

# Assisted Migration

## BULLETIN

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## Assisted Migration Adaptation Trial (AMAT)

### Background

Approximately 300 million tree seedlings are planted in the western USA, British Columbia (BC) and Yukon each year. Many climatologists are predicting that the climate could be 3–4°C warmer when those trees are harvested 60-80 years after planting. These changes to climate will expose trees to increased stress and health risks, compromising the many goods and services from our forests. Consequently, BC Forest Service researchers, with the assistance of the USDA Forest Service and industry, have initiated a large, long-term climate change research study – the Assisted Migration Adaptation Trial (AMAT) – to better understand tree species climate tolerances.

### Objective

The AMAT seeks to better understand the growth and health of reforestation seed sources from BC and north-western United States when planted across a range of climates and latitudes. This information will be used to identify species and seed sources best adapted to future climates of planting sites, in order to maintain healthy productive plantations.

### Experimental materials and test sites

Forty-eight seed sources from 15 tree species originating from BC and the north-west states will be tested at 48 field test locations between central Yukon and northern California.



Fifteen tree species being tested in the AMAT

Sub-alpine fir – *Abies lasiocarpa*  
Amabilis fir – *Abies amabilis*  
Grand fir – *Abies grandis*  
Western redcedar – *Thuja plicata*  
Yellow cypress – *Callitropsis nootkatensis*  
Western hemlock – *Tsuga heterophylla*  
Trembling aspen – *Populus tremuloides*  
Paper birch – *Betula papyrifera*  
Sitka spruce – *Picea sitchensis*  
Interior spruce – *Picea glauca* × *P. engelmannii*  
Western larch – *Larix occidentalis*  
Douglas-fir – *Pseudotsuga menziesii*  
Lodgepole pine – *Pinus contorta*  
Western white pine – *Pinus monticola*  
Ponderosa pine – *Pinus ponderosa*

## Design

Thirty-two seed sources will be planted at each test site in a Randomized Complete Block Design containing four blocks. Within each block, each seed source will be represented by 25 trees planted in a 5 × 5-tree square plot at a spacing of 2.5 m. Stakes identify the centre tree of each plot, and labels on the stakes identify the seedlot.

## Methods

Twelve test sites will be established each year for four years, beginning in 2009. Growth and health of each seed source at each site will be assessed every five years. Response functions will be developed relating growth and health to the climate and latitude of the sites in which each seed source is tested. These relationships will enable the growth and health of each seed source to be predicted in any current or future climate or latitude.

## Funding and technical assistance

- BC Ministry of Forests, Lands and Natural Resource Operations
- BC Forest Genetics Council

## AMAT Collaborators

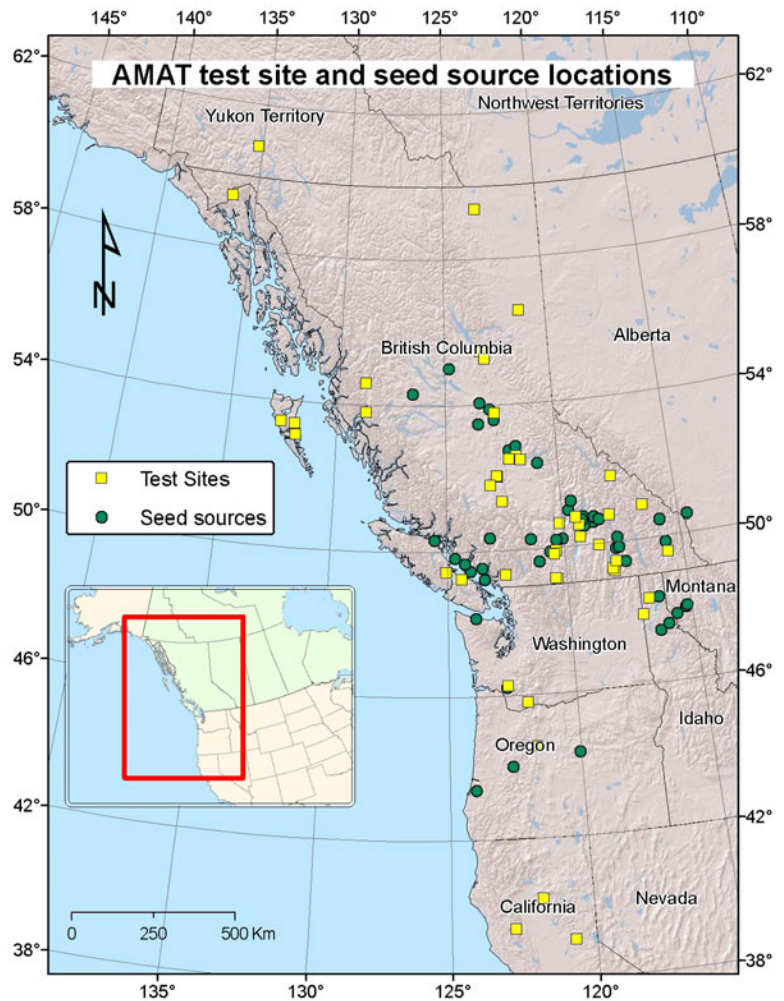
Ardeu Wood Products Inc.  
 ATCO Wood Products  
 BC Timber Sales  
 Brinkman Forest Ltd.  
 Council of the Haida Nation  
 Inland Empire Paper Company  
 Inland Empire Tree Improvement Cooperative  
 Island Timberland LP  
 Landmark Forest Management  
 Louisiana-Pacific Corporation  
 Sierra-Pacific Industries  
 State of Alaska, Dept Nat Resources  
 Stella-Jones Inc.  
 Taan Forest Ltd.  
 Tecfor Resources Ltd.

Teal-Jones Group  
 Tembec Inc.  
 Tolko Industries  
 UBC Alex Fraser Research Forest  
 UBC Malcolm Knapp Research Forest  
 USDA FS - Deschutes National Forest  
 USDA FS - Gifford Pinchot Nat For/PNW Res Stn  
 USDA FS - Mendocina National Forest  
 USDA FS - Priest River Exp Stn/RM Res Stn  
 USDA FS - Tahoe National Forest  
 West Fraser Timber Company  
 Weyerhaeuser Canada  
 Weyerhaeuser USA  
 Yukon Department of Energy, Mines and Resources

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For more information, see: <http://www.for.gov.bc.ca/hre/for/gen/interior/AMAT.htm>



Locations of AMAT seed source origins and test sites. Final eight test sites will be determined in summer 2011.