

57 ROW: Siting, Vegetation Management, and Avian Issues

Program Overview

Program Description

This program provides balanced, cost-effective solutions for addressing economic and environmental challenges associated with siting, developing, managing, and upgrading transmission and distribution (T&D) rights-of-way (ROW). The program offers innovative tools, practical guidance, and state-of-the-art information to help companies control costs and improve service reliability while protecting natural resources and addressing public, other stakeholder, and regulator concerns. Program activities include field studies, best-practices surveys, risk assessments, workshops, and technology development and demonstration projects.

Industry Needs and Issues Addressed

- Efficient, cost-effective transmission line siting
- A reliable power delivery system that conforms to the North American Electric Reliability Corporation's (NERC's) reliability standards
- Reduced avian interactions with T&D facilities and wind turbines
- Protection of sensitive habitats and species during ROW construction and maintenance
- Opportunities to optimize ecological assets associated with new and existing ROW

Impact

- Expedites siting of transmission lines to reduce costs and ensure system reliability
- Addresses ecological issues associated with NERC vegetation management standards
- Reduces ROW maintenance costs and enhances ecological value through application of integrated vegetation management
- Improves ability to prevent and assess bird strike impacts
- Enhances ecosystems along T&D ROW
- Provides communication materials to help companies communicate with regulators and the public

Key Accomplishments

- An integrated vegetation management (IVM) training manual based on long-term field research
- A transmission siting methodology to expedite siting of new transmission lines
- A Bird Strike Indicator to reduce operational impacts and financial and criminal liabilities due to avian interactions with facilities
- Communication materials for public meetings (e.g., "Electricity Needs: A Guide for Local Planners")

Current Year Objectives

- Increase knowledge and application of IVM as a tool for reducing vegetation management costs and a risk reduction strategy to meet NERC vegetation management standards
- Expand the use and attributes of the transmission siting model to expedite siting of new transmission
- Develop ecological assets along transmission corridors to protect rare species and wetlands and to create banking and trading opportunities
- Develop and commercialize the Bird Activity Monitoring System to improve understanding of bird interactions with utility facilities and to test the efficacy of mitigation devices

Industry Involvement

- Estimated 2009 funding: \$0.6M

Program Technical Lead

John W Goodrich-Mahoney, 202-293-7516, jmahoney@epri.com

Summary of Projects

Project Number	Project Title	Value
P57.001	Integrated Vegetation Management (IVM)	Develops information aimed at containing and reducing long-term vegetation management costs for T&D facilities while addressing reliability, regulatory, and environmental concerns.
P57.002	Transmission Siting	Develops information to identify and address ecological issues associated with the construction and maintenance of transmission facilities to further utility stewardship goals.
P57.003	Ecological Asset Identification for Transmission	Develops information for the identification and development of ecological assets within the transmission ROW, such as wetland banking. Development of ecological assets can provide a source of revenue for the transmission operator while enhancing environmental protection.
P57.004	Animal Interactions with Utility Facilities	Develops information and tools to mitigate avian and bat interactions with utility facilities (e.g., T&D facilities and wind turbines). Avian interactions may cause outages, and avian and bat takes may result in fines and penalties under several federal laws.

Project Descriptions

P57.001 Integrated Vegetation Management (IVM) (101938)

Issue

All rights-of-way (ROW) are managed with the general goal of providing safe and reliable transport of electricity. ROW managers strive to meet these goals by developing low-growing vegetation that persists over the long term. For most ROW managers, active management is required to create desired vegetation and related environmental conditions. ROW vegetation management represents a major cost for the industry: individual company costs are in the range of \$5–\$20 million per year. Containing and lowering these costs, while maintaining high reliability and enhancing environmental productivity, are important to competitive success of the company and to environmental stewardship.

Description

This research focuses on providing information and tools to ROW managers for the cost-effective management of vegetation, which is the largest recurring expenditure for ROW.

- Continues IVM field research and utility assessments, leading to an industry certification program
- Assesses the impact of NERC vegetation management standards on IVM and ROW ecology
- Assesses the effectiveness of nonherbicide alternatives for vegetation management

Value

- Provides practical IVM guidelines reflecting the latest field research
- Provides information to assist utilities in addressing NERC mandatory vegetation standards
- Reduces vegetation management costs and vegetation-related outages
- Addresses environmental ROW goals
- Enhances corporate environmental stewardship goals

How to Apply Results

Results from this project will be useful to utility vegetation management and environmental departments. Vegetation managers can apply the information to reduce the cost of vegetation management and the frequency of outages on T&D systems. Environmental managers, in concert with vegetation managers, can apply the information to develop company stewardship goals. It is incumbent upon members to apply the results to meet internal and external needs.

2009 Products

Product Title & Description	Planned Completion Date	Product Type
Use of Integrated Vegetation Management to Promote Conservation Goals for Transmission Rights-of-Way: Key to IVM is the culturing of desirable plant communities that minimize the presence of undesirable plants. In this context, IVM can also be used to promote conservation goals. This research will provide a framework for utilities to use IVM to promote conservation goals along transmission ROW.	12/31/2009	Technical Report

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Cost-Effectiveness of Different Nonherbicide and Herbicide Alternatives for Treating Transmission Rights-of-Way Vegetation: This research will focus on the development of information to support decisions on the selection of treatment options for the control of vegetation along transmission ROW and to communicate to stakeholders the bases for treatment option decisions.	2010	Technical Report
Evaluation of Toxicity of Surfactants in Herbicides: This research will focus on the development of a human health and environmental risk assessment for surfactants used in herbicides commonly used to control vegetation along transmission ROW.	2011	Technical Report

P57.002 Transmission Siting (102814)

Issue

Regulatory agencies at the federal and state levels are turning their attention to environmental issues at the ecosystem level. Regulatory agencies are concerned about the direct and indirect effects on ecosystems of existing transmission ROW and the development of new transmission ROW. Concomitantly, utility ROW transmission managers seek meaningful ways to demonstrate environmental stewardship, while at the same time addressing electrical reliability. Utility ROW managers can meet both environmental and reliability goals with practical information and guidance.

Description

This research provides information to assist utility ROW transmission managers in addressing environmental issues associated with existing transmission ROW and the development of new transmission ROW. The project addresses broad issues, such as siting new transmission through the use of the Electric Power Research Institute (EPRI)/Georgia Transmission Corporation transmission siting methodology, as well as more-focused needs, such the development of best management practices to control nonpoint source pollution along transmission ROW.

Value

- Provides information to address environmental issues at the ecosystem level
- Provides tools to expedite siting of new transmission
- Provides information to support stewardship goals
- Reduces carbon dioxide (CO₂) emissions from vegetation management
- Provides focused analysis of issues of the day

How to Apply Results

Results from this project will be useful to utility vegetation management and environmental departments to address ecological issues associated with the development and maintenance of transmission ROW. Environmental managers, in concert with vegetation managers, can apply the information to develop company stewardship goals. Additionally, the information will be useful in addressing environmentally related questions raised by state regulatory agencies and the public during pre- and postconstruction activities for transmission lines. It is incumbent upon members to be proactive in reading, attending workshops, and applying the results to meet internal and external needs. EPRI staff will produce communication materials for members to use with regulators and the public.

2009 Products

Product Title & Description	Planned Completion Date	Product Type
Cumulative Impact Analysis of Transmission Development: This research will provide guidelines that define what a cumulative impact is. The report will provide information on the relationship between growth inducement and accommodation, and transmission line development. It will also provide information on the specific effects of transmission line development that may be cumulative to other projects.	12/31/2009	Technical Report
Implementation Workshop for the EPRI/Georgia Transmission Siting Methodology: This workshop will inform and train utility staff and others on the benefits and use of the methodology for siting transmission corridors. As part of the training, a demonstration of the methodology will be performed using a utility data set from a utility that has used the methodology.	11/30/2009	Workshop, Training, or Conference

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
<p>Best Management Practices for Nonpoint Pollution from Transmission Rights-of-Way: At the state level, many utilities are or will become subject to nonpoint-source pollution monitoring requirements when one acre or more of land is disturbed during construction and maintenance activities. This research will provide BMP to reduce nonpoint source pollution from transmission ROW during construction and maintenance.</p>	2010	Technical Report
<p>Best Management Practices for Invasive Plant and Animal Species: Federal and state governments are focusing attention on the spread of invasive species. This report will provide BMP to reduce the spread onto or from transmission ROW of invasive species that pose a threat to indigenous species.</p>	2011	Technical Report
<p>Carbon Footprint for Transmission Vegetation Management: With the growing interest in global climate change, it is likely that utilities will need to reduce CO₂ emissions at some future date. This research will provide information on CO₂ emissions for commonly used transmission vegetation management practices to support sustainability decisions.</p>	2012	Technical Report
<p>Global Climate Change and Vegetation Dynamics: This research will involve linking regional global climate models with a plant growth model to evaluate changes in vegetation dynamics and determine cost and other potential impacts of global warming.</p>	2013	Technical Report

P57.003 Ecological Asset Identification for Transmission (103927)

Issue

The development of ecological assets (i.e., conservation and wetland banks) within transmission ROW provides a mechanism for utilities to demonstrate environmental stewardship while simultaneously creating a revenue stream. The development of conservation and wetland banks is the practice of receiving financially valuable credits in exchange for a commitment to protect rare species and wetlands. The credits can be used internally to reduce permitting time and expense or can be sold to third parties.

Description

This work aims to develop ecological assets within transmission ROW to provide a mechanism for utilities to demonstrate environmental stewardship while simultaneously creating a revenue stream.

- Develop information on the political and financial challenges to developing ROW ecological assets
- Identify a banking opportunity with one or more utilities
- Determine the scope of and establish a conservation/wetland bank

Value

- Demonstrate environmental stewardship
- Create credits to reduce permitting time and expense
- Create revenue through the sale of credits
- Potentially sequester CO₂
- Enhance species diversity and productivity

How to Apply Results

Results from this project will be useful to utility vegetation management and environmental departments to advance stewardship goals for transmission line ROW while simultaneously creating credits for internal or external use. Utilities will use the information to address questions from federal and state regulatory agencies and the public about ecological asset development. Ultimately, EPRI would like to partner with one or more utilities to establish a bank as a test case. Results from the test case can be used to promote the development of ecological assets within the industry. Communications materials will be prepared for internal use within companies and with external stakeholders to describe the process and value of ecological assets.

2009 Products

Product Title & Description	Planned Completion Date	Product Type
<p>Identify a Conservation/Wetland Bank for Single- or Multiple-Utility Ownership: Using information collected during 2007–2008, EPRI will work with one or more utilities to identify a conservation/wetland banking opportunity within a transmission line ROW.</p>	12/31/2009	Technical Report

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
<p>Determine Scope of and Establish a Conservation/Wetland Bank: Using information collected during 2007–2009, EPRI will work with one or more utilities to determine the scope of and establish a conservation/wetland bank within a transmission line ROW as a test case.</p>	2010	Technical Report
<p>Transmission Right-of-Way Wetlands as CO₂ sinks: With the establishment of a transmission line ROW wetland bank (s) in 2010, field research will be conducted at one or more constructed wetlands to determine CO₂ sequestration potential.</p>	2011	Technical Report

P57.004 Animal Interactions with Utility Facilities (101940)

Issue

Birds interact with power and communications structures in many ways. Some structures (towers, poles, stacks) and associated ROW habitats can provide favorable sites for nesting, roosting, foraging, and hunting activities of a wide variety of bird species without affecting operations. At the same time, birds are at risk from potential interactions with these structures, including collision (wires, wind turbine blades, towers) and electrocution (transformers, conductor configurations). These and other interactions can result in disruption of service and cause negative impacts on bird populations. Adverse impacts on certain bird species, such as electrocutions of eagles, may result in fines and penalties. Litigation can be avoided through proactive planning to foster stewardship and reduce adverse impacts on avian populations.

Description

This research provides information and monitoring systems to improve understanding and mitigate avian interactions with utility facilities.

- Develop and commercialize the Bird Activity Monitoring System (BAMS), an integrated automatic video-based computer system for monitoring all activities on a continuous basis
- Conduct field trials of the BAMS
- Investigate avian vision perception to develop more-effective mitigation devices
- Conduct a workshop on technology advances in enabling mitigation of avian mortality

Value

- Reduces electrical outages
- Determines causes of interactions of birds and other species with utility facilities
- Evaluates the efficacy of mitigation devices
- Reduces liability under several federal laws
- Reduces impacts on avian populations

How to Apply Results

Results from this project will be useful to utility environmental and power delivery departments to reduce outages and advance stewardship goals for the protection of birds and other federally protected populations. Once development of the BAMS is complete, EPRI will support field testing with interested utilities and others. Upon completion of the field studies, EPRI will commercialize the BAMS for utility use. EPRI will host one or more workshops to convey the results of research on the previously developed Bird Strike Indicator (BSI), the BAMS, and mitigation efficacy studies using both devices.

2009 Products

Product Title & Description	Planned Completion Date	Product Type
Bird Activity Monitoring System (BAMS): This project will complete the development of the BAMS, an integrated, automatic video-based computer system for monitoring all activity (bird, bat, mammal, etc.) at a given site.	12/31/2009	Hardware

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Workshop on Technology Advances in Enabling Mitigation of Avian Mortality: This workshop will convey the results of the development of the BSI, the BAMS, and mitigation efficacy studies using both devices.	2011	Workshop, Training, or Conference
Avian Vision Perception: This research will focus on determining the nature of avian vision perception to support the development of more-effective designs for bird flight diverters.	2010	Technical Report