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# **A Guidebook for Developing Highway Maintenance Vegetation Management Plans as Part of Strategic Planning for the New York State Department of Transportation**

Final Report

SPR Research Project No. C-06-24

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Prepared For:

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(NYSDOT)

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## **DISCLAIMER**

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# 1 EXECUTIVE SUMMARY

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## **Overall Project: Integrated Vegetation Management Program Enhancements**

Five research tasks related to roadside right-of-way (ROW) vegetation management are being conducted by the State University of New York College of Environmental Science and Forestry (SUNY-ESF) for the New York State Department of Transportation (NYSDOT).

General objectives for the research are as follows (as presented in the problem statement provided by the NYSDOT / University Transportation Research Center [UTRC] RFP [RFP Number: C-06-24; dated April 2, 2009] [shortened from original text]) (NOTE: there are only four objectives, generally one for each of the first four Tasks – Task 5 is about reporting and technology transfer and did not have a specific objective other than to write and provide other accessible research materials, e.g., workshops, factsheets, presentations at meetings).

- Objective No. 1: Update the Department’s Integrated Vegetation Management Plan to reflect changes in work practices.
- Objective No. 2: Develop simple decision support tools that NYSDOT roadside vegetation managers can use to decide which vegetation management treatments are most suitable for their roadsides/transportation assets and to help schedule treatments for maximum effectiveness.
- Objective No. 3: Undertake field research on the effectiveness of alternatives to herbicides in controlling unwanted roadside vegetation on a sample of State highways.
- Objective No. 4: Undertake research on whether cut stump applications of glyphosate-based herbicides, such as Accord and Roundup, control Oriental bittersweet (*Celastrus orbiculatus*) in a manner that is efficacious, consistent with regulations and safe to workers and the environment.

SUNY-ESF began meeting these objectives in 2010 by working on five tasks, each with a sequence of sub-tasks and associated deliverables. The current report is the first of two Final Reports associated with Objective No. 1.

## **Task 2: Vegetation Management Planning Support for NYSDOT Regions and Residencies**

### ***Study Objective***

Task 2 had one objective:

Objective No. 1: Develop an advisory paper on how to undertake local plans and work plans to strengthen vegetation management. The paper shall be developed in a way that reflects general vegetation management best practices for planning and treatment. The information shall also

reflect safety, infrastructure preservation, budgetary, environmental and socioeconomic factors that influence roadside vegetation management.

### **Study Benefits**

This task and associated advisory paper could be used by NYSDOT to guide vegetation management planning and documented choices, help schedule treatments for maximum effectiveness, and better communicate with stakeholders about decision-making processes in roadside right-of-way vegetation management.

### **Rationale**

Task 1 addressed the processes and issues with preparing an agency-wide strategic vegetation management plan. However, transportation agencies need plans for shorter time horizons and smaller organizational units than those expected to be in an-agency-wide strategic plan.

### **Methods**

The New York State Department of Transportation (NYSDOT) *Highway Maintenance Vegetation Control Planning Guide* described in this guide is a tailored compilation of existing guidebooks and select other planning and performance references. It provides a suggested format and contents if the agency needs to prepare vegetation management plans at a local level. The guidebook is organized around key components of a resource management plan, principally from the Department of the Interior Bureau of Reclamation's 2003 *Resource Management Plan Guidebook*. Additionally, a variety of other right of way and vegetation management guidebooks and texts were reviewed for relevant ideas.

### **Outcome**

A framework for the development of a highway maintenance vegetation management plan (VMP) was developed and includes a suggested format that contains certain planning components. This framework, including descriptions and definitions of the planning components, is intended to provide direction, consistency and uniformity in the preparation of an VMP.

### **Future Work**

A region or residency could use this guidebook to produce the first VMP, which would test the guide components and their validity and usefulness. A model plan demonstrating how each of the components should be formatted and completed would be a useful companion to this guide in its application. This guide is really a first draft based on research on best practices. It is expected that it will be revised in the near future with use and application.

## 2 PREFACE

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There are many guidebooks available for natural resources management planning, including specific ones aimed at state transportation agency vegetation management programs. Rather than create a new guidebook, this *Highway Maintenance Vegetation Control Planning Guide* is a tailored compilation of existing guidebooks and select other planning and performance references that can be used by regions or residencies who wish to undertake local vegetation management planning. The basis of this guidebook is the Department of the Interior Bureau of Reclamation's 2003 *Resource Management Plan Guidebook* (DOI BOR 2003). The organization and topics around key components of a resource management plan is based on this text (much of the text is either paraphrased or copied near verbatim) and was tailored to address vegetation management concerns on NYSDOT roadside rights-of-way. In addition, a variety of other guidebooks and texts were gleaned for salient ideas on rights-of-way and vegetation management planning, most notably the *ROW Steward Technical Requirement and the Accreditation Standards for Assessing IVM Excellence* ([www.rowstewardship.org/standards](http://www.rowstewardship.org/standards)). The principal for this report (C. Nowak) was largely responsible for much of the writing in the accreditation standards, and his writing was liberally re-applied and re-formed in select areas of the guidebook. Additionally, this guidebook was developed in a way that reflects general vegetation management best practices for planning and treatment. Many of the planning components ascribed to in this guidebook are consistent with formalized Integrated Vegetation Management Performance standards and best management practices (ANSI 2012; Miller 2014). Finally, the reader and user of this guidebook is referred to a companion treatise on planning for NYSDOT, wherein six of the core components of planning documentation as referenced in this guidebook are presented in more detail (Nowak 2015).

### **Literature Cited**

ANSI (American National Standard Institute). 2012. ANSI A300: *American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Management – Standard Practices (Integrated Vegetation Management a. Utility Rights-of-Way), Part 7*. Tree Care Industry Association, Manchester, NH.

DOI BOR (Department of the Interior Bureau of Reclamation). 2003. *Resource Management Plan Guidebook: Planning for the Future*. U.S. Department of the Interior, Washington, DC. Web accessed March 2015: <http://www.usbr.gov/pmts/planning/RMPG/RMPG.pdf>

Miller, R.H. 2014. *Best Management Practice, Integrated Vegetation Management for Utility Rights-of-Way*. International Society of Arboriculture, Martin Graphics, Champaign, IL.

Nowak, C.A. 2015. *A Brief Survey of Strategic Planning Elements for Department of Transportation Vegetation Management Programs*. Final Report associated with SPR Research Project No. C-06-24, prepared for the New York State Department of Transportation, Albany, NY.

ROWSC (Right-of-Way Stewardship Council). 2014. Accreditation Standards for Assessing IVM Excellence. Dovetail Partners, Inc., Minneapolis, MN. Website accessed March 2015: [http://www.rowstewardship.org/resource\\_pdfs/2014\\_rowsc\\_accreditation\\_standards.pdf](http://www.rowstewardship.org/resource_pdfs/2014_rowsc_accreditation_standards.pdf)

# 3 INTRODUCTION

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This guide book will help a Region or Residency develop a Highway Maintenance Vegetation Management Plan (VMP) that contains pertinent information that integrates and displays management actions and directions, implementation strategies, and monitoring procedures, as well as other plan decisions that apply to vegetation management of an area of right-of-way managed by the New York State Department of Transportation (NYSDOT). If a Region or Residency had the need to prepare a VMP, it should also contain information that directly relates to decisions made and information collected as a result of following the major steps in NYSDOT's planning process (e.g., identification of issues, opportunities and constraints, resource inventory, and the formulation of goals and objectives). The VMP also contains maps and attachments and other information relevant to the way in which an area is to be managed. The VMP is a public document that is clear, understandable, and readily available for NYSDOT staff to follow and implement.

To provide consistency and uniformity in the preparation of the VMP documents, it is recommended that each respective VMP follow a format that contains certain components, some of which should be considered essential. However, since the guidance provided in this guidebook is discretionary, individual regions and residencies have the flexibility to modify the format of the VMP and select the components appropriate to their situations. It is important to remember that the essential components of the VMP should be in the order presented in this guidebook, which is a logical order based on a normal planning process.



# 4 STANDARD FORMAT

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It is recommended that the components listed below appear in the VMP document in the order they are listed below. Some optional components are also identified.

Below is the suggested format of the components of a VMP. An explanation of each component follows in Section 5.

An organization may have never prepared a VMP and may not have all the recommended information listed in the format below and described in this chapter. In that case, the organization should prepare as complete a VMP as possible and add information in subsequent plan updates.

1. Cover
  2. Inside Cover
  3. Preface (optional)
  4. Executive Summary (optional)
  5. Abbreviations and Acronyms
  6. Table of Contents
  7. Essential Components Included in a Resource Management Plan (A through Q should be grouped and arranged in logical order)
    - A. Introduction
    - B. Purpose Statement
    - C. Authority
    - D. Plan Organization and Scope
    - E. Management History
    - F. Location / Setting
    - G. Management Framework
    - H. Planning Process
    - I. Opportunities and Constraints
    - J. Issues and Issue Categories
    - K. Existing Resource Inventory / Existing Condition
    - L. Goals and Objectives
    - M. Desired Future Condition
    - N. Management Action(s) / Direction(s)
    - O. Implementation Procedure (Prescriptions, Monitoring, Plan Revision or Amendment and Standards and Guidelines)
  8. List of Preparers
  9. List of References / Bibliography
  10. Glossary of Terms
  11. Attachments / Appendices
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# **5 STANDARD FORMAT COMPONENTS INCLUDED IN A HIGHWAY MAINTENANCE VEGETATION MANAGEMENT PLAN**

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The following information describes each of the components that should be presented in a VMP. The components are listed in the format order in which they are cited above. To aid the user of this guidebook and to facilitate consistency in the preparation of VMP documents, examples with information to be included in certain components of actual VMPs have been provided in the Appendices or via a separate, model NYSDOT VMP. Brief narrative descriptions are used to explain what information should / could be addressed within each component.

Following are the components of a VMP and suggested information that could be included.

## **1. Cover**

The front cover of a NYSDOT VMP should have the following information:

The Region or Residency name in the upper half of the page in large bold type.

- The date the VMP was published below the Region/Residency name (include at least the month and year, such as “June 2015”).
- “New York State Department of Transportation” preferably located in the lower left-corner, with the NYSDOT logo to the right.
- The name of the region or residency office that is managing the VMP is being administered below the NYSDOT name.
- Other graphics, backgrounds, and color on the cover may be used at the discretion of the office preparing the VMP.

## **2. Inside Cover**

The inside cover (back of the front cover) should contain the mission statement and contract information associated with the preparation of the VMP.

The information should be listed as follows:

- Mission Statement of the New York State Department of Transportation

- *It is the mission of the New York State Department of Transportation to ensure our customers - those who live, work and travel in New York State -- have a safe, efficient, balanced and environmentally sound transportation system.*
- Mission statement of NYSDOT's vegetation management program is: *"to provide a roadside environment that is safe, environmentally friendly and appears as though it is being managed by nature"*.
- If prepared by a consultant, the name, mailing address, and government contract number should be listed.
- Acknowledgement of certain groups, individuals, or entities that provided valuable input into the development of the VMP could be made here.

### **3. Preface**

A Preface could be provided that briefly states the purpose of the VMP or to articulate why some action was not addressed.

### **4. Executive Summary**

An Executive Summary could be provided that summarizes the planning process and the contents of the VMP. This would give the reader a brief narrative description of what is contained in the VMP (i.e., critical issues, management actions or directions, public involvement and consultation efforts, and others).

### **5. Abbreviations and Acronyms**

A list of abbreviations and acronyms should be included in the VMP.

Following is an example of a list of common abbreviations and acronyms:

BMPs	Best Management Practices
GIS	Geographic Information System
MOU	Memorandum of Understanding
NYSDOT	New York State Department of Transportation
ROW	Right-of-Way
ROWs	Rights-of-Way
VMP	Highway Maintenance Vegetation Management Plan

## **6. Table of Contents**

The next page (or page after the abbreviations) of a VMP should be a Table of Contents. Headings can be added for tables, figures, photographs, and maps, as necessary and appropriate, and headings can be included to indicate attachments/appendices, followed by their respective names and page numbers.

## **7. Essential Components Included in a Region (or Residency) Vegetation Management Plan**

The following components should be considered essential and included in the main body of a VMP. The below-mentioned components are not necessarily chapters within the VMP. Several of the essential components can be combined to form an individual chapter (e.g., the introduction, purpose statement, authority, organization and scope, project history, and location/setting essential components can be combined to form the introductory chapter of the VMP). Suggestions on ways to combine certain components in the same VMP chapter, when appropriate, are described below.

- A. **Introduction.** – This provides a brief but concise overview of the document. It should state that the VMP is to provide management actions or directions that protect the rights of entities based on existing easements, contracts, and legislation, while identifying and scheduling measures to achieve a desired future condition. It should state that the VMP establishes management actions or directions, both area-wide and specific, in the form of goals, objectives, standards and guidelines, and that the VMP includes monitoring and evaluation requirements to ensure conformance. It should indicate the planning period on which the VMP was based and that it will be updated or revised, as appropriate, over time. This component is usually part of the introductory chapter of the main body of the VMP and should be accompanied by a location map showing the location of the management area within the State/region the VMP is being prepared.
  
- B. **Purpose Statement.** – This component states the reason(s) for preparing a VMP and indicates that the VMP is to guide future right-of-way vegetation management to ensure lands and waters are maintained and protected for authorized purposes. It should also state that the VMP establishes consistent management directions and guidance and ensures that activities or uses are in compliance with applicable Federal, State, and local laws, regulations, and policies.
  
- C. **Authority.** – This component should include authorizations to prepare the VMP, management authorities, and others, as appropriate. This should also include applicable legislation, or other specific laws that address the management of lands and vegetation, how they are to be managed, and who is authorized to manage the land and the vegetation. Indications should be made as to whether or not the ROW is owned in fee or if use and

management are based on easement. Procedures and processes for controlling unauthorized uses could be included in this component, as well as including other policies and plans for action to address other uses in the ROW.

- D. **Plan Organization and Scope** – This component should inform the reader of the way the document is divided into chapters.
- E. **Management History.** – This component should briefly explain the management history of the rights-of-way and include a description of future management, purposes for which the vegetation management work was authorized, and dates when past management cycles were begun and completed. National, regional, or local interagency Memorandums of Understanding (MOUs) for management of lands and vegetation would be addressed, along with policy letters from various administrators. Additional information on the history of the area may be added, as appropriate.
- F. **Location/Setting.** – This component should state the location: counties and towns in which the rights-of-way are located, and the distance and direction from cities, towns, parks, historic sites, mountain ranges, Indian reservations, and other major landmarks. Regional maps could be included that visually, spatially portray the management area.
- G. **Management Framework.** – This component should include relevant information pertaining to all parties that manage or would be interested in and eligible to manage the rights-of-way through contracts, agreements, MOUs, etc., by State or Federal statute (e.g., wetlands; companies that have mowing or herbicide contracts; work that local governments do under arterial maintenance agreements). Information pertaining to management entities that do not manage through an agreement, but manage pursuant to existing laws and regulations, such as State Department of Environmental Conservation, should be provided.
- H. **Planning Process.** – This component should include an overview of the planning processes used to develop and analyze, and select the preferred RVMP treatment alternatives. It is not enough to show the reader of the RVMP a schematic that represents the planning process and the way in which they are related. It is more important that the reader understand why decisions were made.
- I. **Opportunities and Constraints.** – This section documents any opportunities and constraints that were identified in the planning process. This component of the VMP should contain a discussion of the opportunities and constraints that affect NYSDOT’s ability to manage the area covered by the VMP. If possible, the opportunities and constraints should be identified for each of the resources within the right-of-way area. An environmental constraints map showing critical habitat, steep slopes, wetlands, and other features could be included to

supplement this component. Opportunities and constraints in the management areas could be categorized as follows:

- a. *Legal* – Those arising from laws, regulations and authorities that pertain to the management area and the opportunities and constraints they establish, including funding, staffing, work practices, authorization for non-State partners to manage, and safety of vegetation management workers. The plan document should include a list of applicable laws, regulations, standards, BMPs, and administrative requirements that typically apply to vegetation maintenance operations.
- b. *Environmental* – Factors that establish opportunities or constraints: vegetation, soils, topography (steep or gentle slopes), wetlands, wildlife, cultural resources, historical resources, endangered species, water quality, and others.

J. **Issues and Issue Categories.** – During plan preparation, the region, residency or public will identify issues arising from vegetation management treatments. This component should document the issues. It is suggested that similar issues be grouped into issue categories to facilitate the formulation of goals and objectives and ultimately the establishment of management action(s) / direction(s) that will address each issue category. Following are several examples of issue categories that could be created into which similar issues could be grouped.

- a. *Health and safety* – This issue includes the manner in which vegetation management choices in the plan will affect the health and safety of: 1) travelers; 2) transportation workers; and 3) adjoining landowners.
- b. *Asset protection* – This issue identifies transportation assets and considers the manner in which vegetation choices affect the condition of transportation assets. The condition of other assets may be considered here or under the specific heading in issue c through g, below.
- c. *Water resources* – This issues includes the effects of right-of-way vegetation management on water quality and water quantity.
- d. *Recreation and visual resources* – These issues relate to the relationship between recreation and the rights-of-way, including potential conflict among different types of users and natural resources, concerns of dispersed and developed recreation uses with existing management, peak use concerns for public safety and its resource impacts, and scenic qualities that are important to the overall recreational or driving experiences.

- e. *Natural resources* – It is important to identify issues relating to vegetation, wildlife (including migratory birds), fisheries, threatened and endangered species, and invasive, exotic plants. Issues may be related to management, seasonal conflicts, conservation measures, grazing practices, user conflicts, noxious weeds, pests and others.
  - f. *Cultural resources* – Cultural and historic resources issues along the right-of-way may be related to NYSDOT management of a historic or cultural resource on the right-of-way, or managing the right-of-way in a manner to protect historic or cultural resources by the right-of-way.
  - g. *Partnerships* – this issue deal with access to the right-of-way by parties that are not managing the right-of-way for transportation purposes. Such parties could include Adopt-a-Highway volunteers, Sponsor-a-Highway organizations, or parties undertaking work on the right-of-way under the authorization of a highway work permit.
  - h. *Public information* – These issues pertain to providing public information about right-of-way conditions through different media (e.g., internet, brochures, radio, maps, pamphlets, and signage). The information could be about safety concerns, natural resources, recreational assets, or aesthetic concerns.
  - i. *Other considerations* – This broad area covers all land management actions or directions, such as trespass, adjacent land uses, utilities, use authorizations, trails, fencing, and others.
- K. Existing Resource Inventory/Existing Condition.** – This component should provide a complete as possible a description of the physical, biological / ecological and socioeconomic conditions of the right-of-way. This should provide a baseline for developing the VMP, monitoring resources, and measuring successful implementation of the VMP. NYSDOT has many existing sources of inventory information and it may be appropriate to assemble other inventories depending on the issues found on the right of way.
- L. Goals and Objectives.** – Goals and objectives should be established to address the issues and issue categories mentioned above. The goals should be expressed in general terms and should describe a desired condition to be achieved within the planning life of the VMP. Following are several examples of goals (NOTE: action words commonly included in a goals statement are underlined for to promote clarity in use) that could be established for different issue categories.
- a. *Health and safety* – Goals in this area could include providing a safe and healthy environment for travelers and workers within the management area.

- b. *Asset Protection* – Goals in this area could include protecting facilities and purposes; eliminating conflicts; and controlling facilities for security purposes.
  - c. *Water resources* – Goals in this area could include protecting water integrity, controlling pollution, and supporting programs that enhance stated conditions for the management area.
  - d. *Recreation and visual resources* – Goals in this area could include expanding, maintaining, limiting, improving, managing, developing, or rehabilitating recreational facilities; providing accessibility opportunities; and evaluating impacts of recreation use within the management area.
  - e. *Natural resources* – Goals in this area could include: complying with laws and Executive orders; and protecting, improving, and enhancing wildlife, wetlands, fisheries, vegetation, soils, noise and air quality resources within the management area.
  - f. *Cultural resources* –Goals in this area could include: complying with laws and Executive orders; and protecting, improving, and enhancing cultural and historic resources within the management area.
  - g. *Partnerships* – Goals in this area could include working with, maintaining, supporting, adding, pursuing, discontinuing, and improving partnerships with various groups people, to achieve a stated goal for the management area.
  - h. *Public information* – Goals in this area could include providing information through interpretive media, newsletters, or maps, etc.
  - i. *Other considerations* – Goals in this area could include controlling lands to ensure appropriate and compatible land uses, resource protection, user safety, trespass resolution, and avoidance of conflicts within the management area.
- M. Desired Future Condition.** – This component is a short narrative of what the future of the right-of-way should be as a result of implementing the VMP. It may be to extend asset life; achieve sustainable vegetation conditions and wildlife levels; enhance or protect wetlands; or improve coordination and cooperation among entities.
- N. Management Action(s)/Direction(s).** – This component provides management actions or directions for the management area in response to surrounding land use, public issues and other management concerns.

As recommended earlier, the goals and objectives for vegetation management are typically displayed in this component section with the applicable management action or direction. Implementation of the management activities and directions should result in meeting objectives and attaining goals of the management area. All uses and activities of the management area, including permits, contracts, and other instruments, should be consistent with the following:

- a. *Region- or residency-wide actions and directions* – These are overall, general requirements that equally apply to the entire management area.
- b. *Specific area management actions and directions* – These are requirements that only apply to a specific area identified within the management area that are unique to that area. Management actions at this smaller scale could be referenced to accompanying maps and photos.

The management actions or directions can be written in a narrative or table format.

Many issues that require vegetation management action are likely to be similar from one region or residency to another; therefore, the goals and objectives and associated management actions and directions are likely to be similar from one RVMP to another.

- O. **Implementation Procedures (Prescription, Monitoring, Plan Revision or Amendment, and Standards and Guides).** – Four key elements of this component are: 1) prescription; 2) monitoring; 3) plan revision or amendment; and 4) standards and guidelines.

This component should state that the implementation of the VMP by NYSDOT and its partners will be guided by existing and future laws, Executive Orders, regulations, and policies and guidelines, and that the VMP is designed to supplement existing direction provided by these sources. It should also indicate that there is a need for coordination and cooperation with partners and administering entities for the successful implementation of the VMP.

The monitoring and standards and guidelines are often incorporated into an implementation schedule. Other items that could be included in the implementation schedule are the identified management action (specifically what is to be accomplished), the target year or years for implementing the management actions and directions, priority level, funding source, and the responsible entity or entities, including appropriate contacts (i.e., referencing an individual, office, city, county, institution, or entity and their appropriate phone and/or fax numbers and physical and/or email addresses may be helpful). The implementation schedule can be in a narrative or table format.

- a. *Prescription.* – General directions on how to use prescriptions in relation to the VMP should be provided (see Appendix A for a treatise on writing prescriptions for vegetation management on roadside rights-of-way).
- b. *Monitoring.* – Monitoring efforts taken to track the success of implementing management actions and directions should be included in the implementation schedule (i.e., how to evaluate, observe, enforce, comply, achieve, document or report concerning action, or determine that the management action and intended effects was achieved). It should be mentioned that these monitoring efforts would occur periodically over the life of the VMP.

Tables can be a valuable asset when performing monitoring. A table format that facilitates monitoring of the multiple resources by various disciplines can expedite these efforts.

- c. *Plan Revision or Amendment.* – VMPs should be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as respond to changing environmental, social and economic circumstances. It should be stated in the VMP document that a revision or update would occur as necessary, but at least every 3-5 years. State the procedures to revise or amend the RVMP in this component.
- d. *Standards and Guides.* – It is recommended that each identified management action or direction be accompanied by standards or guides that state the laws, agreements, best practices or other directives to follow in meeting the management action or direction.

## 8. List of Preparers

Listing those who had a part in preparing the VMP is an important recordkeeping effort. It is recommended that this be kept on an historic basis through the VMP plan revision process. To help in the organization of this list, the following categories are recommended:

- a. *NYSDOT planning team* – These are NYSDOT employees who participated in the development of the VMP. Each entity in the list should also include “New York State Department of Transportation”, team members’ names, positions, and area of expertise.
- b. *Cooperating entity representatives* – This should include the Federal, State, county (or other entities), department, representative name, position, and area of expertise.

- c. *Consultants under contract (reference contract number), if any* – This should include the name of the consulting firm(s), and consultant name(s), position(s), and area(s) of expertise.
- d. *Overview of Public Involvement Efforts* – This should list the public involvement that was implemented, including meetings with managing entities, affected jurisdictions, users and area-wide special interest groups, general public scoping, and any surveys and mailings such as distribution of news releases. The date that the public involvement process was begun should be mentioned along with the number of public meetings and the number of attendees at each meeting.
- e. *Overview of Consultation Efforts* – This should include a discussion of the consultation efforts that occurred during the planning process. The discussion should include both the formal and informal consultation efforts that may have been initiated with various entities. Dates that letters were mailed to certain entities, meeting dates, results of meetings, and other findings should be documented in the VMP.

## **9. List of References/Bibliography**

This is the documentation of sources cited in preparing the VMP. These should be in alphabetical order and in standard reference format.

## **10. Glossary of Terms**

List terms to be defined in alphabetical order, followed by their definitions. If appropriate, the use of unusual and/or technical terms should be cited or may be footnoted when used in the document.

## **11. Attachment/Appendices**

These include unique and important information that pertains directly to the VMP and should be attached to or reside with the document. These could include studies, reports, inventories, documents, tables, maps, figures, and photos determined important in understanding and implementing vegetation management work. It is suggested that highly technical and lengthy reports not be included as attachments or appendices; instead, refer the reader to the location where this types of reports can be obtained.

## **6 ACKNOWLEDGEMENTS**

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# **A APPENDIX – PRESCRIPTION WRITING**

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A Highway Maintenance Vegetation Management Plan (VMP) as outlined in this report is meant to be a strategic plan. The VMP, as a strategy document, provides general, consistent direction for tactical and operational planning in terms of philosophy, policy and procedure across the whole area of management responsibility. It is meant to be a plan that can function for a decade or two and still be useful. It not only provides directions as to what needs to be done in the managed system, and generally how to get it done, but provides an overview of why management directions have been developed, and how management activity successes or failures will be accounted for through monitoring and evaluation.

The VMP can include directions on how to prescribe treatments across the management area over time.

Tactical planning is how each right-of-way (ROW) may be examined and treated year-by-year.

Operational plans – or prescriptions – are site-specific / at-time-of-management activity accounts of bases and outcomes of decision making.

A vegetation management prescription is usually a written document that describes the following:

1. Current state of a section of ROW
2. How that section of ROW is to be changed, that is, which vegetation is to be removed or left to purposefully shift species composition, density and structure
3. Why the ROW site is to be changed (justification for the treatment) and
4. What is the expected response of the vegetation.

The “Whys” include the bases for the decision (e.g., vegetation management objectives, current state of ROW site), an accounting of vegetation management treatment methods and systems, and justification of the treatment (safety, asset protection, ecological, social, economic).

The “Whats” include what the ROW site is expected to look like in both the short-term (within the year) and long-term (1-10 years).

Additionally, various administrative information is needed, including a map to show the location of the ROW site, and an accounting of unique site considerations (e.g., access, environmentally-sensitive areas, cultural resources, landowner situations).

With all of these elements, a prescription is very much a management plan, and different from a strategic plan in term of scale (time and space).

A key concept in the prescription is that the prescriber and the organization are held accountable the decision to manipulate the ROW site, particularly in how the site is expected to respond to the treatments.

Years after the vegetation management treatment is applied, the next manager can return to the site, observe the current condition, and compare that to the predicted.

If there is a match between predicted and actual outcome, the vegetation manager will better know that if the treatment is applied to another site with similar starting conditions we can expect similar, predictable results. If predicted and actual outcomes do not match, then we are left to try other treatments in the future based on objective information founded in the written prescription.

In the right-of-way vegetation management industry, the prescription is a key part of expected practice in Integrated Vegetation Management (Nowak and Ballard 2005). In the Right-of-Way Stewardship Council's 2014 Accreditation Standards for Assessing IVM Excellence (ROWSC 2014), the need for site-specific management prescriptions is well established. In ROWSC (2014), prescriptions are expected to be used to define treatments for each ROW vegetation management unit (NOTE: specific management units are expected to be designated within each ROW to delineate sites that warrant different management treatments, e.g., buffers to protect water resources, conservation areas, and vegetation communities that may cause a change in successional directions or rate).

Site-specific prescriptions include justifications of treatment choices that include considerations of safety, economic, ecological, and socioeconomic factors, as well as administrative opportunities and constraints.

Prescriptions may be established in advance of the ROW work or determined at the time of scheduled vegetation management through the use of detailed IVM specifications that define treatment prescriptions for the control of incompatible species and to manage for the establishment of compatible species. In either case, IVM prescriptions include: 1) ROW land management unit designation; 2) description of current vegetation including incompatible, target species, compatible species, and environmental conditions; 3) desired future vegetative cover types and conditions being managed for; 4) definition of vegetation management treatment method being prescribed; 5) justifications for treatments prescribed based on tolerance thresholds and economic, ecological, environmental, stakeholder, and administrative considerations; and 6) site-specific maps that detail ROW vegetation management units, and show important cultural and environmental features.<sup>1</sup>

#### Literature Cited

Nowak, C.A., and B.D. Ballard. 2005. A framework for applying Integrated Vegetation Management on rights-of-way. *Journal of Arboriculture* 31: 28-37.

ROWSC (Right-of-Way Stewardship Council). 2014. Accreditation Standards for Assessing IVM Excellence. Dovetail Partners, Inc., Minneapolis, MN. Website accessed July 2015: [http://www.rowstewardship.org/resource\\_pdfs/2014\\_rowsc\\_accreditation\\_standards.pdf](http://www.rowstewardship.org/resource_pdfs/2014_rowsc_accreditation_standards.pdf)

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<sup>1</sup> Text presented here from ROWSC (2014) was originally written by Chris Nowak, author of the current study for NYSDOT, for ROWSC and is presented here near verbatim from that text.