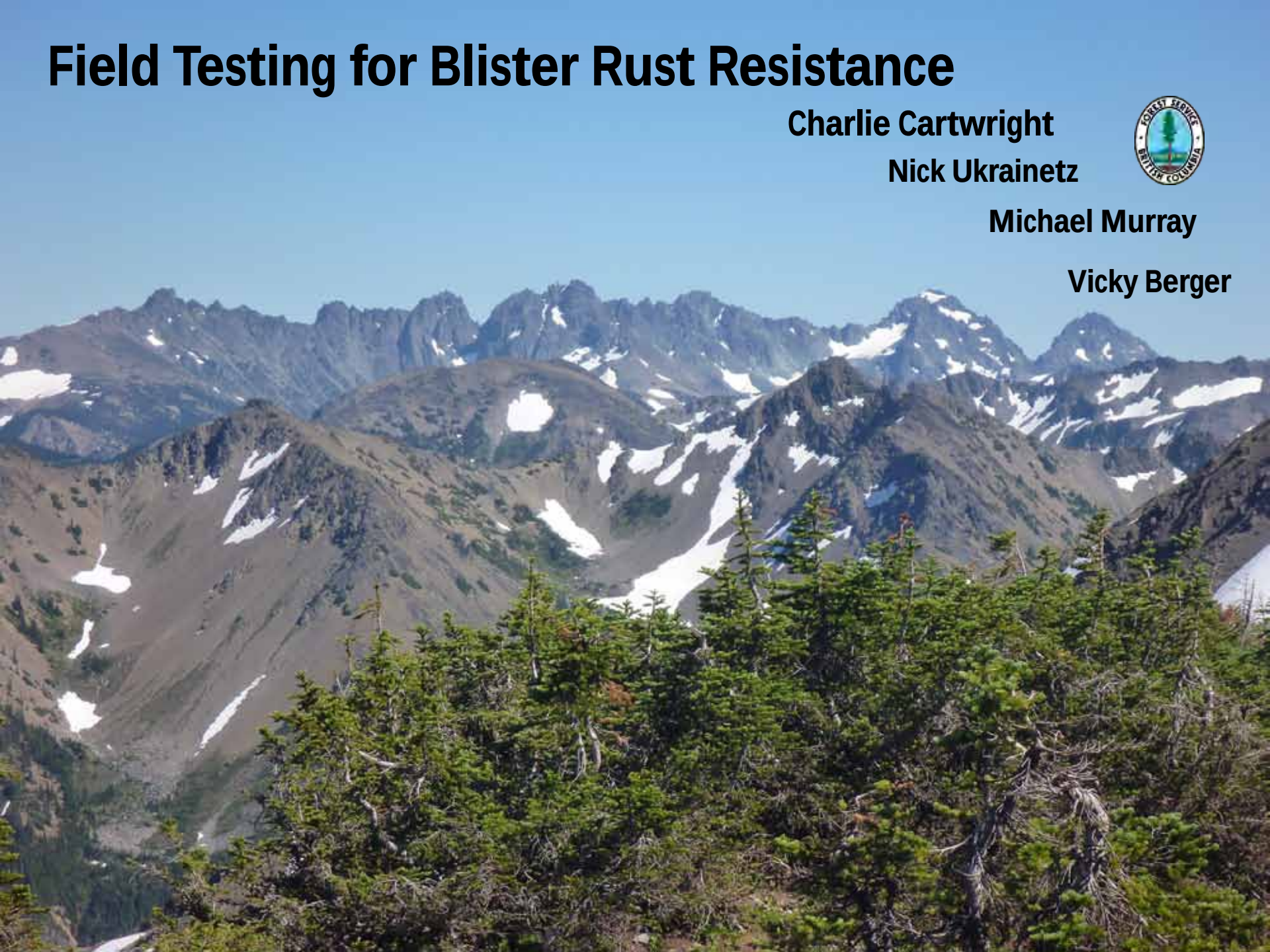
# Field Testing for Blister Rust Resistance

Charlie Cartwright

Nick Ukrainetz

Michael Murray

Vicky Berger



# Screening Whitebark pine against blister rust :

# Options to consider - pros and cons

**John N. King, retired,**

**British Columbia Forest Service**

Research Branch

B
A

P. sibirica, Teletskoe Lake, S. Goroshkevich

# Options – we can reject

- Hybridisation program with P. sibirica
  - politically difficult
  - not enough resources to implement
  - enough resistance in our own species

- Controlled inoc. and monitoring “in house” – no longer have resources to do it in B.C.

- Ribes garden inoc. and monitoring here
  - too brutal – lack of resources

- nt

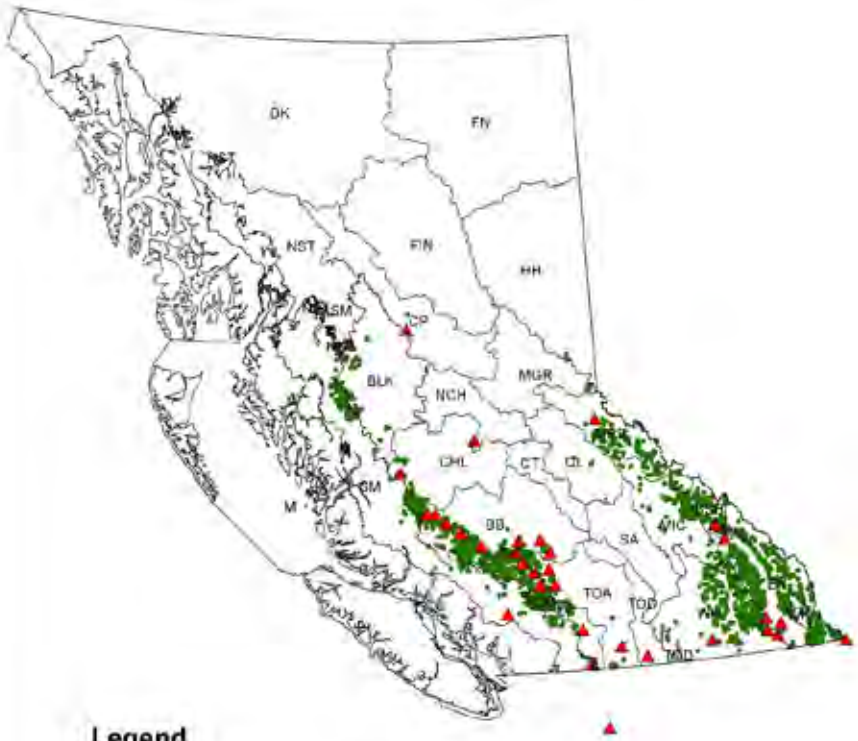
# Options – to consider

- Controlled inoc. in USDA facilities
  - will need to control resources
  - seedlings cannot be returned

- Field trials
  - seed strat and growing
  - experimental design and number of sites
  - planting of alternative host?

telia C.ribicola 6Sep2012 DGRC
60x Ribes nig
1 mm

# Whitebark Pine Seed Collection Inventory
November 2011




**Legend**

- Seed Planning Zones (B Class Seed)
- Pa Seed Collections
- Pa Species Range (VRI)

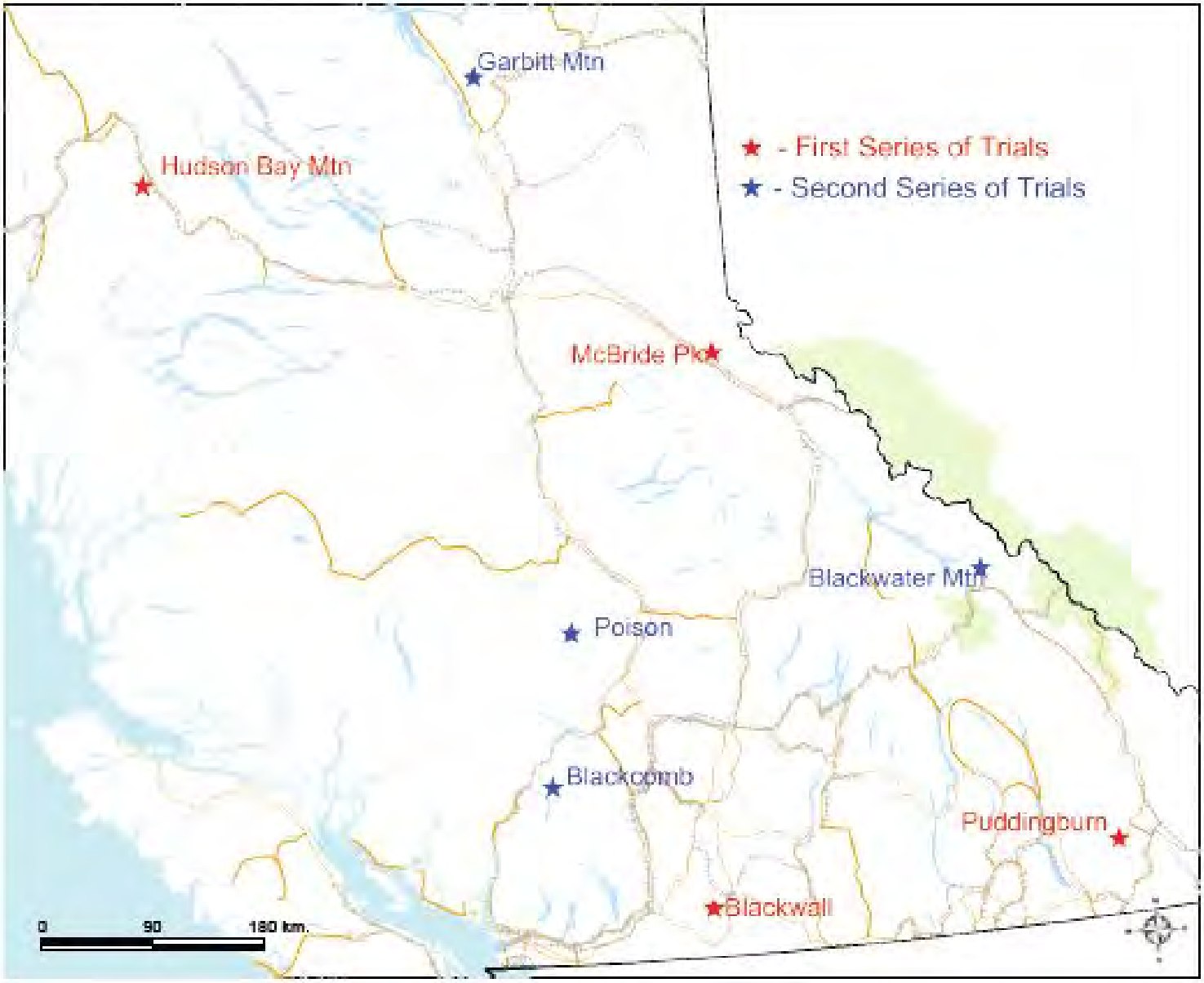
# Appendix A: Seed For Whitebark Pine Testing

| Prov | Lat | Long | Elev | Year | Trees |
|---|---|---|---|---|---|
| | | | | | |
| Mt. Sidney Williams | 55.02 | -125.59 | 1580 | 2007 | 20 |
| Hudson Bay Mtn | 54.77 | -127.28 | 1800 | 2007 | 5 |
| McBride Peak | 53.34 | -120.12 | 2100 | 2010 | 10 |
| Perkins Mtn | 51.83 | -125.04 | 1940 | 2006 | 9 |
| Sapeye Mtn | 51.82 | -124.81 | 2027 | 2006 | 6 |
| Niut Mtn | 51.67 | -124.52 | 2003 | 2006 | 8 |
| Nemaiah Mtn | 51.49 | -124.12 | 2010 | 2006 | 9 |
| Jesmond | 51.31 | -121.92 | 1850 | 2006 | 10 |
| Kickinghorse | 51.30 | -117.06 | 2000 | 2010 | 10 |
| Taseko Mtn | 51.26 | -123.54 | 1950 | 2006 | 9 |
| Lime Mtn | 51.09 | -121.66 | 1935 | 2003 | 10 |
| Mt Carson | 50.80 | -121.72 | 2000 | 2010 | 10 |
| Darcy | 50.52 | -121.58 | 1800 | 2003 | 10 |
| Blackcomb | 50.06 | -122.90 | 1893 | 2007 | 10 |
| Puddingbum | 49.59 | -116.01 | 2340 | 2007 | 10 |
| Apex Mtn | 49.37 | -119.92 | 2100 | 1999 | 12 |
| Moyie Mtn | 49.26 | -115.77 | 2078 | 2007 | 15 |
| Mt. Baldy | 49.17 | -119.25 | 2050 | 2010 | 20 |
| Blackwall | 49.10 | -120.76 | 2005 | 2007 | 20 |
| Colville Forest, WA | 48.67 | 117.57 | 1800 | 2009 | 8 |
| Dosewallips, WA | 47.81 | -123.38 | 2100 | 2007 | 6 |
| Wenatchee, WA | 47.61 | -120.93 | 2100 | 2007&09 | 10 |
| Mt. Rainier, WA | 46.78 | -121.25 | 2000 | 2009 | 5 |
| Mt.Hood, OR | 45.34 | -121.69 | 2351 | 2006 | 6 |
| Umatilla, OR | 44.73 | -118.27 | 2300 | 2003 | 8 |
| Deshutes, OR | 43.69 | -121.26 | 2000 | 2006 | 10 |
| Umpqua, OR | 43.17 | -122.21 | 2150 | 2009 | 5 |
| Coon Creek Summit, NV | 41.79 | -115.49 | 2653 | 2008 | bulk |
| Mt Rose, NV | 39.32 | -119.90 | 2578 | 2008 | Bulk |

# Sample Sources For Whitebark Pine Testing

| Prov | Lat | Long | Elev | MAT | MAP | PAS |
|---|---|---|---|---|---|---|
| | | | | | | |
| Mt. Sidney Williams | 55.02 | -125.59 | 1580 | -0.4 | 714 | 391 |
| Hudson Bay Mtn | 54.77 | -127.28 | 1800 | -0.9 | 826 | 507 |
| Perkins Mtn | 51.83 | -125.04 | 1940 | -1.6 | 977 | 690 |
| Darcy | 50.52 | -121.58 | 1800 | 1.8 | 540 | 260 |
| Blackcomb | 50.06 | -122.90 | 1893 | 0.8 | 2130 | 1401 |
| Puddingbum | 49.59 | -116.01 | 2340 | -0.2 | 726 | 459 |
| Umpqua, OR | 43.17 | -122.21 | 2150 | 4.4 | 1494 | 584 |
| Mt Rose, NV | 39.32 | -119.90 | 2578 | 5.1 | 1133 | 438 |

## Appendix B: Draft Whitebark Pine Test Locations




**Legend**

Provincial Boundary (1:2M)
Boundary (International)
Boundary (Interprovincial)
Provincial Boundary (1:5M)
Boundary (International)
Boundary (Interprovincial)
National Parks
Landmark - Lines (1:2M)
Mine (Underground)
Pit
Quarry
Sewage Lagoon/Settling Pond
Tailing Pond/Impoundment
Drilling Area
Designated Area
Utility Facilities
Ski Lift
Conveyor
Wharf

Scale: 1: 5,000,000

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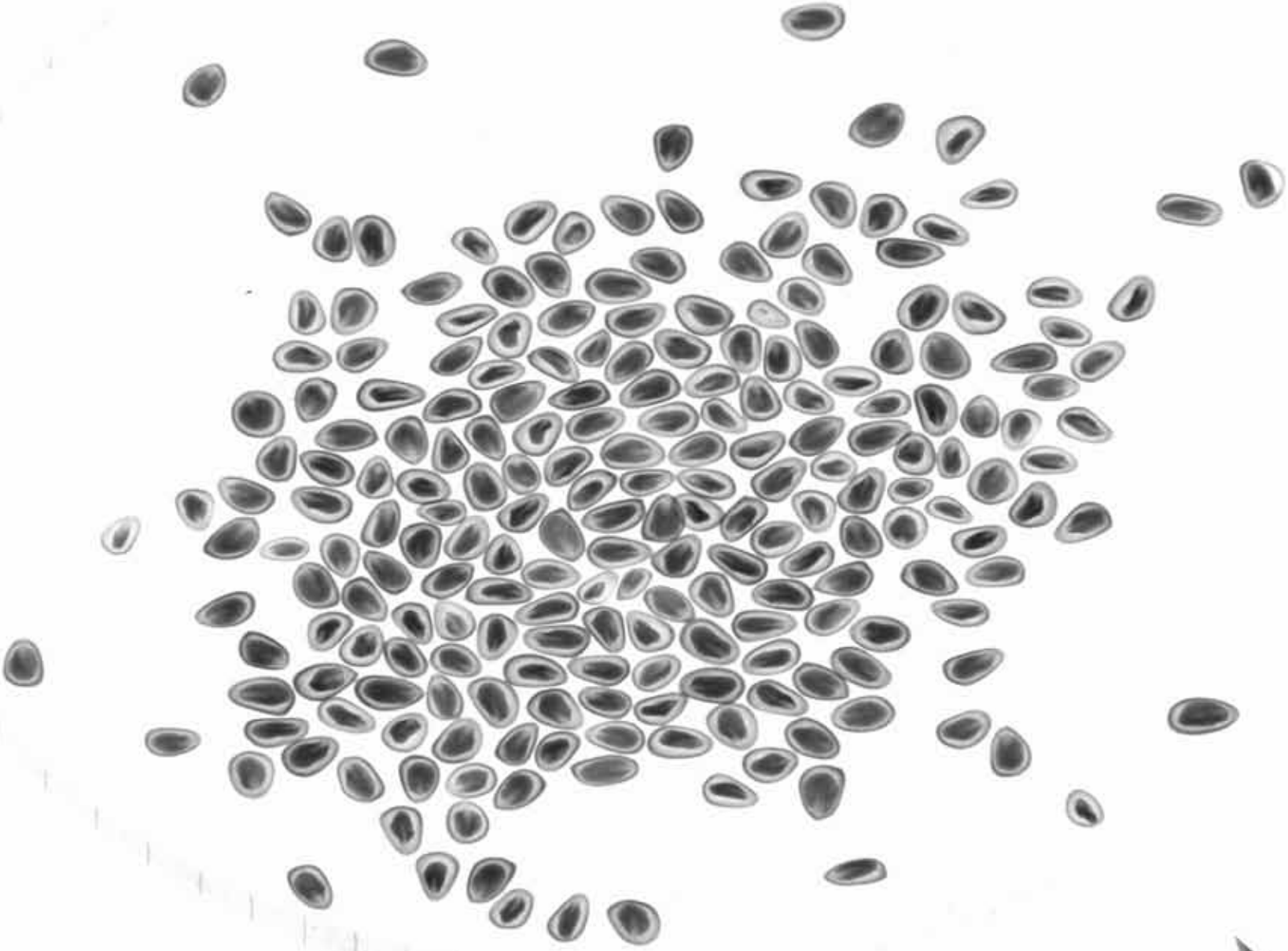
CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions.

Data/Projection: NAD83 Albers Equal Area Conic
Created using MapInfo 6.0 on 1/05/07

**Key Map of British Columbia**

# Draft Whitebark Pine Test Locations

| | Name | Lat | Long | Elev | MAT | MAP | PAS |
|---|---|---|---|---|---|---|---|
| Series 1 | | | | | | | |
| 1 | Hudson Bay Mtn | 54.83 | 127.37 | 1920 | -0.3 | 1547 | 1014 |
| 2 | McBride Peak | 53.33 | 120.12 | 2040 | -0.4 | 1302 | 705 |
| 3 | Perkins Mtn | 51.82 | 125.04 | 1940 | -1.6 | 977 | 690 |
| 4 | Blackwall | 49.1 | 120.77 | 1960 | 0.8 | 1431 | 1009 |
| Series 2 | | | | | | | |
| 5 | Garbitt Mountain | 55.53 | 122.8 | 1740 | -1.3 | 1307 | 877 |
| 6 | Blackwater Mtn | 51.4 | 116.88 | 1900 | -0.8 | 1595 | 929 |
| 7 | Blackcomb | 50.08 | 123.95 | 1800 | 1.5 | 1727 | 1065 |
| 8 | Puddingburn Mtn | 49.55 | 116.08 | 2280 | -0.2 | 901 | 566 |



A3 Stagleap

# Five 4 Tree Row Plots

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 1 | 15 | 23 | 17 | 6 | 11 | 25 | 13 | 28 | 32 | 5 | 22 | 19 | 10 | 7 |
| 8 | 1 | 15 | 23 | 17 | 6 | 11 | 25 | 13 | 28 | 32 | 5 | 22 | 19 | 10 | 7 |
| 8 | 1 | 15 | 23 | 17 | 6 | 11 | 25 | 13 | 28 | 32 | 5 | 22 | 19 | 10 | 7 |
| 8 | 1 | 15 | 23 | 17 | 6 | 11 | 25 | 13 | 28 | 32 | 5 | 22 | 19 | 10 | 7 |
| 30 | 27 | 20 | 3 | 12 | 29 | 24 | 2 | 26 | 21 | 9 | 14 | 21 | 16 | 4 | 18 |
| 30 | 27 | 20 | 3 | 12 | 29 | 24 | 2 | 26 | 21 | 9 | 14 | 21 | 16 | 4 | 18 |
| 30 | 27 | 20 | 3 | 12 | 29 | 24 | 2 | 26 | 21 | 9 | 14 | 21 | 16 | 4 | 18 |
| 30 | 27 | 20 | 3 | 12 | 29 | 24 | 2 | 26 | 21 | 9 | 14 | 21 | 16 | 4 | 18 |

# 20 Complete Randomized Blocks

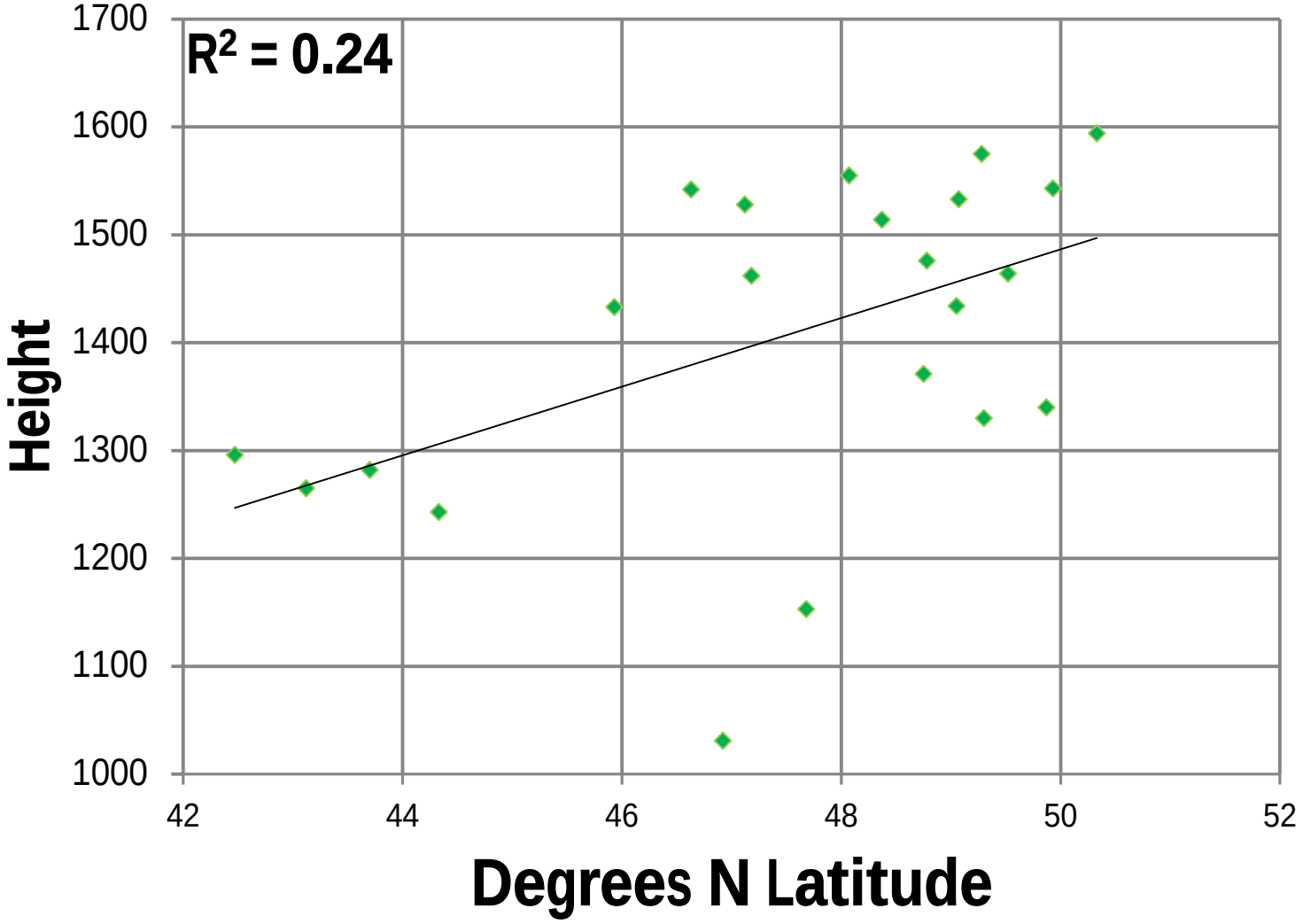
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 8 | 12 | 3 | 22 | 14 | 7 | 4 |
| 30 | 19 | 31 | 25 | 15 | 28 | 24 | 18 |
| 16 | 10 | 6 | 27 | 32 | 13 | 9 | 26 |
| 23 | 20 | 5 | 17 | 2 | 11 | 29 | 21 |

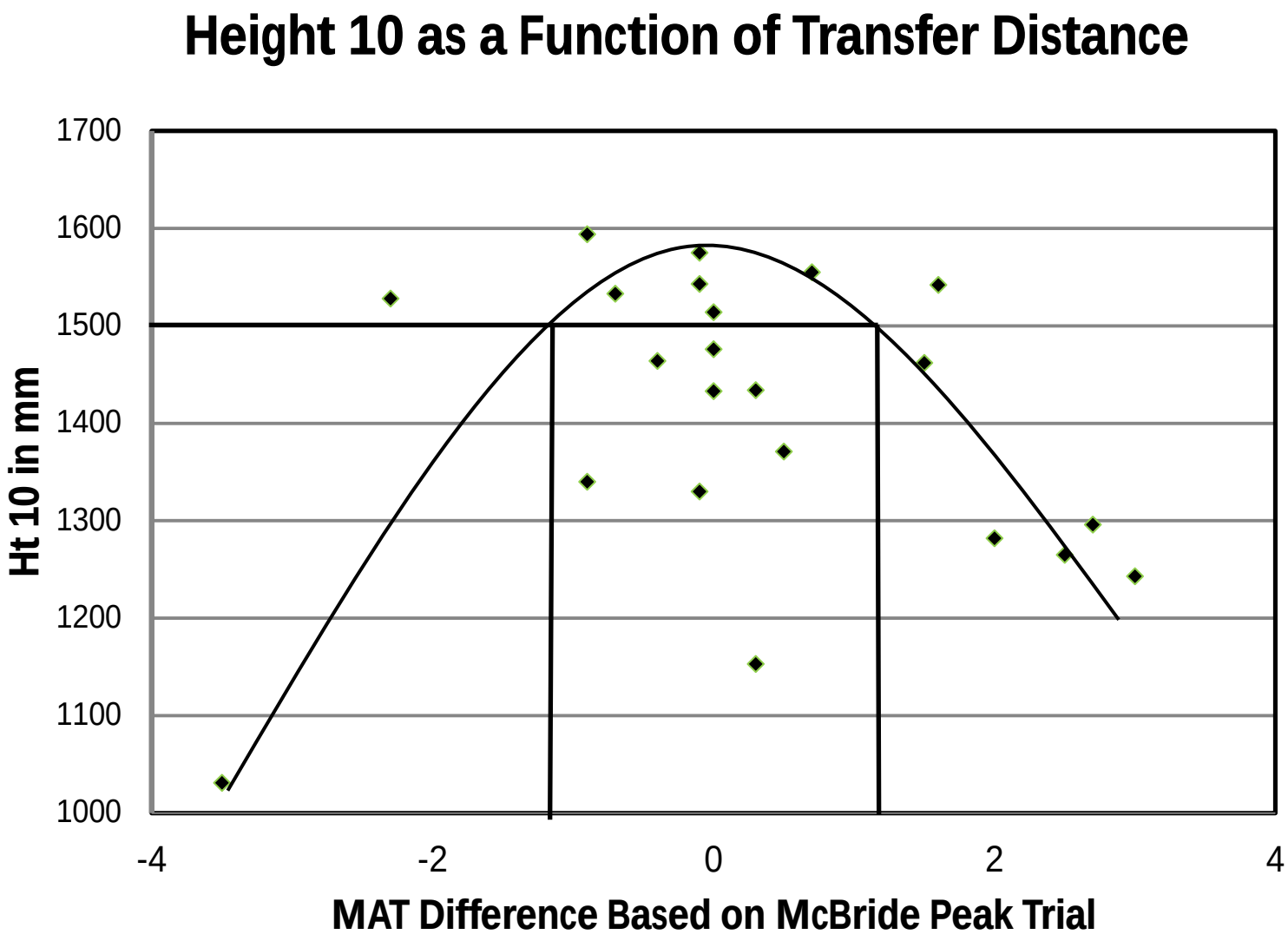
# Incomplete Block Alpha Design

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 24 | 9 | 19 | 5 | 29 | 32 | 14 |
| 10 | 6 | 25 | 30 | 17 | 21 | 13 | 2 |
| 7 | 20 | 15 | 23 | 3 | 31 | 27 | 11 |
| 16 | 4 | 18 | 12 | 28 | 26 | 21 | 8 |

25 4
93 1

# Height 10 as a Function of Latitude of Origin




Height 10 as a Function of Transfer Distance
1700
1600
1500
1400
1300
1200
1100
1000
Ht 10 in mm
-4
-2
0
2
4
MAT Difference Based on McBride Peak Trial

| Name | Date modified | Type | Size | Offline availability | Offline status |
|---|---|---|---|---|---|
| EP1329 | 2011-11-09 10:35 ... | File Folder | | Not available | Online |
| EP1335 | 2011-11-09 10:35 ... | File Folder | | Not available | Online |
| EP1339 | 2008-06-09 2:51 PM | File Folder | | Not available | Online |
| EP1340 | 2012-03-08 8:42 AM | File Folder | | Not available | Online |
| EP1358 | 2011-11-09 10:35 ... | File Folder | | Not available | Online |
| EP1359 | 2011-11-09 10:35 ... | File Folder | | Not available | Online |
| EP1363 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1364 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1365 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1366 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1367 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1368 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1369 | 2011-11-09 9:57 AM | File Folder | | Not available | Online |
| EP1371 | 2011-11-09 9:52 AM | File Folder | | Not available | Online |
| EP1372 | 2011-11-09 9:52 AM | File Folder | | Not available | Online |
| EP1373 | 2011-11-09 9:52 AM | File Folder | | Not available | Online |
| EP1376 | 2011-11-09 9:52 AM | File Folder | | Not available | Online |
| EP1377 | 2011-11-09 9:53 AM | File Folder | | Not available | Online |
| EP1380 | 2011-11-09 9:53 AM | File Folder | | Not available | Online |
| EP1381 | 2011-11-09 9:53 AM | File Folder | | Not available | Online |
| EP1385 | 2011-11-09 9:54 AM | File Folder | | Not available | Online |

# Seed Planning and Registry System



## Welcome to the Seed Planning and Registry (SPAR) Web Application!

Version: 06.05.03 on FREEZER

Environment: PROD

Last Updated: August 01, 2012

You are currently logged on as: IDIR\CCARTWRI

Available links:

1. SeedMap
2. SPAR Website
3. Chief Forester's Standards for Seed Use
4. Email to SeedInfo