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H5II Conference

Conference Proceedings

Organizing Committee and Program Schedule

Whitebark Pine Ecosystem Foundation

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Organizing Committee

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Program Schedule

All times are in Mountain Daylight Time			
Monday, October 4 2021			
10:00 AM - 4:00PM	Crown of the Continent Ecosystem Hi5 Annual Meeting		
Tuesday, October 5 2021			
7:00 AM MDT	Conference Site Available for Log-in		
8:00 - 8:10	Welcome and Opening Message Rob Mangold, Director, Whitebark Pine Ecosystem Foundation		
8:10 - 8:40	Keynote Presentation Anna Schoettle "Taking the long view: Ecology, condition, and outlook for the high-elevation five-needle pines"		
8:40 - 9:05	Plenary Presentation Diana F. Tomback "The National Whitebark Pine Restoration Plan: Restoration model for the high five pines"		
9:05 - 9:30	Plenary Presentation Melissa Jenkins "Restoring the Crown: A plan for whitebark pine restoration in the Crown of the Continent Ecosystem"		
9:30 - 10:00	BREAK <i>Question/Answer with Keynote and Plenary Speakers - Networking Rooms, select Q&A with Keynote, Plenary 1, or Plenary 2</i>		
	Room A	Room B	Room C
	1. Historical Whitebark Pine Research Moderator Bob Keane	2. High-elevation White Pine Communities in the Pacific West Region Moderator Jonathan Nesmith	3. The North American Dendroecological Fieldweek (NADEF): Educational and Research Opportunities to Better Understanding 5-needle Pines Moderator Maegan Rochner
10:00 - 10:15	1-1. My introduction to whitebark pine (Steve Arno)	2-1. Mapping and monitoring California's high-elevation forests: A statewide field and remote sensing campaign (Michele Slaton)	3-1. Education and research through the North American Dendroecological Fieldweek (James H. Speer)

10:15-10:30	1-2. Discovery of WBP, MSU 1974-2001: WBP environment, stand establishment and development, physiology, and follow-up (Tad Weaver)	2-2. An assessment of whitebark pine populations in national parks of the Pacific states (Erik Jules)	3-2. Anatomy measurements from whitebark pine (<i>Pinus albicaulis</i>) in the Beartooth Mountains, WY show strong seasonality signal (April Kaiser)
10:30-10:45	1-3. Seminal research: Foraging strategies of Clark's Nutcracker (Diana Tomback)	2-3. Ecological integrity of whitebark pine on national forests in California (Marc Meyer)	3-3. Summer air temperature for the Greater Yellowstone Ecoregion over 1,250 years (Karen Heeter)
10:45 - 11:00	1-4. The grizzly-squirrel-pine nut connection (Kate Kendall)	2-4. Assessing vulnerabilities in the mutualism between whitebark pine and Clark's nutcracker in Sierra-Cascade parks (Chris Ray)	3-4. Mechanisms of vegetation change in high-elevation forests of the Greater Yellowstone Ecosystem (Erika Blomdahl)
11:00 - 11:15	1-5. Moderated Discussion Panel and Question period with session speakers	2-5. Whitebark Pine Conservation Program at Crater Lake National Park: 2003-2021 (Jen Hooke)	3-5. Variable demographic patterns interact with disturbance to shape limber pine population viability (Justin DeRose)
11:15 - 11:30		2-6. Moderated Discussion Panel and Question period with session speakers	3-6. Whitebark pine as natural archive: the dendrochronological value of whitebark pine and a call to action (Maegen Rochner)
11:30 - 11:45			3-7. Moderated Discussion Panel and Question period with session speakers
11:45 - 12:00			
12:00 - 1:00 PM	<i>Break</i>		
	Room A	Room B	Room C
	4. Fire in High-elevation Five-needle Pine Ecosystems Moderator Alina Cansler	5. High Five Assessments and Analysis Moderator Shawn McKinney	6. Progress in Restoration and Management of Five-needle Pines Moderator Glenda Scott
1:00 - 1:15	4-1. Managing wildfire for whitebark pine ecosystem restoration in Western North America (Bob Keane)	5-1. Limber pine condition on Montana's Rocky Mountain Front (Christy Cleaver)	6-1. Efficacy of pruning limber pine to mitigate white pine blister rust impacts (Kelly Burns)
1:15-1:30	4-2. Whitebark pine regeneration densities, niche, and dynamics three decades after the 1988 Yellowstone Fires (Elizabeth Pansing)	5-2. Application of high-res WorldView-3 satellite imagery to resolve treeline species composition: limber pine in RMNP (Laurel Sindewald)	6-2. Whitebark pine production at the USFS Coeur d'Alene Forest Nursery (Emily Rhoades)
1:30-1:45	4-3. Do whitebark pine regeneration trends support predicted distributional shifts under climate change? Examples from the GYE (Diana Tomback)	5-3. Whitebark & WorldView-2 - looking into the possibilities of using satellite imagery to distinguish subalpine tree species (Stephanie Jouvét)	6-3. Managing high-elevation pine at Great Basin National Park (Gretchen M. Baker)

1:45-2:00	4-4. Fire-caused mortality of whitebark pine (Sharon Hood)	5-4. Assessment of cumulative whitebark pine mortality in the Greater Yellowstone Ecosystem (William Macfarlane Brian Howell)	6-4. Whitebark pine tree improvement and operational management on the Helena-Lewis and Clark National Forest (Tanya E. Murphy Matthew O. Voigt)
2:00-2:15	4-5. Fire, restoration and climate change in southwestern mixed conifer forests: implications for <i>P. strobiformis</i> (Kristen Waring)	5-5. Moderated Discussion Panel and Question period with session speakers	6-5. Overview of whitebark pine restoration efforts in the U.S. Forest Service Regions 1, 2, and 4 (Ellen Jungck)
2:15-2:30	4-6. Moderated Discussion Panel and Question period with session speakers		6-6. Limber pine restoration in the Black Hills National Forest, South Dakota (James T. Blodgett)
2:30-2:45			6-7. Moderated Discussion Panel and Question period with session speakers
2:45-3:00			
3:00 - 3:30	<i>Break - WILD GRACE YOGA with Michelle Geisey (Troy, MT)</i>		
	Room A	Room B	Room C
	7. Fire in High-elevation Five-needle Pine Ecosystems II Moderator Alina Cansler	8. Conservation Status, Planning, and Adaptive Management for the High Five Pines I Moderator Diana Tomback/ Eric Sprague	9. High Five Pine Ecology Moderator Bob Keane
3:30 - 3:45	7-1. Does interannual availability of cones affect Clark's Nutcracker caching in burns and habitat selection (Vernon S. Peters)	8-1. Status of whitebark pine: where we go from here (Ben Solvesky)	9-1. Divergent, age associated fungal communities of <i>Pinus flexilis</i> and <i>Pinus longaeva</i> (Joseph Birch)
3:45 - 4:00	7-2. Post-fire regeneration of endangered limber pine (<i>Pinus flexilis</i>) at the northern extent of its range (Denyse Dawe)	8-2. Whitebark pine restoration in BLM Montana's core areas (Emily Guiberson Rich Byron)	9-2. Alpine treeline ecotones are potential refugia for a montane pine species threatened by bark beetle outbreaks (Colin Maher)
4:00 - 4:15	7-3. Does high severity fire facilitate species transition in California subalpine forests? (Emily Brodie)	8-3. Comparative species assessments of five-needle pines throughout the western United States (Sara A. Goeking)	9-3. A fungal focus: ectomycorrhizal fungi of whitebark pine in interior British Columbia (Hanno Southam)
4:15 - 4:30	7-4. Soil moisture regime and canopy closure structure subalpine understory development over 30 years following stand-replacing fire (Andrew J. Andrade)	8-4. Effective monitoring and evaluation of whitebark pine restoration treatments: key to adaptive management and future applications (Cara R. Nelson)	9-4. Moderated Discussion Panel and Question period with session speakers
4:30 - 4:45	7-5. Moderated Discussion Panel and Question period with session speakers	8-5. Moderated Discussion Panel and Question period with session speakers	
4:45 - 5:00			
5:00 - 5:30 pm	<i>Break and transition to poster session</i>		

5:30 - 6:30 pm	“Posters, Pines, and Wine” (Self-guided Virtual Poster Session - visit with Authors)
7:00 - 8:00 pm	High Five Pines and Communities They Bind (Virtual Event- Community invited)

Wednesday, October 6 2021			
7:00 AM MDT	Conference Site Available for Log-in		
8:00 - 8:10	Welcome		
	Eric Sprague, Director of Forest Conservation, American Forests		
8:10 - 8:40	Keynote Presentation		
	Richard Sniezko “Genetic resistance to white pine blister rust, restoration options, and potential use of biotechnology”		
8:40 - 9:05	Plenary Presentation		
	David Neale “The Whitebark Pine Genome Project”		
9:05 - 9:30	Plenary Presentation		
	Bob Keane “Effective actions for managing resilient high-elevation five-needle pines in western white pine forest of North America under changing climates at multiple scales”		
9:30 - 10:00	BREAK <i>Question/Answer with Keynote and Plenary Speakers - go to Networking Room, select Q&A with Keynote, Plenary 1, or Plenary 2</i>		
	Room A	Room B	Room C
	10. Ecophysiology of Five-Needle Pines Moderator Danielle Ulrich	11. Five-Needle Pine Research, Monitoring, and Restoration in National Parks Moderator Kristin Legg	12. High Five Restoration and Management I Moderator Cara Nelson

10:00 - 10:15	10-1. A tale of two pines: comparing seedling morphological and stomatal traits between whitebark pine and limber pine (Meghan McFadden)	11-1. Adaptive monitoring in action: reconsidering design-based estimators reveals underestimation of whitebark pine disease prevalence in the Greater Yellowstone Ecosystem (Erin Shanahan Kathi Irvine)	12-1. Restoration planting options for limber pines (<i>Pinus flexilis James</i>): 10 years later (Anne Marie Aramati Casper)
10:15 - 10:30	10-2. Within and between species physiological traits and stress resistances of three high-elevation pines (Chloe Wasteneys)	11-2. Compounding effects of white pine blister rust, mountain pine beetle, and fire on white pines in Sequoia and Kings Canyon National Parks (Jonathan Nesmith)	12-2. Forest structure twenty years after the first whitebark pine prescribed burn in Banff National Park (Brendan Wilson)
10:30 - 10:45	10-3. Whitebark pine (<i>Pinus albicaulis</i>) growth and defense in response to mountain pine beetle outbreaks (Nickolas Kichas)	11-3. What have we learned in 20 years of whitebark pine restoration in Glacier National Park? (Rebecca Lawrence Jennifer Hintz Guse)	12-3. Monitoring the effects of prescribed burning on whitebark pine (Cara Nelson)
10:45 - 11:00	10-4. Differential spring budburst phenology across western five-needled pine species (Franklin Alongi)	11-4. Great Basin bristlecone and limber pine in Great Basin National Park: first look into the long-term white pine monitoring efforts (Nicole Hupp Jeff Galvin)	12-4. Long-term assessment of the efficacy of prescribed burning and mechanical thinning for restoration of whitebark pine (Enzo Martelli)
11:00 - 11:15	10-5. Physiological responses of whitebark, limber and Great Basin bristlecone pines to environmental stress (Sean Hoy-Skubik)	11-5. Climatic factors affecting white pine blister rust incidence on whitebark pine in Washington National Parks (Sebastian Espinosa Novoa)	12-5. Verbenone and green-leaf volatiles reduce whitebark pine mortality in a northern range-expanding mountain pine beetle outbreak (Brenda Shepherd)
11:15 - 11:30	10-6. Winter damage is more important than summer temperature for maintaining the krummholz growth form above alpine treeline (Colin Maher)	Challenges to limber pine at Craters of the Moon National Monument and Preserve (Devin Stucki)	12-6. Moderated Discussion Panel and Question period with session speakers
11:30 - 11:45	10-7. Moderated Discussion Panel and Question period with session speakers	11-6. Moderated Discussion Panel and Question period with session speakers	
11:45 - 12:00			
12:00 - 1:00 PM	<i>Break</i>		
12:15 to 12:45	Whitebark Pine Ecosystem Foundation Members Meeting- Open Invitation		
1:00 - 3:10	Virtual Field Trip to the Smith Creek Research Site		
	Welcome and Logistics - Bryan Donner		
	The Smith Creek Research Area: History and Objectives - Cathy Stewart, Leslie Anderson, and Bob Keane		
	Restoration strategies – local, regional, and range-wide strategies for restoration - Diana Tomback		

	Interacting disturbances: how insect, fire, and disease act to influence high-elevation pine dynamics under climate change - Barbara Bentz	
	Smith Creek Lessons Learned - What actually happened that was not anticipated twenty-two years ago - Bob Keane and Steve Arno	
	Wildland fire: High-elevation fire regimes, wildland fire management, and climate change - Alina Cansler	
	Management challenges: regulations, laws, and oversight of local to international management of high mountain resources - Randy Moody	
	Restoration Strategies on the Bitterroot National Forest, Montana - Cheri Hartless	
	Discussion Panel -Q&A with all the presenters	
3:10-3:30	<i>Break</i>	
3:30 - 5:00	Student and Early Professionals Roundtable	Networking (concurrent activities)
	Moderator Cara Nelson	Networking rooms open with focused discussions
3:30 - 3:35	Introductions	1- Rust Ecology and Resistance
3:35-4:15	Panel: “Federal Hiring: the Ins and Outs of Getting Hired by the US Forest Service and National Park Service”	2- Restoration and Management
	Amber Kamps, USFS Regional Outreach, Recruitment, & Retention Program Specialist, FS Region 1	3- Wildland Fire and Climate Change
	Laura Chavers, NPS Supervisory Human Resources Specialist, Interior Regions 6, 7 and 8	4- NWPRP: National Whitebark Pine
	Questions and Discussion period	5- Wilderness Issues in High Five Pine
4:15 - 4:55	Panel: “Getting your Data Published”	Exhibit Hall open Posters, Sponsor and Exhibitor Booths
	Bob Keane, Editor of International Journal of Fire Ecology	Individual interaction opportunities
	Stephen Murphy, Editor-in-Chief of Restoration Ecology Journal	
	Question and Discussion	
4:55 - 5:00	Closing discussion	
5:00-6:30	<i>Break</i>	

6:30 - 8:00	High Five Social (Virtual Event for Conference Attendees)		
Thursday, October 7 2021			
7:00 AM MDT	Conference Site Available for Log-in		
8:00 - 8:10	Welcome		
	Diana Tomback, Board of Directors, Whitebark Pine Ecosystem Foundation		
8:10 - 8:40	Keynote Presentation		
	Charlie Cartwright “Early results from whitebark pine genecology trials in British Columbia”		
8:40 - 9:05	Plenary Presentation		
	Andrew Hansen “Potential changes in climate suitable habitat of Whitebark pine in Greater Yellowstone under climate scenarios”		
9:05 - 9:30	Plenary Presentation		
	Barbara Bentz “Defense characteristics among high-elevation Pinus and vulnerability to native bark beetles”		
9:30 - 10:00	BREAK		
	<i>Question/Answer with Keynote and Plenary Speakers- go to Networking/ Networking Room, select Q&A with Keynote, Plenary 1 or Plenary 2</i>		
	Room A	Room B	Room C
	16. High Five Pine Ecology and Management II	17. White Pine Blister Rust Resistance, Genetic Variation, and Restoration of White Pines I	18. Conservation Status, Planning, and Adaptive Management for the High Five Pines II
	Moderator Liz Davy	Moderator Rich Sniezko	Moderators Diana Tomback & Eric Sprague
1:00 - 1:15	16-1. High-elevation five-needle pine seedling traits vary according to climatic gradients (Lacey Hankin)	17-1. Field-testing whitebark pine resistance to white pine blister rust: a cost-effective approach to progeny testing (Iain R. Reid)	18-1. Integrating restoration practices for whitebark pine with climate change distributional shifts (Katie Ireland)
1:15 - 1:30	16-2. Can we improve western white pine microbiomes to promote resistance to blister rust disease? (Lorinda S. Bullington)	17-2. Evaluating spectroscopy as a tool for rapid identification of WPBR-resistant whitebark pine trees (Pierluigi Bonello)	18-2. Conservation and restoration of whitebark pine by the US Forest Service in Oregon and Washington (Andrew Bower)
1:30 - 1:45	16-3. Does drought response change with parental ancestry across a white pine hybrid zone? (Lulu Peach)	17-3. White pine blister rust resistance programs for Alberta limber and whitebark pine recovery (Jodie Krakowski)	18-3. Whitebark pine restoration on the Flathead Indian Reservation: Tribal cultural benefits reaped from new management strategies (ShiNaasha Pete)

1:45 - 2:00	16-4. Ecology and distribution of Klamath foxtail pine (Michael Edward Kauffmann)	17-4. Moderated Discussion Panel and Question period with session speakers	18-4. High-elevation chilgoza pine forests in western Himalayas: survival threats and conservation exigencies (Rinki Sarkar)
2:00 - 2:15	16-5. Moderated Discussion Panel and Question period with session speakers		18-5. Moderated Discussion Panel and Question period with session speakers
2:15 - 2:30			
2:30 - 3:00	<i>Networking Break</i>		
	Room A	Room B	
	19. The Myths and Realities of Whitebark Pine and Climate Change Moderator Bob Keane	20. White Pine Blister Rust Resistance, Genetic Variation, and Restoration of White Pines II Moderator Rich Sniezko	
3:00 - 3:15	19-1. Predicted impacts of climate change on the northern range limit of whitebark pine (Alana J. Clason)	20-1. Whitebark pine restoration at Crater Lake National Park: the first ten years (Jen Hooke)	
3:15- 3:30	19-2. Nonlinear shifts in white pine blister rust due to climate change (Joan C. Dudley)	20-2. Range-wide testing of white pine blister rust resistance in foxtail pine (<i>Pinus balfouriana</i>) (Richard A. Sniezko)	



Poster Hall	
Poster Title	Presenter
Teaching students about whitebark pine and fire using hands-on activities	Ilana Abrahamson
Challenges of restoring a unique population of whitebark pine	Robin Garwood Deb Taylor
Whitebark pine friendly ski areas	Mike Giesey
Genetic and remote sensing approaches to identify white pine blister rust infection in southwestern white pine.	Jeremy Johnson
Identifying patterns of blister rust resistance in southwestern white pine	Jeremy Johnson
Repeat photography tells whitebark pine stories	Jane Kapler Smith
<i>Pinus flexilis</i> is highly a highly susceptible host of <i>Dothistroma septosporum</i> in Canada- first report	Jodie Krakowski
Preparing for invasion: rust resistance in limber, Great Basin bristlecone, and Rocky Mountain bristlecone pines	Anna W. Schoettle
The great basin five-needle pine proactive strategy engagement: a collaborative and science-based approach	Anna W. Schoettle
Climate correlates of white pine blister rust infection in whitebark pine in the greater Yellowstone ecosystem	David Thoma/Erin Shanahan
Conifer regeneration hinders digital estimation of understory plant cover in post-fire whitebark pine communities	Brandi E. Wheeler
Maintaining <i>Pinus strobiformis</i> , a tree species threatened by climate change and white pine blister rust	Nicholas Wilhelmi