



Background

In response to the “*Native Plant Revegetation Guidelines for Alberta*” (February, 2001) and the complementary regional document for the Northwest Boreal Region, DMI instituted a change to its practices on “timber disposition” operations effective commencing the spring of 2002. For the most part this restoration practice applies to disturbed areas (soil-exposure); temporary roads, associated annual clearings (campsites, borrow-pits), and rights-of-way (ditches) on permanent roads. DMI recognizes also that “land-use disposition” abandonment (i.e. LOC, SML) currently occurs under more specific provincial requirements that describe more intensive reclamation approaches, possibly not as readily achievable under the native-species revegetation guidelines.

The above provincial documents point to a transition away from traditional ‘Forestry Mixes’ developed during the 1970’s because of evidence that those recommended species are not necessarily ‘native’ to boreal ecosystems. In some cases those species are also invasive or persistent against the natural vegetation types found on adjacent undisturbed forest lands. Beyond the risks to normal biodiversity function and ecosystem health, some of those species can also become problematic competition for reforestation. Consequently, DMI deploys practices that favour ‘native species’ recognizing however that:

- Current seed-supply sources (vendors) are founded primarily on agricultural community customer needs, and are yet only evolving to address native-seed quantities and species availability for crown land. Some species are currently unavailable.
- Germination success in-field is largely much slower to establish than the older and now disallowed ‘forestry mixes’.
- Long range native species performance and succession rate is yet largely unknown when introduced ‘artificially’.

Objective

DMI’s approach to reclamation and the use of vegetation in such restoration is intended to address the following objectives:

1. To comply with the new provincial guidelines for use of native-species in reclamation and soil-stabilization activities,
2. To assist soil stabilization, erosion control, and better connection of reclamation practices to the natural succession of various vegetative species on the landscape by the use of species that inherently perform well over the long term,
3. To contribute to biodiversity conservation and boreal ecosystem health by not introducing non-native species or weed species into regional ecosystems,
4. To be specific on where native seed is deployed, in the interests of cost-effective application and reforestation considerations.

DMI’s guidelines are described in the context of three connected practices:

- A. Prescription of vegetation for use in reclamation practices (general principles and practices)
- B. Protocols for prescribed DMI native seed mixes
- C. DMI seed certification standards

DMI Practices

A. PRESCRIPTION OF VEGETATION FOR USE IN RECLAMATION PRACTICES

DMI’s approach to use of vegetation in reclamation will include the following measures:

1. **Minimum disturbance** will continue to be practiced as normal under current DMI guiding documents and objectives. The intent is to leave a forest state wherever possible that is conducive to ‘natural’ recovery of grass, forbs, shrub, and tree regeneration.
2. **Salvage of existing native plant seedbed and topsoils** will continue to be a priority, with ‘rollback’ of strippings being the





primary practiced restoration approach on new clearings.

3. **Rollback** needs to be deployed effectively with clear instruction to contractors on 'how' to accomplish that.
4. **For sites with low erosion potential** where the topsoil seedbed is salvaged (or intact) and surrounding landscape has a ready source of native plant seed, a "natural recovery" approach will be the preferred prescription coupled with the earlier referenced rollback measure. (i.e. Flat profiles of exposed soil or wetland crossings). NOTE re: Seed Mixes: Wetter sites traditionally have not seen re-vegetation problems via a 'leave-for-natural' approach to restoration, and were consequently not considered in developing DMI's seed-mix below.
5. **For sites of high erosion potential and high disturbance** a more intensive and specific prescription will be employed, including seeding to native species. (i.e. side-slopes, cuts, sloped linear access, ditches). Any locations of soil exposure with potential for soil movement during melt or rain-periods would constitute high erosion potential.
6. **In extenuating circumstances only**, non-native species 'may' need to be deployed during initial stabilization stages, but species selection MUST include consideration of compatibility with the native plant community adjacent to the site. Staff must consult with DMI silvicultural staff to determine acceptability and prescribed species in such instances. Appropriate Alberta field-office approval in writing should be obtained

Application and vegetation performance: Early DMI experience suggests that staff can expect a generally slower re-vegetation establishment response when using native seed mixes; relative to historical agronomic-developed seed mixes (pasture seed). This emphasizes the critical value in addressing a package-approach to exposed slope restoration, which includes consideration of:

- Effectively applied rollback practices to supplement the effort (= erosion risk reduction, long-range nutrient returns, micro-site moisture retention, seed-bed shelter, thorough wood-debris mixing with soil layer)
- Supplemental engineered techniques to assist soil stabilization and reduce water efficiency (i.e. geo-textile products, weed-free bales, straw mulch, rock-armouring, bio-engineering prescriptions)
- Calculating a good application-rate (seek advice based on species mix)
- Timing of seeding (soil moisture, early-season)
- Need to schedule re-assessment (monitoring) and possible secondary re-seeding where necessary

B. PROTOCOLS FOR PRESCRIBED DMI NATIVE SEED SPECIES (company seed mixes)

The selected seed species will be consistent with natural surrounding vegetation most often found within ecotypes at DMI activity sites, subject of course to their availability from commercial suppliers. DMI deploys a specific corporate seed mix consistent with the species described for locally encountered vegetation-communities (Alberta natural regions) in the reference document; "*A Guide to Using Native Plants on Disturbed Lands*".

For the most part, DMI operations occur on Mesic and Submesic mixed wood sub region (Boreal Forest Region). Plant community types and species are described in the above reference document. DMI operations most often affect the following two specific vegetation-community types within the above moisture regimes:

- aspen/rose, white spruce succession,
- low bush cranberry, alder, buffalo berry.

Consequently, native plant species selected will be those that are identified within the reference document as a normal part of the plant community in those eco-types. The species mix selected for any one-batch purchase, will ideally cover a range of those individual eco-types. An effort has also been made to select a mix of early and late succession species (as per the above document), for germination efficiency and establishment longevity.





Consequently DMI's initial assessment of species and vendor availability, has selected a mix of grass species that form part of those communities, and as were available in 2002:

- 30% Hairy Wild Rye (*Elymus innovatus*)
- 25% Awned Wheatgrass (*Agropyron trachycaulum* var. *unilaterale*)
- 30% Fringed Brome (*Bromus ciliatus*)
- 15% Arctic Mountain View June grass (*Koeleria macrantha*)

Other factors that staff are to consider in forming a seed-mix of native species:

- Currently, the desired **forb species component** is very poor in availability from suppliers. DMI will however continue to monitor opportunities to revise this mix and include appropriate species as availability improves. Commercial availability of some forb species may likely improve with time and market demand, so it is possible DMI's recommended mix could be improved in the future with addition of some early-establishment forbs. ****This DMI policy will need to be revisited periodically to check for improved availability of native forb species stock (early successional species in particular) toward improvement of the effectiveness of this current DMI mix.**
- **Shrub species** will not be seeded, although they are referenced in the guiding documents. Some experimentation with willow-cutting propagation (bioengineering) 'may' be deployed to measure success and usefulness as a tool in site-specific prescriptions.
- Despite natural community presence of **"Blue joint" (*Calamagrostis* sp.) grass species**, it was deliberately excluded from consideration due to undesirable historical reforestation competition qualities of the species.
- **Number of species per mix** There are no current guidelines limiting the number of species that can be deployed within a bag mix. Optimal mixes are those with increased diversity of plant species.
- **Mix proportions** Flexibility also exists regarding the percentage mixes, as long as some balance is pursued between early and late succession species.

NOTE: Changes to DMI's seed species mixes are to be advised to appropriate Alberta staff (forest or lands) with written approval obtained and placed on DMI file (currently 75.2.4 Native Vegetation and DMI Restoration). E-mail approval format is adequate.

C. DMI SEED CERTIFICATION STANDARDS

A fundamental regulatory objective for application of seed on Crown land is that it MUST be:

1. free of plant content considered non-native, invasive, persistent or noxious (as much as reasonably possible under rigid sampling standards), AND
2. certified by the supplier to be free of weeds (written certification)

Government land management agencies in Alberta require a complete certificate of seed analysis for each native seed lot used for reclamation purposes. This is typically a condition on new industrial and commercial land dispositions. Seed certificates in the Green Zone need to meet the following considerations:

- **Preferably, a 100g sample** from each seed lot of each native species must be inspected (prior to mixing). Where vendor indicates fine seed-size is at issue for a particular species, a 25g sample will suffice EXCEPT if seed lot holds weed-content or other problem-species risks. Common supplier standard testing of seed lots see a 25g sample analyzed which provides 95% accuracy of weed-free guarantee. The above guideline for crown land suggests a 100g sample analysis driving the accuracy to 99%. This is normally a 'special-request' analysis, costly and best requested for an 'annual' size inventory purchase (NOT on a limited single-bag purchase). NOTE of Caution: Canada#1 does not mean that seed is weed free





- Companies may be asked to submit the certificates of seed analysis to the appropriate land management agency prior to seeding.
- Government land management agencies reserve the right to refuse any native seed mix that contains 'agronomic' species that are a known threat to the integrity of natural landscape.

*****It is recommended that DMI obtain a document of certification on an annual basis for each large inventory batch purchased.**

Seed Suppliers

DMI staff should be aware that the primary customers of local seed suppliers are agricultural buyers looking for agronomic mixes that do not hold the same standards as those that apply to crown (public) land. Communication with vendor must be very clear and specific in requesting certification of seed (analysis type), written guarantee of weed & non-native seed content prevention, and native-seed species content desired. Ideally, one staff member should establish annual communications with desired suppliers to ensure consistent purchase standards and to determine opportunity for improvement of DMI species mix.

REVISION HISTORY

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APPROVAL:

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