



RESEARCH SERVICES

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TECHNICAL SUMMARY

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PROJECT COST:

\$111,743



These prairie smoke flowers, an example of vegetation native to Minnesota, were found along a roadside in the Minneapolis area.

Designing Site-Specific Roadside Prairie or Grassland Seed Mixes

What Was the Need?

Vegetation along Minnesota's roads needs to accomplish several goals, from maintaining visibility and safety for travelers to minimizing erosion and maintenance costs. Research and experience demonstrate that native plants are particularly well-suited to these tasks. This primarily herbaceous native vegetation also has significantly greater wildlife habitat value on roadsides compared to non-native herbaceous species. For native vegetation to succeed and thrive, appropriate seed mixes must be used in each location. For instance, a seed mix might need to be designed for the unique soils or climate of a particular region, or it may need to be a more general collection, suitable for statewide use and more likely to succeed in degraded or harsh environments.

Currently, roadside vegetation managers choose from a variety of seed mixes that are designed to be used across the state, but these statewide mixes do not always fit the site conditions of a particular project. Poorly matched mixes can lead to erosion, weeds and other problems.

A standard process for designing site-specific seed mixes, uniform seed quality standards and core seed mixes for statewide use will lead to thriving roadside vegetation in different regions, less confusion and volatility in the pricing of seeds, a steadier supply of commonly agreed upon species, and a more effective and equitable substitution process.

What Was Our Goal?

The goals of the project were to develop a step-by-step manual for Minnesota agencies to design site-specific seed mixes and to provide guidelines for other states to develop their own mixes.

What Did We Do?

Researchers first conducted a comprehensive literature search of efforts to design site-specific native grassland seed mixes. Then they coordinated and conducted a series of stakeholder workshops and technical advisory panel meetings to bring together experts from Mn/DOT, Minnesota Department of Natural Resources, Minnesota Department of Agriculture, Board of Water and Soil Resources, the University of Minnesota, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, and the Native Wildflower/Grass Producers Association. These meetings provided a forum for knowledgeable parties to determine how to develop a native seed mix design methodology suitable for the needs of Mn/DOT and other land management agencies.

In addition to six technical advisory panel meetings, researchers coordinated two large workshops that included members of the panel plus members of the seed community, including vendors, producers, installers, highway maintenance personnel, designers and researchers with knowledge and experience regarding the needs, challenges and effects of seed mixes.

The project also included a seed market survey to investigate the supply of and demand for native seed in Minnesota. Vendors, installers, Mn/DOT staff, researchers, planners and agencies were asked questions regarding available species, desired species, local origin and origin standards.

Researchers worked with experts from every aspect of the seed community to produce a step-by-step guide to designing site-specific native grassland seed mixes for use along roadsides in Minnesota.

“This project was successful in bringing together experts from different perspectives to contribute to a much-needed document that can ultimately be used by various people, from project designers to seed vendors.”

–Ken Graeve,
Botanist, Mn/DOT Office
of Environmental Services

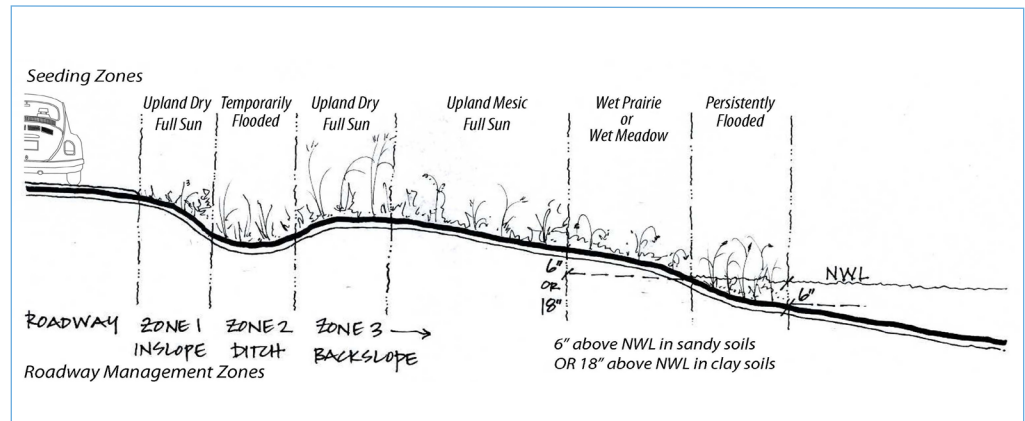
“Substitution of seeds based on availability has traditionally been very difficult and time-consuming. This system changes that dynamic by giving people the flexibility of having multiple species that provide the same ecological service for each unique site.”

–L. Peter MacDonagh,
Director of Design and
Science, Kestrel Design
Group, Inc.

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This is one example of typical native grassland seeding zone analysis for roadsides exposed to full sun in the Easter Broadleaf Forest, Prairie Parkland or Tall Aspen Parkland ecological provinces in Minnesota.

What Did We Learn?

Researchers produced a design manual that empowers users of various knowledge levels to design reliable, site-specific native grassland seed mixes. It allows for flexibility in species selection based on current seed availability and cost, and results in the most diverse possible species use statewide to maximize resilience and biodiversity on a landscape ecological scale.

The manual provides five steps to identify and design appropriate seed mixes, which incorporate project site characteristics, context, goals, seed availability and cost:

- Analyze site and establish goals. A site analysis checklist lists factors such as the ecological province, total acres to be seeded, types of crops used previously and potential invasive species adjacent to the site.
- Choose whether to use a standard or site-specific mix. Site-specific mixes are recommended for sites with more than 10 acres; in areas where wildlife habitat enhancement, conservation or beautification are the primary goals; and for wetland mitigation sites.
- Analyze seeding zones. Seed zones are determined and analyzed based on the amount of water, soil type, sun exposure and slope present at each site.
- Select seed mix design worksheet for each zone. Worksheets provide a list of species that are commercially available.
- Design seed mixes. The manual includes “recipes” for choosing the appropriate quantities of core species, selected species and cover species for each seeding zone.

What’s Next?

Hard copies of the Native Seed Mix Design for Roadside manual will be distributed to agency staff, vendors and design firms; it is also available in CD format and [online](#).

In the future, researchers aim to develop a computer program that will incorporate and expand upon the current manual to allow users to produce a complete, dynamic site restoration plan based on their local site conditions and project goals.

This Technical Summary pertains to Report 2010-20, “Site Specific Native Grassland Seed Mix Design Methodology for Minnesota,” published May 2010. The full report can be accessed at <http://www.lrrb.org/PDF/201020.pdf>.