

Woodland Conservation

Woodlands are an under-appreciated resource in many communities that see no particular reason to adopt planning strategies to protect them. However, woodlands have been described as “the most significant hydrologic feature in the landscape” (Porter, 2000). In addition to their tremendous ability to remove carbon gases from the atmosphere and sequester them (_____), natural woodlands far surpass all other kinds of open space in terms of their ability to reduce runoff and to promote infiltration of rainfall so that aquifers are properly recharged (see also chapter on “low impact development”). We ignore these attributes to our peril: “Many environmental problems such as floods, erosion, sedimentation, landslides, and aquifer depletion can be traced to our tendency to use technology as substitutes for – instead of working with – natural hydrologic systems.: (Porter 2000)

Despite all these highly important attributes, woodlands are often more vulnerable to development than open lands for several reasons. Many developers prefer to site homes among trees because they feel sale prices will be higher, offsetting the expenses involved in cutting trees and removing stumps, which can cost \$15,000 per acre. Some municipal officials and residents would prefer to hide new development within forests to reduce their visibility and preserve “rural character”. Siting homes within woods rather than on farmland is also favored by many farmland preservationists. While this approach might be more acceptable in heavily-wooded regions where woodland habitat loss is less of an issue, and where preserving relatively rare farmland is a higher priority, many environmentalists recommend woodland conservation for a variety of issues (see sidebar – Kim Coder extract)., not least of which is the important carbon sequestration and storage provided by woodlands. For example, a single tree can store 13 pounds of carbon annually, and each acre of a community forest can sequester 2.65 tons of carbon per year (Coder, 2011).

Local preferences will vary. For example, in Lancaster County PA where the farming economy is critical and where agriculture is a traditional way of life for Amish and Mennonite farming families, woodland conservation often takes a back seat. And the same is also true, for other reasons, in densely-wooded regions of the state such as its northeastern corner where open fields or pastures are rare and constitute a valued part of the cultural landscape, as is true throughout most of New England.

In these kinds of areas, it is understandable that local sentiment frequently runs in favor of developing woodlands. Where woodlands are slated for development, local governments should strive to protect the areas of a forest where the greatest diversity in tree species and ages is found. On the other hand, in many of the counties centered around Philadelphia, where woodland clearance during the colonial period historically reduced the original forest to a small fraction of its original extent, local environmental groups such as the Natural Lands Trust and the Brandywine Conservancy have for several decades been helping local governments adopt zoning ordinances in which woodlands are designated as the generally preferred areas for conservation. For example, Wallace Township, in northern Chester County, became the first community in Pennsylvania to adopt the state’s model “Growing Greener: Conservation by Design” ordinances in the mid 1990s, promoting forests as high priority areas for conservation. In that township,

where soils and slopes are not particularly conducive to agriculture, most of the farming has died out, allowing much cropland and pasture land to revert to second-growth woodland even before development pressures began to increase during the 1980s and 1990s.

One of the most impressive manuals on forest conservation produced at the county level -- "Building Greener Communities: Planning for Woodlands Conservation -- was prepared for the Hunterdon County Planning Board (Carter, 2003). <http://www.co.hunterdon.nj.us/planning/Woodland/Cover/Intro.pdf>. Located in one of New Jersey's more rural areas, Hunterdon lies within driving distance of many jobs in suburban office parks in the state's central business corridor and as a result experienced rising levels of development during recent decades. In this geographical context, it came as no surprise to learn that upland forest acreage there declined by 20.3 percent between 1972 and 1995

This manual was created as a resource to inform lay members of local planning boards not only of the benefits of conserving woodlands, but also to serve as a guide for conducting inventories, preparing municipal plans, and adopting land-use regulations to implement woodland conservation policies. After educating community members on the many benefits of protecting woodlands, the process consists of three stages: resource inventory, policy development, and recommended improvements to municipal zoning and subdivision regulations.

The Conservation Element of the municipal Master Plan (or Comprehensive Plan) should include a complete inventory of natural resources plus a discussion of how forests relate to other resources and what criteria have been followed in determining conservation priorities. By overlaying various data layers one can determine the co-occurrence of several features, such as woodlands and slopes or woodlands and wetlands, for example. Where woodlands coincide with steep slopes, wetlands, or floodplains, protection might already be in place to lessen the vulnerability of the woodland resource, as these kinds of inherently unbuildable areas are often protected by existing regulations. However, other areas that might not be adequately protected, such as erodible soils or aquifer recharge areas, gain added significance when they coincide with forested habitat. For example, the two Woodlands Inventory Maps adopted by Tewksbury Township in 2003 illustrate both the resources (areas with mountain laurel understories and by areas dominated by any of a dozen native canopy tree species) and the priorities for conservation as recommended to the Planning Board by the Tewksbury Environmental Commission (steep slopes, wetlands, prime aquifer recharge areas, upland forests, laurel stands, etc.).

Among the recommendations contained in Tewksbury's 2004 Master Plan were the preservation of mature and maturing woodlands and forests through the acquisition of land or easements on critical properties. This was supplemented by reducing net density in forested areas and applying the residential clustering technique to steer development away from critical areas while preserving contiguous open spaces. Much of the township's rural land was subsequently downzoned to lower residential densities, in four districts where the minimum lot sizes are 5, 7, 10, and 12 acres (the latter being in the NJ Highlands Region, whose regulations are discussed in Appendix ___).

Unlike some other townships in Hunterdon County (such as Readington), Tewksbury does not yet require developers to cluster their houseslots in the less critical areas, as recommended in its

Master Plan. However, following the update of that Plan in 2004, which included a significant conservation element, the township hired a consultant to prepare a thorough Environmental Resources Inventory, and adopted a tree clearance ordinance detailing the ways that developers must deal with tree removal and replacement, recommending the types of trees that should replace those that are removed. In addition, Tewksbury's municipal acquisition efforts have been very significant, with 1,100 acres of land (much of it wooded) conserved, plus significant additional acreage preserved through partnerships with numerous environmental organizations and the state's Green Acres program. Implementation of the township's woodland management plan is overseen by the municipal Forest Advisory Commission. Tewksbury has been designated as a Tree City and was chosen in 2009 to host New Jersey's Arbor Day celebration, when the state arranged for the planting of 187 trees and bushes in township parks.

In Clinton Township, also in Hunterdon County, the zoning ordinance so strongly encourages the conservation subdivision design option that most developers follow that approach from the very beginning. The township's conservation objectives do not state a preference for preserving woodlands over farmland, and the value judgment is made on a case-by-case basis, depending on circumstances and the quality of the resource.

Readington Township, another Hunterdon County community, protects its woodlands through ordinances requiring developers to utilize the clustering technique to conserve 80 percent of the unconstrained land as permanent open space, which must also be publically accessible. Its locational siting criteria effectively steer development away from woodlands because moderate slopes and buffers to streams and wetlands are protected, in addition to unbuildable floodplains, steep slopes, and wetlands. Rural densities have been reduced several times since the ordinance was first adopted in the mid-1980s, and currently stand at eight to ten acres of land per dwelling. The ordinance also strives to minimize fragmentation of the protected open space by prohibiting lots backing up to it.

A very important but frequently misunderstood distinction is the difference between protecting trees and conserving woodlands. For environmental health, it is absolutely critical that the forest floor and the understory be protected. Otherwise the habitat will be severely compromised and the forest will lose the ability to regenerate itself, as happens when plants, shrubs and saplings are removed to create a tidy appearance. After a generation or two, the existing trees mature and die. Even if they are replaced by new specimens, what will exist is a stand of trees and not a natural ecosystem. When preservation areas are very small, less than a few acres, this kind of result is usually inevitable anyway, as a tiny forest fragment provides little more than aesthetic benefit, a bit of shade, and some additional pervious ground to absorb stormwater runoff. But when larger areas can be protected from development, as many conservation subdivisions do, the inclination to tidy-up the forest floor should be strongly resisted, and enforced through a conservation easement restricting that kind of compulsive suburban activity.

Of no less importance in the Woodlands Conservation Plan is a discussion of the proposed municipal policies for protecting these resources from carelessly-designed development, with supporting data providing the legal justification for implementing such policies. Those data can be drawn from the extensive literature describing the public and societal value of conserving woodlands for social, economic and environmental perspectives.

See sidebar.

The third and final section of woodland conservation plans is the one detailing the specific kinds of changes needed in existing local ordinances such as zoning and subdivision regulations. Zoning, for example, can classify certain parts of the municipality as woodland conservation districts where preserving forest resources ranks more highly than protecting farmland, and establishing a minimum percentage of open space to be designed around and protected. When subdivisions are involved, Pennsylvania's Growing Greener: Conservation by Design model offers a well thought out approach (See Section _____). In other situations where it might be more difficult to preserve significant parts of the property (such as on land zoned for intensive residential or commercial development), mitigation strategies should be followed.

The best mitigation approach usually involves the developer acquiring and protecting similar healthy upland forest that would otherwise be vulnerable to clearing and destruction (not woodlands choked with invasive vines or dominated by nonnative species such as Norway maple, nor wet woods or forested floodplains already protected by other regulations). A less preferable second option would be for the developer to afforest open land that he purchases or which the municipality or a local conservation organization owns and wishes to see restored to its original wooded condition. However, it is much more difficult, and very costly, to re-establish wooded habitat on open land for a variety of reasons, not the least of which are protecting saplings from deer damage (grazing and rubbing) or controlling invasive vines and shrubs that would soon overwhelm the young trees. If those major threats can be effectively countered (a dubious proposition), planting standards must be set – such as 100 trees/acre at two-inch caliper, or 200 trees/acre at one-inch caliper) with an appropriate period for their care, maintenance, and protection by the developer. If mitigation is chosen, a good set of standards for stocking can be adapted from the regulations governing the Chesapeake Bay Watershed (cite_), where more than 8,200 miles of riparian buffers have been reforested in Maryland, Virginia, Pennsylvania, and the District of Columbia (<http://www.chesapeakebay.net/forestbuffers.aspx?menuitem=14780>).

According to the Maryland Department of Natural Resources, which provides staff support for the Maryland Stream ReLeaf initiative supporting riparian forest buffers, the average planting density was 500 seedlings/acre. A 60 percent survival rate was estimated for planted seedlings, one-third of which consisted of naturally regenerated volunteer seedlings. The newly planted buffers are fairly diverse, averaging more than eight species per acre. The most common problems for seedlings included weed competition, followed by drought, damage by deer and mowing machinery, and insects. The DNR anticipates that 15 to 20 years might be required for significant benefits to develop, by which time the young trees will create crown closure. However, significant nutrient reductions can occur in two to seven years when fast-growing species are planted densely. (<http://www.chesapeakebay.net/forestbuffers.aspx?menuitem=14780>).

To ensure permanent protection of mitigation areas created by developers as part of municipal woodlands protection strategy, conservation easements should be placed on the property, prohibiting removal of trees greater than six inches in diameter (measured four feet above ground), except for diseased specimens or invasive species. Annual monitoring to guarantee

easement compliance is also highly recommended. In the absence of sufficient staff resources, municipalities can develop partnerships with local land trusts willing to hold easements and perform monitoring. Such nonprofit organizations require financial assistance to carry out these added responsibilities, which can often be covered by donations required from developers. In the GG:CbD model ordinances, for example, provisions exist for developers to receive small density bonuses for the express purpose of creating a funding stream to finance such costs.