Integrated Vegetation Management BMP – 2nd Edition
Changes and Impact of IVM on Utility Vegetation Management

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Integrated Vegetation Management

- Origins and History Leading to IVM
- Illinois Contribution to IVM development
- The Revised IVM Best Management Practices
Best Management Practices Progression

• Before 1950: Physical Clearing (Manual & Mechanical)
• 1950-1970: Chemical (Broadcast Herbicides) (Ammate, 2,4-D and 2,4,5-T)
• 1970-1990: Selective Vegetation Management
• After 1990: Integrated Vegetation Management

Photo courtesy of Geoff Kempter
Early Broadcast Treatments - Ammate spray - kills all green plants

Note access road is the same in all photos

Game Lands 33 – 1953 Photo courtesy of Jim Orr
Early Broadcast Treatments – Impact on Aesthetics and Ecology

3 – summer foliar with selective, 2,4-D + 2,4,5-T product

2 – selective basal, showing green

1 – Ammate, non-selective product

Note access road is the same in all photos

Game Lands 33 – August 1953 Photo courtesy of Jim Orr
Early Broadcast Treatments – Impact on Aesthetics and Ecology

1 – Ammate, non-selective product, bare ground year after treatments

2 – selective basal, showing green, became large low bush blueberry patch

3 – summer foliar with selective, 2,4-D + 2,4,5-T product

Note access road is the same in all photos

Game Lands 33 – summer 1954 photo courtesy of Jim Orr
Broadcast to Selective

• Broadcast
  – Total Brush Control (all woody species)
  – Ideal: ROW Dominated by Grass

• Selective
  – Limit target vegetation to just tall-growing species
  – Reduce herbicide usage & retain some vegetation
  – Promoted by Rachel Carson in Silent Spring
“The object of brush control along rights-of-way is not to sweep the land clear of everything but grass; it is, rather to eliminate plants ultimately tall enough to present an obstruction to....or interference with wires on rights-of-way. This means, in general, trees. Most shrubs are low enough to present no hazard; so, certainly, are ferns and wildflowers.”
Carson’s “Silent Spring”

“The spraying can often be done by men on foot, using knapsack sprayers, and having complete control over their material. Sometimes compressor pumps and material can be mounted on truck chassis, but there is no blanket spraying. Treatment is directed only to trees and any exceptionally tall shrubs that must be eliminated. The integrity of the environment is thereby preserved, the enormous values of the wildlife habitat remains intact, and the beauty of shrub and fern and wildflower has not been sacrificed.”
“Among the many advantages of selective spraying is the fact that it minimizes the amount of chemical applied to the landscape. There is no broadcasting of material but rather concentrated application to the base of the trees. The potential harm to wildlife is therefore kept to a minimum.”
Carson’s “Silent Spring”

- Dr. Frank Egler (1911-1996) was the source of all sections and comments involving herbicides & vegetation management
Selective Vegetation Management

• “A demonstration of relatively stable low plant covers created by selective application of herbicides ...”
  – Brush Control in Southeastern New York: Fifteen Years of Stable Tree-Less Communities
    Charles E. Pound and Frank E. Egler, Ecology (Jan. 1953)
Selective Vegetation Management

• 1953 began a 50-year investigation into the potential effects of herbicides and ROW maintenance techniques on wildlife and the stability of ROW plant communities.

  – Pennsylvania State Game Lands 33
  – Green Lane Research and Demonstration Area

Dr. William C. Bramble and Dr. William R. Byrnes
Selective Vegetation Management

“The objective of most rights-of-way maintenance programs in the past has been to eliminate all brush.”

USDA Forest Service – 1966
Selective Vegetation Management

“Selective maintenance can be used to eliminate unwanted species while retaining those benefiting wildlife and which do not interfere with the primary use of the right-of-way.”

USDA Forest Service – 1966
After “Silent Spring”

All in 1970

1. Establishment of CEQ (Council on Environmental Quality)
2. Passage of NEPA (National Environmental Policy Act)
3. Creation of EPA (Environmental Protection Agency)
4. First Earth Day
5. NYS: Article VII of the Public Service Law – certification of all new transmission facilities
After “Silent Spring”

- 1972 – the term IPM (Integrated Pest Management) started to be used.
  – IVM traces its origins to concepts of IPM
- 1980 – NY PSC issued an opinion and order on the role of herbicides in transmission ROW management. – Need to use herbicides “selectively”
- 1988 First Use of the term “IVM”
Illinois History

• Selective Vegetation management - ComEd
  – 1950’s selective high volume herbicide application
  – Through the 1980’s many ROWs had been maintained regularly through selective herbicide use for decades
Illinois History

• Selective Vegetation management - ComEd
  – Fewer Transmission lines 40 years ago than today (small stations closed in favor of larger plants far away)
  – “T” replace with Banvel for most uses
Illinois History

• CIPS - Keith Jones
  – Helped develop use of modern herbicides coupled with low volume foliar backpack application
  – Mid-1980’s and 1990’s
• Manufacturer/distributor/contractor support
• Many field trials
Randall H. Miller, Author

• The Review Committee
  – Paul Appelt, Environmental Consultants, Stoughton, WI
  – Jennifer Arkett, Duquesne Light Co., Pittsburgh, PA
  – Geoffrey P. Kempter, Asplundh Tree Experts, Willow Grove, PA
  – Mike Neal, Arizona Public Service, Phoenix, AZ
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  – William Rees, Baltimore Gas and Electric, Baltimore, MD
  – Matt Simons, Atlantic City Electric, Mays Landing, NJ
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The intent of this publication is to serve as a companion to ANSI A300 Part 7 - Integrated Vegetation Management a. Utility Rights-of-way (ANSI 2012).
BMP for IVM

• It is designed to provide practitioners with what industry experts consider to be the most appropriate integrated vegetation management (IVM) techniques to apply to utility right-of-way projects.
BMP for IVM

- Determining the best technique for a particular project takes experience and knowledge because natural conditions are dynamic.
- It is not intended to substitute for the expertise of a utility vegetation manager.
Expanded Definition of IVM

• It is used to systematically choose, justify, selectively implement, and monitor different types of vegetation management treatments.
• Treatment selection is based on control method’s effectiveness, economic viability and environmental impact, along with their suitability for safety, site characteristics, security, socioeconomics and other factors.
Expanded Definition of IVM

• IVM uses combinations of methods to promote sustainable plant communities that are compatible with the intended use of the site, and to control, discourage or prevent establishment of incompatible plants ....
Definition of IVM

Trees that have grown to the point where spark-over or an interruption to service is likely at any moment indicate a breakdown of the IVM program.
Definition of IVM

An IVM approach is both economically and environmentally sound, because preventing establishment of incompatible vegetation is both less costly and less intrusive than removing or pruning large, established trees.
The key steps of IVM consistent with IPM are:

1) Gaining science-based understanding of incompatible vegetation and ecosystem dynamics;

2) Setting management objectives and tolerance levels based on institutional requirements and broad stakeholder input;
3) Selecting and applying treatments from a variety of options, including biological, chemical, manual, mechanical and cultural control methods to produce desired plant communities, with an emphasis on prevention through biological controls, and
4) Monitoring the system to determine effectiveness and necessity of treatments in creating desired plant communities and achieving management objectives. IVM is considered a sustainable endeavor for management of a specific ROW site because of its balanced considerations and actions upon both socioeconomics and environment.
BMP for IVM

• IVM is **not** a set of rigid prescriptions based upon set time periods, repeated unselective mowing or broadcast spraying across entire right-of-way widths without the objective of establishing diverse, compatible plant communities.
ANSI A300, Part 7 – 6 Steps to Plan and Implement IVM

1) Set Objectives
2) Evaluate the Site
3) Define Action Thresholds
4) Evaluate and Select Control Methods
5) Implement Control Methods
6) Monitor Treatment and Quality Assurance
1. Set Objectives

• Objectives should be based on site factors, such as vegetation type, in addition to human, equipment and financial resources.
• Focus should be on environmentally-sound, cost effective control of species that could potentially conflict with the facility,
• promoting compatible, early successional, sustainable, plant communities.
2. Site Evaluation

• Site evaluations are used to assess field conditions for planning purposes.
• Planning can range from establishing programmatic strategies to setting detailed, tactical operational requirements for individual projects.
• Use data to establish or modifying objectives, set budgets, etc.
3. Define Action Thresholds

• Vegetation managers shall define action thresholds that initiate implementation of control methods to achieve management objectives
• Height, density, location or condition targets that trigger specific control methods
• Action thresholds will vary by utility and project
What are Appropriate Action Thresholds?

Action thresholds in IVM are used to determine when incompatible vegetation control is necessary long before it has the potential to violate minimum clearance.
3. Define Action Thresholds

• Thresholds should be set in advance to meet established objectives and be based on the results of site evaluations.

• A cycle based on an established period of time is often not an appropriate action threshold – changes in growth rates, facility use, and land development will affect when vegetation needs to be worked.
3. Define Action Thresholds

Inspection and maintenance schedules should be based on existing vegetation, expected growth rates, past control methods and action thresholds.

Is this the appropriate action threshold?
4. Evaluate and Select Control Methods

• Managers have a variety of controls from which to choose
• Manual, mechanical, chemical (herbicide and tree growth regulators), biological, and cultural options
• Goal: maintain a desirable plant community with available tools, emphasizing biological and ecological control
5. Implement Treatments

• Work should progress systematically
• The best practice is to remove incompatible trees, encourage compatible vegetation, and assure, through ongoing monitoring and maintenance, that trees do not become established in these areas and have no opportunity to violate minimum clearance requirements.
6. Monitor Treatment and Quality Assurance

• Should have systems and procedures in place for documenting and verifying work completion

• Records are necessary for quality assurance and future planning
BMP Expanded to Include Pipelines

IVM is as applicable to pipeline ROW as to Electric ROW
BMP Expanded to include Pipelines

A pipe zone border zone concept can be a part of pipeline IVM.

Figure 1. Pipe zone-border zone concept for integrated vegetation management on gas pipeline corridors (adapted from Yahner et al. 1999).
Potential of IVM for the Future

• Companies consistently using IVM to manage ROW vegetation have seen outstanding results
  – Low stem counts of target species
  – Declining ROW maintenance costs
  – Wildlife habitat benefits
  – Positive experience to point to in ROW site selection proceedings
Potential of IVM for the Future

• Setting objectives
  – Change plans if they don’t work?
  – Encourage or discourage non-native invasive plants?
  – Prairie plants – use the seed bank?

Mowing/treating shrubs out of control in New York with Brown Brush Monitor

Teasel taking over a ROW

Prairie Flowers
Potential of IVM for the Future

• Learn from the past
  – Don’t reinvent the wheel – some of the old ideas still work
  – Keep management educated to the benefits of IVM and the need for consistency

• Embrace new technology
  – IVM and GIS – capture the opportunity

Commonwealth Edison line clearance training session 50+ years ago
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