Management of a Northern Reclamation Project:

Restoration and Maintenance of Fescue Grasslands
Prince Albert National Park

2012 Native Prairie Restoration/Reclamation Workshop:
Bridging the Gap
February 9th, 2012
Plains Rough Fescue (*Festuca hallii*)
Grasslands in Saskatchewan

- Part of the aspen parkland eco-region
- Historic extent 255,000 ha
- A dynamic mix of fescue grasslands and aspen groves
- Evolved within a fire and grazing disturbance regime
- Floristically diverse community

(Gerry and Anderson, 2002)
Current Distribution in Saskatchewan

- ~5% of the historic grassland remains in Saskatchewan
- 85% of the remaining patches are less than 65 ha in size
  - Small and highly fragmented
- Ongoing threats to fescue grasslands:
  - Settlement
  - Cultivation
  - Lack of fire disturbance
    - Encroachment of aspen
  - Invasive non-native plants
  - Overgrazing
  - Reduction in species richness and genetic isolation of remnant patches

(Gerry and Anderson, 2002)
Fescue Grasslands in Prince Albert National Park:

- Northern outliers of contiguous aspen parkland eco-region

- Ongoing threats to fescue grasslands in PANP:
  - Lack of fire disturbance
    - Encroachment of aspen
  - Small and highly fragmented
    - Genetic isolation
    - Reduction in species richness
    - Potential for local extinctions
  - Invasive non-native plants
    - Disturbed sites
    - Trails and roadways
  - Lack of public understanding of the dynamic nature of native grasslands
Fescue Grasslands in PANP:

Map shows the location of the 18 largest (12-115 ha) grasslands. Many smaller patches are located in this area.
Fescue Grasslands in PANP:

- Approximately 67% of the fescue grassland in PANP was overgrown by aspen forest from 1947 to 1995
- 1968 extent ~670 ha
- 2012 extent unknown
- Currently:
  - Only “Core” grasslands remain
  - “Seral” grassland support mature forest (>50 years)

<table>
<thead>
<tr>
<th>Name of Meadow</th>
<th>1947 area (ha)</th>
<th>1995 area (ha)</th>
<th>Decrease in area (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jonasson’s Flats</td>
<td>95.0</td>
<td>40.6</td>
<td>57%</td>
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<tr>
<td>Twelve Mile Meadow</td>
<td>9.5</td>
<td>5.4</td>
<td>43%</td>
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<tr>
<td>Wasstrom’s Flats</td>
<td>239.5</td>
<td>46.2</td>
<td>80%</td>
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<tr>
<td>South End Meadow</td>
<td>79.9</td>
<td>16.0</td>
<td>80%</td>
</tr>
<tr>
<td>Sugar Creek Meadows</td>
<td>88.5</td>
<td>20.1</td>
<td>77%</td>
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<tr>
<td><strong>Average decrease (%)</strong></td>
<td><strong>67.4%</strong></td>
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PANP - Restore and Maintain Fescue Grasslands

• Fescue Grassland Management Plan for Prince Albert National Park

Actions:
• Re-introduce a representative fire regime to the area known to support fescue grasslands – 40 year fire cycle
• By 2025, restore select fescue grasslands to between 50 and 100% of their 1947 distribution
• Reclamation of disturbed sites within fescue grasslands
• Invasive non-native plant species control
• Increase public awareness, understanding and appreciation of fescue grasslands
Restoration of Disturbed Sites Within Fescue Grasslands of PANP

- Gravel pits are located in 12 Mile and South End grasslands
- No rehabilitation efforts have been made since extraction activities ceased in 1977
- Areas are now:
  - Sparsely vegetated with large patches of bare ground
  - Support non-native plant species
  - Negatively impact the public perception of natural areas
12 Mile Meadow Restoration

- Restoration plan was completed in 2010
- Area: 0.75 ha
- Goals:
  - Remove the steep slopes and remaining topographic features
  - Eliminate non-native plant species and the potential for them to spread into the surrounding area
  - Restore native vegetation
  - Involvement of volunteers to engage the public and to create awareness of native prairie conservation
Baseline monitoring

- Establish restoration perimeter
- Monitoring grid
- Inventory of non-native plant species
- % cover of bare soil
- Slope and aspect
- Overburden and capping material
12 Mile Meadow Restoration - 2010

• Initial Non-native species control:
  – Identify species present
    • Smooth Brome
    • Yellow Toadflax
    • Kentucky Bluegrass
  – Application of Glyphosate in July 2010
    • Spray at 5% concentration throughout the pit
    • Wick at 20% concentration along edge and roadway
Grading/Capping of Restoration Site:

• Grading to reduce slopes
  – Goal is to achieve slopes < 25%

• Cap site with overburden

• Occurred September 2010
  – Vegetation on overburden site was felled and mulched
  – Woodchips and stumps used as fill
  – Excavator and dozer to remove steep slopes and push overburden
  – Grader used to contour the restoration area
Native Seed Collection:

• Hand held seed harvester
  – Collection of local grass and forb seed from grasslands within the park
  – Seed collected over several weeks
  – ~30 kg of seed collected
  – Dried, sieved through screens, cold storage

• Selective hand picking of fescue seed
  – Ensure of pure fescue seed
  – ~0.45 kg of seed collected
  – Contracted to greenhouse for storage
Seeding June 13-17th:

- Area harrowed
- Broadcast seeding of native seed and chaff
- Planting of fescue plugs
  - 8000 plugs grown (PRT Prince Albert)
  - 1 plug/m²
- Additional seeding Oct 18th
  - Aid in native plant establishment
  - Compete against non-native species
  - Reduce amount of bare ground
Volunteer Projects
- Fescue plugs grown in offices of park staff
- Northlands College students involvement

Irrigation
- Use of fire pumps, hoses, and sprinklers
- Water drawn from adjacent beaver pond

Electric fence
- Used to persuade wildlife to avoid area
Monitoring:

- The average slope is now 3.8%
- Topsoil has average depth of 17.5 cm
- Germination rates for native seed was low
  - Need higher amounts of clean seed
- Plug establishment was high
  - Will monitor in spring 2012 for overwinter success
- Vast improvement in the overall condition of the area
  - Contoured gentle slopes
  - Area capped with local topsoil
  - Establishment of native grasses and forbs
12 Mile Meadow Restoration
Non-Native Vegetation

• Improvement in distribution
  – 15% decrease in the amount of monitoring plots with non-natives found

• Increase in non-native species present
  – 4 species identified

• Control Methods
  – Chemical control
  – Mowing
  – Seeding of native species
12 Mile Meadow Restoration
Non-Native Vegetation

Percentage of Plots Containing Non-Native Species

- Pigweed
- Dandelion
- Red Clover
- White Sweet Clover
- Black Medic
- Canada Thistle
- Alsike Clover
- Sow Thistle
- Chickweed
- Alfalfa
- Green Foxtail

Presence of Non-native Species
12 Mile Meadow Restoration
Discussion

Trials and tribulations:

• Logistics of getting to the remote location – travel time
• Adverse weather conditions
• Trail conditions
• Time involved to do workload
• Native seed establishment
  – Seed viability
  – Soil conditions – sandy/gravel
• Dealing with Non-natives
  – Establishment
  – Introduction from equipment and in-fill from other areas
• Patience
12 Mile Meadow Restoration
Moving Forward

- Increase public awareness of the dynamic nature of native grasslands
- Continue with control of non-natives
- Utilise the experience and monitoring of 12 Mile Meadow for future restoration projects
  - Use more native seed
  - Planting methods and equipment
  - Diligence in non-native species control
For more information:

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