Health and Regeneration of Whitebark Pine in Alberta

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Whitebark Pine Ecosystem Foundation
Kimberley, BC
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Whitebark Pine

Figure 1. The continental distribution of whitebark pine. Adapted from U.S. Geological Survey (1999).
Whitebark and Limber Pine

• General separation of range
• Whitebark
  • high elevations
  • majority in protected areas
  • listed provincially and federally
• Limber
  • lower elevations
  • majority outside of protected areas
  • listed provincially
Inventory

• Efforts increased 2005 on
• Fixed and rotary wing and ground surveys
• Support research—predictive modelling
• More whitebark than thought
• Completing inventory one of priorities of recovery plan
Monitoring health

• Documenting and monitoring health transects critical for listing
• Data from Parks Canada led to provincial and federal listings
• Whitebark Pine Ecosystem Foundation protocols used
• Parks Canada information supplemented with Alberta Parks and SRD transects established 2005 on
• Reassessments of Alberta Parks sites underway
Assessing health

• Alberta Parks:
  – 38 health transects established in whitebark
  – 8 in limber pine stands across latitudinal gradient

• Parks Canada:
  – 115 whitebark pine transects between international border and McBride, BC
  – 85 limber pine, including 2 in BC, with Canadian Forest Service (CFS)
Health Transects
Whitebark Pine and Limber Pine
mean infection level -- 41.3%
mean mortality level is 22.1% (Achuff and Wilson 2009).
Willmore Wilderness
• 4,597 square kilometres
• second largest park in the Alberta parks system
• Some of the healthiest whitebark in the province
• Large, cone-bearing trees
• Climax stands
Managing for many endangered species: a park managers dilemma

• Park management not straightforward
  • Wildlife—Fish and Wildlife, ESRD
  • Forests—Forestry, ESRD
  • Parks—habitat and the rest

• Pressure to burn
• Willmore has some of the ‘healthiest populations’ of several listed species
• How do we ensure that management of one endangered species does not negatively impact another?
Regeneration Sites

• What characterizes regeneration sites in the context of the northern Alberta Rockies?
• What role does fire play?
• How does this relate to defining ‘critical’ habitat?
The Research

• Objectives:
  • document the regeneration niche of whitebark pine in the northern Rockies
  • Regeneration densities, health, population age structure in relation to microsite conditions

• Results will inform site level planning as well as recovery planning for the species
Methods

• Paired plot design to compare microsites with seedlings vs. those without
  • microsite
    • Substrate
    • Litter depth
    • Organic matter depth
    • Vegetation cover
  • mesosite
    • pH
    • Slope
    • Aspect
    • Elevation
    • Moisture regime
    • Nutrient regime

• Seedlings
  • Height
  • Number
  • age
• Regeneration within stands and openings within 300 m
Regeneration (preliminary results)

• Representation of single ‘seedlings’ and clumps in all mesosites
• ‘Seedlings’ in forested sites appear to be older than those in adjacent openings
• ‘Seedlings’ within opening appear to be same age and ‘seedlings’ of openings in close proximity to each other appear to be of same age
• Density of ‘seedlings’ same in openings vs. forested stands for some sites; density in openings much higher in others
Regeneration

• How does observed pattern relate to masting events?
• How does observed pattern relate to cone phenology and seed viability patterns noted in Willmore?
0 seedlings
0 seedlings
Stem

Branch

Increase (%) of active and inactive cankers by site, Willmore, 2006-2012
Management

• Site level
  • Management plans for Parks
• Species level
  • Recovery plans
Communication Items

Whitebark and Limber Pine

*Pinus albicaulis* and *Picea glauca*

**STATUS**

The decline of whitebark and limber pines within their natural range is due to the combination of climate change and insects, and demonstrates the importance of maintaining and protecting these species. The species are at risk due to changes in their habitat and the expansion of their range into areas where they have previously been absent.

**Species at Risk**

*Alberta's*

Whitebark Pine

Limber Pine

Government of Alberta
Interpretive Programming

- Public amphitheatre talks
- Guided hikes
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