

Return of the Natives to Minnesota Roadsides

BONNIE L. HARPER

This paper begins with Minnesota's past at a time when we took our resources for granted. It correlates the evolution of early trails to modern Interstate highways with the evolution of native prairie to today's restoration efforts along those roadsides. Roadside development is documented along with vegetation approaches beginning with preterritorial times. As highway purpose changed in Minnesota, so did its roadside policy. The Minnesota Department of Transportation moved from a path of least resistance, to an agriculture approach, to an environmentally aware route. As a result, roadside vegetation changed from existing native prairie, to manicured front yards, to consciously chosen native plantings. The author then examines current Minnesota strategies. The author concludes that the native plants we once took for granted are problem solvers for current and future roadsides. Although standard plantings using exotic species continue to be the rule, more restoration using native species is being attempted. Because Minnesota's past parallels that of most states, Minnesota's present and future could be a model for many.

Midwesterners often take what they have for granted. Case in point: a native wildflower, the Blazing Star, was noticed on a Minnesota roadside right-of-way by a Middle East visitor. He stopped, dug one, and smuggled it home. As a result, Israel now sells the Blazing Star as a fresh-cut flower to florists throughout the United States. Some of us recognized the Blazing Star as a remnant of the past. A foreign visitor recognized one of its values for the present and future.

MINNESOTA ROADSIDE HISTORY

As we explore the development of Minnesota roadsides, we find it parallels the development in many states in different time frames. Let us recall a time when wildflowers grew in abundance, to a time when they were nearly controlled out of existence, to the present when the Minnesota Department of Transportation (MnDOT) is attempting to restore wildflowers.

In the early 1800s, fur traders and soldiers witnessed a vast, roadless, wilderness. The vegetation they saw was memorable because three major ecosystems met in Minnesota, including Conifer Forest, Eastern Hardwood Forest, and Tall Grass Prairie. In the southern and western part of Minnesota where the prairie dominated, travel occurred through "paths of least resistance" along lakes and rivers. "The whole region was open prairie that may be traversed in all directions without difficulty" or almost! (1).

Minnesota Department of Transportation, 704 Transportation Building, St. Paul, Minn. 55155.

Therefore, before 1849 the only "roads" were Indian and fur trader trails along with military roads. These were compacted by hooves and wheels. Rivers were simply, or not so simply, forded. The sides of the roads were bordered by whatever native plants survived the trampling.

During territorial times, 1849–1858, mapped roads became a reality, thanks to federal funding. The purpose of these roads was broadened to provide Indian agency access, military mobility, stage coach routes, and settler movement. The resulting 66-ft-wide roads were built with "landscape treatment" consisting merely of tree and stump clearing. So began our attempt to control native vegetation.

The years from 1858 to 1905 saw a period of local responsibility within the state. The emphasis was on roads to the nearest railroad, which was considered the transportation link to the future. Railroads cooperated by hauling rock for roadbeds at no charge. Meanwhile, roadsides were deliberately planted with trees for three reasons: (a) to beautify the roads, (b) to define nighttime travel with no lights, and (c) to mark edges during deep snow journeys.

Between 1905 and 1920, the State Highway Commissioner began a state participation period. The main goal of the roads built was to get farm products to market. The expanding systems happened to accommodate a growing use of the automobile as well. At this time adjacent landowners were allowed to plow, level, and seed grass plus plant trees to within 6 ft of the road's edge (2).

During the 1920s and 1930s, the state began to build and maintain a network to connect all county seats and principle cities. Roadsides were now enhanced for a new reason—to create parks for picnicking or camping tourists. Clumps of trees were planted in combination with scenic pull-offs, picnic tables, and historic markers (3). Thus appeared our first waysides using roadside right-of-way.

In 1931 the Minnesota Highway Department established the position of Engineer of Roadside Development. By 1933 the Roadside Development Section (RDS) was designed to formally address road corridor needs beyond the roadbed. The roadsides benefited from many landscape architects who were hired during that time. Among them, Art Nichols stood out. He suggested taking advantage of nature rather than working to control it. He believed that the wild, native ground cover was desirable and worthy of preservation or restoration, or both (4). In spite of Nichols' recommendations, most projects in the 1940s added nonnative shrub and flower plantings along with trees, much like people then landscaped their front yards.

From 1950 to 1965, an agronomic approach, treating roadsides much like farm fields, was strengthened with the devel-

opment of chemicals. This high maintenance approach also included mowing 220,000 of 260,000 of Minnesota's mowable right-of-way acres. With the new mechanical and chemical tools, we maintained grass covered and weed-free roadsides for safety and "front yard" aesthetic reasons. This approach to roadsides produced further wildlife habitat loss that had already been reduced by expanding agriculture (5).

In 1965 the Johnson Administration turned the nation's attention to our roadsides with the National Highway Beautification Act. Although the act focused on billboard and junkyard problems, it also underlined a concern for roadside aesthetics in general. By 1968 roadside development approaches were proving that beautification could coincide with maintenance savings (6). Still a popular front yard look was maintained by mowing and applying herbicide.

A beautification objective for roadsides was not enough for some. The National Environmental Policy Act of 1969 required an evaluation of development projects to assess impacts on the roadside environment. In the process we examined road corridors and adjacent land to determine sensitive solutions for the future, including preservation of natural resources where possible.

In 1972 Dr. Lawrence Foote, Director of Environmental Services, called for ecological management goals in Minnesota. The strategies included (a) encourage regeneration of native or indigenous vegetation, (b) blend into adjacent landscapes, (c) provide natural areas for wildlife, (d) improve aesthetics for the highway user, and (e) reduce maintenance costs (7).

An FHWA program instituted in 1973, "Operation Wildflower," encouraged use of native vegetation along roadsides. Federated Garden Clubs provided seed and seedlings. State highway departments provided the necessary labor for installation. In Minnesota this type of cooperation resulted in native prairie flowers and grasses being planted at three rest areas between 1974 and 1976 (Dale Wreisner, unpublished data).

Another 1970s influence for change was the energy crunch that precipitated skyrocketing gasoline prices. Predictably, reduced fuel sales lowered available gas tax funds earmarked for roadside maintenance costs. Up to this point, use of native plants only made ecologic and aesthetic good sense. Now encouraging the return of native vegetation to roadsides by reduced mowing and herbicide application made economic good sense.

Also noteworthy in the movement toward an ecological approach to roadsides was the "Roadsides for Wildlife" program begun by the Minnesota Department of Natural Resources (MNDNR) in 1978.

Although the main goal of cooperation between MnDOT and MnDNR was to increase pheasant habitat, other wildlife and plant species benefited by reduced mowing. Native plantings combined with mowing have caused roadside wildlife populations to triple since 1978. (Ken Varland, unpublished data).

CURRENT CASE STUDIES

Let us examine the roadside vegetation approaches of the 1980s: standard plantings, naturalization, preservation, and restoration. Our planting and management policies do encourage the return of native vegetation in certain situations.

Standard Plantings

Our standard plantings today continue on the high maintenance front yard look of the 1930s. The plants used are mostly horticultural varieties or introduced species. The most used ground cover is Highway Mix No. 5, which includes Kentucky Bluegrass, Smooth Brome, Red Top, Switch Grass, Perennial Rye, White Clover, and Birds Foot Trefoil. All are exotic species with the exception of native Switch Grass, and are intended to build up soils and assure erosion control. This approach is common to freeways and Interstates.

Naturalization

Naturalization occurs when bare ground is allowed to revegetate on its own or when existing ground covers are no longer mowed. With the 1985 Reduced Mowing Act, the Minnesota legislature clearly defined mowing regulations in rural Minnesota. Mowing can occur on the first 8 ft of the road's edge at any time for safety reasons. The rest of the right-of-way can be mowed, but only during the month of August, to a minimum height of 12 in. As a consequence we now mow less than 40,000 acres a year. The result is reduced maintenance cost, increased wildlife habitat, and a new look to the highway.

An experiment of how naturalization occurs on bare ground is now being conducted on a former sand and gravel area used during highway construction. After the sand and gravel removal on the highway right-of-way near Lake George, MnDOT reshaped the land to resemble original topography. No deliberate planting followed. Instead it is hoped that adjacent native vegetation including aspen, sumac, hazelnut, grey dogwood, prairie sage, coneflower, asters, and goldenrod will volunteer. If this is successful, it will stabilize the soils, blend with adjacent vegetation, improve wildlife habitat, and save money. (Kevin Kotts, unpublished data).

The naturalization success of reduced mowing or the Lake George experiment would have been assured in the 1800s. However, today the success is strongly influenced by the not-always-native seed bank on the site or adjacent to the site. Roadsides near railroad right-of-way or park preserves inhabited by natives exhibit desirable return of native wildflowers and grasses. Unfortunately, most roadsides have been drastically disturbed, replanted with exotics, lie adjacent to urban development or intense farming and no native seed source remains. As a consequence, naturalized roadsides tend to be dominated by exotics that prefer to be mowed and look weedy when they are not. The results of some naturalization efforts are not always visually pleasing and the "new look to the highway" can be negative.

Preservation

Whenever possible, preserving highway segments that have escaped disturbance over time is desirable. Minnesota Trunk Highway (TH) 56 is part of a gentlemen's agreement between the MnDNR and MnDOT to do just that. Not only is the area posted for protection of native prairie, but it is also periodically burned by a MnDOT crew trained by the DNR. Burning of prairie is prescribed every 2 to 3 years to reduce

woody or exotic plant invasion and mimic the wildfires that favored prairies before settlement. Where burning is not practicable, an annual late fall mowing is recommended. Not only do these preserved prairie roadsides delight motorists with a changing mosaic of flowers and grasses throughout the season, but the prairies serve as reservoirs of native seed for other projects. The DNR already harvests seed from these sites to be planted in nearby park restoration areas.

Because not all prairie roadsides can be preserved, efforts have been made to salvage areas programmed for upgrading. An example of such a salvage attempt occurred on TH 14 where Ladyslippers, *Cypripedium Candidum* were abundant. The DNR and MnDOT cooperated to remove prairie, sod, and individual transplants and relocate them at a nearby park. Because orchids are difficult to transplant, limited success was observed. (Kathy Bolin, unpublished data). This result underscored the importance of identifying important native vegetation segments early enough in the highway project in order to adjust construction plans to bypass and save them.

Restoration

When construction totally disrupts the corridor, restoration of native vegetation becomes an answer—a functional, ecologic, aesthetic, and economic answer to today's roadside. Most roadways across the country share similar planting conditions: full exposure to the sun and drying winds, steep slopes that shed needed moisture, and highly disturbed soils. Add to Minnesota's roadsides great drifts of snow and an annual average of 10 tons of sand and salt mixtures per lineal mile. Until now, Minnesota's revegetation policy has been aimed at preventing soil erosion and providing a safe driving experience. Restoration adds objectives such as restoring native plants, blending into natural landscapes, improving aesthetics, crowding out noxious weeds, increasing wildlife habitat, and reducing maintenance costs (8). Native plants indigenous to Minnesota just happen to fulfill the needs of the site as well as the objectives of restoration.

By design, MnDOT has chosen a plant list of species that are indigenous to the state, match site conditions, increase species diversity, and consider flower color/bloom period/height. Some specifications require Minnesota seed origin. Site preparation includes stock piling of topsoils that are removed during construction. When soils need not be moved, it is desirable to kill undesirable vegetation using a suitable chemical, that is, Round-up. MnDOT is experimenting with ways of seeding into the dead thatch so as to disturb the soil as little as possible. In the meantime, common planting techniques include drilling with a specialized drill, broadcasting for a natural look, and

hydromulching for steep slopes. Hydromulching has shown limited results. (Leo Holm, unpublished data).

This year, seven sites were deliberately planted with native flowers and grasses. To this point our plantings have had mixed success. We now believe that the factors of matching native plants to the regions in which they are known to grow and using a Minnesota seed source can greatly enhance our success. However, we are encouraged by two recent events in 1987. On September 14, 1987, the FHWA announced a regulation requiring that 1/4 of 1 percent of landscaping budgets be spent on the addition of wildflowers on every road project. Although Minnesota already spends more than this amount annually on its combined plantings, now all federally funded projects will have to be designed with wildflowers in mind. The second event that supports restoration and preservation in Minnesota is the formulation of a wildflower task force by Lieutenant Governor Marlene Johnson. MnDOT, MnDNR, and the office of Tourism are working together to explore how wildflowers fit into Minnesota's future. Their mission is to define policy for Minnesota's roadsides that will address preservation, restoration, and education of Minnesotans about native Minnesota wildflowers with short-term and long-term guidelines. It is becoming clear that the native vegetation the settlers saw in the 1800s offers solutions to problems of the 1980s.

REFERENCES

1. *Minnesota Department of Highways in 1942*. History and Organization of the Department of Highways, State of Minnesota, St. Paul.
2. *The New Minnesota Road Law, 1913*, Minnesota Secretary of State, St. Paul.
3. J. Ray. Native Roadside Plantings. *The Minnesota Horticulturist*, Vol. 115, No. 2, pp. 39–42.
4. A.R. Nichols. *Report on the Relations of Landscape Design to Highway Development in the State of Minnesota*. St. Paul, 1936.
5. D. Montag. Roadsides as a Natural Resource, A Symposium Report by the Wildlife Society Minnesota Chapter, 1978, pp. 6–7.
6. Benefits of Highway Beautification. *Public Roads*, Vol. 35, No. 1, 1968, pp. 1–8.
7. L.E. Foote. Vegetation Management for a Better Roadside Environment. *Roads*, March 1972, pp. 20–24.
8. *Roadside Vegetation Management*. Minnesota Department of Transportation, St. Paul, 1978.

Publication of this paper sponsored by Committee on Landscape and Environmental Design.