lunch break. Wood Johnson, Andy Londo, and Will Shepherd volunteered to be judges. Robert also informed the group that a digital aerial sketch mapping exhibit would be on display outside of the ballroom during the Banquet.
Resolutions – Fred Hain reported that there are no resolutions pending at this time. He requested that the Firewood Movement Resolution approved last year be uploaded to the SFIWC website. The Forest Service Fire Budget Resolution did not have unanimous SFIWC support and will be put on hold, pending further developments in Washington.

Website – Keith Douce invited members to check the website frequently and submit to him or Will Shepherd material they would like to have posted. He stated that he would work to get the Photo Salon submissions posted to the Forestry Images website.

Theses and Dissertations – David Kulhavy reported that this committee may be obsolete due to the common practice of universities posting electronic versions of theses and dissertations.

Rusty Rhea reminded the group that the North American Forest Insect Work Conference (NAFIWC) will be held in Portland, Oregon in May 2011.

Ferenc Lakatos invited the SFIWC membership to the 9th European Congress of Entomology in Budapest, Hungary in 2010.

New Business

Bud Mayfield offered a preliminary proposal for SFIWC to initiate talks with the Southwide Forest Disease Workshop (SWFDW) to combine the two conferences. He told the group that copies of the proposal would be available at the registration table. He explained that some sort of merger would be logical due to a significant overlap in membership, the inability of some members to attend both meetings, and the declining attendance at SWFDW. Bud proposed that (1) the SFIWC Executive Committee approach the SWFDW to determine their level of interest; (2) initiate discussion of logistics and terms of a merger; and (3) develop a joint proposal for review by the SFIWC membership next year (with no merger until 2011 at the earliest).

Nomination – A new Counselor is needed to replace Laurie Reid for a three-year term on the Executive Committee. Voting on nominees will be held during the closing business meeting. Contact John Nowak if you wish to volunteer or have suggestions for the Counselor position.

Scott Salom asked for volunteers and host city suggestions for the 2010 SFIWC. John Nowak volunteered to be Local Arrangements Chair and suggested Wilmington, Charleston, and Savannah as possible venues.

R. F. Anderson Award – Jim Hanula reported that due to a communication mishap, the deadline for nominations for the 2009 award has been extended to September 18, 2009. The winner will be announced to the SFIWC membership via e-mail and will be given a plaque and check.

A.D. Hopkins Award – Forrest Oliveria reported that Scott Salom was awarded this year’s A.D. Hopkins Award. A framed picture and letter will be presented to Scott. Forrest told the group that future nominations can be submitted in written form or as pdf files.
Announcements – Group pictures will be taken in front of the hotel during the morning break. Graduate student presentations should be uploaded by 1:30 pm.

There being no further business, the opening business meeting adjourned at 9:52 am.
Minutes of the Closing Business Meeting  
Friday, July 31, 2009  
Courtyard by Marriott Gulfport Beachfront  
Gulfport, Mississippi

Chairman Scott Salom called the meeting to order at 10:31 am.

Old Business

Election of Officers – John Nowak submitted John Riggins and Jason Moan as candidates for Counselor, 2009-2013. With no further nominations, the members voted, and John Riggins was elected Counselor.

Program chairman for 2010 – John Nowak reported that Kier Klepzig and Fred Stephen volunteered to be the Co-Program Chairs for the 53rd SFIWC.

Meeting site for 2010 – An invitation to host the 53rd SFIWC in 2010 was received from John Nowak (Wilmington, Charleston, or Savannah). The Executive Committee will decide on the location after additional information on costs and feasibility is gathered. Several members recommended that the Executive Committee consider the travel costs for all members when selecting a venue.

Robert Trickel announced the 2009 Photo Salon winners and thanked the judges (see attached).

Frontalis Cup – Bob Coulson reported that he won the Cup on Thursday afternoon.

Frustrana Cup – Steve Clarke reported that 12 teams participated, and the team of Frank Krist and Jason Moan won the beach badminton tournament on Thursday afternoon in a double elimination competition.

The preliminary motion to discuss combining SFIWC with SWFDW was discussed by the membership. Several options were proposed: a full merger with SWFDW, holding a joint meeting with SWFDW, and giving SWFDW a formal invitation to participate at SFIWC. Concerns from the membership included potential meeting length changes, too many concurrent sessions, a possible lack of interest from SWFDW, and a change in the “positive dynamic” to SFIWC where pathologists have traditionally participated. Supporters of the preliminary motion highlighted the unnecessary expense of two meetings with overlapping membership, the benefits of adding a pathology perspective to SFIWC’s entomology-based sessions, “strength in numbers,” and the success of a similar merger in the North Central region. It was noted that the SWFDW had held similar discussions and believed a joint meeting would be preferable to a full merger. Bud Mayfield made a formal amended motion for the SFIWC Executive Committee to ask SWFDW if it would like to participate in a joint meeting at a time in the future that would be mutually beneficial to both groups; Chris Asaro seconded. The motion passed.
New Business

Fred Stephen moved that the Theses and Dissertations Committee should shift its focus to making applicable theses and dissertations available as pdf files on the SFIWC website; Matt Ayers seconded. There was general agreement by the membership for the proposal and that professors should be responsible for ensuring their students’ theses and dissertations are posted to the website. The motion passed.

There being no further business, Chairman Salom again thanked this year’s officers and others who contributed to the 52nd SFIWC.

Meeting adjourned at 11:19 am.

Respectfully submitted,

William P. Shepherd, Secretary-Treasurer
## Financial Report, CY 2009

### SFIWC Income & Expenditures
January 1, 2009 – December 31, 2009

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<th>Description</th>
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Historian’s Report
52nd SFIWC
Gulfport, Mississippi

This is the 52nd meeting of the Southern Forest Insect Work Conference (SFIWC) and the sixth time we have met in the State of Mississippi since the Conference began in 1956. Indeed, Gulfport was the site chosen for the 2nd SFIWC, held in 1957. R.J. Kowal was the Chairman and there were 66 in attendance. The second meeting in Mississippi, our 9th annual conference, was held in Greenville in 1964. Attendance was 69 persons and program chairman was L. O. Warren (U. of AR).

In 1968, the SFIWC was held in Starkville and 62 persons attended. John F. Coyne (USFS) served as Chairman, Harry O. Yates III (USFS) was Secretary-Treasurer, and counselors were Leroy Williamson, John Nord, and Robert Grady. Dr. Leon Hargreaves, Jr., School of Forest Resources, University of Georgia, gave the keynote address. “Where do we go from here” was the general theme and speakers addressed topics including southern pine beetle control, state pest control programs, extension, wood borers, insect research and teaching needs, among other issues. In the case of southern pine beetle control, BHC in fuel oil was the principal direct control method, together with salvage, but pioneering work on SPB pheromones was being conducted in Texas. Some in attendance questioned whether pheromones would ever provide an answer to SPB.

The outstanding Contribution Award (predecessor to the A.D. Hopkins Award) was presented in 1968 to Ed Merkel (USFS) for his publication entitled “Life history of the slash pine seedworm, Laspeyresia anaranjada Miller (Lepidoptera: Olethreutidae).” Also worthy of note is the motion approved at this meeting to establish a slide series of forest insects and the damage they cause for use by all members. This slide series became an important contribution to forest entomology education in the South, until it was replaced by the even more successful Bugwood Network on the Internet.

The 18th SFIWC was held in Jackson, MS from August 15-17, 1973. Seventy-six entomologists, including Bob Coulson, Fred Hain, and Joe Pase, attended the meeting. Chairman was Harry O. Yates III (USFS) while Bill Echols (MS Forestry Commission) served as Secretary Treasurer and A.D. Oliver (LSU), Lloyd Drake (USFS), and Bob Wilkinson (U. of FL) were counselors. Mississippi Governor William Waller welcomed the distinguished group to Mississippi (possibly the first and last time a state governor served in this capacity). He challenged the group to rid the state of its worst enemy, the southern pine beetle. In that regard, it is worthy of note that, 35 years later, only 15 SPB spots were detected in Mississippi in 2008; the governor would be pleased.

Ron Stark (Dean, U. of Idaho) gave the keynote speech in 1973, addressing the topic “Toward Pest Management.” Workshops addressed timely topics ranging from sampling forest insects, to stress physiology in relation to insect attack, to application of pheromones in bark beetle management. The Outstanding Award Committee selected Carl Fatzinger for his work entitled “Bioassay, morphology, and histology of the female sex pheromone gland of Dioryctria abietella (Lepidoptera: Pyralidae).”
Our fifth and most recent opportunity to come to Mississippi was 26 years ago, when the 28th SFIWC was held in Biloxi from August 9-11, 1983 (show of hands of those attending this Conference). Chairman was Evan Nebeker (Mississippi State U) while Scott Cameron (Texas Forest Service) was Program Chair. Approximately 110 persons registered for the Conference. In addition to the usual array of panels and workshops, whether to offer an honorarium for the A.D. Hopkins Award and the need to establish a *Journal of Forest Entomology* were major topics at the business meetings. Neither proposal materialized.

Ronald F. Billings, Historian

July 28, 2009

(Presented by H. A. (Joe) Pase III, Texas Forest Service, in Ron’s absence)
Common Names Committee Report

There have been no requests by any SFIWC member for a common name submission. I will be happy to consider any submission by a member or to discuss with any member the common names procedure. Members should feel free to contact me at their convenience.

Submitted on 29 July 2009

/s/ Alex Mangini

Alex Mangini,
Chair, SFIWC Common Names Committee
Photo Salon Awards
2009 SFIWC – Gulfport, Mississippi
Laurie Reid and Robert Trickel, Organizers

Forest Insects
1st Place  Joe Pase – *Neodiprion lecontei*, red-headed pine sawfly, on longleaf pine
2nd Place  Erich Vallery – *Sirex nigricornis* female
3rd Place  Paul Gellerstedt – Bagworm on silk thread

Forest Insect Damage
1st Place  Chris Asaro – Red maple bowl with ambrosia beetle damage

Other
1st Place  Joe Pase – *Eriophyes ulmi*, elm finger gall, on winged elm, *Ulmus alata*
2nd Place  Jason Moan – Hemipteran preying on a Japanese beetle
3rd Place  Wood Johnson – Spider with dew in her web

Series
1st Place  Erich Vallery – *Ips grandicollis* life cycle
2nd Place  Joe Pase – *Plecia nearctica*, (Lovebug)

Humor
1st Place  Steve Clarke – Some Feds found it hard to wean themselves off of 8 years of succor
2nd Place  Chris Asaro – Beer shrine in Virginia woods

Judges:  James Johnson, Wood Johnson, Andy Londo, and Will Shepherd
Officer and Committees, 2008–2009

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52nd Conference, July 2009
Gulfport, Mississippi

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Officers and Committees, 2009–2010

Officers

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53rd Conference, July, 2010
Wilmington, North Carolina

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