March 2024, Issue 4

TRIA-FoR: Transformative Risk Assessment and Forest Resilience Using Genomic Tools for the Mountain Pine Beetle Outbreak

Newsletter


Credit: Marion Mayerhofer

Annual General Meeting

The first in person AGM took place this August hosted by the University of Alberta. This gave us a great opportunity to bring the team together for presentations, workshops and a field trip to one of our mountain pine beetle (MPB) bait sites. During the trip, team members had the chance to witness a tree that had been subjected to a mass attack by MPB firsthand and gain insights into MPB research from experienced project members.


Credit: Marion Mayerhofer


Credit: Matt Bryman


Credit: Marion Mayerhofer

View more of our photos here

What‘s New

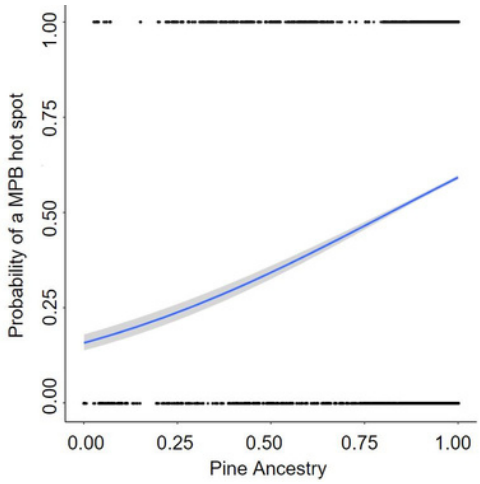
Thanks to our collaborators at BC Ministry of Forest Improvement and Research Management (BC-FIRM) we received over 4,000 seedlings at UAlberta in March 2023. These seedlings are the progeny of mountain pine beetle (MPB)-killed or MPB-survivor lodgepole pines from BC-FIRM's breeding program. FIRM is a unit in the BC Ministry of Forests. These seedlings have been instrumental for Activity 2 work focusing on quantitative genomics and phenotypic characterization of these seedlings, with the aim of discovering traits that confer MPB resilience to MPB. This research aligns with our goal of enhancing forest resilience to MPB.


Credit: Marion Mayerhofer


Credit: Colleen Fortier

Ongoing work on our MPB outbreak mechanistic model was published in the Bulletin of Mathematical Biology (see below for publication link). We are currently working on a hybrid model that combines insights from both mechanistic and statistical approaches, to provide a more comprehensive understanding of MPB outbreak dynamics.

Our research, investigating the potential for continued MPB spread in jack pine, has determined that MPB infestation ("hot spots") is associated with lodgepole pine ancestry. These findings imply that jack pine in Alberta may exhibit a lower suitability as a MPB host compared to lodgepole pine and lodgepole x jack pine hybrids. This trend was further corroborated by our statistical model, which focused on modelling the spatial spread of MPB.




Credit: Yeyang Wu

The groups studying MPB physiology and behaviour as drivers of spread have been busy analyzing, writing up, and presenting data. Following a busy field season to collect MPB materials, our team is continuing experiments studying MPB physiology under different overwintering conditions with help from collaborators at the Canadian Forest Service - Great Lakes Forestry Centre. These materials are also being used to study host effects on MPB flight, colonization, and pheromone production.

The GE3LS groups have begun development of the integrated framework, including mapping of knowledge exchange patterns across jurisdictions, identification of key individuals involved in MPB risk management, and the inclusion of key themes and criteria associated with risk management important to stakeholders. We are holding focus groups to understand preferences and trade-offs for risk management measures and solutions from the perspectives of forest stakeholders. We are grateful to the individuals and communities who have participated in focus groups and interviews so far, and we look forward to holding more of these in 2024

New Team Members

Aryn Laxton
Field Research Technician
University of Alberta

Jeff Kiely
Field Research Technician
University of Alberta

Lauren Miner
Project Manager
Carleton University

Meet the team

Publications

Available online at www.sciencedirect.com

ScienceDirect

Current Opinion in Insect Science

A cold and quiet brain: mechanisms of insect CNS arrest at low temperatures

R. Meldrum Robertson[1], Heath A MacMillan[2] and Mads K Andersen[2]

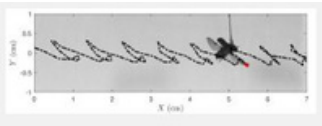
Bulletin of Mathematical Biology (2023) 85:108

ORIGINAL ARTICLE

Coupling Mountain Pine Beetle and Forest Population Dynamics Predicts Transient Outbreaks that are Likely to Increase in Number with Climate Change

Micah Brush[1] · Mark A. Lewis[2,3]

In the News



Preserving pine forests by understanding beetle flight EurekAlert!

WISEST summer research intern Ashlyn Joseph was interviewed about mountain pine beetle geomorphometrics. in the Edmonton Journal, 2023-08-17

Interview about mountain pine beetle body condition and participation in the ISteam program. Acacia Léchot, CBC radio Edmonton,

Interview about mountain pine beetle dispersal. Antonia Musso, CBC radio Kelowna, Segment begins at 53:30

Keep up to date with publications and news here

First Nation and Land Acknowledgement

The various TRIA-FoR University researchers are based at institutions located on traditional/ancestral First Nations lands. As such, we respectfully offer these acknowledgements:

- **UBC Vancouver is situated in the traditional, ancestral and unceded territory of the xʷməθkʷəy̓əm (Musqueam).**
- **The University of Alberta acknowledges that it is located on Treaty 6 territory, and respects the histories, languages, and cultures of First Nations, Métis, Inuit, and all First Peoples of Canada, whose presence continues to enrich our vibrant community.**
- **Carleton University acknowledges thelocation of its campus on the traditional, unceded territories of the Algonquin nation.**
- **Western University acknowledges that it is located on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron peoples, on lands connected with the London Township and Sombra Treaties of 1796 and the Dish with One Spoon Covenant Wampum.**

Funding and Support

You are receiving this email because you are a member of the TRIA-FoR project, a project collaborator or partner, or you have subscribed