



## RESEARCH SERVICES SECTION

# TECHNICAL SUMMARY

### Technical Liaisons:

Paul Walvatne, Mn/DOT

paul.walvatne@dot.state.mn.us

John McDonald, Faribault County

john.mcdonald@co.faribault.mn.us

### Administrative Liaison:

Debra Fick, Mn/DOT

deb.fick@dot.state.mn.us

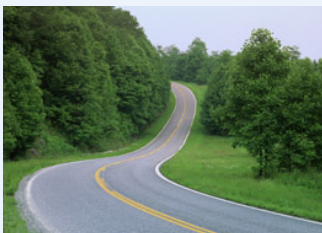
### Principal Investigators:

John D. Krenz, Minnesota State University

Ann Johnson, Professional Engineering  
Services Ltd.

## IMPLEMENTATION PROJECT COST:

\$52,500



BASF Professional Vegetation  
Management

Woody vegetation in roadsides provides cover for deer and increases the risk of deer-vehicle collisions.



# Putting Research into Practice: Best Practices Handbook for Roadside Vegetation Management 2008

## What Was the Need?

Managing vegetation is a critical factor in roadside maintenance, which is an important priority at all levels of Minnesota government. A healthy roadside environment reduces maintenance needs and costs, improves water quality, provides habitat for wildlife populations and maximizes safety for travelers. In 2000, the Minnesota Local Road Research Board published the [Best Practices Handbook on Roadside Vegetation Management](#), which identified seven best practices for roadside vegetation management.

This handbook served as a valuable resource to maintenance and engineering staff, and was used widely in Minnesota and other states. However, no printed handbooks remain, and since the handbook's publication, research has led to new findings not covered in the 2000 edition. These findings include information about roadside habitats and their effects on driver safety, as well as techniques for managing deer-car collisions, which are frequent on Minnesota highways.

With driver safety an increasing concern, the handbook's best practices needed to be updated to address the preservation of roadside habitats without compromising driver safety. This need became especially urgent in light of the 2005 Mowing Law, which required road authorities to reduce mowing and encouraged growth of native plant communities to preserve wildlife diversity—practices that can affect roadside safety.

## What Was Our Goal?

The objective of this implementation effort was to create standard Mn/DOT guidance, through an update of the handbook, based on the most current research on balancing roadside biological diversity with safety issues caused by vegetation and wildlife.

## What Did We Implement?

This project made maximum use of the original handbook; all information from this source that is still accurate is retained in the new edition. Important sources for updates to the new handbook included the following reports:

- [“The Effects of Fire Versus Mowing on Prairie Plant Communities”](#) (2003-20), which identifies management processes that benefit a restored prairie and reduce the need for prescribed burning.
- [“Deer Avoidance: The Assessment of Real World Enhanced Deer Signage in a Virtual Environment”](#) (2004-13), which identifies signage techniques that reduce the incidence of deer-vehicle collisions on Minnesota highways.
- [“Accident Analysis of Significant Crash Rates for Low to Very Low Volume Roadways in 10 Minnesota Counties”](#) (2004-22), which evaluates the causes of vehicle collisions.

## How Did We Do It?

Investigators began by conducting a comprehensive review of published scientific literature and unpublished state and local agency reports relevant to roadside management in Midwestern states. They focused on practices to minimize the use of roadsides by wildlife that are hazardous to traffic while promoting the conservation and diversity of those wildlife species that are minimally hazardous to travelers.

*“The 2000 handbook was a great resource for roadside managers, but we needed a synthesis of new research on the relationship between vegetation, wildlife and driver safety—which the updated handbook provides.”*

**–Paul Walvatne,**  
Mn/DOT Roadside Vegetation Management Unit Supervisor

*“There are lots of valuable wildlife populations that can be cultivated without compromising driver safety. You can judiciously remove woody vegetation to minimize deer collisions and still have very diverse, grass-dominated communities in roadsides.”*

**–John D. Krenz,**  
Professor, Minnesota State University–Mankato Department of Biological Sciences

**Produced by CTC & Associates for:**

Minnesota Department of Transportation  
Research Services Section  
MS 330, First Floor  
395 John Ireland Blvd.  
St. Paul, MN 55155-1899  
(651) 366-3780  
[www.research.dot.state.mn.us](http://www.research.dot.state.mn.us)



BASF Professional Vegetation Management

Kestrels are one example of valuable wildlife that can be cultivated without compromising driver safety. Kestrels are often seen hovering while hunting for mice in roadsides.

This research was used to update the seven existing best practices for effective roadside management from the 2000 handbook, and also formed the basis of an eighth best practice detailed in an additional chapter, “Managing Roadside Vegetation for Wildlife & Vehicle Safety.”

Once the draft of the updated handbook was complete, a technical advisory panel of industry experts and roadside managers reviewed it for accuracy and clarity. This panel included members of the 2004 Roadside Habitat Advisory Committee and representatives of the Minnesota Department of Natural Resources Roadsides for Wildlife Program, as well as state officials and city and county engineers and natural resources staff.

### What Was the Impact?

The new handbook has been widely distributed. The new chapter provides valuable guidance to local officials and Mn/DOT regarding vegetation types (including the safety implications and benefits of using low-maintenance native vegetation in roadsides); species composition; vegetation management (including mowing heights for different types of vegetation); and the frequency and timing of hazardous wildlife road crossings.

The chapter’s primary conclusion is that roadside habitats can be managed to balance biological diversity and safety by selectively reducing woody vegetation without entirely removing grass habitats. Woody vegetation such as brush and trees interfere with the line of sight required by drivers to avoid collisions with deer, while grass is important to benign wildlife such as pheasants and ground-nesting mammals.

### What’s Next?

The updated handbook will be posted on Mn/DOT’s Central Office Library Web site for access worldwide. The handbook will also be used by Minnesota’s Local Technical Assistance Program in its Circuit Training and Assistance Program courses, and it will be presented at the Spring and Fall 2009 Local Technical Assistance Maintenance expos.

---

*This Technical Summary pertains to the LRRB-produced Report 2008-20, “Best Practices Handbook for Roadside Vegetation Management 2008,” published July 2008. The full report can be accessed at <http://www.lrrb.org/PDF/200820.pdf>.*

*The research being implemented via this project can be found mainly in LRRB-produced Reports 2003-20, “The Effects of Fire Versus Mowing on Prairie Plant Communities,” published July 2003; 2004-13, “Deer Avoidance: The Assessment of Real World Enhanced Deer Signage in a Virtual Environment,” published January 2004; 2004-22, “Accident Analysis of Significant Crash Rates for Low to Very Low Volume Roadways in 10 Minnesota Counties,” published March 2004; and the previous version of the handbook, Report 2000-19, “Best Practices Handbook on Roadside Vegetation Management,” published September 2000. These reports can be accessed at <http://www.lrrb.org/PDF/200320.pdf>, <http://www.lrrb.org/PDF/200413.pdf>, <http://www.lrrb.org/PDF/200422.pdf> and <http://www.lrrb.org/PDF/200019.pdf>, respectively.*