Foothills Restoration Forum
and the
Recovery Strategies Project
Promote conservation of Alberta’s native grasslands through:
- information sharing and outreach
- improving reclamation and restoration practices
Annual Outreach Activities

- Fall Information Session – Nov 15, 2018
- Range Health Assessment Training for Reclamation Practitioners – Sept 13, 2018
Foothills Restoration Forum Website

News and Events

Information Portal

- FRF Research Prospectus
- Guidelines and Reference
- Recovery Strategies Manuals
- Research and Technical Reports

www.foothillsrestorationforum.ca
Recovery Strategies for Industrial Development on Native Prairie

Moving from Reclamation to Restoration
It is not clear that current reclamation practices consistently achieve restoration.

Reclamation issues vary with climate, site and plant community

We need to understand what methods have a greater chance of success and create guidance to support them.
The Recovery Strategies Project

Purpose:

- Guidance to promote effective restoration of disturbances.
- Decision making pathways
- Examples of a suitable seed mixes
Process:

- Review existing literature
- Monitor to evaluate performance trends of revegetation strategies
- Link site potential to recovery strategies
- Seek input from grassland stakeholders
Recovery Strategies Manuals
Key Restoration Challenges
– Foothills Fescue Parkland & Montane

Moist, deep, rich soils
Winter thaws
Invasive species
Shortage of suitable materials
Shortage of Plant Materials

- Key species are unavailable as varieties
- Local varieties are unavailable in market volumes
- Substitutions! Supplies of rough fescue seed are limited and particularly prone to substitutions with invasive fescues.
Innovations

• Wild harvested seed
• Native Hay
• Plugs
• Matting
Recovery of Rough Fescue Grassland from Matting versus Topsoil Stripping and Seeding
Recovery of Seeded vs Matted Loamy Range Sites

- Seeded Pipeline RoWs
  - 9 years recovery
- Seeded Wind Farm RoWs
  - 9 years recovery
- Matted Transmission Line Tower Bases and Access
  - 6 years recovery
  - 4 years recovery
# of Range Health Plots for Comparison on Loamy Range Sites

- Seeded Sites – 16 plots
- Matted Sites – 9 plots
- Undisturbed Controls – 16
# Range Health Comparison

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seeded 9 Years Recovery</th>
<th>Matted 4-6 Years Recovery</th>
<th>Undisturbed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range Health Score</td>
<td><strong>53%</strong></td>
<td><strong>58%</strong></td>
<td><strong>71%</strong></td>
</tr>
</tbody>
</table>
Plant community composition and structure scores lower on seeded sites than matted sites

<table>
<thead>
<tr>
<th>Range Health Indicators</th>
<th>Seeded 9 Yrs Recovery</th>
<th>Matted 4-6 Yrs Recovery</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Relative to Control</td>
<td>Score</td>
</tr>
<tr>
<td>Plant community structure</td>
<td>60%</td>
<td>-33%</td>
<td>77%</td>
</tr>
<tr>
<td>Noxious weed cover and distribution</td>
<td>63%</td>
<td>-30%</td>
<td>87%</td>
</tr>
<tr>
<td>Community integrity &amp; ecological status</td>
<td>44%</td>
<td>-19%</td>
<td>56%</td>
</tr>
</tbody>
</table>
Bare soil and litter quantity scores are lower on matted sites than seeded sites.

<table>
<thead>
<tr>
<th>Range Health Indicators</th>
<th>Seeded 9 Yrs Recovery</th>
<th>Matted 4-6 Yrs Recovery</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Score</td>
<td>Relative to Control</td>
<td>Score</td>
</tr>
<tr>
<td>Human-caused bare soil</td>
<td>84%</td>
<td>-13%</td>
<td>53%</td>
</tr>
<tr>
<td>Litter quantity</td>
<td>38%</td>
<td>-13%</td>
<td>28%</td>
</tr>
<tr>
<td>Site stability / Erosion</td>
<td>96%</td>
<td>-4%</td>
<td>93%</td>
</tr>
</tbody>
</table>
Seeded, Matted and Undisturbed Sites
<table>
<thead>
<tr>
<th>Cluster #</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant Species (Cover)</td>
<td><em>Parry's oatgrass (19%) - rough fescue (12%) - Kentucky bluegrass (5%)</em></td>
<td><em>Creeping juniper (14%) - shrubby cinquefoil (9%) - Parry's oat grass (7%) - Kentucky bluegrass (5%)</em></td>
</tr>
<tr>
<td>Introduced Species Cover</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td># of Introduced Species</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Range Health</td>
<td>Healthy with problems (67%)</td>
<td>Healthy with problems (72%)</td>
</tr>
<tr>
<td>Litter Cover</td>
<td>38%</td>
<td>14%</td>
</tr>
<tr>
<td>Bare Soil</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>
## Primarily Seeded Sites

<table>
<thead>
<tr>
<th>Cluster #</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dominant Species (% Cover)</strong></td>
<td>Kentucky bluegrass (38%) Green needle grass (4%)</td>
<td>Kentucky bluegrass (20%) western wheatgrass (19%) Green needle grass (6%)</td>
</tr>
<tr>
<td><strong>Introduced Species Cover</strong></td>
<td>43%</td>
<td>22%</td>
</tr>
<tr>
<td><strong># of Introduced Species</strong></td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Range Health</strong></td>
<td>Unhealthy (46%)</td>
<td>Unhealthy (49%)</td>
</tr>
<tr>
<td><strong>Litter Cover</strong></td>
<td>37%</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Bare Soil</strong></td>
<td>4%</td>
<td>12%</td>
</tr>
</tbody>
</table>
## Primarily Matted Sites

<table>
<thead>
<tr>
<th>Cluster #</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dominant Species (Cover)</strong></td>
<td>Rough fescue (12%) - fringed sage (6%) - western porcupine grass (5%)</td>
<td>Rough fescue (8%) - western porcupine grass (7%) - northern wheatgrass (4%)</td>
</tr>
<tr>
<td><strong>Introduced Species Cover</strong></td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td><strong># of Introduced Species</strong></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Range Health</strong></td>
<td>Healthy with problems (55%)</td>
<td>Healthy with problems (55%)</td>
</tr>
<tr>
<td><strong>Litter Cover</strong></td>
<td>26%</td>
<td>62%</td>
</tr>
<tr>
<td><strong>Bare Soil</strong></td>
<td>12%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Crushed Tussocks

- Tussock recovering – vigour reduced
- Tussock died
Variables

- Range site
- Invasive species
- Duration
- Season
- Vehicle weight

Pitfalls

- Matting during the growing season
- Weed seedbanks and introductions
- Soil compaction
- Reduced growth potential

Brome invading RoW
Matting Potential

Potential to:
- Retain plant community composition
- Retain soil layers and the seed/root bank
- Increase operability on native grasslands

Less potential for non-native species introductions

Possibly less erosion potential
Acknowledgements

Land Access

- AltaLink
- Enmax
- MFC Resources
- Land Owners