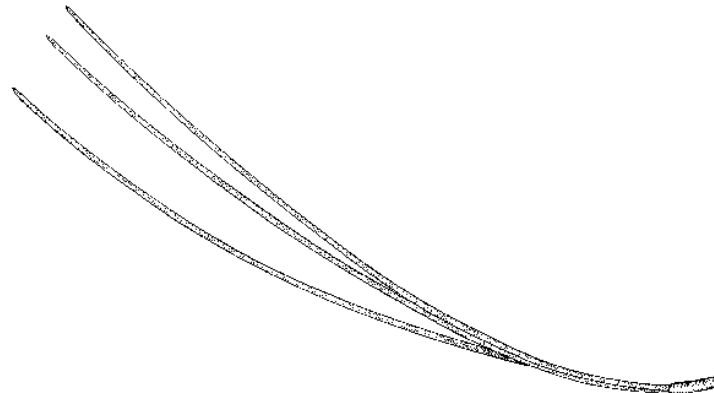


A Breeding Plan for Ponderosa Pine (*Pinus ponderosa*)

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F.I.R.M. Branch
Ministry of F.L.N.R.O.R.D.



Ponderosa Pine

Py Genetic Structure

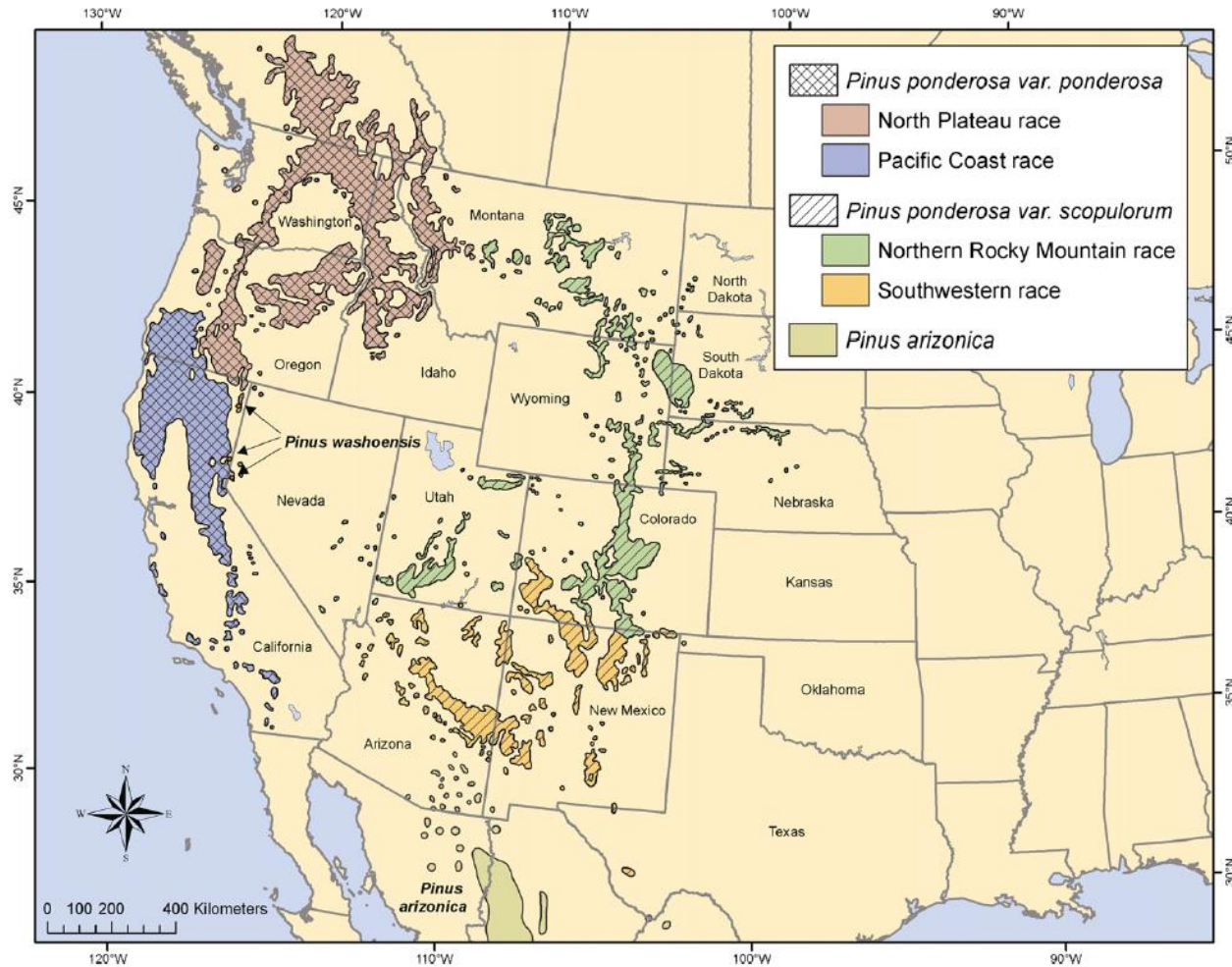


Fig. 1. Geographical distributions of *Pinus ponderosa* var. *ponderosa* and *P. ponderosa* var. *scopulorum* and of the two races described within each variety, in addition to the locations of *P. washoensis* and *P. arizonica*. Boundaries between races are approximate.



Economic Importance

- 11 million hectares of Py in the United States
- > 1 billion m³ of timber
- 9.4 million m³ harvested in 1941

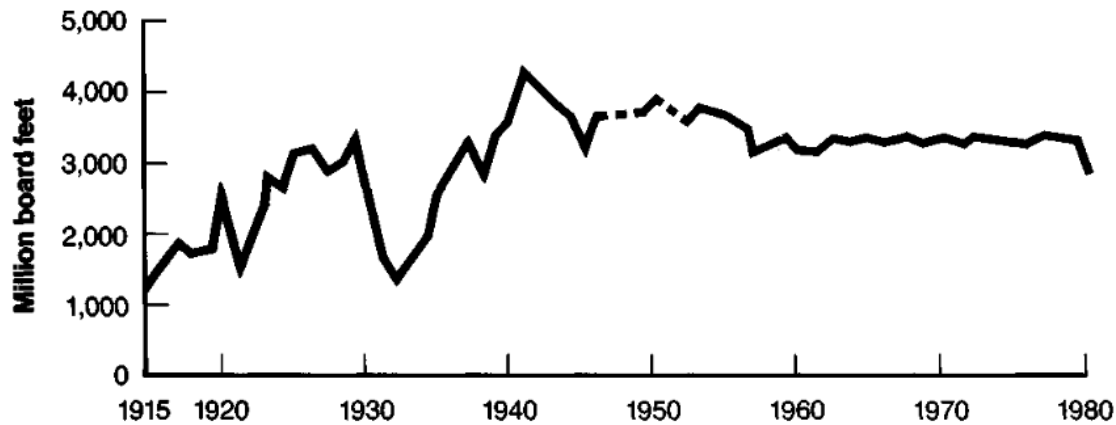


Figure 3—Ponderosa pine lumber production, 1915–80.

Lowery 1980



Economic Importance

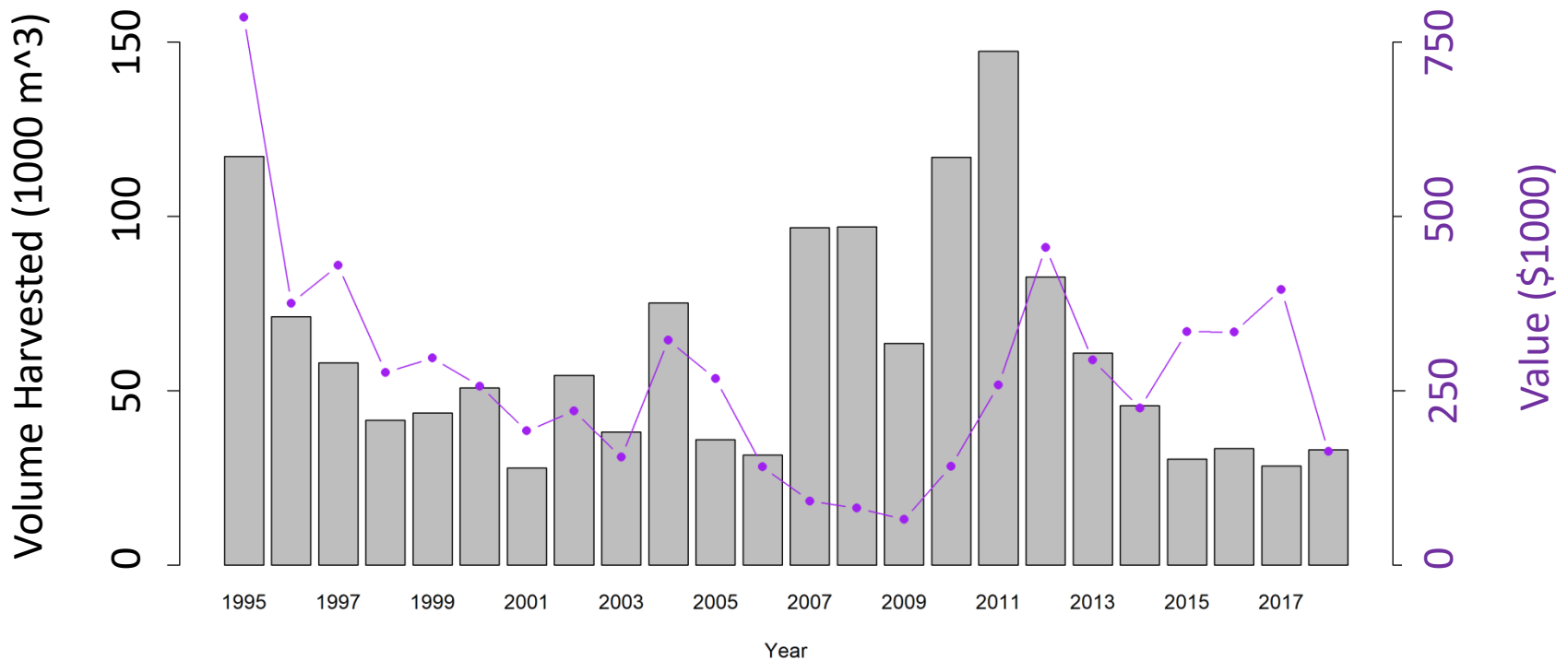


Edward Hines Lumber Co. operations in Malheur National Forest, Grant County, Oregon
Photo: Russell Lee, 1942

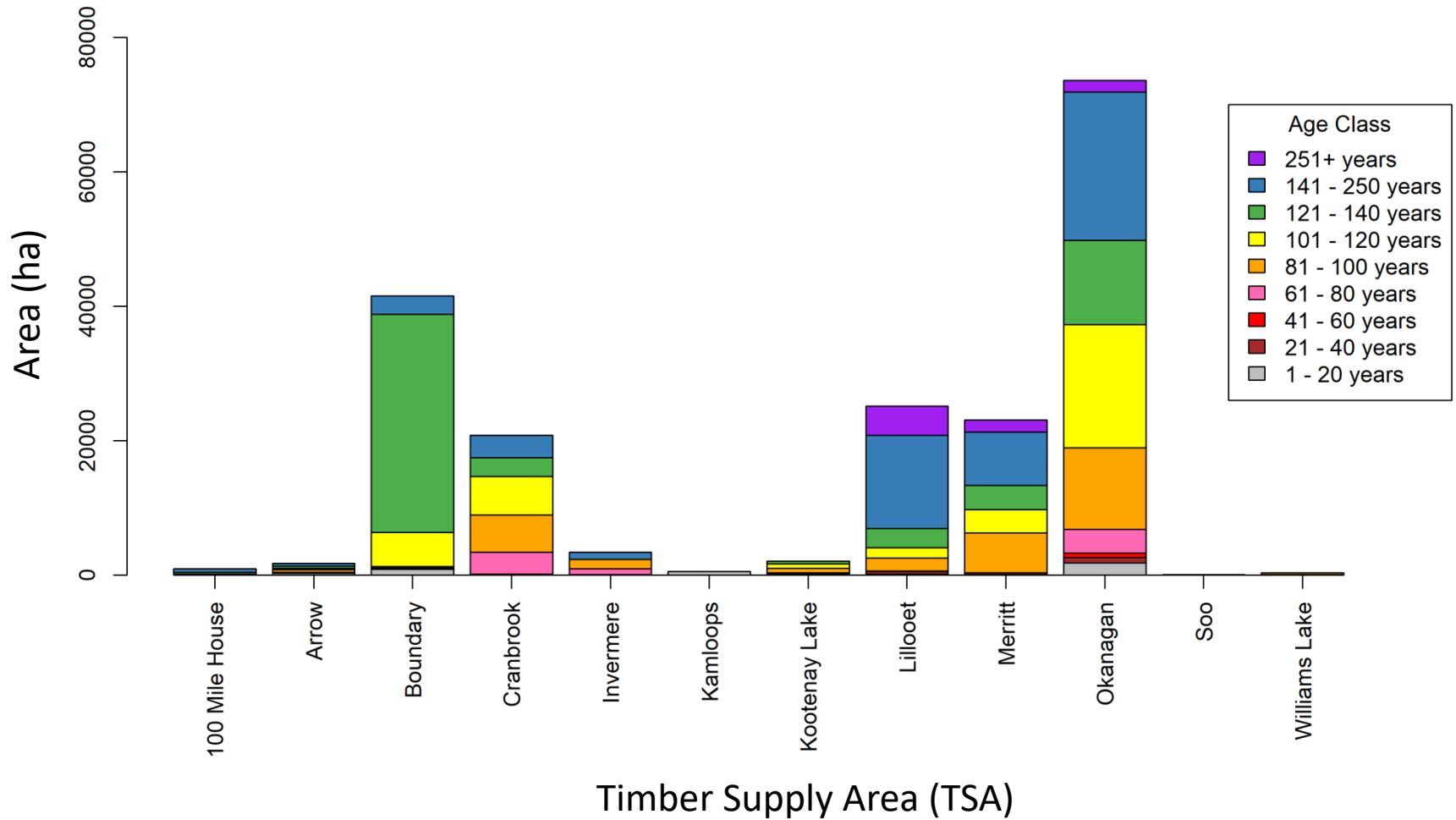


Economic Importance

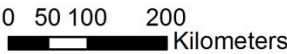
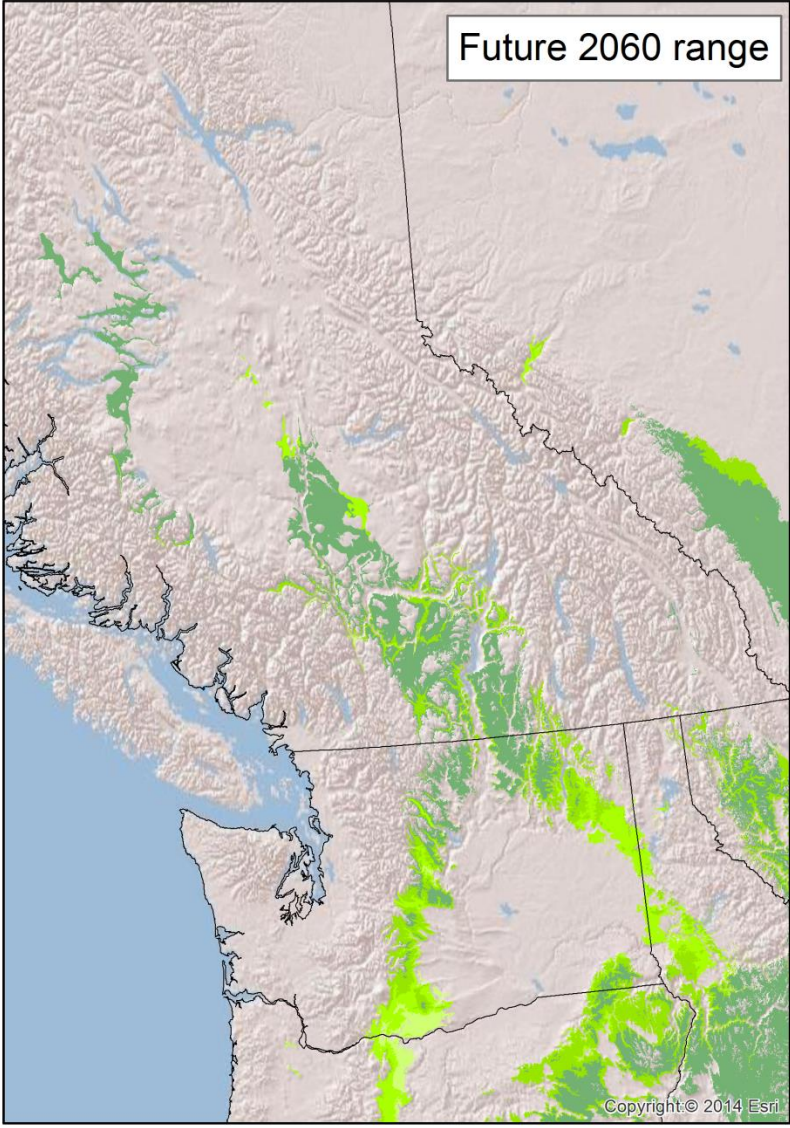
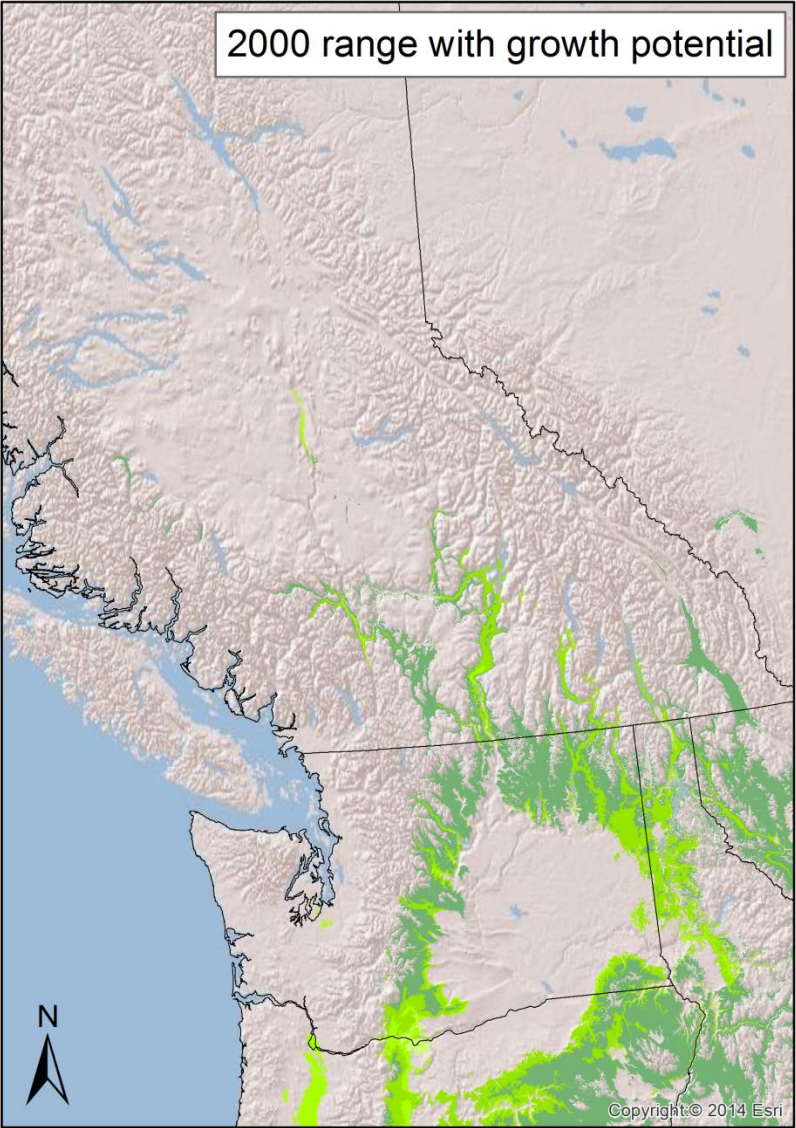
- 0.2 million hectares of Py in British Columbia
- 13.6 million m³ of timber volume



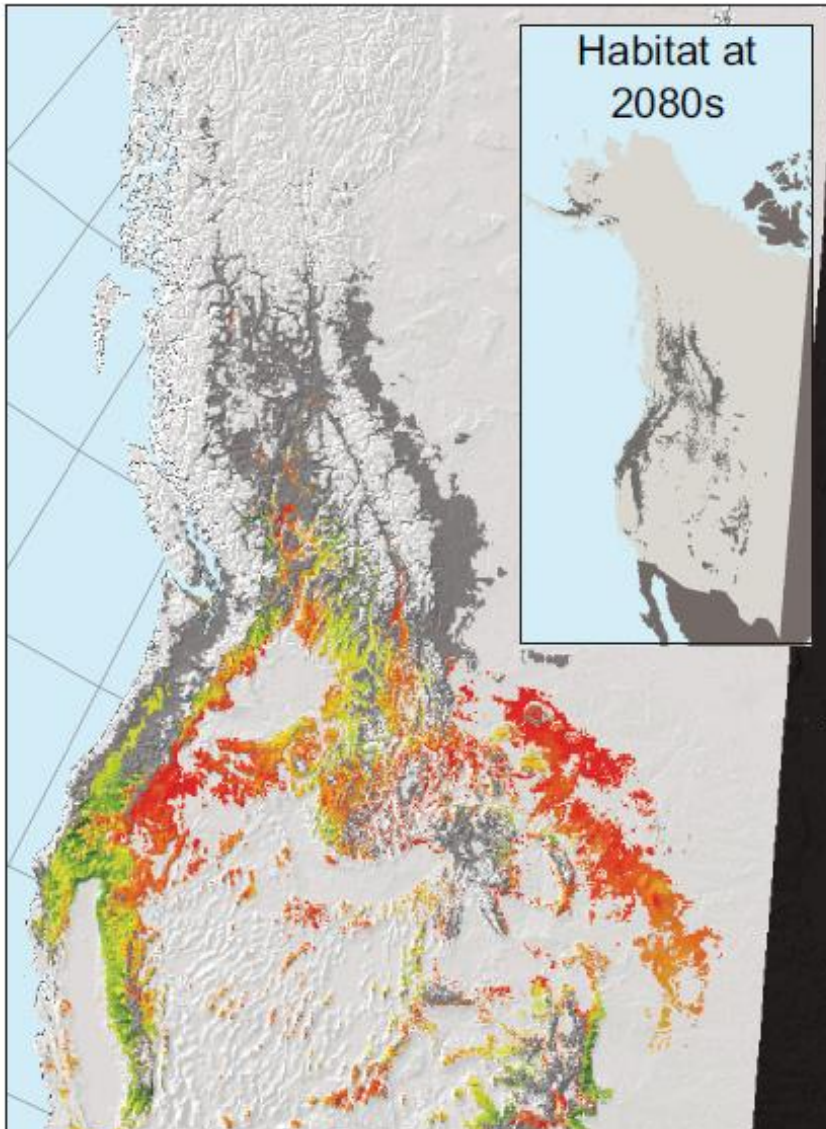
BC Inventory



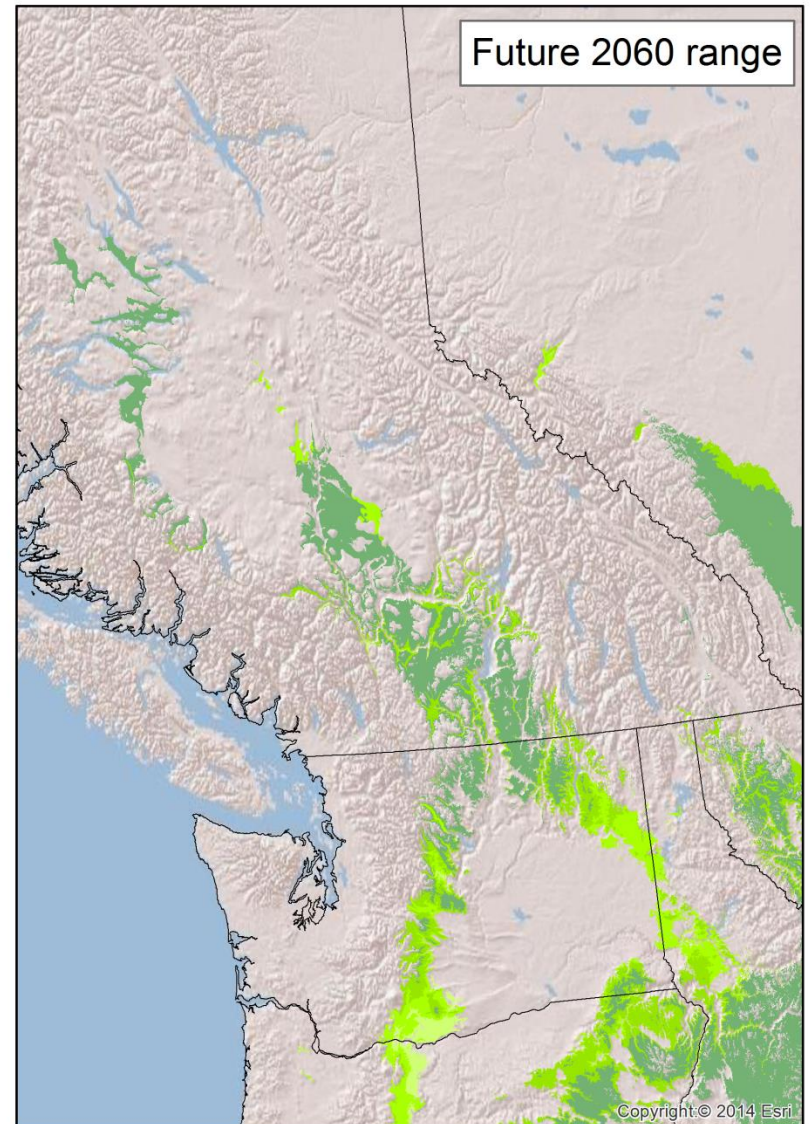
Climate niche data from Rehfeldt *et al.* 2014



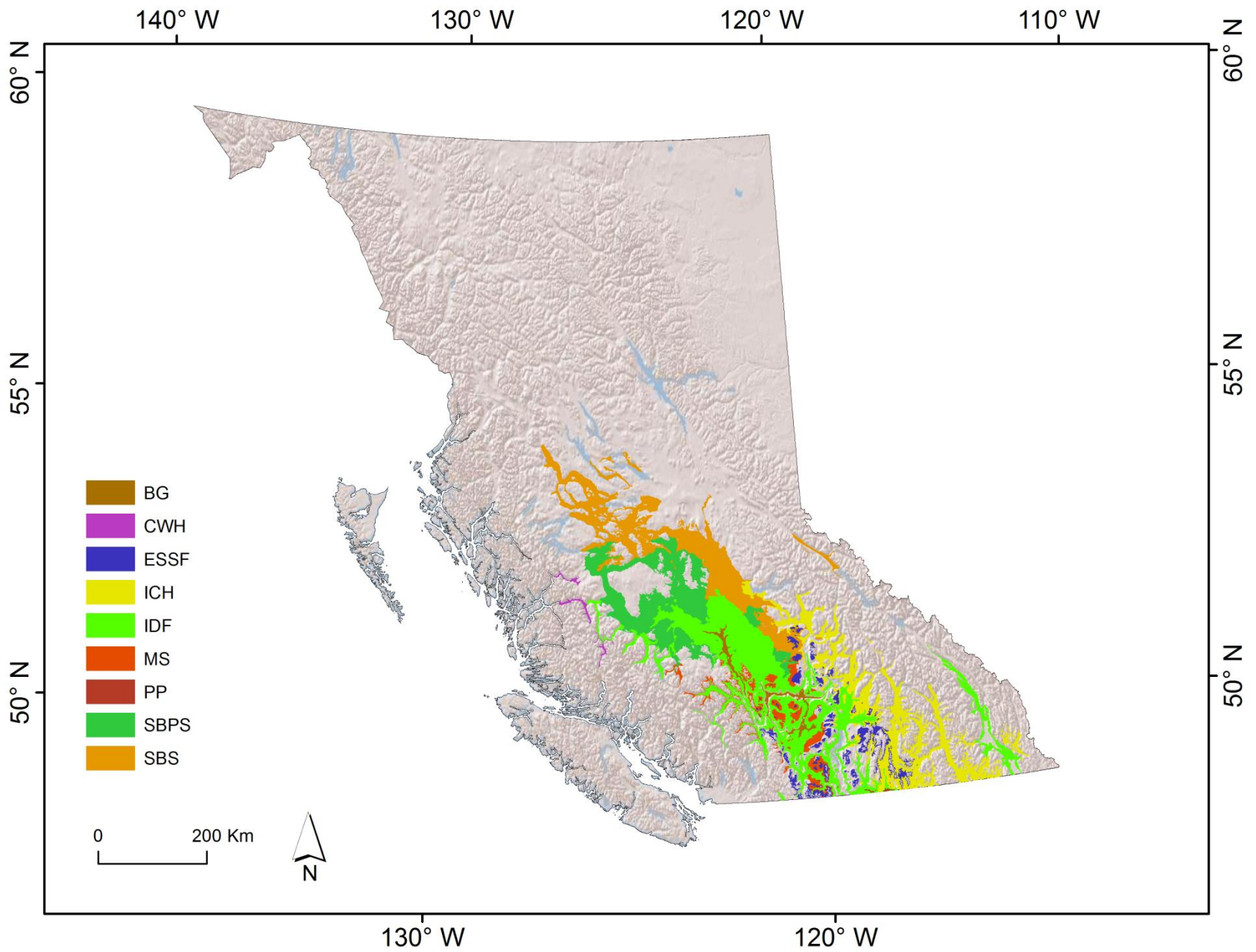
Roberts and Hamann, 2016



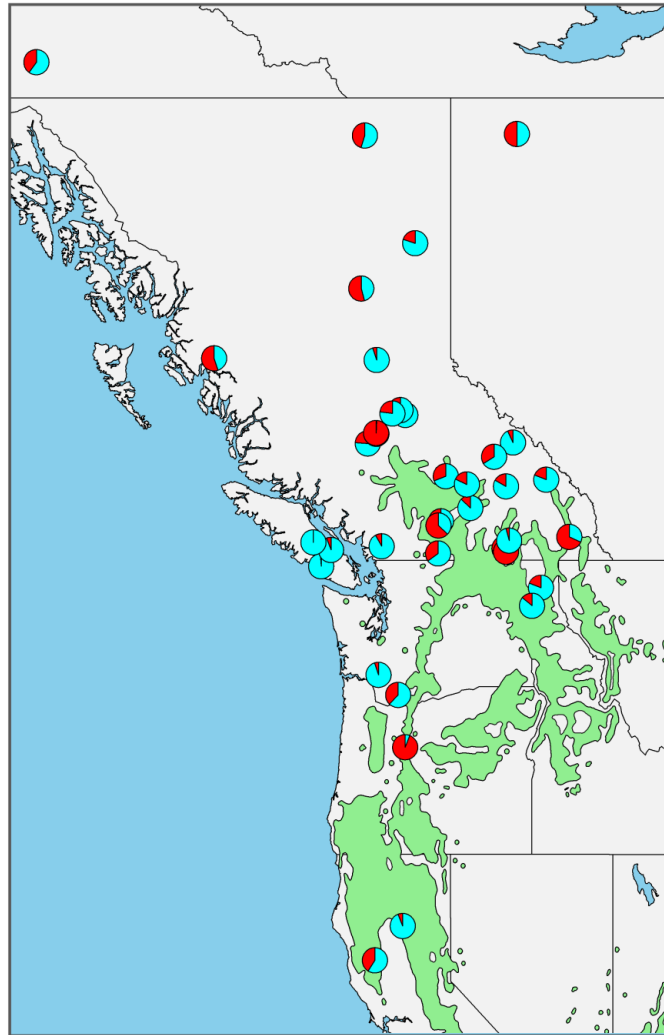
Rehfeldt *et al.* 2014



0 50 100 200
Kilometers



Py Survival in the AMAT (blue)



Research Proposal

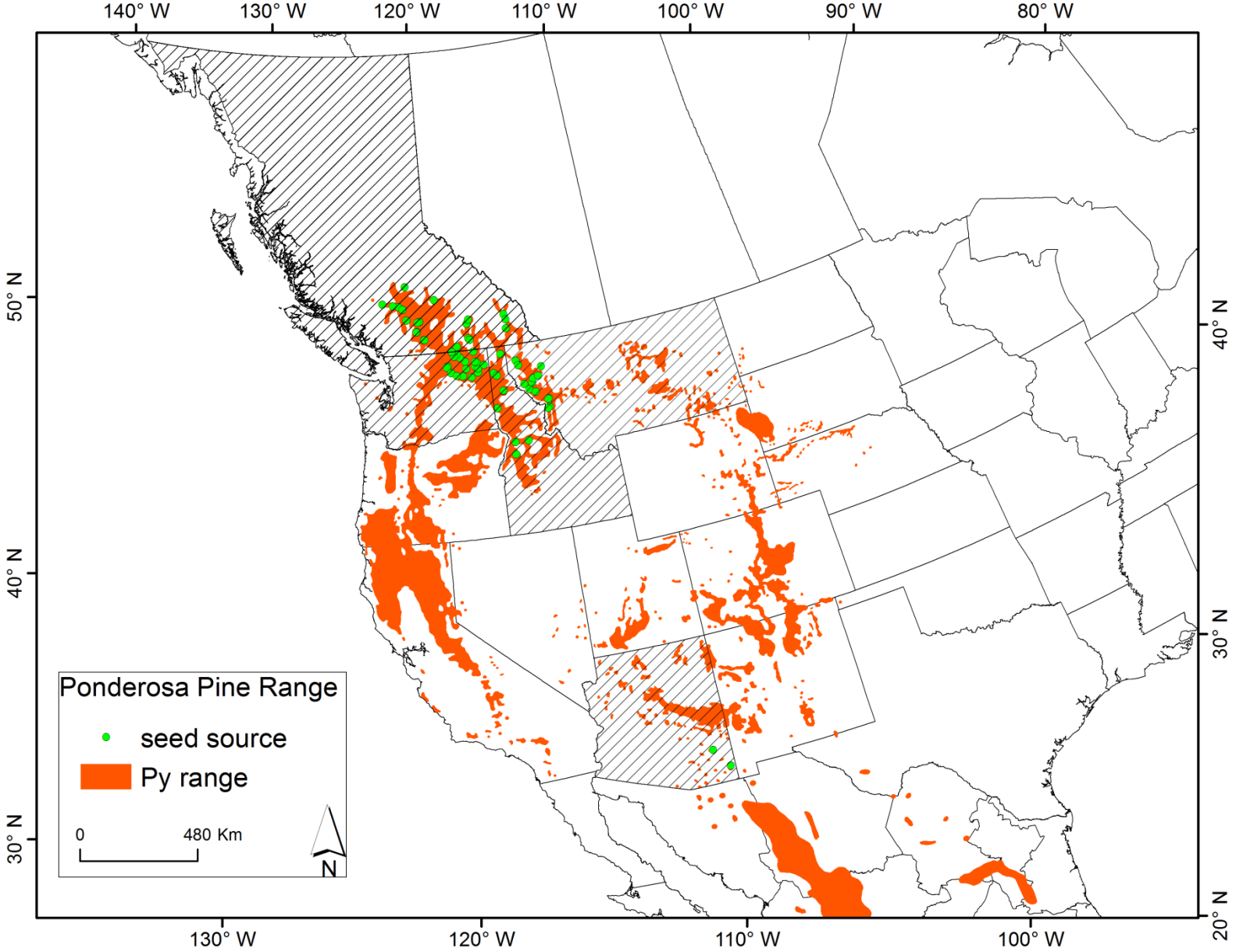


Willamette Valley seed orchard, 11 years from seed (Weyerhaeuser)
Photo credit: Robert L. McNitt

Provenance Trials

- 1992: three test sites planted by M. Carlson
- Skimikin test site
 - IDFmw2 near Salmon Arm
 - 32 individuals per provenance (8 reps)
- Grandview test site
 - IDFxh1 near Vernon
 - 56 individuals per provenance (14 reps)
- Vernon Commonage site destroyed by cattle

Py range as per Little, 1971



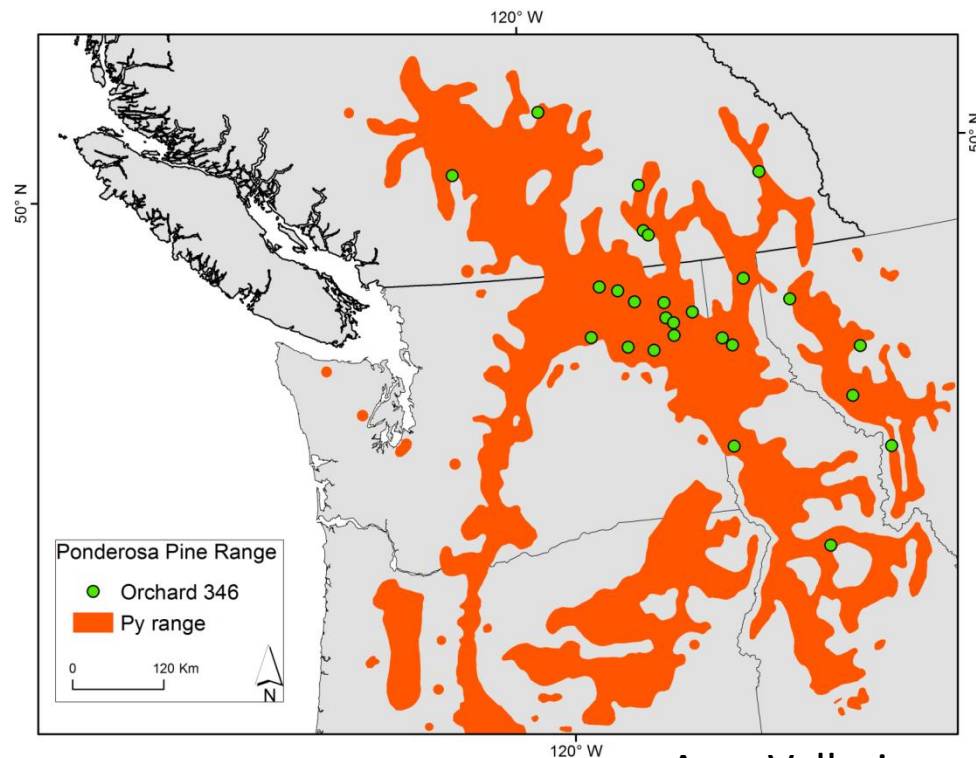
Seed Orchard Establishment

- 1999: Index of selection calculated by C.-Y. Xie
- 2000: Skimikin site thinned to 458 trees (20%)
 - 69/73 provenances retained
 - Mean 6 individuals per provenance
 - Unfortunately the orchard failed to produce seed, even with GA



Seed Orchard Establishment

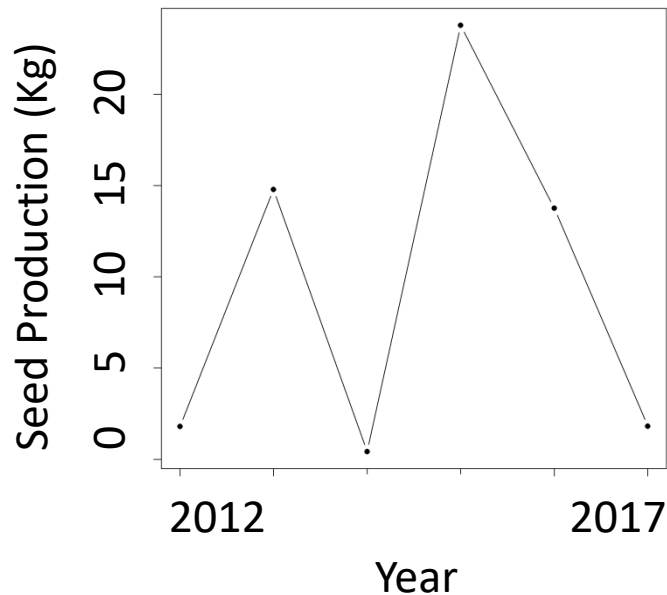
- 2005: N. Ukrainetz calculated BVs using HT8
- Scion for 39 selections collected at Skimikin



Amy Vallarino

Seed Orchard Establishment

- 2006: Bailey Orchard 346 established
- 27 provenances (mean 1.4 ind. per prov.)



Penny May

Orchard 346 Deployment



CBST Seedlot Selection Tool Version 2.0

Instructions | I Have A Cutblock | I Have A Seedlot

Seedlot Number:

63666

Set Species & BEC

OR

Species:

PY

BEC Variant:

ICHxw

GO

Plantation BEC	Seed BEC	Species Suitability	Limit
IDFdm2	ICHxw	Suitable	
IDFmw1	ICHxw	Suitable	
IDFdm1	ICHxw	Suitable	
IDFmw2	ICHxw	Suitable	
IDFdk2	ICHxw	Suitable	
ICHdw4	ICHxw	Suitable	
IDFdk5	ICHxw	Suitable	
ICHmk1	ICHxw	Suitable	
ICHdw1	ICHxw	Suitable	
PPdh2	ICHxw	Suitable	
ICHdw3	ICHxw	Suitable	
IDFwv	ICHxw	Suitable	
ICHmk2	ICHxw	Suitable	
ICHxw	ICHxw	Suitable	
IDFvk	ICHxw	Suitable	

Area available to seedlot: 3,010,102 Ha.

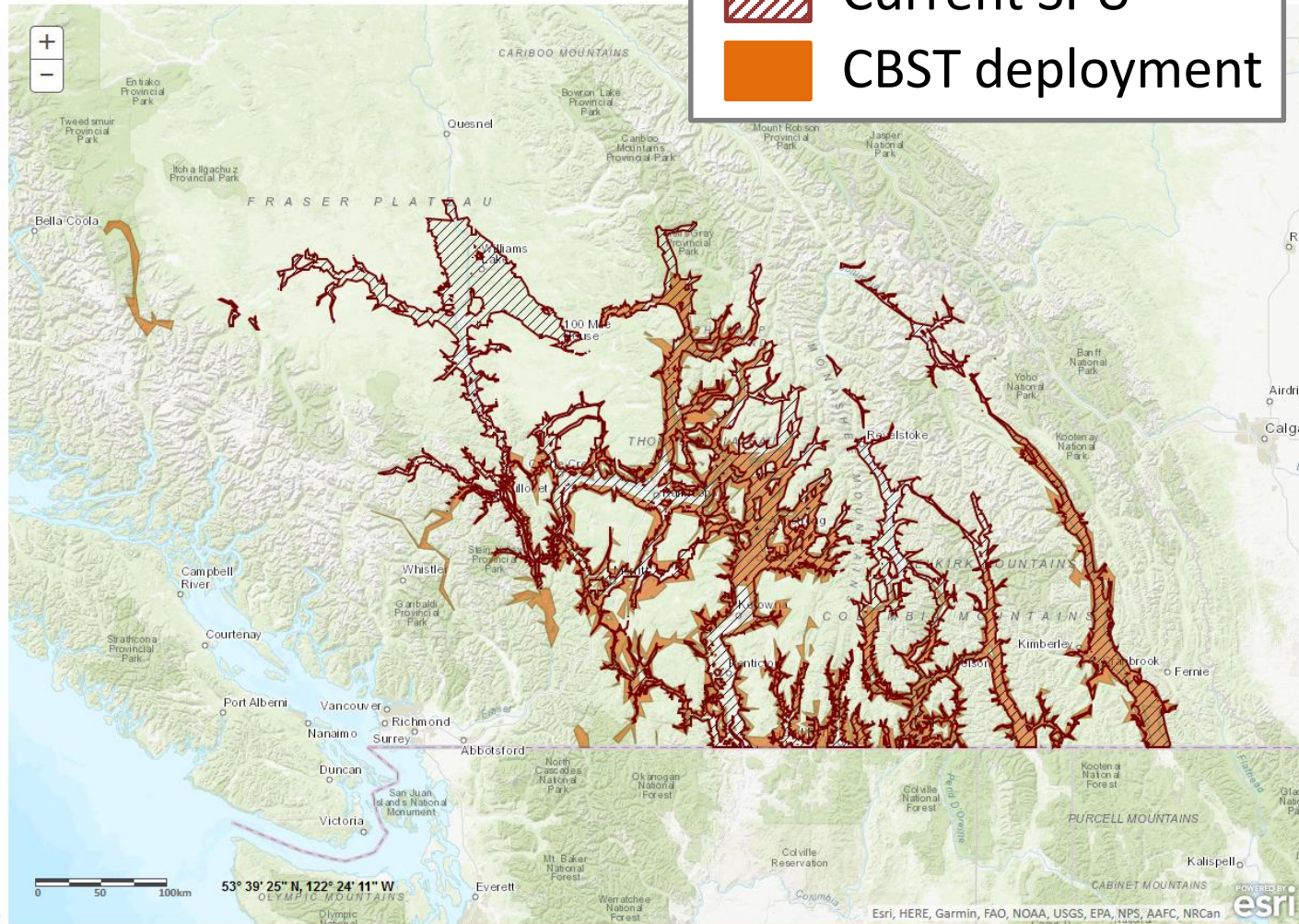
* The selected species may not be suitable in this plantation BEC variant. Please check the Reference Guide for Species Selection



Current SPU

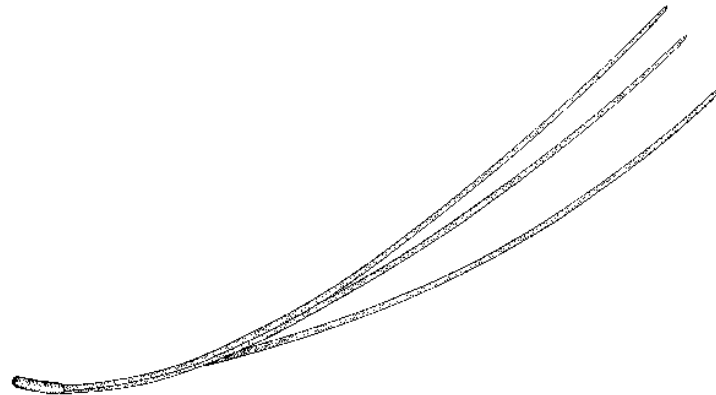


CBST deployment



Moving Forward

- Collect seed & scion
 - BC plus trees
 - USDA Forest Service
- Assess drought tolerance for families collected from parents at Bailey

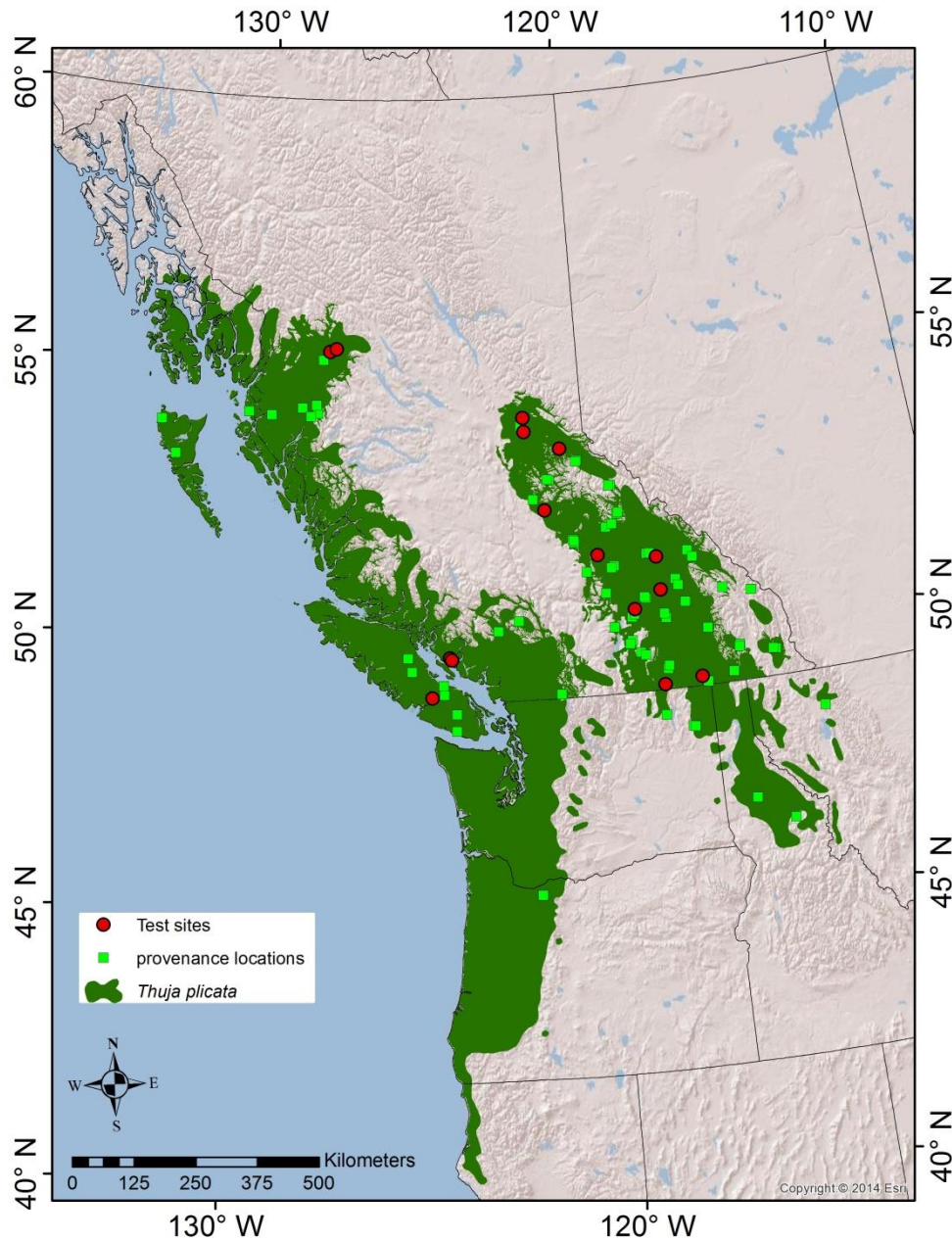


Ponderosa Pine

A Breeding Plan for Interior Cw (*Thuja plicata*)



Cwi Provenance Tests



Barnes Creek Clonebank

- 60 provenances
- Approx. 10 parents per provenance
 - 516 parents
 - 1 - 4 copies each
- Collect OP seed
- Apply GA?



Questions?

