

Forest Seep (S4)

State Status: None
Federal Status: None

Description: Forest Seeps are a very small patch (< 1 acre) community, characterized by northern hardwoods in the canopy and a diverse assemblage on the surface adapted to wet conditions. There may be substantial downed logs due to wet soils and rooting zones promoting periodic windthrow. These seeps may occur in disjunct patches along a slope or along forested river banks or wetland edges. They may also occur in wide or narrow draws along a slope where topography favors groundwater discharge.

Environment: Seeps form near headwaters of streams, on slopes, or at the base of a slope where groundwater discharges to the surface. Groundwater typically flows year round and at a relatively constant temperature of between 40 and 50 degrees F. This may result in early snow melt or even snow free areas in the forest. While generally discharging water, these seeps may recharge groundwater in some conditions. Soils are generally mineral soils and may be deep and contain organic material, or may be shallow and primarily alluvial material from periodic high flows.

Characteristic Species: Canopy and subcanopy species are typical of northern hardwoods and include sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), American beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), yellow birch (*Betula alleghaniensis*), paper birch (*Betula papyrifera*), hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*) red oak (*Quercus rubra*), black gum (*Nyssa sylvatica*), tulip poplar (*Liriodendron tulipifera*), shagbark hickory (*Carya ovata*) and possibly red spruce (*Picea rubens*) depending on the composition of the surrounding forest.

Some occurrences have been described as sloping red maple swamps and, along with red maple,



Shrubby seep in northern hardwood forest matrix, with mixed shrubs, ferns, and herbaceous plants.
Photo: Charles Eiseman.



A narrow seep with sphagnum moss. Beverly Vucson, Dept. of Fish & Game.

contain black ash (*Fraxinus nigra*), green ash (*Fraxinus pensylvanica*) and swamp white oak (*Quercus bicolor*) in the canopy. These may grade into forested swamps at the base of the slope.

The sapling layer generally includes canopy dominants, along with hornbeam (*Carpinus caroliniana*) and witch-hazel (*Hamamelis virginiana*). The shrub layer may include species typical of both wetland and upland areas. For example, black cherry (*Prunus serotina*), hobblebush (*Viburnum alnifolium*) may be found in close proximity with swamp dewberry (*Rubus hispidus*), silky dogwood (*Cornus amomum*), winterberry (*Ilex verticillata*), swamp azalea (*Rhododendron viscosum*), arrowwood (*Viburnum dentatum*), spicebush (*Lindera benzoin*), and highbush blueberry (*Vaccinium corymbosum*). In coastal areas sweet pepperbush (*Clethra alnifolia*) may be a component. Mountain laurel (*Kalmia latifolia*) has been reported in some occurrences.

The herbaceous layer can be highly variable with facultative and obligate wetland species in wet areas and more upland species in dryer portions. Species that are good indicators of seeps reported include bladder sedge (*Carex intumescens*), three-seeded sedge (*Carex trisperma*), common horsetail (*Equisetum arvense*), cinnamon fern (*Osmunda cinnamomea*), ostrich fern (*Matteuccia struthiopteris*), sensitive fern (*Onoclea sensibilis*), marsh marigold (*Caltha palustris*), water avens (*Geum rivale*), golden saxifrage (*Chrysosplenium americanum*), false hellebore (*Veratrum viride*), false nettle (*Boehmeria cylindrica*), blue marsh violet (*Viola cucullata*), and jewelweed (*Impatiens capensis*, *I. pallida*). Upland species grow on hummocks.

The ground surface is generally dominated by litter, though there may be areas of bare soil and scattered stones and rocks, depending on specific soil types. Some larger cobbles and boulders may occur within the microtopography of the seep itself, which may be concave perpendicular to or parallel to slope. Downed logs can also be a major component. The bryophyte layer can be significant in some occurrences.

The abundance of downed woody debris is variable, ranging from small to moderate cover to large trees that have toppled where groundwater limits rooting depth.

Invasive species can include multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*) and common buckthorn (*Rhamnus cathartica*).

Several rare species are found in forested seeps including southern bog lemming (*Synaptomys cooperi*, SC), dwarf scouring-rush (*Equisetum scirpoides*, SC), and leafy white orchis (*Platanthera dilatata*, T) and the recently delisted four-toed salamander (*Hemidactylium scutatum*).

Range: These seeps are found throughout Massachusetts. Since they are often associated with steep slopes, they are likely less frequent in flatter areas of the Connecticut or other major river valleys and on the coastal plain.

Related Communities: The Forested Seep Community is associated with the types of forests within which they are found. There may be certain types of communities, such as Rich Mesic Forests, Red Oak-Sugar Maple Transition Forest or Hemlock Ravine that contain more seeps than dryer forest types, such as an Oak-Hickory Forest. Calcareous Forest Seep Communities are found in conditions similar to those of Forest Seep Communities, headwaters, springs and breaks in slope, but have calcium rich water. The pooling of the seepage waters of the forest seeps creates condition conducive to use by amphibians typical of Vernal Pools.

Riverside Seeps form along riverbanks and are primarily herbaceous.

Red maple swamps may form at the base of slopes and have a similar herbaceous flora.

Status in Massachusetts: Forest Seep Communities are ranked as S4 in Massachusetts meaning that they are widespread and largely secure.

Management Considerations: Since these seep communities are within larger forests, they may be affected by logging and other types of management. In some seepage areas, invasive species, such as multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*) or common buckthorn (*Rhamnus cathartica*), that are tolerant of wet conditions may become established. High white-tailed deer densities may have an impact on the abundance of native species, particularly woody seedlings and herbaceous plants.

Walking through these seeps can create significant disturbance as plants on wet, shallow soils or growing with mosses on rocks or logs may be dislodged. Hiking trails should be rerouted or designed with appropriate crossings.

These seepage communities are likely wetlands, but may be too small to be discerned by typical methods of delineation using aerial photographs. Some may be isolated except for intermittent streams flowing from them. They may also not be readily located in the field. Therefore, they may not receive adequate protection under wetlands protection regulations.

Activities upstream may result in erosion into these seeps. Activities, such as increased development and other land use actions involving groundwater withdrawal may result in reduced groundwater discharge to the surface. Discharges from roads or culverts should have aprons to dissipate energy of storm water flowing into these seeps.

Forested Seeps as headwaters may be important to other species using headwater streams with the latter containing a greater abundance of species associated with limestone or dolostone. Forested seeps may be associated with Vernal Pools in cases where groundwater discharges.

References:

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