

# Western Integrated Management Summit Research Summit White Paper



UTILITY ARBORIST ASSOCIATION

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## Introduction

Integrated Vegetation Management (IVM) has gained support in scientific and professional literature as an effective, efficient, and ecologically appropriate method of maintaining utility Rights-of-Way (ROW). Despite these findings, many barriers remain that prevent utility ROW managers from fully adopting IVM practices and strategies. These hurdles must be addressed if IVM is to gain wider acceptance among practitioners and the larger public. Research and Demonstration (R&D) can be a powerful tool and may serve to ease the fears of private and public stakeholders. This is especially true when interest groups are actively engaged through outreach efforts and partnerships in planning and implementing specific projects.

In the Eastern United States, R&D at the long-standing research plots on Pennsylvania Game Lands 33 has shown the value of collaboration and public involvement. Despite the wealth of research that has come from these testing grounds, additional project sites are needed to strengthen the case for IVM. The research findings from Game Lands 33 have been, and continue to be, influenced by the environmental and political landscape of the Eastern United States. As a result, many question whether the findings from this test site can be directly applied in regions like the American West given differences in ecotypes, public and private land ownership, management objectives, and public perceptions.

Representatives from numerous utility companies, academic institutions, and government and non-government organizations were brought together to discuss barriers and opportunities associated with IVM and IVM R&D. This white paper documents the discussions from this event and is intended to show the value of R&D projects in the Western United States as a means of furthering the acceptance and use of IVM. Key recommendations are outlined below, as well as several potential projects identified during the summit.

## Report Overview

- DESPITE RESEARCH AND DEMONSTRATION EFFORTS, WIDESPREAD ADOPTION OF IVM MANAGEMENT PRACTICES HAS YET TO OCCUR.
- MUCH OF THE CURRENT R&D HAS BEEN CONDUCTED IN THE EASTERN UNITED STATES. PROJECTS IN THE WEST WILL ADDRESS LAND-OWNERSHIP, ECOTOTYPE, AND MANAGEMENT CONSIDERATIONS UNIQUE TO THIS REGION WHILE BRINGING IVM CONCEPTS TO LIFE FOR PRACTITIONERS AND OTHER STAKEHOLDERS
- A COMBINATION OF TECHNICAL, COST/BENEFIT, AND SOCIAL ANALYSES ARE ALL NEEDED TO ADVANCE IVM IN THE WESTERN UNITED STATES

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## The Power of Integrated Vegetation Management Research and Demonstration

### Background

In 1953, a team of industry partners began a research and demonstration project to compare the effectiveness of different vegetation management techniques in a ROW setting. Now known as Game Lands 33, the original study area was set up along a three-mile segment of lines passing through Pennsylvania State Lands. The original partners included the Pennsylvania Game Commission, Pennsylvania Electric Company (now First Energy), Dow AgroSciences, Asplundh Tree Expert Company, and Purdue Researcher Professors Dr. William Bramble and Dr. William Byrnes.

Originally intended to address the concerns of hunters, the research also set out to determine the effectiveness of different maintenance techniques and their individual effects on wildlife and habitat within the ROW. Over time, the plots were modified to apply the knowledge obtained and to demonstrate emerging techniques. A key modification was the development of the wire-border zone concept to IVM.

### Key Findings of Game Lands 33 Researcher

There is an extensive list of articles published in scientific journals and trade magazines resulting from the research at Game Lands 33. Key findings include:

- Selective use of herbicides integrated with other vegetation management techniques reduces work load over time when compared to mowing and hand cutting.
- Grass and low-growing vegetation (typical of early successional plant communities) resist the establishment of new trees within ROW and reduce long-term costs.
- Using the wire-border zone approach to IVM results in greater plant diversity and environmental benefits, such as greater overall “biodiversity” (including the potential repopulation of rare and endangered species).

### Key Results of IVM Research at Game Lands 33

The IVM research conducted at Game Lands 33 has significantly influenced the modern utility vegetation management industry. Specifically, it has resulted in the development of scientifically-based management techniques, the American National Standards Institute (ANSI) Standard A300 (Part 7) IVM, and the International Society of Arboriculture (ISA) IVM Best Management Practices.

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## Beyond Research: Demonstration and Partnership Development

The value of the Game Lands 33 research project as a model for the demonstration of IVM techniques cannot be understated. In addition to the scientific understanding it has provided, Game Lands 33 has served as a model for addressing the concerns of various stakeholders, agencies, and parties concerned with ROW management operations. By partnering with the Pennsylvania Game Commission, as well as hunter and wildlife groups, the utility industry was able to demonstrate how an integrated approach could achieve multiple objectives.

## Facing Today's Challenges

Utilities continue to face significant challenges when maintaining safe and reliable electric systems. In addition to the potential risk, vegetation and power line contact poses to public safety. Federal and State regulations now provide significant penalties for utilities that fail to maintain safe distances between vegetation and electric conductors. Environmental regulations and expectations also place significant demands on utility vegetation managers and in some cases limit the range of solutions that can be used.

In spite of these challenges and benefits identified by IVM research, implementation of IVM best management practices and the wire-border zone is far from widespread. This is especially true in the Western United States. Inadequate vegetation management has been blamed for two major outages in 1996 (Western United States) and 2003 (North Eastern United States and Canada) when large portions of the electrical grid failed and left millions without electricity. These cascading outages were caused by trees that were allowed to grow into the conductors from within the wire zone. Unfortunately, utilities continue to experience significant outages stemming from tree and wire contact.

## IVM Research and the Utility Arborist Association (UAA): Implementing Solutions

The challenges listed above provide the utility industry with a significant opportunity to move towards full implementation of IVM and the wire-border zone concept. The penalties for non-compliance with federal reliability standards have focused the attention of utility executives and others on vegetation management. The methodology developed by Bramble and Byrnes provides utility managers with the means to overcome resistance to IVM implementation through the development of research and demonstration projects.

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To do this, utilities must form partnerships and joint initiatives that leverage IVM techniques for benefits beyond reliability objectives. In the West, additional benefits of interest include: invasive species management, habitat restoration, fuel load management, and recreational opportunity development. Potential partners include: public agencies, universities, environmental groups, non-profits, public interests, and property owners.

## **Focusing R& D Efforts: Core Research Areas Identified at the IVM Summit**

While the discussions at the research summit covered many specific research needs, three broad themes effectively capture the breadth of topics discussed. These areas may be useful in defining funding priorities within an individual utility company or for a future industry-sponsored TREE Fund Grant.

**Technical Research:** Includes investigations regarding the effectiveness of current and emerging management practices, products, and treatments dosages in maintaining adequate clearance. Technical research may also examine the effects of vegetation management operations on the environment, residual trees, reliability, and other factors.

**Cost benefit analysis:** Compares economic and/or environmental costs associated with conventional and integrated vegetation management techniques.

**Social and Marketing Research:** Assesses public perception regarding utilities and utility management practices. Identifies what messages effectively reach target audiences.

## **Key Barriers, Opportunities, and Recommendations Regarding IVM R&D**

During the research summit, participants were first asked to identify key challenges that limit the widespread acceptance of IVM. Several core issues were identified and are listed below. After acknowledging these obstacles, attendees were challenged to link opportunities to each. Recommendations were made based discussions of both challenges and opportunities.

### **1. Public Perception**

#### *Challenge:*

Many in the public are aware of the benefits offered by trees. Beyond this basic level of tree literacy, many people feel an inherent connection to trees and other elements of nature. As such, utility management practices can often be unpopular, especially when they result in drastic visual changes to the landscape or the form of a mature street tree.

Beyond aesthetics, the use of chemical control methods can stir up a wide range of emotions among stakeholder groups. In exposing ecological ills associated with DDT and other chemicals, environmentalists like Rachael Carson (most noted for her landmark book, *Silent Spring*) have had a significant impact on how the public reacts to the use of pesticides and her-

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bicides — even when used in a safe and responsible manner. As such, utilities often opt for less controversial methods of vegetation control (mowing and hand cutting), especially on public and recreational lands.

## *Opportunity:*

Use of the IVM wire-border zone management strategy can be used to create and maintain a relatively static, early-successional plant community. Sustaining this system can reduce the need for periodic and drastic visual disruptions that may anger and alarm the public. By preventing incompatible, naturally-occurring trees from growing to maturity, a ROW manager will largely defuse a potentially emotional situation that may follow the removal of a large, significant tree. Proponents of IVM should practice and advocate responsible, targeted use of chemical herbicides as one of many tools available for vegetation management. Education efforts that highlight the environmental and economic costs and benefits of chemical, cultural, and mechanical control techniques are important for both utility ROW managers and the public. In addition, the ecological benefits associated with creating early successional habitat should be provided to interested user groups, such as hunters and wildlife enthusiasts in an effort to garner outside support. IVM efforts that tie into existing noxious weed control programs may prove mutually beneficial for utilities and land managers.

Finally, partnering with a third-party organization may help give credibility to the information and strategies being presented. No matter how transparent and sound a research project is, stakeholders may mistrust the findings if presented or funded directly by a utility or chemical manufacturing company. Gaining support from recreation and conservation groups or non-governmental organizations can help dismiss unjust perceptions of information bias.

## *Recommendations:*

Research funding should be allocated toward social and marketing research to assess public perceptions of both utilities and IVM management. This is a critical first step toward identifying common misconceptions that may be rectified through targeted research and education efforts.

Other questions may be worth investigating in order to effectively tailor public relations messages. Do stakeholders find early successional landscapes appealing or acceptable? Does identifying this cover type as a source of wildlife habitat have a significant impact on public perception? What does the public know and think of IVM philosophies? Is IVM viewed as an environmentally and economically acceptable vegetation management option? Can it be used by utilities to build trust with the public and interest groups? All are important questions that may help address issues of image while also identifying areas where educational and research efforts have failed to reach utility managers and the greater public.

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## 2. Resistance to Adoption of IVM Strategies within the Industry

### *Challenge:*

There are numerous reasons why a utility ROW manager may resist adopting IVM strategies. Effective IVM practitioners need to understand aspects of plant physiology, ecology, and chemistry that often go beyond what is needed to perform basic line clearance operations. Furthermore, many utility managers do not enter their positions with a background in forestry or land management and may be more hesitant to experiment with vegetation management options beyond what has already been proven to be reliable within their organization. As a result, there can often be an over reliance on strategies that appear to be “one size fits all.”

It may also be difficult for managers to see the value in an integrative strategy that may be more costly upfront, despite the promise of significant savings in the long term. Adopting an IVM approach requires long-term vision that often goes beyond a utility’s operational cycle. Even if the value is recognized, trying economic times can push utilities to adopt conservative line clearance budgets that leave little room for experimentation.

Finally, while there is a growing collection of IVM and Wire-Border Zone research available, many technical research gaps remain. Filling these scientific voids will strengthen the case for adoption of IVM strategies. Research gaps exist at both the macro level and in the context of specific regions.

### *Opportunity:*

Targeted education efforts may be the most effective means of winning over utility vegetation managers. This is where the demonstration in R&D can be particularly valuable. Seeing an effectively managed utility corridor that is maintained using a variety of integrated strategies and being able to interact with IVM practitioners may win over hesitant ROW managers. While a few projects exist in the Eastern United States, closer and more accessible research sites that incorporate conditions, topography, and plant communities of the West may help further the adoption of IVM philosophies.

Cost-benefit analyses are needed convey the long-term savings associated with implementing more diverse management practices. These assessments should be inclusive, assessing hidden costs such as permitting that go beyond equipment, labor, and material expenses.

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## *Recommendation:*

Several regional research and demonstration projects should be established to increase accessibility and capture the diversity of land and plant types found in the West. In addition cost-benefit analyses may help win over vegetation managers and their superiors.

## **3. IVM on Public Lands**

### *Challenge:*

The Western United States is a patchwork of private, state, and federal lands. Working on public land poses its several unique challenges. Policies may limit or ban the use of chemical controls, making it difficult to utilize cultural or biotic management strategies like the wire-border zone. If not banned outright, the additional paperwork, time, and permit fees tied to the use of chemical controls may ultimately make mechanical control methods like mowing the most attractive management option.

Another major consideration for utility management in the Western United States is fire prevention. The current wire-border zone concept is viewed by some government land management and wildfire agencies as a potential hazard. Low and intermediate shrubs can serve as a 'fire ladder,' helping flames from the ground reach the forest canopy. This would result in much more intense and dangerous crown fire conditions.

### *Opportunity:*

Federal and state agencies endure intense scrutiny and are often hesitant to engage in activities (such as the use of chemical controls) that will potentially trigger public outcry. Gaining public support and developing a thorough understanding of an agency's various external and internal processes will significantly improve working relationships with public land managers.

Partnering with government and non-governmental organizations may help highlight the numerous benefits associated with IVM and the Wire-Border Zone method. In addition to the wildlife benefits noted above, research should investigate if IVM significantly reduces fuel loading, controls invasive weed species, or provides additional recreational opportunities. Most or all are issues of concern for government agencies in the West.

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## *Recommendation:*

Actively seek research and development partnerships with public land management agencies. In addition, continue to research secondary benefits (fuel load reduction, noxious weed control, etc) of IVM from both a utility and non-utility perspective.

## **4. Funding Research Projects**

Challenge: Funding long-term IVM R&D projects takes a considerable investment in time, effort, and money. Funding source instability can doom a study just as significant data is being generated. Even successful projects like Game Lands 33 require constant effort to ensure the flow of research dollars. In tough times, even the most successful and productive efforts may be viewed as unnecessary expenditure and dropped from a budget.

Currently, utility and chemical companies provide the major-

ity funding for IVM research. As mentioned earlier, this connection may lead some to question the neutrality of research findings. Funneling money through a third party may be an alternative; however, it may be perceived by some companies as limiting recognition for their commitment to the science and technology development.

## *Opportunity:*

Endowing a fund specifically tailored to the support of IVM and utility clearance projects can help establish a more stable pool of research money. This reduces the financial burden placed on any one company and may stimulate other groups to contribute funds. Granted money could fund short-term technical research projects or serve as seed money to help jump-start longer term R&D efforts. Projects funded through this endowment may have increased success when applying for grants through other agencies. Organizations can and should be listed as key sponsors in recognition of their donations.

## *Recommendation:*

The Utility Arborist Association and Tree Research and Education Endowment (TREE) Fund have established a Utility Arborist Fund with a \$100,000 endowment. Continued support of this ambitious funding initiative will sustain IVM research ef-

**Potential funding sources beyond individual utility companies and the UAA/TREE Fund granting program were discussed at the IVM Research Summit. Sources mentioned include:**

- Environmental Protection Agency – Pesticide Environmental Stewardship Program (PESP) Regional Grants
- Wildlife and Nature Conservancy Groups
- National Institute of Food and Agriculture (NIFA) Grants
- CALTRANS and other state departments of transportation
- Department of Energy (DOE) Grants
- Joint Fire Science Center
- US Farm Bill
- Federal Stimulus Funding
- Timber Companies
- Bureau of Land Management (BLM) – Resource Advisory Councils (RAC)
- Forest Service – Pesticide Impact Assessment Program (FS-PIAP)

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forts and raise awareness of the need for more scientific information

## Summary

While IVM has gained greater exposure and support and appears to provide a multitude of economic and environmental benefits, it has yet to be fully embraced. Technical research will remain at the core of future R&D efforts; however, there is significant value in supporting social research and cost/benefit analyses.

Research sites in the West, which build on the work started at Game Lands 33, will be living laboratories – effectively merging research and outreach efforts. These sites will account for landscape characteristics unique to the region and will provide utility managers with the means to overcome resistance to IVM implementation.

## Appendix A: Proposed R&D projects

### 1. Cosumnes River Preserve, Galt, CA

#### *Potential Partners:*

Bureau of Land Management (BLM), The Nature Conservancy (TNC), California Department of Fish and Game (CDFG), Department of Water Resources (DWR), Ducks Unlimited, Sacramento County, Sacramento Municipal Utility District (SMUD), Western Area Power Authority (WAPA), Pacific Gas and Electric Company (PG&E), State Lands Commission, Dow Agrochemical, Private Landowners

\*Note many are existing partners through the preserve

#### *Stakeholders Identified:*

California residents and researchers

#### *Project:*

This site would be suitable for R&D plots, which compare various treatments employed by utilities. Research would attempt to find optimal strategies for maintaining adequate clearance, creating habitat, and encouraging population growth of preferred plant species.

#### *Opportunities and Challenges:*

This preserve is home to several threatened and endangered species. In addition, noxious and weeds species are being managed on the site. If research plots successfully demonstrate that IVM can control both noxious weeds and incompatible

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trees without any negative (or perhaps even positive) impact to species of concern, the strategies employed will likely gain wider acceptance. As with many public lands, permitting may slow attempts to begin field trials. In addition, the site is very open to the public and trespassing and poaching have the potential to impact findings. However, high visitation (likely encouraged by the presence of a nearby visitor center) could increase visibility of R&D efforts.

## *Funding:*

Potential funding sources include: the Fish and Wildlife Service (FWSO recovery program, Natural Resource and Conservation Service (NRCS), Central Valley Project Improvement Act (CVPIA), Utility Companies, and the BLM Conservation Resource Program (CRP).

## **2. Arizona Public Service, AZ**

### *Potential Partners:*

Members of the Research Community

### *Stakeholders Identified:*

Arizona Public Service (APS), Arizona Fish and Game, Researchers

### *Project:*

This R&D project is currently reviewing its second-year findings. This preliminary work will serve as baseline data for various IVM trials. Both short- and long-term control processes are being evaluated on four sites representing key Arizona ecotypes (ponderosa pine, piñon juniper, chaparral, and Sonoran desert). The research objectives of this project include:

- Identification of net IVM ecosystem benefits
- Assessment of the effectiveness of IVM techniques
- Cost/benefit analysis of the control processes tested
- Assessment of stake holder goals (state agencies, grazing permit holders, private landowners)

### *Opportunities and Challenges:*

Stakeholder engagement (especially researchers) was identified as the single biggest challenge associated with this project. Project managers have been largely unsuccessful in attracting researchers to work with on these sites. APS is focusing on who they should involve and how they can encourage collaboration.

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## *Funding:*

This project is currently funded by APS. However, outside resources from the Utility Arborist Fund could help make this a model program in the West. Additionally, APS has considered the merits of hiring a half-time or contracted grant writer. It was noted that once successful grant gets the process going and can create a positive momentum which helps sustain long-term research.

## **3. American River Parkway, Sacramento, CA**

### *Potential Partners:*

Pollinator Partners (as co-primary investigator and a grant partner)

### *Stakeholders identified:*

California Exposition and State Fair, Sacramento Parks (CAL Expo), Sacramental Fire Department, Sacramento Area Flood Control Agency (SAFCA), utility companies, Sacramento State University, University of California – Davis, Arden Arcade, Woodlake, Fish and Wildlife Service, Department of Fish and Game, and Salmon special interest groups.

### *Project:*

Four key components were identified as research areas for this project. These research topics include: IVM and its influence on fuel loads and wild fires; IVM and electric reliability; costs and benefits of IVM; and public perceptions and knowledge of IVM practices. A strong educational focus will help convey findings to stakeholders and the general public.

### *Opportunities and Challenges:*

The location is near the California State Fair grounds and office. Its unique location makes it an excellent site for reaching a larger audience. Three local utilities have transmission lines on the site, making it a great area for a collaborative research endeavor.

In addition to the opportunities above, the site does pose several key challenges. The American River Parkway is home to the threatened valley elderberry longhorn beetle and any management practices employed take this insect and its preferred host plant/habitat. The river and surround riparian area are also concerns, as water quality and the wellbeing of aquatic life are top priorities.

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## *Funding:*

Possible funding and in kind sources include: California Department of Forestry and Fire Protection (CAL FIRE), utility companies, Pollinator Partners, and Sacramento County.

## **4. Bonneville Power Administration – New 500 kV Transmission Line**

### *Stakeholders Identified:*

Bonneville Power Administration, State Departments of Natural Resources, Friends of the Columbia Gorge, State and Federal Fish and Wildlife Services, Native American tribal groups, USDA Forest Service, Universities within the Pacific Northwest, the forest products industry, regional utilities, and local cable access.

### *Project:*

Work at the site would ultimately lead to the creation of an IVM Best Management Practice guide for the Pacific Northwest. In addition, a cost/benefit analysis will assess the various management techniques implemented. Finally, all efforts will be incorporated into a program for public education.

### *Opportunities and Challenges:*

Some information exists through a previous study conducted by the Bonneville Power Administration. This, combined with a comprehensive literature review, would provide excellent baseline data for future studies.

Given the number of stakeholders identified, it may be difficult to find ways to keep everyone happy. Additionally, including these interests may greatly increase the complexity of the project. Finally, sustaining interest and funding for long-term research sites may be difficult.

## *Funding:*

Bonneville Power Administration

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## Appendix B: IVM Summit Participants

First	Last	Affiliation
Peter	Beesley	California Invasive Plant Council/Pacific Gas & Electric
Bob	Bell	Pacific Gas & Electric
Heather	Brady	California Invasive Plant Council
Bob	Brenton	Consultant
Jessica	Carroll	Utility Arborist Association
Joe	DiTomaso	University of California - Davis
Nancy	Fleenor	USDA Forest Service
Mark	Frizzell	Sacramento Municipal Utility District
Steve	Hallmark	Sacramento Municipal Utility District
Harvey	Holt	Purdue (retired)
Scott	Johnson	Wilbur Ellis
Andrew	Koeser	International Society of Arboriculture
Terrance	Lorick	California Native Plant Society
Mary	Maret	Sacramento County Regional Parks
Jaymee	Marty	The Nature Conservancy
Jack	McCabe	Davey Resource Group/Utility Arborist Association
Harry	McQuillen	Bureau of Land Management
John	Melvin	Cal Fire
Rick	Miller	Dow AgroSciences
Pam	Money	Pacific Gas & Electric
Nelsen	Money	Utility Arborist Association
Mike	Neal	Arizona Public Service
Mark	Newbill	Bonneville Power Authority
Cindy	Oswald	El Dorado National Forest
Scott	Paulsen	Arizona Public Service
Vanelle	Peterson	Dow AgroSciences
Gina	Ramos	Bureau of Land Management
Ramona	Saunders	County of Sacramento
Ramona	Saunders	County of Sacramento
Chuck	Sheppard	Bonneville Power Authority
Steve	Tuggle	Western Area Power Authority
Derek	Vannice	Utility Arborist Association
Wendy	West	El Dorado County Weed Management
Vicky	Wojcik	Pollinator Partnership