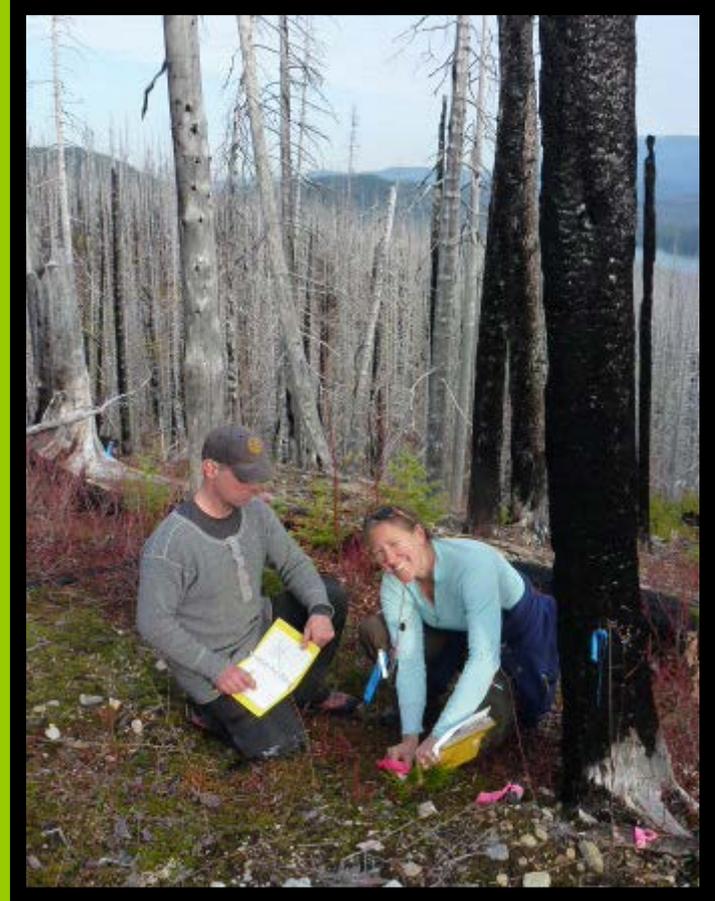


Ten Years of Applied Whitebark Pine Research & Restoration in Northern BC



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A Collaborative Affair



Bulkley Valley Research Centre

**Celebrating 5 years of progress in restoring Endangered Whitebark Pine Ecosystems
of north central BC thanks to the following organizations and individuals:**

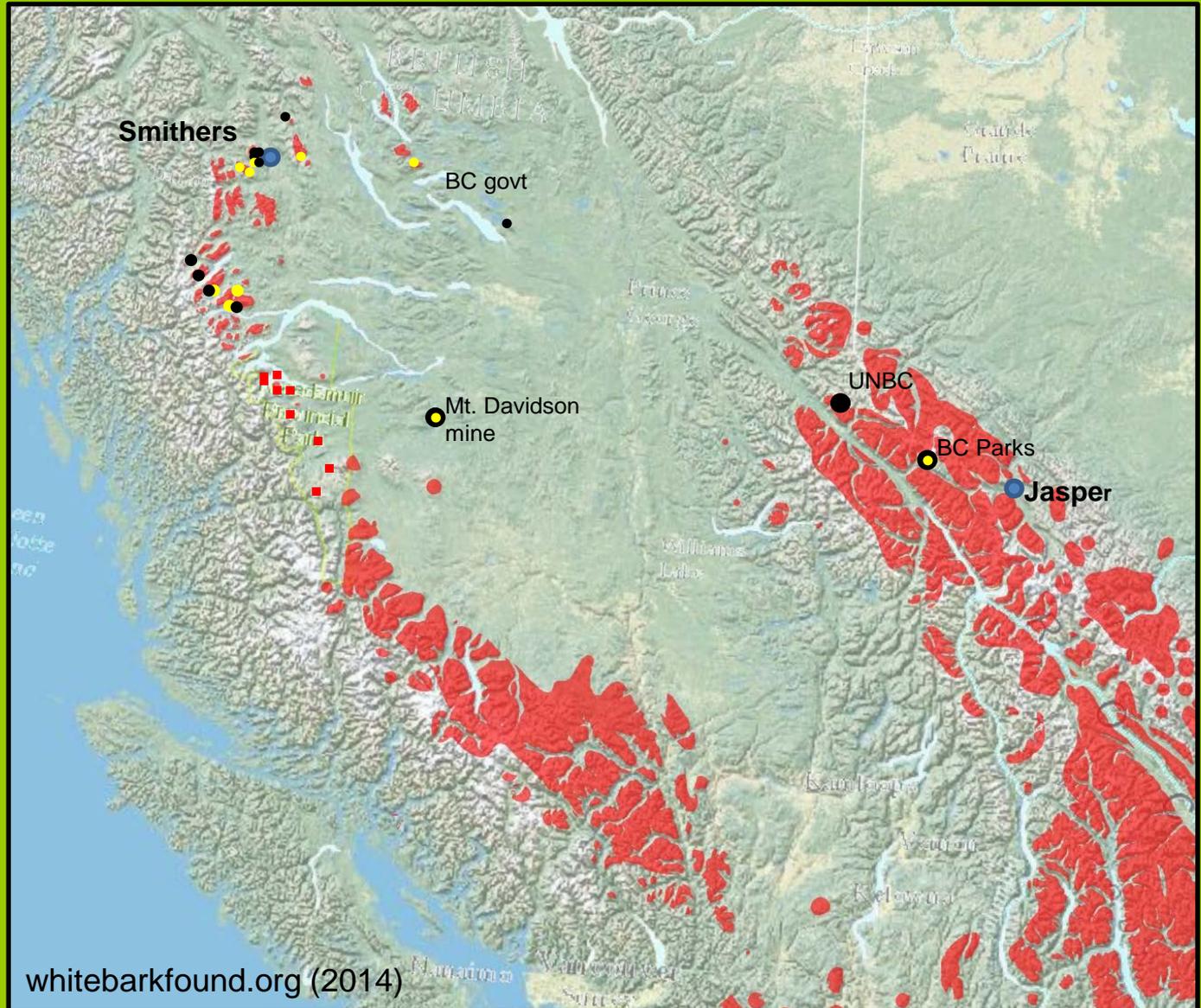
Woodmere Nursery (Joe Wong and staff) | Office of the Wet'suwet'en (Mike Ridsdale, David Dewit) | Wetzin'Kwa Community Forest | McBride Community Forest | BC Parks (Mark Parminter, Scott McMillan & Mike Neto) | Habitat Conservation Trust Foundation | TD Friends of Environment Foundation | BC Timber Sales (Dave Duncan) | Shell Fuelling Change | Mountain Equipment Coop | UNBC (Linda Tackaberry, Hugues Massicotte, Phil Burton) | UAlberta | UBC | SERNBC | BC Wildfire Management Branch (Brad Martin, Olivia Pojar) | BC Ministry of Forests, Lands & Natural Resource Operations (Tatlow Office, Tree Seed Centre, Tree Improvement Branch) | BV Naturalists | BV Backpackers | BV Paragliders | Whitebark Pine Ecosystem Foundation of Canada | Yellowpoint Propagation (Don Pigott) | New Gold & Huckleberry Mines | BC Floatplane Association | Alpine Lakes Air | Canadian Helicopters | Pacific Institute for Climate Solutions | Canada Summer Jobs Program

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Northern BC overview



Assisted Migration Experiment

greenhouse
2007 – 2012
field
2012 – 2017



Linda
Tackaberry,
Hugues
Massicotte
UNBC

Smithers - "Coast" Range

- 5 provenances
- 4 soil types (greenhouse)
- 3 elevations

McBride Peak – Rocky Mtns

- 5 provenances
- 4 soil types (greenhouse)
- 2 elevations

Greenhouse component (2007-2012)



fungal
mycelia

Will mycorrhizal fungi limit assisted migration of whitebark pine to alpine elevations?

- WBP seedlings grew better in field soils with mycorrhizae than in lab soils without mycorrhizae
- Seedlings grown in alpine soils had diverse mycorrhizal symbioses & grew just as well (or better) than those grown in subalpine soils

Field Component (2012 – 2017)

- Hudson Bay Mtn, Smithers installation only



3 elevations on Hudson Bay Mtn:

Low: 1013 m (3300 feet)

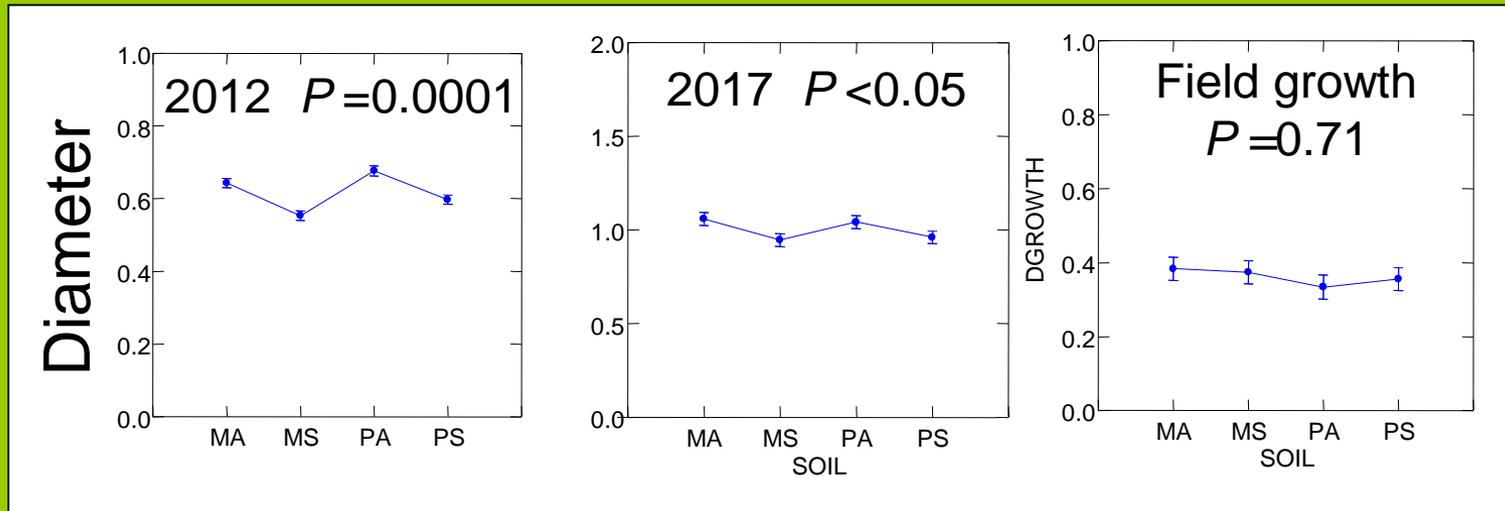
Mid: 1347 m (4400 feet)

High: 1600 -1700 m
spanning treeline (5500 feet)

90 trees planted at each elevation (5 provenances, 4 soil types)

Effect of greenhouse soils on field performance

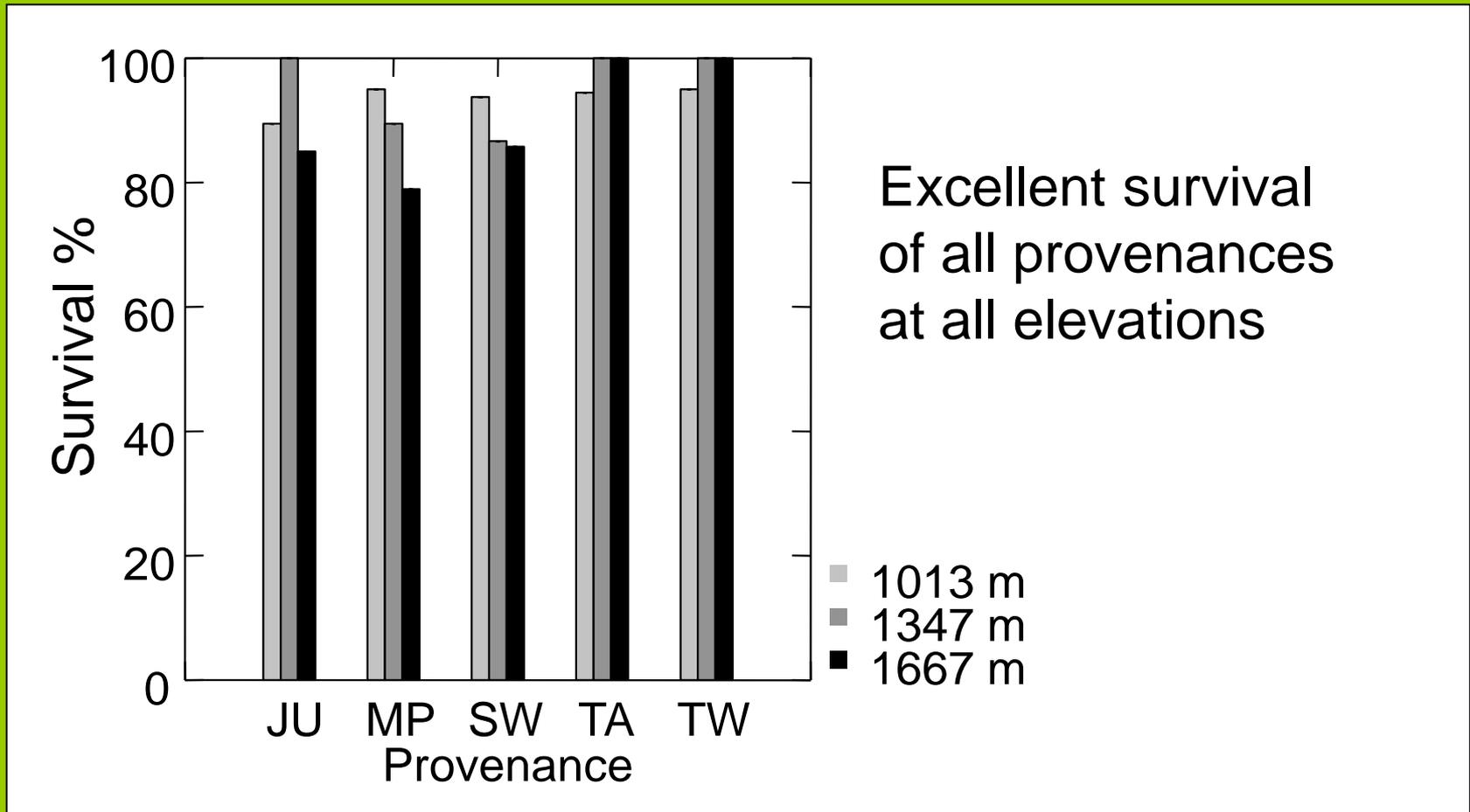
Seedlings grown in alpine soils had significantly larger **diameters** at planting and maintained a slight advantage after 6 years in the field.



But there was no difference in field growth due to soils used in greenhouse (i.e. no mycorrhizal inoculation effect)

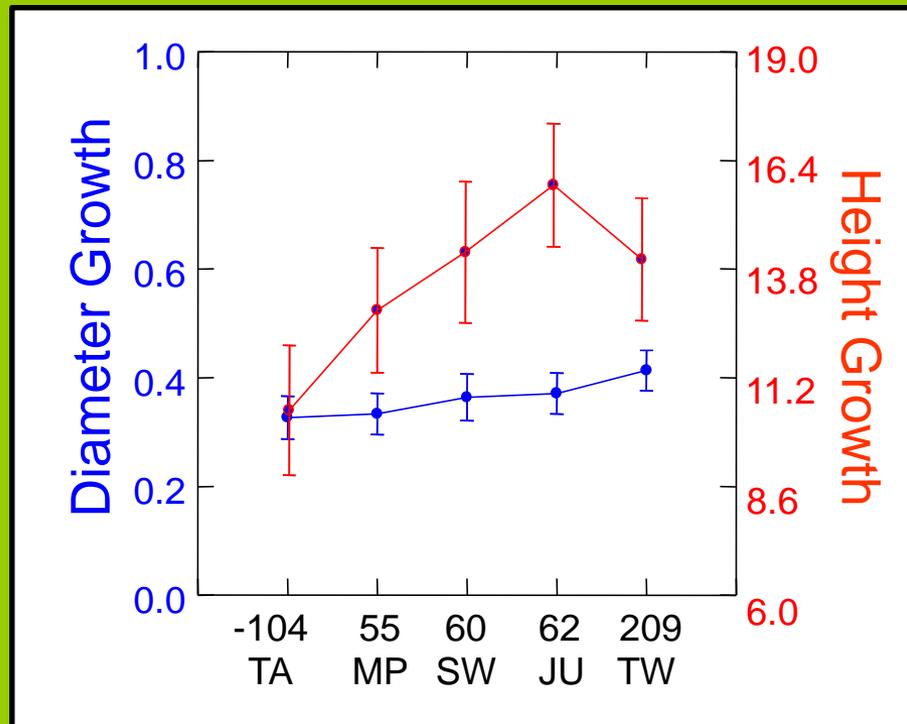
Effect of provenance on field performance

No differences in height, diameter, vigour or survival



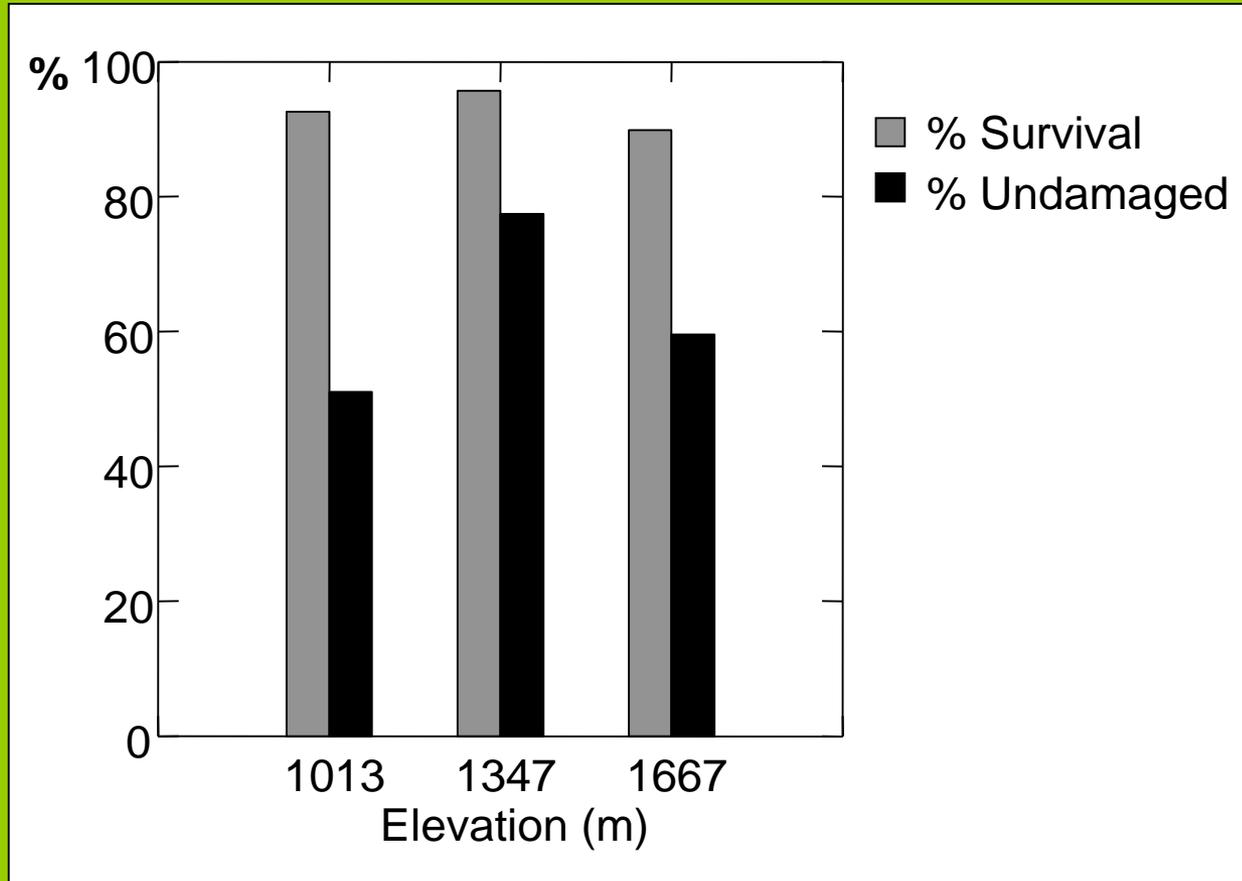
Effect of provenance on field performance

*No relationship with latitude, longitude or absolute elevation
Possible climate-related trend?*



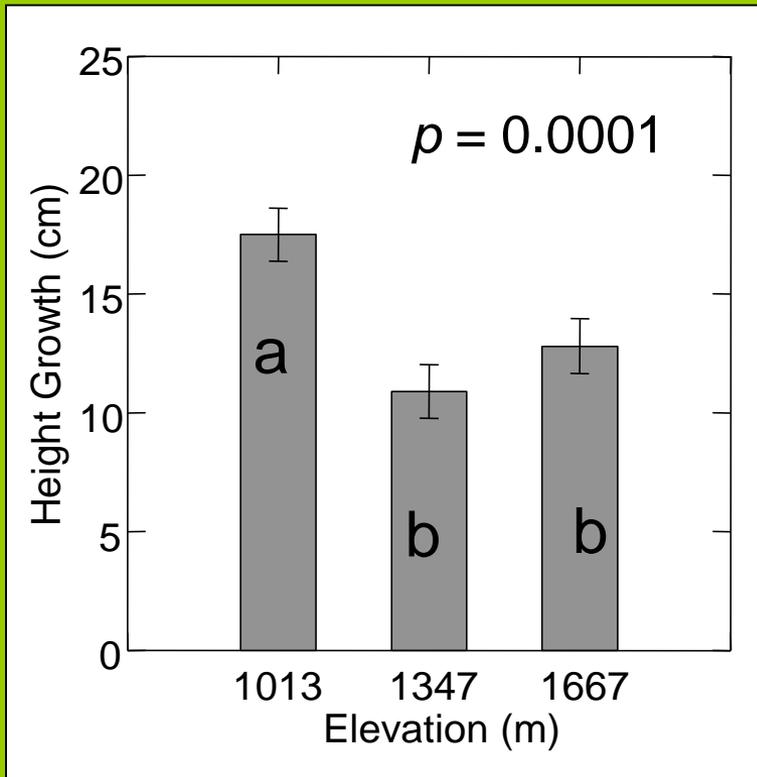
Provenance elevation relative to treeline

Effect of planting elevation on field performance



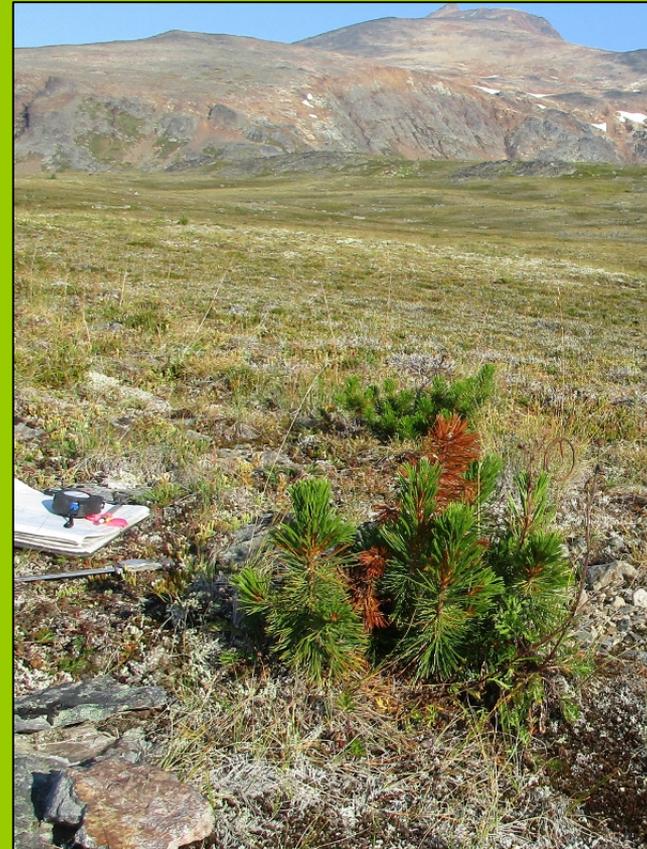
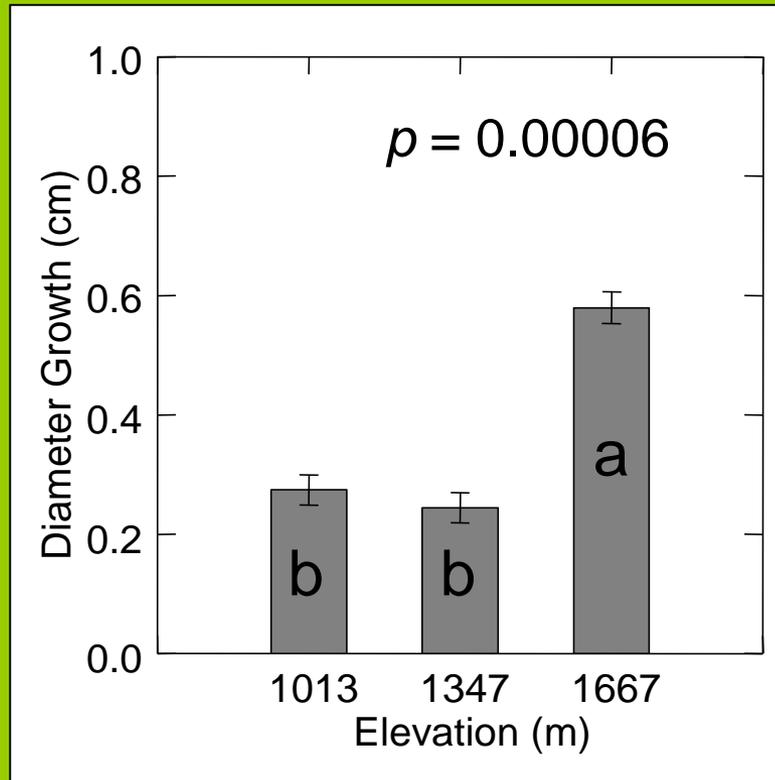
Highest survival and fewest damaged trees at mid elevation site

Effect of planting elevation on field performance



6-yr height growth was best at the low elevation site

Effect of planting elevation on field performance



6-yr diameter growth (& vigour) was best at the high elevation site

Assisted Migration: Early Results

- Whitebark pine is tough & plastic
- All provenances satisfactory to date
- Each elevation has unique benefits/risks
- Local site/soil more important than elevation
- Alpine sites surprisingly hospitable, but trees will have difficulty breaching snowpack



Operational Restoration



MAR/25/2016

Atna wildfire 2367 ha (2010) Morice Lake Provincial Park





A job well done!



Planting in burn pile scars: high risk, high reward?



May 2017 planting day with West Fraser Ltd.



Sept 2017
Yikes, nursery weeds!

5-year succession plan:

- 1) Jointly restore 300 ha over 5yrs
- 2) Jointly collect 1 million seeds over 5 years
- 3) Transition operations to other parties
- 4) Continue community engagement
- 5) Remain involved as a “champion” & advisor

QUESTIONS?

