IVM and Ecosystem Management Regional Case Studies & Workshops

(a) Project Summary

Organization: IVM Partners, Inc is a 501-C-3 non-profit corporation operated exclusively for charitable, scientific, literary, and educational purposes to develop, educate professionals and the public with respect to, and apply best vegetation management and conservation practices and related activities. Our key partners for this grant include the Utility Arborist Association, Edison Electric Institute and the Pollinator Partnership.

(i) Summary Statement: The goal of the project is to develop minimum two-year case studies documenting the effect of various integrated vegetation management (IVM) techniques on rights-of-way (ROW) plant communities in varying ecosystems across at least six different regions of the United States. The results will be shared with industry, agency, conservation and academia in the manner of classroom and field tour workshops and conferences, and through print and Internet by the various partners. The findings will help define what are the best practices for providing the primary service of the ROW; such as safe and reliable electricity or highway safety and aesthetics, while also meeting secondary concerns; such as wildlife habitat, threatened or endangered species, watershed protection, invasive weed control, wildfire protection, reduced pollution and lowering the carbon footprint of maintenance practices.

(ii) Educational Priority: The project provides **capacity building** since it will coordinate education across various regions of the country; **community stewardship** because it addresses multiple environmental issues applicable to all communities; **teaching skills** for university professors and graduate students as it teaches science-based documented best practices for vegetation management; and **career development** as the impact of integrated vegetation management crosses multiple disciplines that can encourage environmental careers in several fields of study.

(iii) Delivery Method: The audience will be reached with classroom and field trip workshops, posting of findings on the Internet and in professional publications, and shared at regional and international conferences.

(iv) Audience: Each regional workshop is expected to reach between 50 and 200 people ranging from electric and highway ROW vegetation managers, public land management agency personnel, university professors and graduate students, local-state-national elected officials and staffs, and the media.

(v) Costs: The grant funds from EPA will be used to pay salaries and travel expenses for developing the case studies and plant community documentation and analysis, and for production of educational materials used in the workshops.

(b) Project Description

(i) Why:

IVM and Ecosystem Management Regional Case Studies & Workshops are designed to meet several educational priorities across six different geographic regions of the United States:

(1) Educational Priorities

- Capacity Building – develop and deliver coordinated environmental education on the best integrated vegetation management (IVM) practices for rights-of-way (ROW) corridors in varying ecosystems specific to different geographic regions of the country.
- Community Stewardship – design and implement case studies documenting the results of various vegetation management practices to educate federal, state and local government agencies, politicians, media, conservation organizations, industry professional associations and academia through classroom and field tours and posting results on a website dedicated to IVM education.
- Teaching Skills – Provide long-term professional development of professors and graduate students by making case study sites available for university research and outdoor classrooms, high school science projects, and conservation instructors.
- Career Development – Educate students and faculty and provide continuing education credits for professionals on science-based, documented effects of vegetation management practices on a wide range of environmental issues.

(2) Environmental Issues: This project cuts across several environmental issues of national importance but defines them specifically to the best practices for local ecosystem sensitivities:

- National Environmental Policy Act (NEPA) – The project's regional case studies will help define which vegetation management practices create and maintain conditions for man and nature to exist in productive harmony.
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) – The project will help define the best IVM techniques for federal agencies to promote through procurement and regulatory policies.
- Endangered Species Act (ESA) – The project will demonstrate which IVM practices can restore or protect habitat conducive to the survival of rare or endangered species, and help the Agency in directing product labeling and regulation.
- Food Quality Protection Act (FQPA) – The project will document the actual herbicide rates, application frequency and techniques used under an integrated program to help chemical manufacturers and regulators label products specific to rights-of-way (ROW).
- Pesticide Environmental Stewardship Program (PESP) – The project will help define and document which IVM practices on ROW lower the level of risk to both humans and the environment, and help encourage wider adoption.
- Energy Policy Act of 2005 – The project will help define what IVM practices are best for electric system reliability and wildfire control to help guide energy corridor siting and management.
- Executive Order #13212 – The project will help federal agencies assess energy corridor environmental impacts when reviewing applications to improve transmission of energy while maintaining safety, health and environmental protection.
- Executive Order #13112 – The project will help agencies coordinate noxious or exotic species control, monitoring and study and define the best practices to restore native species and habitat.
- Clean Water Act – This project will help define which IVM practices limit erosion and sedimentation of streams and introduction of pollutants into water systems, and provide riparian buffers to maintain cool water temperatures necessary for aquatic survival.
- Clean Air Act – This project will help define which IVM practices limit pollution of hydrocarbons and carbon dioxide into the air.
- Global Warming – This project will demonstrate that the development of a stable, low growing plant community can reduce the carbon footprint of ROW maintenance.

- Pollinators – This project will help identify which practices promote plant communities along ROW that are conducive to the survival and expansion of wild bees, butterflies, birds and bats.
- EEI-Federal Agency MOU – This project will help in the implementation of IVM programs on federal lands by helping to define best IVM practices for Edison Electric Institute member electric companies and land management agencies.
- This project will support the Strategic Plan of the U.S. Forest Service, specifically as ROW impact catastrophic wildfire, invasive species, recreation, watershed condition and energy resource needs.
- This project will assist in the adoption of the American National Standard Institute ANSI A300 (Part 7) – 2006 by demonstrating the regional results of IVM practices.
- This project will assist the Department of Energy, Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC) and State Utility Commissions in defining best practices and policy for insuring safe and reliable transmission of energy.

(3) Environmental Stewardship:

- This project will encourage electric utilities to implement the PESP program by demonstrating how IVM best practices can lower safety risks by reducing exposure of workers to hazardous sharp cutting tools or chemicals, and lower environmental risks by reducing exposure to herbicide products or pollution of hydrocarbons & carbon dioxide.
- The case studies will document how voluntary stewardship through IVM best practices can lower dollar costs while minimizing soil erosion and the spread of non-native invasive weeds.
- The best practice demonstrations will show how all types of ROW can be managed to conserve or restore prairie, wetlands and riparian habitats to improve food and cover for a wide variety of wildlife.
- Demonstrating GIS mapping as a best IVM practice will assist in the development of ROW vegetation management plans specific to unique environmental issues.
- Demonstrating the use of returnable/refillable containers in an IVM program will reduce disposal of containers in landfills and potential pollution of soil and water.
- Innovative electronic tracking of herbicide products from the chemical supplier to the actual field application will provide accurate use data for the vegetation manager and regulatory agencies.

(ii) Who

IVM and Ecosystem Management Regional Case Studies & Workshops will be managed and directed by Richard A. Johnstone, President of IVM Partners, Inc, a 501-C-3 non-profit corporation, who has over 32 years experience managing electric system vegetation, experience in controlling non-native invasive plants for federal and state land management agencies, and experience in developing similar case studies and workshops. Botanical documentation of plant community changes will be conducted by Michael R. Haggie, a professional botanist employed with Chesapeake Wildlife Heritage, a 501-C-3 non-profit corporation, who has over 15 years experience in ROW vegetation analysis.

The target audience consists primarily of utility and highway vegetation managers, land management agency and regulatory personnel, and university professors in the various regions where the case studies and workshops will be conducted. Case studies and workshops are targeted for the following regions: Mid-Atlantic, Middle South, Deep South, Midwest, Southwest and Northwest United States. Additional case studies and workshops are possible if increased interest and funding becomes available from host utilities and agencies. It is anticipated that each workshop will have attendance of 50-200 people composed of utility or highway vegetation managers, public agency natural resource managers, conservation managers and university natural resource academics. As the popularity of the workshops grow, additional vegetation managers from other disciplines are expected to attend, since the work is applicable to all ROW vegetation managers; electric, gas or oil utilities, highways, railroads, canals/ditches, nature trails, etc.

The target audience will be recruited by the following:

- Utility Arborist Association (UAA) of the International Society of Arboriculture (ISA) presently conducts regional conferences for its members across North America. These conferences are publicized on its website and with email notices to its 2,000+ members, plus members of the Municipal Arborist Association. The UAA offers continuing education credits for Certified Arborists and Utility Specialists and pesticide recertification credits from states within the targeted region. Information is also shared at the ISA international conference, website and magazine published bi-monthly.
- National Roadside Vegetation Management Association conducts national conferences and provides a website for information dissemination to its members across all 50 states.
- Edison Electric Institute represents over 90% of investor-owned electric companies and provides regular updates to its members through a website and email, as well as a monthly publication "Electrical Perspectives".
- The Pollinator Partnership has a website and disseminates information by electronic mailings specific to regional differences. A ROW Task Force, co-chaired by Richard Johnstone, IVM Partners and Kimberly Winters, National Wildlife Federation, is charged with improving pollinator habitat on all types of ROW. Both organizations have websites and the Pollinator Partnership (North American Pollinator Protection Campaign) disseminates information to the task force membership that crosses all disciplines; national and state politics, natural resource agencies, conservation and academia.

(iii) How

A standardized methodology will be used to document plant community changes derived from various IVM techniques using the following format:

- Choose management areas that impact federal or state agency lands, industry land holdings and/or utility, highway or other type of ROW.
- Interview land stakeholder(s) to determine their vegetation management needs or objectives; safe access and reliability, sight distance, wildlife habitat, endangered specie habitat, pollinators, invasive weed control, etc.
- Develop a synergistic vegetation management plan specific to the land and the primary and secondary objective(s) of the stakeholders.
- Develop a GIS map of the management area, noting any environmental or archeological sensitive sites.
- Perform a botanical and photo documentation of the plant communities present on the management site prior to any interventions.
- Implement the most appropriate integrated vegetation management technique(s).
- Document cost data of the vegetation management techniques used, including the type and rate of herbicides.
- Perform a botanical and photo documentation of the plant community changes before and after each technique.
- Revise vegetation management plans as necessary to further long-term objectives and resume implementation and documentation.

A standardized template of using transects to sample plant communities prior to vegetation clearing for a new ROW, or prior to adoption of a new vegetation management regime, is developed. This baseline plant specie data is then compared against subsequent plant community changes after each growing season resulting from the implementation of various IVM techniques.

A minimum two growing season sampling is recommended following a change in IVM techniques to provide statistically valid data. Additional years may be sampled to monitor plant community stability or specie succession from herbaceous to shrub/scrub plant communities.

A linear transects survey method, suitable for following long-term vegetation succession, is used (from R.L. Smith, 1966, with modifications by D. Whigham). On utility ROW, a 20m-wide by 100m-long centrally located section of ROW, excluding any 10m-wide central access route, is typically selected as

representative of the ROW vegetation to be surveyed. On highway ROW, a similar sized area is selected outside of the road surface and adjacent to regularly mowed area. A similar untreated (UT) area may be selected and surveyed as a control. IVM treatment history is collected and summarized (Appendix Table 1).

Baseline data of tree, shrub and herbaceous species is taken prior to new ROW construction or the introduction of herbicide treatments following a history of hand or mechanical cutting. A short-term study would be two years of data after each growing season following the new management regime intervention, while a long-term study would be a minimum of five years. Tree and shrub data are collected after each growing season in the fall of each year. Herbaceous data is collected in the spring if flowering herbaceous plants are a priority. A four letter code is assigned to each plant identified using the first two letters of the genus and species of the Latin name; e.g. Dichantelium clandestinum (L) Gould = DICL, or, if genus is only possible, DISP (Dichantelium species).

Tree/Shrub Plots: Typically three 2m x 100m shrub plots, 10m apart, are established lengthwise (see appendix Figure 4a) to the ROW or ten 2x10m plots crosswise (Appendix Figure 4b). Surveying 15-20% of the area is considered statistically optimum. Orientation will depend on the site and management goals in the central part of the sample ROW. Wetland ecosystems lend themselves to easier access and less vegetation disruption if the shrub plots are oriented across the ROW. Shrub survey lines are commenced 5-10m from either end of each survey perimeter in order to reduce edge effect.

Herbaceous Plots: Herbaceous plots 1m square are laid out along the mid-line of each 2m x 100m lengthwise or 2x10m crosswise shrub plot at 0 m, 5 m and 10 m. Their central points are marked with wire flags. The beginning and end point of transects are marked with more permanent fiberglass or metal re-bar stakes. Surveying 10-15% of the area is considered a good rule of thumb. To one side of the transect a 5-10m buffer is left to reduce the edge effect of shading from the adjacent woodland, if present, and the travel effect of the maintenance corridor at the other. Herbaceous vegetation is stem counted and percent cover is estimated following identification by species.

All specimens are identified to genus and where practical to species. A prefabricated meter square made from 12.5 mm PVC schedule-40 plastic water pipe is used along the survey line, within which data are gathered. These are either 1m x1m or 0.5x2m. A simple graph, plotting the number of species to the number of plots within which a species is found, can be used to determine the number of plots needing surveyed for statistical purposes.

In addition to simple data analysis (number species, percent cover, stem count, etc.), a modified relative importance value (RIV), developed by J.T. Curtis (1959) in Mueller-Dombois (1974), has been developed (Whigham, 2003) as follows:

Herbs: RIV = (relative frequency + relative % cover)/2; where relative frequency = f of a species/sum f of all species x 100; f = # plots in which a species is found/total # plots in the survey. Relative cover = (% cover of a species/% cover of all species) x 100.
Shrubs: RIV = (relative frequency + relative density)/2; where relative frequency = as above for herbs; and relative density = (# individuals of a species/total # individuals of all species) x 100.

The RIV values for each species can be combined to provide totals for desirable (D), undesirable (U) vegetation and woody vine species groups for each season and year. A high RIV indicates that a particular species or species group was found to occur at a higher density relative to a species or species group having a lower RIV value.

Once the RIV analysis has been performed, the data can be analyzed to identify plant community population trends as follows:

- Annual specie comparison (numerical, percent cover, presence/absence, desirable/undesirable)
- List of species present (herb, shrub, tree, wetland or upland ecosystems)
- Ecosystem comparison (grass, forbs, or shrub communities)
- Beneficial plant communities for various types of wildlife, birds, pollinators, etc.

Nomenclature used for herbaceous and woody species is taken from Brown and Brown (1972 and 1984), Gleason and Cronquist (1991) and for bryophytes, Shuttleworth and Zim (1967).

Multiple data sets can be established to monitor plant community changes, e.g. on electric ROW in the "wire zone" (area under conductors plus ten feet outside conductors) or the "border zone" (area from "wire zone" to ROW edge). Various sets of statistical methods can be applied to the data and the resulting research findings written as a peer-reviewed paper.

(iv) With What

Continuing Education Outputs

A review of the regional best practices vegetation plan and results shall be shared with the Utility Arborist Association, Edison Electric Institute, and/or National Roadside Vegetation Management Association and other interested industry and agency parties and the general public as follows:

- An educational workshop shall be conducted for the stakeholders and others in each region with similar management concerns, including land grant universities. The workshop shall include classroom discussion and a slide presentation review of the management steps, a field tour of the management area, field demonstrations of the IVM techniques used, and a question and answer wrap-up session to resolve issues and advance further research needs.
- Advertise the workshop date in industry and agency publications, websites and email notices, with appropriate media and congressional invitations.
- Conduct the workshop during an appropriate season to highlight the beneficial plant community changes.
- Provide handouts with before and after pictures describing the techniques used and other information to the attendees for use in disseminating the information to other interested parties.
- As a guest lecturer, encourage continued study and sharing of the results with outdoor classrooms for the university system and teach students the best IVM practices.
- Adjust secondary objectives or introduce new techniques as warranted to further objectives.
- Post the slide presentation and other pertinent information on the Internet for continued public education and discussion (www.ivmpartners.org).
- Publish results in industry journals; such as UAA Quarterly and Electrical Perspectives, and those of the agency or conservation collaborators, especially the Pollinator Partnership.
- Act as a liaison and information source for the stakeholders to adopt the best management practices across the region.
- Act as a liaison and information source for other industries and agencies that share the vegetation issues of rights-of-way corridor management.

Performance Outcome

The following beneficial outcomes are expected in each region:

- An increased understanding and adoption of IVM practices by industry and public agencies.
- Increased use of best practices, such as GIS mapping and ultra-low volume applications, to lower the level of risk to humans and the environment.
- Documentation of scientifically-based case studies that support the use of IVM best practices conformed to meet regional geographic differences.
- Increased partnerships that champion mutually beneficial practices between utilities and public agencies.
- Improved safety and reliability of the electric grid to support our nation's security.
- Improved highway safety and aesthetic beauty.
- Overall public awareness of the benefits of an integrated approach.
- Improved ROW habitat, watershed protection, invasive weed control and restoration of ecosystems serving a wide variety of wildlife, pollinators, and threatened or endangered species.
- More accurate "risk cup" analysis of herbicide use on ROW.
- Extensive ROW system managed to serve as wildfire breaks with ready access for fire teams.
- Established study areas to further research and development of improved IVM techniques and products.

(c) Project Evaluation:

The project's purpose is to educate its diverse audience on what constitutes an integrated vegetation management program and to further adoption of the best practices on ROW where they have authority over its implementation. Educational workshops will be evaluated on both their short term and long term effectiveness to determine if they are meeting these goals.

- Short term – At the end of each workshop a survey will be administered to the audience to answer the following questions:
    - Did the workshop help you understand the step-by-step process of an integrated approach? If not, what is not clear and needs improvement?
    - How much of the ROW where you have jurisdiction is managed with an integrated approach (miles or acres/hectares and % of system managed with IVM)?
    - As part of your vegetation management program do you presently track the number of acres, miles or % that is managed by various IVM techniques, their relative cost, and type and volume of herbicide products used? If not, would you be willing to start tracking?
    - If IVM is not widely practiced on your system, please describe the impediments to its adoption (internal or external restrictions, lack of understanding within organization, budget, public opposition, etc) and how we can help you change this situation?
    - Are the types of ecosystem(s) shown on the field tour similar to the types found on your management system? If not, what type of ecosystem should be studied and is your organization willing to sponsor additional studies, where and when?
    - Would you like the field analysis to be continually updated each year and the results shared with you?
    - Should this workshop be conducted on an annual basis, and if so, would you or your employees/students attend?
    - Would you like to schedule a classroom presentation of this workshop at your place of business or university? If so, please provide a contact name and number.
- Long term –Communication will be administered by workshop partners to their respective constituents in the following manner:
    - The workshop results will be publicized in print and Internet to provide wide-scale education.
    - Surveys will be taken to answer the same questions as those used in the short term following each workshop to gauge overall understanding of IVM and the needs of the various vegetation managers/educators.
    - Additional studies will be implemented and workshops scheduled to meet the needs of the varied regions and audiences and resolve any unanswered questions or concerns.
    - Case study results will be summarized at national conferences of the partners and at the International ROW and IPM Symposia.
    - IVM Partners will assist the various partners in developing educational brochures and other information to further IVM understanding and adoption.
    - Meetings will be scheduled as needed with public agencies, regulators and congressional staffs to assist in drafting public policy that encourages adoption of IVM on ROW.
    - Feedback from all parties will be used to continually improve the studies, workshops, surveys and educational material.

Year/Season	Treatment	Effected Quads	Notes
1992 Fall	Clear-cut (CC) Select-cut (SC)	NW, SE NE, SW	CC = tree stumps & shrubs mown to ground level SC = undesirable trees and shrubs removed
1993 Fall	Initial Herbicide Select-Spray (SS)	NE, SE	Code 031, foliage/hydraulic broadcast. NW, SW untreated (UT)
1994 Summer	Follow-up Herbicide Select-Spray (SS)	NE, SE	Same as 1993.
1995	None	All	
1996	None	All	
1997 Summer	Follow-up Herbicide Select-Spray	All	Code 031G, foliage/hydraulic broadcast Code XG670

Table 1: Indian Mission CDP ROW treatment history, Sussex Co. Delaware, USA.

UPLAND HERBICIDE CODES, MIXTURES and RATES

Code 031 1993 = 4.73L (1.25 US gal.) Accord* + 1.18dl (4 oz.) Arsenal + 1.89L (0.50 US gal.) Cleancut +
0.95L (0.25 US gal.) Weedar 64 + 1.18dl (4 oz.) 38F drift control
in 378.5L (100 US gal.) water.

Code XG670 1997 = 4.73L (1.25 US gal.) Accord* + 4.14dl (14 oz.) Garlon 3A + 1.18dl (4 oz.) Arsenal +
56.78L (15 US gal.) Thinvert (total volume = 62.07L (16.4 US gal.))
in 378.5L (100 US gal.) water. Used in upland.

Code 031G 1997 = 4.73L (1.25 US gal). Accord* + 0.95L (0.25 US gal.) Garlon 3A + 1.18dl (4 oz.) Arsenal + 1.89L (0.50 US gal.) Cleancut + 1.18dl (4 oz.) 38F drift control
in 378.5L (100 US gal.) water.
*Glyphosate applied at a rate of 10.44 L/ha (4 qts/ac), 53.8% active ingredient (a.i.)

TRADE NAMES OF HERBICIDES USED

Accord (common name: glyphosate isopropylamine), composition = 53% concentration of isopropylamine salt of N - [phosphono-methyl] glycine.

Arsenal, (family name: imidazolinone), composition = isopropylamine salt of imazapur (2- [4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridine carboxylic acid).

Garlon 3A, (common name: Triclopyr), composition = 3,5,6-trichloro-2-pyridinyloxyacetic acid.

Weedar (common name: 2,4-D), composition = dodecylamine + tetradecylamine salts of 2,4-D.

(Ref: Meister and Sine, 1996).

Surfactants used were Cleancut, Thinvert and 38F used for drift control.

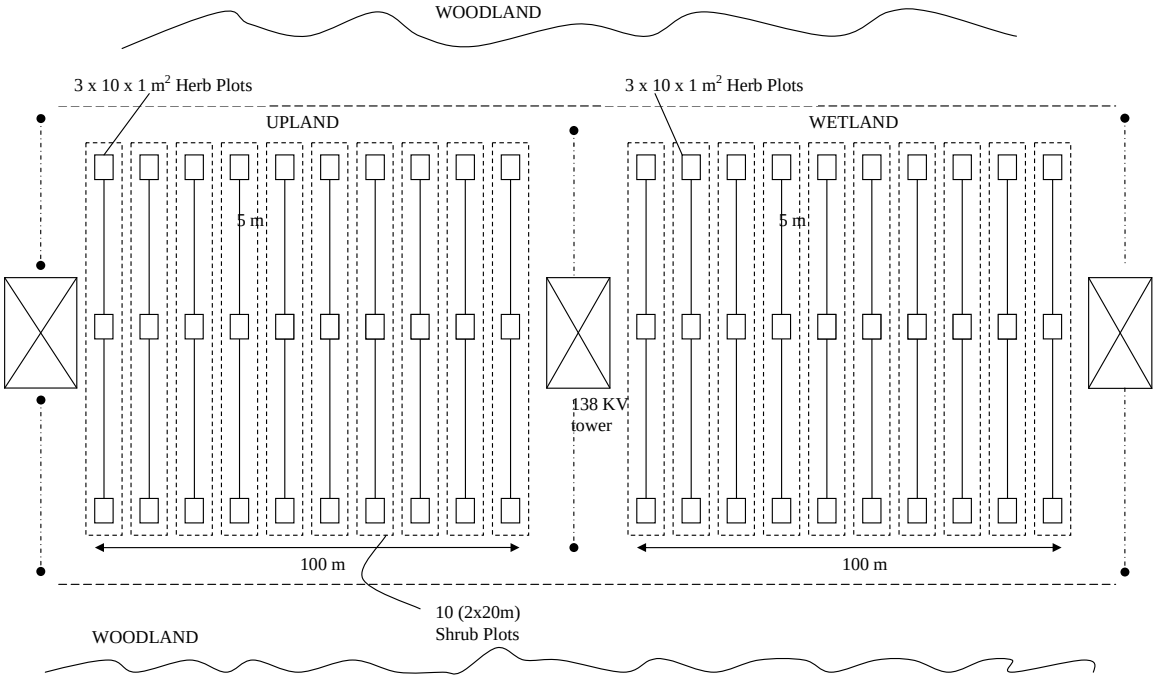

Fig. 4 a: General 138 KV Transmission Line Research Survey Layout for ROW Centerline.

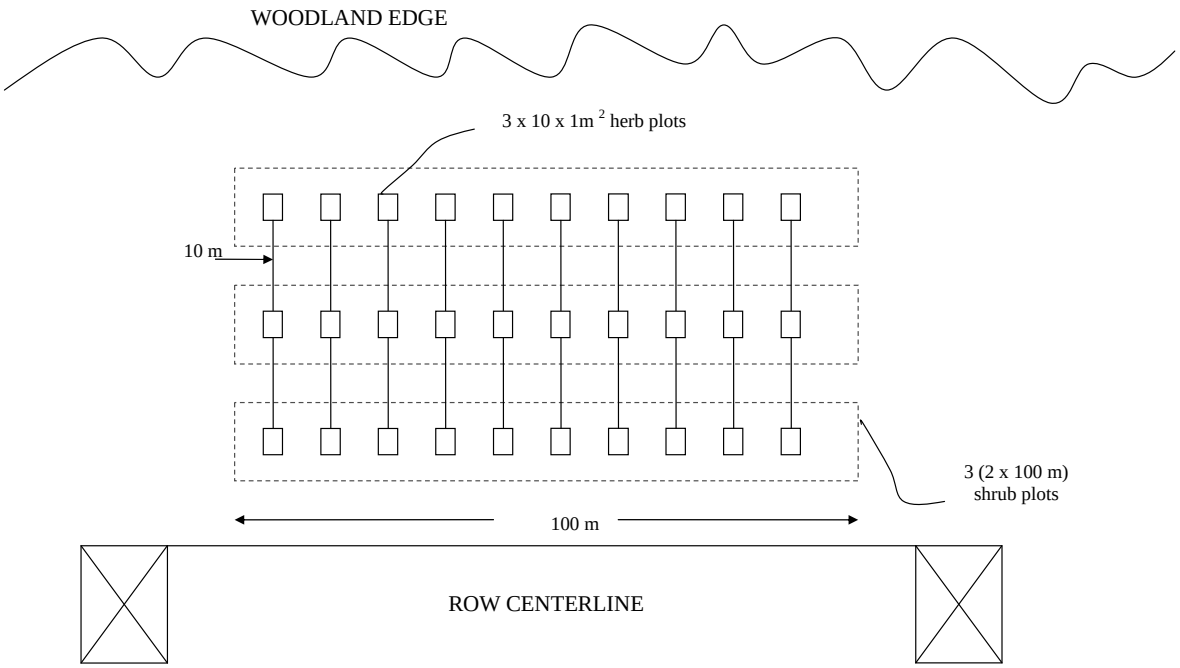

Fig. 4 b. General 138KV Transmission Line Research Survey Layout for ROW Border Zone.

Performance Measures – Logic Model

Outputs	Outcomes		
	Short-term	**Medium-term**	**Long-term**
Recruit utilities and contractors as cooperators in project	Increased awareness of the need for science-based IVM best practices	Case study sites of varying ecosystem types established	Study sites used by cooperating utility, agency, university for ongoing research and field tours
Prescriptive integrated vegetation management plan written	The reason and timing of each proposed IVM technique is explained to cooperators	Cooperators understand the concept of developing vegetation plans that are unique for each ecosystem type	Best IVM practices are used in the wholesale planning of ROW by the cooperators
GIS map developed for study area	Increased awareness of GPS methods and ability to layer information from diverse sources	The location of streams, wetlands, wells, archaeological sites, threatened or endangered specie habitats, etc are incorporated into management plans	The use of GIS mapping for all ROW vegetation management work is adopted
Training is provided on the best selective application techniques and cradle to grave herbicide tracking	Pesticide applicators learn the best methods, herbicide combinations and timing to reduce chemical volume per	Herbicide applications are used in a prescriptive, selective fashion and tracking demonstrates ability to	Best application practices and tracking are incorporated into all ROW vegetation plans with overall reduction

	acre with improved efficacy	reduce volume and costs	in herbicide volume
Field trips	Internal employees of cooperators review work in progress	Vegetation management workers and contractors use study sites for regular meeting reviews	Cooperators use study site field tours for ongoing education of corporate personnel, university academics and students, public officials and media
Workshops	UAA schedules regional meeting for utility arborists & specialists	UAA, EEI and NAPPC publicize study sites, use for conferences and publish results	Ongoing publicity prompts public officials and media to recognize the benefits of an IVM program
Web sites	Locations of study sites and cooperators is noted in cooperator web sites and publications	Ongoing progress of ecosystem changes are publicized with updated photos	Tangible results noted on web prompt wholesale acceptance of IVM as the best management practice
Conference presentations and surveys	Regional workshop conferences and surveys are used to improve education efforts	Survey results are used to expand case studies into other ecosystem types	International conferences provide the education to expand the best IVM practices into wholesale use

Richard A. Johnstone

Biography

Rick Johnstone is President of *Integrated Vegetation Management Partners, Inc. (IVM Partners)* a 501-C-3 non-profit corporation, and Owner of *Vegetation Management with Environmental Stewardship, LLC (VMES)* consulting.

IVM Partners acts as a liaison between industry, public agencies, conservation and academia so that best vegetation management practices are used to resolve vegetation management problems, control invasive weeds, improve wildlife habitat and lower the risk of wildfire. Rick acts as an advisor and trainer for the federal land management agencies and is presently assisting Eastern Neck National Wildlife Refuge, MD and the Detroit River International Wildlife Refuge, MI in controlling invasive weeds and improving wildlife habitat.

VMES provides assistance to utilities in developing vegetation management programs that meet their safety and reliability needs of services to the public in an efficient and economical fashion. Rick is presently assisting ITC Holdings electric transmission and Columbia Gas and Gulf natural gas transmission.

Rick has 32 years experience as a system forester for the electric industry. He is a member of the Edison Electric Institute (EEI) Vegetation Management Task Force that negotiated a 2006 Memorandum of Understanding between the electric industry and

federal agencies (EPA, USFS, FWS, NPS, and BLM) to adopt best IVM practices on rights-of-way of federal lands. He is past president of the Utility Arborist Association, was an advisor to the United States–Canadian Blackout Report, coauthor of the EEI Environmental Stewardship Strategy for Electric Rights-of-Way, producer of a training video with Virginia Tech titled “Integrated Vegetation Management for Rights-of-Way” and expert to the U.S. Fish & Wildlife Service training DVD “Managing Utility Rights-of-Way for Wildlife Habitat”. Rick is a member of the Society of American Foresters, the International Society of Arboriculture, and is a registered professional forester receiving a BS in Forest Resources Management from West Virginia University in 1976.

Rick, his wife Tessa and son reside in Newark, DE and have 3 daughters in college.

Michael Robin Haggie
Biography

Michael Robin Haggie is an Agricultural Wildlife Ecologist with Chesapeake Wildlife Heritage (CWH) in Easton, MD. CWH is a private, non-profit conservation organization dedicated to creating, restoring and protecting wildlife habitat, and establishing more sustainable agriculture through direct action, education and research, in partnership with public and private landowners. Mr. Haggie directs CWH's sustainable agriculture program and wildlife research projects on 500 acres of farms and provides outreach to farmers to help them produce food and fibre with reduced inputs.

Mr. Haggie has over 15 years experience in conducting vegetation management and wildlife research studies on electric and natural gas transmission rights-of-way (ROW). His documentation shows that ROW managed with an integrated vegetation management approach has improved benefits for wildlife by creating stable low growth shrub, herb and grass communities with reduced inputs and lower costs to the utility. He has studied ROW vegetation in MD, DE, NJ, MI and TN.

Haggie is past president of Future Harvest – a Chesapeake Alliance for Sustainable Agriculture, and oversees and implements the Waterfowl Festival's Canada Goose Sanctuary program on Maryland's Eastern Shore. He also served on the Administrative Council for the Northeast Region of the USDA Sustainable Agriculture Research and Education Program (SARE).

Haggie has a BS Degree in Agronomy and Vegetable Crop Production from Cornell University (1978) and studied avian taxidermy, game management, zoology, botany and biology in his native England. He and his wife reside in Crumpton, MD.