

Impacts of vegetation management (VM) techniques used in rights-of-way (ROW) maintenance are often misunderstood by key stakeholders such as federal and state agencies, asset owners and managers, conservationists, and general public. The objective of this paper is to examine what is known from research and operational experience about the impacts of various vegetation management techniques on animal, plant, and pollinator habitats. Armed with the knowledge from this extensive body of research vegetation managers can educate and work collaboratively with all stakeholders to satisfy one another's goals and objectives. Based on years of field research and operational experience, vegetation management techniques employed in ROW management play a significant role in maintaining and improving habitat needed for sustaining threatened and endangered (T&E) animal, plant, and pollinator species. Plant, animal, and pollinator species respond differently to the use of various vegetation management methods. When herbicides are utilized, herbicide selections in combination with application method have a significant impact on the successful establishment and maintenance of desirable plant communities. A better understanding among stakeholders of how the various VM techniques impact animal, plant, and pollinator habitats can lead to improved decision-making and collaboration pertaining to the maintenance and protection of habitat. Knowledge from years of practical experience and 60+ years of research will demonstrate that managing ROWs using integrated vegetation management (IVM) techniques is the best approach for establishing and maintaining these critical habitats.

## Impacts of Vegetation Management Practices on Animal, Plant, and Pollinator Habitats

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**Keywords:** Animal, Habitat, Herbicide, Impacts, Integrated Vegetation Management, Mechanical, Plant, Pollinator.

## INTRODUCTION

Habitat loss is a key factor in the decline of certain animal, plant, and pollinator species in the United States. Millions of ha/acres of rights-of-way (ROW) currently exist with more being constructed which require ongoing vegetation management maintenance. These ROWs consist of very dynamic and diverse environments resulting in excellent opportunities to manage for animal, plant, and pollinator habitats. Provided with knowledge developed through more than 60 years of research and years of operational experience, vegetation managers can effectively manage their ROWs for certain habitat types based on the vegetation management practices employed. Development and maintenance of these early successional stage habitats can prove valuable in the sustainability of important animal, plant, and pollinator species.

## METHODS

Six vegetation management practices have been thoroughly studied to understand their impacts on animal, plant, and pollinator species. These practices include both mechanical and chemical methods such as hand-cutting, mowing, mowing + cut stubble, low volume basal bark, ultra-low volume, and high volume foliar treatments. Additionally, field observations from operational treatments using selective and non-selective methods and/or herbicides performed in a commercial setting provide additional insight into how various vegetation management techniques can lead to improved or poor habitat for various animal, plant, or pollinator species.

## RESULTS AND DISCUSSION

Compared to the adjacent mature forest the treated rights-of-way resulted in greater animal and plant species richness while equivalent for pollinators. Research demonstrated plant

communities can be changed with the use of appropriate herbicide and application methods (Bramble and Byrnes 1983, Bramble et al. 1991, Yahner and Hutnik 2005, Yahner et al. 2008). Practices that include the use of selective herbicides result in diverse vegetation that provides forage and habitat for wildlife on rights-of-way (Bramble and Byrnes 1983, Geir et al. 1992, Yahner 2004). In addition, plant communities can be created that inhibit tree establishment, thereby reducing maintenance costs for utility companies and mitigating the potential for power outage (Bramble et al. 1990)

Vegetation management treatments provide valuable habitat for spring and summer bird populations and bird abundance is about sevenfold higher within the treated right-of-way compared to the adjacent forest (Bramble et al. 1984, Bramble et al. 1986, Yahner and Smith 1990, Bramble et al. 1992, Bramble et al. 1994). The number of bird species is 33% greater on herbicide treated areas compared to those that were mechanically treated (Yahner et al. 2002, Yahner et al. 2003). The diversity of native plant species on the right-of-way provides a variety of nest sites for different bird species that depend on early successional habitat for breeding (Bramble et al. 1994, Yahner et al. 2004, Yahner 2007).

Plant diversity and cover type within the right-of-way provided preferred habitat for most reptiles and amphibians. With exception of the red-backed salamander (*Plethodon cinereus*), amphibians and reptiles were more common within the right-of-way compared to the adjacent forest. Reptiles and amphibians were more prevalent on herbicide treated units compared to hand-cutting units (Yahner et al. 2001, Yahner et al. 2001). A properly maintained right-of-way is not a barrier to movement of reptiles and amphibians.

Small mammals contribute to the diversity of wildlife on a right-of-way and species richness is greater within the treated right-of-way than the adjacent forest (Bramble et al. 1992, Yahner

2007). Cover types that benefit small mammals can be predicted through the implementation of specific right-of-way maintenance techniques (Bramble 1991). Small mammals use a diversity of cover types that result from integrated vegetation management (IVM) on the right-of-way. As a biological control small mammals are important in reducing tree reinvasion by feeding on tree seeds and seedlings (Bramble et al. 1992, Yahner et al. 2007).

Flowering herbaceous plants (forbs/wildflowers) occurring within the right-of-way provide excellent habitat for butterflies and other pollinator species. With the exception of hand-cutting, all herbicide and mowing plus herbicide treatments provided habitat for a diverse butterfly community within the right-of-way. Selective vegetation management consisting of selective herbicide use or selective application methods did not have a detrimental impact on butterfly species or total number of butterflies (Bramble et al. 1997, Bramble et al. 1999).

Years of operational experience have demonstrated that improper use of non-selective herbicides can remove desirable grass/forb/wildflower species favorable for animal, plant, and pollinator habitats and can even lead to soil erosion. Once desirable habitats are established selective vegetation management techniques can effectively be used to maintain these areas as incompatible plant species attempt to get established.

Vegetation management practices play a critical role in determining both the short and long-term habitat types established on a right-of-way. It is important that vegetation managers understand how these practices can dictate the type of habitat created within their rights-of-way. There are many areas across the United States where integrated vegetation management principles are prohibited or restricted due to concerns over the impacts on threatened and/or endangered species or loss of certain habitat types. As a result right-of-way maintenance costs in these designated areas can be



significantly higher. Vegetation managers armed with the knowledge from this extensive body of research have the perfect opportunity to educate and work collaboratively with both internal and external stakeholders to satisfy one another's goals and objectives.

## CONCLUSIONS

Following IVM principles is the best approach for achieving and maintaining certain animal, plant, and pollinator habitat types. Selective vegetation management practices result in diverse vegetation which provides forage and habitat for wildlife. Properly maintained ROWs create an opportunity to restore early successional habitat which is needed for many types of dwindling bird populations. The use of herbicides as part of an IVM methodology does not have a detrimental impact on pollinator species. In fact, as incompatible species are controlled on the rights-of-way, compatible species such as grasses, forbs, and wildflowers are allowed to flourish which leads to habitat favorable for not only pollinators but also most reptiles and amphibians, small mammals, and large game animals.

With careful and deliberate planning and execution, right-of-way managers can manage plant communities in a manner compatible with both internal and external stakeholder objectives. As more stakeholders understand the implications vegetation management practices can have on these vital corridors, the more likely these critical habitats can be created or maintained.

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