John Confer

Best Management Practices For

Golden-winged Warbler Habitat in Forest and Shrub Wetlands of the Appalachians

A publication of the Golden-winged Warbler Working Group, www.gwwa.org

This supplement for Forest and Shrub Wetlands accompanies *Best Management Practices for Golden-winged Warbler Habitats in the Appalachian Region*, which includes general information that applies to all habitat types in this area. Users should refer to both documents to develop a comprehensive management strategy for Golden-winged Warbler. The following are guidelines and not absolute rules for the creation of breeding habitat, thus prescriptions that fall outside the numerical ranges presented can provide habitat, too. Consult a Golden-winged Warbler or young forest habitat expert for assistance in tailoring a management plan to your property.

In the Appalachians, beaver wetlands (Figure 1), valley bottoms, and the perimeters of high elevation bogs can provide habitat for breeding Golden-winged Warblers. The perimeters of beaver meadows are often used shortly after a pond and its dam are abandoned, and the water level drops allowing a luxuriant growth of both herbs and shrubs to develop in the wet edges of the former pond. In high elevation wetlands of the Appalachians, Golden-winged Warblers occur in the forested perimeter around bogs, in forest wetlands dominated by red maple and sedges, and in scrub-shrub wetlands dominated by blueberry, willow, and sedges (Larkin pers. com.). See Table 1 for a list of common wetland plants of the Appalachians. Not all forest and shrub wetlands are occupied by Golden-winged Warbler for a variety of reasons, including high water levels, lack of vegetation patchiness, too few canopy trees, and a lack of surrounding forest. Reduced flooding and beaver activity may be partially responsible for these conditions and restoration of these natural disturbances can improve habitat quality. In other cases, mechanical treatments provide the mechanism for creating or restoring breeding habitat (Figure 2). In the Hudson Highlands of New York, it has been shown that forested wetland sites with > 30% forest cover can decrease overlap with Blue-winged Warbler (Confer et al. 2010).

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Figure 1. *Golden-winged Warbler territory in a beaver wetland.*

Aaron Brown, Habitat Forever

Figure 2. *Wetland in an extensively forested landscape after a mechanical treatment in Bald Eagle State Park, Pennsylvania. Note frozen lake in background.*

Promote Golden-winged Warbler use and limit Blue-winged Warbler co-occurrence by working in landscapes:

- within defined focal areas or < 5 miles (preferably < 1 mile) from known breeding populations and < 1 mile from other early successional patches
- with > 70% deciduous forest cover within 1.5 miles of the site, preferably < 1 mile from other early successional patches
- with shrub wetlands ≥ 5 acres in size where rotational management can be applied so that at least 20% of the area is cut every 5 years

Table 1. *Common plants associated with Golden-winged Warbler habitats in Appalachian wetland systems.*

Characteristic Canopy Species	Characteristic Shrub Species	Characteristic Herbs
red maple *(Acer rubrum)*	spicebush *(Lindera benzoin)*	sensitive fern *(Onoclea sensibilis)*
green ash *(Fraxinus pennsylvanica)*	alders *(Alnus* spp.*)*	cinnamon fern *(Osmunda cinnamomea)*
black ash *(Fraxinus nigra)*	viburnums *(Viburnum* spp.*)*	royal fern *(Osmunda regalis)*
elm *(Ulmus* spp.*)*	blueberry *(Vaccinium* spp.*)*	marsh fern *(Thelypteris palustris)*
willows *(Salix* spp.*)*	shrubby dogwoods *(Cornus* spp.*)*	tussock sedge *(Carex stricta)*
yellow buckeye *(Aesculus octandra)*	swamp azalea *(Rhododendron viscosum)*	iron weed *(Vernonia noveboracensis)*
	poison sumac *(Toxicodendron vernix)*	wing stem *(Verbesina* spp.*)*
	hawthorn *(Crataegus* spp.*)*	

Is Management Necessary?

Forest and shrub wetlands might not need management if they have **1)** many small open herbaceous patches with either dry ground or sedge tussocks for nest sites, **2)** scattered patches or clumps of woody shrubs that are not continuous in large blocks, **3)** scattered trees throughout, and **4)** natural processes that periodically disturb (e.g., flood, fire) the area (Figure 3). The absence of any of these characteristics suggests that there is a current or future management opportunity to improve habitat. Certainly not all forest and shrub wetlands should be managed, particularly those that are not accessible with the necessary equipment, have rare plants or animals that may be harmed by the management activities, or where soils remain wet or are sensitive even in winter.

Figure 3. *Aerial photo taken during winter of an extensive wetland system supporting Golden-winged Warblers at 4,200 ft in North Carolina. Management consists of limited sporadic mowing in the upland borders and fire twice in the past five to six years.*

Forest and Shrub Wetland Management Guidelines

Treatment Practices:

Shrub management is needed when shrub cover is continuous in large blocks with few large patches of herbaceous vegetation (> 70% shrub cover). Use small machinery to shear, cut, or chip woody shrubs or individual trees (Figure 4) to open patches of herbaceous vegetation, regenerate decadent patches of mature shrubs, and to create a more balanced mix of shrub and herbaceous patches. Hand-cutting woody vegetation is an option for small areas and places sensitive to disturbance by large equipment. In most places, wetland shrub treatment will be noncommercial so material can be left scattered on-site. For private landowners, cost-share programs (e.g., Natural Resources Conservation Service EQIP) are available to reduce the expense of management.

Treatment Patterns:

Cut shrub wetlands as strips and blocks with irregular edges on a rotational schedule. Within treatment areas > 5 acres, retain 50% of the shrubs in patches to create a patchwork of shrub and herbaceous vegetation throughout the managed area. Deciding which shrub patches to cut and which to retain is as much art as science. Follow the topography and retain trees and other features that increase vegetation structural diversity. Canopy trees are important for breeding habitat. For forested wetlands, manage for 30–70% canopy cover and for shrub wetlands, retain all trees up to 15 trees/acre.

Pennsylvania DCNR – Bureau of Forestry

Figure 4. *Winter wetland treatments at Delaware State Forest target removal of some canopy red maple trees to promote sedge growth, providing increased herbaceous habitat for Golden-winged Warbler.*

Other Management Considerations

Invasive Plants:

Prior to wetland shrub management, identify invasive plant species on-site or nearby. Pre-treatment of invasives may be necessary to prevent their spread or potential competition with desired regenerating species. Cut sites in winter and routinely clean machinery between sites to minimize the spread of invasive plants. Forested wetlands of the Hudson Highlands (New York and New Jersey) have recently experienced a major expansion of *Phragmites communis*. This non-native, invasive species forms dense, monotypic stands, which are rarely used by Golden-winged Warbler. Wherever possible, *Phragmites* should be aggressively controlled through flooding, herbicide treatments, or grazing by small ungulates such as goats.

Riparian Zone Management:

Wetland shrubs in riparian zones, especially where adjacent to or intermixed with deciduous forests and in the absence of Blue-winged Warbler, can be managed for Golden-winged Warbler. Follow riparian zone management guidelines for your area.

Resources/References

- Golden-winged Warbler Status Review and Conservation Plan, **www.gwwa.org**
- Confer, J.L, K.W. Barnes, and E.C. Alvey. 2010. Golden-winged and Blue-winged Warblers: Distribution, nesting success and genetic differences in two habitats. Wilson Journal of Ornithology 122:273-278.
- Rush, T. and T. Post. 2008. Golden-winged Warbler *(Vermivora chrysoptera)* and Blue-winged Warbler *(Vermivora pinus)* surveys and habitat analysis on Fort Drum Military Installation. NYSDEC, Division of Fish and Wildlife.

Prepared by Amber Roth, Ron Rohrbaugh, Curtis Smalling, David Buehler, Jeff Larkin, and Sara Barker Swarthout with additional information from the *Golden-winged Warbler Status Review and Conservation Plan*. **www.gwwa.org**