Setting a Standard of Excellence in IVM

ROW Steward is a proactive industry initiative intended to raise the bar for responsible management of millions of acres of land occupied by electric transmission lines.

By **John Goodfellow**, *BioCompliance Consulting Inc.*

On Aug. 14, 2003, three transmission lines sagged into trees in quick succession, setting in motion cascading failures as protective relays opened on one power system after another. The result: the largest blackout in North American history. This incident resulted in a rewrite of the rules under which utility vegetation managers operate.

While vigorous enforcement and compliance efforts on the part of vegetation managers have driven improvements in power system reliability and a reduction in the liability of potential regulatory citations, there also have been some unintended consequences. Increased vigilance and increasingly aggressive vegetation maintenance activities on transmission rights-of-way (ROW) have the potential to dramatically alter the ecological characteristics of existing transmission corridors and result in unnecessarily disruptive impacts to the environment.

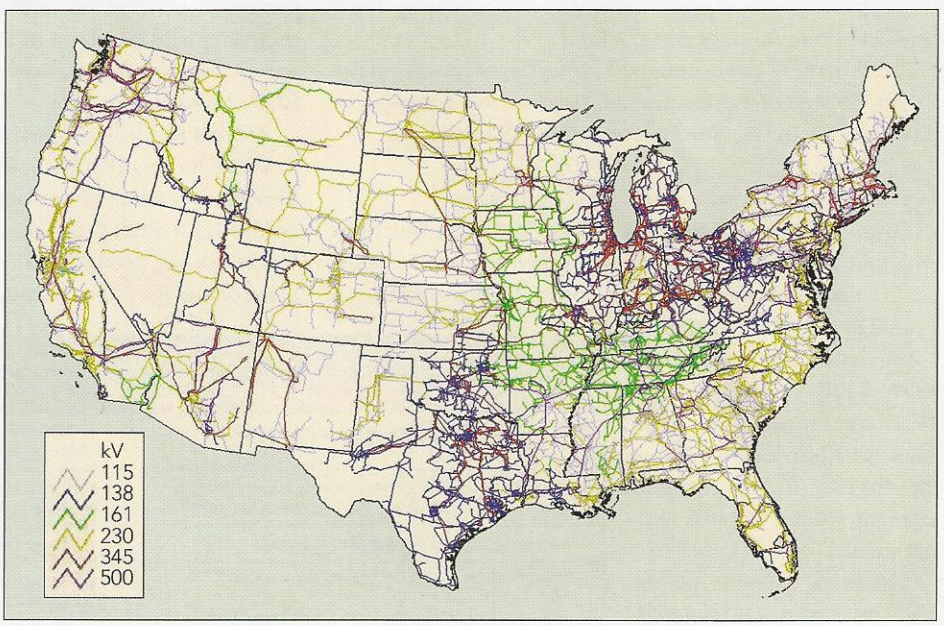
A new initiative known as ROW Steward is taking shape, with an aim of renewing the industry's commitment to the practice of integrated vegetation management (IVM). The intended outcome of this effort is the creation of a means of recognizing excellence in the application and practice of IVM on the North American electric power grid.

Philip Charlton, Utility Arborist Association (UAA) executive director, said, "The UAA is committed to helping utilities be proactive in the use of best management practices and industry standards for sustainability and environmental stewardship. Federal regulations demand they be aggressive in their management of vegetation on high-voltage transmission rights-of-way to ensure service reliability. The ROW Stewardship Accreditation program is an opportunity to recognize those utilities that are demonstratively successful at achieving both and to encourage those that are not."

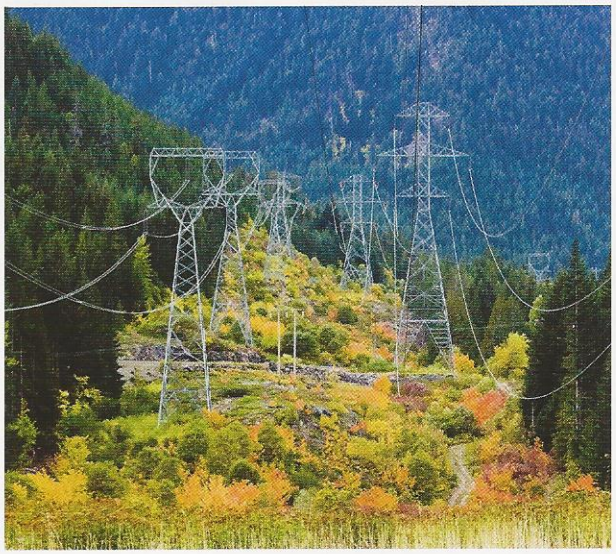
North American Transmission ROW Footprint

The high-voltage bulk power transmission system is spatially dispersed. High-voltage corridors, ranging in width from 100 ft to 300 ft (30.5 m to 91 m), crisscross the United States connecting the nation's population centers. About 160,000 miles (257,495 km) of transmission line are operating at 230 kV to 765 kV, which make up the bulk power grid regulated by the Federal Energy Regulatory Commission.

The North American transmission system in total, in-



The U.S. transmission grid of voltages from 115 kV to 500 kV. (Courtesy of FEMA.)



Low-growing shrub species compatible with overhead transmission lines occupy the ROW and add diversity to the otherwise continuous forest. (Photo by Regis Cordeiro.)

cluding lines operating at 35 kV and above, is estimated at more than 450,000 miles (724,205 km). The Electric Power Research Institute (EPRI) has estimated the total land area being managed as transmission corridors encompasses 8.6 million acres (3.5 million hectares). Other estimates place the total land area being managed as electric transmission corridors as high as 11 million acres (4.5 million hectares).

The extent of land being managed as ROW has attracted the attention of leading natural resource and environmental organizations. The Nature Conservancy (TNC) and the Wildlife Habitat Council are partnering with industry groups, including the UAA, EPRI and the Edison Electric Institute (EEI), to work out the details of this initiative.

Bill Toomey, TNC's director of forest health protection, sees ROW Steward as "an opportunity for TNC to leverage our expertise and improve natural resource management practices on millions of acres of land."

Both the U.S. Environmental Protection Agency and the SUNY College of Environmental Science and Forestry are participating in the effort to create ROW Steward.

Ecological and Environmental Significance

Transmission corridors can provide animal populations with migration corridors and safe passage between habitats, yet in some cases, they may contribute to habitat fragmentation. The open meadow-like cover types that occur on ROW being managed using IVM-based practices are well known to provide rich habitat diversity for the benefit of many species of birds and mammals.

Issues of invasive plants and rare and endangered species also have direct bearing on ROW vegetation maintenance activities. ROW also can provide green spaces for recreational opportunities such as pedestrian and bicycle trails.

"Electric transmission rights-of-way can be managed to provide positive ecological benefits while maintaining reliability," said Richard Loughery, director of environmental activities with the EEI. "The ROW Steward program is an important part of the effort to promote this win-win for the environment and electric utilities."

Josiane Bonneau, director of field programs for the Wildlife Habitat Council, commented, "ROW across the country represent an invaluable opportunity for the creation of native habitats, control of invasive species and enhancement of early successional habitat for nesting birds. Offering landowners, operators, companies and the community a credible system to better manage the extensive transmission and distribution network has the potential to positively impact a large number of species for the benefit of all.

"The Wildlife Habitat Council is excited to participate in the ROW Steward initiative to support the inclusion of sustainability concepts into land management on a land-based system with such potential," said Bonneau.

Principles of IVM

The technical basis of IVM is sound. It has proven to be an effective means of achieving management objectives in an economically efficient and environmentally responsible manner for the long term. An IVM-based program typically involves less-disruptive maintenance practices and requires fewer inputs, as relatively stable communities of compatible plants are established, thereby resisting re-invasion by tall-growing tree species.

The ANSI A300 (Part 7) industry standard was published in 2006 and the *Best Management Practices: Integrated Vegetation Management* guide was published in 2007. EPRI created a method for assessing transmission ROW IVM programs and practices in 2008. These references are being used in developing accreditation requirements for the ROW Steward program.

Models of similar accreditation programs can be found in other industries. "Sister industries and disciplines have developed certification systems over the past 20 years to recognize high level, professional performance of work," said Chris Nowak, professor, SUNY College of Environmental Science and Forestry. "Forestry, for example, has exemplary

Table 1. Example of the Hierarchical Nature of Potential Accreditation Requirements

Level	Focus	Father-of-the-bride example
Principles (10)	High-level statements	A wedding reception should be an enjoyable, celebratory affair
Criteria (±50)	For example, existing IVM best management practices and standards	Guests leave well fed and many are feeling tipsy, but not excessively so
Indicators (±100)	Performance metrics	Guests receive appropriate food and drink
Verifiers (±100)	Evidence, outcomes	Menus, invoices, exit interviews with guests and venue waitstaff interviews

Note: Values in parentheses indicate the expected number of each requirement that will be developed.

systems that recognize management that is environmentally sensitive, socially responsible and economically feasible — that is, sustainable. I think the electric utility industry is ready to do exactly this, too."

The ROW Steward accreditation model will follow, for example, that found in the forest industry. The plan is to initially work the 10 principles of IVM developed by EPRI.

"Integrated vegetation management is critical to maintaining the reliable transmission of electricity while at the same time addressing key ecological concerns," said John Goodrich-Mahoney, senior project manager who directs EPRI's transmission ROW program. "These principles provide the framework for an effective approach in managing transmission corridors that are integral to meeting the power requirements of modern-day society."

The first four EPRI principles are not specific to IVM but simply represent responsible management. The remaining six principles establish the foundation for IVM. Together, these 10 principles serve to provide a basic structure:

- Compliance with laws
- Tenure and use rights and responsibilities
- Community relations and workers' rights
- Management planning
- Understanding pest and ecosystem dynamics
- Setting management objectives and tolerance levels
- Compilation of a broad array of treatment options
- Accounting for economic and ecological effects of treatments
- Site-specific implementation of treatments
- Adaptive management and monitoring.

A hierarchical construct will be used to translate principles into criteria, indicators and verifiers. This, too, is based on the forestry model. Table 1 provides a description of each level of requirement and uses a general example of the construct as applied to a social function to illustrate the concept.

The intent of ROW Steward requirements is to enhance the adoption of IVM standards and practices throughout North America, and yet recognize the need for site-specific management plans that reflect regional and local requirements. An example of this might be that woody stems of low-growing shrub species may be generally encouraged in the border zone, yet in the Western United States some otherwise-compatible yet highly combustible species may be inappropriate on sites where wildfire risks are high and one of the management objectives would be to reduce the risk of fire "laddering" into the canopy of trees adjacent to the ROW.

Table 2. Types and Level of Recognition (ROW Steward will be based on accreditation)	
Type of recognition	**Description**
Certification	A voluntary process by which individuals are assessed against predetermined standards for knowledge, skills and competencies, and granted a time-limited credential
Licensure	A mandatory government requirement necessary to practice in a particular profession or occupation
Certificate of qualifications	Designates that participants have completed a relatively short non-degree program and passed an end-of-program assessment
Accreditation	The establishment of the status, legitimacy or appropriateness of an institution or program granted upon meeting approved criteria or standards

Accreditation Model

The utility vegetation management industry has experience with recognition programs. The TreeLine USA program, administered by the Arbor Day Foundation, has been in place for more than 15 years. This program focuses on distribution line clearance pruning and tree removal activities that affect individual trees in the urban forest. The ROW Steward program will focus on corridors that traverse a wide range of ecosystems and land-use types across North America. Adoption of the accreditation model will set a higher bar for achievement in recognizing excellence in transmission ROW IVM.

As acknowledged earlier, the ROW Steward program will be based on the accreditation model found in the forest industry, per the Sustainable Forestry Initiative and the Forest Stewardship Council. It is expected an independent board of directors will provide oversight and an independent review board of subject-matter experts will be responsible for technical issues.

Objective standards of accreditation will be established and form the basis of a formal application process. And, as is the case with forest industry accreditation programs, an independent audit will be used to assess the degree to which an applicant's IVM program is compliant with ROW Steward program requirements.

Development Process

A small group of industry professionals has been working to promote the concept of the new accreditation program and develop some basic constructs. The initiative has been met with keen interest and support from industry practitioners and regulators.

"The Environmental Protection Agency supports the industry's idea of a credible third-party certification program for utility rights-of-way based on IVM principles and standards, which provide a means of reducing the need for pesticides and greater natural species diversity along rights-of-way and better control of invasive species," said Frank Ellis, chief of the environmental stewardship branch. "The agency would welcome exploring with the industry the development of a program to ensure credibility, appropriate standard development and the promotion of IVM adoption on the U.S. electric power grid."

A first meeting was held at EEI's Washington, D.C., offices on April 26, 2012. The goal is to be able to receive initial applications for ROW Steward accreditation in 2013, 10 years after the great Northeast blackout. Core concerns such as governance, program requirements, the application process and independent audit functions will need to be resolved over the next several months.

Following the approach taken with forest certification programs, a diverse group of stakeholders will be invited to participate.

"Our organization is excited to join the ROW Steward project and bring a set of diverse partners to the table to create a strong set of standards, facilitate the discussion between ENGOs and industry, as well as promote a credible sustainability certification/accreditation," said Wildlife Habitat Council's Bonnueau.

At the time of this writing, it is expected a working meeting of stakeholders will take place in mid-June. The intent is the path forward will be defined by the working group at that time.

Industry Interest in ROW Steward

There are at least two motivations for a utility to seek ROW Steward accreditation. First, IVM has proven to be an effective means of achieving management objectives in an economically efficient and environmentally responsible manner for the long term. Achieving ROW Steward status will be a demonstration that a program employs best practices and is fully compliant with all regulations, benefiting from both cost efficiency and reduced liability.

The second reason has to do with the industry's heightened interest in developing a green reputation. Existing initiatives such as offering customer choices for green or alternative energy, energy-conservation programs and, in some cases, taking a proactive position on climate change are evidence of the utility industry's interest in enhancing its brand by demonstrating responsibility as good stewards of the environment.

The ROW Steward program is intended as a means of setting a standard of excellence for environmental stewardship. Achieving ROW Steward status should be viewed favorably by customers and regulators.

"The ROW Steward Accreditation program is an opportunity for utilities that practice professional IVM to be recognized by a reputable third-party conservation organization," said Rick Johnstone, president, IVM Partners.

Future Expansion to Other ROW Vegetation Managers

While this initiative will focus initially on the North American high-voltage power grid, it should be easily adapted to other ROW users and segments of the IVM industry. Table 3 provides a summary of the magnitude of ROW miles.

When considered in total, the sheer size of the land area being used and managed as ROW is surprisingly large. As mentioned, there are 8.6 million to 11 million acres of electric transmission ROW. Petroleum and natural gas pipeline ROW total approximately 2.1 million acres (849,840 hectares) of ROW. Together, the acreage dedicated to energy delivery totals approximately 12 million acres (4.9 million hectares). The widths of road and railroad ROW varies, but could easily match the total acres of energy-related ROW.

A study by Purdue University in 1979 estimated that 1% of the land area of United States was in ROW. Viewed strategically, these ROW corridors have the potential of support and contribute to larger conservation efforts.

Table 3. Types and Linear Quantities of ROW Where Vegetation Must Be Maintained

Miles (km) of ROW	Branches of the ROW IVM industry
160,000 (257,495)	Transmission lines operating at 230 kV to 765 kV
290,000 (466,710)	Transmission lines operating at 35 kV to 138 kV
306,000 (492,459)	Petroleum and natural gas pipeline
33,000 (53,108)	Rural interstate highway system
3.1 million (5 million)	Rural roads
170,000 (273,588)	Railroad tracks

Raise the Bar

The ROW Steward program is a proactive industry initiative intended to raise the bar for responsible management of millions of acres of land occupied by electric transmission lines. The principles of IVM and recent industry standards provide basic constructs and accreditation programs found in the forest industry provide a useful model.

Participation in the ROW Steward program should generate success stories for many years to come. To request more information or express interest in participating in the ROW Steward initiative, contact the Utility Arborist Association. TDW

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