Integrated Vegetation Management

By Rick Johnstone, IVM Partners, Inc.

Science Background

The science of integrated vegetation management (IVM) can trace its roots to the invention of modern herbicides following World War II. Dr. William C. Bramble and Dr. William R. Byrnes started research on electric transmission rights-of-way (ROW) in 1952 in the hills of central Pennsylvania because of a concern by that state's deer hunters that herbicides were harming their largest game animal. The two researchers were able to show that the deer hunters' fears were unfounded because herbicides proved to be a valuable tool in developing plant cover diversity for deer and a number of other animals and plants (Bramble and Byrnes 1976, 1983).

The studies continue to monitor plant community changes following various vegetation maintenance procedures (hand cutting, mowing, broadcast and selective herbicide applications, or a combination of treatments) and their relative effect on a multitude of plants and animals. Small mammals (Bramble et al. 1992), birds (Bramble et al. 1994), butterflies (Bramble et al. 1997; Bramble et al. 1999), and reptiles and amphibians (Yahner et al. 2001) have all been shown to benefit from the proper use of herbicides in developing and maintaining habitat diversity.

Mowers contaminate with hydraulic fluid and oil

Cultural Divide

While the Bramble and Byrnes scientific studies are well known by utility arborists, they have received little attention within federal and state land management agencies. A cultural divide seems to have originated in the 1960s, when the environmental movement grew up, along with a belief that, during the unpopular Vietnam War, the military abused herbicides in jungle warfare. Any mention of chemical control by a utility was equated with wanting to use "Agent Orange." This bias against herbicides continued to cloud natural resource management decisions for the next 40 years. Some utilities chose to abandon herbicide use altogether in order to appear more environmentally conscious. (Electrical World 1991).

Public utility commissions that regulate electric utilities shared this bias and placed restrictions on chemical use when granting certificates for new high-voltage transmission construction. Some went so far as to dictate what type of vegetation management practice was allowed on a ROW (Patty et al. 1997). Additional environmental studies were demanded and arbitrary buffers were mandated to prevent herbicide use near streams, wetlands, and other environmentally or visually sensitive sites. Although most studies revealed that herbicidal chemicals were more benign to the environment than the alternative cutting practices (chain saws and brush mowers contaminate the environment with discharges of toxic hydrocarbon chemicals such as oil, gasoline, and hydraulic fluid, and they increase erosion and sedimentation potential from tire rutting and other exposure of bare soil), these facts were overlooked because they ran counter to popular opinion (Nickerson 1992; Johnstone 2006). ►

Maple swamp prior to treatment.

Restored Wetland Meadow.

The Comprehensive Management Plan for the unique pine barrens of southern New Jersey banned the use of herbicides altogether for ROW vegetation management. Integrated pest management (IPM) took on a corrupted definition of "pesticides as a last resort." The environmental activists favored steam for vegetation control of railroad beds while condemning the use of herbicides. The fact that steam was nonselective and also killed unsuspecting birds, mammals, desirable plants, and invertebrates evidently was overlooked.

The National Environmental Policy Act (NEPA) was signed into law on January 1, 1970. Title I of NEPA contains a Declaration of National Environmental Policy that requires the federal government to use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony. Section 102 requires federal agencies to incorporate environmental considerations in their planning and decision-making through a systematic interdisciplinary approach. Specifically, all federal agencies are to prepare detailed statements assessing the environmental impact of and alternatives to major federal actions significantly affecting the environment. These statements are commonly referred to as "environmental impact statements" (EIS).

Logic would dictate that NEPA scientific environmental studies of various vegetation maintenance techniques would validate the use of herbicides for utility ROWs. However, perception is more powerful than fact. Hand and mechanical cutting of vegetation were accepted practices considered harmless to the environment, while a request for herbicide use activated an EIS request. The cost and time constraints of filing a full environmental impact statement discouraged many utilities from attempting herbicide use on federal lands. As for federal agency personnel, a disincentive existed for one to stick his or her neck out and approve practices contrary to the accepted environmental doctrine. Granting herbicide use for a utility could raise the ire of environmental activist groups, resulting in nuisance lawsuits that tied up precious budgets and manpower. This was a no-win situation and career breaker for lower-level federal employees; thus, the status quo continued.

Winds of Change

About 20 years ago, I witnessed a change in direction of an environmental organization as it matured from activism to true conservation. A steward of the Maryland Chapter of The Nature Conservancy requested assistance in managing a wetland bog on an electric transmission ROW of Delmarva Power that grew unique populations of green pitcher plants (*Sarracenia oreophila*). Upon inspection, it was noted that encroaching trees and the invasive giant reed *Phragmites australis* threatened the rare plants. When the steward learned that herbicide use was necessary to kill the root systems of the encroaching trees and invasive phragmites, he was adamantly opposed. However, an invitation to observe a selective herbicide application at another location provided the education necessary for the steward to see the benefits of judicious herbicide use. The trees and phragmites were subsequently treated with wetland-approved herbicides that destroyed weed plants and duplicated past fire regimes of the coastal plain. This recreated the open wetland meadow habitat necessary for the rare plants' survival, and a 20-year partnership was formed.

Similar habitat restoration occurred when a red maple swamp was aerially treated with glyphosate to maintain electric reliability on a high-voltage transmission ROW. The initial aerial broadcast treatment was followed two years later with a selective herbicide application using backpack applicators. This treatment selectively removed undesirable tree species that prevented them from again dominating the site. This management permitted the germination and establishment of a community of desirable low-growing plants. The rare white-fringed orchid (*Platanthera blepharigiottis*) was one species discovered growing where the maple trees once dominated. The Maryland Heritage Program was contacted, and their biologist's research found that the rare plant seeds could stay dormant for up to 150 years waiting for proper growing conditions. These conditions historically were produced by fire, but herbicide applications duplicated the effect by eliminating the competing plants and providing a favorable site for desirable plants (Maryland Natural Heritage Program 1992). ▶

This phenomenon was documented at another Delmarva site by a botanist from Chesapeake Wildlife Heritage, a nonprofit conservation group. Wildfire burned a portion of a transmission ROW in Maryland adjacent to an area that was treated with a broadcast herbicide application. A two-year study was initiated to document and compare the plant community changes on the two sites. This study found that 32 different plants germinated in both the fire and herbicide sites. Twenty-five additional plants were found growing in fire sites but not herbicide-treated sites, while 17 plants were found in herbicide sites but not fire sites. Not exactly the same, but for wildlife management where fire is not practical, herbicide applications proved to be a viable and effective option (Haggie et al., in press).

Outreach

The transition from dense stands of trees and undesirable invasive plants to a managed state is not a pretty sight, whether the tool used is fire or herbicides. Those unschooled in vegetation management are often alarmed by this fact. Unless an experienced, qualified forester is quick to respond and take the time necessary to educate the public, a public relations firestorm is likely to occur. However, education and the knowledge gained is the most powerful ally to correct the tide of misperception.

A respected wildlife conservationist wrote a newspaper editorial attacking a utility herbicide application and blaming the decline of bobwhite quail (*Colinus virginianus*) populations on this blatant destruction of habitat. Instead of remaining quiet in the hope that the attack would be singular and pass, an editorial response was written that explained the facts and offered to take the conservationist on a ROW tour to learn more about IVM. Surprisingly, the conservationist accepted the offer and spent a day with the utility forester to learn about the entire process. The result was an unsolicited endorsement of an IVM program in the form of an article in the Virginia Wildlife Magazine (Badger 1988).

These examples and others from eastern utilities were reviewed by the EPA Office of Pesticide Programs in the early 1990s and helped lay the foundation for utility involvement in the agency's new Pesticide Environmental Stewardship Program. Edison Electric Institute joined this program and its Vegetation Management Task Force produced a study guide and video *Environmental Stewardship Strategy for Electric Utility Rights-of-Way* that outlined IVM as the best practice (VMTF 1996). I assisted in this development and followed with another video collaboration between the Vegetation Management with Environmental Stewardship and Virginia Tech pesticide programs titled *Integrated Vegetation Management for Rights-of-Way,* which outlined the reasons for and similarities between IVM for utilities and highways.

IVM was also shown to be important during endangered species consultation with the U.S. Fish & Wildlife Service when reviewing new transmission line construction in New Jersey. "The purpose of the Endangered Species Act is to protect and recover imperiled species and the ecosystems upon which they depend" (USF&WS 2006). The proposed transmission right-of-way route traversed an area that historically held a population of bog turtles (*Clemmys muhlenbergii*). Bog turtles have been extirpated from several New Jersey counties as a result of development activities, woody plant succession, and invasion by exotic plants. The proposed IVM plan called for mechanical cutting of the trees and brush followed by a ground-based, selective foliar herbicide treatment one growing season later to remove the competing trees and the invasive giant reed *Phragmites australis* (Johnstone 2006). The Fish & Wildlife Service approved this plan because it reclaimed open wetland meadow habitat needed for bog turtle survival.

Threatened and endangered (T&E) species are also in peril because they may exist only in isolated islands of compatible habitat. Utility transmission corridors traverse all types of habitat; thus, they can connect isolated T&E islands if vegetation is managed properly. However, instead of being seen as attributes, utility corridors are often maligned for disrupting contiguous forest. A case in point is the same New Jersey transmission corridor where the bog turtles had been eliminated. The corridor also intersected a population of swamp pink orchids (*Helonias bullata)*, a plant that exists only in a forested wetland.

Swamp Pink Orchid

The environmental engineering firm consulting on this project suggested that the proposed line be re-routed to avoid the swamp pink population, because a wetland meadow habitat would not support a population of swamp pink. However, an electric utility ROW does not necessarily need to be managed for low-growing grasses and herbs. Arresting the plant community at the shrub–scrub forest stage can also provide the necessary line clearance and access for electric service reliability and the shaded habitat necessary for swamp pink survival (Johnstone 2006). This management plan was also approved and resulted in memorandum of understanding (MOU) between the utility and the Northeast Region of the U.S. Fish & Wildlife Service,

demonstrating that utility IVM plans can be written to help conserve two entirely different ecosystems.

The possibility of partnerships is discussed in a National Conservation Training Center video titled *Managing Utility Rights-of-Way for Wildlife Habitat*, which "provides instruction to U.S. Fish & Wildlife Service refuge personnel and other natural resource managers who are responsible for lands crossed by utility corridors. The video identifies basic management issues, describes various habitat conditions possible on utility corridors, presents techniques for producing the different habitat types, and discusses integrated planning and partnership approaches" (USF&WS 2004). In 2005, the video was distributed in DVD format to all personnel managing federal wildlife refuges.

Wildfire

Understanding management options is crucial to deciding where new utility corridors should be sited to provide the increasing energy needs of society. As previously discussed, properly managed utility corridors can provide scarce habitat that is not provided by other land uses such as contiguous forest, agricultural, or urban lands. But in addition to acting as wildlife and T&E greenways, utility corridors can also act as firebreaks to effectively battle wildfire or manage controlled burns. The Energy Policy Act of 2005 calls for the siting of energy corridors to meet the United States' increasing energy demands. Locating these corridors where fire-fighting access is important should be one of the considerations.

Examples of fire-fighting cooperation have occurred in Arizona and New Jersey. The Arizona Forest Fire Service and Arizona Public Service cooperated in stopping the devastating Chediski–Rodeo wildfire of 2002. The utility agreed to de-energize a 500-kV transmission line in order for the Forest Service to access the area and use the ROW to backfire (Neal 2004). It is important for safety reasons to de-energize conductors before attempting to fight a fire from under a high-voltage transmission line. Carbon particles in fire smoke can act as a conductor allowing the electric current to arc to ground. Electricity arcing through the smoke of a fire near a power line would behave similarly to a 500,000-volt lightning strike, proving deadly to unsuspecting fire fighters. Cooperation of this type was also written into a memorandum of understanding between the New Jersey Forest Fire Service and Atlantic City Electric Company for battling wildfires in the oak–pine forests of southern New Jersey. This MOU included consultation on IVM management for preferred ROW plant communities that are not high-fire fuels.

Misperceptions Continue

Despite the IVM success stories of agencies and utilities working together for the common good, this unfortunately has not been the norm. A 1995 survey found that mechanical cutting of vegetation outnumbered herbicide treatments on electric transmission ROWs by a margin of 2.7:1. When asked why mechanical methods were chosen over herbicide methods, the two most frequent responses were public perception and cost (Sulak and Kielbaso 2000).

Public perception problems are understandable given the adverse publicity surrounding herbicide use in Vietnam and pesticide abuses noted in *Silent Spring* (Carson 1962). However, the perception that mechanical cutting is less expensive than herbicide application, especially over the long term, is not accurate (Wildlife Habitat Enhancement Council 1992; Abrahamson et al. 1995). It is very difficult to manage a ROW for compatible low-growing plants without using herbicides. Herbicides eliminate the entire target plant by controlling the root systems of target weed species. If root systems are not controlled when cut, they will vigorously resprout with multiple, fast-growing stems that quickly outcompete low-growing, desirable plants and dominate the site. If aggressive, undesirable invasive species are present, a strict cutting regimen serves only to spread and exacerbate the situation, with increasing invasion and costs over time. Total control of undesirable plants through the judicious use of herbicides permits establishment of a community of low-growing, desirable plants that will inhibit the establishment of undesirable plants and significantly minimize the time and cost required for subsequent vegetation management operations.

In 1999, President Clinton signed an executive order (EO 13112) to increase coordination of federal agencies to prevent introductions of noxious or exotic species; provide for control, monitoring, and study; and restore native species and habitats in areas degraded by invasive species. Once again, logic should lead agencies to more readily accept herbicide use for these purposes.

It is important to recognize that herbicide use alone does not constitute an IVM program. Some utilities use herbicides for the sole purpose of extending their maintenance cycles to save money. Instead of mowing a ROW every three years, they might instead apply broadcast herbicide treatments every five years. A true IVM program may begin with mowing, followed by a broadcast herbicide treatment to control the high density of undesirable species, but then follow with selective herbicide treatments to develop an increasingly dense desirable plant community of grasses, forbs, and shrubs. Once this desirable plant community is established, it provides the primary management method of cultural and biological control by inhibiting the establishment of undesirable plants (Bramble and Byrnes 1976; Carvell 1976). Periodic, very selective herbicide applications are conducted that carefully target and control the few undesirable plants that become reestablished to maintain the low-growing, desirable plant community. ►

Backpack selective herbicide treatments.

If one looks at the strategic goals of the U.S. Forest Service (USDA Forest Service Strategic Plan for Fiscal Years 2004–08), they seem very compatible with an electric utility IVM program:

1. Reduce the risk from catastrophic wildland fire.
2. Reduce the impacts from invasive species.
3. Provide outdoor recreational opportunities.
4. Help meet energy resource needs.
5. Improve watershed condition.
6. Conduct mission-related work in addition to that which supports the agency goals.

Electric utility IVM programs directly share goals 1, 2, and 4 and indirectly provide for goals 3, 5, and 6 through their effective vegetation management results.

EEI–Federal Agency MOU

An IVM program would support federal efforts to meet their strategic goals on lands where electric utility powerline corridors are sited. In 1999, recognizing this fact and the challenges faced by utilities when attempting to implement IVM programs on federal lands, the Edison Electric Institute Vegetation Management Task Force began to discuss forming a memorandum of understanding between the electric industry and the federal land management agencies.

Utilities were becoming increasingly concerned that a major outage could be caused by trees on the many miles of transmission lines that cross federal lands if they were not permitted to implement IVM programs. This was deemed necessary because incompatible trees caused two major power outages on western U.S. transmission lines in 1996, and trees again were implicated in the massive power failure of August 14, 2003, that affected 50,000,000 people in the United States and Canada.

In response to this latest outage, obstacles to proper management were addressed by the Federal Energy Regulatory Commission as follows: "The Commission believes that better coordination among federal agencies and between the federal and state governments to develop clear, consistent policies and procedures for timely and effective vegetation management by transmission owners could help to alleviate many real and perceived obstacles to proper vegetation management." (FERC 2004).

The MOU was signed on May 25, 2006. In stated, in part:

> This MOU is intended to provide a working framework among EEI, international affiliates, and industry associates worldwide. The EEI works closely with its members, representing their interests, and works with the Department of the Interior Agencies, the Forest Service, and the EPA to develop practical, sustainable, and cost-effective policies, procedures, and practices that will reduce risks to the environment and the public while ensuring uninterrupted electrical service to customers. These practices are intended to protect human health and the environment and may reduce fires. The Federal land management agencies, through coordination with the EPA and other Government agencies, industry representatives, and local landowners, can promote IVM and other best management practices (BMP) as part of their review of rights-of-way vegetation management plans.

The MOU references as background an executive order signed by President Bush in 2001 (EO 13212) directing executive departments and agencies to take appropriate actions, to the extent consistent with applicable laws, to expedite projects or review of permits in order to improve the production, transmission, and conservation of energy while maintaining safety, public health, and environmental protection. Recognizing the importance of reliable electric service in the Energy Policy Act of 2005 (P.L. 109-58, enacted August 8, 2005, section 1211), Congress made provisions for electric system reliability standards, including vegetation management. All of the signatories agree that properly maintained ROW vegetation can act as effective firebreaks for the control and suppression of wildfire, reducing risk to the wildland–urban interface.

Integrated vegetation management is defined in the MOU as a system of controlling undesirable vegetation in which (1) undesirable vegetation within an ecosystem is identified and action thresholds are considered, and (2) all possible control options are evaluated and selected control(s) are implemented. Control options, which include biological, chemical, cultural, manual, and mechanical methods, are used to prevent or remedy unacceptable, unreliable, or unsafe conditions. Choice of control option(s) is based on effectiveness, environmental impact, site characteristics, worker/public health and safety, security, and economics. The goal of an IVM system is to manage vegetation and the environment to balance benefits of control, costs, public health, environmental quality, and regulatory compliance.

The MOU calls for utilities to work with federal land management

agencies to adopt consistent application processing and ROW management practices in concert with agencies' missions. It also requires utilities to coordinate utility vegetation management plans with the appropriate federal agencies and incorporate information on invasive species, threatened and endangered species, and other agency concerns. Utilities also agree to manage ROW areas to maintain wildlife habitat and protect threatened and endangered species habitat; reduce the introduction and control the spread of non-native invasive species or noxious weeds in the ROW and adjacent lands; and develop mutually acceptable corridor vegetative management plans.

Technologies such as GIS mapping and PC-based automated work management systems have made cooperation much easier. A utility can plan its work onto land-based maps to clearly identify areas and "layer" information from public agencies to coordinate areas of special concern for site-specific vegetation management plans.

IVM Best Practices

Now that we have agreement between the electric industry and the federal land management agencies that IVM is the preferred management scheme, the questions are, "Will we know it when we see it?" and "Will there be consensus on what constitutes a best practice?"

The American National Standard Institute ANSI A300 (Part 7)-2006 outlines IVM practices as follows:

1. Define the objectives.
2. Define action thresholds.
3. Inspect the site to determine if thresholds are met and what control is necessary.
4. Pre-control evaluation should include ROW use, type of electric line, general conditions, ownership, intended uses, adjacent uses, existing vegetation, topography, soils, fire risk, sensitive or protected areas or species, water resources, and regulations.
5. Proactively communicate.
6. Choose and implement appropriate control methods.
7. Post-control evaluation, quality assurance, and documentation

The U.S Department of the Interior updated its integrated pest management policy on May 31, 2007, to be in compliance with this directive from the Federal Insecticide, Fungicide and Rodenticide Act: "Federal agencies shall use integrated pest management techniques in carrying out pest management activities and shall promote integrated pest management through procurement and regulatory policies and other activities" (FIFRA, 7 U.S.C. 136r-1). The Department of Interior's Office of Environmental Policy and Compliance provides this guidance: The Department's policy is to manage pests and use IPM principles in a manner that reduces risks from both the pests and associated pest management activities. IPM is a science-based, decision-making process. IPM incorporates management goals, consensus building, research, pest biology, environmental factors, pest detection, monitoring, and the selection of the best available technology to prevent unacceptable levels of pest damage. Bureaus will accomplish pest management through cost-effective means that pose the least risk to humans, natural and cultural resources, and the environment (U.S. Department of the Interior 2007).

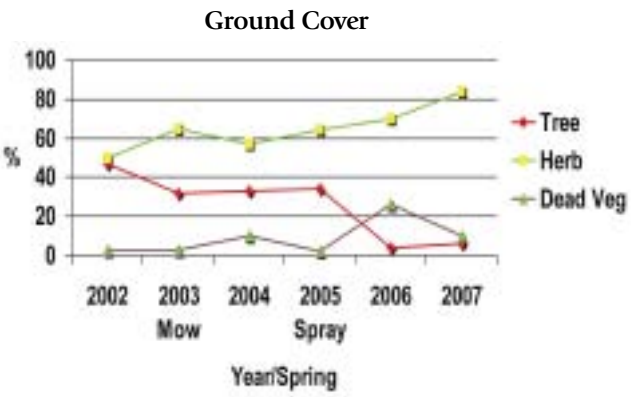
To assist in the development of best IVM practices a 501(c)(3) nonprofit corporation, Integrated Vegetation Management Partners, Inc., was formed in 2003 to act as a liaison among industry, public agencies, conservation organizations, and academia. It is chartered to be organized and operated exclusively 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 including
- develop, educate the public with respect to, and apply integrated vegetation management and conservation practices to provide safe, reliable, and accessible utility and highway rights-of-way that transport vital services for public necessity and homeland security;
- improve wildlife and endangered species habitats, control exotic weeds, and lower risk of wildfire;
- inform and educate land managers and public officials so that best practices are used to resolve vegetation management problems in a safe, economical, and environmentally responsible manner;
- develop partnerships between industry and government so that best management practices are used to resolve vegetation problems in military installations, communities, forests, parks, and wildlife refuges; and
- with cooperation from land grant universities, industry, government, and conservation organizations, conduct research and disseminate information with respect to regional geophysiological differences in vegetation management practices."

Ecosystem Management

IVM Partners' first project involved controlling the invasive giant reed *Phragmites australis* within the Delaware estuary under a grant with the National Fish & Wildlife Foundation (NFWF). *Phragmites australis* forms a dense, 15-foot tall monoculture that displaces native marsh plants that provide food and shelter for migratory waterfowl and marine life. The U.S. Coast Guard has warned that these dense, tall plants can also harbor terrorists by providing cover and posing a security threat to industries such as power plants, chemical plants, and oil refineries. Industry needs to maintain sight distance around their perimeters, and cutting invasive *Phragmites* is futile.

This plant is also a severe fire threat because it burns readily during the



dormant season, producing 30-foot-tall flames. IVM Partners organized aerial and ground herbicide treatments followed by mowing or controlled burns to remove the hazardous dead canes and thatch layer. Additional fire mitigation funds were secured under the Healthy Forest Initiative in a partnership with the Delaware Urban & Community Forest Service to remove the plant's fire risk near coastal communities and to reclaim lost parkland.

IVM Partners is also providing the expertise required to determine best management practices in various ecosystems. A multi-year project, also funded with a NFWF grant, is nearing closure in the Pinelands of South Jersey to compare hand and mechanical cutting of vegetation with herbicide treatments. Chesapeake Wildlife Heritage botanist M. Robin Haggie has established permanent transects to track plant community changes each spring and fall following hand cutting, mowing, and herbicide applications. The initial findings following the herbicide treatment discovered rare Pogonia orchids (*Pogonia ophioglossoides*) growing where phragmites was once dominant. Data continue to be analyzed to make recommendations to the Pinelands Commission for best vegetation management practices that meet the needs of the utility ROW and the historical coastal plain plant communities. It is hoped that Rutgers University can continue to use the ROW site to increase knowledge of various IVM practices and their impact on ecosystem management.

Similar projects are planned for determining best management practices in Michigan, Tennessee, and Arizona on electric and gas utility ROWs. In Michigan, ITC Holdings is sponsoring IVM partnerships for invasive weed control and habitat restoration on ROWs within the Clinton–Huron Metroparks system. They have made a commitment to be best-in-class for IVM practices and have taken this philosophy outside of their transmission corridors by providing cost-sharing funds for habitat restoration of the Detroit River International Wildlife Refuge.

IVM best practice demonstrations are under way in Tennessee for Columbia Gulf Transmission's natural gas ROW in cooperation with the Army Corp of Engineers. In Arizona, the U.S. Forest Service, Fish & Wildlife Service, and Bureau of Land Management, along with Arizona Game & Fish, Arizona Public Service, Salt River Project, and Western

IVM Partners at Chesapeake Farms, MD.

Area Power Authority are planning cooperative studies for the various ecosystems of the southwest.

IVM Partners cooperates with CropLife Foundation, Responsible Industry for a Sound Environment, Arborchem, Waldrum Specialties, DuPont, Dow, BASF, Weeds Inc., and other industry groups to establish vegetation management test sites at Chesapeake Farms, Maryland. The site is within 100 miles of Washington, D.C. on a tributary of the Chesapeake Bay on Maryland's eastern shore, making it convenient for federal agency personnel normally locked within the D.C. beltway. It hosted federal agency IVM workshops in October 2005, 2006, and 2007.

In 2005, attendees came from EPA, Fish & Wildlife Service, National Park Service, Department of Defense, National Fish & Wildlife Foundation, Maryland Forest Service, Delaware Forest Service, county personnel, and Maryland State Highway Administration. The second annual workshop in 2006 included a field tour of successful invasive plant control (phragmites, Japanese honeysuckle, mile-a-minute, Chinese lespedeza, autumn olive, multiflora rose, and ailanthus) and reclamation of warm-season

Germinating plants after Phragmites Control

Spotted cowbane
Barnyard grass
Smartweed
Halberd & Arrow-leaved tear thumb
Aster
Rice cutgrass
False nettle
Sow thistle
Water horehound
Sedge
St. John's wort
Dodder
Horse weed
Pepper bush
Little bluestem
Goldenrod
Moss
Giant foxtail
Wild bean
Cardinal flower
False pimpernel
Spike rush,
Water plantain
3-way Sedge
Rush
Marsh skullcap
Jewel weed
Water hemlock
Wood reed
Climbing hempweed
Boneset
Beak rush
Water purslane
Tulip poplar
Beggar tick
Bed straw

140 acres treated.

prairie grass. This tour included a look at invasive weed control efforts at nearby Eastern Neck Wildlife Refuge that IVM Partners coordinated for the U.S. Fish & Wildlife Service.

The 2007 tour provided an update of these control and habitat restoration projects and stressed the benefits of modern herbicide products and application techniques to more than 50 EPA employees and other federal and state agency personnel. These workshops are now presented on an annual basis, to demonstrate how the same IVM practices used by industry are applicable to management of multi-use public lands.

Bright Future

The Bramble and Byrnes studies were started more than a half-century ago, and, although it has been a frustrating time for many in the vegetation management field, it is gratifying to know that science-based management is finally receiving its due recognition. However, we still have a long way to go. Some utility asset managers believe that the vegetation management budget can be reduced when funds are short, not understanding that IVM is a long-term process and not a short-term solution; some utility arborists employ one management technique (e.g., mowing) and call that IVM, corrupting the name by not using the best practices. Some federal and state agency personnel still hold a bias against the use of herbicides, believing them to be harmful despite improvements in technology and safety. Pseudo-environmentalists continue to file nuisance lawsuits to achieve their activist agendas; and the media can seldom teach science effectively to the general public without prejudice.

To balance the energy needs of society with stewardship of our environment, all vegetation managers need to approach problems with a synergistic philosophy and consistently use IVM practices. IVM practices require that you define short and long-term objectives, set action thresholds, inspect sites and evaluate conditions, communicate proactively, choose and implement best control methods, and evaluate and document results. It is also necessary to adjust objectives as necessary and set new thresholds if appropriate. IVM is a continuous improvement process that can meet multiple needs by most effectively and safely managing vegetation challenges and establishing plant communities compatible with land use objectives.

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