

Executive Summary

On May 16, 2006, the Town of Somers together with its funding partners and assisted by the Westchester Land Trust closed on a historic deal to purchase 654 acres of open space in the center of town. In a unique partnership, Somers, Westchester County, the City of New York-- through the Department of Environmental Protection (DEP), and the State of New York— through the Department of Environmental Conservation (DEC), cooperatively purchased the property for conservation and recreational purposes thus concluding years of effort to save one of the most environmentally sensitive lands in northern Westchester. **New York City acquired title to approximately 269 acres, Westchester County and Somers to 370 acres, and Somers itself to another fifteen.** New York State holds a conservation easement on all but the Town-owned parcel. This easement sets forth the permitted uses and management obligations governing each of the parcels that make up the total Angle Fly Preserve (AFP).

The following management plan was **prepared for the Town of Somers through the collaborative efforts of the Westchester Land Trust, Somers Land Trust, and Teatown Lake Reservation. The plan was also supported in part through a grant provided by the Department of Environmental Conservation of the State of New York and administered through the Land Trust Alliance of New York.** Its purpose is to establish policies that will guide future use of the natural areas of the Angle Fly Preserve and ensure that the purposes for which the property was purchased become the guiding principles under which it is managed.

This management plan is primarily concerned with those acres held by both the Town and County jointly and seeks to lay down principles that implement the required uses stated in the State's conservation easement in a way that maximally protects the parcel's formidable natural resources. Additionally, the plan aims to establish broad goals and policies that the DEP also accepts so that the property can be managed in a way that enhances its value both from the standpoints of conservation and recreation. Therefore, it seeks a coordinated approach to habitat and species protection, passive recreational uses such as hiking, and the development of public areas, emphasizing the value of a **"landscape perspective" and "adaptive management"** in designing policies and recommendations.

Broadly, the management plan has two **main objectives**. The first is to provide **baseline documentation of the natural, cultural/historic, and scenic resources on AFP. The second is to make recommendations regarding future use and management of the property.** Baseline documentation of the natural resources of the property takes the "habitat assessment" approach of **Hudsonia Ltd.**, which provided assistance in preparing the appended habitat report. **Florence Oliver**, Somers' longtime town historian, provided the history of the property and a description of its cultural/archaeological resources.

The most important “finds” as a result of such documentation have been, on the natural resource side, both the **wood turtle and brook trout** population associated with the Angle Fly Brook as well as the numerous bird species and great variety of lichens and mosses documented during the **Bedford Audubon BioBlitz of 2007**. The plan recommends that hiking trails and other forms of human disturbance to habitat associated with these species be avoided, especially in regard to wood turtle, currently listed as Westchester County endangered and New York State special concern. It also recommends that various measures aimed at controlling the alarming spread of **invasive plants** be undertaken including their removal and containment, **management of the over-populous deer herd**, and selective cutting of various trees in order to improve the health of the upland forest resources, as suggested in the appended forestry management plan. The plan also recommends a program of selective mowing in the upland meadows and shrub areas to improve overall bird habitat.

With regard to cultural/archaeological resources, the plan identifies the **late eighteenth century “Reynolds Farmhouse”** as an important historic structure that is worth preserving through adaptive reuse, perhaps as a caretaker’s residence. It also recommends future study of possible archaeological sites given the documented use of the area in pre-settlement times. Finally, the plan advocates **securing other existing structures until such time as they are removed from the property, including the model townhouses on the Somers-owned fifteen acres, the “Tatham House” mansion, and the remains of the chicken farm off Plumbrook Road.**

The recreational uses of the property detailed in the DEC’s conservation easement are the basis for the plan’s discussion of recreation. Furthermore, **this management plan is designed to provide a “recreation management plan” for the “open space recreation area” as called for in the DEC conservation easement.** The plan proposes policies and a preliminary **trail plan aimed at providing opportunities to visit all major areas of the property as well as provide links with trails in Somers-owned Reis Park to the north and County-owned Lasdon and Muscoot Parks** to the south. A handicapped-accessible trail loop is also suggested. Recommendations regarding the placement and maintenance of trails as well as associated public facilities such as parking primarily seek to minimize their impact on AFP’s sensitive habitats while still providing a worthwhile recreational experience. The proposed trail plan is based on **the recreational trails grant application that Somers submitted to the State, a grant that it was successful in obtaining in 2006.**

Because of the complexity and potential sensitivity of the topic, the plan provides a separate discussion of **recreational hunting on AFP**. This is a use mandated by the DEC conservation easement and so must be accommodated. Management of the deer herd is also essential to controlling the spread of invasive plants that threatens the overall ecology of the property. The

plan recommends first that licensed hunters be qualified through an appropriate test. Second, that a lottery system limit the number that are admitted onto the property. Third, that hunters be targeted to specific areas at certain times in order to both improve the efficiency of the hunt and minimize impact on other users of the property. Finally, that a tag system be implemented that requires hunters to take substantial numbers of does and fawns in order to have a real impact on the overall size of the population.

Finally, and as part of a strategy of adaptive management, the plan provides a number of proposals for **encouraging and targeting additional scientific study of the property.** **Monitoring the populations of plants and animals** and adjusting to such major impacts as climate change will be essential to adequately protecting the Angle Fly into the future.

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Introduction

The Angle Fly Preserve (AFP) represents one of the largest and most complex land purchases for conservation purposes in Westchester County's history. Four government agencies: the Town of Somers, County of Westchester, New York City Department of Environmental Protection (DEP), and the New York State Department of Conservation (DEC), jointly purchased the 654-acre property, known as Eagle River, held by Eaglet Associates, LLP, for \$20.5 million in May 2006. The DEP took title to 269 acres on the western flank nearest the Amawalk Reservoir. The Town and County jointly took title to an additional 370 acres, with the Town retaining sole title to what will amount to fifteen acres in the central section bordering Route 139. The DEC for its part holds a conservation easement with each of the other entities for all but the Town's fifteen acres. The property had been the subject of a number of residential development proposals over the last decades and was purchased with the avowed purpose of conserving its natural resources and providing recreational opportunities to the residents of Somers and Westchester. Somers plans on placing a senior/community center on its portion and an athletic field on a small open area on the eastern side of the property. The rest of the property is to be left in its natural condition and used only for passive recreation as governed by the conservation easement held by the State DEC.

It is the DEC conservation easement that principally guides the following management plan. (A copy is appended.) The easement divides the area it covers into an "open space recreation area" and an "athletic field recreation area" with different stipulations for each. Most of this plan pertains to the former. However, the plan does recommend relocation of the proposed athletic fields to the open shrub land immediately to the south of Reis Park and east of Mt. Zion Church and its burying ground. Such relocation would dramatically reduce the ecological impact of fields as well as the necessary parking and other infrastructure and provide for a more convenient location for public access. The natural resource recommendations for the designated site of the athletic fields, therefore, focus on its importance as bird habitat and recommend selective mowing and cutting only, without touching on other improvements associated with ball-field construction.

In regard to the "open space recreation area," the DEC conservation easement provides the following guidance:

4. Public Recreation Within the Open Space Recreation Area. Grantors agree to provide public recreation within the Open Space Recreation Area for non-motorized recreation including but not limited to: hiking; mountain biking and horseback riding on trails

designated for such use in the Recreation Management Plan; snowshoeing; cross-country skiing; nature study; wildlife observation; hunting and fishing; and providing access to those with mobility impairment.

The management plan proposes to accommodate the above uses over a period of time as appropriate trails and facilities are laid out and constructed and as a system for managing hunting is put in place. Generally, recommendations will follow the easement's injunction to "maintain and manage the Protected Property forever as parkland in its natural, scenic, forested, and open space condition."

Broadly, the management plan adopts two related approaches to its task: taking a "landscape perspective" and following a program of "adaptive management." Taking a landscape perspective means that one seeks to understand a particular parcel as a whole and beyond its property lines in terms of its ecological and cultural role in the larger geographical area of which it is a part. Only then will one have a full understanding of the value of a place and be able to arrive at recommendations that truly enhance its value within both the natural and human community. Recognizing that places are part of dynamic and evolving landscapes requires that one view managing a property not only as following certain rules and principles but also as an on-going knowledge-gathering and policy-reviewing enterprise that requires adapting to changing circumstances. This is the goal of adaptive management, and much of this management plan involves suggesting where and what sort of things on the Angle Fly Preserve ought to be studied and perhaps what policies ought to be revisited over the long term.

Specifically and in regard to natural communities, the management plan seeks to document the biodiversity of the AFP through a descriptive assessment of its diverse mosaic of habitats following the method developed by Hudsonia Ltd. and presented in its *Biodiversity Assessment Manual* (Kiviat and Stevens 2001). Instead of merely presenting lists of species found on the property, this plan presents a description and map of the specific habitats and their location prepared under Hudsonia's guidance. Recommendations tailored to protect the diversity of habitats and associated plants and animals are presented as part of the habitat descriptions and summarized in the conclusion of the section on natural communities.

The baseline condition of the property as well as consideration of what measures will most effectively protect its natural resources drive the remaining sections of the management plan, those dealing with passive recreation, existing historic and cultural resources, and plans for on-going study. These are all detailed in separate sections with a special discussion set aside for the rationale and means of accommodating hunting on AFP.

Natural Communities

Topography, Geology, and Soils

The Angle Fly Preserve (AFP) sits just north of the geographic center of the Town of Somers, NY. Bounded by Route 35 to the south, Orchard Hill Road to the west, Plumbrook Road and the Valley Pond Estates subdivision to the north, and bisected on its eastern end by Primrose Street (Route 139), it represents a significant amount of undeveloped open space in northern Westchester by itself. Additionally, its southwestern tip sits just across Route 35 from Lasdon Park which is also adjacent to Muscoot Farm, both sizable county-owned parklands. Together, all three form an area of approximately 1700 acres of undeveloped land, and if one includes the roughly 1200 acres of watershed land that follows the Muscoot River corridor running between Lasdon and Muscoot, the total acreage rises to almost 3,000 acres. In a recent study for the Town of Somers, the Metropolitan Conservation Association identified this combination as a significant area of biodiversity and recommended steps to preserve and protect its natural resources.

The land itself exhibits a rolling topography following three roughly north-south oriented ridges along which flow three distinct stream systems that eventually drain into the Muscoot Reservoir via the Angle Fly Brook. The Angle Fly forms the central stream and lies between the western and central ridges bisecting the property. The eastern and western streams that feed the Angle Fly join it at the southern end of the parcel. Numerous and extensive wetlands lie along these stream systems and together with the adjacent uplands contribute to the rich mosaic of habitats that characterize the AFP. The ridges lying on the eastern and western borders of the property reach an elevation of 587 and 537 feet above sea level, respectively. The low end of the property lies on the southern end of the DEP property along Route 35 at 231 feet. The central ridge is the lowest of the three (around 480 feet at its highest), and it is upon its two summits that the few structures on the property are to be found. On the north end sits the derelict “Tatham Mansion,” and on the south end, approximately ten townhouse model units constructed around a small courtyard in the early 1970s. These have also deteriorated and are slated to be demolished to make way for the Town’s planned community center. An additional structure, the late 18th century farmhouse known as the Reynolds House, is to be found on the western side of Route 139, towards the property’s northern end.

Geologically, the underlying bedrock consists of Fordham gneiss—composed of a combination of amphibolite, biotite, and a blend of other minerals—and Manhattan Formation, composed of pelitic schists and amphibolite. Soils are generally mineral and non calcareous from till alluvium

and outwash. However, **two significant areas of calcareous soil in wetland areas may be found—one along the southern edge of Plum Brook Road and the other just north of Route 35 in the DEP’s land.** Drainage is mixed. [See appended maps.]

Historically, the property was used extensively for hunting in pre-settlement days, and there is at least one known site, an ancient hunting camp and tool-making workshop, just to the north that was studied as part of a planning board application some years ago.[] The land was extensively farmed from the colonial period on into the mid-twentieth century, much evidence in the form of stone walls and abandoned agricultural sheds and equipment remains scattered throughout the woods and fields, which are in various stages of successional transition. As with many areas in Westchester County, much of this former farmland has reverted almost entirely to forest. However, a number of areas, those that were the last to be farmed, remain open and meadow-like, especially a roughly ten-acre area towards the top of the easternmost ridge and high point of the AFP.

Major Habitat Types

The Angle Fly Preserve displays a healthy mosaic of wetland and upland habitats. It is also relatively large and unfragmented for northern Westchester. Consequently, a significant amount of biodiversity exists within and around its borders as well as a number of threatened and development-sensitive species, as documented in Metropolitan Conservation Alliance’s recent study in this area of Somers [See appended report].

Generally the wetland habitat types follow the three stream systems that flow north-to-south through the property between the ridges. As runoff flows down the hillsides and seeps into the valley floors it creates a patchwork of hardwood swamp and cattail-dominated marsh alternating with slightly drier wet meadow. Upland forest climbs the ridges out of these stream corridors with some areas of rocky crest and ledge, particularly on the western and highest ridge. The two intermittent woodland pools (vernal pools) found on AFP sit within this knoll-and-basin topography. A few upland meadow areas can be found on the eastern side adjacent to the Somers Manor property, one ten-acre example of which is still in a fairly open condition.

The following AFP habitats and their associated plants and animals will be discussed in more detail in the following order:

Wetland habitats: wet meadow, calcareous wet meadow, springs and seeps, hardwood swamp, emergent marsh, intermittent woodland pool, intermittent stream, perennial stream, constructed pond

Upland habitats: upland meadow, shrub upland, upland forest, crest and ledge (non-carbonate)

The abbreviation provided for each habitat type keys to the appended habitat map.

Wetland Habitats

Wet Meadow (WM)

A wetland dominated by herbaceous plants and with little or no standing water during much of the growing season. Typical plants include late goldenrod, Joe Pye weed, soft rush, bulrush, tussock sedge, arrow-leaved tearthumb, as well as invasives such as reed canary grass, purple loosestrife, and common reed. Sensitive fern is often found in wet meadows in the study area. Areas mapped as “wet meadow” were either verified as non-calcareous wet meadow in the field or were identified as wet meadows remotely and may be either calcareous or non-calcareous.

Wet meadows tend to occur in patches on larger upland meadow areas. A good example may be found in the AFP Central Section just to the east and downslope from the old condos. There, several acres of wet meadow lie between upland meadow and an area of hardwood swamp bordering a stream. These patches vary from .5 acre to 3-4 acres in size and often in areas that show evidence of seepage. Generally, few wet meadow areas exist on the AFP as many of the original agricultural fields have reverted to forest. A few open areas in the extensive wetlands south of Plumbrook road also exhibit this type of habitat, although these may also be calcareous due to the fact that they are underlain by calcareous soils.

Species of conservation concern that may occur include southern bog lemming, as well as birds such as Virginia rail, American woodcock, sedge wren and Henslow’s sparrow (both listed as Threatened in New York State), as well as numerous types of butterfly. The wet meadow areas in the proximity of the old condominiums has been identified as very good spotted turtle habitat (NYS Special Concern, Westchester County Threatened) by Michael Klemens (see appended report to Somers Planning Board). Rare species listed by the New York Natural Heritage Program for the study area that may use these habitat types are dusted skipper (butterfly), American burying beetle (last sighted in 1923), and purple milkweed. Generally, the few areas of wet meadow on AFP tend to support abundant numbers of birds, for example blue-winged warbler (Nationally listed, Migrants in Jeopardy).

Given the very limited amount of this habitat type and the proximity of a sizable example to the location of the proposed Somers Community Center on the site of the vacant condos, special measures should be taken to ensure against its loss. Locating access roads, septic fields, and structures as far as possible from patches of wet meadow and taking extra precautions to avoid runoff and other damaging effects of construction will be crucial to maintaining the health of the little of this habitat that remains.

Calcareous Wet Meadow (CWM)

A calcareous wet meadow is a wet meadow habitat (see above) underlain by calcareous soils or bedrock and supporting calcicolous plants (those with an affinity for calcium-rich environments). Calcareous wet meadows are both an important habitat type for biodiversity and relatively rare in Somers and on AFP. A large number of both state and regionally rare species are found in these habitats including the federally listed bog turtle (see Klemens 8/2/04), which is principally associated with fens, a related habitat type. Spotted turtle (NYS Special Concern) is also associated with these and adjoining habitat complexes and may be present in the area.

In the Angle Fly Preserve, three areas of wet meadow may be calcareous. One is very small (approx. ½ acre) area and lies on the **eastern side of the wetlands adjoining the pond downslope from the vacant condominiums**. A second is rather larger, perhaps 3-5 acres in total, and constitutes a strip of patchy meadow areas along the southern edge of Plumbrook Road and approximately 100'-200' in from the road. This larger area is underlain by calcareous soil, mapped as sun loam with a small area of palms muck. The smaller area contains a number of calcicolous plants including **halberd-leaved tearthumb**. Both meadow areas contain numerous wet meadow plants including fox sedge, and soft rush as well as patches of invasive multi-flora rose, particularly close to bordering roads. Neither area stands alone but lies in a much larger mosaic of wetland habitat surrounding the easternmost of the three perennial streams that flow through the AFP.

A third area that may contain some wet meadow areas mixed in with emergent marsh and hardwood swamp lies adjacent to Route 35 at the extreme southwest end of the DEP portion. While much of this area is heavily inundated and appears marshy, several dryer spots were visible during a field visit and may contain typical wet meadow plants. Because the underlying soils are marked as calcareous, **this area should be more carefully surveyed for important species connected with CWM habitat**.

Hudsonia notes that this habitat type supports a number of rare and important species including small-flowered agrimony (NYNHP Watch List), butterflies including the Baltimore (NYNHP Watch List), which was noted on the property (Peter Burckmyer/Somers Land Trust, personal communication). The spotted turtle—a NYS Species of Special Concern—has been found in nearby Muscoot Farm Park (Natural Resources Management Plan 2004) and may exist on the property. Michael Klemens (8/2/04) has noted that the open meadow (CWM) area around Plumbrook may be an appropriate habitat for bog turtle as well as spotted turtle. A visiting BAS Bioblitz group found green frogs along the edges of the stream corridor and wet meadow areas below the condominiums.

Areas of open meadow in general are becoming increasingly rare in Westchester and its former farming communities as many fields have been developed for residential or commercial use and many others have reverted to forest. Calcareous wet meadows are even rarer, particularly in our study area, thus giving them special conservation importance. Additionally, Hudsonia notes in its *Biodiversity Assessment Manual* that these habitats “are sensitive to hydrological changes and pollution” (Kiviat and Stevens 2001). **Muscoot Farm has designated these as a special Biodiversity Reserve Area, and its Natural Resources Management Plan calls for measures to restore and protect Baltimore butterfly and spotted turtle among other plant and animal species.** Implementing the various recommendations in the AFP, especially in regard to control of invasive species, will be an important part of protecting this sensitive habitat type.

Springs and Seeps (SS)

Springs and seeps are places where groundwater emerges at the ground surface. In the case of springs, there is a concentrated flow to either the ground or to an overlying body of water; seeps display a diffuse release of groundwater to ground surface. Because groundwater temperatures average between 10 and 13°C in the study area, it is not uncommon to see small areas of melt when the surrounding ground is covered with snow and ice. Their presence is easily recognized during dry seasons by the darker color of the moisture-laden soils, as well as the noticeably cooler atmosphere, they create.

Ground surfaces continuously bathed in often mineral-rich water produce lush growing areas for plants, and fertile breeding grounds for insects. Because some springs and seeps remain ice-free in winter and wet in dry seasons, springs and seeps constitute an important source of water. As such, a variety of wildlife benefit from their presence. Hudsonia (Kiviat and Stevens 2001) notes that springs and seeps are important habitat for a number of regionally scarce salamanders, for example marbled salamander (NYS Special Concern), which has been detected in SS areas on the property (Klemens 8/2/04). State-listed tiger spiketail dragonfly (Extremely Rare, New York Natural Heritage Program) is also a possibility as it has been reported on nearby Muscoot Farm (Natural Resources Management Plan). Springs and seeps also supply cool, clean water to streams, for example Angle Fly Brook, thus helping to maintain habitat for fish and aquatic invertebrates.

SS were observed throughout the Angle Fly in the presence of a variety of other habitats including wet meadows, upland deciduous and mixed forest, as well as on rocky slopes (crest, ledge, and talus). Large areas of seepage were observed along the base of steep forested slopes bordering the western side of the Angle Fly Brook suggesting the profound contribution that groundwater discharges make to maintaining the flow of the Croton reservoir system.

Hardwood swamp (HS)

Hardwood swamp is a wetland dominated by deciduous trees and/or shrubs, typically red maple in the Angle Fly Preserve. Additionally, American sycamore, pin oak, and swamp white oak were also identified. Shrubs and herbaceous plants typical of the Angle Fly's swamps include spicebush, clearweed, jewelweed and skunk cabbage. Tussock sedge is often present in more open areas that include patches of marsh and wet meadow.

Throughout the spring and early summer hardwood swamps are often characterized by standing water; at other times, soft muck can be felt underfoot. In AFP swamps the underlying soils tend to be mineral but non-calcareous in nature, although several occur on calcareous, organic soils. An especially significant example can be found south of Plumbrook Road.

Standing dead trees within swamps provide nesting sites for owls, woodpeckers, and other birds as well as roosting sites for bats. Tussocks or elevated root crowns also comprise another common microhabitat that supports various species, for example the regionally rare four-toed salamander (NYS Special Concern Species). Hardwood swamps are recognized as important habitats for a variety of amphibians, reptiles, and birds.

Hardwood swamps are fairly common and widely distributed throughout the various drainages on the property. Most tend to be relatively small (< 2 acres) although there are three very large areas, the above-mentioned swamp south of Plumbrook Road (10-15 acres), the area surrounding Angle Fly brook itself on the northern end of the central section of the property, and north of Route 35 across from Lasdon Park (15-20 acres). All the AFP swamps are at significant risk due to or infiltration by invasive, non-native species, especially Japanese barberry, Japanese stiltgrass, and multi-flora rose.

Hardwood swamp is an important habitat, not only because it protects species of conservation concern in Westchester, but also because it fulfills important water quality functions. Swamps absorb stormwater runoff thereby mitigating flooding, filtering groundwater, and protecting overall water quality. Because the Angle Fly brook serves as a headwater stream for the Muscoot Reservoir, the hardwood swamps throughout the property are especially important in this regard.

Emergent Marsh (EM)

A wetland dominated by herbaceous plants, characteristically emergent marsh contains standing water throughout much of all of the growing season. The underlying soils may be organic or mineral. Typical plant species include cattail, tussock sedge, common reed, purple loosestrife, and bur-reed.

In the Angle Fly Preserve, emergent marshes tend to appear within a mosaic of other wetland habitats such as wet meadow and hardwood swamp with some habitat areas intermediate between wet meadow and marsh. Generally, these wetland complexes lie on floodplain surrounding the perennial streams that traverse the property. Two important marsh areas exist on AFP, one found in the wetlands adjacent to Plumbrook Road and the other lying just north of Route 35 in the southwestern end of the DEP's western section. Though of limited size and extent on AFP, EM is an important ecological habitat. Not only does it provide shelter and breeding places for a broad variety of animal species, but a marsh may retain large quantities of floodwater that can subsequently be absorbed into underground aquifers.

Emergent marshes play a significant role as breeding grounds for amphibians and reptiles including spotted turtle (NYS Special Concern). EM also supports a number of uncommon water birds such as American bittern, American black duck, wood duck, and marsh wren. A site visit to the edge of the marsh area along Plumbrook Road included a sighting of American bittern (NYS Special Concern).

On AFP, the emergent marsh areas south of Plumbrook Road in the eastern section are severely impacted by large stands of common reed (*phragmites australis*). Moreover, these areas have increased over the last few years. Generally, they follow the AT&T easement that cuts through the property in this area. Measures to at least contain this invasive ought to be considered.

Intermittent Woodland Pool (IWP)

Intermittent woodland pools are isolated shallow pools (10-50 in. deep) surrounded by upland forest that typically dry up in the later summer months. IWPs usually lack obvious inlets or outlets. Pools tend to be less than an acre in extent with extensive woody hummocks supporting tree growth and resembling hardwood swamps. IWPs also tend to occur at higher elevations, on the tops of forested ridges and hilly areas, often showing 'knoll and basin' characteristics on a topographic map. Only two IWPs have been definitively identified on AFP. They lie in close proximity to each other in the extensive upland forest areas (269 acres) on the DEP side of the property.

IWPs provide critical habitat for a special group of amphibians. Lacking fish, they are "virtually the only significant spawning areas for spotted salamander, Jefferson salamander, marbled salamander, and wood frog, and are also favorable spawning areas for spring peeper and certain other amphibians" (Kiviat and Stevens 2001, 128). Other species of conservation concern that frequent IWPs are spotted turtle (NYS Special Concern), wood duck, American black duck, black dash butterfly, and featherfoil (NYS Threatened) and false-hop sedge (Rare in NYS).

Generally, owing to their ecological importance and sensitivity, all human disturbance in the vicinity of woodland pools should be kept to a minimum. Metropolitan Conservation Alliance recommends a distance of 750' be maintained around IWPs, ideally. Currently, an old logging/agricultural road passes through the center one and along the periphery of the other of the two aforementioned pools. This road should not be used for the construction of any recreational trails, which should be routed well away.

Intermittent Stream (IS)

Usually small, no more than one-to-two meters wide, intermittent streams flow for only part of the year, usually in fall, winter, and spring. Most examples on the Angle Fly Preserve are fairly short and serve to feed the main perennial streams that lead into the Muscoot Reservoir.

Intermittent streams occur in proximity to almost all other habitat types, especially upland forest and wet meadow.

Intermittent streams are crucial to the biodiversity of an area. Besides providing an important source of water, they harbor aquatic invertebrates, sometimes small fishes, and as noted by Hudsonia, “may provide habitat for stream salamanders, especially if associated with seeps or springs” (Kiviat and Stevens 2001). Since many of our intermittent streams border areas of significant seepage, they probably do support such salamanders as northern two-lined (found on Angle Fly during the Bedford Audubon BioBlitz) or perhaps even northern dusky salamander (Westchester County Threatened). Significant invertebrates that are known to occur in the area and are associated with intermittent streams include tiger spiketail dragonfly (Extremely Rare, NYNHP), which has been observed on adjacent Muscoot Farm (Natural Resources Management Plan).

Intermittent streams clearly play an important role in supporting the plant and animal life of the study area and are especially vulnerable to human impact due to their small size and limited flow. Recreational uses that lead to stream disturbance should be avoided and appropriate mitigation measures taken in areas where trails may cross stream corridors. Since such streams may not be flowing and hence visible when trails are being located, it is crucial to be extra diligent in identifying and avoiding potentially impacted stream areas.

Perennial Stream (PS)

A perennial stream is a stream that flows continuously throughout the year, given normal precipitation. Angle Fly Preserve contains three perennial streams that flow through each of the three main sections of the property. The central and most remote of these, Angle Fly brook is reputed to be the last brook trout spawning stream in Westchester.

Most such streams tend to be small, little larger than the intermittent streams that are more common. Their substrates can be bedrock, rock rubble, cobbles, gravel, sand, and silt. Siltation due to stormwater runoff is a worsening problem in the area due to increasing development and therefore impervious surfaces and poor erosion control. Especially where the Angle Fly streams lie close to adjoining roads, especially Route 139 in the central section and along Route 35 in the western section, heavy deposits of road silt were evident.

Perennial streams are very important for biodiversity. Rare native fishes may occur. During the Bedford Audubon BioBlitz, brook trout (regionally scarce, Kiviat and Stevens 2001) was confirmed in the Angle Fly streams, but other fishes such as eastern mudminnow (Rare to Uncommon, New York Natural Heritage Program) also occur in this habitat in the Hudson River Valley. Other common fishes found in Angle Fly streams include blacknose dace, golden shiner, and creek chub (Bedford Audubon BioBlitz 2007). Salamanders also occur in PS as does wood turtle (Westchester County Endangered), which has been found numerous times on Angle Fly (John Behler, personal observation and personal communication).

Perennial streams are especially sensitive to impacts such as the loss of upland forest or an increase in impervious surfaces that reduce stream flow or increase the amount of runoff and pollution. Siltation and fertilization are increasing threats in the general area and especially to those portions of a stream that sit adjacent to a road. Conservation efforts should be directed at reducing the amount of runoff. Dam structures that are no longer used should also be removed to improve flow and the movement of fish and other organisms. Additionally, because cool water temperatures are necessary for fish such as brook trout, maintaining adequate tree cover along the banks and buffers of these streams is also essential.

Constructed Pond (P)

A constructed pond is a manmade impoundment placed within the course of a perennial stream. Typically, such impoundments have silty, unconsolidated bottoms and host a variety of aquatic plants and animals. Over time, they tend to silt up and revert to a marshy or swampy state depending on the degree of tree cover.

On AFP, approximately four such ponds may be found. One exists on the eastern edge of the property bordering Route 100 and is fed by the outlet stream of a neighboring pond on the Somers Manor property. Two others lie next to Route 139 in the AFP's central section and lie along the course of the eastern stream corridor that feeds into the Angle Fly Brook at its junction at the southern end of the property near the Van Rensselaer and Route 35 intersection. A fourth sits on the northern end of the central portion of AFP where the Angle Fly Brook enters the property. This last is far more silted in the others and gradually acquiring some of the

characteristics of an emergent marsh. A large snapping turtle has been frequently observed in the deeper areas of the pond. The pond bordering Route 100 is also beginning to silt in although remains far more open than the Angle Fly Brook pond. The ponds adjacent to Route 139 are comparatively deep and much larger, although the lower of the two is filling with emergent marsh around its edges. This last also feeds a fairly large area of hardwood swamp with small marshy and wet meadow areas to its south.

Though manmade, constructed ponds are an important wetland habitat, especially on AFP. They support a variety of fish including creek chub, bluegill, and brown trout as well as amphibians and turtles. Pickerel frog, bullfrog, and green frog have been observed at the Route 139 ponds as have common snapping turtle and painted turtle. Wood duck, great blue heron, and mallard also use these ponds regularly. Wood turtle (NYS Special Concern, Westchester County Endangered) has been found in the vicinity of the interior Angle Fly Brook pond and may depend on it to overwinter. Hudsonia notes that spotted turtle also uses constructed ponds and may be present on AFP. American bittern has also been found on the property and is another pond user. Spiny coontail (NYNHP very rare - rare, uncommon) is also found in this habitat and may be present, particularly as “the occurrence of rarities is enhanced if better quality or ‘core’ habitats are nearby” (Kiviat and Stevens 2001, p. 174).

Hudsonia notes that ponds often substitutes for other wetland habitats in our area due to their ubiquity. The habitat quality of ponds depends on a number of factors including “presence of springs or marginal seeps, presence of submerged, floating, and emergent vegetation, natural or semi natural vegetation (especially trees) on the banks, and the distance from buildings, roads, and intensive agricultural activities” (Kiviat and Stevens 2001, p. 174). Clearly, the ponds that lie closest to roads on AFP ought to be monitored in order to maintain their habitat value.

Upland Habitats

Upland Meadow (UM)

UM is old-field habitat on dry soils that, unlike shrub upland, is dominated by grasses and forbs. Typical forbs include goldenrod, wild madder, and yarrow. The most extensive and important area of upland meadow is found in the eastern section of AFP towards the crest of the ridge running north to south. Approximately 10-15 acres in size, it is an unusually open example for the area, especially given that it has not been mowed for a considerable period. Other important areas of UM are found in the central section adjacent to the abandoned model condominiums.

UM is especially important for the eastern bluebird, which forages on the ground and nests at meadow edges. Although once imperiled, it is making an excellent comeback and has been sighted in abundance, particularly in the large, abovementioned eastern meadow. Other birds

that are of conservation concern and nest in large upland meadows include upland sandpiper, sedge wren, bobolink, eastern meadowlark, grasshopper sparrow, Henslow's sparrow, and vesper sparrow. More common species observed on AFP meadows are Baltimore oriole, yellow warbler, eastern phoebe, red-winged blackbird, and American goldfinch. This type of meadow also attracts regionally uncommon butterflies such as the dusted skipper (Rare, New York Natural Heritage Program). Numerous monarch butterflies have been observed in the large areas of upland meadow on AFP.

Typically UM in northern Westchester contains non-native species introduced during the years these lands were primarily used for agriculture. Timothy and velvet grass, along with dewberry and scattered multiflora rose were found, especially in areas where UM is giving way to forest succession. Measures to control the spread of multiflora rose ought to be encouraged.

Suburban development and re-forestation has threatened much of the upland meadow areas in Westchester. An effort should be made to maintain those areas on AFP that remain open and perhaps restore others to their former meadow-like condition.

Shrub Upland (SU)

Shrub upland is old-field habitat on dry soils that is transitional between upland meadow and upland forest. This is a fairly common habitat in the study area as many former agricultural fields revert back to forest cover. A large variety of plants from forbs and grasses to shrubs and small trees, especially red cedar, are present. Shrub upland areas on AFP are usually adjacent to other more open habitats such as upland meadow and wet meadow, especially in the area of the abandoned condominiums in the central section where a fairly extensive SU may be found.

Typical vegetation includes goldenrods, asters, orchard grass, little bluestem, black raspberry, prickly dewberry, and hawthorns as well as patches of invasive multiflora rose. Gray-stem dogwood, black locust, and red cedar are common as are occasional large trees that served as shade for livestock.

Shrub upland is an important habitat for bird life on AFP. The shrubs and low trees often support a fairly rich variety including gray catbird, brown thrasher, American robin, a number of warblers, American goldfinch, and cedar waxwing. Northern saw-whet owl is also sometimes found in dense stands of red cedar. SU also provides habitat for a number of butterfly species especially if little bluestem is present. Species of conservation concern include Aphrodite fritillary and Leonard's skipper (both Endangered, Westchester County).

Hudsonia notes that this type of habitat is fairly tolerant of human disturbance (Kiviat and Stevens 2001). However, as with upland meadow, suburban development threatens the existence

of this habitat type. Given their importance as bird habitat and the potential presence of rare butterflies, attention to their preservation ought to be given, especially through good management practices, such as the control of multiflora rose.

Upland Forest (UDF, CP)

Much of the AFP is forested, between 300 and 500 feet in elevation, and covered with relatively young trees (<12in DBH). As farming gradually diminished, many former pastures and fields returned to forest. The varying age of different woodlots on the property probably corresponds to the gradual cessation of mowing and grazing over ever larger areas throughout the 20th century. The basic type of forest habitat corresponds to the type of tree that predominates. On AFP, deciduous trees constitute the vast majority of the forest cover, although conifers of various sorts—eastern hemlock, Norway spruce, and white pine—occasionally occur. Consequently only two types of upland forest are described: upland deciduous forest, and conifer plantation.

Upland Deciduous Forest (UDF)

UDF is forest consisting of greater than 75% deciduous tree cover. Typical species in the Angle Fly Preserve are ash, beech, black birch, red and sugar maple, red and white oak, sassafras, shagbark hickory, and black cherry. Typical shrubs include spicebush and witch-hazel. In some of the more disturbed areas as well as those adjacent to roads, Japanese barberry is abundant. Some native plant species identified on field visits were partridgeberry, Virginia creeper, and spotted wintergreen. In less disturbed areas of UDF, the forest floor is typically spongy with large accumulations of leaf litter and uncompacted soil. Downed wood, woody debris and mounded areas due to the decay of tipped-up root systems are also indicators of higher quality forest. In general, the forest is healthier towards the center and throughout the northwestern sections where a relatively high-quality example of mature forest may be found amongst areas of crest, ledge, and talus.

Many bird species depend upon mature forests of this type. These include eastern wood-pewee, wood thrush (Special Concern, Westchester County)—the presence of which was confirmed on several field visits, veery, worm-eating and black-and-white warblers, American redstart, ovenbird, scarlet tanager, and many others—most of which were confirmed during the Bedford Audubon BioBlitz. Many neotropical migrants depend on UDF interiors for breeding and nesting, at least in the larger, less-fragmented examples. The forest themselves shelter a variety of mammals small and large, including possibly, according to one neighboring property owner who has seen it, a bobcat.

UDF is perhaps the most common habitat type in the entire study area. However, deer browsing of the understory and earthworm infestation of the soil pose serious risks to the health

and integrity of the forest. Many of the smaller parcels of UDF as well as the edges of the larger parcels also have significant numbers of invasive plants such as Japanese barberry, Japanese stiltgrass, Norway maple, and some *Ailanthus* (tree of heaven). Efforts aimed at controlling the deer population and limiting the spread of invasives due to human recreational activities would go a long way towards protecting the area's biodiversity.

Conifer Plantation (CP)

CP is an area of forest composed of planted, coniferous trees such as Norway spruce or white pine. One such area is found in the central section of AFP, adjacent to Angle Fly Brook and at the bottom of the ridge forming the western DEP section of the property. Though not in rectilinear rows, a distinctive feature of plantations, the trees appear to have been spaced in order appear as though naturally occurring, and are rather large (>12 in DBH). A number of hardwoods, sugar maple for example, are intermixed as well as some shrubs. The ground is heavily covered with white pine litter. **The watershed forester who surveyed the property believes that this plantation was planted in the 1930s by the Civilian Conservation Corps** (Hubbard 2007).

Conifer plantations are attractive to a number of bird species of conservation concern that have been sighted on the property owls including barred owl (Regionally Scarce Breeder, Kiviat and Stevens 2001), Cooper's hawk (NYS Special Concern), and American woodcock (Westchester County Threatened; Declining, Kiviat and Stevens 2001). Hudsonia notes that "Even single rows or small clusters of planted conifers may be used for nesting by red-breasted nuthatch" (Kiviat and Stevens 2001).

Crest and Ledge (non-carbonate) (CL)

Crest and Ledge (CL) habitat is characterized by exposed rocky outcrops and knobs along ridge summit and shoulder slopes, or ledge areas, often on the sides of relatively steep(>15degrees) slopes. CL habitats vary in size from relatively small, isolated outcrops to large knoll and basin areas (>5acres). Typically on AFP, they are relatively small (<1 acre) and distributed throughout larger areas of upland deciduous forest (UDF). **The most extensive of these lie on the upland portions of the western (DEP) section of the property** where numerous ledges and rocky knolls obtrude into the surrounding forest. Such rocky areas exhibit shallow soils and sparse vegetation with scattered trees. CL can be underlain by either carbonate or non-carbonate bedrock. The AFP study area is mostly non-carbonate, Manhattan formation or Fordham gneiss.

The vegetation found in CL habitats includes trees, shrubs and herbs, sometimes existing in similar patchwork to oldfields. Given the shallow soils, trees are often smaller than in adjacent forest areas and on AFP consist of red oak, red maple, black birch and an occasional hemlock. Shrubs may include low blueberries, huckleberries, and chokeberries. Because of the forested

nature of most CL areas in AFP, few grasses or forbs are evident. Lichen and various ferns are also common in areas of CL.

Typical fauna found with CL habitats include “crevice-using” animals such as porcupine, snakes, and salamanders. However, CL also supports relatively rare animals in the study area including bobcat (Westchester County Threatened; Vulnerable, Kiviat and Stevens 2001) and eastern box turtle (NYS Special Concern; Westchester County Threatened). Some birds found in the study area that depend on CL include turkey vulture, eastern bluebird, and common raven (all regionally rare breeders, Kiviat and Stevens, 2001).

Besides development, recreational use can also pose a threat to CL habitat, both by eroding the shallow soils and disturbing wildlife. This may be a particular concern as the Town moves ahead in the planning and construction of various recreational trails, especially on the DEP side of the property. Some existing trails come fairly close to areas of CL. Since buffering these habitats from human disturbance could enhance their value for biodiversity, consideration should be given to trail relocation.

Natural Communities—Findings and Management Objectives

Findings

Biodiversity

Given the size and variable topography of the Angle Fly Preserve, it is unsurprising that a broad variety of significant habitat exists within its boundaries. Generally, AFP consists of three parallel, north-south ridges and at the base of each, a stream corridor with associated wetland habitats—hardwood swamp interspersed with emergent marsh and wet meadow areas. Numerous ponds also exist along the easternmost of these streams, probably constructed for farm use over the years, and harbor a variety of amphibians. The ridges between these stream corridors tend to be heavily forested with a mixture of beech, hickory, oak, and maple. The westernmost, is characterized by shallow soils and rocky crests and ledges. The other two tend to be less steep, more rolling and have deeper soils. Additionally, the central and eastern ridges show more signs of human disturbance from both farming and limited development, especially in the central section with its abandoned manor house (“Tatham House”)—now a home to several turkey vultures and the derelict model condominiums. There is also an access road through the central section along which lies a large area of upland and wet meadow as well as interspersed shrub upland.

Perhaps the most significant wildlife find on the property that has been consistently reported is the presence of wood turtle, confirmed most recently during the June 2007 Bedford Audubon BioBlitz. Considered endangered in Westchester County and of special concern in New York State, its presence lends a special character to the AFP. **All finds have been in the central and most isolated section of the preserve, around the eponymous Angle Fly Brook and its associated wetlands. Numerous eastern box turtles (NYS Special Concern, Westchester County Threatened) have also been found, especially in this area as well. Not only is the brook an important habitat area for these turtles but the sandy areas both adjacent to the brook and in upland areas near the abandoned “Tatham House” appear to serve as important breeding habitat.** Also, the unbroken upland forest surrounding the brook serves an important function as a foraging area and offers protection from roads and human contact. The integrity and protection of this habitat complex is vital for the continued existence of these turtle populations.

Other important habitat areas also exist on the property. Besides the open meadow area around the old condominiums, a large upland meadow exists on the eastern side of the property. Both afford important habitat for the large variety of birdlife on AFP. The large eastern meadow

has been identified as a gathering area for migrating eastern bluebirds as well as monarch butterflies, which have been sighted in large numbers at the appropriate seasons (personal communication, Peter Burckmyer). Numbered amongst the bird species that depend on the Angle Fly's mixture of habitats are American woodcock (Westchester County Threatened) and wood thrush (Westchester County Special Concern). American woodcock has been confirmed (personal communication, Peter Burckmyer) and wood thrush is commonly heard on the property. Additionally, the size and relatively unbroken nature of the forest land within Angle Fly make red-shouldered hawk (NYS Special Concern, Westchester County Threatened) a possibility. It shouldn't be surprising that Bedford Audubon reported its ornithologists were uniformly impressed with the quality and diversity of AFP during the recent BioBlitz.

Challenges

Though there is significant biodiversity and intact habitat within the AFP, some important challenges to its ecological integrity are clearly evident. First, as noted in the habitat profiles, large numbers of invasive plants were found throughout the AFP. It is especially worrisome to note that these invasives have dramatically extended their reach into the property over the last five years that the interior has been monitored. Besides the persistence of multi-flora rose in the wetland and upland meadow areas, Japanese barberry has been increasing in thickness and extent on both the low-lying parts of the western DEP side and up the slope of the easternmost ridge. Oriental bittersweet is also attacking large numbers of trees at the crest of this ridge as well.

Second, the deer herd is fairly sizable and appears to be growing rapidly, especially now that informal hunting on the property has subsided. Deer consume native vegetation, diminishing their ability to compete with invasive plants. They also facilitate the spread of invasives by spreading seeds that cling to their coats or hooves and defecating the seeds of those plants they consume. Though they also eat young invasive plants as well, they tend to leave the older specimens alone, not so with regard to native vegetation. In fact, one can detect a virtual "browse line" in the forest where deer have stripped lower leaves and branches on many native trees and consumed shrubby understory creating an opportunity for invasive shrubs and plants such as Japanese barberry to become established (Hubbard 2007, 8-9). Furthermore, they consume native saplings, thus diminishing forest regeneration of which there is very little throughout AFP (Hubbard 2007).

Besides natural challenges, there are also a number of human ones: accommodating future passive recreational use and the new community center destined for the fifteen acres that Somers owns in the central section of the property.

Hiking and other activities, hunting for example, raise the possibility both of human contact with sensitive species such as wood turtles and the degradation of habitat due to the spread of invasive plants. As hikers move through areas with invasive plants, the possibility of unwittingly transporting seeds on shoes or clothing exists. Also, turtles have been especially vulnerable to collection, another possibility as long as trails cut through the property. Even touching turtles has been found to pose dangers in that raccoons will often find such turtles through following human scent (Rod Christie, personal communication).

The proposed recreation center for the site of the old condominiums also poses challenges to protecting the biodiversity of the AFP. Besides the enlarged footprint of human disturbance, the traffic and road infrastructure can negatively impact the area's wildlife. The open meadow area that construction will inevitably disturb in order to build wastewater management systems is one of the few on the property and important for its birdlife. Even the loss of the old condominiums is itself a negative impact in that a number of snakes and other amphibians, green frogs for example, make use of the debris and water-filled depressions around the site.

Additionally, AT&T Corporation owns an easement that runs through the entire northern side of the property from east to west. The open corridor plays host to a large number of invasives, particularly in the hardwood swamp area in the eastern section of the property where a large and growing stand of *phragmites australis* is present. Line construction and ongoing maintenance has contributed to the spread of Japanese stiltgrass, multiflora rose, and Japanese barberry across the property.

Management Objectives

Protecting Angle Fly Preserve's important mix of habitats while accommodating future recreational use is both a challenge and a necessity. The following measures are designed to both protect and enhance AFP's biodiversity as well as to manage the various challenges identified above.

- **Map the location of invasive plants** on AFP, especially Japanese barberry, Oriental bittersweet, mile-a-minute vine (if present), and multi-flora rose. This should be followed up with a comprehensive plan to contain their spread and eradicate the most serious threats.
- **Manage the large and growing deer herd** through recreational hunting as permitted by the DEC conservation easement. Management should be based on a plan to preserve and enhance native vegetation and contain invasives.

- **Route trails away from important habitat areas**, especially the turtle-breeding areas around Angle Fly Brook. Additionally, keep trails well away (300') from the intermittent woodland pools on the DEP side of the property.
- **Clear invasives from areas where trails will be routed** to minimize the spread of seeds and plant material.
- **Minimize trail incursions** into wetland areas.
- **Follow up all management activities with appropriate scientific study** to determine effectiveness and make further recommendations.
- **Undertake a program of neighbor outreach to soften edges of preserve** and avoid potential impacts such as dumping of yard debris, ATV use, improper disposal of wastes, and so forth. Also encourage donation of conservation easements where feasible with larger neighboring landowners.
- **Encourage study and foster recognition of AFP's biodiversity** through involvement of area conservation organizations such as Bedford Audubon and their consideration of AFP as an Important Bird Area (IBA).
- **Continue established contacts with AT&T** in order to receive notice of work along the corporation's utility easement and ensure mitigation efforts to contain the spread of invasives are undertaken.

The following recommendations target specific areas and habitat types within AFP and incorporate suggestions also found in the appended "Watershed Forest Management Plan" (Hubbard 2007) (FMP).

Wetland Habitats

Emergent Marsh and Wet Meadow areas, Plumbrook Road: These important wetland areas may provide important habitat for spotted turtle (NYS Special Concern) as well as offering some possibility for bog turtle (Federal, Threatened; NYS Endangered), though unlikely. Further study of this important area is very desirable. Additionally, the emergent marsh areas are threatened by a large and growing population of *phragmites australis*. A program of containment or possibly eradication should be pursued; the FMP advocates hand-pulling of invasives in this area (Hubbard 2007, 32).

Hardwood Swamp / Wet Meadow Complex, Route 139 and condominium site (central section):

This wetland complex, that also shades off into upland meadow / shrub upland as the topography steepens, is a potential site for spotted turtle (NYS Special Concern) and other rare and important amphibians. Generally, both Hudsonia and Metropolitan Conservation Alliance recommend much greater than 100' buffers from human disturbance in order to protect the habitat value of such areas (750' in the case of intermittent woodland pools). The proximity of Somers' proposed community center and the disturbance associated with its construction pose a significant challenge to the amphibian life associated with these habitats. Consultation with a panel of biologists in the design and ensuing construction as well as careful study and monitoring of these populations are vital to mitigating the negative impacts that are sure to result. The Town of Somers must exercise the utmost vigilance and insist on vigorous enforcement of best practices.

Constructed Pond adjacent to Route 139: This pond has a fairly rich abundance of turtle and amphibian life and flows into a substantial wetland complex to its south. It is also bordered by *phragmites* as well which should be monitored and contained.

Angle Fly Brook: This perennial stream supports two focal species of management concern, wood turtles and brook trout. Mianus River Gorge is currently involved in a brook trout program to study threats and devise protection strategies. Mianus is willing to extend this program to the Angle Fly. Additionally, turtle nesting sites in the adjacent sandy shrub upland should be monitored and efforts made to minimize human disturbance. Trails should be kept to the western side of the brook and well away from the nesting sites. Removal of the dam structure at the north end of the property might improve stream flow and should be considered as well.

Intermittent Woodland Pools, DEP: Two woodland pools lie just downhill from an area of rocky crest and ledge. One of these pools supports an abundance of wood frog and salamanders such as marbled and two-lined. An old skid trail runs through this latter pool, and though this corridor presents a natural trail route, hikers should be routed away from the pools to minimize disturbance.

Emergent Marsh/Hardwood Swamp wetland complex, Route 35 (western side): A fairly extensive area (approximately 20 acres) under DEP ownership that hosts a large amount of amphibian life and is drained by the western arm of the Angle Fly Brook, this wetland complex is especially vulnerable to siltation from the adjoining road. Mitigation measures should be considered. Also, as a trail crossing into Lasdon Park is planned for this area, careful planning aimed at minimizing disturbance is necessary. Especially as the trail will be coming from upland areas that are heavily infested with Japanese barberry, removal of these plants along the trail corridor is extremely important in order to minimize the risk of further spreading their seeds.

Upland Habitats

Upland Meadows and Shrub Uplands, eastern section: The relatively large (10 acres) open field area and adjacent shrubland/upland meadow complexes should be maintained through a program of selective mowing that aims to maintain half the area in shrubland and half in open field. Mowing should be no more than once a year, on only a portion of the area, and late in fall when grassland birds or turtles are unlikely to be present. The mowing should create irregular patches and dense edges that will enhance their habitat qualities and should be carried out under the direction of a biologist.

Additionally, the forest edge surrounding these meadow areas might be improved through following some of the silvicultural recommendations of the FMP for these stands. Removal of diseased ash trees and some of the black locust might contribute to maintaining the open, meadow character of the area. Also, thinning aimed at enhancing the sugar maples present ought to be considered. The relative accessibility of this area might make it an ideal site for maple sugaring, perhaps involving Boy Scouts or the local schools.

Upland Meadows and Shrub Uplands, central section: Those areas adjacent to Route 139 have been identified as important bird habitat and a similar program of mowing and maintenance as on the eastern side should be carried out here as well. The sandy upland meadow on the north end of the property just beyond the Tatham House is also potential turtle nesting area and should be maintained through hand pulling of invasives.

Upland Deciduous Forest, eastern section adjacent to Route 139: This forested area is identified in the Forestry Management Plan (FMP) as severely impacted by barberry in its upper reaches as well as Norway maple. The Norway maple is relatively easy to identify and remove. The barberry needs to be controlled and the level of tree diversity increased through thinning of dominant red maple and removal of diseased ash trees as per the FMP.

Upland Deciduous Forest adjacent to Angle Fly Brook: The FMP identifies two separate stands in this area, a transitional hardwood forest stretching north from Van Rensselaer Street and a degraded northern hardwood forest climbing up the ridge to the west of Angle Fly Brook. The transitional forest is described a “fairly unique” in the FMP and should be studied for the employment of “sustainable silvicultural practices” that will preserve this forest type. The upland forest west of the brook is seriously degraded due to a poorly managed timber harvest 10-15 years ago that left the stand “occupied primarily by diseased and disease-prone low-value trees.” It also suffers from a serious erosion problem on a former skid trail. The FMP’s recommends placing water bars on the skid trails and cropping to release pole-size disease-resistant tree

species. Scattered barberry is also present and should be removed before it becomes more established in the area.

Conifer Plantation, Angle Fly Brook area: This white pine plantation offers habitat to owls and other species. It also supports an understory of sugar maple, which the FMP points out is absent on much of the rest of the property due to deer browse. The FMP recommends thinning out poorly formed pines and the barberry that is present, which will also sugar maple regeneration.

Conclusion

In general, biodiversity and forest health will be improved through the removal of the more pernicious invasives. Norway maple is prevalent in many of the forested and shrub areas and is relatively easy to remove. It is also a threat to the sugar maples and other natives that are more long-lived and generally healthy forest species. A program of eradication together with efforts to control the spread of Japanese barberry and cull some diseased trees, especially could easily be carried out by a volunteer group such as Friends of Angle Fly, and therefore should be pursued as a first phase of forestry management. These can be followed up by other methods of timber stand improvement, for example thinning and “patch cutting,” at the direction of the Watershed Agricultural Council foresters and consulting biologists. All such activities should be aimed at maintaining optimal habitat for native plants and animals.

Cultural and Historic Resources

The cultural landscape surrounding the Angle Fly Preserve is rich in scenery and history. The area was heavily used in pre-settlement times by Native Americans, primarily for hunting. Archaeological investigations connected with the Primrose Farms subdivisions just to the north of AFP uncovered a prehistoric “lithic workshop” and encampment and a pattern of use that extends over thousands of years.

The area was acquired from the Native Americans as part of the vast Van Cortlandt Manor at the close of the seventeenth century. Early settlers moved to the area, as did Daniel Wright to land around Primrose Street (Route 139), and began farming. Other early families include the Teeds and Turners. During the American Revolution, marauding “Skinners” and “Cowboys” associated with the armies infested the area. One account, attributed to Daniel Wright, tells of his family driving their cattle into the swamps, possibly around the Angle Fly Brook, to protect them from theft (O’Donnell 2003). Following the revolution and on into the nineteenth century, the area was heavily farmed, supplying dairy and produce for New York City and the surrounding region. Many of the original nineteenth century houses of these families still exist along Primrose Street, including the house of Silas Reynolds on the AFP itself.

In the twentieth century, farming gradually gave way to residential development and the pattern of relatively small-parcel holdings that exist today. However, a good number of the nineteenth century dwellings remain, although the farmhouse on AFP is unique in possibly dating to the eighteenth. The presence of these structures lends a strong historic presence to the area as does the landmarked Mt. Zion Church (1794) and Cemetery adjoining the northeastern end of AFP. The scenic vistas established by the protection of Angle Fly Preserve also contribute to the cultural landscape and preserve its historic associations.

Historic Structures (by Florence Oliver, Town Historian)

The Reynolds House, which is to be restored and preserved, can be traced back to 1803. An architectural historian has stated that the structure is a “late 18th or early 19th century farmhouse with later add-ons. But main façade has original integrity: basic 5-bay, side gable, two story, center chimney building with shed-roof porch over central three bays.....Core structure could be ca. 1776. Originally clapboard. Three barns in the rear.”

The property must have been owned by John Teed prior to 1803. It was that year that John Teed and his wife Hannah sold 73 ¾ acres to Caleb Nichols. Caleb Nichols, a farmer, and his wife Phebe took out two mortgages on the property, which were foreclosed in 1828. At the

foreclosure the property was bought by Minott Mitchell of White Plains, a speculator, for \$750. The same day Minott Mitchell sold the property to Silas Reynolds for \$2900.

Silas was the son of James Reynolds who lived in the Pines Bridge area of Somers. James fought in the Revolutionary War and is buried in Mt. Zion Cemetery.

Silas Reynolds died in 1878 at the age of 86. He had married Annie Haight in 1827, just before he purchased the Reynolds House. They had three children, Samuel H., Katherine and Sarah Ann. Annie died in 1833.

Silas took as his second wife Amy Merritt and had two more children, Deborah M. and James Lyon. Amy died in 1868. Silas and his two wives are buried in Mt. Zion Cemetery, overlooking the old homestead.

Silas Reynolds occupied the house until 1878. His son Samuel had died in 1875 at the age of 45 and is buried in Mt. Zion Cemetery. His daughter Katherine had moved to Iowa, his daughter Sarah Ann to South Salem. Deborah M. and James Lyon Reynolds lived in New York City. There was no one with whom to share the homestead.

That year, and just before his death, Silas sold the property to Samuel H. Wood of Bedford for \$6500. In 1905 Samuel H. Wood of Bedford and Catherine, his wife, sold the property to Edwin Tatham of New York City. Mr. Tatham had an interest in the United Lead Company of Brooklyn, N.Y. He was also active in the Somers community, serving for many years as the Clerk of Rural School District #4.

By the 1920s the property was owned by Warren D. Orvis and called Somers Orchards. Mr. Orvis was a broker, with a business address of 14 Wall Street, New York City. He had been a Lieutenant in the Air Force during World War I, and was a Defense Volunteer in Somers during World War II. His family was connected with the Orvis Fly Fishing Company.

The property was sold to Primrose Farms around 1970 and became part of a much larger tract of land.

The Reynolds House is a fine example of the farmhouses that once dotted the landscape. Apparently it was not grand enough for the Tathams who built another structure on the hill behind it. The farmhouse was probably used as a caretaker's cottage. It is still occupied and seems to be in reasonably good condition.

According to the author of a DEIS prepared for Primrose Farms, "The large house, which stands on the hill to the west of the Reynolds House, does not appear on the 1908 map, but is clearly visible, along with its tree lined drive, garden and automobile turnaround, in the aerial

photographs made of Westchester County in 1926. Based on the Spanish-style architecture, a date after World War I is suggested.

“The 1926 aerial photographs show that the land was orchard and open fields, as was still the case in 1930, when the property was called ‘Somers Orchard.’ [By] 1953 the property belonged to Warner Davis Orvis, a New York City broker..... Mr. Orvis died in 1967. His wife, who had been active locally, died in 1969.”

The Tatham/Orvis house reflects a time in the life of Somers when a number of large farms were turned into “Gentlemen Estates”, with elaborate buildings, sweeping views, formal gardens and drives, all reflecting the owner’s affluence. This house has not been occupied in several years and is in a much deteriorated condition.

Other Structures

A number of dilapidated or collapsed farm structures also exist on AFP. Specifically, there are the garage and pool house that lie in the vicinity of the Tatham/Orvis mansion together with a long-disused, elevated water tank just to the north of the house. Additionally, a collapsed outbuilding and sheds sit just to the north of Plumbrook Road and near the Reis Park property line. Two-to-three small, collapsed farm sheds also exist on the north western end of the large upland meadow towards the top of the easternmost ridge, south of Plumbrook.

Community Center

Currently, the Town of Somers plans to place a community recreation center on the fifteen acres it owns that include the entrance road off Primrose Street (Route 139) and model condominium units constructed in the 1970s and in a seriously dilapidated condition. As things stand, plans involve the construction of a 47,000 square foot facility with a pool, basketball courts and other athletic amenities, as well as parking for ___ cars. Stormwater management systems and an access road will extend out over an area of upland meadow and shrubland, and together with the main access road take up virtually all of the Town’s allotted fifteen acres, extending the infrastructure envelope right to the Town parcel’s very borders.

This area falls outside the scope of the Management Plan. However, due to the size of the project its construction will certainly impact upon the open space recreation areas that are Town/ County owned. Potential disruptions to birds and amphibians that use the meadow areas adjoining the site of the community center have already been noted in this plan. Salamanders and turtles found in the constructed pond and adjacent swamp and wet meadow complex likely cross the site at present, and milk snakes and green frogs have been found in the vicinity of the dilapidated townhouses. Though they may find routes around the community center and the

construction site, these will be limited. The center will cover much of the hilltop above, and movement to the east is blocked by Route 139. High mortality rates amongst amphibian populations are a distinct possibility.

Furthermore, traffic and intensive human use of the community center will dramatically elevate the level of human disturbance throughout. For example, amphibians and turtles will be faced with roads and traffic through their habitat that they do not now. Noise and artificial lighting, especially at night, will increase as will human intrusions into the wetland areas and other sensitive habitats. Clearly, increased human presence will disrupt animal use and change the ecological balance of this portion of the property. Therefore, management of these impacts needs to be addressed within this plan.

Management Objectives

Reynolds House: The Town Historian, Florence Oliver, has urged that this structure be restored, possibly for use as a caretaker's house. A similar suggestion is contained in the End Use Plan developed during the purchase of the property. Because the house represents one of the few relatively unchanged examples of a late eighteenth-early nineteenth century farmhouse, roughly contemporary with neighboring Mt. Zion Church, it is a historically important part of the cultural landscape documented in the Landscapes Report of 2003. It is also desirable to have an individual on site who can serve as a caretaker and security presence. The house, because of its proximity to the main entrance and easy access, is in an ideal location to accommodate such an individual. Preservation and development of the house into a one-two family caretaker's residence is therefore a primary objective.

Tatham/Orvis House: Though of some historic note, this structure is both too dilapidated and too remote to justify its restoration. The ecological impact and the associated expense would simply be too high. This structure, however, is partially open, and though the Town has made some effort to secure it, it needs to be more adequately sealed off. As long as public access is effectively curtailed, it poses little danger and can, perhaps, be left to deteriorate as a picturesque ruin as has, for example, the Cornish estate in Hudson Highlands State Park.

Miscellaneous Structures: The garage and water tank near the Tatham House, and farm outbuildings near Plumbrook Road should all be effectively secured to prevent public access. The collapsed pool house associated with the Tatham House should either be effectively fenced off or perhaps removed altogether given its unsightly appearance and dangerous condition.

Community Center: As discussed in the section dealing with natural communities, impacts associated with the design, placement, and construction of the Town's proposed community center should be carefully monitored and appropriately mitigated to the full-extent possible. A careful and detailed wildlife study of the site and its environs should be conducted by expert biologists chosen in consultation with the Westchester Land Trust and monies should be set aside for continued monitoring during construction.

Open Space Recreation Plan

The Open Space Recreation Plan (OSRP), as called for in the NYS DEC's conservation easement follows the Recreational Trails Plan Program Application, 2007, submitted by the Town of Somers to New York State for funding through the Federal Highway Administration (See appendix __). That application was successful, and the trail network described therein and as provided for by the DEC's conservation easement forms the basis for the following plans and objectives.

The relevant portion of the DEC conservation easement states,

Grantors agree to provide public recreation within the Open Space Recreation Area for non-motorized recreation including by not limited to: hiking; mountain biking and horseback riding on trails designated for such use in the Recreation Management Plan; snowshoeing; cross-country skiing; nature study; wildlife observation; hunting and fishing; and providing access to those with mobility impairment.

The following plan addresses all such uses, although no suitable area for an equestrian riding trail has, as yet, been identified. Furthermore, no stables exist on the property nor may be constructed, and those few areas where parking is located will be unable to support horse trailers thus making it impractical to bring horses onto the property. However, all other uses are supported by planned trails and parking as detailed in the following sections.

Trails

The trail network described below and detailed on the attached map will not only provide a vastly expanded opportunity for hiking in Somers, but also most of the activities listed in the State's conservation easement. The trails will provide opportunities for nature study and wildlife observation, snow-shoeing, and cross-country skiing on those that are groomed. Additionally, plans call for a separate loop for those who suffer mobility impairment. All of these trails have been laid out and are being adjusted in consultation with those biologists who have been involved with the Management Plan. Several basic principles have guided the selection of routes and number of trails:

- Provision of at least 10 miles of continuous trail
- Provision of a trail connection throughout the property and onto adjoining Reis Park and Lasdon Park

- Avoidance of environmentally sensitive areas, such as turtle-breeding habitat to the maximum extent possible and use consistent with provisions of the natural communities management objectives, as articulated in this document
- Use of existing logging trails, old farm roads, and the AT&T utility easement to avoid forging new trails as much as possible
- Utilization of best practices in trail construction as per NYNJ Trails Conference standards
- Provision of as many scenic opportunities as possible
- Provision of opportunities for nature study and wildlife observation through interpretive signs, observation platforms, or other infrastructure located at key points
- Maintaining a sense of remoteness and privacy in the location of trails and other infrastructure

The trails will also flow seamlessly between the NYC DEP's western section and the Town/County central and eastern sections. Currently, agreement is being reached between DEP land managers and the Town of Somers to lay out trails that pass through the DEP's side and allow non-permit access for hikers and other trail users, for example cross-country skiers. Discussions are underway with Westchester County to provide underpass access to Lasdon Park across Route 35 as well. Once a trail connection between the county-owned parks of Lasdon and Muscoot Farm is forged, a continuous set of trails will connect all three with the Town of Somers own Reis Park and the Central Somers Trailway (CST) that currently terminates at Somers High School. CST itself is designed both to provide a connection to the old Mahopac Branch Railroad bed that offers a potential extension of the North County Trailway and also a connection to Somers hamlet. Thus, the AFP trails form a crucial part of a much larger town-wide system.

The following loops with approximate mileages are currently planned for the AFP itself:

Trail 1: Extends from the main parking lot and access point (off the road to the Somers Community Center) westwards to trail 5 on the DEP western side of AFP. This trail crosses the Angle Fly Brook on a small footbridge, through a junction with Trail 3, and proceeds up the wooded slope to join Trail 5 at the top. A bench may be located at this terminus. Approximately 1 mile.

Trail 2: A loop for the mobility-impaired that begins in the same parking lot as Trail 1. Trail 2 proceeds through the woods slightly to the south of trail 1. Approximately ½ mile.

Trail 3: A largely north-south trail paralleling Angle Fly Brook. Trail 3 crosses Trail 1 and leads to a small, scenic impoundment on the north end of the brook as well as along the brook to the southern end of the property terminating at Van Rensselaer. Approximately 1 ½ mile.

Trail 4: A loop through the northern, forested end of the DEP's western section of AFP, it takes off from the northern end of Trail 5. A fairly rugged trail crossing a variety of steeper crest and ledge terrain, trail 5 also lets out onto Adams Farm Road and the adjoining subdivision. Approximately 2 miles.

Trail 5: A north-south trail connecting Trail 4 loop on the northern end with Lasdon Park at the far southwestern end of the DEP's western section. Also connects with Trail 1 where it terminates on Trail 5. From the terminus of Trail 1, the trail crosses several rocky ridges and descends rapidly, skirting the edge of the swamp/marsh complex adjacent to Route 35. It is expected to terminate at an underpass beneath Route 35 that will open onto county-owned Lasdon Park. Trail 5 also includes a separate spur that leads to Route 35 and the access point to the property just across from the ___ subdivision. Approximately 2 miles.

Trail 6: Extends from Reis Park into the eastern section of AFP. It ascends the ridge along the property line with Somers Manor, crosses the ridge top, and circles the shrub area and pond on the southern end. The trail then descends through successional agricultural fields, crosses just to the south of the hardwood swamp downslope and emerges onto Route 139 (Primrose Street). The trail crosses the road and proceeds to the roadway accessing the community center and terminates at the main parking lot that is the terminus of Trails 1 and 2. Approximately 3 miles.

While the basic trail layout has been decided upon, some side loops to scenic or special natural areas and historical points of interest may also be designed and constructed.

Mountain Bike Trail. Study is currently underway on the feasibility of locating a short mountain-bike trail on some portion of the Town-County portion of the property. The most promising area involving the least impact appears to be in the upland forest area on the eastern side of AFP that climbs the ridge to a scenic overlook. A combination of steeper terrain and few wetlands, make this an area where such a trail would involve fewer environmental impacts. Furthermore, as noted in ___, even a short (1/4 mile) trail can be worthwhile if it involves a mix of challenging terrain, as this location does. The approximate length of a trail in this area could range anywhere from ½ to 1 mile in length. The area north of Van Rensselaer Road has also been proposed and is being studied as a possible bike trail location. However, considerable care will have to be taken in regard to either proposal as the former is encumbered with many invasives, especially Japanese barberry, which will require removal in the area of any trail, and the latter is crossed by two stream corridors, including Angle Fly Brook. Construction of either proposal will

have to wait until considerable progress is made on managing the invasive plant problem that currently exists on AFP.

Rules

Generally, rules governing the use of trails will be similar in nature to those that apply to other Town-owned property where hiking is allowed, such as Koegel Park.

- All hikers must keep to designated trails
- Dogs must be on a leash no more than six feet in length
- No firearms of any sort
- No fires or camping
- Picnicking only in designated locations
- No collecting of plants or animals, except with special permission as part of an approved plan of scientific study
- Use during daylight hours only, except with special permission from Somers Recreation Office
- No motorized vehicles of any sort

Facilities

Currently, besides the main parking lot off the main access road to the Somers Community Center the following facilities are included in the recreation plan.

- A secondary and smaller parking area on pervious surface, located off Plumbrook Road near the Somers Manor property boundary as well as additional pull-in parking off the main access road to the Somers Community Center
- A gate at the location of the Plumbrook Road parking area
- A comfort station consisting of a composting toilet, located near the main parking area and the trailhead for Trails 1 and 2
- Two trail kiosks, one located at the trailhead and main parking lot, the other at the smaller parking area off Plumbrook Road

- Six trail signs positioned at trailheads and the access points where trails cross the property lines (i.e. Reis Park, Plumbrook parking lot, main parking lot, Van Rensselaer, Lasdon Park underpass (projected), and Adams Farm Road).

Construction and Maintenance

The various tasks associated with construction and maintenance of the trail system will be handled by a combination of professional and volunteer labor. The Friends of Angle Fly Preserve (FAFP), a support organization for AFP and a pool of volunteer labor, has been formed under the auspices of the Somers Land Trust (SLT). FAFP will take responsibility for much of the actual trails construction as well as routine maintenance of the hiking facilities. Construction and on-going trail maintenance will be undertaken under the guidance of the New York-New Jersey Trails Conference (NYNJTC) and according to their standards of design and construction. NYNJTC has already offered their technical assistance, agreed to train FAFP volunteers, and to consult during trails construction. Additionally, the grant that supports this project is administered through the Somers Recreation Department with oversight and professional assistance provided through that department. Assistance with heavier construction in and around access roads on AFP has been provided by the Somers Highway Department, assistance which continues to be available.

Potential Impacts/Mitigation

Impacts identified in the discussion of natural communities and conservation objectives that are directly related to passive recreational use of the property fall under three main categories: possible spread of invasive plants, damage to native flora and fauna due to human contact, erosion of slopes and contamination of water courses due to trail construction and use. In addition to these general problems, vandalism and unauthorized ATV use represent a current and persistent challenge to the integrity of the property.

The following measures represent management objectives aimed at mitigating these impacts:

- Route trails away from areas containing rare plant or animal communities, particularly areas where wood turtle and other turtle species are likely to breed, to avoid human contact and possible collecting
- Remove invasive species from the vicinity of trails and facilities in order to minimize risk of spreading seeds and plant material
- Route trails around steep areas as much as possible and install waterbars and other approved means of minimizing erosion

- Install barriers to ATV traffic at all trail access points and along AT&T easement
- Routinely monitor and patrol trails and natural areas to check for damage and unauthorized use
- Regularly maintain trails and remove trash
- Locate all signage at access points away from roads and property boundaries in order to discourage vandalism
- Post property boundaries and regularly inspect and maintain signs; remove vandalized signs

Hunting and Fishing

Hunting and fishing represent important recreational uses of the property. However, each poses significantly different challenges and requires different kinds of accommodation from other passive recreational uses.

Fishing

Fly fishing has occurred on the Angle Fly Brook from at least the nineteenth century on and will continue to be allowed. However, as indicated in the natural communities plan, protecting the population of native brook trout is a major management objective. Studies in coordination with biologists at Mianus River Gorge will be undertaken to determine the health and numbers of brook trout within Angle Fly. Based upon the results of this analysis, rules will be developed concerning numbers of fish taken and other matters. Fishing in all ponds and streams on the property will be governed by the following rules:

- All applicable NYSDEC regulations apply, e.g. season, catch limits, protected species, permits and licenses
- No live bait permitted
- Barbless hooks
- Angle Fly Preserve is a designated catch and release management area

Hunting

Though explicitly provided for in the DEC conservation easement, recreational hunting can also serve an important purpose as a tool for deer management. NYSDEC itself has concluded that traditional hunting represents an important and cost-effective management tool to reduce

overpopulation of white-tailed deer (See the appended Citizen's Guide 1999, p. 8). Additionally, a number of Towns, Pound Ridge for example, as well as nature preserves such as Rockefeller State Park in Pocantico Hills and Mianus River Gorge in Bedford have instituted programs of controlled recreational hunting in order to reduce their deer populations.

As noted in the natural communities section, the AFP shows every sign of a significant overpopulation of white-tailed deer. Invasive plant populations have increased alarmingly, which can be directly attributed to an increase in the number of deer. As the FMP notes, "There is an obvious browse line through the forest with no desirable growth below 4 or 5 feet from ground level" (FMP 2007, p. 9). Areas stripped of native vegetation provide opportunities for invasive plants, which once beyond the early stages of growth, are less attractive to deer. Furthermore, in a self-fulfilling cycle, some invasives, Japanese barberry for example, affect soil conditions in a manner that makes it difficult for native plants to remain or reestablish themselves. Forest regeneration is all-but-absent in most areas of AFP.

The DEC has itself recommended "controlled recreational hunting" as the most suitable and effective of the various means of population control available for coping with the problem (Citizen's Guide 1999, p. 9). Not only does it reduce numbers in the short term, but as an ongoing recreational activity, if suitably controlled, it offers the potential of keeping numbers within an ideal range over the long haul. Deer reproduce rapidly and can double in size in two years, and without sustained efforts to keep numbers down, populations will quickly rebound. Since the overall purpose of acquiring Angle Fly Preserve was conservation of its biodiversity as well as recreation, hunting will be regulated according to a management strategy based upon vegetation and the reestablishment of native vegetation. Therefore, reduction of the overall population will be the goal, and hunters will be asked to take significant numbers of does and abide by other regulations that are designed to further these objectives.

Hunting Impacts

Once hunting begins on AFP, a number of consequences may be anticipated. In particular, experience at Mianus has shown that the number of invasive plants may actually increase, at least initially. While deer tend to avoid most invasive plants, as young shoots, some plants such as oriental bittersweet or winged *euonymus* are enticing to deer. Thus, measures to contain and eliminate invasives must be concurrent with recreational hunting.

Often, hunters have been known to shoot coyotes they encounter. This will be prohibited as coyote is the deer's only remaining natural predator in the local ecosystem. Coyotes prey on sick, wounded, and young deer, thus not directly competing with hunters while making an important

contribution to maintaining a healthy population. They represent another element in an overall effort at deer management.

So far, there is little knowledge as to the exact number of white-tailed deer on the property, nor is their knowledge as to their movement patterns and interaction with adjoining areas. In order to manage hunting in a responsible manner that protects the natural communities on AFP, it will be important to carry out a sustained program of scientific study. Mianus River Gorge is currently involved in movement studies and has agreed to share its researcher with Somers in a similar study on AFP. Additionally, hunters themselves can be very useful sources of information, not only on the number and location of deer on the property, but also of other wildlife. Efforts to solicit such reports will be encouraged and provide an important management tool. Ultimately, the purpose is to achieve a healthy balance in the numbers of deer on AFP, perhaps on the order of 12-15 deer per square mile, as is commonly recommended.

Overall Hunting Regulations

1. Hunting will be permitted in designated areas of the preserve by NYS licensed hunters. There will be no shot guns used on the preserve for small game or the taking of any wild life. Hunters will be restricted to the use of a bow for hunting big game on the preserve. Bow hunters will be proficiency tested and given access to designated hunting locations throughout the parcel. Falconers are welcome to hunt the preserve during their regulated hunting season.
2. Hunting will commence on the first Saturday following Columbus Day and will end on December 31st. Fifteen to twenty-five hunters will be selected by lottery and an evaluation of their archery skills will be made prior to being allowed to hunt on the preserve. Each hunter will be permitted to take one buck for every two does and a signed agreement to this policy will be required. Additionally, each hunter will be asked to complete "observation sheets" to report any wild life observed while hunting on the Angle Fly Preserve. Enforcement of the signed agreements and adherence to hunting regulations will be the responsibility of the Somers Police Department or their designee. Hunters will be responsible for reporting each of their two doe kills prior to reporting the taking of a buck.
3. All DEC general hunting regulations must be followed by each hunter accessing the preserve.

Definitions:

Bow – includes long (stick), compound, or recurved bow.

To hunt – means to pursue, shoot, kill or capture (other than trap) wildlife and includes all lesser acts that disturb or worry wildlife whether or not they result in taking. Hunting also includes all acts to assist another person in taking wildlife.

Manner of Taking

It is illegal to take or hurt wildlife:

- while in or on a motor vehicle (except by the holder of a Non Ambulatory Hunter Permit)
- with the aid of a vehicles lights.
- on or from any public road
- with any firearm.
- with a spear
- with a bow equipped with any mechanical device which is attached to the bow (other than bowstring) for drawing, holding or releasing the bowstring except for a physically disabled person in possession of a Handicapped Archer Permit (compound bows are legal)
- with a spear gun or crossbow except for a physically disabled person in possession of a Modified Crossbow Permit.
- with an arrow with an explosive head or shaft.
- with any device designed or intended to deliver drugs to an animal.

Baiting

It is illegal to hunt with the aid of bait, or over any area when hunting big game, upland game birds, turkey or waterfowl.

Discharge of Bows

It is illegal to discharge a bow:

- so that the arrow passes over any part of a public highway
- within 500 feet of any school, playground, or occupied church
- within 500 feet of a dwelling, farm building or structure in occupation.
- You may hunt waterfowl, over water, within 500 feet of a dwelling or public structure as long as neither is within 500 feet in the direction you are shooting.

Athletic Field Recreation Area

The conservation easement also describes an “Athletic Field Recreation Area.” As the document currently stands, this refers to the largest of the upland meadows on the eastern side of the

property and towards the high point of the ridge. This is an area that has been identified in the natural resources portion of the plan as an important natural area that provides habitat to abundant bird and other animal life. Development of this field and the continuous human disturbance associated with athletic field use would have a profoundly negative impact on the wildlife ecology of this side of the property.

Furthermore, a far more suitable area already exists. The eleven-acre area north of Plumbrook Road and bordering Reis Park represents an already somewhat ecologically compromised section that would suffer far less impact should a ball field and supporting structures be located upon it. Parking and other infrastructure is already located close by, hence potentially reducing the amount of construction necessary to create an athletic field. Thus, relocating the site of any future athletic-field construction to the area bordering Reis Park in order to minimize both the impact on AFP as a whole and the costs associated with future facilities constitutes an important management objective.