Challenges of Ecosystem Restoration in Ponderosa Pine Okanagan Valley, British Columbia

White Lake Grasslands Protected Area, BC Parks

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Photo by Daryl Stepaniuk
Relevance

- Restore ecological resilience for healthier ecosystems that can withstand pests and disease

- Apply restoration techniques and management guidelines:
  - Re-create pre-fire suppression native plant communities
  - Control and manage of invasive species

- Implement ecosystem restoration projects:
  - Define restoration challenges (changing)
  - Set restoration priorities
  - Develop goals and objectives
  - Develop detailed plans

Photo by Judy Millar
The Goal

Ecosystem

- Very hot and dry grasslands, open pine forests and associated alkali ponds, riparian areas, rock outcroppings and associated wildlife habitats
- One of the four most endangered ecosystems in Canada

Restore ecological resilience for healthier ecosystems

Photo by Rose Gunoff
Restoration Challenges

- Restore the natural ecosystem structure, function, composition and dynamics
- Restore ecosystem resilience
- Reduce fuel build-up, encroachment & infilling
- High Risk Urban Interface
- Species/Ecosystem at Risk (Antelope Bruch and WHWO)
- Improve management techniques
- Limited staff time and funding

New Challenges

- Px fire - IP's and WPB

Sulphur cinquefoil direct competition with native grasses

Western pine beetle

Photo by Judy Millar
Establishing Priorities
Species and Ecosystems at Risk

- WLGPA - 20% is grassland 0.4% is antelope-brush (Red-listed; globally imperilled)

88 provincially listed Species at Risk

- Antelope-brush (*Purshia tridentata*) Plant Community
- Bighorn Sheep
- Western Rattlesnake
- Showy Phlox

Photos: MOE
Establishing Priorities

White-headed Woodpecker

Provincially “Red-listed” & Federally Endangered

- Small population size
- Restricted range
- Dependency on Py seeds
- Loss and degradation of habitat
- Breed only in the south Okanagan

Two critical needs for White-headed Woodpeckers in the South Okanagan are a good food source and ‘snags’ for nesting sites;

Px fire challenge of protecting old ‘snags’
Fuel reduction is a priority and required to decrease the risk of wildfire near communities and to prevent damage to ecosystems from high intensity wildfires.
New Challenges
Western Pine Beetle
(*Dendroctonus brevicomis*)

- Can attack and kill Py trees of all ages and vigor
- Breed in and kill mature, diseased or drought stressed OR trees impacted by lightning, fire or mechanical injury
- Disrupt management planning and operations, and increase forest fire danger by adding to available fuels
- 135 ponderosa pine trees infested with bark beetles

(Clarance J. DeMars, Jr., and Bruce H. Roettgering, USFS)
Thinning of dense, 70- to 80-year-old trees is an effective silvicultural method to reduce stocking to ~50%.
Reduces competition among the remaining trees, improve their vigor, and make them less prone to successful bark beetle attack.
Sulphur cinquefoil
(Potentilla recta)

- Common in southern BC
- Adapted to a wide range of soils and climates
- Does not need disturbed soils
- Very competitive
- Unpalatable to grazing animals
- Long growing season
- Effectively dispersed by birds, animals and livestock
- Also spread by its roots

Monoculture-forming a dense cover, limiting the regeneration of native plants.

Photo by Judy Millar
White Lake Grasslands Location

Map

White Lake Grasslands Protected Area, BC

Vancouver

Okanagan Valley

Vancouver Island

Washington

Idaho

Alberta

"Columbia Basin - Shrub-Steppe" - Hot, Dry Ecosystems

Ecologically linked to the Sonoran, Mojave, and Chihuahua Deserts further to the south
White Lake Grassland Protected Area (3700 ha.) 20 kms southwest of Penticton

Ponderosa Pine biogeoclimatic zone (PPxh1); very hot, xeric (dry)

Photo by Judy Millar
Implementation - Thinning

- Cut over-mature Saskatoon to <1m and burn
- Cut immature trees <20 cm DBH
- Retain large Py trees and snags >20 cm
- Cut, pile and burn dense Py and Df

Photo by Judy Millar
Remove all trees <20cm dbh to reduce the fire hazard along the access road/trail within 30 m.

Produce open habitats (i.e. 20-50% canopy closure)

All material chipped 30m x 2 for 1km. $10K

Photo by Rose Gunoff
Monitoring

- 75 monitoring plots
- 100 m apart on a grid pattern

Data collected:

- UTM coordinates/photos
- Tree, shrub, herb spp. and % cover
- Species & # of trees in diameter classes: <1 cm; 1-10 cm; 10-20 cm; and >20 cm
- DBH of trees greater than 20 cm
- Fuel depth
- % cover of coarse woody debris
- Weed species and number of stems

BC Parks Photo
COST

- 2001 - Restoration Plan (CWS ~$5K)
- 2004/05 - Planning/Prescriptions ($20K)
- 2005-07 - Thinning ($100K)
- 2005 - Fuel hazard Assessments - Interface ($5K)
- 2005 - Access Road/Trail (Fire Smart) - ($10K)
- 2005/06 IP treatments/inventory ($7K)
- 2007 - Beetle Survey (MOFR ~ $5K)
- 2007 - Green Attack Cut and Burn ($15K)

Total of Project to date - $167K
Outcomes

Thinning

- Significant reduction in fuel loads
- Decrease the number of stems per hectare; open parkland-like habitat with scattered mature trees and snags
- Significant improvement in the habitat WHWO; increased cone production and improvement to habitats for other species of concern including bats and Mule Deer
- Prepared the site for Px Fire

Photo by Judy Millar
Final Challenge – Prescribed Fire

Invasive plants
WBP attracted to stressed Py
Burning in the interface

Photo Crystal Klym
The End

Cathedral Provincial Park

Photos by Judy Millar