

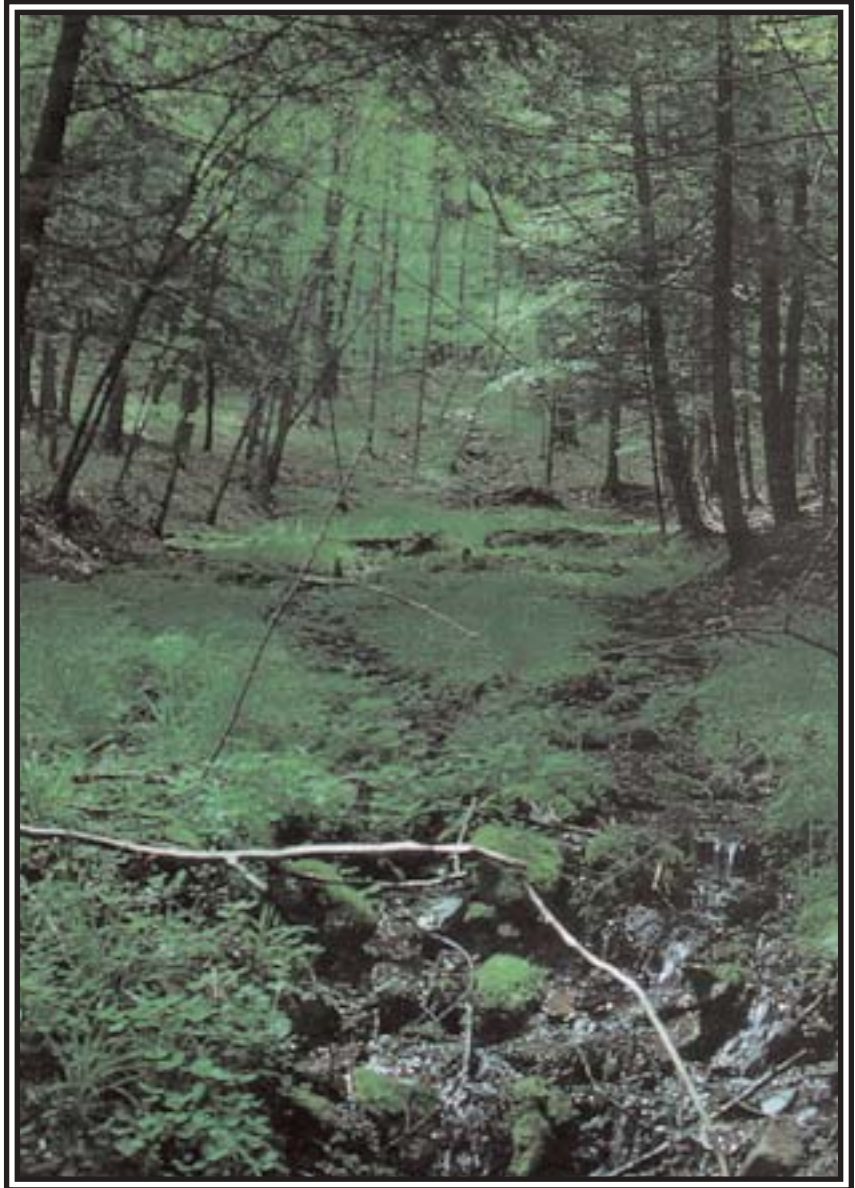
## Spring Seep Management for Wild Turkeys and Other Wildlife

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**S**prings and seeps provide open, snow free areas during the winter months which are used by wildlife as feeding sites. They occur where ground water flows to the soil surface. Springs flow from a clearly defined opening, and seeps form a saturated area where water percolates slowly through the soil. Small springs and seeps are so similar that both are usually called spring seeps. Water flowing from spring seeps is true ground water and not surface runoff, so the water temperature remains relatively constant year round. In the mid-Atlantic states, ground water temperatures range from 50 to 60 degrees F; temperatures are slightly cooler in New England and warmer in the South. Most spring seeps are true wetlands because they flow all year and form channels that connect with larger stream systems.

Spring seeps are easiest to locate during coldest or driest times of the year when temporary streams that carry surface runoff are either frozen or dry. Spring seeps can be positively identified at any time by taking the water temperature at the source. Seep temperatures will always remain between 50 and 60 degrees F, while surface runoff will be within a few degrees of air temperature.

Spring seeps are best known for providing winter habitat for wild turkeys and other wildlife in the Appalachian mountain region but are



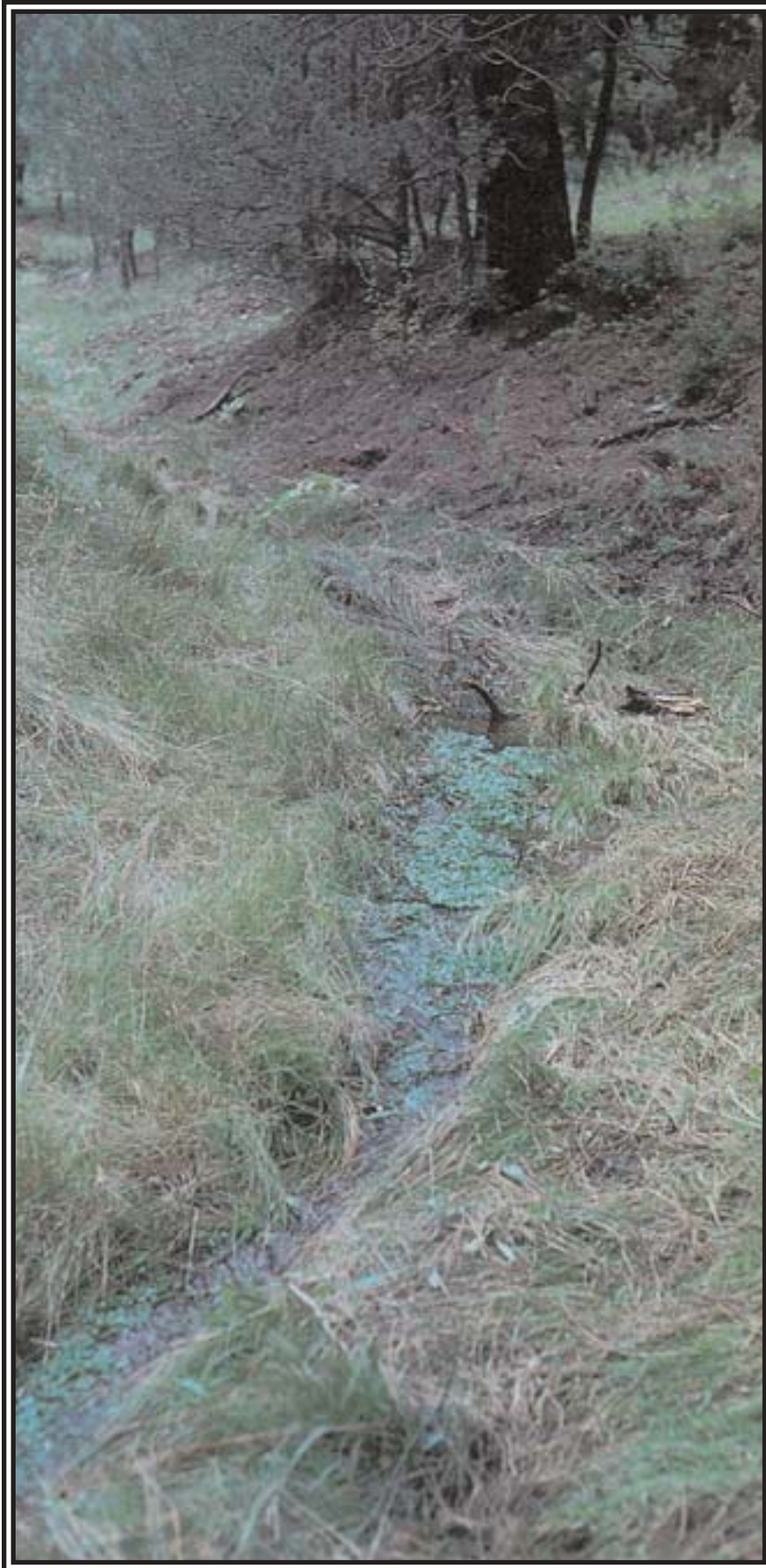
*Spring seeps provide valuable habitat for wild turkeys during the long cold winters.*

also important in other areas. When the snow cover is deep, spring seeps provide critical feeding areas for wild turkeys and other animals. Warm ground water flowing from the seep melts snow and exposes a rich source of seeds, green vegetation, insects, and other invertebrates. In the mountains of West Virginia when snow depths exceed 4 inches, about 85% of turkey feeding activity occurs in spring seeps and the small streams connecting them.

Spring seeps provide much more than winter habitat for wild turkeys. Spring seeps provide habitat for aquatic species, plus food and a year-round water supply for many terrestrial birds and mammals. The moist environment around seeps often supports a rich community of grasses and succulent forage plants, and spring seeps are one of the first areas where vegetation emerges in early spring. This early food source is available at a critical time when most other plants are dormant, and it is eagerly sought by turkey, bear, deer, and other species recovering from the stress of winter. Spring seeps are essential breeding areas for frogs, salamanders, invertebrates such as fairy shrimp and crayfish, and a variety of aquatic insects. Thus, these small but unique wetlands provide valuable habitat for many wildlife species.

### **MANAGEMENT OVERVIEW:**

Because seeps are important habitat for many wildlife species, they should be recognized in land management plans. In forested areas a relatively intensive inventory is usually required to locate these valuable wetlands because individual seeps can be missed since they are often quite



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*Water cress grows year round in western state spring seeps. This lush growth photo was taken in New Mexico in the fall.*

small. Management for seeps should be coordinated with management on the rest of the property. Some management activities that might be used in seeps are regulated by state and federal laws protecting wetlands. Forestry practices are usually governed by state forest management or wetland laws, which may establish buffer zones or limit the amount of timber cutting in and around wetlands. Enlarging or digging out seeps may be regulated by the U.S. Army Corps of Engineers under the Clean Water Act of 1972 and possibly by state laws. Because of these regulations, it is best to seek technical assistance from state foresters, USDA Extension Service agents, Natural Resource Conservation Service personnel, or private consultants when developing management plans.

## **SEEPS IN FORESTS:**

### **Setting Goals**

Spring seeps are generally managed as feeding areas for wild turkeys because they provide a year-round source of green forage, tubers, tree seeds, insects, and aquatic invertebrates. Some of these foods are more abundant in seeps than in surrounding uplands, and during winter, seeps may be the only source of these foods.

The general approach to management depends on your goals. For example, managing winter habitat in mountainous areas involves treating seeps on southern exposures where snow melts most rapidly. Work should be concentrated on lower slopes where seeps are abundant and turkeys congregate during winter. Treatment areas should be small – just large enough to include the snow-free area. The best winter range may have as many as 30 to 50 seeps per square mile. Improving year-round habitat might include all seeps, and combining seep and stream-side management zones.

### **Individual Seeps**

The treatment of individual seeps will depend on conditions around them. Large seeps surrounded by mature sawtimber often provide



*This seep in the mountains of West Virginia is a good candidate for thinning. There is little woody undergrowth and it contains a small stand of manna grass, a native forage species that will respond to thinning.*

turkey food in abundance. Trees usually do not grow in the saturated area, so enough sunlight reaches the ground to stimulate forage production. If the trees around the seeps are oaks or other good seed producers, it is hard to improve the situation for wildlife. Seeps in this condition need to be protected from road building activities and heavy equipment during timber harvest operations, and cutting will usually be limited to trees that are unlikely to survive much longer. In contrast, most spring seeps in smaller timber stands are crowded with trees and so shaded that they have little undergrowth. Careful thinning can almost always increase forage, browse and seed production.

#### **Thinning Timber Around Seeps**

In dense stands, cutting trees that compete with the best seed producing trees will increase both seed and forage production. Start by making a list of the best seed- and fruit-producing tree species in your area (see NWTW Wildlife Bulletin No. 13 - "Regional Recommendations for Planting for Wild Turkeys"). Remember that some species that are most favored for seed production may not have commercial timber value. For example, serviceberry and

hornbeam are desirable for their seeds and fruit, and ruffed grouse prefer their buds during winter. Conifers, such as hemlock and red spruce, are less desirable directly over seeps because herbaceous vegetation does not grow beneath them, and they shade seeps in winter. However, conifer thickets growing near, but not shading seeps, provide valuable roost sites for turkeys and shelter for other wildlife.

Thinning to stimulate seed and forage production will often create a more "open" condition than that used for timber production. The goal is to leave preferred trees with room to grow. You also want to let some sunlight reach the ground, but not so much that water temperature is altered. The best approach is to identify the trees and fruiting shrubs that you want to keep and then cut trees that are crowding them. It's important to keep at least 60% overstory canopy cover, so that you will get some understory development, but not a thicket of tree regeneration.

In small sawtimber stands you will have to cut many small (2-6 inch) low wildlife value trees, and a few large ones to release the best stems of mast producing red oak, black cherry, white ash, hickory, beech, hornbeam, and serviceberry. Try to create a relatively open stand with a uniform distribution of seed-producing trees and small patches of sunlight hitting the ground. It is perfectly all right to cut large trees from the main canopy, but avoid cutting adjacent big trees to prevent creating large gaps in the canopy. Because you will cut more small trees than big ones, you will generally remove about half of the stems but only about 20% of the timber volume. The trees and shrubs removed in this kind of thinning are a great source of firewood, or may be sold for pulp.

Openings in the canopy are important to let sunlight in for understory development, and heavier thinning is appropriate where herbaceous vegetation is well established, and good seed-

producing trees are well distributed around the seep.

### Regenerating the Timber Stand Around the Seep

The goal is to keep seeps surrounded by well-spaced, mature seed- or fruit- producing trees indefinitely. It is unwise to harvest and regenerate all these trees at the same time. However, regeneration cutting may be appropriate for the larger forest area that includes seeps being managed for wildlife. There are a few things you will want to consider when that situation arises.

The regeneration method will determine how seeps are treated. In northern hardwood forests where the single-tree selection method (removing individual trees) of regeneration works, only minor adjustments are needed. Follow your tree preference guidelines when marking around seeps and leave those wildlife trees.

In oak and Allegheny hardwood forests, the shelterwood (the removing of a large proportion of the trees and leaving a few for shade) and clearcutting (the removing of almost all of the trees) methods of regeneration are appropriate. With either system, seeps and streamside management zones should be used to leave a "legacy" of wildlife habitat and valuable timber in the new stand. When the rest of the stand is cut, seep areas should be thinned as described previously. Trees left around seeps will add wildlife values as the stand grows, and many will have considerable timber value when the new stand is thinned for the first time.

If there are few desirable wildlife trees around seeps, regeneration cuts may provide opportunities to plant mast- and

fruit-producing trees. Plantings should be small; 2-12 seedlings widely spaced around the seep. Tree protectors should be used to protect planted seedlings from browsing and competition with other plants (see NWTF Wildlife Bulletin No. 11 - "Tree Shelters").

### GETTING THE WORK DONE:

Managing seeps for wild turkeys can improve habitat for many species, yield income from the sale of wood, and provide a great source of firewood. For landowners with large tracts and



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numerous seeps, habitat improvement can usually be accomplished as part of a larger timber sale – one reason for including seep management as part of your overall management plan. The best opportunities occur when there is a market for small diameter, low-value material such as pulp, firewood and chips. Habitat improvements, such as cutting non-merchantable trees around seeps can be carried out in conjunction with a larger sale, and stumpage prices reduced to cover the cost. Large non-merchantable trees can simply be girdled and left as snags,

*A similar seep 3 years after thinning. A vigorous stand of manna grass has matured where patches of sunlight reach the forest floor. The large black cherries are free to grow. Opening a seep this much is appropriate where herbaceous vegetation is present before thinning.*



*This seep has a woody understory and little herbaceous ground cover. Thinning will improve the habitat for wildlife, but the seep should not be left as open as in the preceding example.*

or felled and limbed to reduce slash. Left in place these larger logs provide down woody material for decades for wildlife.

Private landowners may be able to accomplish some habitat improvement activities by enrolling in the U.S. Forest Service's Forest Stewardship Program. This program provides technical and cost-sharing assistance for a variety of planning and management activities. Consult your state service forester for details. Advice can also be obtained by contacting the Natural Resources Conservation Service, USDA Extension Service, or your state wildlife agency. On lands open to public hunting, management activities around seeps in non-merchantable timber stands may also be accomplished through State Wild Turkey Super Fund projects by local NWTf chapters.

### **VALUE OF SEEPS TO OTHER WILDLIFE SPECIES:**

Thinning trees around spring seeps to increase forage and seed production for wild turkeys seems to benefit most wildlife species using seeps. Thinning will increase herbaceous vegetation, including native grasses and spring wildflowers, whose leaves and

tubers are important foods. Woody browse also increases although it is sometimes limited by deer browsing. Some of the wildlife response may be surprising. In one study in West Virginia, bog lemmings took up residence in the better stands of manna grass. In spring, black bears will feed heavily on serviceberry and may damage these small trees by climbing them. During winter and early spring most resident mammals are attracted to spring seeps and use them intensively. Keep enough canopy cover around seeps so that water temperatures will remain unchanged, and the aquatic community protected. In summary, managing seeps will enhance 3 elements of wildlife habitat – forage, mast and browse. Seep management can also be used to provide den trees and large, down woody material, extending benefits to much of the forest wildlife community.

### **SEEPS IN OPEN LAND:**

Managing seeps in open land differs from managing seeps in forested landscape. First, it is more difficult to support wildlife habitat improvements through timber sale activities, so management usually represents a direct expenditure. Second, there is more opportunity for intensive management such as planting trees, building ponds, and fencing. The management you choose will depend on the surrounding landscape, your goals and resources. In much of the Northeast and Mid-Atlantic region, open and early-successional habitats are becoming rare. Here, you should consider spring seeps a valuable addition to an already valuable habitat type, and treat the entire area as a unit.

### **Old Pastures**

In the mountains from southern New York south through West Virginia, old pastures often revert to thickets of hawthorn, dogwoods and viburnum. A lush growth of grass usually surrounds seeps in these areas, and many old pastures

contain sizable springs. These areas are wildlife magnets. They provide nesting habitat for birds; an abundant source of fruit for many migratory birds and other wildlife, and excellent grouse, turkey and woodcock habitat. If left undisturbed, these shrubby habitats gradually develop into young forest. Slowing this process, known as setting back succession, to maintain the existing conditions is a preferred management choice.

### Slowing Succession

Girdling, cutting, herbicides, and controlled burning can be used to eliminate invading trees. Cutting or herbicide treatments at 3- to 5-year intervals can be effective for maintaining shrub communities and controlling species composition. Some invading oaks and hickories can be retained along with fruiting shrubs to provide a combination of hard and soft mast.

Black locust and black walnut are desirable trees in these habitats because grass grows well beneath them and most shrubs thrive beneath a partial canopy of locust. Planting black walnut at a wide spacing will help maintain grassy areas because secretions from walnut roots inhibit the establishment of other woody species.

Spring burning can be used to maintain openings. Periodic mowing, once every 2-4 years, is also useful where slope and soil conditions permit. Over the long-run, mowing will be less effective than burning at preventing encroachment by trees. Consult your local or state forest fire control agency before attempting any burning.

In the earliest stages of succession, planting can be used to speed the establishment of fruit- and nut-producing species. Mixed plantings of fruiting shrubs and hard mast-producing trees are desirable. Shrubs can be planted in clusters to form thickets; trees should be scattered to produce open grown, large-crowned individuals that are the best seed producers.

### Active Pastures

Spring seeps in active pastures are often badly trampled and eroding. Fencing to exclude livestock will improve the situation quickly. Water can usually be piped from the seep to a watering tank on firm ground. Expanding the seep or building a pond may require state and federal permits. Consult a state extension agent for help in planning these activities.

Fenced seeps usually revegetate naturally, but planting is always an option. The choice of species will depend on the size of the fenced area and your goals for wildlife. Black locust is useful for shade and improving soil conditions.

### SUMMARY:

Spring seeps are small, unique wetlands that provide valuable habitat for many wildlife species. The small size of spring seeps necessitates that their management be coordinated with that of the surrounding land. Most spring seeps in younger sawtimber stands can be enhanced for wild turkeys by thinning. In open areas, enhancements may include planting, fencing, and cutting, mowing, or burning to slow succession. Improving seeps for wild turkeys does not seem to

*Turkeys feeding in a seep at the edge of an old pasture. This site is also good brood range and the fruiting shrubs provide food for many species during the autumn. This seep should be maintained in its current condition by eliminating invading trees.*



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*This seep is in the earliest stages of succession. Planting a few fruiting shrubs or nut producing trees might speed the development of mast sources.*

conflict with the needs of other wildlife species. In fact, spring seeps and streamside management zones should be considered opportunity areas for providing key elements of wildlife habitat – mast, forage, browse, den trees, snags, and down woody material. Providing these habitat elements will represent some lost opportunity for timber production, but these costs are minor and the benefits to wildlife will be greatly enhanced.

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