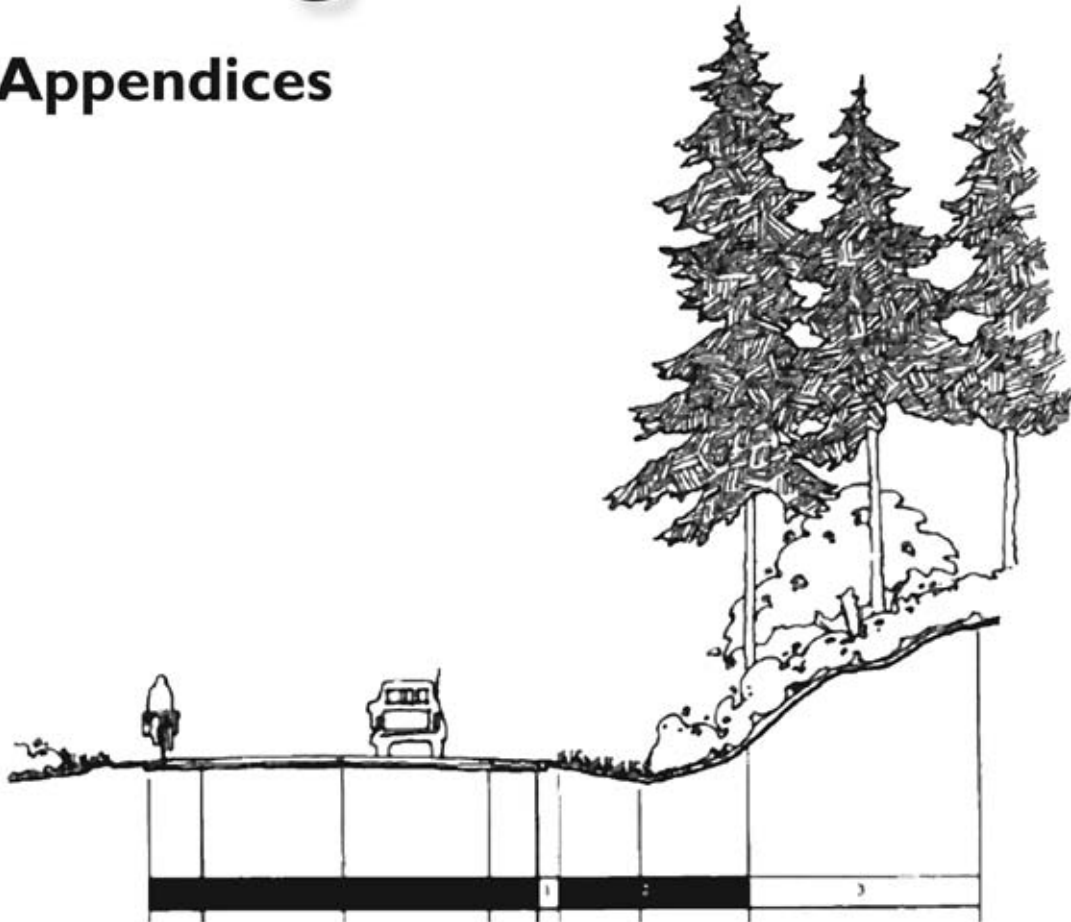


Guidelines for Vegetation Management

Appendices



American Association of State Highway and Transportation Officials. **The Voice of Transportation**

© 2011 by the American Association of State Highway and Transportation Officials.
All rights reserved. Duplication is a violation of applicable law.

Executive Committee 2010–2011

Voting Members

Officers:

President: Susan Martinovich, Nevada

Vice President: Kirk Steudle, Michigan

Secretary-Treasurer: Carlos Braceras, Utah

Regional Representatives:

REGION I:

George Campbell, New Hampshire, One-Year Term

Beverley Swaim-Staley, Maryland, Two-Year Term

REGION II:

Mike Hancock, Kentucky, One-Year Term

H. B. “Buck” Limehouse, South Carolina, Two-Year Term

REGION III:

Thomas K. Sorel, Minnesota, One-Year Term

Vacant, Two-Year Term

REGION IV:

Amadeo Saenz, Jr., Texas, One-Year Term

Francis G. Ziegler, North Dakota, Two-Year Term

Non-Voting Members

Immediate Past President: Larry L. “Butch” Brown, Mississippi

AASHTO Executive Director: John Horsley, Washington, DC

SUBCOMMITTEE ON MAINTENANCE 2010–2011

Chair: Carlos Braceras, Utah

Vice Chair: Robert “Chris” Christopher, P.E., Washington

Secretary: Celso Gatchalian, FHWA

Liaison: Steve Olson, AASHTO

STATE MEMBERS

ALABAMA	G. Mike Harper George H. Conner, P.E. Ronald D. Pruitt	MARYLAND	Russell A. Yurek
ALASKA	Michael Coffey	MASSACHUSETTS	Thomas Loughlin, P.E. Ron Dionne
ARIZONA	Lonnie D. Hendrix Marwan Aouad Dennis G. Halachoff	MICHIGAN	Jon W. Reincke, P.E.
ARKANSAS	Tony Sullivan Emanuel Banks	MINNESOTA	Steven M. Lund
CALIFORNIA	Steve Takigawa Alan R. Mills	MINNESOTA	Susan J. Lodahl, P.E.
COLORADO	David C. Wieder, P.E.	MISSISSIPPI	John D. Vance Celina Sumrall
CONNECTICUT	Robert P. Mongillo Richard Baron Alastair Probert	MISSOURI	Don Hillis, P.E. James Carney
DELAWARE		MONTANA	Jon Swartz
DISTRICT OF COLUMBIA	Mesfin Lakew Aaron Horton	NEBRASKA	Michael T. Mattison, P.E. Craig R. Lind
FLORIDA	Tim Lattner	NEVADA	Richard J. Nelson, P.E. William Hoffman, P.E.
GEORGIA	Eric Pitts Keith Golden, P.E. Rachel Brown	NEW HAMPSHIRE	Caleb B. Dobbins, P.E. Douglas Gosling William Carter
HAWAII	John Williams	NEW JERSEY	Dennis Ortiz
IDAHO	Brent Jennings, P.E. Steve Spoor	NEW MEXICO	Peter Weykamp
ILLINOIS	Aaron Weatherholt, P.E.	NEW YORK	Lacy D. Love, P.E.
INDIANA	Todd Shields	NORTH CAROLINA	Jennifer P. Brandenburg, P.E. Dan Holderman
IOWA	Bob Younie, P.E.	NORTH DAKOTA	Brad Darr
KANSAS	Roy D. Rissky, P.E. Peter Carttar, P.E. Tim D. Cunningham	OHIO	David Ray, P.E., P.S. Halle Jones Capers, P.E., S.I.T.
KENTUCKY	Nancy B. Albright	OKLAHOMA	Kevin S. Bloss Tom Wadley
LOUISIANA	Gill M. Gautreau Janice P. Williams, P.E. William Drake Jr.	OREGON	Lucinda M. Moore
MAINE	Michael E. Burns Brian T. Burne John E. Buxton David Bernhardt, P.E.	PENNSYLVANIA	Daryl R. St. Clair W. James Smith Charles C. Goodhart
		PUERTO RICO	Jorge A. Vega-Barrios
		RHODE ISLAND	Paul R. Annarummo
		SOUTH CAROLINA	James J. Feda
		SOUTH DAKOTA	Ed Rodgers, P.E. Jason Humphrey

TENNESSEE	Joe Holt Greg Duncan Chris Harris	VIRGINIA	Erle W. Potter Anwar S. Ahmad, P.E., C.E.M. Robert E. Prezioso, P.E.
TEXAS	Toribio Garza	WASHINGTON	Robert "Chris" Christopher, P.E.
UTAH	Carlos Braceras Richard L. Clarke, P.E. Steven J. McCarthy, P.E.	WEST VIRGINIA	Steven B. Cole, P.E.
VERMONT	Scott A. Rogers Wayne Gammell, P.E.	WISCONSIN	David I. Vieth Thomas R. Lorfeld
		WISCONSIN	John Kinar, P.E.
		WYOMING	Ken L. Shultz, P.E.

U.S DOT MEMBER

FHWA	Eugene Hoelker Wade Casey Christopher Newman Paul Pisano William Beatty Steve Mueller Peter Kopac Mike Moravec Celso Gatchalian
------	---

ASSOCIATE MEMBER— INTERNATIONAL

BRITISH COLUMBIA	Rodney Chapman
NEW BRUNSWICK	Kenneth Connell
NOVA SCOTIA	Bruce Fitzner
ONTARIO	Jeff Baker
SASKATCHEWAN	Brent Marjerison, P.E.

OTHER

TRB	Frank Lisle Jr., P.E. Amir N. Hanna
-----	--

NCHRP PROJECT 14-16 PANEL FOR AASHTO GUIDELINES FOR VEGETATION CONTROL

Chair

John W. Rowen
Vegetation & Environmental Program
Manager
New York State DOT

Juanita M. Owens, P.E.
Assistant Bureau Chief Research &
Development
Alabama DOT

Other Liaison

John W. Bell, P.E.
National Road System O&M Engineer
USDA Forest Service

AASHTO Monitor

Mark C. McConnell, P.E.
Assistant State Maintenance Engineer
Mississippi DOT

Joy H. Williams
Agronomist
Iowa DOT

William W. Witt
Professor
University of Kentucky

NCHRP Staff

Christopher J. Hedges
Senior Program Officer
Danna Powell
Senior Program Assistant

Members

Jack Broadbent
Roadside Management
California DOT
Charles Edson
Vice President
Greenman-Pedersen, Inc.

FHWA Liaison

Bonnie Harper-Lore
Restoration Ecologist
Federal Highway Administration

TRB Liaison

Frank N. Lisle
Engineer of Maintenance
Transportation Research Board

FOREWORD

These guidelines will be of interest to local, regional, state and federal officials as well as other transportation professionals who work with them in dealing with roadside vegetation management. They will be of particular interest to those roadside vegetation managers just beginning their careers. The guidelines provide an overview of current agency practices, recent literature findings, and research on roadside vegetation management. Their primary purpose is to assist roadside vegetation managers in integrated roadside vegetation management decision-making processes into highway project planning, design, construction, and maintenance, as well as to document existing research and practice. Roadside vegetation managers are often faced with problems for which information already exists, in the form of reports and documents, or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated and as a result much of this useful information may go unused by the majority of roadside vegetation managers. These guidelines incorporate the current knowledge and practice of roadside vegetation management. The guidelines also include information extracted from survey responses from 29 state agencies, a glossary that defines technical terms and acronyms, and a compendium of 40 common roadside invasive species, with descriptions of each species, its biology, and common methods of control.

PREFACE

The impetus to writing these guidelines came about from the realization that there was an enormous amount of practical information on roadside vegetation management available but much of it was not being used because it was scattered and unevaluated. The information was dispersed not only in the mainstream literature, but in localized documents and research reports within government agencies. Upon undertaking this task, it quickly became apparent that another major source of the most current practical information on roadside vegetation management was that of the undocumented experience and expertise of roadside vegetation management practitioners. The unselfish cooperation of these individuals has greatly enhanced the utility of these guidelines. These guidelines provide DOT executive managers, middle managers, and supervising practitioners with a toolbox of effective strategies for planning and executing integrated roadside vegetation management programs.

ACKNOWLEDGEMENTS

This study was requested by the American Association of State Highway and Transportation Officials (AASHTO), and conducted as part of the National Cooperative Highway Research Program (NCHRP) Project 14-16. The NCHRP is supported by annual voluntary contributions from the state Departments of Transportation. The report was prepared by a team led by Ian Heap and including David Nelson and Joseph DiTomaso. The work was guided by a task group led by John Rowen and including John W. Bell, Jack Broadbent, Charles T. Edson, Bonnie Harper-Lore, Frank Lisle, Mark C. McConnell, Juanita M. Owens, Danna Powell, Joy H. Williams, and William W. Wit-tand. Thanks are also given to the many state department of transportation vegetation managers that participated in the survey. The project was managed by Christopher Hedges, NCHRP Senior Program Officer. Graphic design and layout by Mario Olivero, AASHTO Senior Graphic Designer.

APPENDICES TABLE OF CONTENTS

APPENDIX A: FULL SURVEY RESULTS A-1

APPENDIX B: COMMON INVASIVE WEEDS B-1

APPENDIX C: DEFINITIONS OF TECHNICAL TERMS C-1

REFERENCES R-1