



CORNERSTONE

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Louisville and Jefferson
County Comprehensive Plan

Jefferson County Memorial Forest Resource Management Plan



Final Report

December 1995



A project of the
Livability Committee
of Cornerstone 2020

Introduction

In the forested knobs of southwest Jefferson County, Kentucky, lies the Jefferson County Memorial Forest, a wilderness area in the midst of an urban county. The Forest's ridges, steep side slopes and narrow valleys are a unique visual resource, contrasting dramatically with the surrounding landscape. The largest remaining tract of forested land in the County, the Forest contains over 5,000 acres of mature woodlands, meadows, and streams. It is a tremendously significant natural resource with important recreational and educational value to the residents of Jefferson County.

The Jefferson County Memorial Forest, protected since the mid 1940s, was originally envisioned as a 20,000 to 30,000 acre preserve for recreation and sustained yield timber harvesting. This vision has changed over time; timber harvesting is no longer permitted and the Forest now strives *"to promote awareness of natural resources through quality programs, facilities, and recreational opportunities; and to continue the augmentation and protection of forest lands and resources for the citizens of Jefferson County."*

Achieving this vision requires balancing the impacts of recreation with the needs of natural resource protection: a difficult and critical task. This plan was developed to provide a framework for achieving such a balance, with the understanding that protecting the Forest and its immediately surrounding environs for future generations will require sound forest management practices that emphasize restoration and preservation.

In May of 1994, the Louisville/Jefferson County Metropolitan Parks Department (Metro Parks) contracted with the Jefferson County Division of Planning and Development Services (DPDS) and Ecological Stewardship Services, Inc. (ESS), to prepare this Resource Management Plan (RMP). The purpose of the RMP is to enable a shift in Forest management from a mainly recreational focus to a strong commitment to sustainable forest management practices and ecological restoration.

An extensive inventory and analysis of natural resources and landscape characteristics, facilities and structures, recreational activities, programs, and visitor services was conducted to identify critical issues. Two issues of great importance emerged: forest degradation due to recreational use, and the importance of preserving wilderness character and conserving biological diversity in the last large forested area of Jefferson County. These issues are discussed in further detail in the following sections.

An ecological assessment, identifying critical habitat and areas to restore, protect, or open to recreational activities, was used to prepare general recommendations for natural resource protection, resource restoration and enhancement, and visitor services. The ecological assessment was also used to identify management areas, based on forest quality, existing use, and future use. Specific implementation strategies were developed to guide restoration or enhancement activities within each management area.

Need for the Plan

The secret is out! Visitation at the Jefferson County Memorial Forest has increased significantly in recent years. So much, in fact, that its slogan, "the best kept secret in

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"Since I was here last the leaves have fallen. The forest has been at work, dying to renew itself, covering the tracks of those of us who were here, burying the paths and the old campsites and the refuse. It is showing us what to hope for. And that we can hope. And how to hope. It will always be a new world, if we will let it be."
■

Wendell Berry
"The Unforeseen
Wilderness"

■
“About 2,000
gross of pencils
can be made
from the
average cedar
tree.”

■
Forestry Journal— 1948

Jefferson County,” no longer seems appropriate. While the slogan may have contributed to an increase in visitation, development of a wide variety of educational programs is the more likely cause. According to the *1994/95 Annual Report* developed by Forest staff, program participation increased from 3,278 in 1990/91 to 26,514 in 1994/95, with outdoor education and team building programs drawing the greatest attendance.

In addition to program participants, hikers, equestrians, and picnickers are using the Forest with greater frequency. This trend has resulted in increased impacts to natural resources, with the greatest degradation occurring in intensively used recreation areas. Creating a balance between recreation and natural resource protection is a critical component of this plan.

Environmental Context

Forest land in the United States is being converted to agriculture and urban uses at an alarming rate. Expanses of forest have been reduced to small fragmented parcels, often confined to areas of steep terrain or along riverbanks. This loss of forested land impacts the environment in a variety of ways: it adversely affects water quality, contributes to the loss of fertile topsoil, reduces the population of many native plants, and destroys wildlife habitat. The forested parcels that remain are often invaded by exotic plant species, threatening the survival of many native plant species and reducing biodiversity.

The preservation of 5,000 acres of forest land as the Jefferson County Memorial Forest is a significant accomplishment. Managing these holdings to preserve wilderness character, conserve biological diversity, and provide high quality recreational uses is an equally significant challenge. Developing management practices to achieve this goal is the second critical component of this plan.

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Acknowledgments

Front Cover: Gerald Boston

JEFFERSON
COUNTY
MEMORIAL
FOREST
RESOURCE
MANAGEMENT
PLAN

SUMMARY

The largest remaining tract of forested land in the County, the Jefferson County Memorial Forest consists of over 5,000 acres of mature woodlands, meadows and streams. Preserving a forest of this size is a significant accomplishment; managing it in a way that preserves the wilderness character, conserves biological diversity, and provides high quality recreational experiences is an equally significant challenge.

In May of 1994, the Louisville/Jefferson County Metropolitan Parks Department (Metro Parks) contracted with the Jefferson County Division of Planning and Development Services (DPDS) and Ecological Stewardship Services, Inc. (ESS), to prepare this Resource Management Plan (RMP). The purpose of the RMP is to enable a shift in Forest management from a mainly recreational focus to a strong commitment to sustainable forest management practices and ecological restoration.

Using a multi-disciplinary team of landscape architects, planners, biologists, botanists, educators and Forest staff, an extensive inventory and analysis of visitor services was conducted to identify critical issues. An ecological assessment, identifying critical habitat and areas to restore, protect, or open to recreational activities, was prepared for the entire Forest.

The following goals were developed to guide management of the Forest. (These goals and a series of objectives for accomplishing the goals are described in detail on pages 35-38.)

- Protect the unique natural communities and preserve the biological diversity within the woodlands, meadows, streams, ponds and lakes of the Jefferson County Memorial Forest;
- Restore the impacted areas, improve biological diversity, and enhance wildlife habitat in the Forest, and;
- Provide high quality recreational and educational opportunities within a wilderness setting.

Recommendations

1. Shift the focus of the Forest to restoration, preservation and sustainability.

- Restore the Forest by striving for the highest ecological quality, preserving wilderness character, and increasing biological diversity. Require that all planning, management and development be based on sound forest stewardship practices.
- Promote the Forest as Jefferson County's foremost resource for wilderness experience and ecological systems research.
- Prohibit incompatible uses including grazing, hunting, utility and road construction and any recreational activities that would have an impact on the restoration of the Forest ecosystem without thought to enhancement.

2. Utilize the management area designations defined below to guide preservation, restoration and enhancement activities.

The following management area designations have been established and applied Forest wide based on forest quality/integrity, existing use, and future suitability for restoration or recreation. Each management area designation prescribes specific goals and allowable uses suitable to that area. (Management areas are described in detail on pages 41-56 and illustrated on Map #4, page 43.)

Recreational Forest

- The goal of the Recreational Forest is to accommodate a wide variety of recreational uses in a well-planned, environmentally responsible manner, and to prevent further degeneration of the forest by closely monitoring activities and repairing impacts as soon as they are discovered. Approximately 1,350 acres, or 26%, of the Forest is designated as Recreational Forest. Forest quality is low (mainly D-quality and some C-quality) and highly fragmented, encompassing many meadow and lawn areas for recreational activities.

Significant Resource Area (SRA)

- Significant Resource Areas, as the name implies, are the most ecologically significant areas of the Forest. Restoration is the primary goal within the SRA. Approximately 1,750 acres, or 34% of the Forest, is designated an SRA. Forest quality is good, mainly B and C-quality with some D-quality to buffer adjacent uses

Recovering Forest

- Although Recovering Forest areas are currently less significant than SRAs, they have the potential to become SRAs in the future. For this reason, the primary goal of the Recovering Forest is restoration. Recovering Forest areas are regenerating from past logging, grazing, or recreational activities. Approximately 2,000 acres, or 40% of the Forest, is designated as Recovering Forest. Forest quality is average; mainly C-quality with some D-quality.

3. The Future Forest — Protect the Forest and the adjacent, steeply sloping knob topography through land acquisition and community stewardship.

- Acquire land or obtain conservation easements for the steeply sloping, forested knob topography surrounding the Forest in order to protect the Forest's natural resources, reduce forest fragmentation, and connect the Forest parcels.
- Develop a Community Forest Stewardship program to educate surrounding property owners and visitors about stewardship techniques such as reforestation, wildlife habitat improvement, and soil and water protection.
- Form a citizen advisory group that includes members of the 1990 Forest Committee, Forest and Metro Parks staff, user groups, conservation organizations, and surrounding landowners.

Study Area

Location

The Forest is made up of four separate sections: (Map #1)

- Paul Yost Forest, the easternmost section of the Forest. Bound on the east by the National Turnpike and on the west by Holsclaw Hill Road, this 858 acre section has a picnic area and horse and hiking trails.
- Horine Forest, a 1000 acre parcel between Mitchell Hill and Holsclaw Hill Roads. This section includes the Horine Manor House, the Environmental Education Center, camping and educational program facilities and hiking trails.
- Tom Wallace Forest, the central section of the Forest, is bounded on the east by Old Mitchell Hill Road and stretches beyond Scotts Gap Road to the west. It includes the Welcome Center, Tom Wallace Lake, picnic areas, and hiking trails.
- Moreman's Hill Forest, the westernmost section of the Forest, is bound by the Louisville, Henderson, St. Louis Railroad and the Gene Snyder Freeway. This "land-locked" tract is not accessible by road or trail.

History

Efforts to preserve the forested areas of southern Jefferson County began in 1945. Dedicated to World War II veterans, the Forest was envisioned as a 20,000 to 30,000 acre preserve for recreation and sustained-yield timber production. A Forestry Commission made up of Fiscal Court commissioners, veterans, and conservationists was charged with purchasing land and managing the Forest. Over 1300 acres had been acquired by 1948, and the remaining lands were to be acquired over a 25-year period for an average price of \$10 per acre. However, rising land prices, costly court cases, and shifting government priorities halted acquisition in the mid-1950s.

Recreational uses evolved quickly at the Forest. By 1949, Tom Wallace Lake had been constructed, offering boat rentals, concessions, picnicking and fishing. A Ranger Station was established in the schoolhouse on Mitchell Hill Road, a bow hunters range was developed on Bearcamp Road, and a girl scout camp was created in the Holsclaw Hill area.

The environmental movement of the late 1960s and 1970s revived interest in protecting and preserving the Forest. Wilderness Jefferson County, a coalition of environmental groups, worked to expand the Forest and preserve its wilderness character. By 1979, the Forest had expanded to 2,100 acres and the Paul Yost Forest, also known as Forest View, offered hiking trails, picnic areas and a playground.

In 1980, the *Jefferson County Memorial Forest Project*, developed by the Louisville/Jefferson County Planning Commission, proposed a land use management plan and land acquisition program to preserve the remaining forested areas in southern Jefferson County. Purchases from 1979 to 1984 increased the Forest's size to almost 4,000 acres. In that same period, one million dollars was spent rebuilding the dam at Tom Wallace Lake, renovating picnic areas, paving roads, and building a wheelchair accessible fishing dock.

■
"If we want to have mature forest that is ecologically unimpaired, then we must realize that we are no longer privileged to have it merely by preserving it. Now, if we want it, we will have to grow it. If we want it we must bow to its conditions, get out of its way, invite it to return."

■

Wendell Berry
"The Unforeseen Wilderness"

An additional 1,237 acres were added to the Forest in 1988-89. The heirs of the late Emmet F. and Helen Horine donated a 1,000 acre tract at the top of Holsclaw Hill, previously occupied by the Boy Scouts. Approximately two-thirds of this tract lies in Bullitt County. Sixty acres were donated by the heirs of the Stober Estate and 21 acres were donated by Wilderness Jefferson County, which also helped finance two additional 13-acre tracts. The remaining acreage was purchased using federal and local government funds.

In 1990, County Judge/Executive David L. Armstrong appointed the Jefferson County Memorial Forest Committee to plan for the future development and protection of the Forest. The *Plan for the Future* emphasized environmental education, public awareness and the importance of the Forest as a memorial to veterans. Key recommendations implemented thus far include acquisition of an 11 acre parcel, creation of the Welcome Center in the old Ranger Station, construction of the Environmental Education Center, and development of a new logo.

In 1991, a taskforce was formed by the Louisville/Jefferson County Planning Commission to consider an areawide zoning change and development of an overlay district to guide development in the forest area. Due to community concern, both the zoning change and overlay district were deferred.

Community Setting

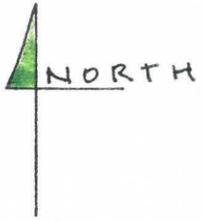
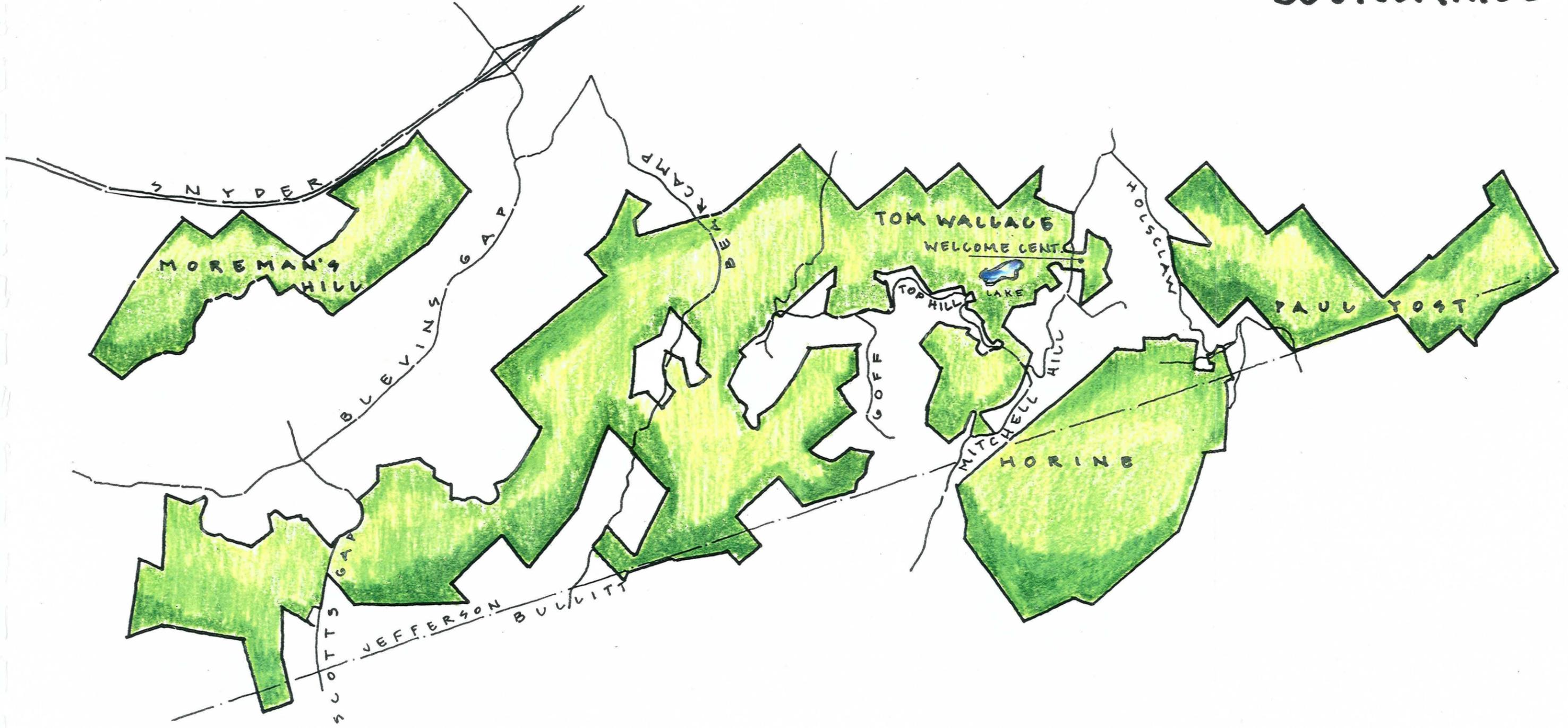
According to the 1990 census, approximately 7,500 residents live in the area surrounding the Forest (census tracts 120.01, and 120.03). The median age of residents is 32.6 years, with a median household income of \$30,000. A majority of residents (86.5%) own their own home, with the median value at \$42,050.

Much of the Forest area, including the surrounding communities of Fairdale and Hollyvilla, are zoned R-4, which allows a variety of uses including single-family residential development, farming, golf courses, parks, churches and schools. A land use inventory conducted in 1992 by the Division of Planning and Development Services (DPDS) revealed that, in these census tracts (120.01 and 120.03), 48% of the area is undeveloped, 27% is recreational/cemetery, 21% is single family residences, and less than 1% each were multi-family, industrial, commercial, and public/semi-public.

Population forecasts completed for Cornerstone 2020, the comprehensive plan for all of Jefferson County, project a county-wide population increase between 1990 and 2020, including a 28% increase in the two census tracts that include the Forest. Housing units are projected to increase from 2,765 in 1990 to 3,563 in 2020. Much of this development is expected to occur west of the Forest, where land has fewer environmental constraints. Development will be limited in areas closest to the Forest where much of the undeveloped land is on steep slopes (20% or greater) or lacks sewer and water service.

In areas that are developable, land use guidelines will be needed to ensure that the type and design of new development is compatible with the surrounding area. Guidelines

FOREST BOUNDARIES



MAP #1

will also be needed to protect trees, streams, steep slopes and erodable soils during and after construction to protect the Forest. These guidelines will be developed as part of Cornerstone 2020, and will address land use, site design, and community design issues.

Relationship to Cornerstone 2020

Planning for the Forest is part of Cornerstone 2020, the comprehensive plan for all of Louisville and Jefferson County. Several Cornerstone 2020 projects are linked to this management plan and are described below.

1. Parks and Open Space Master Plan, 1995

The Jefferson County Memorial Forest is designated as a regional park in the *Parks and Open Space Master Plan (POSMP)* for Louisville and Jefferson County. A regional park is defined as “the largest category of park, designed to serve the entire metropolitan area as a nature park; undeveloped except for facilities such as campgrounds, picnic areas, and hiking trails.” The Forest is the only regional park in the county; the nearest comparable regional park is the 2,800 acre Otter Creek Park in Hardin County, located 27 miles from the Forest. Owned by the City of Louisville, it has some of the same active recreational activities, such as the Alpine Tower and hiking trails, and also offers overnight lodging and a restaurant. The public park nearest the Forest is Nelson Hornbeck Park, an 18 acre neighborhood park with tennis courts, ballfields, a playground and swimming pool.

The *POSMP* notes that the Forest, River Fields Nature Preserve and Twin Park are the only three parks in Jefferson County managed as natural areas and wildlife habitat with passive recreational use. River Fields Nature Preserve (31 acres) and Twin Park (42 acres) are both located along the Ohio River in northeast Jefferson County. A needs assessment conducted for the *POSMP* recommends the acquisition of an additional 5,210 - 6,368 acres of regional park land in the County, 720 to 880 acres of which are recommended to connect the portions of the Forest. The *POSMP* also recommends development of a bicycle and pedestrian loop trail around Jefferson County linking scenic and natural resources such as the Ohio River and Floyds Fork with the Forest.

2. Multi-Objective Stream Corridor/Greenway Plan, 1995

The *Greenway Plan* strives to develop an interconnected network of lands along stream corridors for flood control, recreation, wildlife habitat, and water quality. Goals of the *Greenway Plan* which relate to the Forest include:

- ensure that the greenways system provides linkages to existing and proposed parks, in addition to functioning as stand alone destinations for recreation.
- preserve and encourage biodiversity through the protection of important and distinctive habitat throughout the region, and
- utilize greenways to create opportunities for environmental education.

Through the *Greenway Plan*, open space linkages can be created which connect the Forest to all of Jefferson County. One potential linkage along Pond Creek could connect the Forest to the Ohio River.

3. Community Form Plan

The Community Form Plan is the land use component of Cornerstone 2020. It combines the best of past planning efforts with an approach that is suited to the community's need for greater certainty and continued flexibility in the development and redevelopment process. The Community Form Plan identifies distinguishable patterns of use, or forms, within the built and natural environments of Louisville and Jefferson County. These forms can be characterized as various types of form districts, and actions can be taken or prescribed to preserve, maintain, and improve the function and quality of each district. Form districts recognize the environmental framework of greenways, parks and open spaces, and sensitive natural resources to preserve and enhance the livability of the community.

Inventory and Analysis

This section provides a detailed inventory and analysis of the natural resources and landscape characteristics, facilities and infrastructure, recreational activities, and programs at the Forest. Information was gathered by DPDS and ESS with assistance from Forest staff.

Natural Resources and Landscape Characteristics

1. Forest communities

Although virtually all of the Forest was logged in the past, no timber has been harvested since 1986 (Goodwin, 1995). Much of the woodland has attained a mature second growth stage and is valuable for a variety of reasons including protection of water quality, wildlife habitat, and mitigation of soil erosion.

The integrity of the Forest's woodlands have been seriously impacted by recreational uses, especially on trails, at stream crossings, and in high use areas such as picnic and camping sites. Invasion by non-native plant species in all areas of the Forest has also reduced Forest integrity. Multiflora rose, buckthorn and Japanese honeysuckle are abundant along ridge tops and woodland interiors. These and other non-native plants drive out the native species that are important habitat and food sources for wildlife. (A list of troublesome exotic species and recommendations for removal are found in Objective 2.3.)

There are no documented occurrences of endangered, threatened or special concern species of plants or animals within the Forest (Kentucky Department of Fish and Wildlife Resources Wildlife Information System 1994, Kentucky State Nature Preserves Natural Heritage Database 1994). Additionally, the latter database identifies no state-monitored ecological communities as occurring within the Forest. Suitable potential habitat does exist, however, for the following state-monitored species of plants known to occur within Bullitt or Jefferson counties:

- *Agrimonia gryposepala* (Tall hairy groovebar). Rich mesic woods, thickets, woodland borders.
- *Castanea pumila var pumila* (Allegheny chinquapin). Dry woods on sandy or acid soil.
- *Malus ioensis* (Iowa crabapple). Open oak woods and clearings.
- *Melanthium woodii* (False hellebore). Rich dry or mesic woods.
- *Rubus whartoniae* (Wharton's dewberry) Dry, shaly soil in disturbed sites or along edges of dry woods.

Four forest communities were identified in the Forest: acidic mesophytic, acidic sub-xeric, acidic xeric, and shale barrens. These communities are described below, and mapped on an Ecological Communities Map available for viewing at Metro Parks headquarters. Methods of assessment and dominant and associate species of trees and shrubs which characterize each community are listed in Appendix B, pages 7 and 40, respectively.

Acidic mesophytic forest

The mesophytic forest community occupies upland areas such as ravines and protected slopes. The soils are generally moist, moderately well-drained, and moderately shallow to moderately deep over sandstone or shales or colluvium derived from them. The understory and ground cover are moderately dense to somewhat sparse. The canopy trees in this community commonly attain impressive dimensions with well-developed vertical stratification in the understory, both of which contribute to the highly aesthetic quality of this forest community. North and east-facing slopes characteristically support a high diversity of spring wildflowers. Characteristic overstory species include beech, sugar maple, white oak, red oak, tulip poplar, and cucumber magnolia with flowering dogwood, paw-paw, maple-leaved viburnum, spicebush, hornbeam, ironwood, and hearts-a-bursting in the understory.

A community closely associated with the acidic mesophytic forest is the alluvial forest community. This community is poorly developed and limited in extent in the Forest, so is mapped with the acidic mesophytic forest. It occurs on level to gently sloping ground in the narrow floodplains of small to medium size streams. The soils are generally deep and poorly to fairly well drained. Characteristic species are those tolerant of seasonal or intermittent flooding, and include sycamore, box elder, green ash, red maple, and tulip poplar.

Acidic sub-xeric forest

The acidic sub-xeric forest occupies mid and upper slopes of hills and ridges and other relatively dry upland areas over non-calcareous sandstone, shales and siltstones. The soils are generally well-drained and moderately shallow to deep. The dominant species are mainly oak and oak-hickory with a mostly complete canopy cover. The understory and ground cover, which are not well developed and may appear sparse in some areas, often contain interesting species not found elsewhere in the Forest, including sourwood, mountain laurel, low-bush cranberry, and dittany. Canopy trees in this community usually do not achieve the dimensions of those in the mesophytic community. This community often grades into the xeric forest and barrens communities on very dry exposed sites. Characteristic overstory species include white oak, black oak, chestnut oak, southern red oak, scarlet oak, pignut hickory, mockernut hickory, and sweet pignut hickory.

Acidic xeric forest

The xeric forest community often exists as small inclusions or narrow bands within the sub-xeric forest, some of which were too small or limited in extent to map at the scale used for this project. It often occurs in association with the shale barrens community and for this reason the two communities are mapped as a single unit (Xeric Forest/Barrens) on the Ecological Communities Map.

Xeric forests occur on ridgetops and moderately steep to steep upper slopes and other areas with shallow, rapidly drained acidic soils, on south and west exposures. The soils are generally shallow over parent material of sandstone or shales. The bedrock is usually near the surface with outcrops and boulders being common. Canopy trees are typically

stunted in form and extremely slow growing due to extreme environmental conditions. The tree canopy is moderately open (70-90% cover), and the understory is poorly developed with widely scattered shrubs and a sparse ground cover of scattered herbs and grasses, mosses and lichens being common. Characteristic trees include post oak, black-jack oak, and chestnut oak with highbush and lowbush blueberry in the understory.

The Pine-Oak Association community occurs as small, isolated units on ridges and other dry, exposed sites. The characteristic overstory tree is Virginia pine, which is typically mixed with the same hardwood species found in the xeric community. Within the Forest, it is closely associated with the xeric forest and barrens communities and is too poorly developed and limited in extent to map as a separate community. The canopy is somewhat more open, and the ground cover may contain many of the species commonly associated with the barrens community.

Shale barrens

The shale barrens community is distinguished as areas of exposed bedrock and shallow soils with an open tree canopy of chestnut oak and post oak and an unusual ground cover of prairie grasses and forbs such as blazing star, birdfoot violet, and wood mint. Within the Forest, it was closely associated with the xeric forest community and was too poorly developed and limited in extent to map as a separate community.

2. Topography, Geology, and Soils

The Forest is located in the Knobs Physiographic region, characterized by gentle to steep topography expressed as knobs, hills and sharp ridges. The Knobs within the Forest are highly dissected and include narrow, gently sloping ridges, steep side slopes, and narrow valleys. In some areas, ridges are broad and flat. Some ridges rise 105 m (350 ft.) to 122m (400 ft.) above the valley floor. The long, steep slopes cross geologic formations of shale, sandstone, and limestone, shale being dominant along the lower part of the slope, sandstone along the middle, and limestone along the upper part. The soils which overlie these formations occur as parallel strips across the slopes (Zimmerman 1966).

The soil association prevalent throughout the Forest is the Westmoreland-Litz-Muskingum association. Westmoreland, Litz and Muskingum soils cover about 45 percent of the association; Zanesville soils cover 25 percent, and other minor soils cover about 30 percent. These soils are generally unstable with a high erosion potential which discourages development. Zanesville soils occur on most of the foot slopes. Normally they have a surface layer of friable silt loam and a subsoil of silty clay loam. Loring and Rockcastle soils are the minor soils in this association. Loring soils, found on some of the gently sloping ridges, have characteristics similar to those of Zanesville soils, but are developed in more than 42 inches of loess overlying cherty limestone residuum. Rockcastle soils, found on a few of the steeper slopes, have a surface layer of silt loam and a subsoil of silty clay or clay developed in residuum derived from acid clay shale (Zimmerman 1966).

3. Meadow/Lawn Areas

There are approximately 125 acres of meadow and open lawn areas in the Forest. Located primarily in the Horine Recreation Area and Tom Wallace Lake vicinity, these areas are used for environmental education, informal team sports, gathering areas, and wildlife management. Some areas, however, are kept open out of habit rather than to accommodate a specific purpose (Figure 1).

Figure 1
Allow natural succession to occur in mown areas that are not used for group activities



Most meadow/lawn areas are maintained by mowing, although some areas are grazed. Both mowing and grazing, however, have highly undesirable impacts on the Forest. Both prohibit the natural succession process of the woodland and decrease the amount of

rainfall that infiltrates the soil, resulting in erosion and increased runoff into streams. Mowing and grazing along streambanks in particular dramatically increases soil erosion. Intensive grazing disturbs the soils and causes compaction, sometimes to the point that the soil can no longer absorb precipitation. Severe compaction eventually causes trees to die because of poor infiltration and lack of adequate moisture.

Despite these undesirable impacts, mowing is necessary in certain areas, such as those used for recreational activities. Regular mowing can also be used near the woodland edge to keep woody vegetation from invading the Forest and can, in some instances, give a sense of order and neatness to the landscape. Mowing in appropriate areas can give a subtle message to visitors that there is a human presence in the Forest. While staff might not be visible, visitors know that the landscape is maintained and cared for, possibly discouraging vandalism and providing a sense of security.

4. Water Resources

A few permanent and numerous intermittent tributaries of Pond Creek exist within the Forest, including Crane Run, Bearcamp Run, Beelick Creek, Sugartree Run, Claybank Creek, Brier Creek, Wilson Creek, Knob Creek, and Salt Block Creek. Brooks Run, a tributary of Floyds Fork, has headwaters arising on the south slope of the extreme eastern end of the Forest.

The ten acre lake at Tom Wallace drains to Bee Lick then to Southern Ditch. Be-

cause of heavy recreational use, the banks have lost most buffering vegetation and show signs of severe erosion and compaction.

The same is true of Shannon's Pond, adjacent to the Environmental Education Center. The edges of this small pond are unable to support the aquatic vegetation associated with healthy pond systems. The banks are eroding and are heavily compacted.

5. Wildlife

Although identified as one of the last remaining "wilderness" areas in Jefferson County, little attempt has been made to inventory or study the wildlife species of the Forest (Goodwin, 1995). Field data from the Kentucky Breeding Bird Atlas, however, provides a listing of bird species observed during the breeding season in surveys made either on or adjacent to the Forest (see Appendix B, page 50).

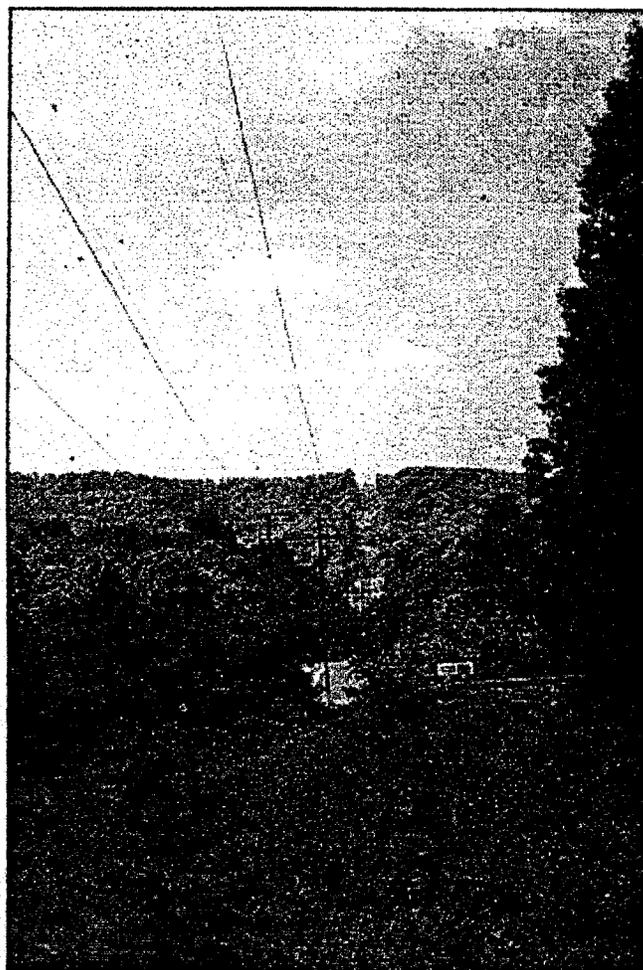
A summary of environmental resources in the Jefferson County Open Space Action Plan (Miller/Wihry/Lee, Inc. 1980) described the landscape, flora and fauna within the Forest in very general terms. The fauna listed in the report are those common to forests within this region, such as opossum, raccoon, and gray squirrel. Similarly, only a few species of birds were listed. No mention was made of rare or endangered species.

It is important to note, however, that the Forest provides critical breeding habitat along the navigational route for migratory neotropical birds, or songbirds. The importance of this breeding habitat is underscored by the fact that songbirds are undergoing rapid declines in population nationally. Some of the species affected include Kentucky warblers, wood thrushes, vireos and indigo buntings (Line, 1995).

Evidence has mounted to support the theory that forest fragmentation is a major cause of songbird population decline (Askins, 1995). Forest fragmentation results when large forested areas are bisected by roads or utility corridors, or are interrupted by non-forest areas like recreation areas, pastures, and residential subdivisions. Jagged forest boundaries, such as those that exist at the Forest, also increase fragmentation (Figure 2).

Fragmentation results in excessive forest edge, where nest predators such as raccoons, feral cats, and blue jays concentrate their hunting. Cowbirds, which invade nests and leave their own eggs for songbirds to hatch, are also concentrated along forest edges but may extend as far as 984 feet into the forest (ESS, 1995). In a small forest, where most or all of the songbird nesting area is within the forest

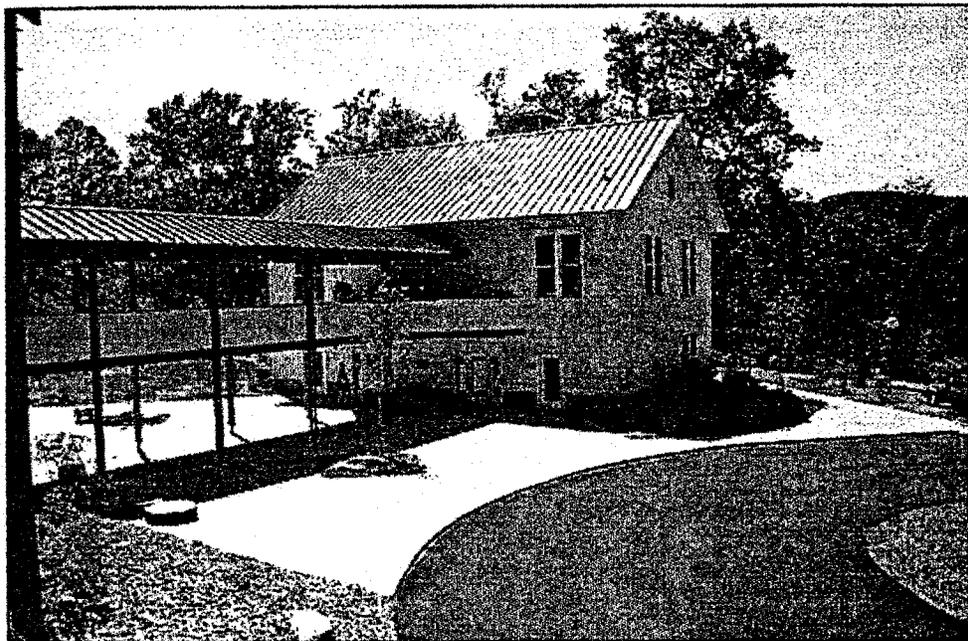
*Figure 2
 Utility line cuts add to
 forest fragmentation*



edge, reproductive success is low. Because cowbirds and nest predators are most active in the forest edge, the interior of the forest provides an important haven for nesting songbirds (Askins, 1995).

An analysis of the Jefferson County Memorial Forest (ESS, 1995) revealed that only two parcels in the Forest meet the criteria for interior nesting: a 2,625 feet wide corridor of unbroken woodland (a minimum depth of 656 feet of forest interior surrounded by 984 feet of forest edge) or a 5,250 feet diameter forested parcel. These areas are discussed in detail on page 41.

Figure 3
The Welcome Center was
dedicated in 1994



Facilities and Infrastructure

1. Structures

Structures at the Forest are described below.

- The Welcome Center, located adjacent to the Tom Wallace Recreation Area, houses visitor information, offices, and classroom space. Restrooms, vending machines, a gift shop, and parking are available in the historic schoolhouse, renovated in 1994 (Figure 3).
- The Horine Manor House, renovated in 1991, is used mainly for corporate programs and retreats. It includes two meeting areas, restrooms, a kitchen, and shower (Figure 4).
- The Maintenance Center, located at the entrance to Horine, contains office space for the maintenance staff, equipment storage, a restroom, and kitchen. Because it is



Figure 4
The Manor House at
Horine may be reserved
for meetings

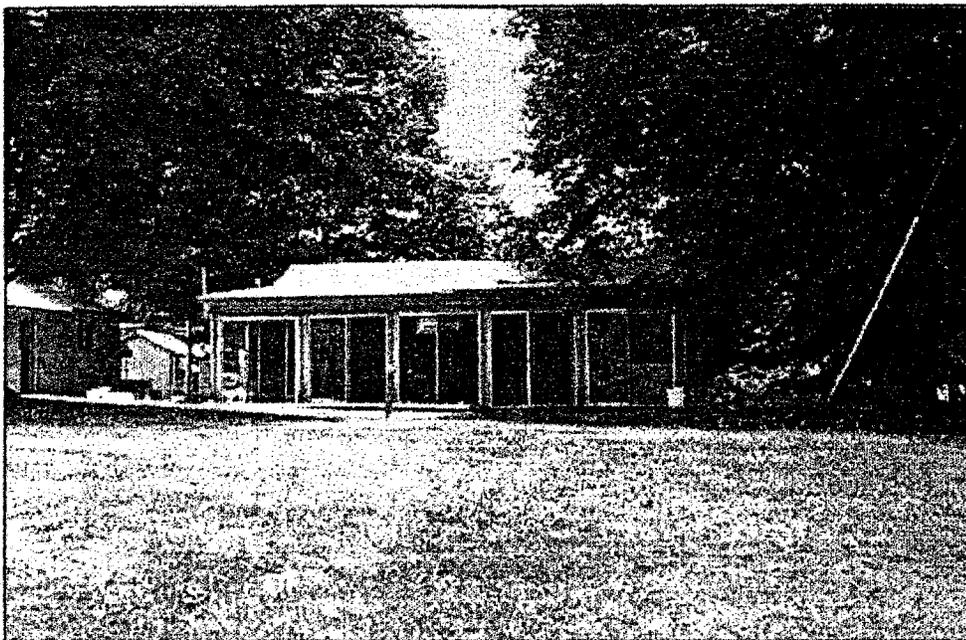


Figure 5
The Maintenance Center at
Horine once functioned as
the Ranger Station

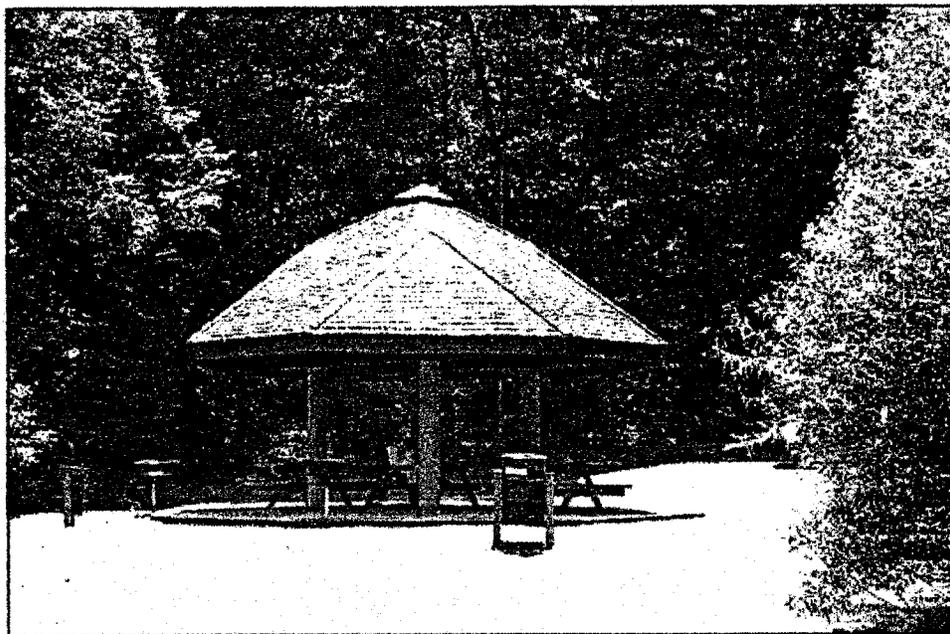
located along the road leading to the Horine Manor House, screening and buffering of equipment storage areas is needed to block unsightly views (Figure 5).

- The Environmental Education Center, constructed in 1993, is located in the Horine Recreation Area. It contains one large classroom, offices, and has outdoor latrines and water (Figure 6).
- There are seven pavilions in the Forest, used for picnicking or programs. Three are

Figure 6
The Environmental
Education Center provides
programs on natural history



Figure 7
Tom Wallace picnic
pavilion



located at Tom Wallace Recreation Area (Figure 7), one at Paul Yost Recreation Area, and three at Horine Recreation Area.

All structures are in good condition. However, materials, style and siting criteria of structures such as trailhead kiosks, picnic shelters, latrines and bollards vary considerably (Figures 7, 8). Some facilities were built using National Park Service design standards; others were designed by Forest maintenance staff. Consistency in design and construction materials is needed to visually link each section of the Forest.



Figure 8
Example of one style of
trail kiosk in the forest



Figure 9
Parking at upper level at
Tom Wallace

2. Roads/Parking/Signage

Due to steep topography, roadway access in the Forest is limited. Most Forest roads, which follow ridge lines or streams, are narrow and steep. Vehicular access from the region is primarily from Mitchell Hill Road, which leads to the Welcome Center and the entrance to Tom Wallace Recreation Area. Paved parking is available at both locations, but does not meet demand on busy weekends (Figure 9). Holsclaw Hill Road provides access to Paul Yost and Horine Recreation Areas. Limited paved parking is available at

Paul Yost; graveled and mowed parking areas are available at Horine. Moremen's Hill, the westernmost Forest tract, lacks both vehicular and pedestrian access.

Bearcamp Road and Scotts Gap Road provide access to the Siltstone Trail. Parking is limited, however, and in some places non-existent. One small gravel parking lot for Siltstone Trail hikers is located on Scotts Gap Road, south of Blevins Gap Road.

Roadway access between sections of the Forest is indirect and often confusing for visitors. Poor signage also makes access between sections of the Forest difficult. Although signs to the Welcome Center are adequate, signs to other areas of the Forest are confusing or nonexistent. Excessive signage at the intersection of Holsclaw Hill Road and Mitchell Hill Road, the gateway to the forest, is confusing and gives a poor first impression of the Forest.

3. Utilities

Water is currently available at the Welcome Center but not at Tom Wallace or Paul Host Recreation Areas. The Horine Recreation Area has city water, stored in a large cistern under the Horine Manor House which is pumped full via connections to Louisville Water Company lines. A decision was made in early 1995 to construct a water tower at the Forest and extend water lines to the Horine Recreation Area and to 11 adjacent residents on Mitchell Hill Road. Construction of the approximately 150 foot tower will have a significant visual impact on the Forest. This facility has the potential for expanded water service to the Forest and surrounding lands.

No sewer service is available, and the Metropolitan Sewer District (MSD) has no plans to extend sewers to the Forest.

Recreation Activities

The Forest has been a popular recreation area for many years, offering mainly hiking, horse riding, fishing and facilities for youth activities such as Scouting events. It is difficult to assess whether additional acreage, activities or facilities are needed at the Forest because a needs analysis has never been conducted and visitation numbers for general use activities are not tracked.

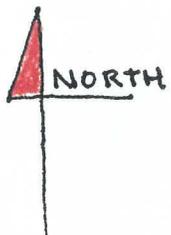
The following list describes each activity that was allowed in the past or now takes place in the Forest and briefly discusses carrying capacity, visitor experience and impact on natural resources.

1. Camping

The Forest offers both individual and group camping in the Horine Reservation (Figure 10). Nine individual camp sites are located in a loop off the Red Trail. Three group sites with picnic tables, and five canvas tee-pees are located near the Alpine Tower. All camp sites have latrine access and are rented for \$5.00 a night plus \$1.00 a person. Reservations and check-in are handled at the Welcome Center.

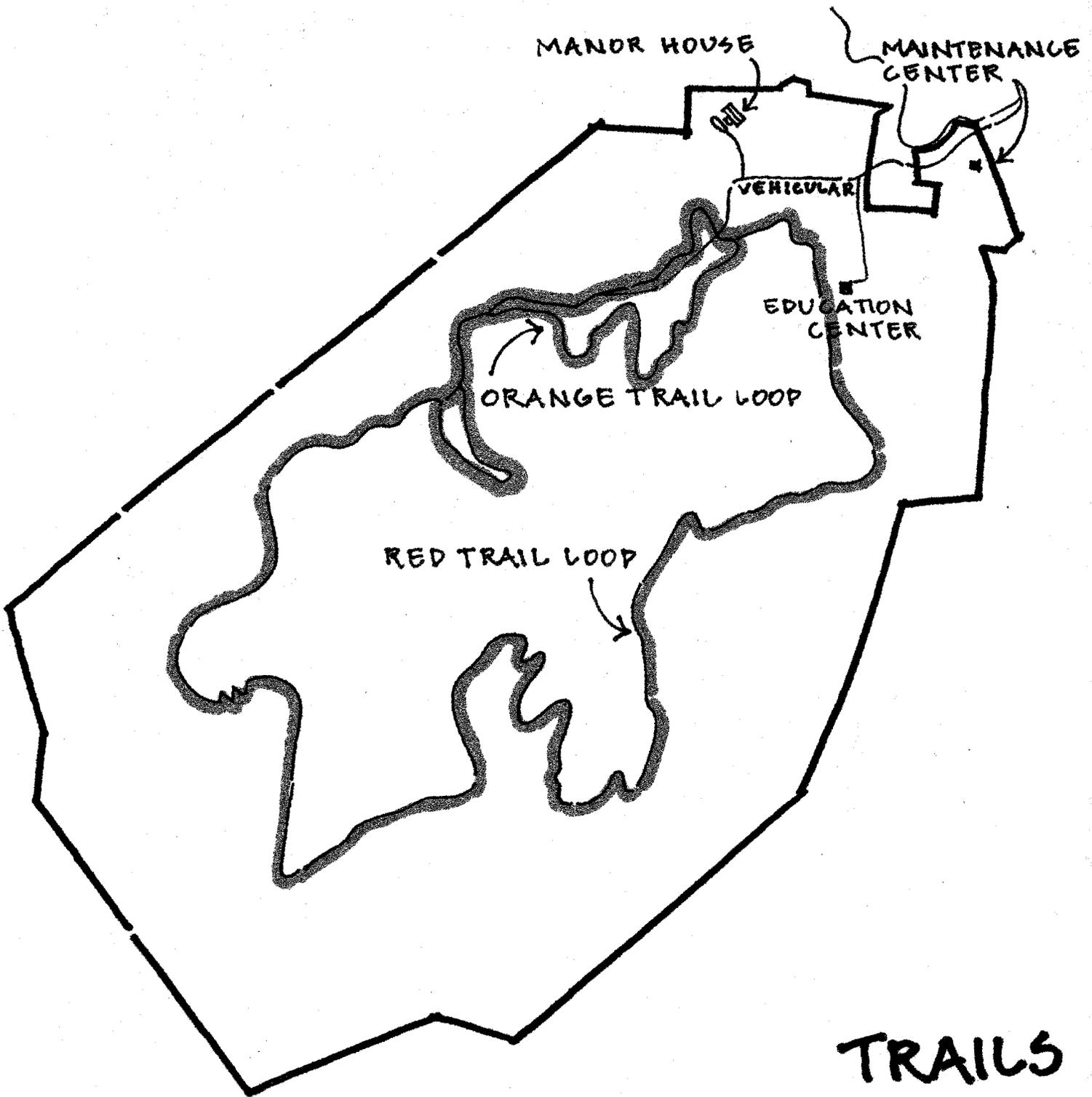


TRAILS

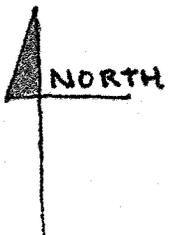


-  RED TRAIL 4.9 MILES MODERATE/DIFFICULT
-  ORANGE TRAIL 2.9 MILES EASY/MODERATE

MAP # 2



TRAILS



— RED TRAIL 4.9 MILES MODERATE/DIFFICULT

— ORANGE TRAIL 2.9 MILES EASY/MODERATE

MAP # 2



*Figure 10
 Group camping site at
 Horine*

According to Forest staff, campsites are rarely filled to capacity. Exceptions occur during Scouting events or other multiple-day group events. Staffing of camping areas is a concern, as Forest staff is not available in the evening and public telephones are not available. Camp sites are sometimes patrolled by the Sheriff's Department, but not on a regular basis.

2. Hiking

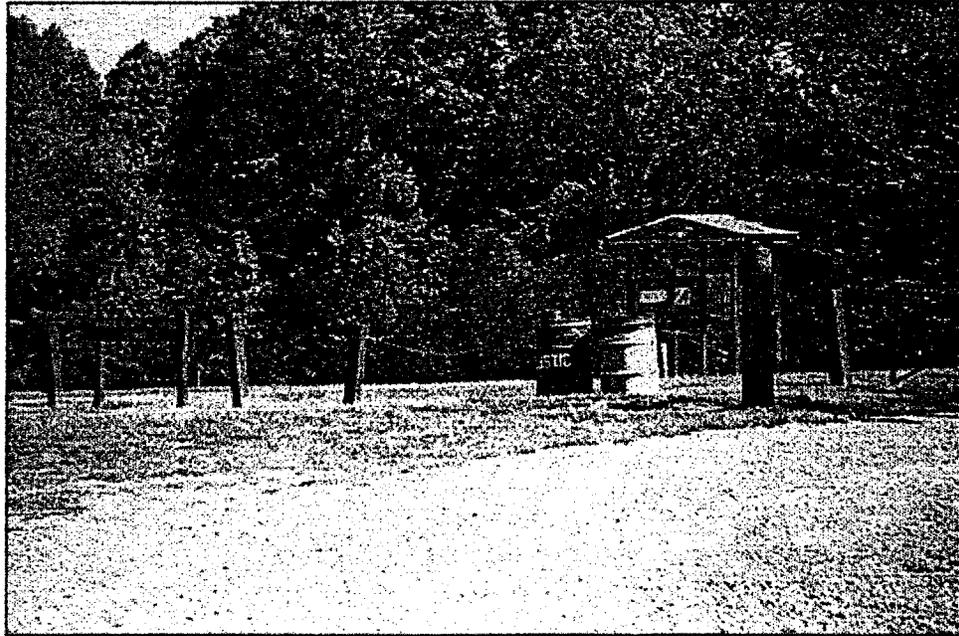
The Forest contains approximately 22.5 miles of trails. Many trails were poorly designed, and due to staffing constraints, many are poorly maintained. This not only degrades the wilderness experience for hikers, but causes negative impacts on natural resources, including loss of vegetation, soil compaction and erosion, and changes in drainage. Hikers who stray from trails can cause similar negative impacts on natural resources.

Inadequate and inconsistent mapping and signage are critical problems throughout the trail system. No single map is available showing the entire Forest trail system. Trails in each section of the Forest are described below.

The Horine Forest has a loop trail system that was developed by the Boy Scouts. Two trails make up the loop system -- the Red Trail (moderate to difficult, 4.9 miles) and the Orange Trail (easy to moderate, 2.9 miles). Both trails start at the public parking lot near the Manor House (Map 2). The trails join for a short distance and sometimes intersect with abandoned roads that are now used as service roads by the Forest staff (Figure 11).

Blazes along the trails are inadequate. The standard diamond and circle symbols marking the red and orange trails are too infrequent. Hikers often get lost along the trails

Figure 11
Red/Orange Trailhead at
Horine



where service roads and hiking paths intersect. Consequently, hikers are largely dependent on Forest staff when using these trails.

In locations where the trails are on steep slopes, erosion is moderate to severe. Forest staff has attempted to correct this problem by closing trails that were routed on the incline and to reroute trails to follow the contours of the slope. Some trails on steeper slopes still remain precipitous and potentially dangerous because of the steepness of slope and narrowness of the trail.

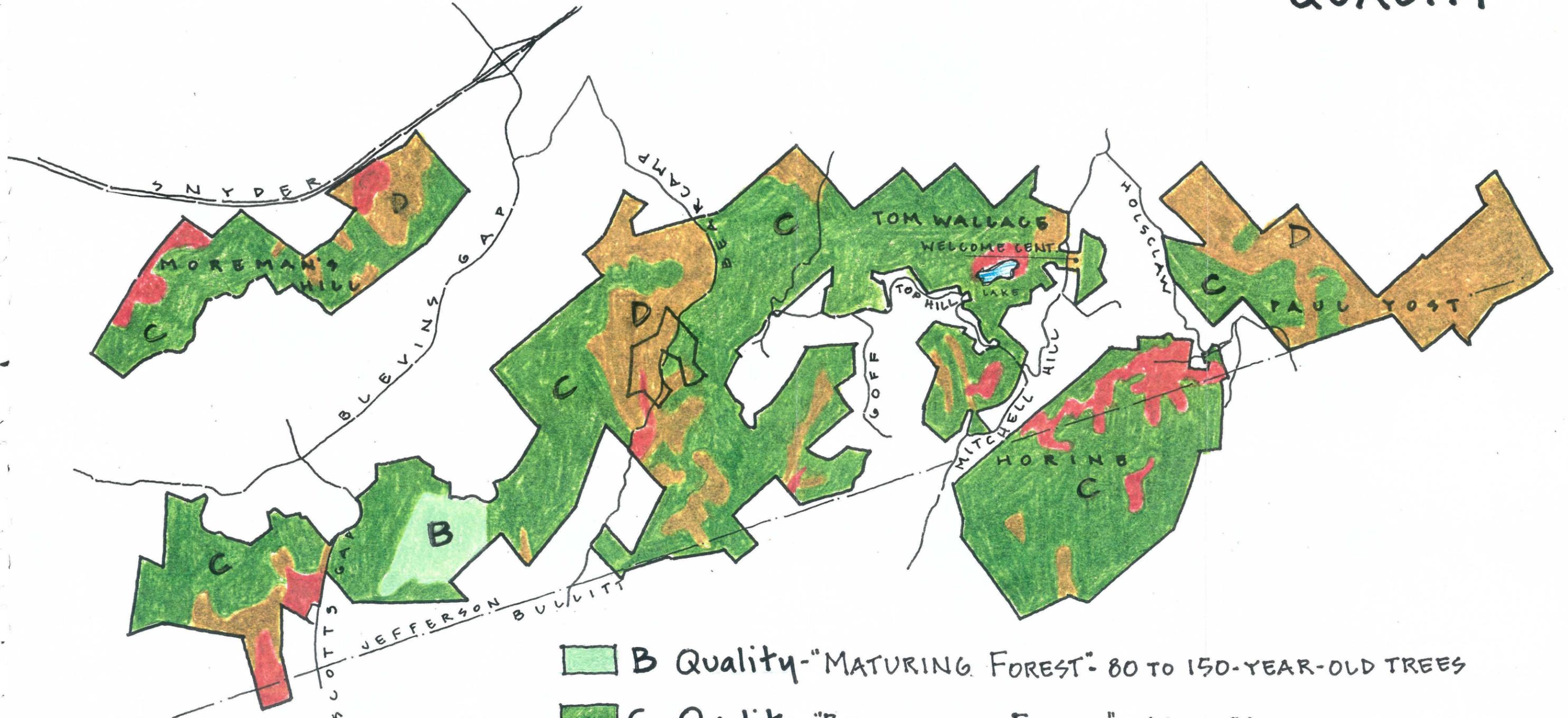
Paul Yost Recreation Area contains the Mitch McConnell Loop trail which is shared by hikers and horse riders. The trail is severely eroded, and conflicts between users are frequent. Much of the severe trail erosion in Paul Yost is attributed to the horse use. As a consequence of the poor trail condition, users have developed renegade trails throughout Paul Yost, seriously degrading forest quality.

Tom Wallace Recreation Area contains the trail head for the Siltstone Trail, a 6.5 mile trail. A 3.5 mile loop, called the Loop Trail, was added to the western terminus of the Siltstone Trail during this planning process. Some of the trail blazes are not consistent along the Siltstone Trail, especially where remnants of paint ball games have confused the markings. Due to its length and isolation, the Siltstone Trail is difficult to monitor regularly for erosion problems or safety hazards.

3. Field Games and Large Gatherings

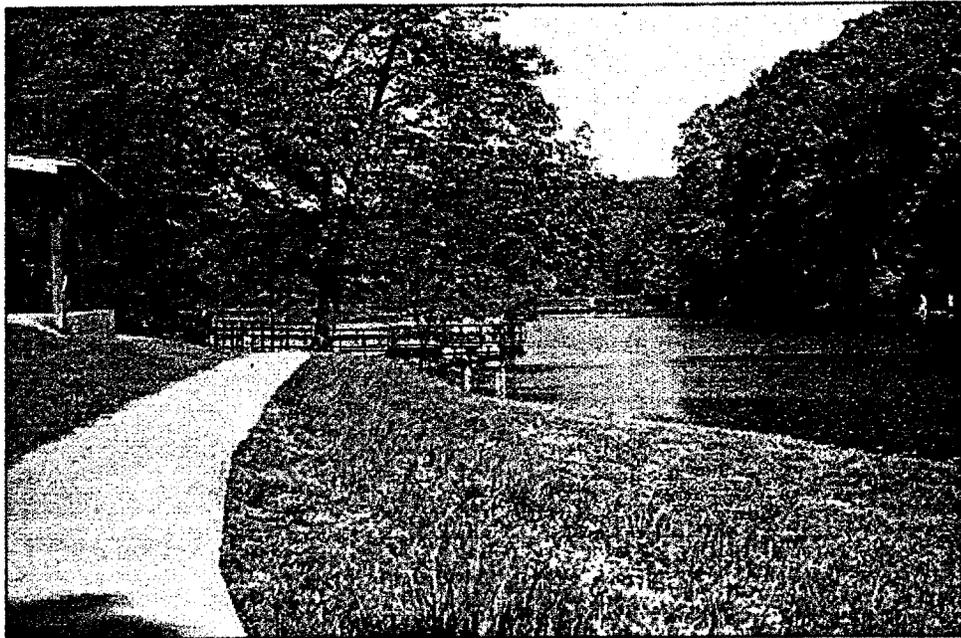
Open areas have been maintained for field games and large gatherings in Horine, but the demand for organized sports has been low (West, 1995), presumably due to the availability of sports fields in Nelson Hornbeck Park on Fairdale Road.

FOREST QUALITY



- B Quality**- "MATURING FOREST"- 80 TO 150-YEAR-OLD TREES
- C Quality**- "RECOVERING FOREST"- 40 TO 80-YEAR-OLD TREES
- D Quality**- RECENT DISTURBANCE - CLEARED WITHIN 40 YEARS
- NON Forest**- ANTHROPOGENIC AREA - RECREATION, MOWED, GRAZED

MAP #3



*Figure 12
Accessible fishing at
Tom Wallace*

4. Fishing

Fishing is available at Tom Wallace Lake. The lake is stocked with trout twice a year by the Kentucky Department of Fish and Wildlife, and also contains bass and bluegill from previous releases. Because fishing is such a popular activity, much of the vegetation along the banks has been trampled, resulting in soil erosion, compaction and increased sedimentation in the Lake (Figure 12).

5. Horseback Riding

Horse trails, available at Paul Yost and Tom Wallace Recreation Areas, are used frequently by both neighboring residents and equestrians who bring horses by trailer. Rental horses were available adjacent to the Paul Yost Recreation Area until recently.

The horse trail in the Tom Wallace Recreation Area, a one mile loop, begins at the Welcome Center and extends to the north and west. Although it is intended solely for equestrians, hikers often use part of the horse trail in combination with the Tuliptree Trail to create a two mile loop. Parts of the horse trail are on private property and need to be relocated onto Forest property. According to Forest staff, the trail is in poor condition.

In the Paul Yost Recreation Area, the Mitch McConnell loop trail is shared by hikers and equestrians. Conflicts occur between the user groups, partly because trail etiquette rules are not clearly defined or posted. Due to lack of staff for enforcement and maintenance, horse trails have not received the attention needed for healthy sustainability.

Forest staff is currently working with a newly formed local equestrian group to encourage trail stewardship and to improve trail maintenance, design and construction. This group has invested many hours over the past several months repairing horse trails at Paul Yost.

6. Mountain Biking

Mountain biking is not currently allowed at the Forest, although it has been allowed in the past and still occurs. The Kentucky Mountain Bicycling Association (KMBA), a 200-member mountain biking organization, is lobbying for trails to be open to biking throughout the Forest. Specifically, they ask that bikes be allowed on all paved and service roads at Horine, the Mitch McConnell Loop Trail in Paul Yost Recreation Area, and all sections of the Siltstone Trail. In addition, they propose to construct a perimeter trail through Horine. Mountain bikers enjoy a challenge, meaning that significant elevation changes on the trail are very desirable.

Documents attesting to the responsibility of KMBA cyclists have come from Otter Creek Park to the credit of the KMBA. It is important to remember, however, that mountain biking is a high impact activity. KMBA members have observed that Otter Creek Park is showing signs of adverse impact from mountain bikes and are actively seeking additional land for new trails in order to lessen the impact on currently stressed land (Craday, 1995).

Because soils in the Forest are generally unstable with a high erosion potential, mountain biking will result in significant damage to the Forest and is not a sound long term forest management practice. For this reason, mountain biking should be prohibited in order for restoration and regeneration of the forest to be accomplished. (See Appendix A)

7. Bicycling

The public roadways through the Forest are favorite routes for many cyclists, both to enjoy the breathtaking scenery and to train on the steep hills. The Louisville Wheelmen, a 700 member local cycling organization, lead group rides through the Forest several times during the riding season. Because this type of cycling is confined to roadways, it does not impact the Forest and should be encouraged. Facilities to encourage cycling, such as bike racks, water supply, and parking areas, could be provided at the Welcome Center.

8. Picnicking

Picnic tables are available throughout the Forest, usually with trash collection nearby. Three picnic pavilions are associated with the group camping sites in the Horine Recreation Area, with access to latrines and water. Paul Yost has one pavilion with tables, but water and latrines are not available. Tom Wallace has two pavilions and a gazebo at one end of the lake with a nearby playground, and latrines. Only the gazebo meets Americans with Disabilities Act (ADA) guidelines for accessibility.



Figure 13
Play structure at Tom
Wallace

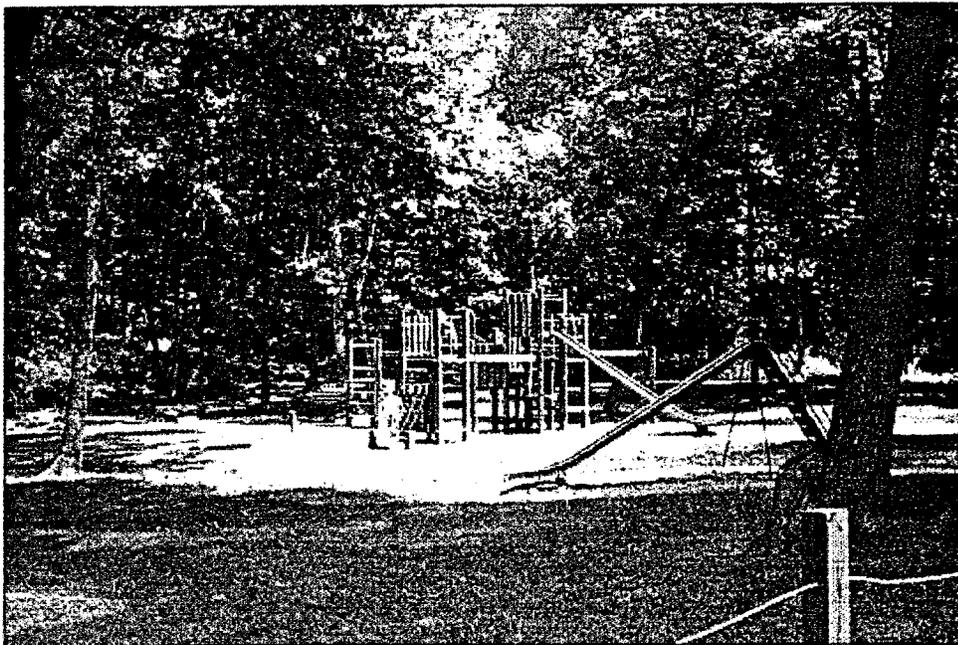


Figure 14
Play structure at Paul
Yost

9. Play

Two children's play areas are located in the Forest. Paul Yost Recreation Area has older playground equipment, and a newer one-unit, modular play structure is located at Tom Wallace Recreation Area. Both need some modifications or rehabilitation in order to meet Consumer Product Safety Guidelines and ADA accessibility guidelines (Figure 13, 14).

10. Orienteering

Orienteering is a sport using compasses and maps to find marked destinations in the forest. Markers are in place throughout the Horine Forest, and are used by orienteering groups and Adventure Program participants. Orienteering is considered a relatively low impact recreational use, compatible with Forest restoration and preservation, if numbers of participants are low. Because participants do not stay on trails, they could cause significant impact if large numbers move about the forest damaging understory and compacting soil. Numbers of orienteering participants, as well as forest condition in orienteering areas, should be monitored to avoid impact due to overuse.

11. Paint Ball Games

Paint balling, a military reconnaissance game using paint to mark hits to the enemy, is not currently allowed but has been allowed in the past in the central portion of the Forest. Random paint left on adjacent trees and understory vegetation is unsightly and can be misconstrued as trail blazes. Forts made of plastic garbage bags filled with soil have been left behind from previous games. Due to impacts on the Forest, this activity is not considered compatible with current recreational activities in the Forest.

Programs

Development of education programs has been a major focus at the Forest. According to the *1994/95 Annual Report* developed by Forest staff, attendance increased from 3,278 in 1990/91 to 26,514 in 1994/95. Following is a breakdown of participation in each program area for 1994/95:

Adventure programs (leadership and collaborative training for youth)	6,533
Environmental education (includes In-Service Teacher Training)	4,776
Corporate programs	2,144
Manor house (retreat center)	3,626
Public programs (weekend hikes, classes)	817
Other programs (in collaboration with police, EMS, etc.)	4,955
General use	3,220

Each program is described below.

1. Environmental Education

Environmental Education programs are conducted mainly at the Environmental Education Center at the Horine Recreation Area. Although many programs are directed at elementary school age students and teachers, the Center provides year-round interpretive opportunities for children of all ages and activities for teachers and parents. Public school teachers can fulfill their Environmental Education In-Service requirements by taking

certified classes, and a variety of programs and exhibits on composting, regional ecology and wildlife observation are available. Shannon's Pond serves as an aquatic/wetland study area, nearby wildlife food plots designed by the naturalist provide opportunities for wildlife study, and transitional plots show vegetation in various stages of succession (Figures 15, 16).

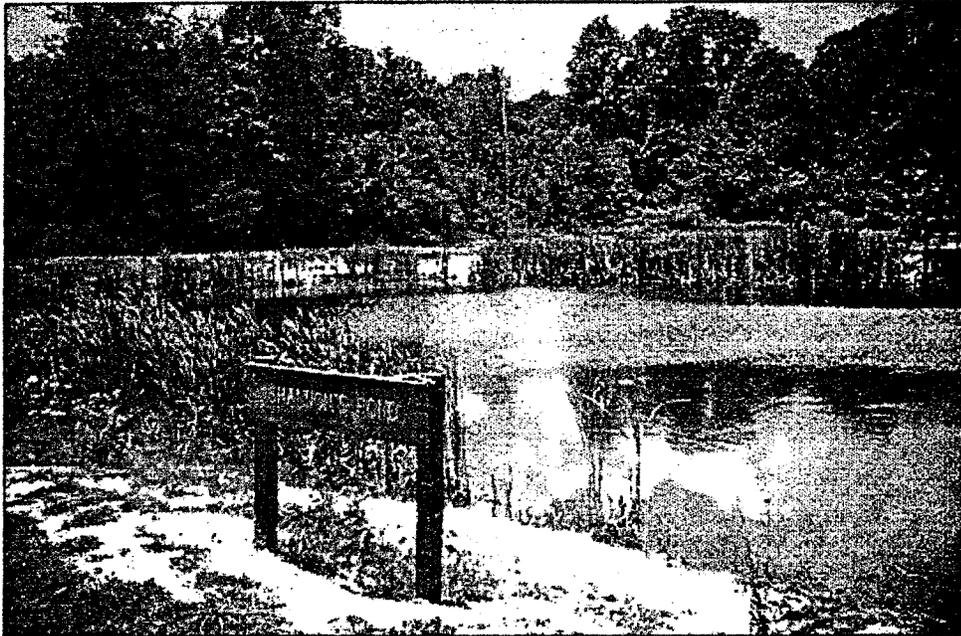


Figure 15
The edge of Shannon's Pond at Horine erodes in several places



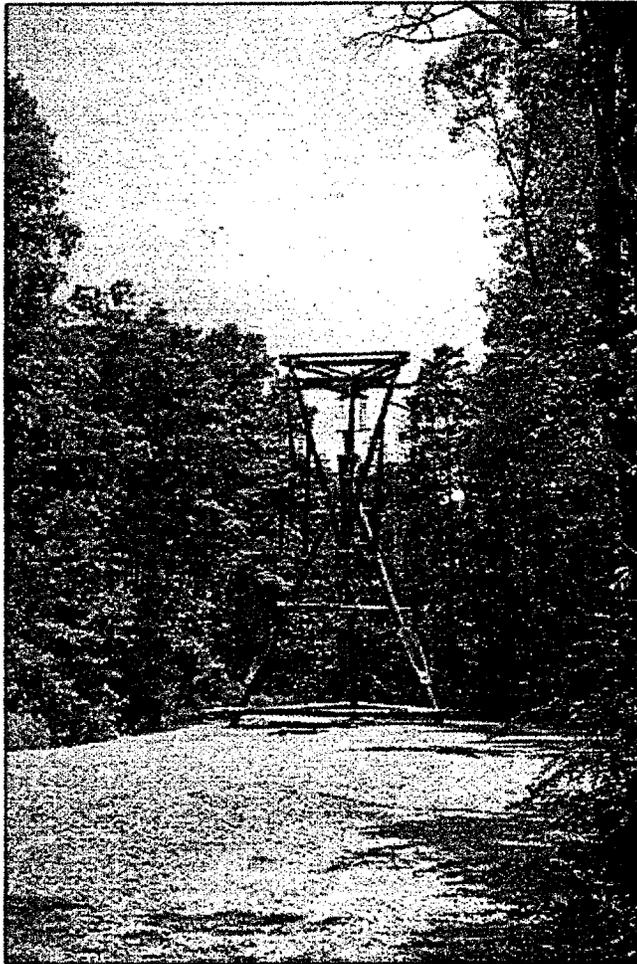
Figure 16
Transition Plots at Horine show successional vegetation

2. Adventure Programs

Team building and leadership training activities for youths are the focus of Adventure Programs. Considered by Forest Staff to be a major revenue producing program for the Forest, participants use the Teams Course, Alpine Tower, and Low Ropes Course to develop self-esteem, communication and problem solving skills. Participants can also

explore the Forest while learning to orienteer. The Alpine Tower, a 50' climbing structure, is designed to present challenges similar to rock climbing and high ropes courses. To ensure the safety of participants, at least one trained staff member per 12 students is required. The Teams Course is an obstacle course made up of walls, towers and nets, encouraging team work and trust. The Low Ropes course contains a series of ropes that participants must navigate, promoting problem-solving skills and communication.

Figure 17
Alpine Tower at Horine



3. Corporate Programs

The Leadership Development Center began at Horine in 1989 with the goal to provide quality corporate development programs tailored to meet each corporation's needs and budget. Programs focus on developing skills such as team building, trust building, and communications. Outdoor programs can utilize the Teams Course, the Low Ropes Course, the Alpine Tower, or orienteering, while indoor activities are held in the Manor House, the Environmental Education Center, or pavilions. Providing adequate numbers of trained staff is critical to the future success of Corporate Programs (Figure 17). Financial support is needed to train staff through programs such as Outward Bound for Instructors, the Outdoor Leadership School, or the Tom Brown Survival School.

4. Public Programs

These programs are mainly weekend programs open to the public with advance registration. They include nature hikes and programs geared to the natural sciences, and are advertised through Metro Parks publications and signs posted at the Welcome Center.

5. Other Programs

Many organizations, such as DARE, (the County's drug and alcohol program for adolescents,) the Police, and EMS (Emergency Medical Service) hold functions at the

Forest. These organizations bring their own program leaders but utilize the Forest's program facilities and camping areas.

Visitor Services

1. Staffing

Although Jefferson County owns the Forest property, programs and maintenance are the responsibility of Metro Parks. The Regional Director leads a team of twelve full-time employees including an assistant ranger, two naturalists, two program assistants, a secretary and receptionist, and a maintenance crew of five. Two seasonal workers are hired for a total of 50 weeks per year, and 20 part-time workers are hired to assist with programs.

2. Orientation

Visitor orientation is especially critical at the Forest because destinations are so spread out. The Welcome Center is the central check-in site, housing trail maps, interpretive guides, and historic information. Improvements in trail maps, interpretive guides, and additional trained staff are needed.

3. Security/Enforcement

Limited security surveillance is provided by the Sheriff's Department in the form of vehicular patrol, but it is inconsistent and there is not regular communication between Forest staff and enforcement entities. Staff does not have designated enforcement capabilities.

One assault occurred several years ago at the small parking lot on Scotts Gap Road, now closed and relocated. In addition, more serious assaults occurred during the preparation of this report. Vandalism of vehicles has been reported at Horine, and several break-ins have occurred at the Maintenance Center and Environmental Education Center. Bathrooms at Tom Wallace Recreation Area have been vandalized on several occasions. Illegal hunting occurs in the Forest, causing a safety hazard for hikers, equestrians, staff and adjacent property owners. Forest staff have no authority or resources for dealing with these problems which will likely increase as more people use the Forest.

Emergency phones are not available in most areas of the Forest. There is no reliable radio communication between program staff and the Welcome Center. Radio communication is impossible from some ravines in the Forest. This lack of ability to communicate in case of emergency is a concern that deserves priority attention.

Ecological Assessment

The ecological quality of the natural communities within the Forest was assessed to determine critical habitat areas to restore, protect or open to recreational activities. Through a rating system used by the Kentucky Nature Preserves Commission, forest quality was divided into four distinct classifications: A-quality, or old growth forest, B-quality, or mature forest, C-quality, or maturing second growth forest, and D-quality, or young second growth forest (Map #3).

Good ecosystem management strives to have as much area in A-quality forest as possible, surrounded by B-quality buffer zones which are surrounded by C-quality zones. A principle management objective is to upgrade, over time, lower quality areas to higher quality areas, so that B-quality areas eventually develop into A-quality and C-quality areas develop into B-quality buffer zones.

The findings of the ecological assessment are described below:

1. Category A: Old-Growth Forest

There are no stands of A-quality forest within the Jefferson County Memorial Forest. A-quality forest is defined as old-growth forest areas that are not logged and relatively undisturbed except for natural phenomenon.

2. Category B: Mature Forest

One forest tract of approximately 145 acres is designated as B or B/C-quality forest. This area encompasses the watershed of Headly Hollow, in the southwestern portion of the Forest, and includes approximately 35 acres of B-quality mesophytic forest and about 110 acres of B/C quality subxeric forest on upper slopes and ridges. Although previously disturbed by logging activities, it contains several forest community types which are well-developed and highly representative of the region. The tract includes mesophytic forest on the steep lower slopes of a south-facing ravine and adjacent sub-xeric forest on upper slopes and ridgetops. This community supports a high diversity of overstory and understory species, including numerous species of wildflowers. Within the mesophytic community the canopy trees reach impressive dimensions, with a dbh (diameter at breast height) of 1 m or greater and very large, spreading crowns. In addition to its high ecological integrity, this area has high aesthetic and interpretive values, with minimal restoration needed. (See Appendix B, page 40-47.)

3. Category C: Maturing Second Growth Forest

Most of the Forest is designated as C-quality forest. This category includes most

undeveloped portions of the Forest which are characterized by maturing, second growth forest that exhibits various degrees of recent or past disturbance. Species diversity is often reduced as a result of intensive logging or other land uses. Generally, restoration of these areas requires localized eradication and control of exotic vegetation (see page 23, Objective 2.3), tree planting to improve species composition (see Appendix B, page 40-47), and soil stabilization on eroding trails and other disturbed soils. Botanical and soil surveys are needed to identify specific areas requiring restoration efforts.

4. Category D: Young Second Growth Forest

D-quality forest occurs in areas of fairly recent and intensive past disturbance. Most of this forest was cleared in the past 40 years and is regenerating through natural succession. Restoration priorities should include protection of soil and water quality, eradication of exotic vegetation, and reforestation with native plant species.

Recommendations

Natural Resource Protection

Goal

To protect the unique natural communities and preserve the biological diversity within the woodlands, meadows, streams, and ponds of the Jefferson County Memorial Forest.

Objectives

- 1.1. Prohibit practices that fragment the forest including logging, timber stand improvement, road construction, creating new wildlife openings, excessive trail construction, cutting trees for visual purposes, etc.
- 1.2. Prohibit activities incompatible with Forest restoration including grazing, off-road vehicle use, and mountain biking.
- 1.3. Contain high-impact recreational activities within designated areas.
- 1.4. Allow low-impact recreational uses such as hiking and nature study throughout the Forest.
- 1.5. Limit all access to the Forest to the minimum needed for stewardship and designated recreation.
- 1.6. Conduct more detailed botanical and wildlife inventories to guide future land use and development decisions and to educate visitors about the natural resources at the Forest. Areas where trails are proposed and B quality forest should receive the highest priority. This task should be completed by a professional field botanist during the growing season.
- 1.7. Encourage local birding groups (Beckham Bird Club, Louisville Audubon Society) to conduct breeding bird surveys and Christmas bird counts.
- 1.8. Locate and correct areas of soil erosion to protect water quality.
- 1.9. Develop and implement a fire management plan appropriate for specific areas including wilderness and developed areas.

Resource Restoration and Enhancement

Goal

To restore impacted areas, improve biological diversity, and enhance wildlife habitat within the Jefferson County Memorial Forest.

Objectives

- 2.1. Identify and map areas of the Forest which lack biological diversity. Improve diversity by planting native trees, understory shrubs and wildflowers that are characteristic of the forest community (Appendix B, page 40-47). Utilize nursery-propagated plants of Kentucky genotype, or plants salvaged from construction sites within the region, for native planting.

- 2.2. Use native plants in landscaping around recreational and interpretive facilities to the extent possible. Such plantings, when correctly labeled or interpreted by staff naturalists, help visitors identify the local forest flora, learn about ecological communities and relationships, and demonstrate the principles and practices of conservation landscaping.
- 2.3. Eradicate invasive exotic vegetation throughout the Forest by identifying and mapping areas of forest impacted by invasive exotic vegetation and implementing a program for eradication and control. Below is a list of some of the most troublesome exotic species that were either observed during this study, or that are becoming widespread throughout Kentucky and should be searched for during future inventory efforts: (See Appendix B, page 19.)

<i>Ailanthus altissima</i>	Although the Tree-of-heaven spreads rapidly by suckers in disturbed areas, is extremely invasive to natural areas, and is difficult to eradicate.
<i>Alliaria petiolata</i>	An aggressive biennial herb from the mustard family that dominates the ground layer in lightly to heavily disturbed forests and woodlands.
<i>Eleagnus spp.</i>	Both autumn and Russian olive are aggressive woody plants that invade forest, especially along edges.
<i>Euonymus fortunei</i>	Although not observed, Wintercreeper Euonymus is increasingly invading forest areas throughout Kentucky and should be looked for.
<i>Ligustrum sp.</i>	Privet is a commonly planted hedge plant that escapes cultivation and overtakes the understory in forests and woodlands.
<i>Lonicera spp.</i>	Shrubby honeysuckles which form dense thickets in the under-story, especially within 50 m of forest edges.
<i>Lonicera japonica</i>	An aggressive vine in disturbed forest and forest edges.
<i>Microstegia</i>	An aggressive grass which sometimes dominates the <i>vimining</i> ground layer in the mesophytic forest, especially along trails and old logging roads.
<i>Morus alba</i>	A native of China, White mulberry spreads rapidly.
<i>Rhus radicans</i> L.	An aggressive vine, poison ivy, can cause a severe skin reaction in many people.
<i>Rosa multiflora</i>	Noticed mostly along ridge tops, multiflora rose was originally planted in the 1940's for erosion control.

Because methods of eradication and control of invasive species are site specific and vary depending upon the species, a detailed program should be developed using the techniques outlined in the Louisville's Olmsted Parks and Parkways Master Plan, pages 195, 196.

- 2.4. Limit mowing as a management practice to areas used for specified open-space activities such as:
- picnic and playground areas,
 - grass-surfaced trails and access to trailheads,
 - team sports such as soccer and baseball,
 - staging areas for group activities such as hiking, camping,
 - maintenance of the existing memorial tree plantation, as needed for access around buildings and group or team recreational facilities.
- 2.5. Designate and map areas to be mowed based on the criteria listed above. Areas that will no longer be mowed should either be restored to forest or established with native prairie forbs and grasses. Both options provide interpretive opportunities and are summarized below.
- Restore to forest through natural succession or tree planting. Natural succession has minimal costs for establishment and maintenance and provides weedy successional habitat for wildlife. Tree planting is initially more expensive, but accelerates the restoration process and provides the opportunity to establish a good diversity of quality tree species. A combination of both methods, planting trees into successional growth, is often most desirable; or,
- Establish with native prairie forbs and grasses. It may be desirable to maintain certain open areas for purposes other than recreation. Such areas would attract birds and butterflies for observation; provide early successional habitat for wildlife; eliminate the need for annual food plots which are costly and utilize exotic species; and increase the natural beauty of the landscape. These areas should be converted to diverse native prairie forbs and grasses to provide early successional wildlife habitat, conserve biodiversity, protect soil and water quality, and provide unique interpretive opportunities. Maintenance would be reduced to a semi-annual mowing schedule or controlled burning as described in Louisville's Olmsted Parks and Parkways Master Plan, page 190-191.
- 2.6. Delay mowing, wherever possible, until May and June to minimize mortality of early ground nesting bird species.
- 2.7. Develop transition zones of grassland and shrub vegetation between forested and mowed areas managed for recreation (These diverse early successional habitat areas will provide food, cover, and nest sites for many species, may reduce the negative impacts of forest edge on the ecosystem, and will enhance the aesthetic quality of the forest edge). Transition zones should average 30 m (98 ft.) to 50m (164 ft.) in width. A shrub border of native prairie plants can also be used in these areas; shrub borders should be at least 10 m (33 ft.) in width.

- 2.8. Train maintenance staff at the Forest to implement management practices such as removing exotic vegetation and reforesting meadow areas. Utilize existing training programs developed by Metro Parks for Olmsted Parks maintenance crews.
- 2.9. Develop a management log to record change over time and serve as a primary record of the impacts of management and use. (An in-process draft management log is described in Louisville's Olmsted Parks and Parkways Master Plan, pages 205 - 213.)
- 2.10. Develop a volunteer program for woodland management to assist Forest staff and provide education on forest stewardship.

Visitor Services

Goal

To provide high quality recreational and educational opportunities within a wilderness setting.

Objectives

- 3.1. Limit trails to a single loop with occasional side trails to access scenic vistas or interesting non-sensitive features. All trails should be routed along topographic contours to minimize erosion and reduce cut and fill. Avoid steep slopes, erodable soils, stream beds and populations of rare or sensitive plants or animals. Design trails

with input from a naturalist and a landscape architect, consistent with Trail Design, Construction, and Maintenance as used by the Appalachian Trail Conference.

- 3.2. Reroute trails and restore eroded areas by planting native trees, understory shrubs, and wildflowers characteristic of the forest community. Discourage new or "renegade" trails.

- 3.3. Mark trails with clear, consistent and permanent icons, and provide directional signage at each trailhead and wherever trails intersect (Figure 18).

- 3.4. Develop accurate trail maps, check-lists of wildflowers,

Figure 18
Trail kiosk at Paul Yost



birds, etc., and descriptions of visitor services and programs. Provide this information at the Welcome Center, Environmental Education Center, Horine Manor House, and at each trailhead in weather-proof boxes with hinged lids.

- 3.5. Develop a system for issuing recreational user permits for high impact activities such as horseback riding and activities which need to be monitored such as orienteering. These users should display permits at all times when in the Forest.
- 3.6. Prohibit activities incompatible with visitor safety including hunting and off-road vehicle use.
- 3.7. Strengthen enforcement capabilities of Forest staff through development of a park ranger program.
- 3.8. Implement a radio communication system and install public telephones.
- 3.9. Conduct a needs assessment that includes a survey of current users and a demand study of recreational needs in the region to identify future trends, guide decisions, and plan for future facility and staffing requirements.
- 3.10. Prepare detailed master plans for Paul Yost Recreation Area, Tom Wallace Recreation Area, and Horine Recreation Area based on the results of the needs assessment survey. Master Plans should address:
 - development of a sign system,
 - analysis of parking and circulation patterns,
 - location and design of kiosks, pavilions, latrines,
 - detailed study of hiking and horse trails, and other facilities based on needs assessment study.
- 3.11. Adopt official names for sub-areas and structures in the Forest to standardize terminology and improve consistency. The following sub-area names are recommended: Tom Wallace Forest, containing the Tom Wallace Recreation Area, and Tom Wallace SRA; Paul Yost Forest, containing the Paul Yost Recreation Area; Horine Forest, containing the Horine Recreation Area and Horine SRA; and Moremen's Hill Forest. Structure names recom-

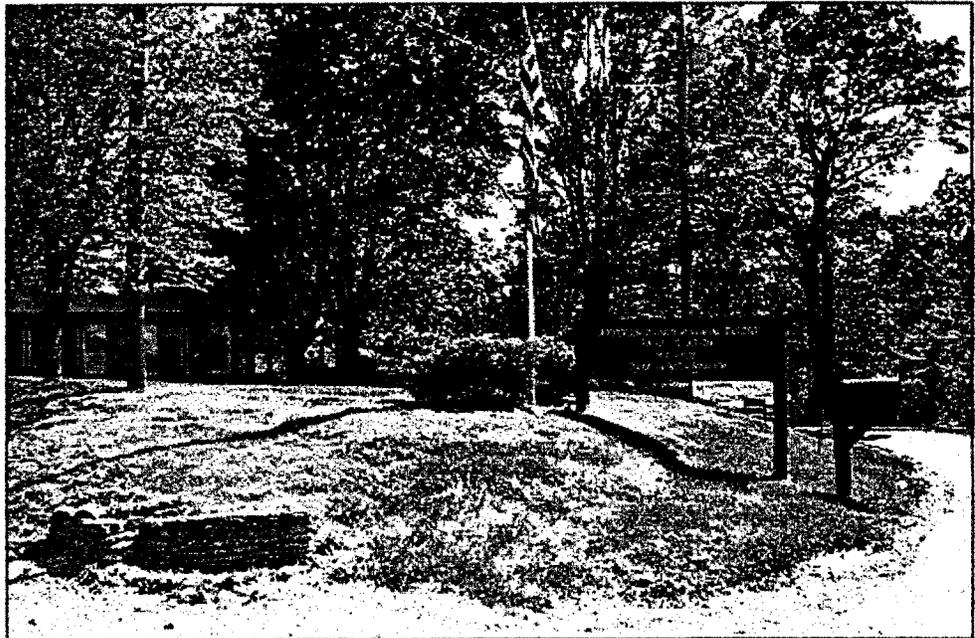
*Figure 19
Maintenance Center at
Horine is still called
Ranger Station*



mended are: Welcome Center, Horine Manor House, Environmental Education Center, and Maintenance Center.

- 3.12. Develop clear and concise signage at the intersection of Holsclaw Hill and Mitchell Hill Road directing visitors to the Welcome Center, Recreation Areas, and Siltstone Trail parking lots (Figures 19 and 20).
- 3.13. Revise existing signage to reflect official sub-area and structure names.
- 3.14. Evaluate the need for additional staffing, and financial resources for protection, restoration and enhancement of the Forest.

Figure 20
Revise existing signage to
reflect official sub-area
and structure names



Management Area Recommendations

Three management area designations have been established and applied forest wide based on forest quality/integrity, existing use, and future suitability (i.e., for restoration, recreational use, or forest fragmentation reduction). The management area designations are (Map # 4):

- Recreational Forest, which contains areas already impacted by recreational uses and designated for further recreational development;
- Significant Resource Areas (SRA), which contain the most ecologically significant forest areas that should be preserved and restored, and;
- Recovering Forest, areas that are currently less significant but may be restored to SRA quality.

Each management area designation prescribes specific goals and allowable uses suitable to that area providing a framework for guiding development and management decisions in the Forest. The following section describes each management area and its related implementation strategies.

Recreational Forest

The Recreational Forest is managed for high impact recreational uses such as horse riding, picnicking, and educational programs. Forest quality is low (mainly D-quality and some C-quality) and highly fragmented, encompassing many meadow and lawn areas for recreational activities. Approximately 1,350 acres, or 26%, of the Forest is designated as Recreational Forest.

Tom Wallace Recreation Area, the primary recreation area, includes approximately 225 acres with facilities for picnicking, fishing, play, and hiking. It contains the Welcome Center, which serves as the “heart of the Forest.” All visitor services should be located at the Welcome Center, with the exception of services for pre-registered groups using the Horine Recreation Area.

Horine Recreation Area, an approximately 250 acre tract, is designated for pre-registered group activities only including school and youth groups, scout groups, and educational program participants. Hiking trails within the Horine SRA should be open only to those participating in a program or group activity. Detailed resource management recommendations for Horine Forest are mapped and described on pages 46-55 of this report.

Paul Yost Recreation Area, an 858 acre tract, is designated for equestrians and hikers. Alternatives to trail design and management should be examined in order to accommodate both user groups. Possible strategies could include alternating days or separate trails.

Picnicking and support facilities should also be provided here. Mountain biking should be prohibited within the Forest.

Uses Allowed in the Recreational Forest:

- hiking on designated trails,
- horse riding on designated trails.
- group and family activities including picnicking and play.
- educational programs including environmental education and team building,
- orienteering,
- group camping,
- fishing,
- research and nature study.

Goal

To accommodate a wide variety of recreational uses in a well-planned, environmentally responsible manner, and to prevent further degeneration of the forest by closely monitoring activities and repairing impacts as soon as they are discovered.

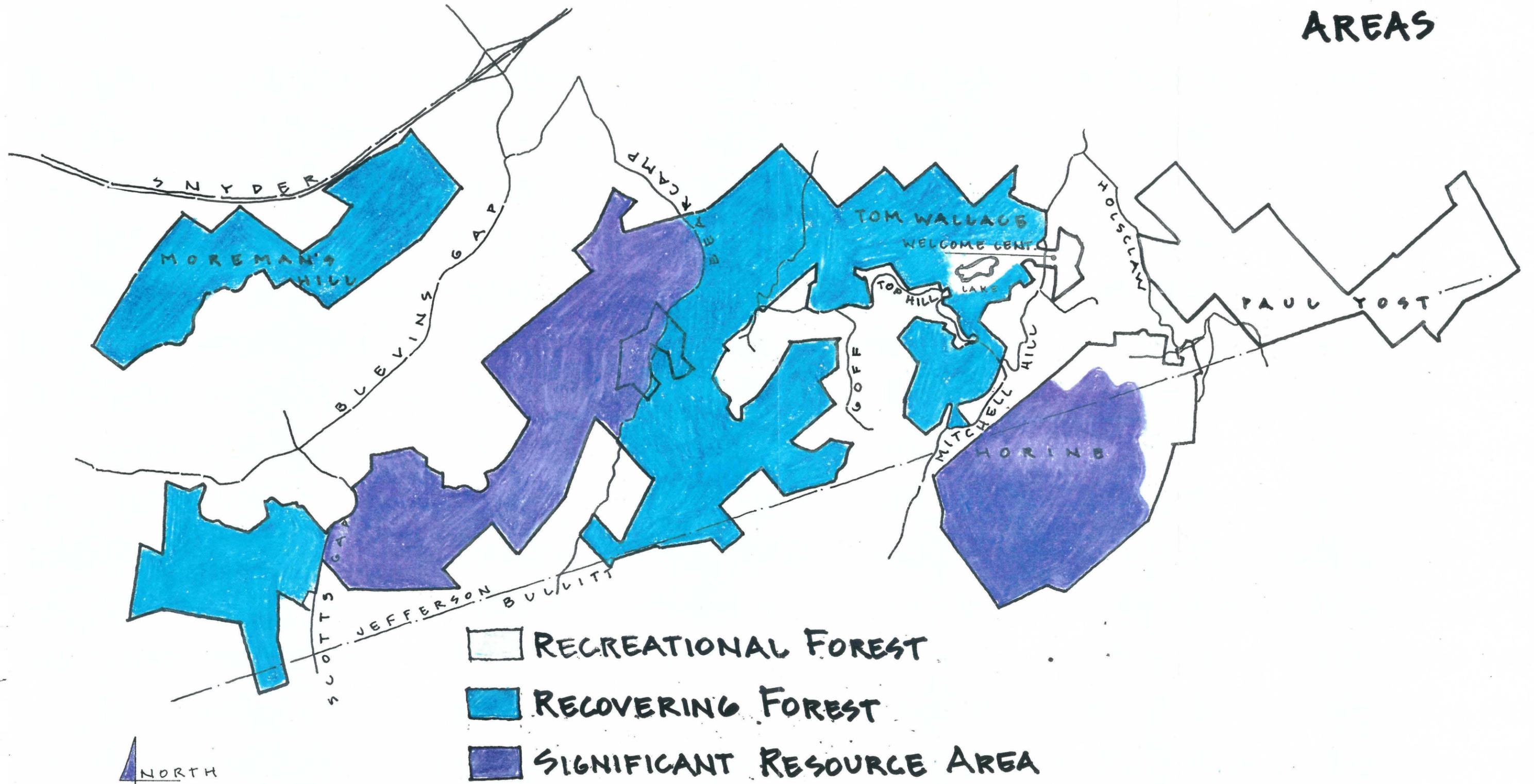
Implementation Strategies

- Develop a self-guided nature trail with a trailhead at the Welcome Center. The trail should pass through different ecological communities with numbered points of interest corresponding to a map in a trail brochure.
- Eliminate individual camping from the Horine Recreation Area.
- Improve the environmental quality of Tom Wallace Lake and Shannon's Pond by:
 - « regrading steep banks to a more gradual contour, allowing for the development of saturation zones supporting emergent wetland vegetation;
 - « stabilizing eroding banks with a diversity of attractive wetland plants (planting trees and shrubs along the banks discourages visitor use that can compact soils and cause erosion);
 - « routing hiking trails a minimum of 10 m (33 ft.) from the shoreline, and;
 - « constructing a boardwalk along the banks and extending over Shannon's Pond to provide access for wildlife observation and educational uses. A boardwalk or several platforms may be needed at Tom Wallace Lake to provide access for fishing.
- Relocate the section of the horse trail in Tom Wallace Recreation Area that is not on Forest property. All trails should remain within the Forest boundaries.

Significant Resource Area (SRA)

Significant Resource Areas, as the name implies, are the most ecologically significant

EXISTING
FOREST
AREAS



MAP # 4

areas of the Forest. They are characterized by good quality forest, mainly B and C-quality with some D-quality to buffer adjacent uses. The forest community within the SRA is highly representative of the region, and occurs in large contiguous tracts without roads or developed areas. SRAs contain potential habitat for State-monitored species which are endangered, threatened or of special concern. Approximately 1,750 acres, or 34% of the Forest, is designated an SRA.

Location of Significant Resource Areas:

The Horine SRA consists of approximately 750 acres of sub-xeric and mesophytic forest community types. Although most of this area was assessed as C quality forest, it is significant due to its roughly circular shape and the absence of paved roads or other permanent developments, making it an ideal habitat area for migratory songbirds.

The Tom Wallace SRA consists of approximately 1,000 acres of sub-xeric and mesophytic forest community types, with minor, scattered xeric forest/barrens intrusions. It includes all Forest land located between Scott's Gap Road and Bearcamp Road in the western section of the Tom Wallace Forest.

Uses Allowed within the SRA:

- Wilderness recreation such as hiking and bird watching,
- Research and study in the fields of ecology, soil science, forestry and natural history by sanctioned educational institutions.

Goal

Forest restoration is the primary goal within an SRA. Specifically, the goals are to restore B-quality forest to A-quality, and restore C-quality forest to B-quality. Because the B-quality area is currently in good condition, restoration efforts should begin with C-quality then D-quality areas, focusing on correcting areas of eroded soil, improving biodiversity, and removing exotic vegetation.

Implementation Strategies

- Relocate the Red Trail in the Horine SRA to correct existing soil erosion.
- Relocate the Teams Course from the Horine SRA to the Horine Recreation Area.

Recovering Forest

Location of Recovering Forest Areas

Approximately 2,000 acres, or 40% of the Forest, is designated as Recovering Forest. The largest Recovering Forest area is located in the central portion of the Tom Wallace Forest, from Mitchell Hill Road to Bearcamp Road. This area is mainly C-quality with

some D-quality forest and several small non-forested areas. The westernmost portion of the Tom Wallace Forest, west of Scotts Gap Road, is also designated Recovering Forest. This area is C and D quality with two large non-forested areas formerly used for grazing. Many soils in this area are susceptible to erosion.

The entire Moremen's Hill Forest is designated as Recovering Forest. It contains C and D quality forest, with non-forest areas adjacent to the Gene Snyder Freeway and railroad tracks.

Uses Allowed within the Recovering Forest:

- Wilderness recreation such as hiking and bird watching,
- Research and nature study,
- Orienteering.

Goal

Although Recovering Forest areas are currently less significant than SRAs, they have the potential to become SRAs in the future. For this reason, the primary goal of the Recovering Forest is restoration. Recovering Forest areas are regenerating from past logging, grazing, or recreational activities. Forest quality is average; mainly C-quality with some D-quality. Restoration efforts should focus on restoring C-quality to B-quality then D-quality to C-quality forest by correcting areas of eroded soil, improving biodiversity, and removing exotic vegetation.

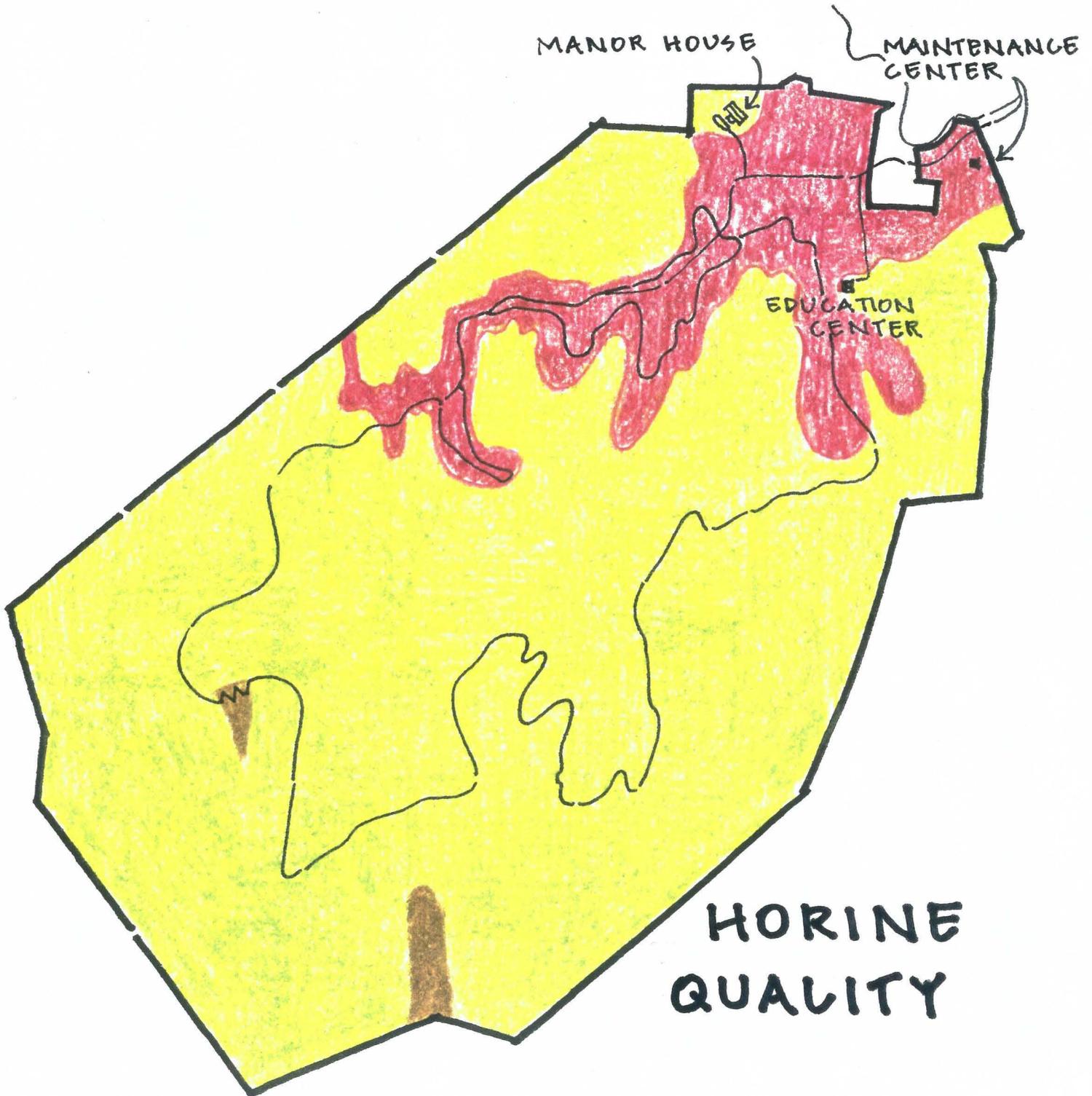
Implementation Strategies:

- Locate a parking lot for Siltstone Trail hikers at Jefferson Hill Road. Remove the abandoned parking lot.
- Relocate sections of the Loop Trail in the Tom Wallace Forest onto stable soils following natural contours.

Case Study: Horine Forest

Before the renovation of the Welcome Center in the Tom Wallace Recreation Area, the Horine Reservation was the center of Forest activities. The Ranger Station was the place for hikers to pick up information and check in before hiking or camping; it now serves primarily as headquarters for the Forest's maintenance operations. Although there has been a shift in focus for many public programs to the Tom Wallace Area, Horine continues to be the hub of group activities such as school and scout groups and organized outdoor education activities such as team building. The Manor House continues to serve as a meeting place for groups with reservations taken through the County Judge Executive's office.

Recent improvements at the Horine Recreation Area, including construction of the Environmental Education Center (which provides programs for students and teachers year



- C QUALITY - 40 TO 80 YEAR-OLD TREES
- D QUALITY - CLEARED WITHIN 40 YEARS
- NON FOREST

MAP # 5

round), and renovation of the Horine Manor House, have enabled the group educational programs and organized recreational activities to expand significantly in this area. Because this expansion has occurred in close proximity to the Significant Resource Area, the Horine Forest serves as a useful case study for applying the recommendations for natural resource protection, resource restoration and enhancement, and visitor services.

Natural Resource Protection

The Horine Forest contains two forest communities, acidic mesophytic and acidic subxeric, and extensive non-forest areas. An ecological assessment revealed that essentially all of the forest area within Horine is C-quality, with some minor areas of D-quality (Map # 5). The Horine Significant Resource Area (SRA), however, has important value for threatened neo-tropical migratory songbirds because of its relatively large area of contiguous interior forest habitat. Since it is one of two areas in the Forest with these important characteristics, recreational use should be limited to low impact activities such as supervised hiking and nature study that occurs through the Environmental Education Center. The teams course should be relocated outside of the SRA into the Recreational Forest area (Map 8).

Map 8 identifies areas of trail erosion and off-road vehicle traffic. Trail erosion problems need to be corrected and monitored closely to prevent further degradation of habitat and water quality in streams. Sources of the erosion problems are primarily off road vehicles and other high impact recreational uses such as horseback riding and mountain biking. Horseback riding (and mountain biking, if permitted) should be directed to the Paul Yost Recreation Area, and ORV use should be prohibited throughout the Forest.

Increased enforcement capability and trail management expertise on the Forest staff is critical for the protection of the important natural resources of the Forest.

Resource Restoration and Enhancement

The Horine Recreation Area contains the largest areas of lawn in the Forest. Mowing these areas requires a large proportion of the Forest staff's time and resources. Many of the lawn areas that are not used for specific group activities should be managed for native-species meadow and/or forest regeneration rather than lawn (Figure 21). Mowing should occur only in areas where there is a specific need for a group activity on a lawn or where there is a facility maintenance or operations need for access to an area. Map #6 recommends areas for reduced mowing.

Although one strategy for reducing the amount of lawn is to simply stop mowing all but the essential lawn areas, there are other management practices that have both educational and wildlife benefits and are consistent with the overall goals of forest restoration. For example, the transition plots that are currently used as educational tools to illustrate natural succession should be expanded throughout much of the existing lawn area. The educational and aesthetic value of these plots would be greatly enhanced if they were

located along natural contours and managed so that a gradual transition was evident from the forest areas to the remaining mowed areas.

These expanded transition plots could also replace the existing wildlife food plots and would improve and enlarge habitat areas if planting mixes with Kentucky genotype native plants with high wildlife value are used. Diverse successional habitat provides food, cover and nest sites for many species and helps to reduce the negative impacts of forest edge on the ecosystem. It also enhances the aesthetic quality of the forest edge. Forest staff could mow paths through some of the meadows and transitional areas so that interpretive activities can continue. Bird and bat boxes and wildlife observation blinds could also add to the educational experience.

Figure 21
Potential site for open
meadow restoration
adjacent to Maintenance
Center at Horine



The current food plots have a high proportion of exotic annuals some of which have questionable wildlife value and tend to out-compete the native species with greater value. These food plots may need to be burned under the supervision of a botanist to reduce the incidence of the invasive plant species and allow natives to reestablish.

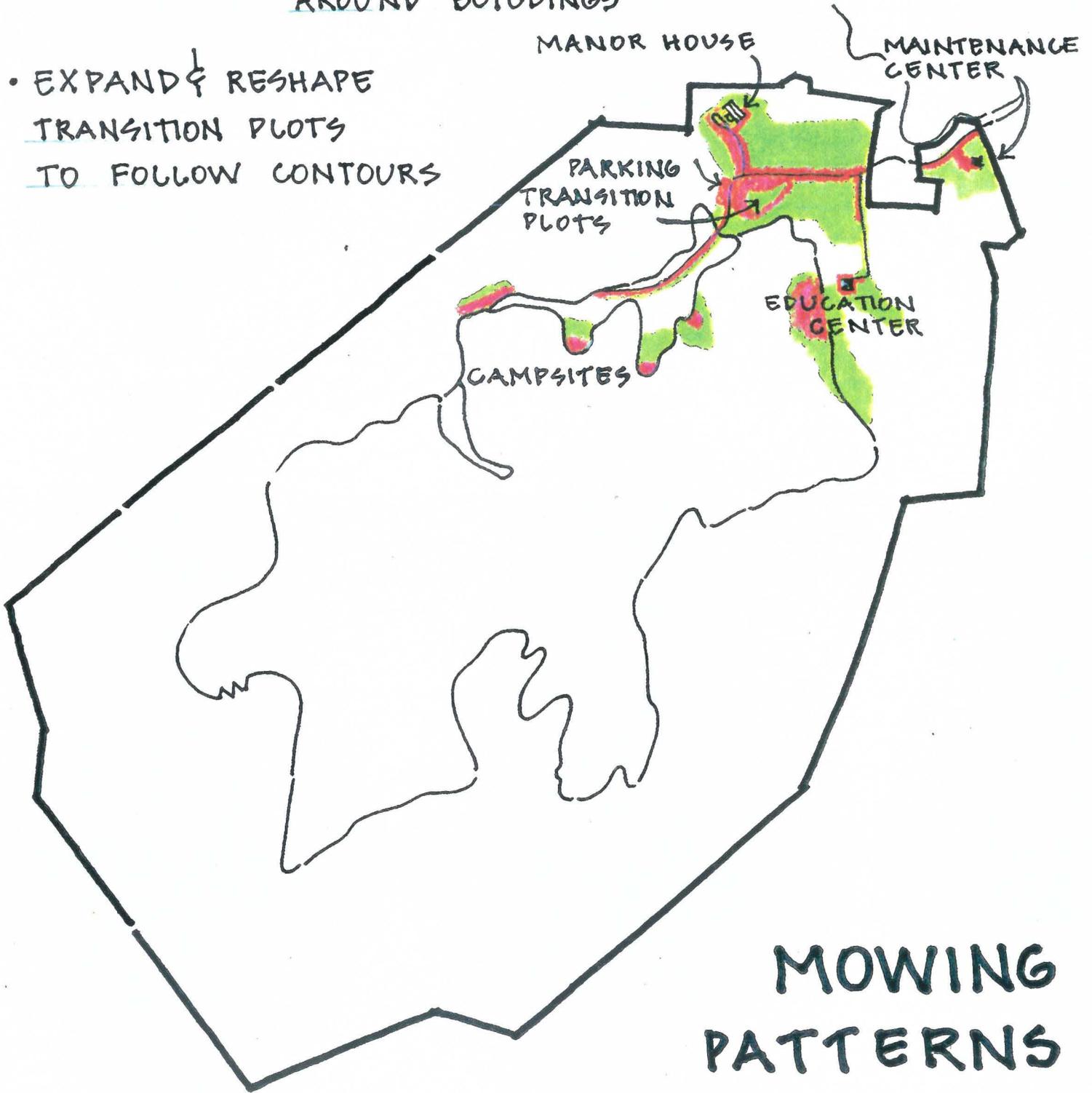
Both the water quality and educational value of Shannon's Pond could be dramatically improved if the banks were regraded and planted with native aquatic plants. A board walk should be constructed to provide better access to the Pond while minimizing further damage to the banks.

Visitor Services

Most of the programs now occurring in the Horine area are prearranged group activities, such as school and scout activities, corporate meetings and team building

• LANDSCAPE WITH NATIVE PLANTS
AROUND BUILDINGS

• EXPAND & RESHAPE
TRANSITION PLOTS
TO FOLLOW CONTOURS



MOWING PATTERNS



 CURRENT MOWING

 PROPOSED MOWING

• CONSIDER IMPLEMENTING MOWING PATTERNS
ACCORDING TO OLMSTED MASTER PLAN

exercises. Because of this pattern of use and the proximity of the Significant Resource Area to these activities (Map #7), it is appropriate to continue use of this area for groups only while directing “drop-in” activities such as family hiking and picnicking and high impact activities to the Tom Wallace and Paul Yost Recreation Areas.

Signage along trails in the Horine Significant Resource Area is currently confusing for visitors. Additional signs are needed at ambiguous trails intersections, especially where hiking trails meet service roads.

Many opportunities for interpreting natural and cultural resources exist at Horine; one such cultural resource to be interpreted is the Horine Cemetery. Natural resource interpretation could be as simple as printing wildlife and plant checklists on the back of the hiking maps, enhancing the visitor’s wilderness experience. Native landscaping around facilities could also be interpreted for the public, giving visitors and maintenance staff a chance to become more familiar with these species. The equipment storage area located along the road to the Manor House offers an opportunity to use native landscaping for screening.

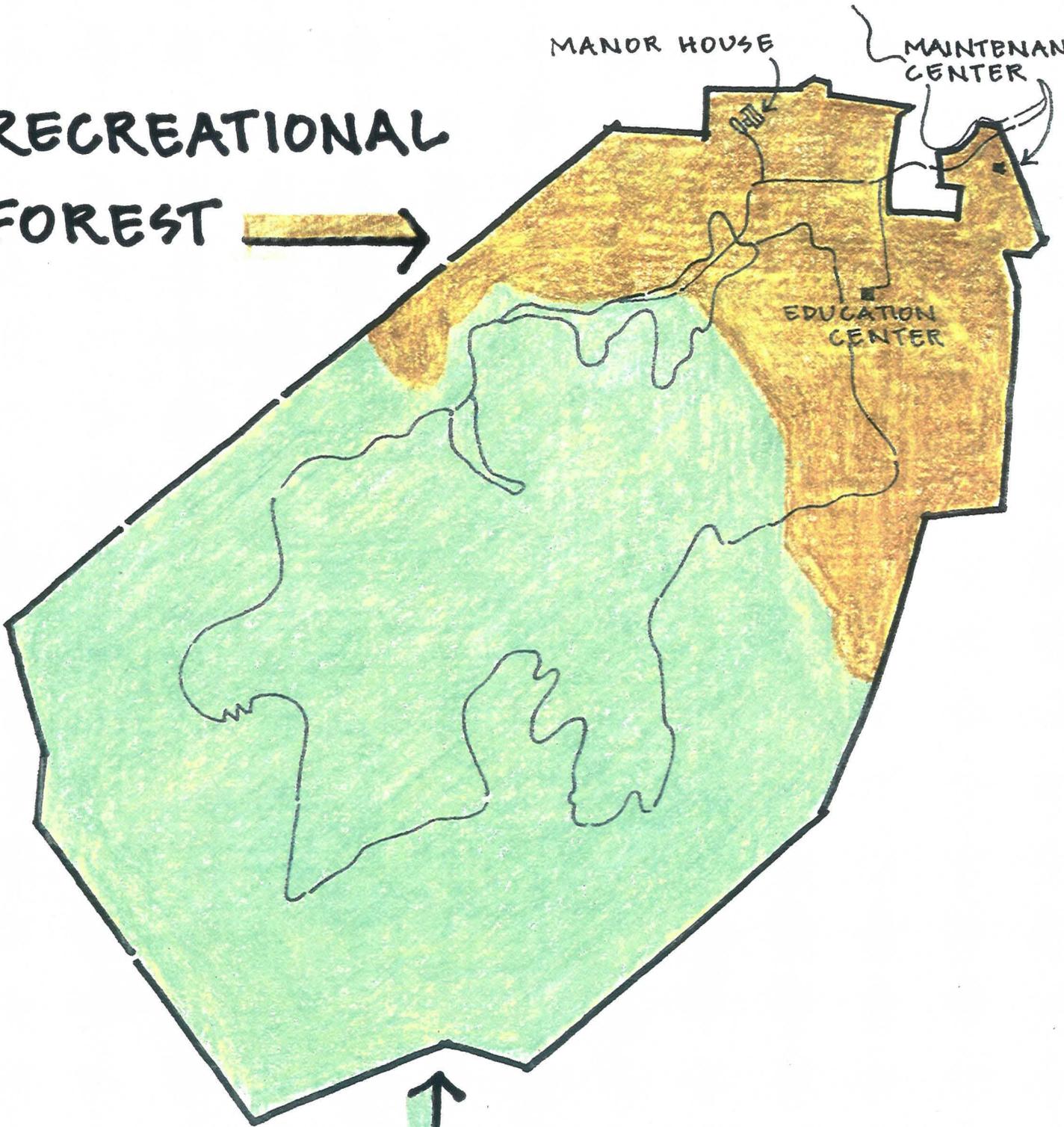
**RECREATIONAL
FOREST**



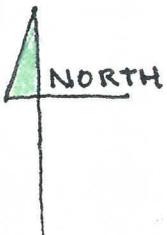
MANOR HOUSE

MAINTENANCE
CENTER

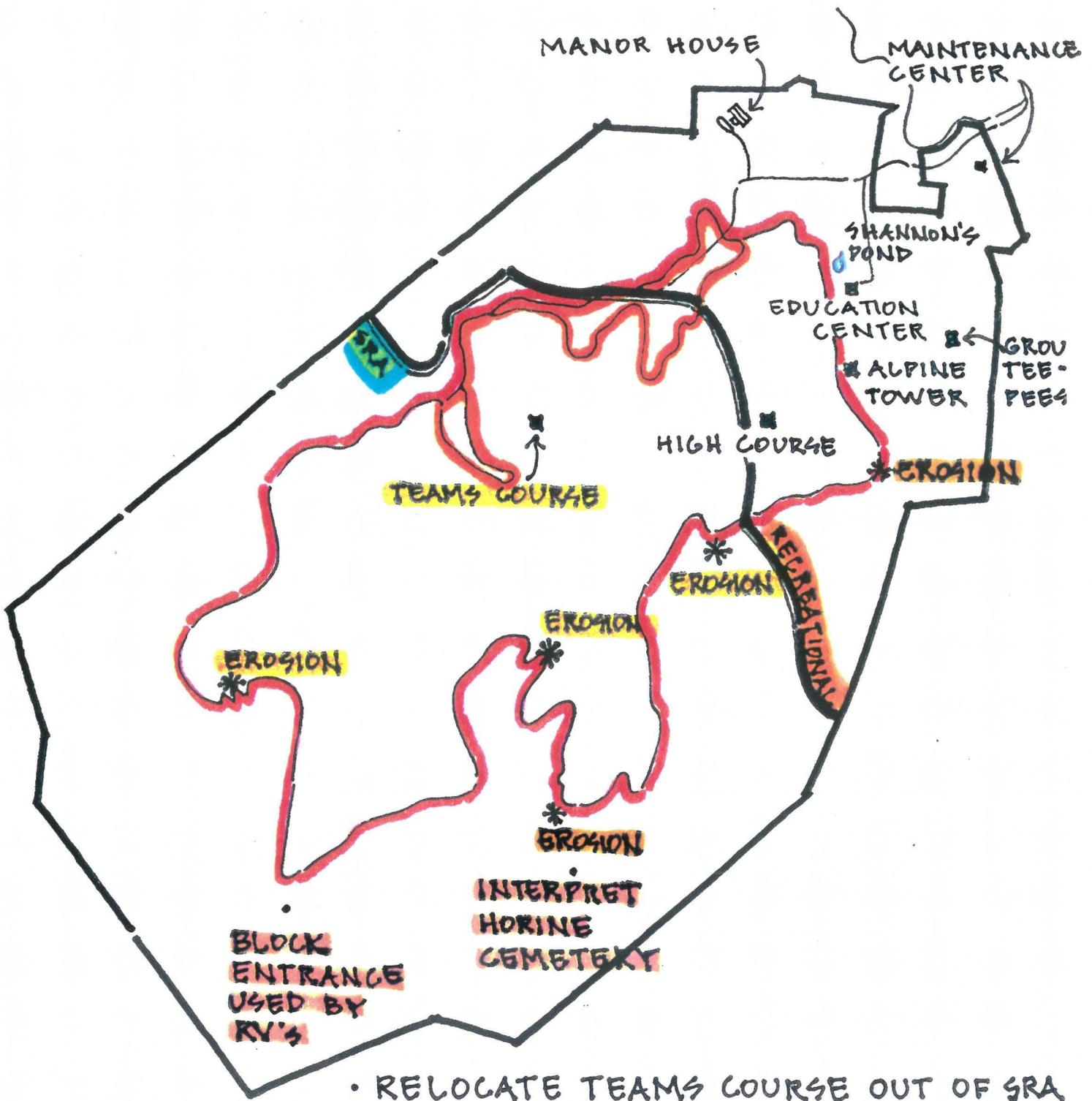
EDUCATION
CENTER



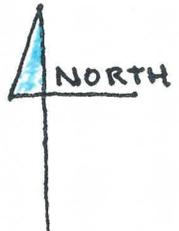
**SIGNIFICANT
RESOURCE AREA**



MAP # 7



- RELOCATE TEAMS COURSE OUT OF SRA
- FIX TRAIL EROSION



MAP # 8

Next Steps

In addition to the recommendations for the Forest and each management area, actions are needed to address issues which relate to the Forest as a whole: land acquisition, community stewardship, decision making, and funding sources. Each issue is described below.

Land Acquisition

Land acquisition is needed to protect the steeply sloping, forested knob topography surrounding the Jefferson County Memorial Forest. Acquisition may also be needed to accommodate expanded recreational uses; the extent of these needs will become more clear following the needs assessment recommended by this plan. Map 9 identifies and prioritizes property acquisition needs to guide annual capital expenditures as recommended by the *Park and Open Space Master Plan*. The pace of acquisition will depend on actual budget levels and market influences.

Acquisition areas have been targeted to: 1) enhance the ecological value of the forest or 2) provide critical links between existing holdings. Acquisition areas are prioritized based on two criteria: areas located within the interior of the forest are of the highest priority for acquisition, and areas located along the perimeter of the forest are the second highest priority (Properties with improvements, such as barns or houses, are not necessarily desirable).

While these criteria guide decision-makers in targeting acquisition areas, additional factors should be weighed in prioritizing individual properties. These factors include:

Availability

- on the market
- not listed but willing to sell
- potential for life-estates

Increased Cost

- existing improvements
- access
- availability of infrastructure
- supply & demand

Development pressure

- adjacent land uses
- cost
- availability

Attributes

- lot size
- environmental features
 - « steep slopes
 - « stream, wetland, floodplain
 - « unstable soils, constrained soils
- condition of site (e.g., significant erosion problems)

Alternatives to land acquisition should also be considered, especially for environmentally significant parcels that are not for sale. One such alternative is purchase or donation of conservation easements. Conservation easements place use and development restrictions on the land, and should be in perpetuity if possible to allow for consistent, multi-generation forest management. Although the property owner retains rights to the conservation easement land, the property taxes can be paid by the County, an economic incentive for the landowner.

Some areas within the Forest, such as those previously grazed, may not be critical to ecological restoration or recreational use. The sale of these properties could make a significant financial contribution to the Forest, provided funds are earmarked for acquisition or forest restoration. Before Forest property is sold, a conservation easement should be obtained and resource management plan agreed upon. These precautions will ensure that the property will not negatively impact the forest in the future.

Community Stewardship

When land acquisition is not feasible, forested land can be protected through voluntary stewardship programs such as the Kentucky Division of Forestry's Stewardship Incentive Program (SIP). The SIP is a cost-share program designed to assist non-industrial private landowners in developing and implementing a Forest Stewardship Plan. Participating landowners may be reimbursed for the practices they implement at a flat rate of 75% of the average statewide cost. Practices include reforestation, wildlife habitat improvement, and soil and water protection.

Another alternative is a *Forest Registry Program*, where landowners may "register" their forest land with the County if they voluntarily agree to practice good forest stewardship practices, not cut the timber, and to notify the County of intent to sell the land. The County would give each registered landowner a plaque or certificate of registry. This option provides an avenue of communication with landowners and gives them some recognition for sound forest management.

Landowners are more likely to commit to sound forest management if they are involved as partners in the stewardship process. This is equally true for area residents and user groups, who may wish to be involved in stewardship activities at the Forest. Stewardship activities could include recreation area cleanup, trail monitoring and maintenance, or forest restoration. Restoration activities may require training on forest management practices, which may be beneficial to both landowners and volunteers. This type of training could be provided through workshops sponsored in conjunction with agencies such as the Kentucky State Nature Preserves Commission or the Kentucky Division of Forestry.

Formation of a citizen advisory group is another potential tool for improving stewardship of the Forest. This group could include members of the 1990 Forest Committee, developed by Judge Armstrong, and other individuals concerned about the Forest. (The

Forest Committee included representation from Forest and Metro Parks staff. County Government, user groups, conservation organizations, and surrounding landowners.) The citizen advisory group could establish routine communication among all parties, obtain public input on planning and development decisions, seek funding for Forest acquisition and improvements, and sponsor stewardship and restoration activities.

The existing *Memorial Forest Insider* newsletter is an excellent vehicle for communicating information about stewardship activities at the Forest. It could include educational articles on conservation easements and zoning issues as well as other Forest activities. The newsletter should be sent to every adjacent property owner, members of the citizen advisory group, and other interested parties.

Decision Making at the Forest

Decision making at the Forest has long been complicated by the fact that many divisions of Jefferson County government take an interest in the Forest. For example, Public Properties staff are involved in land acquisition and facility renovation, DPDS staff assist with planning and design, and Public Works staff negotiate easements for utilities such as water line extension. Despite this involvement, it is clear that the primary responsibility for decision making rests with Metro Parks staff.

In order to assist Metro Parks, development of a Technical Review Team (TRT) is recommended. This team would include a representative from Public Properties, DPDS, Public Works, and any other department deemed necessary by Metro Parks. The committee would be chaired by the Metro Parks Regional Director. The role of the TRT is to make recommendations to Metro Parks Director, and the County Judge/Executive on priorities and approaches to implementation strategies, cost proposals for budgeting, funding sources, etc. Additional tasks which may fall within the purview of the TRT are listed below.

- Develop design standards for all recreation structures, facilities and signage in the Forest. Structures should have a rustic appearance in context with Kentucky's vernacular architectural heritage and harmonize with the surrounding Forest.
- Develop criteria for facility siting and other land use decisions in the Forest.
- Create a research component at the Forest. Research could develop state of the art natural resource management practices using the Forest as a laboratory, and assist Metro Parks in training volunteers and students in sustainable forest management practices.

Funding Sources

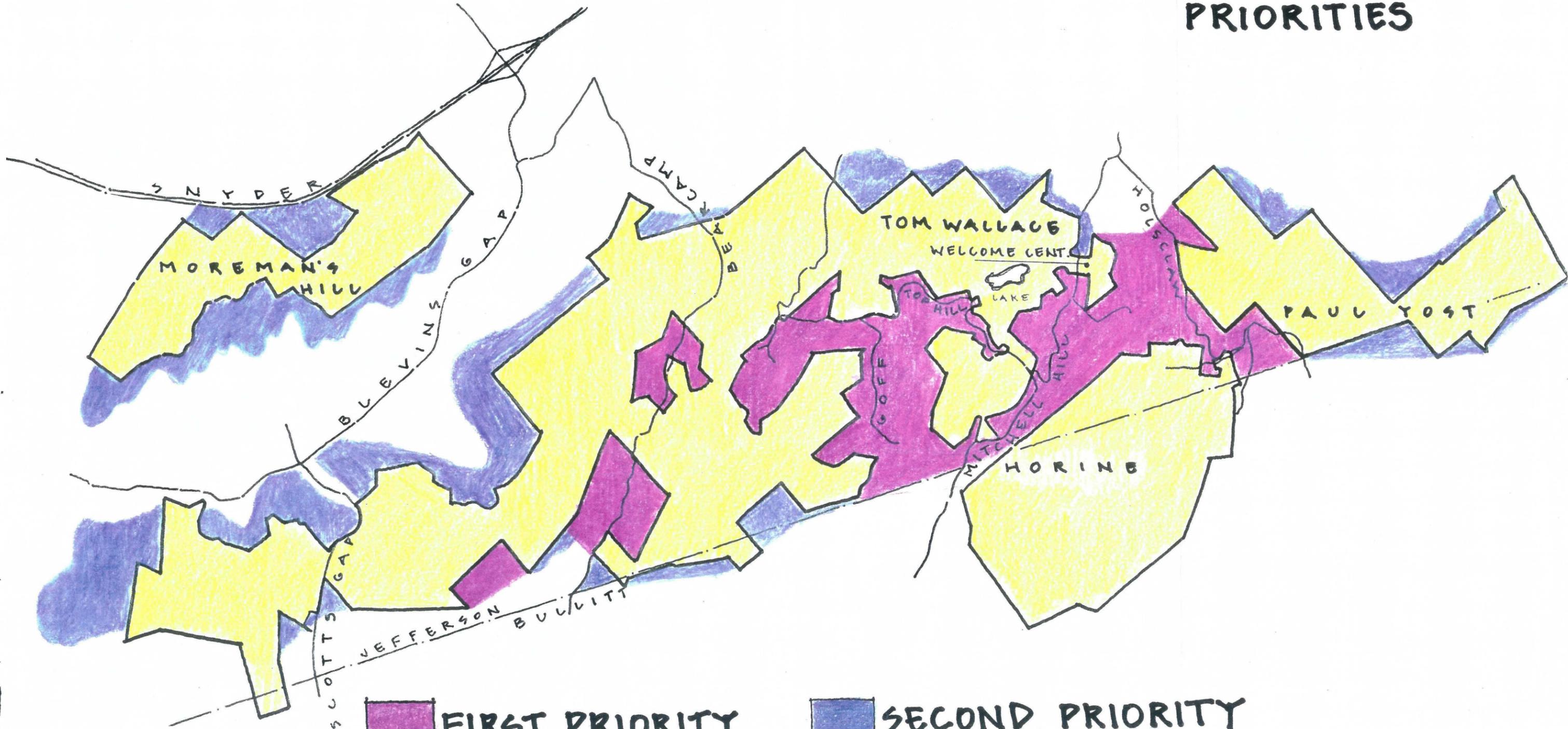
There are several sources of funding available for acquisition and forest stewardship. One new and promising source is the Kentucky Heritage Land Conservation Fund, which is funded through the sale of special vehicle license plates, environmental fees and

unmined mineral taxes. More information about this fund can be obtained from the Kentucky State Nature Preserves Commission.

Formation of a non-profit organization charged with fundraising for the Forest is another potential source of funds. In order to eliminate duplication and ensure coordination, this organization could be combined with the citizen advisory group described on the previous page.

Other public and private sources of funding are listed in Appendix B.

ACQUISITION PRIORITIES



- FIRST PRIORITY**
 PARCELS THAT:
- ① FILL IN THE FOREST GAPS
 - ② PROVIDE LINKAGE
 - ③ BUFFER SRAS

- SECOND PRIORITY**
 PARCELS THAT:
- ① INCLUDE STEEP SLOPES OF KNOB TOPOGRAPHY
 - ② ARE MOSTLY FORESTED
 - ③ CONTAIN STREAM HEAD WATERS

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Appendices

Appendix A: New York Times, April 1995

Appendix B: Ecological Stewardship Plan Prepared by Ecological Stewardship Services (ESS)

Appendix C: Public Meeting Summary, December 2, 1995

Appendix A

JEFFERSON
COUNTY
MEMORIAL
FOREST
RESOURCE
MANAGEMENT
PLAN

Appendix A: New York Times, April 1995

JEFFERSON
COUNTY
MEMORIAL
FOREST
RESOURCE
MANAGEMENT
PLAN

Unhappy Trails for Nature Lovers: Hikers and Mountain Bikers Bicker

By GEORGE JUDSON

STAMFORD, Conn., April 2 — The mountain bikers gathering at Mianus River Park were from all over, but they had one thing in common besides their fat-tired bicycles. They loved the quiet trails in the park, 215 acres of undisturbed woods in the heart of busy Fairfield County.

"I lived on Cat Rock Road near here when I was growing up," Barry Biondo of Stamford said as he lifted two bicycles off the rack of his Porsche Carrera. "When I got my mountain bike, I remembered this and thought, 'Wow!'"

"They're not going to kick us out of here, are they?"

Marjie and Steve Roney, a Manhattan couple who had heard of the park from a bike shop, were back for another ride. "It's really beautiful," she said, then paused. "I don't understand what hikers get upset about."

It is actually quite simple: hikers are upset about sharing nature trails with people on wheels, and about the damage that mountain bikes are causing to trails as the sport grows in popularity.

Hikers are fighting back, demanding that bicycles be banned from parks, and in a few cases resorting to sabotage. Carpet tacks have been spread on the Peekskill-Briarcliff Trailway in Westchester County. Cords have been tied between trees in South Mountain Reservation in Essex County.

But mountain bikers are also determined to secure their place in the outdoors. When bicyclists came to Mike Zuckerman, a bike shop manager in Croton-on-Hudson, N.Y., with flat tires caused by carpet tacks, he called in county officials. "It seemed to us there was sabotage on the trails," he said.

Bikes, the officials told him, were illegal on the booby-trapped hiking trails. So he began a petition drive to make them legal.

From Central Park to suburban nature preserves, park officials say there are too many mountain bikers who seem determined to ride where they want and in the process tear up the ground and wear new trails into the terrain.

Some parks officials, like many hikers, are out of patience. "If you want to mountain bike, go to the mountains," said Henry Stern, New York City's parks commissioner, who has ordered patrols to confiscate bicycles found off the pavement in Central Park and Prospect Park.

Park officials, however, also recognize that much of the conflict — and much of the trail damage from overuse and illegal riding — comes from the fact that there are more and more mountain bikes in the region and not enough places to ride them off the road.

One result is widespread illegal riding. But another is that the relatively small number of parks like Mianus River that allow bikes are quickly deteriorating.

"Mountain biking can cause disproportionate damage if you have tremendous demand and hardly anywhere to ride," said Tim Blumenthal, the executive director of the International Mountain Bicycling Association in Boulder, Colo., which works with local groups to gain access to trails.

"In suburban areas, people get home from work and want to ride and they can only think of one place," he said. "It gets kind of boring riding the same loop, so then they see a deer trail and start riding that. And there are so many mountain bikers that it doesn't take long before that trail is absolutely clear and starts to form another, unplanned loop."

As a new outdoor season arrives, park officials are working with bicycling groups for the first time to open more trails. Their success, however, will depend on bicyclists' giving up much of the mobility that their bikes offer, for most park officials agree with hikers that bicycling on every trail is as inappropriate as bicycling on city sidewalks.

In the 73-square-mile Harriman State Park, for example, the Palisades Interstate Park Commission is preparing to allow bikes off paved roads for the first time but will restrict them to one six-mile loop, made up mainly of fire roads.

Similarly, under a statewide trail system being proposed by the New Jersey Office of Parks and Forestry,

In a New York park, carpet tacks appeared on paths used by cyclists.

mountain bikes will be largely directed to fire roads and abandoned rail beds.

At the root of the conflict, however, is not eroded trails but clashing sensibilities. It is a question of whether hiking and biking are incompatible and whether one activity ruins the other.

Many hikers say that sharing narrow trails with bicyclists speeding by is as much fun as driving along a country road crowded with moving vans. Many bicyclists say, "What's the problem?"

Neil Zimmerman, for example, is unpopular with many of his fellow hikers. As president of the New York-New Jersey Trail Conference, which maintains 1,200 miles of hiking trails, he favors giving up some trails to mountain bikes.

"Mountain biking is a legitimate activity and should be allowed," he said. "But when a hiking trail has mountain bikes on it, it's no longer a hiking trail. And many of our members fear that no matter what kind of agreement you reach, mountain bikers will go wherever they want."

Mike Pollock, a bicyclist from Pound Ridge, N.Y., said: "I get the impression that some people think walking in the woods is a better and more human use than being on a bicycle. I hike, too, and I don't see the difference. I see it the same way as bicyclists who hate motorcycles. It's a traffic issue. The world isn't getting less populated."

The ability of the two groups to share park land is being tested most severely in parks where the number of bikes is so large that trail damage is obvious to everyone.

In Stamford, where parks officials

were approached by both Mr. Pollock and hikers about trail damage in Mianus River Park, a coalition of biking, hiking and conservation groups is forming volunteer crews to repair trails and to educate park users about trail etiquette.

"We've agreed the damage results from increased use — of all kinds," said Jeff Green, a walker who helped form the coalition. "My fear is that unless we do something today, three years from now the park will be so damaged that no one will use it."

In Essex County, N.J., every trail in the 2,000-acre South Mountain Reservation is being used by bicyclists, despite an ordinance banning them, and hikers are so angry that they're refusing to cooperate in any plan to share the trail system.

Some of the narrowest trails have been sabotaged with cords tied across them, a potentially lethal hazard to bicyclists.

"Neither side would cooperate," said Patricia Sebold, an Essex County Freeholder who has been working on a compromise. "The hikers want the bikers out totally, and the bikers want total access."

A compromise being considered by the county would bar bicycles on Mondays, Tuesdays and Wednesdays but allow them on all trails the rest of the week. But the problem facing Essex County and every other park system is enforcement. Budgets have little enough money for necessary maintenance, let alone for trail police.

"Some bicycle riders see it as very acceptable, and some see it as not acceptable at all," said Pat Driscoll, the owner of the Millburn Bike Shop next to the reservation. He added that the only bicyclists he knew who were respecting the recently imposed ban on bikes in the park were himself and his employees. He now rides in the Watchung Reservation in Union County.

Mountain biking is illegal in Watchung, too, he was told. "It is?" he said. "Have you seen an ordinance?"

Many bicyclists say the solution isn't to keep bikes off trails, but to teach bicyclists to share them responsibly.

"The biggest problem we have is renegade riders, who either don't know the rules or don't care," said Mr. Blumenthal, of the International Mountain Bicycling Association. "There are bonehead hikers, too. But because of the range of a mountain bike, the negative impression that one wayward mountain biker can leave is pretty amazing."

Appendix B

Appendix B: Ecological Stewardship Plan Prepared by Ecological Stewardship Services (ESS)

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Introduction

In July 1994, Louisville Metro Parks and the Jefferson County Office of Planning and Development contracted with Ecological Stewardship Services to develop an *Ecological Stewardship Plan* (ESP) for Jefferson County Memorial Forest. The purpose of the ESP is to provide guidance in the protection, management and development of the forest based on sound ecological principles that preserve biological diversity while allowing for compatible uses such as recreation and environmental education. Specific objectives of the plan are to:

- (1) Classify the ecological communities occurring within the Preserve.
- (2) Assess ecological quality and integrity throughout the Preserve.
- (3) Identify forest management issues and provide recommendations to address major issues affecting the Preserve.
- (4) Propose assessment-based strategies for protecting the ecological integrity and biological diversity of the Preserve while allowing for compatible public uses.
- (5) Develop a Forest Preserve Corridor Design which includes protected as well as potential acquisition land needed to protect and enhance the ecological integrity of the forest.

Throughout this plan, Jefferson County Memorial Forest is referred to as the Preserve. This term is used because it is concise, it recognizes the protected status of the forest, and it encompasses not only the forest ecosystem but developed recreational areas as well.

Physical Environment

Topography, Hydrology, Geology and Soils

The Preserve is located in the hilly southwest portion of Jefferson County and northern Bullitt County, Kentucky. It is approximately 11 km (6 miles) south of the City of Louisville, the largest metropolitan area in the state. This area represents the north-westernmost extension of the Knobs Physiographic Region in Kentucky (sometimes considered a subsection of the Bluegrass Physiographic Region) (Zimmerman 1966). It is characterized by gentle to steep topography expressed as knobs, hills and sharp ridges. Elevations within the Preserve range from approximately 131 m (430 ft.) above sea level (ASL) near Pond Creek at the extreme northwest end of the Preserve, to approximately 268 m (880 ft.) ASL in the north end of Horine.

Surface drainage in the Preserve is by numerous intermittent and a few permanent tributaries of Pond Creek, including Crane Run, Bearcamp Run, Bee Lick Creek, Sugartree Run, Claybank Creek, Brier Creek, Brooks Run, Wilson Creek, Snob Creek, and Salt Block Creek. There is one stream, Brooks Run, with headwaters arising on the south slope of the extreme eastern end of the Preserve, which flows south into Floyds Fork. One large surface impoundment, Tom Wallace Lake, occurs within the Preserve. Several other small ponds are scattered throughout the area.

The Knobs within the Preserve are highly dissected and include narrow gently sloping ridges, steep side slopes, and narrow valleys. In some areas ridges are broad and flat. Some ridges rise 105 m (350 ft.) to 122 m (400 ft.) above the valley floor. The long, steep slopes cross geologic formations of shale, sandstone, and limestone, shale being dominant along the lower part of the slope, sandstone along the middle, and limestone along the upper part. The soils which overlie these formations occur as parallel strips across the slopes (Zimmerman 1966).

The soil association prevalent throughout the Preserve is the Westmoreland-Litz-Muskingum association. Westmoreland, Litz and Muskingum soils cover about 45 percent of this association; Zanesville soils cover 25 percent, and other minor soils cover about 30 percent. These soils are generally unstable with a high erosion potential which discourages development. Zanesville soils occur on most of the foot slopes. Normally they have a surface layer of friable silt loam and a subsoil of silty clay loam. Loring and Rockcastle soils are the minor soils in this association. Loring soils, found on some of the gently sloping ridges, have characteristics similar to those of Zanesville soils, but are developed in more than 42 inches of loess overlying cherty

limestone residuum. Rockcastle soils, found on a few of the steeper slopes, have a surface layer of silt loam and a subsoil of silty clay or clay developed in residuum derived from acid clay shale (Zimmerman 1966).

Flora and Fauna

Although identified as one of the last remaining "wilderness" areas in Jefferson County, no attempts have been made to inventory or study the natural resources of the Preserve. Field data from the Kentucky Breeding Bird Atlas (KBBA) project (Kentucky State Nature Preserves Commission 1995) provides the most complete listing of wildlife occurring within the Preserve and immediately adjacent Knobs Hills.

A summary of environmental resources in the Jefferson County Open Space Action Program described the landscape, flora and fauna within the Preserve in very general terms (Miller/Wihry/Lee, Inc. 1980). Oak-hickory forest communities were reported to be predominant within the forest, with moist slopes supporting a beech-maple-tulip poplar community, and ridgetops supporting a dry oak or oak-pine forest. The fauna listed in the report are those common to forests within this region, such as opossum, raccoon, and grey squirrel. Similarly, only a few species of birds were listed. No mention was made of rare or endangered species.

According to a 1992 report submitted by the district Service Forester with the Kentucky Division of Forestry (Lewis 1992), the overall quality of the forest is considered to be good. The report stated that there appeared to be "an abundance of wildlife...including game animals such as deer and turkey." It further stated that the general absence of exposed soil resulted in very little erosion with excellent watershed characteristics. Sample plots had a total basal area of 65.0 square feet with over 70% attributed to sawtimber 12 inches or more in dbh. Red oaks, chestnut oak, and white oak accounted for most of the sawtimber species composition.

Land Use and Ecological Integrity

History of Land Use and Management

The forest Preserve consists of many tracts of land acquired over time through purchases and donations. Prior to acquisition, a variety of land uses occurred on these lands, including timber harvest, crop production, grazing, residential development, and recreational activities such as hunting and hiking. Recreation and sustained-yield timber production were the original management objectives for the Preserve (Louisville and Jefferson County Planning Commission 1980). Recreation has been an ongoing use, and a number of facilities and programs have been established for this purpose.

The history of land use throughout the Preserve is not well documented, but examination of old aerial photographs and discussions with local residents suggest that high-intensity uses predominated. Prior to the establishment of the Preserve, most of the forest was intensively logged, both by clearcutting and selective high-grading, as well as heavily grazed by livestock. Many of the broader ridgetops were at one time cleared and subsequently converted to pasture. Some of these were later planted in monotypic stands of pine or mixed stands of hardwood and pine, while others were left to regenerate and today exist in various stages of early successional growth. Uncontrolled fires have damaged some areas of the forest (Goodwin, pers. comm.).

Current Land Use and Management

Management objectives for the Preserve have been modified in recent years to give full consideration to preserving natural resource and wilderness as well as recreational values, and timber production is no longer considered to be a legitimate use of these public lands.

Present recreation management policy allows for a diversity of high and low impact uses. Since its acquisition, a significant portion of Horine has been developed for recreational and educational purposes. Developments include a welcome center, a nature center, a conference center, individual and group campsites, tepee campsites, maintenance buildings, a climbing tower, parking lots, and a system of access roads (primarily on old logging roads). These developments are concentrated on the previously-cleared ridges while most of the slopes remain well forested.

Portions of Tom Wallace and Forest View have also been developed for recreational purposes. Developments include Tom Wallace lake, picnic areas, parking lots, hiking trails, and a playground. All of these areas receive high visitor use, and use is projected to increase substantially in the near future (Goodwin, pers. comm.). Fishing is a popular activity at the lake, and uncontrolled visitor use of the shoreline has caused some damage to vegetation and soils.

The Preserve is currently about 95 percent forested. The condition of the forest today reflects its land use history, and is not consistent throughout the Preserve. Generally, the forest can be considered as recovering second-growth with quality ranging from very poor to good. There is presently no timber management policy or program for the forest, but some tree planting has been done at Horine, primarily the establishment of pine and mixed hardwood plantations. Overall, the forest is in good condition, but it will be many years before the forest can be considered as fully recovered.

Non-forest lands are scattered throughout the Preserve, mostly on the broad and more level ridges. These lands are used primarily for high impact (developed) recreational and educational activities, as described above (Horine, Tom Wallace, and Forest View). These areas are typically maintained by a high intensity regimen of mowing. Exceptions are areas used to demonstrate the principles of ecological succession and a few wildlife food plots. Other non-forest lands include pastures and old (unmanaged) fields in various stages of early succession from herbaceous to early woody development (eg., Miller Hill in the southwestern-most section). Grazing is allowed on at least one pasture within the Preserve.

Low impact (primitive) recreational activities are available elsewhere in the forest. Hiking trails occur throughout the forest, and primitive campsites are accessible only by trail. Detrimental impacts to the forest which have resulted from camping activities include fire damage, unsightly ash pits, cutting of trees for firewood, soil compaction, and littering. Horseback riding is usually considered to be a low impact activity. Several trails have been designated exclusively for horseback riding, but hiking trails have been used for this activity as well. Horses impact trails by compacting soils which causes the soil surface to become rough, poorly drained, and eroded.

Although not allowed within the Preserve, off-road vehicles such as four-wheelers and dirt bikes gain access to the forest along paved roads which dissect the Preserve (Louisville and Jefferson County Planning Commission 1980). This activity can have severe impacts on vegetation and soils, especially on steep slopes. Other activities which present safety or resource hazards are target shooting and paint balling. Illegal dumping has also been a problem in the past.

Forest Fragmentation

Past and present land use practices within the Preserve contribute to forest fragmentation. Forest fragmentation degrades the wilderness quality of the Forest, decreases ecological integrity, and can reduce biological diversity by restricting gene flow, reducing habitat size, and increasing competition from non-indigenous and early successional, or edge, species such as Cowbirds.

Migrant songbirds, many of which require "interior" forest habitat, are among the most threatened with extinction nationwide and should be given high priority in any management strategy devised for the Preserve. Cowbird nest parasitism is thought to be a major factor in the decline of many migrant songbirds. Cowbirds nest primarily along forest edges, but their nesting activities may extend as far as 300 m (984 ft.) into the forest interior (Robinson and Hoover 1995). In order to provide a minimum of 200 m (656 ft.) depth of forest "interior" nesting conditions and reduce nest parasitism on migrant songbirds, the width of forest ecosystems should be at least 800 m (2,625 ft.) in depth wherever possible.

Forested "corridors" of various dimensions are often used to connect disjunct tracts of forest. These corridors allow movement of wildlife and plants between isolated tracts of forest. Riparian forests (ie., forested banks of rivers and streams) serve as important corridors through agricultural and other developed landscapes, as do wooded fencerows enlarged by tree planting. Most interior songbird species will not nest in forests less than 50 m (164 ft.) wide. Therefore, forested corridors connecting distjunct tracts of forest should be either less than 50 m in width (making them unsuitable for songbirds) or greater than 500 m (1,640 ft.) in width (to provide forest interior unsuitable for cowbirds).

Major causes of forest fragmentation in this area are residential development on private lands and recreational land use management. The discontinuous pattern of County land ownership, a sluggish land acquisition program, and the absence of regional zoning or other land use controls have contributed to the development of private lands in and around the Preserve. Residential developments which involve clearcutting or clearing of land are increasingly fragmenting the forest ecosystem. Additionally, some landowners sell large tracts of forest to developers intending to subdivide the land into small residential lots. Within the Preserve, high intensity landscape management practices used to maintain open areas in early successional stages cause further forest fragmentation.

Ecological Assessment Methods

Baseline natural resources information was compiled from existing sources, including soil surveys, topographic quadrangle maps, geologic maps, databases, published and unpublished reports, contact with local experts, and other available sources.

Ecological communities were delineated using a classification system developed by the Kentucky State Nature Preserves Commission (Evans 1991). This system is based on the associations of overstory and understory species which characterize each community, as well as on soils, geologic substrate, topography, and physiography.

Because of the large amount and fragmented pattern of the forest and limited funding available for field inventory, aerial photograph interpretation was largely relied upon to delineate ecological communities, assess forest quality, and identify current land uses. Recent aerial photographs of the entire project area, taken during the 1993 growing season, were purchased for this purpose. Older aerial photographs (1937, 1951, 1956 and 1960) were used to identify past land uses and changes to the forest over time. Aerial photograph interpretation has some limitations. The scale used does not support the detection of small-scale natural features which may be significant, nor the delineation of community types which may be minor in extent. All interpretation data was recorded on 7.5-minute topographic quadrangle maps for use in field surveys.

Field surveys were conducted to verify aerial photo interpretations, classify and map ecological communities, and assess forest quality. As it was beyond the intent or scope of this assessment to survey the entire Preserve or to field check all potentially significant natural features, areas of contiguous mature forest, xeric forest/barrens associations, exposed bedrock, and other large-scale natural features received priority during surveys. Characteristic tree and shrub species were recorded and used in the delineation of communities. Although it was beyond the scope of this project to conduct a floristic or faunistic inventory within each community type, herbaceous plants and birds detected during field visits were also recorded. Survey information was transferred to topographic maps and used to produce base and overlay maps of the Preserve. The boundary lines of the community types are approximations, as communities grade into each other and normally do not have distinct boundaries.

Ecological Assessment Categories

All natural forest communities were rated as to their overall ecological integrity or quality. This is a qualitative ranking system that compares existing forest conditions to the presumed original (pre-European-American settlement) forest conditions. The strategy, which has been adapted from that used in the Kentucky Natural Heritage Program (Kentucky State Nature Preserves Commission 1991), utilizes four categories or classes of ecological integrity (A-D) as summarized below. The graphic information prepared for this plan will be entered into the Jefferson County Geographic Information System (GIS) to produce maps for the Stewardship Plan.

- (A) Old-Growth Forest. An essentially unlogged and undisturbed (or thoroughly recovered from past disturbance) natural community with high ecological integrity or quality, and high wilderness, research, and educational values;
- (B) Maturing Forest. Previously (lightly to moderately) disturbed area (usually as a result of logging) highly representative of a community type, having high to moderate wilderness, research and educational values;
- (C) Recovering Forest. Moderately disturbed area recovering from past heavy disturbance; some level of restoration (usually the eradication of exotic vegetation which invades disturbed areas) is frequently needed to restore ecological integrity;
- (D) Young Second-Growth Forest. Severely disturbed area with minimal natural or interpretive value. May require extensive reforestation or restoration efforts and many decades to restore ecological quality.

Significant Resource Areas (SRA's)

In addition to assessing overall ecological integrity, the assessment further recognized areas having ecological significance as *Significant Resource Areas (SRA's)*. These areas include: (1) habitat or potential habitat for federal or state-monitored species which are endangered, threatened or of special concern; (2) areas having unique or outstanding natural resources or features; and (3) areas having at least one ecological community which is highly representative of a regional community type and/or which occurs in a contiguous tract.

Forest Preserve Corridor Design

As a critical part of this assessment, a Forest Preserve Corridor (hereafter referred to as the Corridor) was designed (*Land Acquisition Priorities Overlay Map*, Exhibit C). The Corridor is a landscape-scale area that includes existing Preserve lands as well as adjacent lands needed to protect and restore the ecological integrity of the forest ecosystem. This concept roughly coincides with the "forest corridor" described in the Jefferson County Forest Project (Louisville and Jefferson County Planning Commission 1980).

Results from the ecological assessment and aerial photograph interpretation were used to draw proposed Corridor boundary lines onto a large-scale (1 in. = 1000 ft.) acetate map overlay. These boundaries were then transferred to smaller scale (1 in. = 200 ft.) GIS maps to increase accuracy. Corridor design boundaries do not follow property tract lines, but were drawn to maximize interior forest area and make more defensible (ie., enforceable) boundaries. By necessity, a number of inholdings and private property corridors exist within the boundaries. It is recognized that these developments are probably here to stay, and these landowners should be targeted for information and education efforts that will make them good forest neighbors.

Ecological Assessment Results

Natural Community Classifications

Four natural forest communities and a non-forest area were identified and delineated on the *Ecological Communities Map* (Exhibit A). The communities and non-forest area are described below; plant species which characterize each community are listed in Appendix A. A check-list of birds recorded in the KBBA Valley Station and Brooks topographic quadrangle blocks or during the assessment appears in Appendix C.

Acidic Mesophytic Forest

The mesophytic forest community occupies upland areas such as ravines and protected slopes. The soils are generally moist, moderately well-drained, and moderately shallow to moderately deep over sandstone, chert, or shales or colluvium derived from them. The understory and ground cover are moderately dense to somewhat sparse. The canopy trees in this community can attain impressive dimensions with well-developed vertical stratification in the understory, both of which contribute to the highly aesthetic quality of this forest community. North and east-facing slopes characteristically support a high diversity of spring wildflowers. Characteristic overstory species include beech, sugar maple, white oak, red oak, tulip poplar, and cucumber magnolia with flowering dogwood, paw paw, maple-leaved viburnum, spicebush, hornbeam, ironwood, and hearts-a-bursting in the understory.

The Alluvial Forest Community occurs on level to gently sloping ground in the narrow floodplains of small to medium size streams. The soils are generally deep and poorly to fairly well drained. Characteristic species are tolerant of seasonal or intermittent flooding, and include sycamore, box elder, green ash, red maple, and tulip poplar. Within the Preserve, this community was closely associated with the mesophytic forest and was too poorly developed and limited in extent to map as a separate community.

Acidic Sub-Xeric Forest

An acidic sub-xeric forest community occupies mid and upper slopes of hills and ridges and other relatively dry upland areas over non-calcareous sandstone, shales and siltstones. The soils are generally well-drained and moderately shallow to deep. The dominant species are mainly oak and oak-hickory with a mostly complete canopy cover. The understory and ground cover, which are not well developed and may appear sparse in some areas, often contain interesting species not found elsewhere in the Forest, including sourwood, mountain laurel, low-bush cranberry, and dittany. Canopy trees in this community usually do not achieve the dimensions of those in the mesophytic community. This community often grades into the xeric forest and barrens communities on very dry exposed sites. Characteristic overstory species include white oak, black oak, chestnut oak, southern red oak, scarlet oak, pignut hickory, mockernut hickory, and sweet pignut hickory.

Acidic Xeric Forest

The xeric forest community often exists as small inclusions or as narrow bands within the subxeric forest, some of which were too small or limited in extent to map at the scale used for this project. It often occurs in association with the **shale barrens community** and for this reason they were mapped as a single unit (Xeric Forest/Barrens) on the *Ecological Communities Map*.

Xeric forests occur on ridgetops and moderately steep to steep upper slopes and other areas with shallow, rapidly drained acidic soils, on south and west exposures. The soils are generally shallow over parent material of silstones or shales. The bedrock is usually near the surface with small outcrops being common. Canopy trees are typically stunted in form and extremely slow growing due to extreme environmental conditions. The tree canopy is moderately open (70-90% cover), and the understory is poorly developed with widely scattered shrubs and a sparse ground cover of scattered herbs and grasses with mosses and lichens being common. Characteristic trees include post oak, blackjack oak, and chestnut oak with highbush and lowbush blueberry in the understory.

The Pine-Oak Community occurs as small, isolated stands on ridges and other dry, exposed sites. The characteristic overstory tree is Virginia pine, which is typically mixed with the same hardwood species found in the xeric community. Within the Preserve, it was closely associated with the Xeric Forest and Barrens communities and was too poorly developed and limited in extent to map as a separate community. The canopy is somewhat more open, and the ground cover may contain many of the species commonly associated with the barrens community.

Shale Barrens

The Shale Barrens Community is distinguished as areas of exposed bedrock and shallow soils with an open tree canopy of chestnut oak and post oak and an unusual ground cover of prairie grasses and forbs such as blazing star, birdfoot violet, and wood mint. Within the Preserve, it was closely associated with the Xeric Forest Community and was too poorly developed and limited in extent to map as a separate community. Because of their limited extent within the forest and their unique species composition, well developed barrens should be designated as SRA's. In the absence of fire, barrens may develop into xeric forest. Prescribed fire should be considered as a potential management practice in the barrens.

Non-Forest Areas

Non-forest areas of the Preserve were designated as **Anthropogenic Areas**. These are areas of past or present disturbance that do not support a natural forest community. They are dominated by anthropogenic features such as roads, buildings, and other structures and include all developed areas, areas maintained by mowing or other routine disturbance, pasture and hay lands, old fields, and cleared land converted to tree plantations. Old fields include fields dominated by grasses and forbs as well as dense shrubby thickets.

Ecological Assessments

All of the natural communities within the forest were assessed as to their ecological quality (*Ecological Assessment Overlay Map Exhibit B*). The assessment identified no A-quality forest and a very limited area of B-quality forest. The majority of the forest is rated as C or D-quality. The predominance of C and D-quality forest is due to past timber management practices that degraded the quality of the ecosystem. In some areas categories were combined, indicating that the forest stand is either in the high or low range of the category (ie., C/B is high C-quality, C/D is low C-quality). Although most of the xeric forest/barrens are of a C/B quality, this is not indicated on the maps because of the scale and small size of the mapped xeric forest/barrens community. The assessment findings are summarized below.

Category A: Old-Growth Forest

There are no stands of A-quality (old-growth) forest within the Preserve.

Category B: Mature Forest

Small-scale (ie., unmappable) areas of B-quality forest occur scattered in the Preserve, mainly in the region between Scott Gap Road and Bearcamp Road. One significant tract of approximately 60 ha (148 acres) is delineated as B-quality forest. This area encompasses the watershed of Headley Hollow, in the southwestern portion of the Preserve, and includes approximately 15 ha (37 acres) of B-quality mesophytic forest on the steep lower slopes of a south-facing ravine, and about 45 ha (111 acres) of B/C-quality subxeric forest on upper slopes and ridges. Although previously disturbed by some selective logging activities, the communities are well-developed and highly representative of the region. The mesophytic community supports a high diversity of trees and wildflowers, and the canopy trees often reach impressive dimensions, with a dbh (diameter at breast height) of 1 m (3.28 ft.) or greater and very large,

spreading crowns. In addition to its high ecological integrity, this area has high aesthetic and interpretive values.

Category C: Recovering Forest

Most of the Preserve is designated as C-quality forest. This category includes most undeveloped portions of the forest which are characterized by maturing, second-growth forest that exhibits various degrees of recent or past disturbance. Species diversity is often reduced as a result of past intensive logging or other land uses. Generally, restoration of these areas requires localized eradication and control of exotic vegetation, tree planting to improve species composition, and soil stabilization on eroding trails and other disturbed soils. Botanical and soil surveys are needed to identify specific areas requiring restoration efforts.

Category D: Young Second-Growth Forest

D-quality forest occurs in areas of fairly recent and intensive past disturbance. Most of this forest was cleared within the past 40 years and is regenerating through natural succession.

Significant Resource Areas.

Two areas of forest have been identified as Significant Resource Areas (SRA's) as delineated on the *Ecological Communities Map* (Exhibit A). These areas qualify for this designation because they meet two of the three criteria established for this assessment, including: (1) potential habitat for state-monitored species which are endangered, threatened or of special concern; and (2) at least one ecological community which is highly representative of a regional community type and which occurs in a large, contiguous tract.

The White Oak Ridge SRA is located in the Horine Section. It consists of approximately 232 ha (574 acres) of sub-xeric and mesophytic forest community types. Although most of this area was assessed as C-quality forest it is significant because, due to its roughly circular shape and the absence of paved roads or other permanent developments, it probably contains the largest area of "interior" forest in the Preserve.

The Headley Hollow SRA consists of approximately 405 ha (1,000 acres) of sub-xeric and mesophytic forest community types, with minor, scattered xeric forest/barrens intrusions. It includes all Preserve land located between Scott Gap Road and Bearcamp Road. It contains most of the mature areas of forest and appears to be in the best condition overall. Because of its

ecological integrity and quality, this area has the best potential for dedication as a Kentucky State Nature Preserve.

Endangered and Threatened Species Habitats

There are no documented occurrences of endangered, threatened or special concern species of plants or animals within the Preserve (Kentucky Department of Fish and Wildlife Resources Wildlife Information System 1994, Kentucky State Nature Preserves Natural Heritage Database 1994). Additionally, the latter database identifies no state-monitored ecological communities as occurring within the Preserve. Suitable potential habitat does exist, however, for the following state-monitored species known to occur in Bullitt or Jefferson counties:

Agrimonia gryposepala (Tall hairy groovebur). Rich mesic woods, thickets, woodland borders.

Castanea pumila var *pumila* (Allegheny chinkapin). Dry woods on sandy or acid soil.

Malus loensis (Iowa crabapple). Open oak woods and clearings.

Melanthium woodii (False hellebore). Rich dry or mesic woods.

Rubus whartoniae (Wharton's dewberry). Dry, shaly soil in disturbed sites or along edges of dry woods.

Stellaria longifolia (Longleaf stitchwort). Mesic woods.

Botanical inventories should be conducted within all communities, and any areas supporting these or other rare species should be designated as SRA's.

Ecological Stewardship Issues and Recommendations

The following issues and recommendations were developed based on the results of the ecological assessment and on established principles of ecological stewardship and management.

1. FOREST STEWARDSHIP

Issue 1.1: Management Goal

There is no clearly stated and accepted mission statement providing umbrella direction in the overall management and development of the Preserve.

Recommendations:

Develop an umbrella mission or policy statement with emphasis on ecosystem management and conservation of biodiversity. A suggested mission statement for the Preserve is: *To preserve the wilderness character, conserve biological diversity, and afford high quality outdoor recreational and educational opportunities.* All strategies for protection, management and development should be planned and implemented in a manner consistent with the principles of ecosystem stewardship which promote sustaining biological diversity within the Forest, the county, the region, and the Commonwealth of Kentucky.

Issue 1.2: Natural Resources Data

Natural resources data has never been systematically collected within the Preserve. This information is needed to guide future land use and development and to use in programs that will educate visitors about the natural history and heritage of the Preserve.

Recommendations:

- Biological inventories should be conducted throughout the forest, with B-quality forest and designated SRA's receiving the highest priority for study. Potential SRA's and other areas having potential habitat for rare species should receive the second highest priority for inventory efforts. Both botanical and wildlife inventories should be conducted.

- Local birding groups (Beckman Bird Club, Louisville Audubon Society) should be encouraged to conduct breeding bird suveys and Christmas bird counts.
- Botanical inventories should be conducted throughout the growing season prior to initiating any construction activities (ie, trails, road and utility rights-of-way).

Issue 1.3: Ecosystem Integrity and Biological Diversity

The integrity of the forest ecosystem has been compromised by various types of land use activities that cause forest fragmentation and reduce the amount of mature forest habitat. There is an abundance of early successional and edge habitat within the Forest corridor resulting from residential development, farming, and other uses which cause loss of forest cover.

Recommendations:

The following strategies should be used within the Preserve to protect and restore the integrity of the forest ecosystem:

- Management practices that create edges/openings should be strictly avoided within contiguous tracts of forest. This includes wildlife food plots and "wildlife openings".
- Land acquisition and other less than fee simple methods should be used wherever possible to protect forest resources and protect/increase the contiguous pattern of protected forest area. The Forest Reserve (recommended below) and all Category B or C areas with high development potential should receive priority for acquisition.
- Where fee simple acquisition is not possible, purchase or donation of conservation easements should be used.
- Zoning or regulations should be considered as a last resort if other types of protection are not feasible. Such restrictions often meet with strong opposition from local residents and landowners, and enforcement is often difficult and costly.
- The largest tracts of undeveloped forest land should be set aside as a Forest Reserve. No new developments should be allowed which would fragment this area below the existing size and extent. Land acquisition should be used to connect these tracts. Where fee simple land acquisition is not possible, easement donations or purchases should be used.

- Road and utility rights-of-way construction should be routed outside of the Forest corridor. If this is not possible, rights-of-way should be routed through Category D areas or along the perimeters of forested tracts to avoid further forest fragmentation. Rights-of-way through forest should be planted with native species to avoid introduction of invasive exotics into the forest ecosystem.

Issue 1.4: Ecological Restoration

1.4.1. All of the forest has been impacted by past land use activities. In areas where these activities were of low intensity, the forest has substantially recovered. Other areas require some restoration efforts in order to improve their ecological quality.

Recommendations:

- Areas of forest impacted by invasive exotic vegetation should be identified, and an eradication and control program should be implemented in these areas.
- B-quality forest and SRA's should receive priority for restoration activities.
- Forest parcels should be as large as possible to provide habitat for forest "interior" species, particularly migrant songbirds. A minimum width of 16 km (5,250 ft.) should be used as a guideline, as this would provide the minimum amount of "interior" habitat considered necessary to support a diversity of breeding neotropical songbirds.
- Contiguous forest parcels should be as close to circular in shape as possible to protect the forest ecosystem from invasive exotic weeds and provide the maximum amount of "interior" habitat of value to many wildlife species. Preserve shapes which maximize interior area are usually round or square rather than elongate in shape, and straight boundaries are preferable to irregularly shaped ones.
- Forested corridors used to connect disjunct forest tracts should be either less than 50 m (164 ft.) or greater than 500 m (1640 ft.) (800 m preferably) wide to minimize impacts on songbirds caused by cowbirds and other nest predators. Management activities that would reduce the width of any forested corridor below 500 m should be avoided.

- Reforestation should be used where possible to improve the dimensions of contiguous parcels of forest and to increase the width of existing forested corridors that connect disjunct forested parcels. Top priority should be given to lands adjacent to or within existing large tracts. Lowest priority are isolated tracts and narrow corridors.
- A diversity of native species should be utilized in all restoration activities. The diversity used should be as near as possible to the diversity found in a comparable natural community, ie., tallgrass prairie, oak barrens, or mesophytic forest.
- Tree species used for reforestation should be selected from among those listed for each natural community in Appendix A of this plan and should be characteristic of the community type(s) adapted to the site. Both hard and soft mass-producing species should be included, as well as oaks from both the white and black oak groups.
- Only native (indigenous) species of plants should be used to revegetate areas impacted by construction activities.
- Areas impacted by invasive exotic plants should be mapped, and an eradication and control program should be implemented. Below is a list of some of the most troublesome exotic species which were either observed during this study, or which are becoming widespread throughout Kentucky and should be searched for during future inventory efforts:

<i>Alliaria petiolata</i>	An aggressive biennial herb that dominates the ground layer in lightly to heavily disturbed forests and woodlands.
<i>Eleagnus</i> spp.	Both autumn and Russian olive are aggressive woody plants that invade forest, especially along edges.
<i>Euonymus fortunei</i>	Although not observed, this cultivar is increasingly invading forest areas throughout Kentucky and should be looked for.
<i>Ligustrum</i> sp.	Privet is a commonly planted hedge plant that escapes cultivation and overtakes the understory in forests and woodlands.
<i>Lonicera</i> spp.	Shrubby honeysuckles which form dense thickets in the understory, especially within 50 m of forest edges.
<i>Lonicera japonica</i>	An aggressive vine in disturbed forest and forest edges.
<i>Microstegia vimining</i>	An aggressive grass which sometimes dominates the ground layer in the mesophytic forest especially long trails and old logging roads.

Issue 1.5: Open Space Management

1.5.1. Open space refers to areas where the ground is maintained, usually by mowing, in a closely manicured or unweedy condition, either beneath trees or in the open. Large areas of Horine are maintained by mowing with no clearly stated purpose or intended use requiring open space. Such areas afford poor wildlife habitat, are costly to maintain, fragment the forest, and provide no interpretive opportunities.

Recommendations:

- Mowing as a management practice should be limited to areas used for specified recreational activities requiring open space, such as:
 - picnic and playground areas, cemeteries
 - grass-surfaced trails and access to trailheads
 - team sports such as soccer and baseball
 - competitive walks or runs
 - staging areas for group activities such as hiking, camping
 - maintenance of the existing memorial tree plantation
 - as an edging along public access roads
 - as needed around buildings and group or team recreational facilities
- Wherever possible, mowing should be delayed until May or June to minimize mortality of early ground nesting bird species.
- Transition zones between forested and non-forested areas managed for recreation should be converted to grassland and shrub vegetation. Diverse early successional habitat provides food, cover and nest sites for many species, may reduce the negative impacts of forest edge on the ecosystem, and will and enhance the aesthetic quality of the forest edge. Transition zones should average 30 m (98 ft.) to 50 m (164 ft.) in width. A shrubby border of native plants can also be used in these areas; shrub borders should be at least 10 m (33 ft.) in width.
- Areas not used for the open-space activities listed above should be either:
 - a. Restored to forest through natural succession or tree planting. Both methods provide interpretive opportunities. Natural succession has minimal costs for establishment and maintenance and provides weedy successional habitat for wildlife. Tree planting is initially more expensive, but accelerates the

restoration process and provides the opportunity to establish a good diversity of quality tree species. A combination of both methods, planting trees into successional growth, is often most desirable; or,

- b. Restored to native prairie. It may be desirable to maintain certain open areas for purposes other than recreation. Such areas should be converted to diverse native prairie vegetation to provide early successional wildlife habitat, conserve biodiversity, protect soil and water quality, and provide unique interpretive opportunities. Such areas would attract birds and butterflies for observation; provide early successional habitat for wildlife; eliminate the need for annual food plots which are costly and utilize exotic species; and increase the natural beauty of the landscape. Maintenance would be reduced to a single semi-annual mowing or controlled burn.

1.5.2. Some open lands on the Preserve are maintained as pasture by haying or livestock grazing. Such areas not only fragment the forest ecosystem, but are planted in non-native cool season grasses which afford poor quality wildlife habitat. Grazing causes additional impacts including soil compaction, soil erosion, invasion by agricultural weeds, and water quality degradation.

Recommendations:

Pasture lands should be restored to forest through natural succession or an active reforestation. A second option would be establishment of prairie to increase habitat diversity and quality. Existing ponds should be retained for use by wildlife. No grazing should be allowed on County-owned lands.

Issue 1.6: Impoundments

There are a number of small impoundments on the Preserve. Tom Wallace Lake, the largest impoundment, provides opportunities for fishing and birdwatching. Smaller ponds, such as Sharon Pond, have potential value for outdoor education concerning aquatic systems.

Recommendations:

The following practices may be used to restore the environmental quality and interpretive value of impoundments:

- Regrade steep banks to a more gradual contour allowing for the development of saturation zones supporting emergent wetland vegetation.
- Stabilize eroding banks with a diversity of attractive wetland plants; plantings of trees and shrubs along the banks discourages visitor use that can compact soils and cause erosion.
- Route hiking trails a minimum of 10 m (33 ft.) from the shoreline.
- Construct a boardwalk along the banks and extending over Sharon Pond to provide access for wildlife observation and educational uses.
- Retain forest ponds for use by wildlife.

2. RECREATION AND OUTDOOR EDUCATION

Issue 2.1: Trail Erosion.

In some areas abandoned roads and steep trails are experiencing moderate to severe erosion. An inventory of trail conditions is currently in progress. This information should be useful in prioritizing trail closure and reconstruction activities that will ensure visitor safety while protecting natural resources. Excessive erosion was noted in the picnic area at Paul Yost; on an abandoned roadbed near the old log cabin at Horine; generally throughout the forest where trails were not routed on the contours.

Recommendations:

- Trails cause detrimental impacts on natural resources, including loss of vegetation, soil compaction and erosion, and changes in drainage. Trail systems should be well planned and be kept to the minimum needed to provide access for specified recreational activities.
- Trails should be routed along topographic contours to minimize erosion and require minimal cut and fill for stability. Steep slopes, erodible soils and streambeds should be avoided. Eroding trails should be closed to foot traffic and reclaimed by planting native trees and shrubs.
- Brush piles (preferable in back country areas), gates or other barriers should be constructed as necessary to prevent access and use by off-road vehicles and horses.

- Trails should be designed with input from the naturalist and a landscape architect, and should be consistent with "Best Trail Construction Guidelines" as used by the National Park Service.
- Trails should be routed so as to avoid populations of rare or sensitive plants or animals. Prior to trail construction, a botanical inventory of the proposed routing should be conducted by a professional field botanist during the growing season.
- Pedestrian trails should be kept separate from horse trails. Signs prohibiting horses should be installed wherever confusion could result.
- Trails in Forest View should be reduced in extent to prevent confusion and to protect natural resources.

Issue 2.2: Trail signing.

Trail signing is often inconsistent and confusing to visitors.

Recommendations:

- Well-marked trails help direct recreational use into appropriate areas and protect natural resources. Use permanent icons to clearly and consistently mark trails to make them easy to identify and which refer directly to accurate trail maps.
- Locate small parking lots for vehicles at trailheads and wherever a marked trail crosses a road.
- Provide directional signing at each trailhead and wherever trails intersect.

Issue 2.3: Visitor orientation.

Visitors do not have access to accurate information on trails, facilities, educational programs and other services.

Recommendations:

- Provide accurate trail maps; check-lists of wildflowers, birds, etc.; and descriptions of visitor services and programs at the Welcome Center and Nature

Center, and at trailheads. Each trailhead should feature a weather-proof box with hinged lid containing: (1) a general brochure describing the Forest, programs, and services; (2) a brochure describing the trails system; and (3) check-lists of birds, wildflowers, etc.

- Have a staff position, located at the Welcome Center, with responsibilities which include dissemination of general information about Preserve facilities, services and programs, and handling reservations for group recreation, corporate team activities, and use of the Convention Center.
- Use radio announcements to disseminate information about rules and regulations, programs, facilities, and services for the Preserve, similar to that utilized by tourism agencies.
- Trail maps should be topographically-based, and should include one map illustrating the names, routes, and difficulty for all trails in the Preserve, and a detailed map of each trail with notations as to points of interest along the route.

Issue 2.4: Self-guided Trails.

Self-guided trails could be used to provide educational opportunities for individuals and school groups.

Recommendations:

Develop a self-guided trail system, with a trailhead at the Welcome Center. The trail should traverse different land uses and ecological communities with numbered points of interest corresponding to a map in a trail brochure.

Issue 2.5: Recreational Compatibility

Some recreational uses in the past have been incompatible with forest stewardship or with each other. While there will continue to be pressure on the Preserve to provide many forms of high and low intensity recreational uses, those which cause unavoidable impacts on the integrity or quality of the forest ecosystem are not consistent with management objectives, and therefore are not appropriate activities throughout most of the forest.

Recommendations:

- All recreational activities should be compatible with the primary mission statement for the forest and with preserving the ecological quality. Recreational activities within designated areas of the forest should be compatible with each other.
- Horseback riding and mountain biking are not normally allowed within state nature preserves because of the potentially harmful impacts these activities have on natural resources. If allowed within the Preserve, these activities should be restricted to Forest View.
- Horseback riding and mountain biking trails should be separate from hiking trails for safety and maintenance purposes. These trails should be routed through areas with minimal potential for erosion and safety hazards.
- Hunting is frequently considered inappropriate in a preserve, especially by the non-hunting public. Hunting is not generally considered to be compatible with hiking for safety reasons. Areas open for hunting must be closed to other types of recreation (except for camping by hunters), including research and educational uses, during the hunting season. Because this is an exclusionary type of recreation, we do not recommend it as a compatible use. If hunting is allowed, however, a game census should be conducted and harvest limits set, possibly using a special permitting system that limits hunter numbers.
- Off-road vehicle use is not compatible with maintaining the wilderness character of the Preserve and can damage natural resources. Points of egress and ingress should be determined and effective barriers installed.
- Motorized boating and recreational vehicle (RV) camping are not compatible uses within the Preserve.
- Lodges, sport courts and fields, swimming pools and other high impact recreational amenities should be located outside of the Preserve.
- Collection of plants or animals should be allowed only for legitimate research or educational purposes and only upon the issuance of a special permit; collection of rare or endangered species should be prohibited.
- Additional recommendations for recreational activities compatible with ecological quality are provided in the following section, Ecological Assessment-Based

Recommendations.

Issue 2.6: Picnic Facilities

There are no water fountains or restroom facilities at the Forest View picnic area. Erosion problems result when visitors do not use designated trails into the woods.

Recommendation:

Provide water fountains and latrines at Forest View picnic area. Stabilize heavily eroded areas and erect barriers to prevent visitor use of these areas.

Issue 2.7: Standardization of Preserve Names

There is presently inconsistency in the naming of Preserve sub-areas (eg., Forest View = Mitch McConnell=Paul Yost).

Recommendation:

Adopt the names of sub-areas as used on the GIS maps prepared for this project. Names should be consistent and should reflect local physical features (eg., White Oak Ridge) to the greatest extent possible.

Issue 2.8: Standardization of Recreation Structures

Recreation structures are of many varying designs and materials.

Recommendations:

Standardize recreation structures used throughout the Forest. They should be rustic in appearance and harmonize with the surrounding forest.

3. Landscaping

Landscaping around recreational and interpretive facilities does not enhance interpretive opportunities or demonstrate good conservation practices that minimize use of natural resources.

Recommendations:

Landscaping around recreational and interpretive facilities should provide multiple benefits of beautification, soil and water protection, resource conservation, and environmental education. Native plants are ideally suited to these purposes and require minimum maintenance as compared to most cultivars. Additionally, there are strong federal directives, likely to be mirrored by similar state directives in the near future, to use native plants on all public lands as possible and appropriate.

- Landscaping around recreational and interpretive facilities should incorporate native plants to the extent possible to provide interpretive opportunities. Such plantings, when correctly labeled or interpreted by staff naturalists, help visitors in identification of the local forest flora, learn about ecological communities and relationships, and demonstrate the principles and practices of conservation landscaping.
- Native landscaping should ideally utilize nursery-propagated plants of Kentucky genotype, or plants salvaged from construction sites within the region.
- "Native" should include only those species known or believed to have been a component of the ecological communities in the forest prior to European settlement. It should not include species naturalized from Europe or Asia, cultivars, or wildflowers native to regions outside the eastern United States except as may be desirable for educational purposes.

4. Community Relations

There is no aggressive program to involve community leaders and neighbors in the protection and management of the Preserve.

Recommendations:

- Re-activate the Forest Committee and expand it to include adjacent landowners and local community leaders along with representatives of conservation groups, The Nature Conservancy, natural resources agencies, Preserve managers and staff, and other interested parties.

- Develop a quarterly newsletter about the Preserve and disseminate to the community at large and specifically to neighboring and inholding landowners. Suggested information for inclusion in the newsletter is:

- Outstanding and unique values of the Preserve.
- The purpose and primary management goals for the Preserve.
- Rules, regulations and policies pertaining to the Preserve.
- The availability of Preserve programs, services and facilities.
- Opportunities available to volunteers to assist with Preserve programs and restoration efforts.
- Promotion of effective forest stewardship practices and government programs that provide assistance to private landowners.
- Preserve Committee activities.
- Conservation easements, registry programs, and other options for protecting forestland.

Ecological Assessment-Based Protection Strategies

Good forest stewardship is based on sound principles of ecosystem management that conserve biodiversity and result in sustainable landscapes. Ecosystem management uses a landscape-scale approach which takes into account the role of each site in sustaining the biodiversity unique to the region. The goal is not to cram as much biodiversity as possible onto a single management parcel, but to assure that natural communities on each parcel are of sufficient dimensions and quality, either alone or combined with additional parcels, to contribute to the biodiversity of the region.

Forest management practices which emphasize maintenance and restoration of ecological integrity can be used to preserve wilderness character, conserve biological diversity, and provide opportunities for compatible public uses of the forest. The ecological assessments resulting from this planning effort are intended to guide future decisions in a manner consistent with the principles of ecosystem management.

Good ecosystem management strives to have as much area in A-quality forest as possible. Good preserve design favors having one or more core areas of A-quality forest surrounded by B-quality buffer zones which are surrounded by C-quality zones. A principle management objective is to upgrade, over time, low quality areas to high quality areas, so that B-quality areas eventually develop into A-quality and C-quality areas develop into B-quality buffer zones. Non-forest (anthropogenic) areas not used or planned to be used for specified recreational activities should be allowed to regenerate to forest, and should be managed similarly to D-quality forest.

In order to restore and sustain the quality of the forest ecosystem, some specific management practices need to be implemented. Principle among these is to confine developments which might cause additional forest fragmentation to areas which are currently non-forested or assessed as low (D) quality. Other assessment-specific recommendations are presented below.

Category A: Old-Growth Forest

No A-quality forest was identified within the Preserve.

Category B: Maturing Forest

Management Goals

- The primary goal is restoration to A-quality forest.
- B-quality forests and barrens should be managed in an undeveloped condition to preserve biological diversity, provide opportunities for wilderness recreation, research, and education, and provide old-growth habitat (forests only).

Forest Stewardship Practices

- Management practices which would further fragment the forest (ie., roads, wildlife openings, excessive trail construction, and cutting of trees for visual purposes) should be prohibited.
- Access should be limited to the minimum needed for stewardship and passive recreation; access by off-road vehicles should be prohibited.
- Restoration priorities should include protection of soil and water quality and eradication of invasive exotic vegetation along trails and forest edges.
- Forest management should focus on protection from fire and vandalism. Logging, timber stand improvement, and other forestry practices should be prohibited except as deemed necessary for visitor safety.
- Prescribed fire may be an appropriate management tool for use within sub-xeric, xeric, and barrens communities. Fire management should be implemented upon the recommendation of a communities ecologist and in accordance with a fire management plan.
- B-quality forest should receive highest priority for implementation of the Preserve Protection Strategies presented in the following section.
- Xeric forest/barrens require periodic fire to maintain their quality. Without fire, barrens develop into forest and biological diversity is reduced. In lieu of fire management, woody plants can be manually removed. Plant removal should be performed under the direction of a communities ecologist.

Recreation and Education

- Appropriate recreational activities include hiking and nature study (birdwatching, etc.).
- Protection in an undeveloped state will afford opportunities for research and study in the fields of ecology, soil science, forestry, and natural history which are unavailable elsewhere in Jefferson County.
- Recreational development should be limited to the construction of foot trails on stable soils. Trails should be routed on the contours with sufficient cut and fill to prevent erosion or safety hazards.
- Trails should be limited to a single loop trail with occasional side trails to access scenic vistas or interesting, nonsensitive features.
- Parking and other access and directional amenities should be located outside of these areas.

Category C: Recovering Forest

Management Goals

- The primary goal is restoration to B-quality forest.
- C-quality forests should be managed in an undeveloped condition to promote growth of trees, preserve biological diversity, and provide opportunities for wilderness recreation, research, and education.

Forest Stewardship Practices

- Management practices which would further fragment the forest (ie., roads, wildlife openings, excessive trail construction, and cutting of trees for visual purposes) should be avoided.
- Access should be limited to the minimum needed for primitive recreation and fire prevention; access by off-road vehicles should be prohibited.

- Restoration priorities should include protection of soil and water quality, eradication of invasive exotic vegetation, and reforestation of disturbed areas.
- Forest management should focus on protection from fire and vandalism. Logging, timber stand improvement, and other forestry practices should be prohibited except as deemed necessary for visitor safety.
- Prescribed fire may be an appropriate management tool within sub-xeric, xeric and barrens communities. Fire management should be implemented upon the recommendation of a communities ecologist and in accordance with a Prescribed Fire Management Plan.
- C-quality forest should be established as a buffer around B-quality areas and SRA's. These buffers should be a minimum of 50 m in width and managed in a manner consistent with protecting the integrity of the C and SRA sites.

Recreation and Education

- Appropriate activities include hiking, primitive camping in designated areas, nature study (birdwatching, etc.), and orienteering.
- Protection in an undeveloped state will afford opportunities for research and study in the fields of ecology, soil science, forestry, and natural history which are unavailable elsewhere in Jefferson County.
- Primitive camping should be allowed only in designated areas which are not prone to soil erosion and have no populations of rare or sensitive (eg., ginseng, goldenseal) species. Camping areas should be clearly designated on trail maps.
- Recreational development should be limited to the construction of foot trails on stable soils. Trails should be routed on the contours with sufficient cut and fill to prevent erosion or safety hazards.
- Trails should be limited to that needed to provide access for appropriate recreational activities.
- Parking and other access and directional amenities should be located at the edges of these areas to minimize forest fragmentation.

Category D: Young Second-Growth Forest

Management Goals

- The primary goal is restoration of these areas to C-quality forest.
- Management of D forest should not be allowed to infringe upon the extent or the integrity of adjacent C or B-quality forest.

Forest Stewardship Practices

- Access should be limited to the minimum needed for recreation, research, and fire prevention; access by off-road vehicles should be prohibited.
- Restoration priorities should include protection of soil and water quality, eradication of invasive exotic vegetation, and reforestation with native species.
- Timber management should focus on protection from fire and timber stand improvement to restore natural diversity. Other forestry practices may be implemented in conjunction with research activities.

Recreation and Education

- Appropriate activities include hiking, environmental education, and research-oriented activities in forestry and related fields.
- Development should be limited to the construction of foot trails on stable soils. Trails should be routed on the contours with sufficient cut and fill to prevent erosion or safety hazards.
- Trails should be limited to that needed to provide access for appropriate activities.
- Parking and other access and directional amenities should be located at the edges of these areas to minimize forest fragmentation.

Preserve Protection Strategy

The goal of the Preserve Protection strategy is to protect the Forest Preserve Corridor from new developments that would further fragment the forest and reduce the ecological integrity of the forest. The ideal situation would be to purchase all lands within the Corridor and restore and protect these lands as a contiguous forest ecosystem. The current extent of private inholdings, however, greatly reduces the potential of achieving this ideal. Core properties needed to protect and restore the integrity of the Preserve should continue to be acquired as the opportunity arises. Other lands should be the focus of less than fee simple protection options. Appendix D contains a listing of government and private programs that provide technical assistance or funding for land acquisition as well as restoration activities.

Land Protection Options

The land protection options described below are divided into non-regulatory, or voluntary, and regulatory options. When many parcels of land within a preserve are in private ownership, a combination of options are often employed. It is often most effective to implement the non-regulatory options, which are considered landowner-friendly, before attempting any regulatory measures. Essential to the protection strategy proposed here, is: (1) involving the landowners as partners in the protection process; (2) opening and maintaining channels of communication with landowners; and (3) establishing procedures that are viewed by landowners as consistent and dependable.

Non-regulatory (Voluntary) Options

Land acquisition is the preferred means of providing permanent, long-term protection for the Forest, however it can be costly and decreases the local tax base. Acquisition should be on a willing-seller only basis. It may include acquisition of a purchase option, or **right of first refusal**, or a **life estate** agreement whereby the resident is allowed to remain on the land during his/her lifetime without property taxes. In order for land acquisition to be effective as a protection strategy, it must proceed at a consistent level with adequate annual funding.

When land acquisition is not possible due lack of funding or unwillingness of the private landowner, other less than fee simple means should be considered. Some which are most

attractive to landowners who do not necessarily derive income from their forest include donation or purchase of a *conservation easement*. Easements place development restrictions on the land, and should be in perpetuity if possible to allow for consistent, multi-generation forest management. The property taxes on easement lands can be paid by the County, which is an economic incentive for the landowner. An alternative similar to an easement is **purchase and lease back/sell back**. Land is purchased, restrictions are placed on the deed, then the land is sold back or leased to a private owner.

Another option for protecting forest land in private ownership is to involve private landowners in a forest stewardship planning process. Through this process, a *Forest Stewardship Committee* comprised of landowners, natural resource agencies, and conservation groups is formed for the purpose of developing and implementing a *Landowner Forest Stewardship Plan* (LFSP). The LFSP is a document that provides guidance to landowners in implementing effective forest stewardship practices on private lands. It fosters private stewardship and encourages land uses that are compatible with ecosystem management. The Committee may be set up in a number of ways which enable it to apply for grants that provide technical or cost

share assistance to landowners for restoration and management of forest resources. A *Forest Land Trust* may be established for the purpose of managing large blocks of forest having multiple owners. Because landowners are involved throughout the planning process, they are more likely to be committed to stewardship management.

Another option that fosters stewardship on private lands is the establishment of a *Forest Registry Program*, whereby landowners may "register" their forest land with the County if they voluntarily agree to practice good forest stewardship practices, not cut the timber, and to notify the County of intent to sell the land. The County would give each registering landowner a plaque or certificate of registry. This option provides an avenue of communication with landowners and gives them a sense of pride in their forest. As recommended in Issue number 4, disseminating a newsletter is an effective way of communicating with actual and potential registrees.

Regulatory Options

Dedication as a Kentucky State Nature Preserve offers permanent legal protection. Only high quality natural areas qualify for dedication under the Nature Preserves Act (KRS 146.410-146.480). Dedication is the strongest land protection law in Kentucky, which states that the highest and best use of the land is in its natural condition. Dedicated land is protected from activities which would cause further fragmentation of the forest, including powerlines, roads, and pipelines. Within the Preserve, the area most likely to qualify for dedication is the Headley Hollow SRA.

Zoning or land use regulations are often used as a means of controlling development of private lands within a community. Zoning or regulations should be considered as a last resort within the Preserve when other types of protection are not feasible. Such restrictions often meet with strong opposition from local residents and landowners, and enforcement can be difficult and costly.

Activities outside of the Corridor can have detrimental impacts on the Preserve. The Corridor is currently zoned R-4 which allows development of single family housing at a density of 4.8 units per acre and other uses such as agriculture, churches, country clubs, libraries and schools (Louisville and Jefferson County Planning Commission 1980). Zoning revisions or use of a multiple use district have been suggested as potentially effective means of controlling development on lands adjacent to the Corridor. When zoning or districting is used, it should be applied throughout the Corridor. The process should encourage public input, and provide for alternatives that do not impose an economic burden on landowners who want to protect their forest.

Land Protection Criteria

The protection strategy for the Corridor, whether it involves fee simple or lesser forms of protection, should be prioritized according the following ecological stewardship criteria, with 'A' receiving highest priority:

- (A) Forested areas needed to create large blocks of forest and that contribute to the development of interior forest conditions. Category B areas and SRA's should receive highest priority for protection efforts.
- (B) Forested areas threatened with eminent development.
- (C) Lands needed to provide access for primitive recreation, such as parking lots for established hiking trails.
- (D) Disturbed lands with high restoration potential needed to increase the integrity of the forest ecosystem.

If land trades are considered to be a viable means of acquiring priority tracts of land, Category D sites should receive primary consideration as tradelands.

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Appendix A

Characteristic Species of Ecological Communities in Jefferson County Memorial Forest

Part I of this appendix contains lists of the dominant and associate canopy trees, understory trees and shrubs, and woody vines used to characterize each of the ecological communities described in this plan. Part II of this appendix contains an annotated list of herbaceous species observed incidentally during the assessment.

PART 1: Trees, Shrubs and Woody Vines

Acidic Mesophytic Forest

Dominant Canopy

Acer saccharum
Fagus grandiolia
Fraxinus americana
Quercus alba

Sugar maple
American beech
White ash
White oak

Associate Canopy

Acer negundo
Acer rubrum
Aesculus glabra
Carya glabra
Carya ovata
Diospyros virginiana
Fraxinus pennsylvanica
Gymnocladus dioica
Juglans nigra
Liquidambar styraciflua
Liriodendron tulipifera
Magnolia acuminata
Nyssa sylvatica

box elder
red oak
Ohio buckeye
Pignut hickory
Shagbark hickory
Persimmon
Green ash
Kentucky coffee tree
Black walnut
Sweetgum
Yellow poplar
Cucumber magnolia
Black gum

Platanus occidentalis
Prunus americana
Prunus serotina
Quercus rubra
Tilia americana
Sassafras albidum
Ulmus americana
Ulmus rubra

Sycamore
American plum
Wild black cherry
Red oak
American basswood
Sassafras
American elm
Red elm

Understory

Amelanchier arborea
Asimina triloba
Bignonia capreolata
Campsis radicans
Carpinus caroliniana
Celastrus scandens
Cercis canadensis
Cornus florida
Euonymus americanus
Hydrangea arborescens
Lindera benzoin
Ostrya virginiana
Parthenocissus quinquefolia
Smilax bona-nox
Staphlea trifolia
Viburnum acerifolium
Vitis aestivalis
Xanthoxylum americanum

Serviceberry
Paw paw
Crossvine
Trumpet creeper
Ironwood
Bittersweet
Redbud
Flowering dogwood
Hearts-a-bursting
Wild hydrangea
Spicebush
Hornbeam
Virginia creeper
Catbrier
Bladdernut
Maple-leaf viburnum
Wild grape
Prickly ash

Appendix A

Acidic Subxeric Forest

Dominant Canopy

Quercus alba

Quercus montana

White oak

Chestnut oak

Associate Canopy

Carya glabra

Carya tomentosa

Diospyros virginiana

Nyssa sylvatica

Oxydendron arboreum

Prunus americana

Robinia pseudoacacia

Quercus coccinea

Quercus falcata

Quercus marilandica

Quercus stellata

Quercus velutina

Pignut hickory

Mockernut hickory

Persimmon

Blackgum

Sourwood

American plum

Black locust

Scarlet oak

Southern red oak

Blackjack oak

Post oak

Black oak

Understory

Amelanchier arborea

Bignonia capreolata

Campsis radicans

Celastrus scandens

Cercis canadensis

Juniperus virginiana

Lonicera japonica

Ostrya virginiana

Parthenocissus quinquefolia

Sassafras albidum

Smilax bona-nox

Symphoricarpos orbiculatus

Ulmus alata

Vaccinium arboreum

Vitis aestivalis

Xyanthosylum americanum

Serviceberry

Crossvine

Trumpet creeper

Bittersweet

Redbud

Eastern red cedar

Japanese honeysuckle

Hornbeam

Virginia creeper

Sassafras

Catbrier

Corralberry

Winged elm

Highbush cranberry

Wild grape

Prickly ash

Appendix A

Acidic Xeric Forest

Dominant Canopy

Quercus marilandica

Quercus montana

Quercus stellata

Blackjack oak

Chestnut oak

Post oak

Associate Canopy

Pinus virginiana

Quercus coccinea

Virginia pine

Scarlet oak

Understory

Kalmia latifolia

Symphoricarpos orbiculata

Ulmus alata

Vaccinium simulatum

Vaccinium stamineum

Vaccinium vacillans

Mountain laurel

Coralberry

Winged elm

Highbush blueberry

Deerberry

Lowbush blueberry

Pine-Oak Forest

Dominant Canopy

Pinus virginiana

Quercus montana

Virginia pine

Chestnut oak

Associate Canopy

Quercus coccinea

Quercus velutina

Scarlet oak

Black oak

Understory

Smilax sp.

Vaccinium stamineum

Vaccinium vacillans

Catbrier

Deerberry

Lowbush blueberry

Appendix A

Shale Barrens

Herbaceous species are included in this list because they are dominant components which characterize this community type.

Dominant Canopy

Quercus marilandica

Quercus montana

Quercus stellata

Blackjack oak

Chestnut oak

Post oak

Associate Canopy

Quercus coccinea

Ulmus alata

Scarlet oak

Winged elm

Understory

Ceanothus americanus

Coreopsis major

Crataegus sp.

Helianthus hirsutus

Juniperus virginiana

Liatris aspera

Rhus aromatica

Rhus copallina

Rosa carolina

Rudbeckia hirta

Schizachyrium scoparium

Sorghastrum nutans

Symphoricarpos orbiculata

Tridens flavus

Vaccinium arboreum

Vaccinium vacillans

New Jersey tea

Large coreopsis

Hawthorn

Sunflower

Eastern red cedar

Rough blazing star

Fragrant sumac

Smooth sumac

Wild rose

Black-eyed susan

Little bluestem

Indian grass

Corralberry

Purpletop grass

Highbush cranberry

Lowbush blueberry

PART II: Herbaceous Flora and Habitat Associations

The herbaceous plant species listed below were observed incidentally to the assessment study during August-December 1994. This list should be considered as a preliminary check-list of herbaceous plants and should not be considered as an exhaustive botanical inventory. Systematic botanical inventories should be conducted throughout the growing season to catalogue the flora.

The habitat type is coded as: M=mesic forest, S=subxeric forest, X=xeric forest, B=barrens. The relative abundance in each habitat type is coded as: A=abundant, C=common, U=uncommon, R=rare.

Botanical Name	Common Name	Habitat			
		M	S	X	B
<i>Actaea pachypoda</i>	White baneberry	C			
<i>Adiantum pedatum</i>	Maidenhair fern	C			
<i>Amphicarpa bracteata</i>	Hog peanut	C			
<i>Arisaema triphyllum</i>	Jack in the Pulpit	C			
<i>Asarum canadensis</i>	Wild ginger	C			
<i>Asplenium platyneuron</i>	Ebony spleenwort	C			
<i>Aster cordifolius</i>	Blue wood aster	U	U		
<i>Aster divaricatus</i>	White wood aster	U	C	U	
<i>Aster lateriflorus</i>	Calico aster		C	C	C
<i>Aster patens</i>	Spreading aster		C	C	
<i>Aster Shortii</i>	Short's aster		U	U	
<i>Aster undulatus</i>	Wavy-leaf aster		U	U	
<i>Athyrium pycnocarpon</i>	Glade fern	C			
<i>Athyrium thelypteroides</i>	Silvery spleenwort	C			
<i>Boehmeria cylindrica</i>	False nettle	C			
<i>Botrichium dissectum</i>	Cut-leaf rattlesnake fern	C			
<i>Botrichium virginianum</i>	Rattlesnake fern	C			
<i>Campanula americana</i>	American bellflower	C			
<i>Caulophyllum americanum</i>	Blue cohosh		C		
<i>Cassia nictitans</i>	Sensitive plant			C	C
<i>Coreopsis major</i>	Large coreopsis				C
<i>Cystopteris</i> sp.		C			

		M	S	X	B
<i>Danthonia spicata</i>	Curly grass				C
<i>Desmodium nudiflorum</i>	Bare-stemmed tick trefoil	C	U		
<i>Desmodium rotundifolium</i>	Round-leaved tick tref.		C	C	
<i>Diarhena americana</i>	Rich grass	A			
<i>Dioscorea sp.</i>	Wild yam	C			
<i>Elymus hytrix</i>	Bottlebrush grass	C	U		
<i>Eupatorium sp.</i>		C			
<i>Eupatorium maculatum</i>	Joe-pye-weed				
<i>Galium sp.</i>	Bedstraw	C			
<i>Gillenia stipulacea</i>	Indian physic		C	C	U
<i>Helianthus hirsutus</i>	Hirsute sunflower		C	C	
<i>Helianthus microcephalus</i>	Sunflower		C	C	C
<i>Hydrastic canadensis</i>	Goldenseal	U			
<i>Hydrophyllum canadensis</i>	Waterleaf	C			
<i>Impatiens capensis</i>	Jewelweed	A			
<i>Impatiens pallida</i>	Jewelweed	C			
<i>Jeffersonia diphylla</i>	Twinleaf	C			
<i>Kuhnia eupatorioides</i>	False boneset				C
<i>Laportea canadensis</i>	Stinging nettle	A			
<i>Lespedeza virginica</i>	Virginia lespedeza			U	U
<i>Liatris aspera</i>	Blazing star				C
<i>Lithospermum canadense</i>	Hoary puccoon		C	U	C
<i>Lobelia spicata</i>	Spiked lobelia				U
<i>Menispermum canadense</i>	Moonseed	C			
<i>Microstegia viminium</i>	Ulalia	C	C		
<i>Monarda fistulosa</i>	Wild bergamot				U
<i>Onoclea sensibilis</i>	Sensitive fern	U			
<i>Osmorhiza sp.</i>	Sweet cicely	C			

		M	S	X	B
<i>Panax quinquefolia</i>	Ginseng	U			
<i>Perilla frutescens</i>	Beefsteak	C			
<i>Phryma leptostachya</i>	Lopseed	C			
<i>Pilea pumila</i>	Clearweed	A			
<i>Podophyllum peltatum</i>	Mayapple	C	U		
<i>Polygonatum biflorum</i>	Solomons seal	C			
<i>Polystichum acrosticoides</i>	Christmas fern	A	C		
<i>Schyzachyrium scoparium</i>	Little bluestem			U	C
<i>Scutellaria elliptica</i>	Skullcap		C	U	U
<i>Solidago arguta</i>	Goldenrod		C	C	
<i>Solidago caesia</i>	Blue-stemmed goldenrod	C	C		
<i>Solidago flexicaulis</i>	Zig-zag goldenrod	C	U		
<i>Solidago ulmifolia</i>	Elm-leaved goldenrod		C	U	
<i>Sorghastrum nutans</i>	Indian grass			U	C
<i>Spiranthes</i> sp.	Ladies tresses				
<i>Stylophorum americanum</i>	Celandine poppy	C			
<i>Tephrosia virginiana</i>	Goatsrue				C
<i>Thalictrum dioicum</i>	Early meadow rue	C			
<i>Thaspium trifoliatum</i>	Meadow parsnip			U	C
<i>Thelypteris hexagonoptera</i>	Broad beech fern	C			
<i>Tipularia discolor</i>	Cranefly orchid	U			
<i>Tradescantia subaspera</i>	Zigzag spiderwort	C			
<i>Tridens flavus</i>	Purpletop grass				C
<i>Trillium flexipes</i>	Nodding trillium	U			
<i>Viola odorata</i>	Sweet violet	C			
<i>Viola pedata</i>	Birdfoot violet				C
<i>Zizia</i> sp.	Golden alexander				C

Appendix B

Ecological Assessment Categories

Category A: Old-Growth Forest Community

- 150+ years old ('old-growth')
 - largest size class 2.5 ft.+ dbh (mesophytic forests)
 - largest size class 2.0 ft.+ dbh (sub-xeric forests)
 - largest size class 1.0 ft.+ dbh (xeric forests)
- No anthropogenic disturbance, including stumps or grazing
 - commercially valuable species are present (eg., cherry, walnut, white oaks, ash, hickory)
 - unaltered hydrology (no ditches, drainage tile, artificial ponding)
 - no exotic or disturbance-associated species
- Dead trees common on forest floor, gaps in canopy
- Standing snags

Category B: Mature Forest Community

- 80-150 years old ('old second-growth'), or light selective logging of a former A-quality forest (economically valuable species harvested or a natural disturbance has affected the area but the canopy is still more or less continuous).
- All size classes are represented but their distribution is skewed towards smaller classes.
- Largest size classes approaching but not reaching A forest dimensions.
- Minimal anthropogenic disturbance
 - Light grazing or other disturbance evident but recovering well from significant grazing or other disturbance in the past.
 - Original hydrology has been altered minimally, not affecting the structure and natural diversity of the forest.

Category C: Recovering Forest Community

- 40-80 years old (maturing second-growth) or moderately disturbed A or B forest with the original structure largely destroyed and composition altered.

- Moderate anthropogenic disturbance.
 - Light or no grazing or heavily grazed A or B forest.
 - Hydrology moderately disturbed, changing the structure and composition of the forest.

Category D: Young Second-Growth Forest Community

- Trees less than 40 years old (young second-growth).
- Severely disturbed or degraded area dominated by anthropogenic features.
- Original forest structure completely destroyed.

Adapted from Kentucky State Nature Preserves Commission (1991).

Appendix C

Bird Check-List

The following list contains species of birds observed during the breeding season as part of the Kentucky Breeding Bird Atlas (KBBA). KBBA surveys were made in the Valley Station and Brooks U.S.G.S. topographic quadrangles, either within or adjacent to the Preserve. Also included in this list are species observed during the assessment that were not recorded for the KBBA (these are delineated with an asterisk (*)). Bird species are listed alphabetically by common name (nomenclature follows the American Ornithologist Union checklist of birds, 1986).

American crow	Heron, green-backed
American goldfinch	Indigo bunting
American kestrel	Killdeer
American redstart	Northern bobwhite
American robin	Northern cardinal
Blue grosbeak	Northern flicker
Blue jay	Northern mockingbird
Blue-gray gnatcatcher	Oriole, northern
Brown thrasher	Oriole, orchard
Brown-headed cowbird	Owl, barred
Carolina chickadee	Swallow, barn
Cedar waxwing	Swallow, northern rough-winged
Chimney swift	Tanager, scarlet
Common nighthawk	Tanager, summer
Common yellowthroat	Tufted titmouse
Dove, mourning	Vireo, red-eyed
Dove, rock	Vireo, warbling
Eastern bluebird	Vireo, white-eyed
Eastern kingbird	Vireo, yellow-throated
Eastern meadowlark	Vulture, turkey
Eastern phoebe	Warbler, black and white
Eastern wood-pewee	Warbler, hooded
European starling	Warbler, Kentucky
Finch, house	Warbler, worm-eating
Flycatcher, Acadian	Warbler, yellow

Appendix C

Gray catbird
Hawk, Cooper's
Hawk, red-shouldered
Hawk, red-tailed

Wild turkey*
Woodpecker, downy
Woodpecker, hairy
Woodpecker, pileated*
Woodpecker, red-bellied

Warbler, yellow-throated
Waterthrush, Louisiana
Whip-poor-will
White-breasted nuthatch

Wood thrush
Wren, Carolina
Wren, house
Yellow-billed cuckoo
Yellow-breasted chat

Appendix D

Sources of Funding/Assistance

The following list includes sources of funding available to local governments and private landowners for forest stewardship. The list may not include all available sources, particularly private foundations or private organizations which might offer labor or technical assistance for specific restoration or protection practices.

Government Programs

Community Rivers and Streams Program

Provides matching start-up funds to local governments in partnership with citizen groups for establishing local river and stream stewardship programs. Fundable activities include assessment, planning, design, implementation, community education, stream cleanups, tree planting/revegetation, habitat/wildlife protection, and pollution control. Will accept 100% in-kind matching source. Administered through the Kentucky Department of Local Government. Contact Jim Barker (502-564-2382). Dependent on reauthorization by the Kentucky General Assembly for fiscal '95-96.

Conservation Districts

Obtain funding to develop and implement conservation plans involving tree planting/revegetation, stream cleanups, recreation, and habitat/wildlife protection. Administered through the Kentucky Division of Conservation (DOC) and Kentucky Soil and Water Conservation Commission. Contact Stanley Head, DOC (502-564-3080).

County Cooperative Extension Services (CES)

Provide technical assistance with plan implementation. Many CES offices have horticulture, forestry or agriculture experts on staff. Administered through the Soil Conservation Service (SCS).

Forest Stewardship Program (FSP)

Provides technical assistance for developing Forest Stewardship Plan on private forestland. Plans are comprehensive and include multiple resource forest planning, tree planting/revegetation, water quality protection, recreational enhancement, and habitat/wildlife

protection. Preferred recipients are individuals. Administered by the Kentucky Division of Forestry (DOF). Contact Cary Perkins (502-564-4496).

Habitat Improvement Program (HIP)

Provides technical assistance for developing wildlife management plans and cost-sharing to implement the plans. Historically such plans have focused on game management but more recent strategies emphasize ecosystem management for a diversity of species. Cost sharing can be applied towards, site preparation, plants and seeds and maintenance activities, and can be used for prairie and wetland restoration activities. A maximum amount of \$500 is reimbursed for establishing native vegetation in a given fiscal year. Preferred recipients are private landowners but government agencies may also apply. Administered through the Kentucky Department of Fish and Wildlife Resources. Contact Jeff Sole (502-564-3400).

Heritage Land Conservation Fund

Funding available to city, county, and state agencies for purchase of natural areas. Approximately \$2 million available per year. Administered by the Heritage Land Conservation Fund Board. Contact Dr. Bill Martin (502-564-2184).

Kentucky Urban and Community Forestry Assistance Program (UCFAP)

Provides grants for sustainable community forestry programs. Fundable activities include assessment, planning and design, educational materials, and tree planting/revegetation. A 50% cost share (cash or in-kind) is required. Citizen groups and government agencies are preferred recipients. Administered by the Kentucky Division of Forestry. Contact Bernie Andersen (502-564-4496).

Kentucky Water Watch Program

State program that provides technical assistance for water quality monitoring, stream cleanup, grants writing, and community education. Preferred recipients are schools and citizen groups. Administered through the Kentucky Division of Water. Contact Ken Cook (502-564-3410).

Land and Water Conservation Fund

Provides up to 50% reimbursement of costs for the acquisition and/or development of public outdoor recreation areas. Applicant must be a local government agency. Administered through the Kentucky Department of Local Government. Contact Jim Barker (502-564-2382).

National Endowment for Soil and Water Conservation

Usually a one-time grant funded through donations. No match required. Type of projects funded dependent on source of donations. Administered through ASCS through local Soil and Water Conservation Districts. Contact your local district office.

Partners for Wildlife

Provides technical assistance and funding to non-federal landowners to protect, restore and enhance fish and wildlife habitat. Requires 50% cost-share (in-kind or cash) from non-federal source. Recipients may be individuals, government or groups. Grants awarded one-time with regional competition, and average \$1,000-\$2,000 per year. Administered by the U.S. Fish and Wildlife Service. Contact: Jody Jenkins (615-528-6481) in KY or Dough Winford (same phone).

Resource Conservation and Development

Funding and technical assistance available to government agencies and citizen groups with 75% matching funds for community education, recreation, tree planting/revegetation and pollution control projects. Administered by the Soil Conservation Service through local RC&D offices.

SBA Tree Planting Grant Program

Provides funding for contractual services to purchase and plant trees on public lands by a small business. Recipient must be a government agency with 50% matching funds or in-kind services. Administered through the Kentucky Division of Forestry. Contact Diana Olszowy (502-564-4496).

Soil and Water Conservation Program

Provides funding for projects that protect soil and water, wildlife and fisheries. Can be used to match other sources of funding. Administered through local Soil and Water Conservation Districts (ASCS). Contact your local district office.

Sport Fish Restoration Program (SFRP)

Provides technical assistance for managing fisheries resources in private lakes. Recipients include individuals and government agencies. Administered through the Kentucky Department of Fish and Wildlife Resources. Contact (502-564-6508).

Stewardship Incentive Program (SIP)

The SIP provides technical assistance and cost-share funding to help landowners implement Forest Stewardship Plans. This program is administered by the Kentucky Division of Forestry in cooperation with other state resource agencies and USDA agencies such as the U.S. Forest Service and Division of Conservation. Authorized through FACT and funded through the Forest Stewardship Act of 1990. A maximum amount of \$10,000 is reimbursed for site preparation, plant and seed materials, and maintenance. Preferred recipients are non-industrial private forest (NIPF) lands. Contact Cary Perkins (502-564-4496).

University Biology, Environmental and Forestry Programs

Biology and forestry departments at local colleges and universities will often provide assistance with tree planting, vegetation monitoring and other activities as part of hands-on education for students. Contact local school department heads.

USDA Natural Resources Conservation Service (formerly SCS)

Technical assistance is provided through a variety of programs (RC&D, Rural Abandoned Mile Program, Emergency Water Protection, Earth Team Volunteers, etc.) for protection and enhancement of soil and water resources including assessment, planning and design, tree planting/revegetation, habitat/wildlife protection. Contact Freddy Cockrell (606-224-7350).

PRIVATE ORGANIZATIONS

American Greenways DuPont Award

Provides matching funds to community projects that serve as a model for planning and developing greenways (which should include wildlife corridors across the landscape). Awards are limited to \$2,300 but usually range from \$500-\$1,000. Preferred recipients are nonprofit organizations, but has been used to honor individuals "whose ingenuity and creativity foster creation of greenways." Administered cooperatively by DuPont, the Conservation Fund and National Geographic Society. Applications available from: American Greenways, The Conservation Fund, 1800 North Kent St., Suite 1120, Arlington VA 22209 (703-525-6300).

Coors Pure Water 2000

Provides funding for restoration of aquatic/riparian habitat and water conservation education. Grants average \$1,000-\$5,000. Recipients may be citizens or citizen groups. Administered through local Coors distributors. Call 1-800-to-Coors for name of local distributors and application information.

Ducks Unlimited (DU)

Provides technical advice and funding for protecting/developing wetland habitat. Contact the local DU Chapter for membership information.

Quail Unlimited (QU)

Local chapters provide assistance and possibly funding to QU members for habitat improvement practices. Contact the regional director for membership information.

APPENDIX C

Summary of Public Meeting Open House on December 2, 1995

(Sources: Staff notes, flip chart recording of the meetings which are filed under 94.33 of the Jefferson County Memorial Forest file.)

General Comments

- Staff has witnessed increase of use at Forest over past few years.
- Designated Forest areas (Recreational Forest, Recovering Forest, Significant Resource Area) have specific uses allowed within each area and these uses need to be respected.
- Population increasing while resources are decreasing
- Green areas are treasures. If damage occurs in these areas, it takes years to recover.
- This is one of few wilderness areas close to an urban area.
- The Forest is not a true wilderness and should not be treated as such.
- Funding for enforcement is scarce. Are “volunteer” rangers an option?
- Accurately locate and map all fire roads and old logging roads. Evaluate condition and location to see how they should be used.

Recreational Forest

- Even hikers can cause damage in the Forest.
- When horses moved in, motor vehicles moved in. Some hiking trails need to be closed, relocated because of erosion and fragile soils.
- Isn't this what the management plan is saying? Evaluate conditions and set the criteria before allowing the use?
- Consider a permitting system for all users. This would enable the Forest to collect more accurate documentation on a variety of recreational activities.
- When charging for a permit, liability becomes an issue.

Restoration

- Certain areas need to be taken out of use, because of over-use.
- Excessive use of anything will make the mission of the Forest difficult to attain.
- Any environmental impact to the Forest, no matter what the cause needs attention and a plan for mitigation.
- Wherever there are erodible soils in the Forest or fragile vegetation, high impact uses should not be permitted.

Mountain Biking

- More research needs to be collected about mountain biking.
- Include mountain bikers in the decision making policy of the Forest.
- If horse back riders are allowed in the Forest, why aren't the mountain bikers?
- Could horse back riders and mountain bikers use the same trails in Paul Yost, but on alternate days?

- Mountain biking is “hiking on wheels”.
- Even though the majority of mountain bikers are responsible, Cherokee Park has had a difficult time monitoring the few destructive mountain bikers that do the damage.
- Waverly Park and Otter Creek Park currently allow mountain biking.
- Participation by mountain bikers can be an asset. They could be trained for enforcement and medical emergencies.
- Consider allowing mountain bikes on all fire roads.

Acquisition

- Acquire more land for the Forest.
- More acquired land could expand the Recreational Forest and provide buffers for Recovering Forest and Significant Resource Areas.

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**JEFFERSON
COUNTY
MEMORIAL
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**Louisville and Jefferson
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