Challenges of Gravel Pit Reclamation on a Federal Community Pasture in Central Manitoba

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Outline

• Players and Their Roles
• Site Information
• Resource Extraction
• Revegetation Recommendations
• Results
• Reflections
The Players

- Rural Municipality
  - Land owners, gravel users, contractor guidance
- Contractors
  - Surveying, stripping, quarrying, reclamation and revegetation
- Land Manager
  - Administrator of regional pastures, guidance to RM
- Pasture Manager
  - Operator of pasture
- Rangeland Management Specialist
  - Guidance to Pasture Manager, Land Manager, RM
Federal Community Pasture System

- Manage a productive, bio-diverse rangeland and promote environmentally friendly responsible land use practices
- Utilize the resource to complement livestock production
- 929,000 ha of rangeland, mostly native grassland
- Created in the 1930s to reclaim and conserve grassland using sound grazing management practices
Portage AESB Community Pasture
Portage Pasture Landscape
Grassland Composition

- Historically this is the northwest extent of Tallgrass Prairie and thus we expect a similar composition on good condition upland grasslands
  - Big and little bluestem, prairie dropseed, switchgrass, various native wildflowers
- Range inventory 2001
  - Transect of 10 frames across open areas
  - Upland grasslands
- Diverse stand, uncovering 25 – 30 species per transect
  - Tall grass prairie species, cordgrass, mat muhly, awned and western wheatgrass, upland/mesic sedges, various native wildflowers
  - Kentucky bluegrass, creeping bentgrass (red top), white clover, black medick, dandelion, plantain
  - Species indicating a range of well drained to poorly drained habitats
Gravel Extraction
Revegetation Strategy

• First of all, to seed or not to seed?
  – Weed/exotic spp. management
  – Forage loss
  – Soil loss
  – Culture
  – Natural invasion
  – Wide area of disturbance

• Native or tame?
  – Exotics already present
  – Longer and more challenging establishment of natives
  – Complement the grazing system

• Seed mix considerations
  – Environmental factors
  – Land use needs (grazing, ecology)
  – Economic factors (availability, cost, local access)
## Seed Mix

<table>
<thead>
<tr>
<th>Pre-Disturbance</th>
<th>Tame Seed Mix</th>
<th>Two Native Seed Mixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Big and little bluestem</td>
<td>• Smooth brome</td>
<td>• Western wheatgrass</td>
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<tr>
<td>• Prairie dropseed</td>
<td>• Kentucky bluegrass</td>
<td>• Switchgrass</td>
</tr>
<tr>
<td>• Switchgrass</td>
<td>• Red top</td>
<td>• Big bluestem</td>
</tr>
<tr>
<td>• Cordgrass</td>
<td>• Timothy</td>
<td>• Slender wheatgrass</td>
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<tr>
<td>• Mat muhly</td>
<td>• Clover</td>
<td>• Green needlegrass</td>
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<tr>
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<td>• Various native wildflowers</td>
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</tr>
</tbody>
</table>
Seed Mix

Actual

- Timothy
- Orchard Grass
- Creeping Red Fescue
- Annual Ryegrass
- Kentucky Bluegrass
- Smooth Brome

- Broadcast, harrowed, no fertilizer
- Good representation by all species seeded, but CRF most abundant and vigorous
- Cattails and sedges coming up in middle of depressions
Seed Mix

**Adjusted**
- Timothy
- Orchard Grass
- – Creeping Red Fescue
- Annual Ryegrass
- Kentucky Bluegrass
- Smooth Brome
- + Reed canary (overseeded in wetter spots)

- Broadcast, harrowed, no fertilizer
- I expect cattails and sedges will continue to come up in middle of depressions
What worked?

• Good job of topsoil replacement
• Climate
  – Lots of moisture for plants
  – Good vigour of seeded species
• Natural invasion by depressional native species
Challenges – Decision-Making

• Land use values
  – Leaning in different directions
  – Weighted by many factors

• Effort and money
  – Labour
  – Time
  – Cost
  – Seed availability

• Authority
  – AESB staff are not regulators
  – AESB do not own the land or control resource extraction

• Land ownership
  – Weight of perspective in decision making.
Challenges - Environmental

- Changes in contouring
  - New environments formed
  - Drainage issues
- Knowledge for reclaiming gravel pits in this part of the Prairies
- Performance of plants
  - Native vs. tame
  - Upland vs. depressional
  - Presence of exotic species in seedbank
- Timing of revegetation
  - Balance ideal with possible
Lessons Learned

• Put extra effort into communication
• Don’t work in isolation
  – Bounce ideas off other people within your skill set
• Monitor/followup
  – Communications
  – On-the-ground results
• Expect the unexpected
• Flexibility: be willing to concede to other viewpoints and change accordingly
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