

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

**White Lake Grasslands
Protected Area, BC Parks**

Judy Millar, RPBio

**Workshop on Ecological Restoration Best Practices in Protected
Natural Areas, Waterton, Alberta, October 3, 2007**

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

Restore ecological resilience for healthier ecosystems

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

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

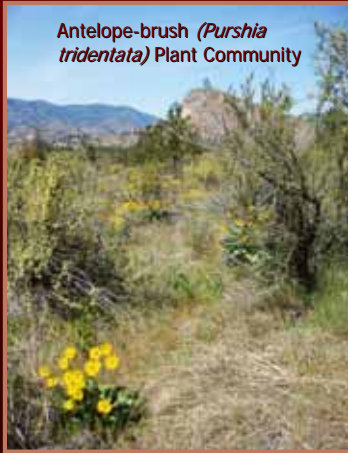
Photo
by Judy
Millar

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



Western
Rattlesnake

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

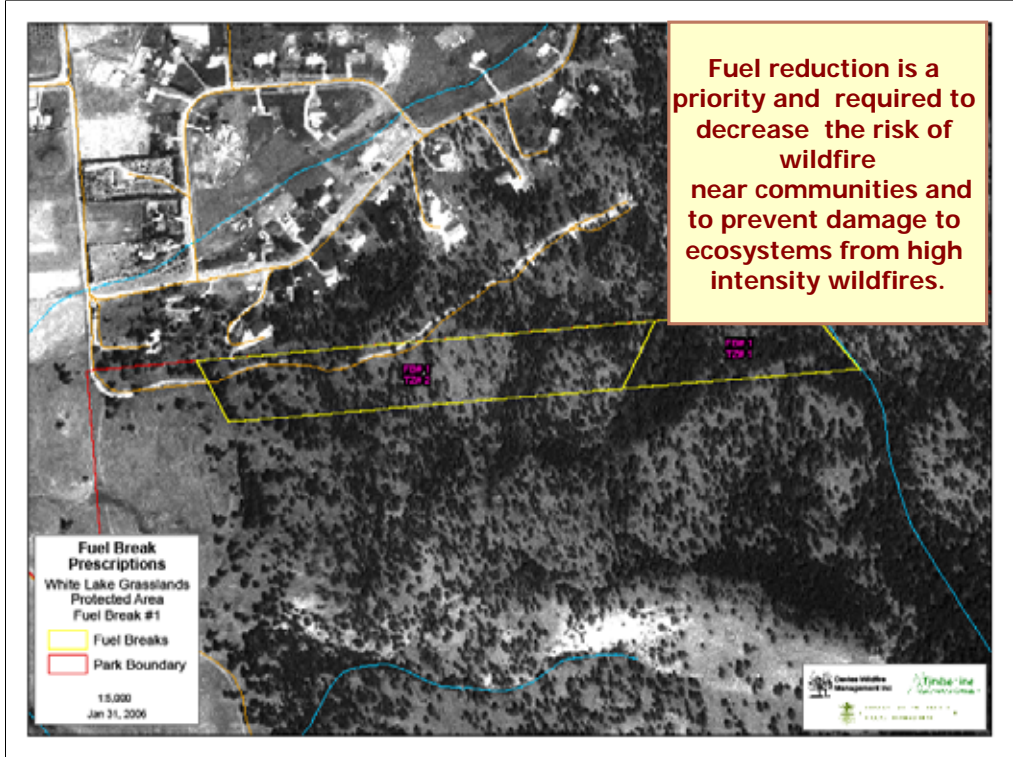
❑ Two critical needs for White-headed Woodpeckers in the South Okanagan are a good food source and 'snags' for nesting sites;

❑ Px fire challenge of protecting old 'snags'



Photos by Judy Millar, Crystal Klym & MOE





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



(Clarence J. DeMars, Jr., and Bruce H. Roettgering, USFS)



**Western Pine Beetle
Cut, pile and burn**

Photo Mark Weston

**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

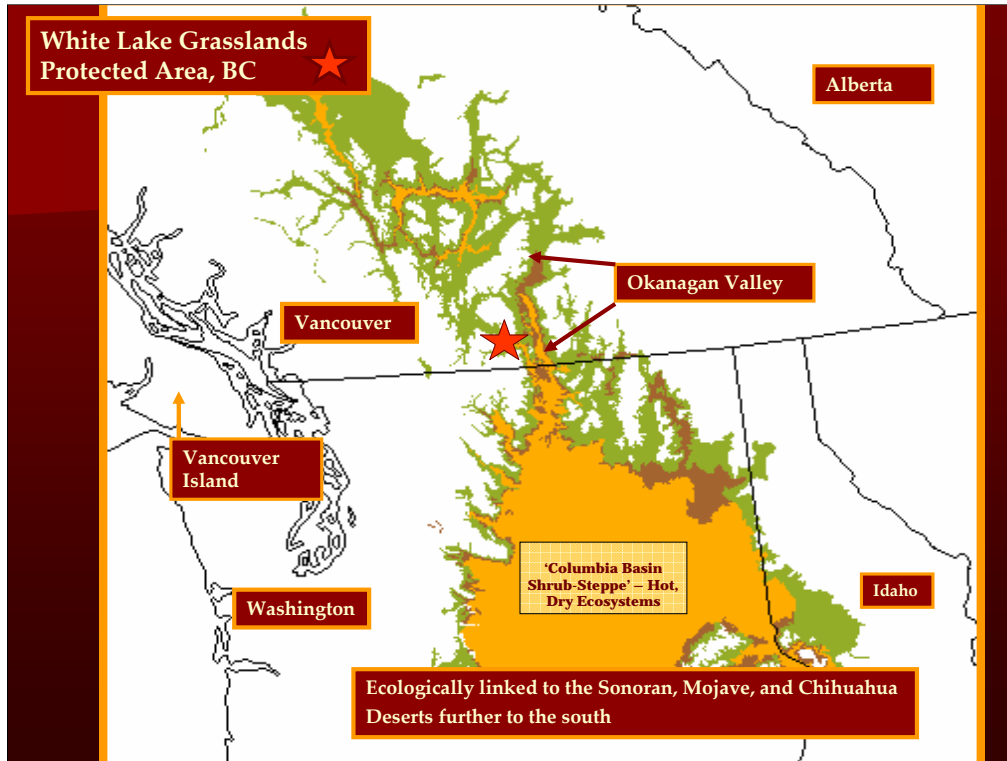
(Potentilla recta)

- 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

Photo by Judy Millar

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





White Lake Grassland Protected Area (3700 ha.) 20 kms southwest of Penticton

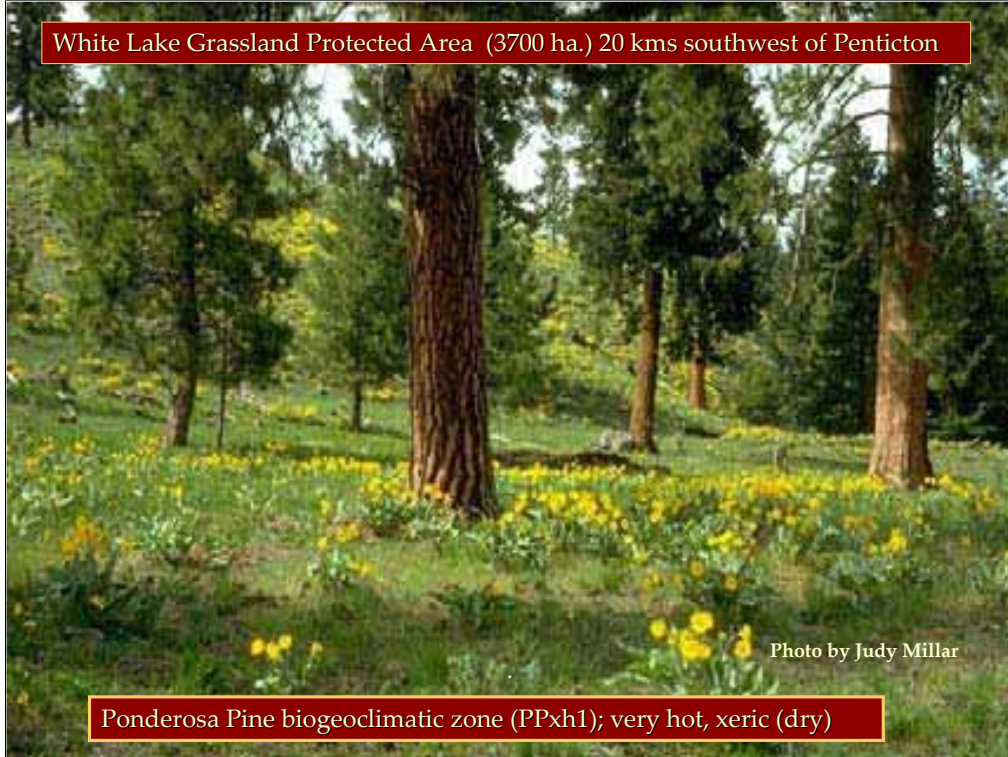
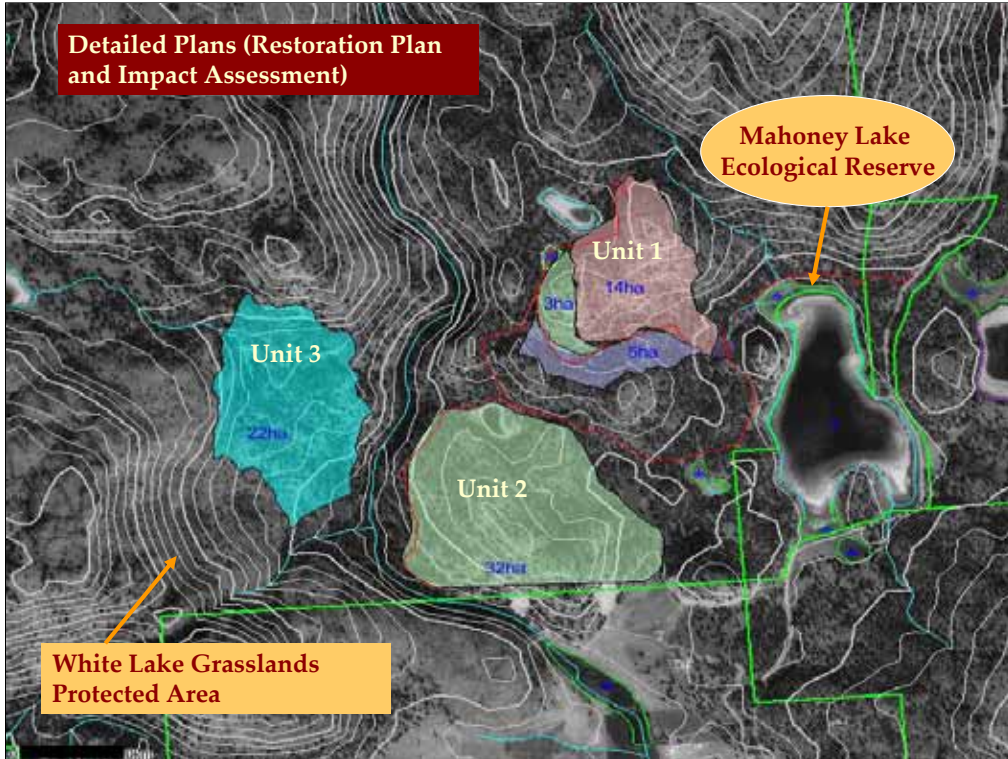


Photo by Judy Millar

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



Implementation - Thinning

Cut over-mature Saskatoon
To <1m and burn

Cut, pile and burn
dense Py and Df

Cut immature trees
<20 cm DBH

Retain large Py trees
and snags >20 cm

Photo by Judy Millar





All material chipped
30m x2 for 1km.
\$10K

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)

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: <1cm; 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

Photo by Judy Millar

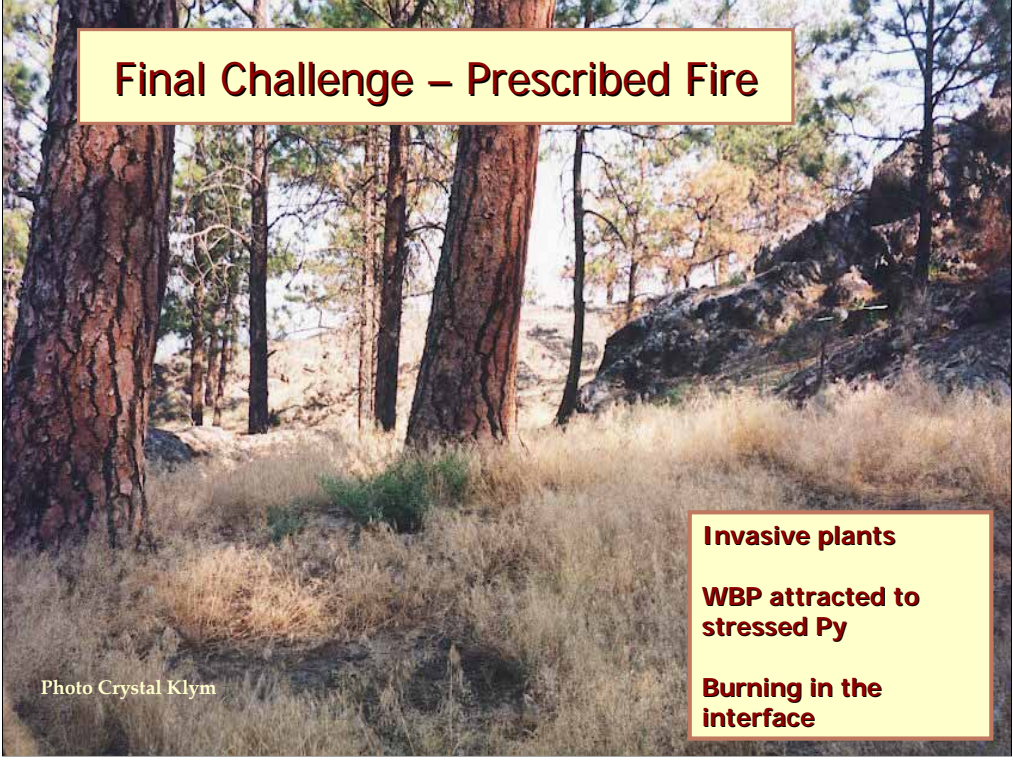
Outcomes

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

Photo Crystal Klym

Invasive plants

WBP attracted to stressed Py

Burning in the interface

