

Species at Risk Implementation Report

Limber and Whitebark Pine Recovery Implementation 2022

Background

Whitebark pine and limber pine are endangered species in Alberta. Whitebark pine is endangered under the federal *Species at Risk Act* and limber pine is recommended for federal endangered listing. The main threat to both species is the introduced pathogen causing the fatal disease white pine blister rust (*Cronartium ribicola*). Threats interact and also include mountain pine beetle, changes in fire regimes outside the natural range of variation, human impacts and climate change.

Whitebark and limber pine trees grow very slowly, requiring a long-term commitment for recovery. For details, see the [Alberta Whitebark Pine and Limber Pine Recovery Plan](#). Actions include: identifying a genetically diverse base of disease resistant trees (plus trees) that are adapted to each restoration region, collecting seeds, testing the parent trees for genetic disease resistance, propagating and planting enough resistant seedlings to restore connected populations across the range, restoring habitat through treatments, and monitoring performance and trends. Baseline data collection is crucial to document the status and trends of whitebark pine and limber pine. Ongoing monitoring will show the effectiveness of these actions over time.



2022 Recovery implementation activities

Rust-resistant trees for genetic conservation and to produce seed for restoration

- Surveyed the health of 114 plus trees identified in previous years (80 limber, 34 whitebark).
- Collected and processed cones to extract seeds from one limber pine and 30 whitebark pine trees, mostly from Willmore Wilderness Park, yielding over 8 kg or nearly 105,000 seeds. Seeds from 29 trees were sent for non-destructive X-ray viability assessments.
- 13 high-value sites (research plots, plus trees) in high-hazard area were protected against mountain pine beetle based on 2021 overwinter survival surveys. Additional sites were identified for mountain pine beetle control actions and plus tree risk assessment.
- Inoculated seedlings from 15 limber and one whitebark pine plus trees for disease-resistance screening.
- Sent seeds from four limber pine plus trees for genomics studies of resistance screenings.
- Planted 10,735 seedlings (6509 whitebark pine, 4226 limber pine) plus tree seedlings in four restoration sites in high-priority habitat, restoring nearly 13 hectares.
- Established survival and health monitoring plots for every parent tree in each restoration planting site and monitored sites planted in previous years.
- With Parks Canada and B.C. Ministry of Forests, Forest Improvement and Research Management Branch, planted 144 rust-resistant limber pine grafts to expand the limber pine seed orchard and 51 grafts in the limber pine clone bank.
- Supported establishment of a second rust-resistant whitebark pine seed orchard in B.C. and evaluated additional candidate orchard locations.

Information sharing on high-value trees and stands

- Engaged with other partners in the Canadian Whitebark and Limber Pine Seed Orchard Working Group, a multijurisdictional collaboration to establish seed orchards and clone banks of rust-resistant whitebark and limber pine to maximize seed supply of well-adapted material to support recovery efforts in Canada.
- Provided information to the B.C. 5-Needle Pine Working Group about Alberta program status.
- National informal recovery team participant setting and reviewing goals, objectives, targets, and status criteria; and tracking progress.
- Annual program reporting of field data related to stands, trees, surveys, collections, projects, grafts and screening.
- Provided referral reviews for diverse proposed projects overlapping whitebark and limber pine habitat to identify high-value trees and sites, and shared information on high-value elements and best practices so project options could be developed to avoid, minimize and mitigate impacts.
- Best management practices and one-page fact sheets for Alberta were posted on the [Whitebark Pine Ecosystem Foundation of Canada](#) website.
- Better mapping of whitebark pine and limber pine.
- Measured live mature pine basal area data in several additional plots in the Ghost watershed to better characterize habitat in Alberta.

Other habitat restoration

- Remeasured a replicated whitebark pine thinning treatment trial from 2018.
- Together with B.C., helicopter surveying and field work to validate the Crown of the Continent Ecosystem (CCE) implementation plan elements such as core habitat and priority restoration sites and activities. Working toward completing the CCE implementation plan.
- Planning to support the CCE restoration planning model revision and expansion to the rest of the Alberta range of both species, to follow with validation and implementation planning for an expanded area.
- Assessed seed inventory and seedling planning needs until 2027 and identified candidate restoration areas.
- Adaptive management: re-assessed restoration site criteria considering climate change and planting monitoring results.

Recovery plan extension and priorities

- A new [recovery plan for both species](#) is published.
- Presented information and data on Alberta's recovery program at cross-jurisdictional, provincial and regional workshops, webinars and meetings.
- Published several papers highlighting Alberta's research and recovery in peer-reviewed journals and conference proceedings.
- Shared information on provincial recovery efforts and conservation status at various workshops, meetings and other forums with landowners, stewardship enthusiasts, NGOs and resource professionals.
- Installed permanent signage on the limber pine recovery program at the Burmis Tree pullout.

Table 1: Summary of recovery actions to date

| Year | New plus trees identified | Plus trees health & cones monitoring | High-value sites protected from MPB | Trees sent for genetic screening* | Plus trees with seed collection | Seedlings planted from plus trees | Hectares restored-planting |
|--------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------------|---------------------------------|-----------------------------------|----------------------------|
| 2022 | 0 | 114 | 13 | 0 | 31 | 10,735 | 18.4 |
| 2021 | 1 | 171 | 13 | 2 | 63 | 7,150 | 12.7 |
| 2020 | 0 | 173 | 13 | 0 | 8 | 6,000 | 23.5 |
| 2019 | 0 | 0 | 0 | 16 | 0 | 7,200 | 36 |
| 2018 | 0 | 187 | 0 | 21 | 113 | 1,100 | 12.3 |
| 2017 | 94 | 0 | 0 | 57 | 0 | 0 | 0 |
| 2016 | 98 | 0 | 0 | 58 | 0 | 0 | 0 |
| 2015 | 84 | 0 | 0 | 56 | 0 | 0 | 0 |
| Pre-2015 | 0 | 0 | 0 | 10 [^] | 0 | 0 | 0 |
| Total | 277 | 645 | 39 | 210 | 215 | 32,185 | 102.9 |

*includes some trees sent for re-testing due to low sample size

[^]not from plus trees

Acknowledgements and partnerships

Provincial recovery plans for whitebark pine and limber pine cover a large area that crosses jurisdictions. Collaboration and partnerships are required for success. Alberta Environment and Protected Areas is the primary responsible agency in the province as species at risk in Alberta are listed under the *Wildlife Act*. Location records are stored in [ACIMS: Alberta Conservation and Information Management System](#).

Provincial recovery implementation is co-led by Alberta Environment and Protected Areas and the Whitebark Pine Ecosystem Foundation of Canada.

Most of the ranges of these species in Alberta falls within the Rocky Mountain National Parks. Under the federal *Species at Risk Act*, a [draft federal whitebark pine recovery strategy is available](#). Limber pine and whitebark pine are both assessed as federally Endangered. Recovery partners have developed recovery goals, objectives and strategies together to align best practices.

Photos supplied by Jodie Krakowski

Academic institutions, government agencies, and non-governmental organizations have collaborated to address identified research gaps. Partners to date include:

- Government of Alberta: [Forestry and Parks](#); [Environment and Protected Areas](#)
- Government of British Columbia: [B.C. Ministry of Forests](#); [B.C. Ministry of Water, Land and Resource Stewardship](#), [B.C. Parks](#)
- Government of Canada: [Parks Canada Agency](#) (Rocky Mountain National Parks); [Natural Resources Canada-Canadian Forest Service](#) (Pacific, Laurentian and Atlantic Forestry Centres), [Environment and Climate Change Canada](#) – Canadian Wildlife Service
- United States Government: [U.S. Department of Agriculture Forest Service-Dorena Genetic Resource Center](#), [Coeur D'Alene Forest Nursery](#), [Rocky Mountain Research Station](#), Intermountain Research Station
- Industry: [Spray Lake Sawmills](#) and Crowsnest Forest Products, Moody Tree, [Teck Resources Ltd.](#), [Canfor](#), [Yellow Point Propagation](#), [Castle Ski Resort](#)
- Non-governmental organizations: [Whitebark Pine Ecosystem Foundation of Canada](#) is a non-profit agency that can leverage funding, provide volunteers and connect partners to enable sharing of information and work on projects related to the recovery plan. Other organizations instrumental in endangered pine recovery include: [Whitebark Pine Ecosystem Foundation \(U.S.\)](#), [Nature Conservancy of Canada](#); [Crown Managers Partnership High-5 working group](#); [Oldman Watershed Council](#); [Alberta Invasive Species Council](#), [American Forests](#), [Waterton Biosphere Reserve Association](#), [Columbia Basin Trust](#), [Canada Wildfire](#), [Forest Genetics Council of B.C.](#)
- Academia: Kings University College; Montana State University; University of Alberta; University of British Columbia; University of Calgary; University of Northern British Columbia; University of Victoria
- Generous permission has been granted to access land with endangered pines for surveys and material collection by Stoney Nakoda Nation, Piikani Nation and many private landowners in Alberta, as well as many Indigenous Nations in B.C. We are grateful for their collaboration