

72ND WESTERN FOREST INSECT WORK CONFERENCE

RIISING TO THE OCCASION: ADAPTATION AND CHANGE

**HOLIDAY INN PARKSIDE
200 South Pattee Street, MISSOULA, MT**

APRIL 22-25, 2024

PROGRAM AGENDA

PROGRAM COMMITTEE:

JOHN FORMBY (CHAIR), JACKSON AUDLEY, BEVERLY BULAON, DANNY CLUCK, STEPHEN COOK, MARIANNE DAVENPORT, MARNIE DUTHIE-HOLT, MATTHEW ETHINGTON, MELISSA FISCHER, ROBBIE FLOWERS, ANDY GRAVES, JEFF HICKE, DANIELLE MALESKY, AND WYATT WILLIAMS

THE WESTERN FOREST INSECT WORK CONFERENCE THANKS OUR 2024 SPONSORS:



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INSECT WORK CONFERENCE BY

GARRETT BURKE

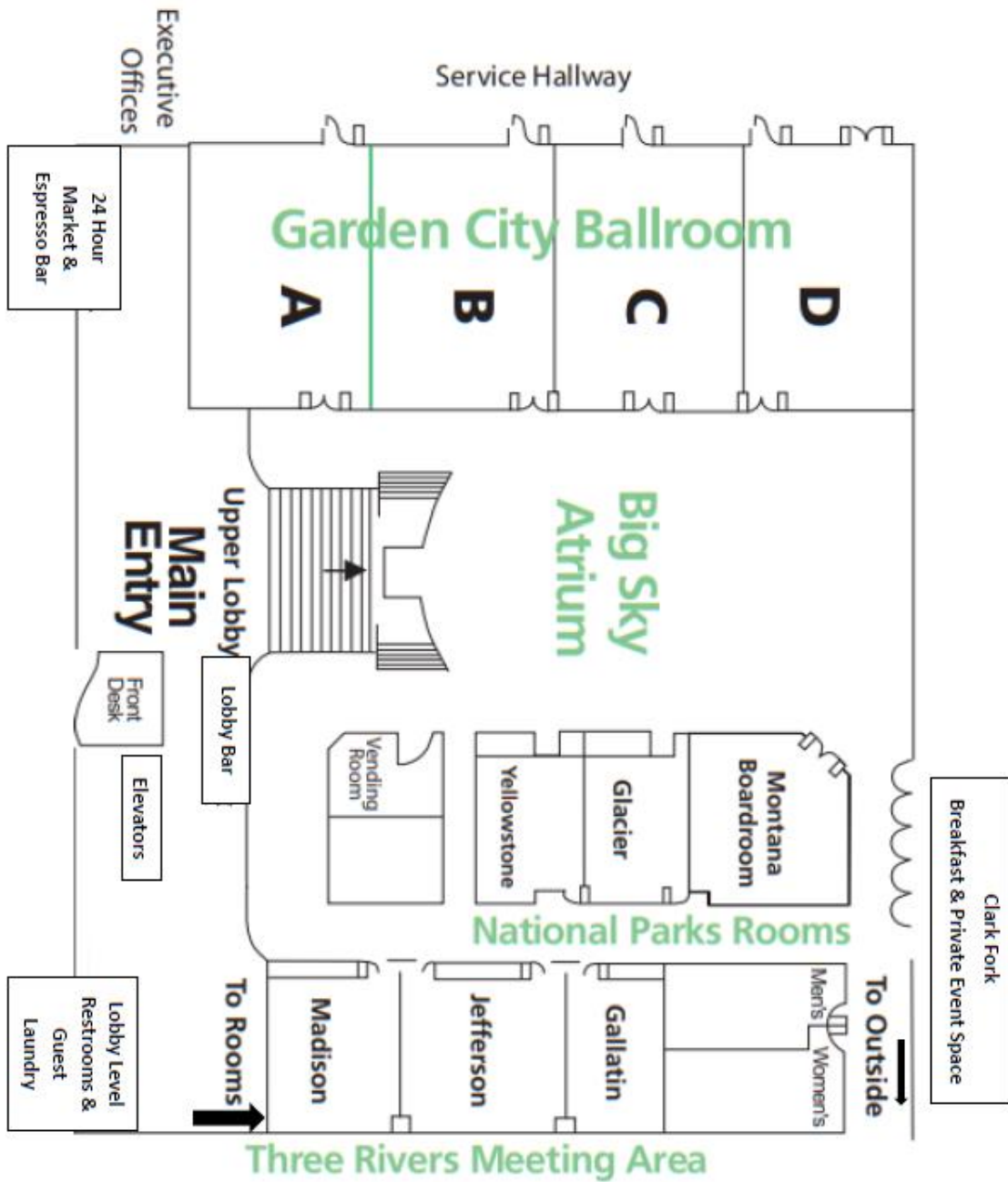
IN MEMORY OF
JORDAN BURKE

ANN LYNCH

IN MEMORY OF
TERRY SHORE



MAP OF HOLIDAY INN MEETING SPACE



MONDAY APRIL 22, 2024

- 15:00-19:30 **Registration** *Garden City Parlor C/D Atrium*
- 16:00-17:00 **Executive Committee Meeting** *Garden City Parlor C/D*
- 17:00-19:00 **Welcome Mixer & Yard Games** *Clark Fork*
Yard games accessed through Clark Fork room

TUESDAY APRIL 23, 2024

- 7:00-10:00 **Registration Open** *Garden City Parlor C/D Atrium*
- 8:00-8:30 **Welcome to Missoula** *Garden City Parlor C/D*
John Formby & Amy Gannon
- In Memoriam for Those We Have Lost**
John Formby
- Welcome to Montana**
Wyatt Frampton, State of Montana Deputy Forestry Division Administrator
- 8:30-9:00 **Opening Keynote Presentation** *Garden City Parlor C/D*
Understanding the complexities of climate change: Implications across disciplines
Nick Silverman, Adaptive Hydrology
- 9:00-9:30 **Memorial Scholarship** *Garden City Parlor C/D*
Darrell Ross, Moderator
- 2023 Memorial Scholarship Honoree**
The evolution of bark beetle–fungus mutualisms: Insights from a hardwood system
Debra Wertman, University of British Columbia
- 9:30 – 10:00 **BREAK** *Garden City Parlor C/D Atrium*
Group photos
- 10:00-11:00 **Initial Business Meeting** *Garden City Parlor C/D*

11:00-12:00 **Concurrent Session 1: Tree Physiology and Defense** *Garden City Parlor C/D*
Danny Cluck, Moderator

Characteristics of whitebark pine (*Pinus albicaulis*) growth and defense in disturbance prone, high elevation, montane ecosystems of the Northern Rocky Mountains
Nicholas Kichas, US Geological Survey

Growth and physiological risk factors for tree mortality during extreme drought and bark beetle outbreaks
Charlotte Reed, USDA Forest Service

Fool me once? The potential role of long-term herbivore-induced phytochemistry in determining insect immunity during outbreak
Amy Trowbridge, University of Wisconsin-Madison

11:00-12:00 **Concurrent Session 2: Novel Tools I** *Gallatin/Jefferson*
Jackson Audley, Moderator

Semiochemical interruption of spruce beetle host searching and aggregation behaviors for protecting spruce trees
Jackson Audley, USDA Forest Service

Status of remote sensing in Forest Health Protection
Ryan Hanavan, USDA Forest Service

Testing Hercon® Disrupt® Bio-Beads™ MCH (Patent Pending No. 18/521,155), a new formulation made with biodegradable ingredients, for protecting live trees from the Douglas-fir beetle
Darrell Ross, North Dakota State University

12:00-13:30 **LUNCH ON YOUR OWN**

13:30-15:00 **Concurrent Session 3: Insect Phenology** *Garden City Parlor C/D*
Marnie Duthie-Holt, Moderator

Western pine beetle voltinism in a changing California climate
Barbara Bentz, USDA Forest Service

Climate change and phenology of spruce budworm and its hosts
Deepa Pureswaran, Canadian Forest Service

How warm is too warm for mountain pine beetle? Implications for the southern boreal forest and southern British Columbia
Katherine Bleiker, Canadian Forest Service

Phenology of Douglas-fir beetle in western Washington

Patrick Tobin, University of Washington

Unravelling development requirements of western balsam bark beetle, *Dryocoetes confusus*

Lorraine Maclauchlan, British Columbia Ministry of Forests

13:30-15:00 Concurrent Session 4: Forest pollinators and other insects *Glacier/Yellowstone*
Steve Cook, Moderator

Assessing pollinator friendliness of plants to restore habitat for bees

Justin Runyon, USDA Forest Service

Pollen nutrition, bee-flower interactions, and implications for conservation

Anthony Vaudo, USDA Forest Service

Landscape-based forest restoration-based programs enhance plant-pollinator networks via thermal effects

Seth Davis, Colorado State University

***Cydia laricana*: a new threat to young western larch in the Intermountain West**

Stephen Cook, University of Idaho

15:00-15:30 BREAK

Group photos

Garden City Parlor C/D Atrium

15:30-17:00 Graduate Symposium A
Jeff Hicke, Moderator

Garden City Parlor C/D

Improving monitoring tools to detect mountain pine beetle at low densities in novel habitats: Incorporating host-tree stress and fungal volatiles in beetle attraction

Leah Crandall, University of Alberta

Presence of disease vector *Bursaphelenchus xylophilus* in *Monochamus* beetles as a function of spatial and temporal distance to fire

Hailee Nolan, Colorado State University

Secondary metabolite profile of phloem in Engelmann spruce in response to MeJA treatment

Ehsan Khedive, Colorado State University

Drought-induced constraints on stem terpene defense are uncoupled from non-structural carbohydrates in *Pinus edulis*

Shealyn Malone, University of Wisconsin

The resin defenses of tamarack (*Larix laricina*) in response to eastern larch beetle (*Dendroctonus simplex* LeConte)

Grace Graham, University of Minnesota

17:30 -18:00 **Costello Fun Run & Social Walk** *Meet in hotel lobby (upstairs)*

19:00-21:00 **Poster Session & Silent Auction** *Garden City Parlor B*

Spruce aphid population density response to temperature regimes in the Pinaleno Mountains, Arizona

Ann Lynch, University of Arizona

Ethanol, α -pinene, ipsenol, and ipsdienol in Western Canada and USA: CERAMBYCIDAE

Dan Miller, USDA Forest Service

Ethanol, α -pinene, ipsenol, and ipsdienol in Western Canada and USA: BARK BEETLES

Dan Miller, USDA Forest Service

Ethanol, α -pinene, ipsenol, and ipsdienol in Western Canada and USA: PREDATORS

Dan Miller, USDA Forest Service

The Forests Chapter of the Fifth National Climate Assessment

Grant Domke, USDA Forest Service

New review published on the chemical ecology of western pine beetle, with implications for management

Crystal Homicz, University of California-Davis

Reconstructing outbreak histories for two native insect defoliators across Pacific coastal temperate rainforests

Marlee Theil, University of Washington

Tracking beetle community responses to major western pine beetle-driven mortality event in ponderosa pine forests in the central and southern Sierra Nevada

Jackson Audley, USDA Forest Service

Testing western North America fir species for genetic tolerance and resistance to balsam woolly adelgid

Gissella Quiroga, University of Washington

Resin canals and ponderosa pine stand susceptibility to mountain pine beetle

Jose Negron, USDA Forest Service

Improving management tools for low-density mountain pine beetle populations in novel habitats: investigating anti-attraction properties of fungal volatile compounds
Leah Crandall, University of Alberta

Continued range expansion of California fivespined Ips (*Ips paraconfusus*) into Western Washington State
Glenn Kohler, Washington State DNR

Assessing parasitoid wasp diversity and community dynamics in response to Mediterranean oak borer (*Xyleborus monographus*) infestations in Oregon's Valley Woodlands
Allison Monroe, Oregon State University

Evaluation of a novel approach to detect the vertical structure of insect damage in trees using multispectral and three-dimensional data from drone imagery in the northern Rocky Mountains, USA
Abhinav Shrestha, University of Idaho

A piece of history from vignettes on the WFIWC web site
Sandra Kegley and Malcolm Furniss, WFIWC History Committee

WEDNESDAY, APRIL 24, 2024

- 7:00-9:00 **Registration Open** *Garden City Parlor C/D Atrium*
- 8:00-8:30 **Announcements and Housekeeping** *Garden City Parlor C/D*
John Formby & Amy Gannon
- 8:30-10:00 **Concurrent Session 5: Invasive Insects I** *Garden City Parlor C/D*
Melissa Fischer, Moderator
- Looking for black and white in the gray: predicting high impact insect invasions**
Patrick Tobin, University of Washington
- Investigating coastal grand fir decline in northern California: Balsam woolly adelgid and other stressors**
Wallis Robinson, University of California
- Evaluating pest risks in novel environments**
Sky Stephens, USDA Forest Service
- Are spruce aphid-defoliated trees a sink or source for spruce beetle populations?**
Monica Gaylord, USDA Forest Service
- 8:30-10:00 **Concurrent Session 6: Forest Disturbances I** *Gallatin/Jefferson*
John Formby, Moderator
- When tussock moth doesn't follow the rules: The Idaho experience**
Tom Eckberg, Idaho Department of Lands
- Weathering the storm: Tracking the recovery of lodgepole pine after an extreme weather event**
Caroline Whitehouse, Alberta Forestry and Parks
- Olfactory responses of pine-infesting beetles in the southeastern US to odors associated with fire**
Brian Sullivan, USDA Forest Service
- A shrinking envelope: Climate warming across the Pacific coastal temperate rainforest and its projected impact on a native defoliator**
Michael Howe, USDA Forest Service
- 10:00-10:30 **BREAK** *Garden City Parlor C/D Atrium*
Group Photos (Last chance for pictures)

- 10:30-12:00 **Graduate Symposium B** *Garden City Parlor C/D*
Brytten Steed, Moderator
- Intra-stand dispersal of the balsam woolly adelgid (*Adelges piceae* (Ratz.)) in Utah**
Mike Wayman, Utah State University
- Predicting endemic mountain pine beetle habitat: exploring the predictive capacity of conventional forest inventory data and LiDAR**
Lucas Peng, University of British Columbia
- Disturbance legacies drive complex outcomes for bark beetle outbreaks: investigating the interactions between bark beetles and wildfires in mature, dry forests**
Kate Kitchens, University of British Columbia
- Could eastern larch beetle *Dendroctonus simplex* LeConte pose a threat to western and subalpine larch?**
Rose Picklo, University of Minnesota
- Unraveling the multifaceted effects of climatic factors on mountain pine beetle and its interaction with fungal symbionts**
Rashaduz Zaman, University of Alberta
- 12:00-13:15 **LUNCH ON YOUR OWN**
- 13:15 **Field Trip** *meet at Holiday Inn*
*Buses will load and depart from the Holiday Inn front entrance at **1:15 PM***
- 13:45-15:15 **Willis Chip Mill**
Rich Lane, Montana Log Buyer
Amy Gannon, Montana DNRC Forest Pest Management Program Coordinator
Matt Arno, Montana DNRC Forestry Assistance Bureau Chief
*Buses will unload and depart (**15:15**) at the scale*
- 15:45-17:00 **Montana Department of Natural Resources and Conservation Nursery**
Michael Butts, Montana DNRC Nursery Program Manager
Ashley Mattson, Montana DNRC Nursery Operations Specialist
Ben Jones, Montana DNRC Nursery Foreman
- 17:00 **Return to Holiday Inn**
*Buses will load and depart at **17:00** from the DNRC Nursery parking lot.*
- 18:00-21:00 **Banquet Dinner** *Garden City Parlor C/D*
- 2023 Founder's Award Recipient: Lorraine Maclauchlan**
A B.C. forest entomologist: A weevil woman's wanderings

THURSDAY, APRIL 25, 2024

- 7:00 - 9:00 **Registration Open** *Garden City Parlor C/D Atrium*
- 8:00 – 8:30 **Keynote Presentation** *Garden City Parlor C/D*
**Recovering the threatened whitebark pine in the face of climate change:
Challenges and successes.**
Robert Keane, Whitebark Pine Ecosystem Foundation
- 8:30-10:00 **Concurrent Session 7: Whitebark pine** *Garden City Parlor C/D*
Marianne Davenport, Moderator
- Using paleoecological methods to study long term disturbance patterns in high
elevation whitebark pine ecosystems**
Jennifer Watt, University of Utah
- Evidence for alpine treeline ecotones as refugia for whitebark pine from mountain
pine beetle**
Colin Maher, USDA Forest Service
- Thinning enhances whitebark pine growth and defense**
Nicholas Kichas, US Department of Energy/USDA Forest Service
- Fire-caused mortality of whitebark pine**
Charlotte Reed, USDA Forest Service
- 8:30-10:00 **Concurrent Session 8: Forest Disturbances II** *Gallatin/Jefferson*
Matthew Ethington, Moderator
- Bark beetles have phenological traits that can limit shifts in response to climate
change**
Barbara Bentz, USDA Forest Service
- Characteristics and drivers of fir engraver outbreaks: Insights from aerial surveys in
the Western US**
Jeffrey Hicke, University of Idaho
- Expanding range and effects of a roundheaded pine beetle complex in Southwestern
Colorado**
Matthew Ethington, USDA Forest Service
- Sudden Aspen Decline: 15 Year remeasure in Colorado indicates expansion of
mortality**
Matthew Ethington, USDA Forest Service

Basic life history and host-use ecology of *Phloeosinus* sp., an emerging pest of Giant Sequoia

Seth Davis, Colorado State University

10:00-10:30 **BREAK**

Garden City Parlor C/D Atrium

10:30-12:00 **Concurrent Session 9: Merging genetics, resistance, and integrated pest management**

Danielle Malesky, Moderator

Garden City Parlor C/D

Progress and partnerships in traditional breeding of pest resistant ash, beech, and hemlock

Leigh Greenwood, The Nature Conservancy

A stinging rebuke of reforestation efforts: What invisible creature is attacking people in the cone shed?

Glenn Kohler, Washington Department of Natural Resources

Increased spider mite activity in western conifers: why is this occurring and how do we reduce their impacts?

Richard Hofstetter, Northern Arizona University

Adaptation and change: seed and cone insects and reforestation objectives

Iral Ragenovich, USDA Forest Service

10:30-12:00 **Concurrent Session 10: Novel Tools II**
Jackson Audley, Moderator

Gallatin/Jefferson

Opportunities for TLS in forest disturbance scenarios

Sarah Flanary, USDA Forest Service

Recent advancements in equipment for tree health care

Don Grossman, ArborJet

Novel tools: Making forests more resistant and resilient to bark beetles in a hotter and drier "Southwest"

Christopher Fettig, USDA Forest Service

Evaluating a decade (2011-2020) of integrated forest pest management in the United States

Robbie Flowers, USDA Forest Service

12:00-13:30 **LUNCH ON YOUR OWN**

13:30-15:00 **Concurrent Session 11: Invasive Insects II** *Garden City Parlor C/D*
Robbie Flowers, Moderator

Observations after one year of emerald ash borer in Oregon
Wyatt Williams, Oregon Department of Forestry

Mediterranean oak borer – an emerging pest in Oregon
Wyatt Williams, Oregon Department of Forestry

The Mediterranean Oak Borer (MOB, *Xyleborus monographus* Coleoptera: Curculionidae: Scolytinae) an invasive ambrosia beetle infesting white oaks in Northern California and Oregon.
Curtis Ewing, CA Dept. of Forestry & Fire Protection (Cal Fire)

Improving firewood and invasive forest pest messages in the western states
Leigh Greenwood, The Nature Conservancy

13:30-15:00 **Concurrent Session 12: Forest Insect Ecology and Tools** *Gallatin/Jefferson*
Jackson Audley, Moderator

Development of a semiochemical tool to protect *Sirex noctilio* trap trees from *Ips grandicollis* attack in Australia
Brian Sullivan, USDA Forest Service

Minimal tree mortality in unburned areas linked to bark beetles emigrating from wildfires
Robbie Andrus, Washington State University

Bark beetle-fungal symbioses affect nutrient dynamics and decay communities in tree ecosystems
Lorinda Bullington, University of Montana

MULTITRAP. The need of fluon coating or not to catch large numbers of common woodborers
Jorge Macias, Synergy Semiochemicals Corporation

15:00-15:30 **BREAK**

15:30-17:00 **Graduate Symposium C** *Garden City Parlor C/D*
Jeff Hicke, Moderator

Efficacy of Acer Kairomone Blend, “Verbenone Plus”, and other semiochemicals for protecting ponderosa pine trees from western pine beetle
Crystal Homicz, University of California-Davis

Spatio-temporal effects of mixed severity wildfires on native bee community composition in Ponderosa pine forests

Autumn Maust, University of Washington

Plant-pollinator network response to high severity fire along a gradient of time-since-disturbance

Ryleigh Gelles, Colorado State University

The effect of evolutionary history on plant-insect interactions

Ryan Garrison, University of Washington

Terpene defense variation among host species of mountain pine beetle in western North America: Implications to the potential host expansion to the Canadian boreal forests

Yanzhuo Liu, University of Alberta, Canada

17:00 – 17:30 **Final Business Meeting**
Committee Chairs

Garden City Parlor C/D

17:30 **Conference Adjournment**

Garden City Parlor C/D