Alberta's Draft Native Plant Revegetation Guidelines*

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Abstract

The second draft of *Native Plant Revegetation Guidelines for Alberta* was released in June 1999 by the Native Plant Working Group. This multi-stakeholder committee has representation from provincial government agencies, various industries and non-government organizations. There is currently no legislation in Alberta that requires the use of native species in reclamation. However, the use of native species for reclamation projects in natural landscapes on public land can be required, if the surrounding land use and the revegetation objectives for the area warrant it. The guidelines provide a clear, consistent and integrated information package about using native plant materials where the revegetation goal is to re-establish a native plant community. The guidelines are not prescriptive. It is recognized that site specific circumstances have to be considered when planning revegetation projects. This paper reports on the process used to develop the guidelines and the major topic areas covered by the guidelines. The complete draft document can be viewed at **http://www.agric.gov.ab.ca/publands/nprg/**.

I. Introduction

1.1 Background

The use of native plants in reclamation has been recognized as important for protecting the integrity of Alberta's natural landscapes since the 1970's. The use of native grasses to revegetate wellsites and pipelines has been required on publicly owned prairie areas since 1990. The use of native species on disturbances in forested areas in the province is quite variable, depending on land use patterns in different regions of the province. With the increasing use of native species come concerns about inconsistencies in regulatory requirements, as well as concerns about seed purity and the potential for the introduction of undesirable plants. Costs of native plant materials are high and their commercial availability is often poor. There is also unease about movement of plant materials across large distances, as it might affect plant performance and the genetics of local populations.

In late 1997, land managers from Alberta Environment (AENV) and Alberta Agriculture, Food and Rural Development (AAFRD), who manage the Green (forested) and White

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(settled) areas of Alberta, respectively, met to discuss their concerns and to determine a course of action to address them. A decision was made to invite affected industry groups and interested non-government organizations to participate in the development of guidelines that would promote consistent and appropriate use of native plant materials on public lands.

Guidelines, rather than a formal policy, have been favoured for several reasons. First, the guidelines give direction but also provide much-needed flexibility and lead-time for development of supplies. Second, industry response to some other guidelines in Alberta has been very encouraging. For example, the Alberta Energy and Utilities Board information letter, Petroleum Activity on Native Prairie: Guidelines for Surface Disturbances (1996) has been implemented successfully. The oil and gas industry has been very responsive and continues to find innovative ways to reduce impacts. Third, the use of native plants in revegetation is still in its infancy. As new knowledge comes to light, it is easier to modify guidelines than to change policy or legislation.

1.2 Process

The Native Plant Working Group (NPWG) has representatives from various provincial government jurisdictions, the oil and gas industry, coal industry, seed industry, cattle industry and some non-government organizations. The members of the NPWG are: Heather Gerling, Public Lands Division, Alberta Agriculture, Food and Rural Development (Chair); Andy Etmanski (Coal Association of Canada); Elgar Grinde (Alberta Cattle Commission); Rob Kesseler, Land and Forest Service, Alberta Environment; Cam Lane, Land and Forest Service, Alberta Environment; Jim Lindquist, Public Lands Division, Alberta Agriculture, Food and Rural Development; Kerby Lowen, Canadian Seed Trade Association; Laura Morrison, Alberta Energy and Utilities Board; Michelle Pahl, Alberta Research Council; Ann Smreciu, Alberta Native Plant Council; Dan Smith, Public Lands Division, Alberta Agriculture, Food and Rural Development; Don Watson, Environmental Services Division, Alberta Environment. The following people had previous involvement in the process, or provided substantial review of the document: Terry Anderson, Canadian Seed Trade Association; Jeanie Bietz, Canadian Environmental Pipeline Association; Lorne Cole, Special Areas Board; Rick Ferster, Coal Association of Canada; Bernd Martens, Coal Association of Canada; Ian Proctor, Canadian Association of Petroleum Producers; Rob Staniland, Canadian Association of Petroleum Producers.

The first draft of the guidelines was released in November of 1998 to both academic reviewers and the general public. The comments received during this review were used to revise the document. The second draft was released in June 1999, and it will be used on a trial basis for the 1999 field season. The working group will prepare a final version using the comments and recommendations received during the trial period. The final document will be released in 2000 following government approval.

1.3 Objectives

The NPWG has developed the following objectives for the guidelines:

- To promote the use of native species in the revegetation of disturbed sites within native plant communities,
- To encourage the eventual establishment of native plant communities within native landscapes,
- To acknowledge the site specific role of non-native species to meet short-term revegetation goals or meet accepted land use needs.

II. Guidelines

The guidelines are not intended to be prescriptive. The working group recognizes that site specific circumstances, including land use objectives, have to be considered when planning revegetation projects. Many of the more prescriptive statements found in the first draft were deleted and will be treated in more detail in a companion document, *How to Revegetate Native Landscapes.* The anticipated publication date for this new book is June of 2000.

2.1 Planning

Public land managers in Alberta are stressing the importance of minimum disturbance to natural landscapes when planning industrial or commercial activities. Avoidance of rare or sensitive plant communities is often required. Industry has developed various techniques to reduce the area of disturbance and may have to time their operations carefully. Special equipment has been designed for projects to minimize damage or to promote better re-establishment of vegetation.

The use of native plants should be consistent with local and/or regional land use plans or objectives and the surrounding vegetation. The guidelines promote the use of native species only where appropriate. If the surrounding area is already dominated by non-native crops or there are problems in the local area with invasive non-native plants, it often does not make sense to plant expensive native plant materials.

Project goals need to be clearly understood. They can include, for example, erosion control, sustainable grazing, wildlife habitat, reforestation, maintenance of biodiversity and aesthetics. Revegetation planning may need to address potential conflicts in goals. In the past, erosion control has often been the only revegetation goal, with thick carpets of non-native grasses/legumes established on reclamation sites. Today, erosion control is still a primary goal on many sites, however, the species composition and seeding rates can often be adjusted to meet other project goals.

2.2 Plant Species Selection

The selection of appropriate native plant materials to fit site specific requirements and project objectives is critical to the success of native revegetation efforts. As a general rule, native species should be selected based on their compatibility with pre-disturbance plant communities. However, there are reclamation sites that are radically different from their predisturbance condition, with different soils, drainage and topography. In these cases, similar sites (if they exist) in the same Natural Subregion should be examined to see what native plants are performing well. Efforts should be made to source these plants. If this is not possible, then short-lived natives (from other Natural Regions) or non-natives can be used to stabilize reclamation sites on an interim basis, until local plants can reestablish on the site. On large sites, island plantings may be required to provide an adequate seed source.

Current thought is that a range of plant materials should be seeded to handle the range of growing conditions during establishment and to allow time to produce an increasingly diverse stand on the site through reversion and succession. This includes the use of multiple species, but can also include the use of different varieties of the same species and multiple age classes. Multiple planting events can also be considered, especially on large areas. Thought should also be given to the possible interactions of planted species, and the potential effects on project goals. For example, if reestablishment of shrubs or trees is a desired outcome, then the amount of grass planted should be minimized as much as possible.

2.3 Sourcing Native Plant Materials

The guidelines emphasize the importance of seed quality to both growers and buyers. Included in the guidelines document are appendices showing users how to interpret a seed testing certificate, as well as national and provincial lists of problem weeds are. Native seed lots should be free of prohibited, primary and secondary noxious weeds as defined by the *Canada Seeds Act*. Lots should also be free of restricted and noxious weeds designated by the Alberta *Weed Control Act* or by a local municipality.

One of the difficulties facing public land managers is the introduction of invasive species to natural landscapes because of the use of untested native seed mixes. Operators can be required to produce a seed analysis certificate for any native seed lot used on public land. Since 1996, AAFRD has had zero tolerance for specified invasive species that show up in native seed testing (AAFRD, 1996).

Seed testing can also assure buyers that the seed is viable, i.e. that it will germinate. Wild harvested seed typically has a lower percent germination than seed that has been cultivated. Some seed has a very low germination and more seed is used to achieve the desired results.

The source of native seed can have implications for performance on the reclamation site and there is considerable controversy over genetic effects of moving native plant materials over long distances. Rules about movement of native tree seed for the forest industry have been in effect for many years. There are no rules for any other native species. Most jurisdictions in North America are placing some kind of limitation on movement of seed. Alberta recognizes that definitive research on this topic is lacking and that, very likely, requirements are species specific.

The guidelines take a conservative approach until more information is available. They promote the use of seed whose genetic origin is from within the same Natural Subregion as the disturbance (Figure 1). If such seed is unavailable, users are directed to try using native plant material that has been performance tested in Alberta. If the performance meets project goals then the seed can be used, otherwise it is removed from the revegetation mix. Native plant materials used to reconstruct natural landscapes in Alberta should be not be sourced outside North America.

2.4 Supply and Demand

Synchronizing supplies of and demand for native plant materials is quite difficult. Lead times to produce commercial quantities of materials can vary from two to five years. Industrial project planners seldom have this kind of lead time. Growers would like to have some assurance that there will be a market for the materials they are producing. The guidelines attempt to bring some stabilization to supply and demand by providing two appendices.

One appendix lists native species that are commercially available at the moment; are currently in development for commercial supply or are considered priority species for revegetation projects in the future. Selections for the last category were based on: wide application (across several Natural Subregions), potential for erosion control, legumes, early successional plants or key components in various plant community types. Since this is a draft document, suggestions for additions or deletions (with supporting reasons) to this list are welcomed.

The second appendix is a listing of native species currently recommended for reclamation projects in various natural landscapes on publicly owned land in Alberta. These species are either currently available in commercial quantity or are considered to be key species that will be available commercially within a five year timeframe. This listing is intended to be a starting point only and users are directed to *A Guide to Using Native Plants on Disturbed Lands* (Gerling et al., 1996) for detailed plant or plant community information. AAFRD and AENV will update the appendix in the guidelines yearly. Public land managers should also be consulted to determine site specific requirements.

2.5 Wild Harvesting

The guidelines do not promote wild harvesting as a normal way of obtaining native plant material for commercial use. Significant and irreparable damage can be done through over-collection of plant materials from natural landscapes. Wild harvesting is necessary to obtain original genetic material for propagation purposes. Seed collection is allowed on public land in Alberta to obtain commercial volumes of seed for revegetating significant vegetation communities that would otherwise be replanted with unsuitable plant materials. A Termporary Field Authority (TFA) with conditions is required to collect native seed on public land.

Specific guidelines and procedures (adapted from ANPC guidelines) for this wild harvesting are included as an appendix in the document. Emphasis is given to getting appropriate permission, avoidance of rare plants/habitats, collection of ripe seed or cuttings and not whole plants, leaving sufficient seed behind for natural propagation and food for animals, and resting areas (minimum 2 years) between collections.

2.6 Site Preparation, Planting and Maintenance

A number of general guidelines are included in this section. The importance of good site preparation is emphasized. Many failures of native revegetation projects are due to inadequate preparation, particularly weed control. The existing seedbank and distance to cultivated areas are very important considerations when deciding on whether to use native species in the first place, what species to plant and what strategies should be employed during planting and maintenance.

Attention is drawn to the current practice of straw crimping (for erosion control) and the importance of inspecting the fields that the straw is coming from for weeds. Public land managers are starting to favour the use of annual crops over straw in some areas because of the ability to examine seed lots for weed content. Subsequent management of weeds on reclamation sites is also very important to ensure the sustainability of native plantings.
The potential benefits of non-persistent annual weeds, e.g., flixweed for erosion control, soil amelioration protection of native plants from grazing are pointed out. Too often these are unnecessarily sprayed, which removes reestablishing native forbs. The companion book in progress, *How to Revegetate Native Landscapes,* will provide much more detailed information on these subject areas.

2.7 Assessing Reclamation Success

Project planners and public land managers need to readjust their expectations when evaluating revegetation efforts in natural landscapes. Considerable time may pass before reclaimed areas look anything like, or blend into, surrounding areas. Early successional species may dominate reclaimed areas for long periods of time before late successional species become established. The extent to which project goals are met and the demonstration of a successional trend toward a desired native plant community should be considered when determining the success of a revegetation project. Monitoring and reporting of results is crucial to the evolution of better science for native plant revegetation.

III. Future Needs

The NPWG has identified future needs that require immediate attention:

- Development of "source-identified" tags to enhance the movement of appropriate native plant materials into revegetation projects. A committee established following last year's Native Plant Summit IV: Native Plant Production, held in Calgary, Alberta, is looking into this possibility with the Canadian Seed Growers Association.
- Development of joint government/industry support for a performance evaluation program for native plants from known sources.
- Support of ongoing native plant cultivar development programs.
- Development of knowledge about successional trends to assist in the determination of revegetation success.
- Development of rhizobial and mycorrhizae inoculants for those species that require them for successful establishment and survival.

IV. References

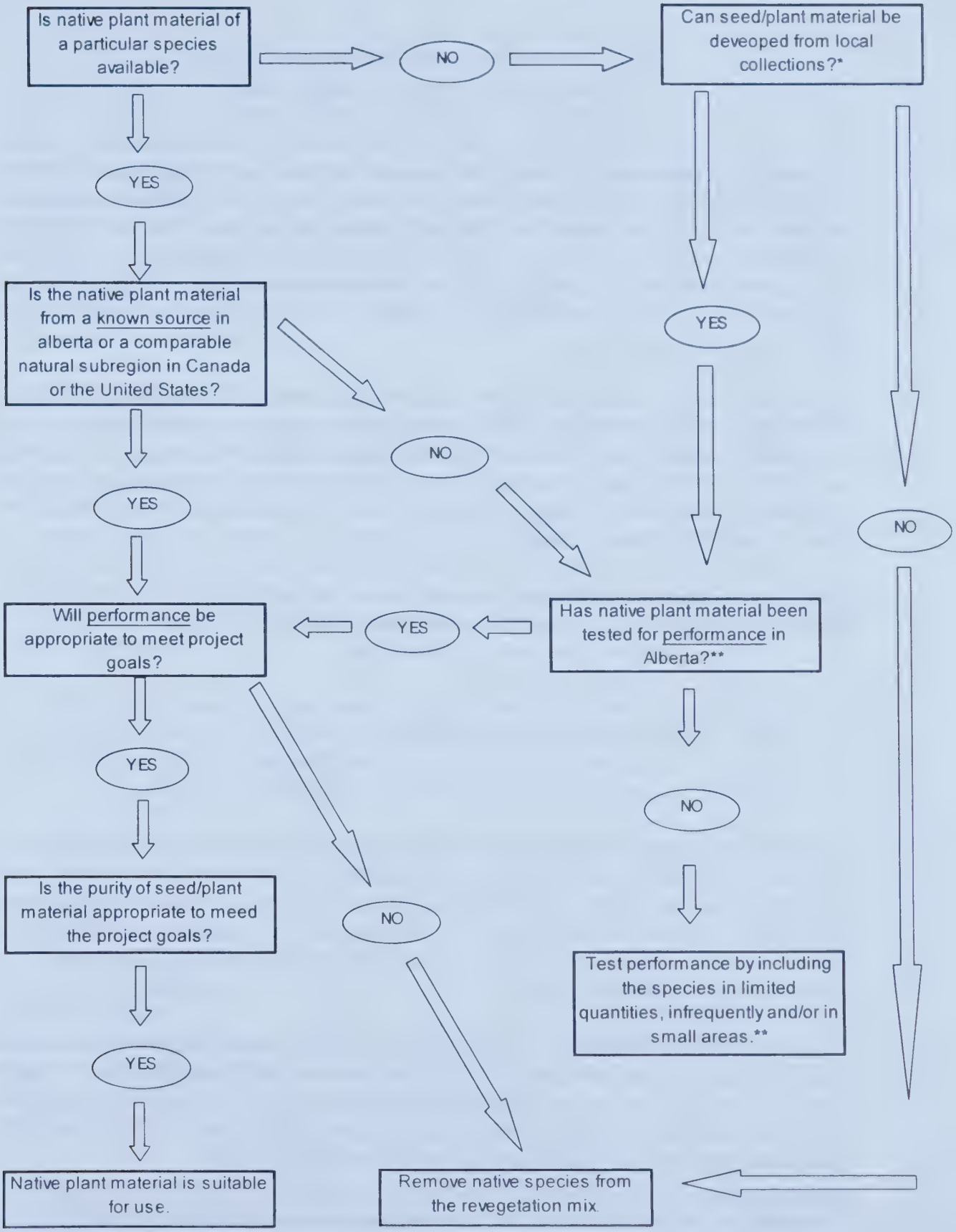
Alberta Energy and Utilities Board. 1996. Petroleum Activity on Native Prairie: Guidelines for Surface Disturbances. 10 pages.

Alberta Agriculture Food and Rural Development, Public Lands Division. 1996. Weed content in native seed used for revegetation of natural landscapes. IND 96-1. 3 pages.

Alberta Agriculture Food and Rural Development and Alberta Environment. 1999. Draft Native Plant Revegetation Guidelines for Alberta. 55 pages.

Gerling, H.S., M.G. Willoughby, A. Schoepf, K.E. Tannas and C.A. Tannas. 1996. A Guide to Using Native Plants on Disturbed Lands. Alberta Agriculture, Food and Rural Development and Alberta Environmental Protection. 247 pages.

Figure 1. Decision-Making Chart: Sourcing Native Plant Material



NOTES

* prior to removing species from the revegetation mix, multiple attempts to secure alternative sources is recommended

** records of procedures and results should be maintained and made generally available.

Perspectives in Land Reclamation and Restoration

Presented by:

Canadian Land Reclamation Association/
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