EXECUTIVE SUMMARY

Introduction

Tymor Park sits at the southern edge of Union Vale, straddling the boundary between the towns of Beekman and Union Vale. The park was given to the town between 1971 and 1978, when Ralph and Jean Connor donated five hundred acres of their former dairy farm to the town. Their gift encompasses expanses of hardwood and softwood forest, open fields, wetlands, and water bodies. The donors' intent in giving the park to the town is partially expressed in the Deeds of Covenance that state that the land "shall be dedicated in perpetuity to the recreation and nature conservancy uses of the People resident in the Town of Union Vale."[1]

Since 1971, the town has actively developed a variety of recreational facilities at Tymor Park, providing a diversity of passive and active recreational opportunities to town residents. Management of the park's natural resources in relation to the stated nature conservancy function of the park has not been as active. Today, the park's recreational facilities, year-round programming, natural and historic features, and sheer size combine to make it a center of activity in Union Vale and an important part of the town's overall identity.

As the population of Union Vale has increased, so have the demands upon the park. Recognizing the value of the park to current and future residents, and anticipating the pressures of future town growth and development upon the park, the Town of Union Vale identified the need for a planning framework to ensure preservation of this significant resource.

In January of 2004, the Town of Union Vale contracted a graduate student team from the Conway School of Landscape Design to develop a Master Plan to guide the town in preserving the natural heritage of Tymor Park while meeting the recreational needs of the town residents. The resulting Tymor Park Master Plan is a multi-purpose document to be used by park managers, park staff, and local government in ongoing park management, operation, and planning. Its recommendations take into account the unique nature of the park's resources, the long- and short-term needs of the community, and the intent of the donors, as expressed in the Deeds of Covenance and the park's original management plans written by the park's donor.[2]

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[1] See *Deeds of Covenance* analyses.

[2] See Appendix C.

The Planning Process

Resources

Between January and late March of 2004, the CSLD team worked with local and regional resources to gather information regarding the regional context, features, and uses of Tymor Park. Information was collected on multiple site visits, at two public meetings, through a written survey, in interviews with local residents, and from the Town of Union Vale, Tymor Park staff, Dutchess County Department of Planning and Development, Dutchess County Environmental Management Commission, the New York State Natural Heritage Program, the New York State Department of Environmental Conservation, and the Cooperative State Research, Education and Extension Service (CREES).

Site Analyses

The information gathered from these sources led to the site analyses presented in the Natural Features Analyses and Social Analyses chapters of the Master Plan.

These analyses revealed many of the uses, opportunities, sensitivities, and conflicts which together define Tymor Park. Analyses of the park's natural features identified the great diversity of natural resources and wildlife habitat within the park as well as the opportunity for extensive nature enjoyment and nature education within the park. These analyses also identified threatened and degraded natural resources and conflicts between recreational uses and natural resources protection.

The Social Analyses revealed the diversity of passive and active recreation opportunities available in the park and ascertained that park facilities generally appear to meet current demand. They identified the many historic and scenic resources within the park and the need to assure preservation of some of these defining qualities. The social analyses also identified an imbalance toward development and maintenance of active recreation facilities within the park.

Concept Plans

Site analyses lead to the development of two Concept Plans. An Environmental Management Zones Plan developed the conceptual framework for use and management of the park's natural resources in its capacity as a "nature conservancy.' A Site Enhancement Plan identified concepts for enhancement of the park's role as an active and passive recreation facility.

Major topics considered in the development of these concept plans included:

- Values and sensitivities of the park's natural resources
- Current and future recreation supply and demand
- Local and regional historic, cultural, and scenic resources
- Surrounding land uses
- The Deeds of Covenance and other regulatory considerations
- The balance between the park's nature conservancy and recreational uses
- The balance between the park's active and passive recreational uses

Master Plan

The Master Plan used the broad guidelines established in the Concept Plans to create a framework of specific recommendations guiding sustainable and integrated management of the park's diverse natural resources and recreational facilities. Similar to the Concept Plans, the Master Plan utilizes two complementary components, an Environmental Management Plan and a Site Enhancement Plan. These Master Plan recommendations address the range of values, opportunities, sensitivities, and conflicts identified by the site analyses within the necessary framework of the Deeds of Covenance.

Recommendations in the Environmental Management Plan address the following objectives:

- Sustain or improve the park's value as a nature conservancy
- Ensure the long-term preservation of the functions of the park's natural features, including habitat, forage, cover, erosion control, shade, recreation, and aesthetic values
- Address environmental stressors within the park including elevated deer populations, invasive plant species, pests and diseases, and human uses
- Educate park users about the natural features within the park and about the park's environmental management strategies

Recommendations within the Site Enhancement Plan address the following objectives:

- Ensure compatibility of active and passive recreation facilities and uses
- Provide safe, clear access to passive and active recreation

- Create a consistent and clear system of informational signs
- Restrict active recreation development to a "site development envelope" that considers environmental sensitivities, slope limitations, and language in the Deeds of Covenance
- Protect scenic views within and beyond the park
- Create destination sites within the existing park trail system that will enhance passive recreation experiences
- Decrease restricted uses of the park

Implementation Plan

The Implementation Plan creates a framework for implementing recommendations from the Master Plan. It identifies three stages of implementation that prioritize Master Plan recommendations and maximize the efficient use of financial and human resources.

The Tymor Park Master Plan

Tymor Park represents a unique and special place. It provides a multitude of human recreational uses; protects a significant amount of open space and the natural systems contained within; serves as a reminder of the generosity of the generations that have gone before us; and challenges its custodians to have the foresight and wisdom to protect and enhance a resource that will only become more valuable as time goes by.

The Master Planning process was initiated to ensure the long-term preservation of the irreplaceable nature conservancy and recreation values of this special place. The Tymor Park Master Plan provides a framework and a starting place for addressing that goal.

ACKNOWLEDGEMENTS

Understanding the natural features and social concerns within and surrounding a five-hundred-acre, multiple-use park in twelve weeks provides considerable challenges. Providing legitimate, durable, and meaningful recommendations requires numerous perspectives and sources of information. The plan and the planning process benefited greatly from a variety of professionals and volunteers who readily gave their time and energy with the intention of enhancing the special resources at Tymor Park.

Many town citizens and park users contributed information, time, and resources to the planning process. They made themselves available during site visits, walked miles in the snow to help us attain a clear and complete picture of Tymor Park, and fed and housed us during our visits. These dedicated friends of the park include Jane Geisler, Lalita Malik, Elfriede Tillman, Jane Smith, Tom Farmer, and Sarah Hart.

Town and Park staff were generous in providing town offices for meeting space and assisting in the information gathering processes. Lisette Hitsman, Warren Sullivan, Tom St. Onge, Betty Albrecht, Joanne Miracco, and Lynn Preston all lent their time and talents to the Master Plan.

Information and technical resources were provided by Danielle Aiello at Dutchess County Department of Planning and Development, Sal Licausi and David Burns at Dutchess County Environmental Management Council, Ron Pierce and Barbara Lucas-Wilson at New York State Department of Environmental Conservation (NYSDEC), and many others.

Constant guidance and critical feedback was provided by the Conway School of Landscape Design faculty Jean Akers, Don Walker, and Ken Byrne. Their assistance supported the planning process from its early inquiries through to the detailed analyses and recommendations presented in this document.

Finally, we wish to acknowledge the late Ralph and Jean Conner for their gift of Tymor Farm to the Town of Union Vale. Their gift, and their intentions, have created an invaluable town asset of protected natural open space and diverse recreational opportunities.

TABLE OF CONTENTS

CONCEPT PLAN

MASTER PLAN

IMPLEMENTATION PLAN

CONCLUSION

REFERENCES

APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

STATEMENT OF PURPOSE

"To lose by want of action now what will be so precious to the future... would be no less than tragic."

George B. Dorr, 1916[3]

Five-hundred-acre Tymor Park was established in the 1970's to provide "recreation and nature conservancy uses" for the residents of Union Vale.[4] Today the land protects undeveloped forests and historical agricultural land, offers a wide variety of passive and active recreation opportunities for Union Vale residents and their guests, and functions as the center of activities for the town of Union Vale.

Projected Union Vale population growth of up to 78% in the next two decades may yield a corresponding increase in use of the park's current facilities and in demand for additional recreational offerings.[5] As park use and interest increase, questions have been raised regarding appropriate use of the park, the donors' intent in granting the park to the town, the future of the resource, and the relationship between "nature conservancy" and "recreation" in current and future park use and management decisions. Recognizing the important role that Tymor Park plays, the Town of Union Vale has identified the need for a planning framework to ensure that the park continues to serve its functions successfully and sustainably into the future.

In January of 2004, the Town of Union Vale contracted a student team from the Conway School of Landscape Design (CSLD) to develop a Master Plan to guide the town of Union Vale in preserving the natural heritage of Tymor Park while meeting the recreational needs of the town residents and adhering to the conditions set forth in the Deeds of Covenance associated with the park. The resulting Master Plan is a multi-purpose document to be used by park managers, park staff, and local government in ongoing park management, operation, and planning. The product of extensive site analyses, the recommendations within this document provide a framework for park management which takes into account both the unique nature of the park's resources and the long- and short-term needs of the surrounding community.

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[3] Quoted in the park's original master plans written by Ralph Connor, one of the park's donors (see Appendix C).

[4] Language uniform to all Deeds of Covenance for each of the eleven park parcels.

[5] Town of Union Vale Master Plan, 2001.

PROJECT SCOPE

The development of this Master Plan relied upon analysis of information gathered from multiple site visits, two public meetings, a written survey, available mapping resources, and a variety of local, regional, and state resources.

Significant areas of consideration addressed in the research, analysis, and planning phases included:

- Local and regional historic and cultural resources
- Environmental resources
- Current and future recreation supply and demand
- Regulatory considerations
- Surrounding land uses
- The Deeds of Covenance that run with the land

This document presents the results of extensive site analysis and based on this information outlines and evaluates options for the future uses and management of the park; selects and presents a final framework to guide long-term management decisions; and establishes a timeline for phasing in aspects of the Master Plan recommendations.

PLANNING PROCESS AND PUBLIC PARTICIPATION

Between January and late March of 2004, the Conway School of Landscape Design team worked with the Town of Union Vale and local and regional resources to gather and assess information regarding the regional context, features, and uses of Tymor Park. Information regarding the uses and natural features in the park and surrounding area were provided by local residents, Tymor Park staff, the Town of Union Vale, minutes from past Conservation Advisory Council meetings, newspaper articles and historical documents, the park Deeds of Covenance,[6] the original park management plans written by one of the park's donors,[7] the Dutchess County Department of Planning and Development, the Dutchess County Environmental Management Council, the New York State Natural Heritage Program, the New York State Department of Environmental Conservation, the Cooperative State Research, Education and Extension Service (CREES), USGS topographic maps, and Geographic Information System (GIS) mapping tools.

The planning process relied in part on incorporating residents' and park users' concerns, ideas, knowledge, and perspectives. Comments were gathered through a written survey[8] and two public meetings. The purpose of the survey was to gain further understanding of park use patterns, identify park users' interest and potential concerns, and inform the public of the planning process. The survey was distributed by the town and thirty-four completed surveys were returned to the CSLD team. Results from the survey were used to inform relevant site analyses and to help guide the CSLD team in understanding, defining, and prioritizing goals for the Master Plan.[9]

In addition to the write-in survey, two public meetings were held during the planning process. The meetings were advertised on the local television station, in the local papers, and through fliers. Approximately sixteen residents attended the first public meeting on February 10th, 2004. At this meeting, the CSLD team explained the purpose of the Tymor Park Master Plan process, presented the results of some preliminary site analyses, and provided participants the opportunity to share their personal knowledge of the park as well as their priorities and goals for its future. Information was solicited through an interactive mapping activity, in which participants shared knowledge of specific sites within the park, and through facilitated brainstorming sessions oriented towards gathering general information related to the park's natural features, its uses, and residents' goals and visions for its future.[10]

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[6] See *Deeds of Covenance* analysis p 65

[7] See Appendix C.

[8] See survey sample and survey results in Appendix B.

[9] While completed surveys were helpful in providing the CSLD team new information and additional perspectives, survey results cannot be assumed to fully represent the interests and priorities of the community due to the relatively small number of surveys returned.

[10] See Appendix B.

At the second public meeting on February 28, 2004, the CSLD team presented the results of the site analyses and a preliminary concept plan based on those analyses. Twenty-one residents attended this meeting and provided their response to the preliminary concept plan. The additional insights and questions raised by attendees of this meeting were addressed in the final stages of the planning process.

CONTEXT

Regional and Local Context

The town of Union Vale, New York, is located roughly in the center of Dutchess County, east of the Hudson River and on the western edge of the Taconic Highlands (see Figure 1). The region is characterized by north-south running ridges which continue from the town of Beekman north into the town of Union Vale. These natural geologic features remain largely forested, providing valuable wildlife corridors and opportunities for recreation.

Union Vale encompasses a total land area of thirty-eight square miles and has a population of 4,546.[11] In the past, agriculture and mining employed a significant percent of the population. Today, however, only 1% of residents are employed in agriculture, forestry, fishing, hunting, or mining. Despite changing trends in employment and land use, the land character remains largely rural; local rod and gun clubs own a comparatively large amount of undeveloped land, large-lot zoning in much of the town maintains a low density of development, and commercial land uses in the town are limited. Together, these factors contribute to the preservation of Union Vale's rural character.

Although the town has successfully retained much of its rural character thus far, Union Vale's population is on the upswing. The town's population increased by 27% between 1990 and 2000[12] and a recent build-out analysis projects further population growth of 3,527 individuals before Union Vale reaches total build-out, between 2012 and 2020.[13] By this time, the population will have reached approximately 8,073, representing a 78% increase in the town's total population.

Site Description

Tymor Park is one of two parks owned by the town of Union Vale and is the largest town park in the state of New York. The approximately 500-acre park sits at the southern edge of Union Vale, straddling the boundary between Beekman and Union Vale. It encompasses a portion of the north-south running ridge of West Clove Mountain and extends downslope into Clove Valley (see Figures 2 & 3).

The park was given to the town of Union Vale by Jean and Ralph Conner in fourteen separate parcels. While the language within the Deeds of Covenance is not uniform for each of the parcels, a common intent expressed in all the deeds is that the land serve

[11] 2000 US Census.
[12] Ibid.
[13] Town of Union Vale Master Plan, 2001. (Build-out projections reflect the maximum potential for development under *current* Union Vale zoning regulations.)

"nature conservation" purposes and provide recreational opportunities for the residents of Union Vale and their guests.

The park contains a mix of hardwood and softwood forest, open fields, wetlands, and water bodies. Fishkill Creek enters the park from McKinney Pond to the north and feeds 8.5-acre Furnace Pond within the Park. Furnace Pond itself was the location of an iron ore stripmine in the 1800's and was subsequently turned into a pond through the damming of Fishkill Creek. Located near the Furnace Pond dam are the historical remains of an iron smelting furnace and lime mill.

Development within the park is centered around, and makes use of, the historic farm buildings of the original Connor dairy farm. Today the farm buildings house two residential rental properties, park staff offices, park equipment storage, indoor recreational resources, an historical museum, and a senior center. The only new building within the park is the Union Vale Town Hall.

The park provides multiple active and passive recreational facilities including a swimming pool, horseback-riding facilities, sports fields, tennis courts, picnic grounds, and other seasonal community classes and activities. Trail loops throughout the park provide opportunities for hiking, biking, horseback riding, skiing, snowshoeing, and snowmobiling.[14] The park's recreational opportunities, facilities, year-round programming, central location, natural and historic features, and sheer size combine to make it a center of activity in Union Vale and an important part of the town's overall identity.

[14] Snowmobile use within the park is only allowed west of Duncan Road.

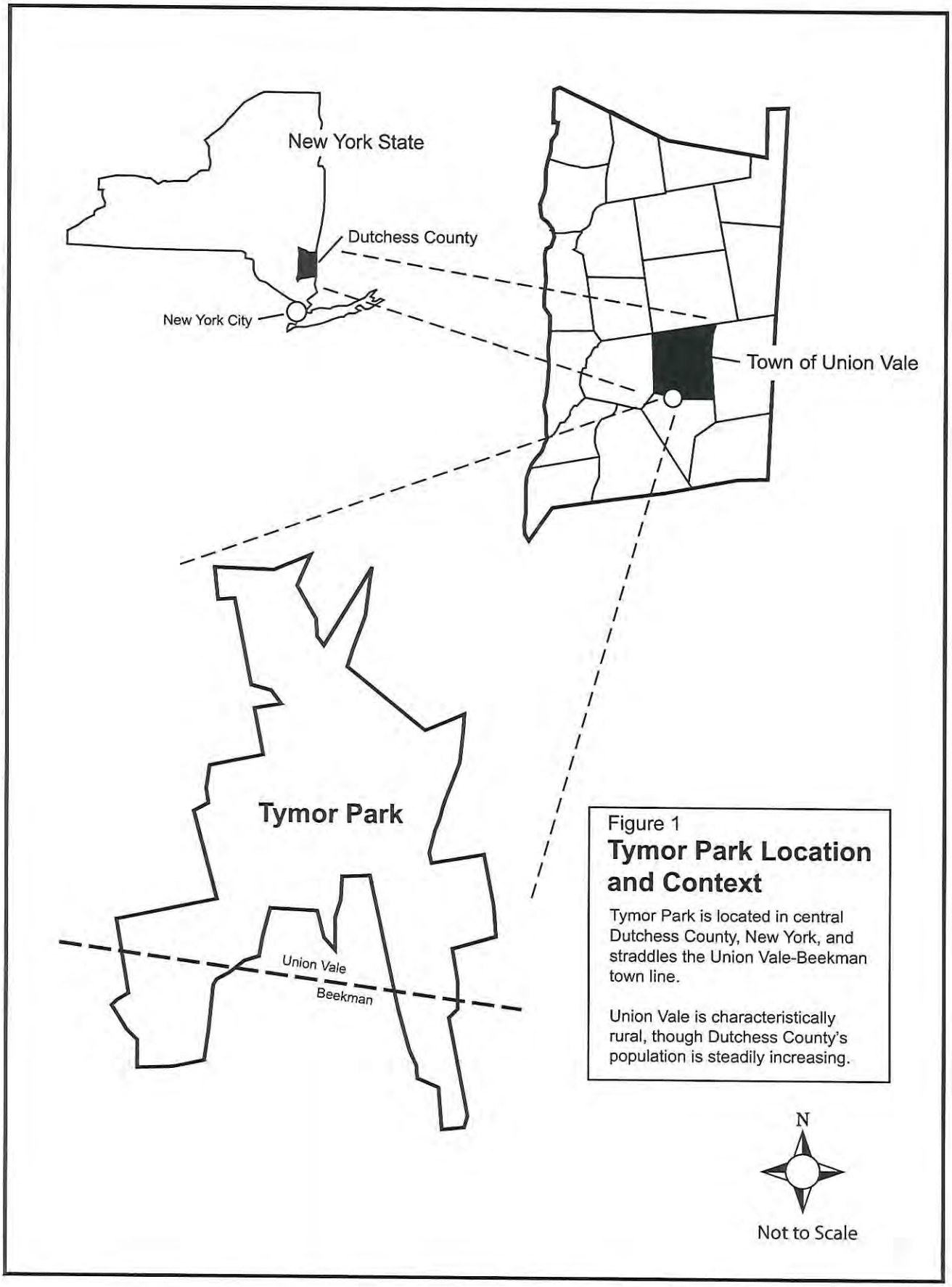
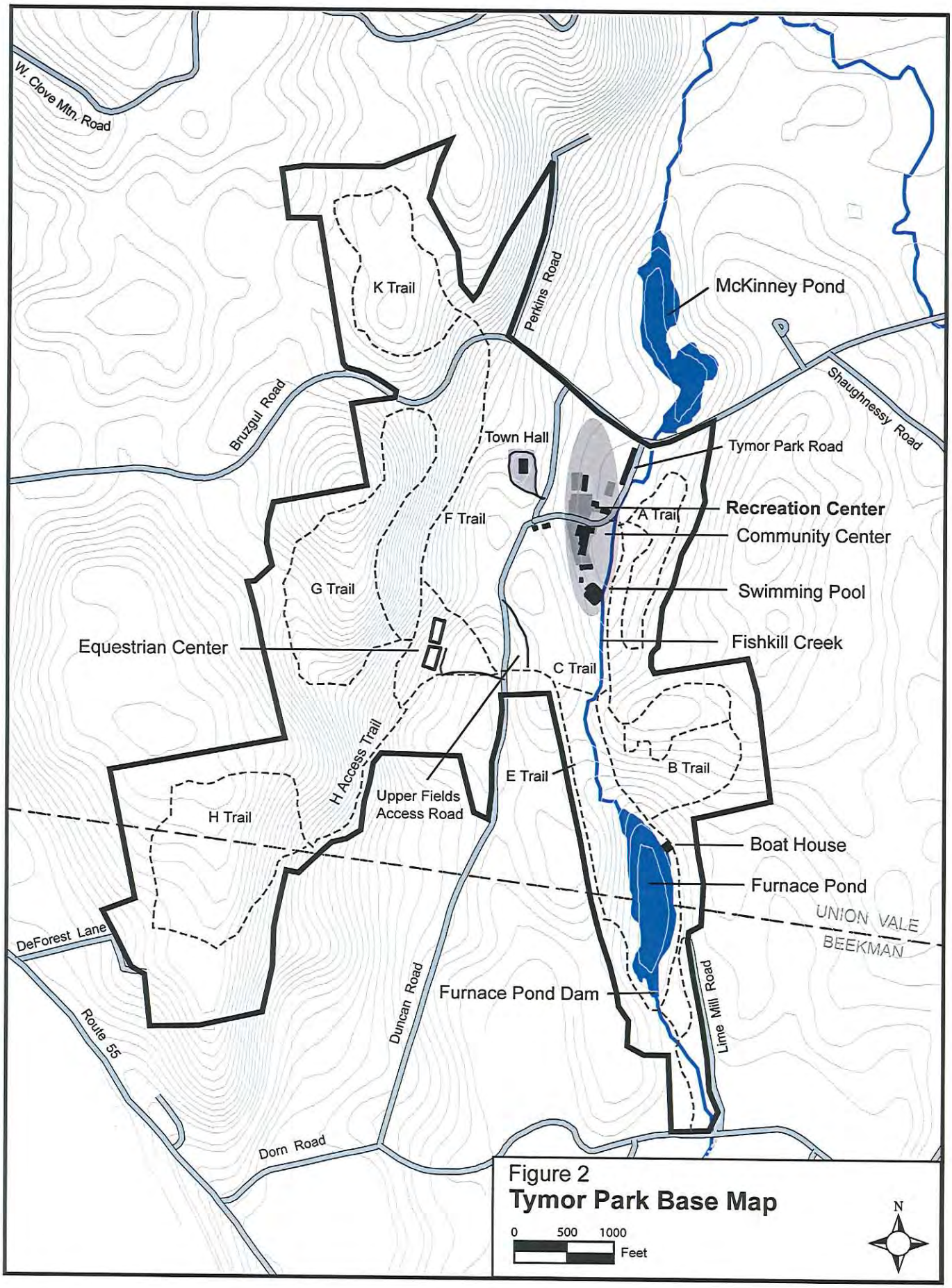


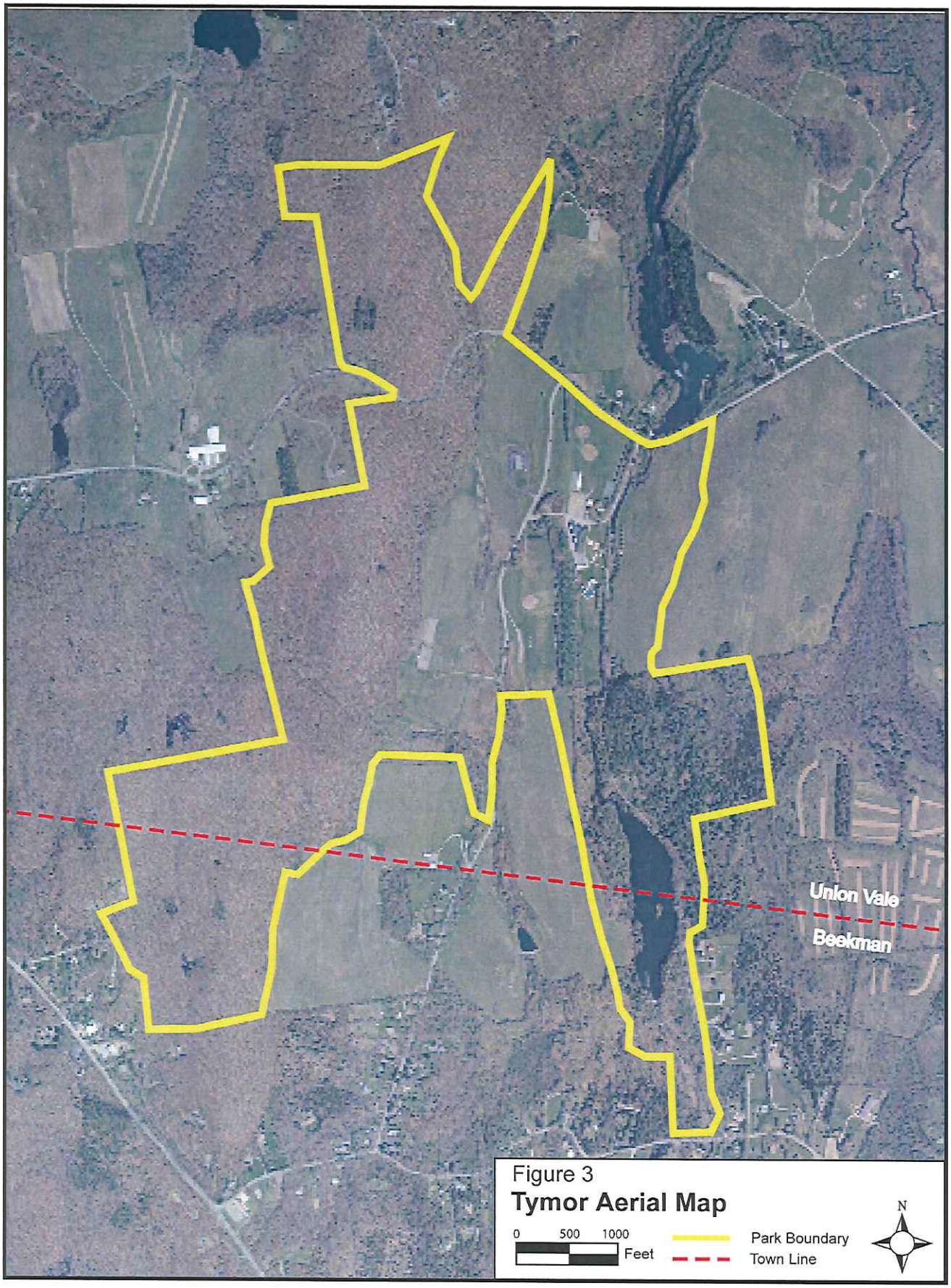
Figure 1

Tymor Park Location and Context

Tymor Park is located in central Dutchess County, New York, and straddles the Union Vale-Beekman town line.

Union Vale is characteristically rural, though Dutchess County's population is steadily increasing.


W. Clove Mtn. Road
K Trail
Perkins Road
McKinney Pond
Shaughnessy Road
Bruzgul Road
Town Hall
Tymor Park Road
Recreation Center
A Trail
F Trail
Community Center
G Trail
Swimming Pool
Equestrian Center
Fishkill Creek
C Trail
H Access Trail
Upper Fields Access Road
E Trail
B Trail
H Trail
Boat House
Furnace Pond
UNION VALE
BEEKMAN
DeForest Lane
Duncan Road
Furnace Pond Dam
Lime Mill Road
Route 55
Dorn Road
Figure 2
Tymor Park Base Map
0 500 1000
Feet
N


Union Vale
Beekman
Figure 3
Tymor Aerial Map
0 500 1000
Feet
Park Boundary
Town Line
N

DEFINITIONS

Recreation Center

In this document, the term *Recreation Center* refers to the area in the northeast quadrant of the park that encompasses the park buildings, the main parking lot, and the active recreation facilities. The most intensive park uses occur in the Recreation Center.

Passive Recreation

In this document, *passive recreation* is defined as recreational activities which rely primarily on natural environments and trails, including hiking, biking and horseback riding. Passive recreational activities do not require developed facilities.

Active Recreation

Active recreation is defined as activities that require dedicated spaces, structures, and support facilities, such softball, tennis, and basketball.

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NATURAL FEATURES ANALYSES

PURPOSE OF NATURAL FEATURES ANALYSES

> *"To protect a park's natural amenities, to minimize conflicts between visitor-types, and to encourage respectfulness among visitors, it is obviously necessary to develop park standards and establish use-regulations. A basis for standards and regulations is, of course, study and planning relative to the Park's ecology."*
>
> *Ralph Connor, park donor, 1972.*[1]

This chapter includes analyses of the natural features of Tymor Park including bedrock and surficial geology, soils, slopes, water resources, land cover, and wildlife habitat. These features determine the natural context of the site, define the function of the natural systems within and surrounding the site, and suggest limitations and opportunities for appropriate human use of Tymor Park. The Master Plan recommendations are guided by the information resulting from these analyses, and from the social analyses of the subsequent chapter.

Each analysis in this chapter follows the same format including a graphic to illustrate site conditions and patterns, a brief summary of the analysis, a detailed description and interpretation of the analysis, and an outline of the planning implications suggested by the analysis. The planning implications represent those elements that will be considered and treated in developing the Master Plan. The final section in this chapter summarizes these site analyses and presents a composite index of environmentally sensitive sites and site use limitations within Tymor Park.

Research for this section utilized a wide variety of sources including USGS topographic maps, Dutchess County Department of Planning and Development, Dutchess County Environmental Management Council, New York Department of Environmental Conservation, New York State Natural Heritage Program, Soil Conservation Service Dutchess County Soil Survey, and GIS.

Additional site analyses relating to human uses of the park are presented in the next chapter, *Social Analyses.*

[1] *Recreation Management Plan for Tymor Forest*, 1972. See Appendix C.

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GEOLOGY AND SOILS

Summary

The bedrock geology of Tymor Park is characterized by folded metamorphic rock and the surficial geology is composed of the glacial till characteristic of much of the northeast. The soils of Tymor Park reflect the influences of local variations in bedrock type, glacial till, landform, and climate. Together, the geology and soils represent the foundation upon which all other natural features and human uses of the park are based. They yield unique characteristics and establish opportunities and limitations to potential site uses. Specific factors limiting site use at Tymor Park are areas of thin and erosive soils, primarily in the uplands, and areas of poorly draining soils, primarily in the lowlands.

Geology

Bedrock Geology

Tymor Park lies on the western edge of the Taconic Highlands, near the boundaries of the Hudson Highlands and the Hudson Lowlands. The folded bedrock underlying Tymor Park was formed 500-1000 million years ago and is composed of metamorphosed shale, sandstone, limestone and dolomite. The bedrock in the lowlands is predominantly Fishkill limestone and dolostone of the Wappinger Group. The bedrock of the uplands is primarily phyllite, schist, and meta-graywacke of the Walloomsac Formation with some Everett Schist in the northernmost uplands.[2] Isolated deposits of iron ore are also found in Tymor Park and throughout the region. Mining of local limestone and iron ore deposits has been significant to the history of both Tymor Park and the surrounding region.[3] Figure 5 shows the locations of the different bedrock formations in Tymor Park.

Surficial Geology

Tymor Park was covered by nearly a mile of glacial ice before the Laurentide ice sheet receded approximately 10,000 years ago. When the glaciers receded, deposits of glacial till[4] and glacial outwash[5] were left in the lowlands while the uplands were covered with only a thin layer of glacial till.

---

[2] Dutchess County Soil Survey, 2002.
[3] See *Historical and Cultural Resources* analysis.
[4] Deposits of unsorted mud, clay, silt, sand, rocks, and boulders laid down by ice.
[5] Deposits from glacial meltwater streams.

Soils

The eighteen different soils types within Tymor Park are derived from the local bedrock and glacial till and reflect characteristics of these parent materials (see Figure 4). In the valley, limestone-influenced soils are alkaline and support plant species such as bladdernut, sycamore, and walking fern. The upland soils originated from more acidic parent material and support an oak-dominant forest.

Soil characteristics such as pH, erosivity, drainage, and depth determine the appropriateness of various uses such as recreation, development, or forestry. In general, the upland soils are shallow to bedrock, erosive, well drained to somewhat excessively drained, and acid. The lowlands are characterized by deeper, less erosive soils, poorly to somewhat excessively drained, and more alkaline than the upland soils. Figure 6 shows the location of the different soils within Tymor Park and Table 1 provides detailed information for each soil type.

Of particular significance to park use and management are the areas of highly erosive and poorly draining soils. Highly erosive soil types are found on the slopes of West Clove Mountain, on the steep slope east of the soccer field, and west and southwest of Furnace Pond. These areas have a high potential for soil erosion if the vegetative cover is removed in association with development or other human uses and are often shallow to bedrock.

Poorly draining soils are found near the softball fields south of Bruzgul Road and between the equestrian center and Duncan Road. These soils also present significant limits to use and development due to seasonal high water table, slow water percolation, and frost action.

Two areas within the park are underlain by soil designated as "prime farmland" by the Natural Resources Conservation Service. These areas roughly encompass the meadow east of Fishkill Creek and the upper ball fields. Areas designated prime farmland are a sensitive resource that, once lost, are irreplaceable.

Planning Implications

- Areas of erosive and poorly drained soils are inappropriate for development.
- Any necessary development within areas of erosive or poorly draining soils must employ special considerations.
- Soils designated as prime farmland are inappropriate for development.

Soil Symbol	Soil	Slope	Depth to Bedrock	Erosion Hazard	Soil Characteristics	Use Limitations
DwB	Dutchess-Cardigan complex	1-6%	20" to >60"	Slight	Silt loam and loam, rocky, well-drained, moderately permeable, slightly to very strongly acid.	Depth to bedrock, slow percolation, frost action.
DwC	Dutchess-Cardigan complex	5-16%	20" to >60"	Moderate	Silt loam and loam, rocky, well-drained, moderately permeable, slightly to very strongly to acid.	Slope, depth to bedrock, slow percolation, frost action.
FcD	Farmington-Galway complex	15-30%	10" to 40"	Severe	Very fine sandy loam to gravelly loam, very rocky, 2-10% rock outcrop, moderately well to somewhat excessively drained, moderately permeable, moderately alkaline to strongly acid.	Severe erosion hazard, slope, depth to bedrock, rock outcrops, seasonal high water table.
FeE	Farmington-Rock outcrop complex	25-65%	10" to 20"	Very Severe	Very fine sandy loam and loam, 20% rock outcrop, well to somewhat excessively drained, moderate permeability, mildly alkaline to strongly acid.	Very severe erosion hazard, slope, depth to bedrock, rock outcrops.
GfB	Galway-Farmington complex	1-6%	10" to 40"	Slight	Very fine sandy loam to gravelly loam, rocky, moderately well- to somewhat excessively well-drained, moderate permeability, moderately alkaline to strongly acid.	Depth to bedrock, rock outcrops.
GfC	Galway-Farmington complex	5-16%	10" to 40"	Moderate	Very fine sandy loam to gravelly loam, rocky, moderately to somewhat excessively drained, moderately alkaline to strongly acid.	Slope, depth to bedrock, rock outcrops, seasonal high water table.
GfD	Galway-Farmington complex	15-30%	10" to 40"	Severe	Very fine sandy loam, loam and gravelly loam, moderately well to somewhat excessively drained, moderate permeability, seasonal high water table, moderately alkaline to strongly acid.	Severe erosion hazard, slope, depth to bedrock, rock outcrops, seasonal high water table.
GsC	Georgia silt loam	8-15%	> 60"	Moderate	Silt loam, loam and gravelly fine sandy loam, moderately well-drained, moderate to slow permeability, seasonal high water table, neutral to strongly acid.	Slope, seasonal high water table, slow percolation, frost action.
MnB	Massena silt loam	3-8%	> 60"	Moderate	Fine sandy loam and loam, somewhat poorly drained, moderate to slow permeability, seasonal high water table, moderately alkaline to moderately acid.	Somewhat poorly drained, seasonal high water table, slow percolation, frost action.
NwC	Nassau-Cardigan complex	5-16%	10" to 40"	Moderate	Silt loam and loam, very rocky, 2-10% rock outcrop, well- to somewhat excessively well-drained, moderately permeable, moderately to very strongly acid.	Slope, depth to bedrock, rock outcrops, frost action.
NwD	Nassau-Cardigan complex	15-30%	10" to 40"	Severe	Silt loam and loam, very rocky, 2-10% rock outcrop, well- to somewhat excessively well-drained, moderate permeability, moderately to very strongly acid.	Severe erosion hazard, slope, depth to bedrock, rock outcrops, frost action.
NxE	Nassau-Rock outcrop complex	25-45%	10" to 20"	Very Severe	Silt loam, 30% rock outcrop, somewhat excessively drained, moderate permeability, strongly to very strongly acid.	Very severe erosion hazard, slope, depth to bedrock, rock outcrops.
NxF	Nassau-rock outcrop complex	45-70%	10" to 20"	Very Severe	Silt loam, 30% rock outcrop, somewhat excessively drained, moderate permeability, strongly to very strongly acidic.	Very severe erosion hazard, slope, depth to bedrock, rock outcrops, frost action.
SkB	Stockbridge silt loam	3-8%	> 60"	Slight	Prime farmland. Silt loam, well-drained, moderate to slow permeability, moderately alkaline to strongly acid.	Slow percolation, frost action.
SkC	Stockbridge silt loam	8-15%	> 60"	Moderate	Silt loam, well-drained, moderate to slow permeability, moderately alkaline to strongly acid.	Slope, slow percolation, frost action.
SmB	Stockbridge-Farmington complex	1-6%	10" to >60"	Slight	Silt loam, very fine sandy loam and loam, rocky, well to somewhat excessively drained, moderate to slow permeability, moderately alkaline to strongly acid.	Depth to bedrock, rock outcrops, slow percolation, frost action.
SmC	Stockbridge-Farmington complex	5-16%	10" to >60"	Moderate	Silt loam, very fine sandy loam and loam, rocky, well to somewhat excessively drained, moderate to slow permeability, moderately alkaline to strongly acid.	Slope, depth to bedrock, rock outcrops, slow percolation, frost action.
Su	Sun silt loam	0-3%	> 60"	Slight	Silt loam, loam and gravelly loam, poorly-drained and very poorly drained, moderate to very slow permeability, moderately alkaline to strongly acid.	Poorly drained, seasonal high water table, frost action, slow percolation.

Table 1. Tymor Park Soil Types and Characteristics.

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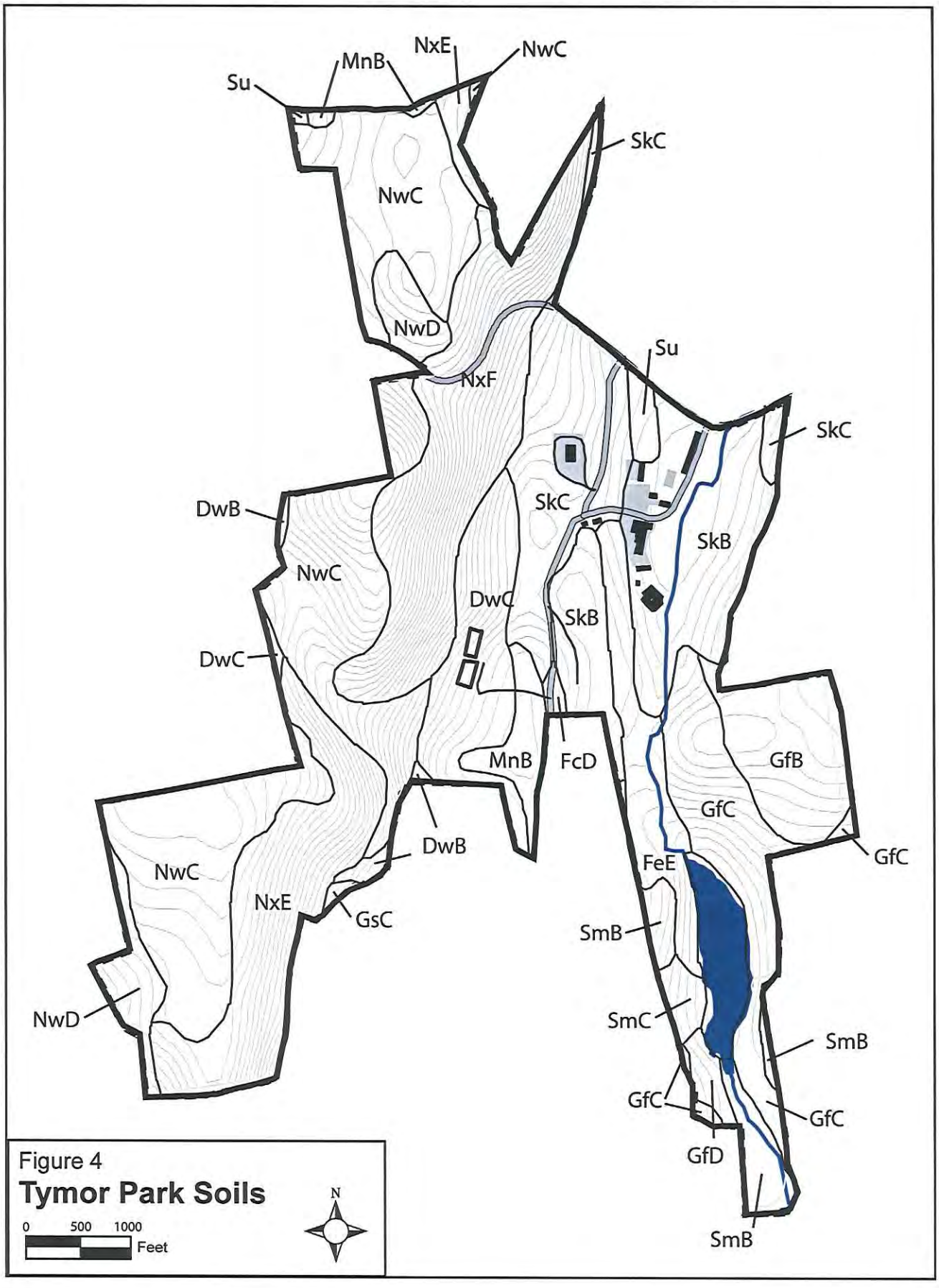
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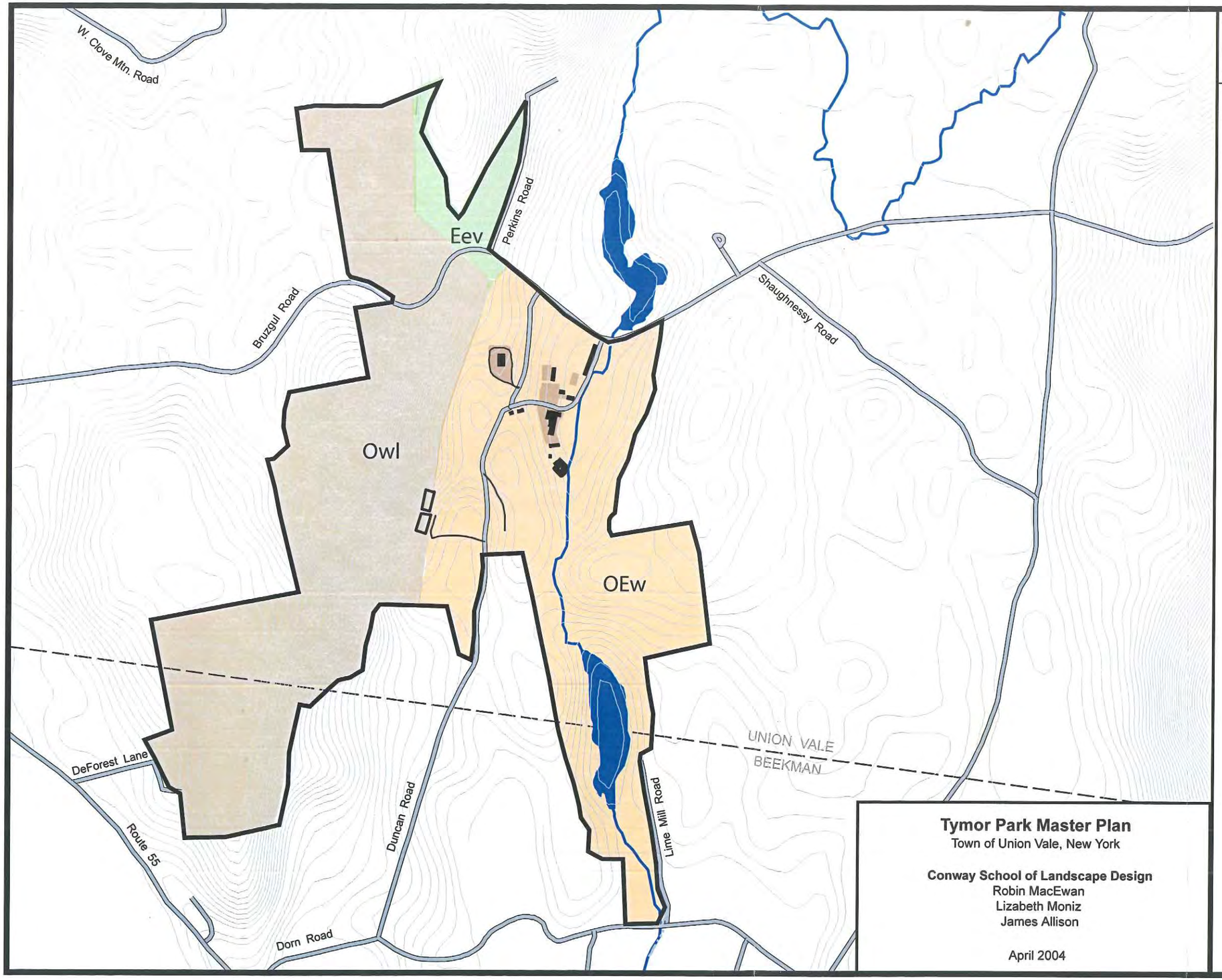
SmB
GfC
GfC
GfD
SmB
Figure 4
Tymor Park Soils
0 500 1000
Feet
N

Figure 5

Geology Analysis

Summary: The bedrock geology of Tymor Park is characterized by folded metamorphic rock and the surficial geology is composed of the glacial till characteristic of much of the northeast. The bedrock in the lowlands is predominantly limestone and dolostone. The bedrock of the uplands is primarily phyllite, schist, and meta-graywacke. Isolated deposits of iron ore are found in the park.



LEGEND

- **Owl:** Walloomsac Formation (phyllite, shist, meta-graywacke)
- **Eev:** Everett shist (locally with meta-graywacke lenses)
- **OEw:** Wappinger Group (limestone, dolostone)

KEY

- Water
- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Building footprint

0 500 1000 2000 Feet

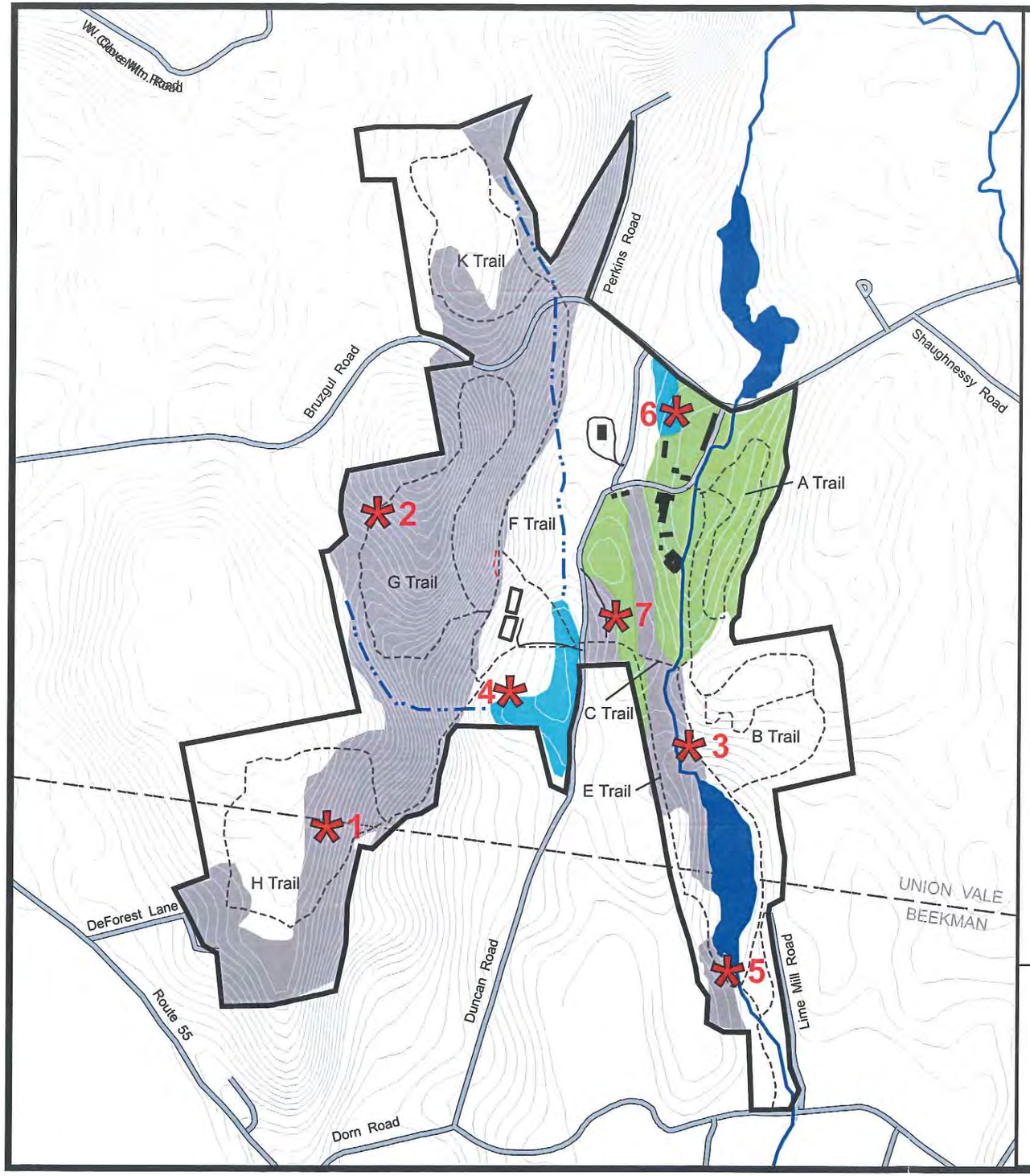
N

Data Source: Natural Resources Conservation Service, Dutchess County, Dutchess County Environmental Management Council.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004



Management Considerations

1. Trails located on steep slopes through zones with erosive soils in multiple areas.
2. ATV and snowmobile use on erosive soils throughout West Clove Mountain trails.
3. Multiple uncontrolled access points to Fishkill Creek Gorge. Potential erosion on trails and Furnace Pond access road.
4. Equestrian use and mowing on poorly draining soils.
5. Multiple-use trail on erosive soils causing erosion on E Trail.
6. Athletic fields on poorly draining soil.
7. Erosion on access road and in parking area for upper athletic fields.

Tymor Park Master Plan
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Figure 6

Soils Analysis

Summary: Soils of particular significance to park use and management are the areas of highly erosive and poorly draining soils. Intensive use on highly erosive soils degrades natural systems and increases maintenance requirements. Poorly draining soils present significant limits to use and development due to seasonal high water table, slow water percolation, and frost action.

LEGEND

- Poorly draining soils
- Severely erosive soils
- Prime farmland
- Management considerations

KEY

- Water
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Natural Resources Conservation Service, Dutchess County, Dutchess County Environmental Management Council, Trail locations are approximations, based on existing trail map and aerial photo interpretation.

LANDFORMS AND SLOPES

Summary

Closely mimicking its underlying bedrock, the landform of Tymor Park consists of ridges and valleys, steeply sloped uplands, and more gently sloping lowlands. Flat areas are restricted primarily to ridge tops and floodplains. Active recreation and park facilities are located within the flatter areas. Steep slopes in many areas, especially along the east face of West Clove Mountain, limit the potential for certain human uses.

Landforms

Tymor Park lies on the western side of the six-mile-long, north-south running Clove Valley. Approximately half of the park lies on the steep, east-facing slopes of the ridge that forms the western boundary of Clove Valley. This north-south running ridge, referred to in this document and in some historical sources as West Clove Mountain, is the southern extension of Clove Mountain.[6] At its highest point within the park, West Clove Mountain reaches over 840 feet above sea level.

The remainder of Tymor Park lies in the lower reaches of West Clove Mountain, extending to the bottom of Clove Valley. This part of the park is characterized by gently sloping hillsides, infrequent bedrock outcrops, and relatively flat areas along portions of the floodplain of Fishkill Creek. Fishkill Creek flows through the park lowlands, and through a channel carved through bedrock,[7] before entering Furnace Pond in the southeast corner of the park. The elevation at Furnace Pond is 440 feet above sea level.

Current and traditional land use within Tymor Park generally follow the natural limitations of the landforms and slopes. Historically, buildings and agricultural uses were concentrated in the lowlands and roads and trails followed waterways. Current land uses continue these patterns and the lowlands remain primarily unforested and are developed only in concentrated pockets. Historically, the uplands were largely undeveloped and used for grazing and timber harvest. Today, they remain undeveloped and are used for passive recreation.

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[6] While consistent names do not appear on current maps of the area, this document refers to the ridge along the western boundary of Clove Valley as West Clove Mountain and to the ridge along the eastern boundary of Clove Valley as East Clove Mountain. This is consistent with historic maps of the area.

[7] This area is locally referred to as "The Gorge."

Slopes

Steep slopes are vulnerable to soil erosion when vegetation is removed or soils are disturbed by development and other uses. Eroding soils pollute waterways, disrupt the functions of surrounding natural systems, and may take many thousands of years to replace through natural processes. An understanding of slope categories and slope delineations enables future land use and management decisions to minimize or eliminate soil loss.

Slopes in Tymor Park range from flat (0%), along some ridge tops and valley bottoms, to extremely steep (>25%) along the east face of West Clove Mountain and west of Furnace Pond. The majority of land in Tymor Park falls in the 10-25% slope category. In Table 2, slopes are categorized according to steepness in relation to current uses of the site. Figure 7 delineates the boundaries of these slope categories within the park.

PERCENTAGE	STEEPNESS	USE IMPLICATIONS
0-5%	Flat	0-2% slopes unsuited to development due to poor drainage. 2-5% slopes appropriate for active recreation and development. Little to no grading required.
5-10%	Moderate	Ideal for trails. Grading required for any development.
10-25%	Steep	Upper limit for trails. Trails must employ erosion control measures. Extensive grading required for any development.
25%+	Extremely Steep	Severe erosion potential. Not appropriate for new development. Trails must have significant erosion control measures.

Table 2. Comparison of slope categories.

Current land use generally adheres to the natural limitations and opportunities of the slope categories on the site. Development is clustered primarily in the flatter locations, where it presents minimal erosion potential and requires little grading. Exceptions to this include the Equestrian Center which falls within the 10-25% slope category and trails which bisect many of the steeper slopes within the park. Trails in these steeper areas do not currently employ erosion control measures adequate to divert runoff and prevent soil erosion.

Planning Implications

- Slopes on the property constrain use and development due to the high erosion potential and the requirement for extensive grading when developing on steeper ground.

- Existing land uses that occupy areas with elevated erosion potential, yet do not currently incorporate adequate runoff and erosion control measures, conflict with the nature conservancy function of the park.

- Siting of future active recreation or intensive-use facilities in areas outside of the 0-5% slope zones have a high potential to conflict with the nature conservancy function of the park and would be expensive due to the extensive grading required.

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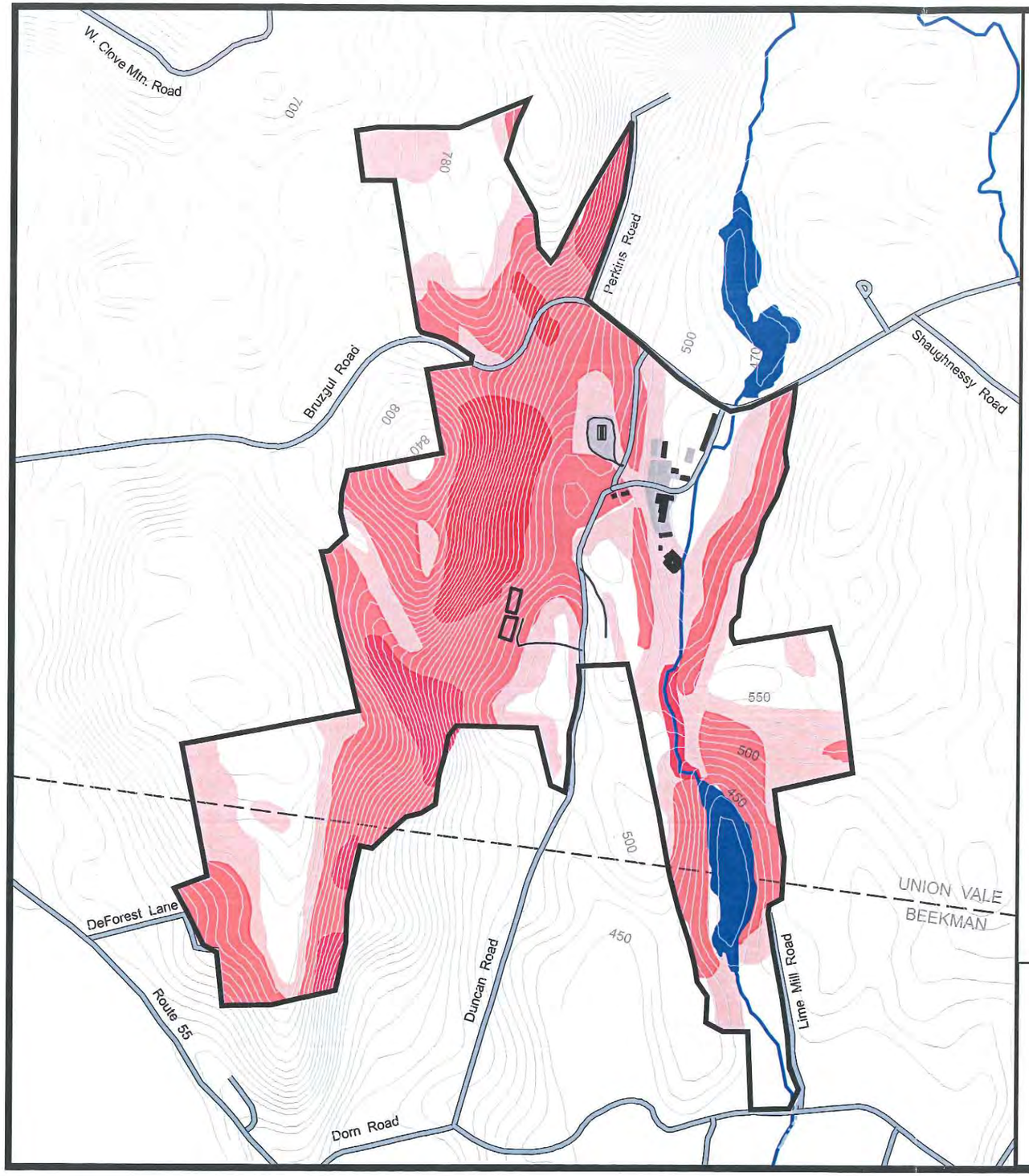

Management Considerations

- Slopes on the property constrain use and development due to the high erosion potential and the requirement for extensive grading when developing on steeper ground.
- Existing land uses that occupy areas with elevated erosion potential, yet do not currently incorporate adequate runoff and erosion control measures, conflict with the nature conservancy function of the park.
- Siting of future active recreation or intensive-use facilities in areas outside of the 0-5% slope zones have a high potential to conflict with the nature conservancy function of the park and would be expensive due to the extensive grading required.

Tymor Park Master Plan
Town of Union Vale, New York

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April 2004

Figure 7

Slopes Analysis

Summary: Tymor Park is characterized by ridge and valley topography, steeply sloped uplands, and more gently sloping lowlands. Flat areas are restricted primarily to ridge tops and floodplains. Active recreation and park facilities are located in flatter areas. Steep slopes in many areas limit the potential for use and development.

LEGEND

- 0-5% Slope
- 5-10% Slope
- 10-25% Slope
- >25% Slope

KEY

- Water
- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

WATER RESOURCES ANALYSIS

Summary

Water resources in Tymor Park include streams, wetlands, and a groundwater aquifer. They provide wildlife habitat, natural resource services such as water filtration, and opportunities for aesthetic and recreational enjoyment. Some site uses contribute to degradation of the park's water resources. These include structures in the Fishkill Creek floodplain, frequent mowing in riparian corridors and buffer areas, road and trail crossings through wetlands, chemical use and application, increases in erosion and stormwater runoff from impervious and unvegetated surfaces, and degradation of riparian forests. Many of these land use conflicts were initiated during agricultural development of the area, prior to the park's existence. Figure 8 illustrates known water resources within the park and some of the areas where current or past uses create water resources management concerns. Table 3 illustrates some of the functions of these resources.

RESOURCE	FUNCTIONS
Intermittent streams	Wildlife habitat, wildlife corridors, flood storage, aesthetic appreciation.
Perennial streams	Wildlife habitat, wildlife corridors, flood storage, recreation, aesthetic appreciation.
Riparian forests	Water temperature regulation, wildlife habitat, wildlife corridors, stream bank stability, erosion control, passive recreation, aesthetic appreciation.
Wetlands	Flood storage, water pollution filtering, groundwater recharge, wildlife habitat, wildlife corridors, passive recreation, aesthetic appreciation.
Aquifer	Water source, provide majority of in-stream flow to perennial streams during dry months.
Upland forests	Flood storage through holding snow pack, erosion control, groundwater recharge, wildlife habitat, wildlife corridors, passive recreation, aesthetic appreciation

Table 3. Water resources and functions.

Fishkill Creek Watershed

The Fishkill Creek watershed begins in the Hudson Highlands and drains southwest toward the Hudson River. This watershed occupies 193 square miles and supplies important surface and groundwater resources to citizens between the Hudson Highlands and the Hudson River.

Prior to European settlement in the 1700's, the Fishkill Creek watershed was a forested landscape. During settlement, the forests were largely cleared for agriculture, mining, and firewood. Watershed function, water quality, and riparian and upland habitat diminished.

More recently, forests have regenerated and currently the entire Fishkill Creek watershed is 60 percent forested, 30 percent agricultural, and 10 percent urban. However, rapid land use changes, in the form of residential subdivisions and new impervious surfaces that lead to increased flooding and erosion, are again leading to degradation of the water resources within the watershed.

Intermittent Streams

Intermittent streams flow from the hillsides of West Clove Mountain, behind the town hall, and past the equestrian center. These seasonal watercourses provide wildlife corridors and feed wetlands. Ultimately, they drain into the main stem of Fishkill Creek in Beekman, about one mile south of the park boundary. Where the streams flow through unforested areas, native trees and shrubs were historically removed and generally have not regenerated. The result is erosion, decreased groundwater recharge, and reduced wildlife habitat.

Fishkill Creek

Tymor Park has five sub-watersheds that each drain into Fishkill Creek either within the park or slightly downstream of the park. Fishkill Creek travels approximately 1.2 miles through Tymor Park, as a low-gradient, slow moving stream. South of Tymor Park, the creek flows through nine towns before reaching the confluence with the Hudson River, about 56 miles from New York City. The stream and stream corridor provide habitat for many aquatic species.

Today, Fishkill Creek water quality is degraded compared to healthy forested streams in the region. Road salts, fertilizers, and failing septic systems contribute most of the aquatic pollution in the form of phosphates, chlorides, sulfates and nitrates. Like many streams, pollution in Fishkill Creek increases with distance from its headwaters and is relatively healthy in Union Vale compared to downstream reaches.

The New York State Department of Environmental Conservation (NYSDEC) has regulatory jurisdiction over Fishkill Creek and classifies it as a "C(T)" stream.[8] The NYSDEC requires and reviews permits for activities that disturb the stream bed, stream banks, and a fifty-foot area on both sides of the creek. The Town of Union Vale regulates

[8] "C" indicates water quality appropriate for recreation and fishing, but not drinking, and "T" indicates that the creek supports trout species.

development within one hundred feet on both sides of NYSDEC-classified streams[9] and requires a fifty-foot vegetated buffer on both sides of NYSDEC-classified streams.[10]

Historical Channelization

A thorough understanding of the creek's morphology is difficult because roads, culverts, dams, and natural landforms all combine to create a series of unnatural features.

Parts of the upper section of Fishkill Creek, most notably to the east of the park buildings, were straightened and channelized, probably in association with historical agricultural activities. Channel morphology appears natural in the Gorge above Furnace Pond. Below the Furnace Pond dam, the stream channel also appears to follow more natural meanders.

In-stream Impoundments

Two dams exist on Fishkill Creek in Tymor Park. The large dam at the south end of Furnace Pond impounds water, retains sediment, limits fish passage, raises water temperatures, and serves as a substantial grade control. A smaller dam upstream, east of the park buildings serves these same functions on a smaller scale.

Culverts

Fishkill Creek is culverted where it enters the park at Bruzgul Road and where it exits the park at Dorn Road. These culverts have a negative effect on streamflow and wildlife passage.

Stream Corridor & Floodplain

The 100-year floodplain of Fishkill Creek is that area which floods, on average, once every 100 years. It is regulated by state and federal agencies and is delineated in Figure 8. The Town of Union Vale regulates development within a flood hazard area mapped by the Federal Emergency Management Agency (FEMA).[11] Environmental Overlay Districts established by the Union Vale Town Code also regulate development within a 100-foot buffer around water resources and require a 50-foot vegetated buffer around these resources. The New York State Department of Environmental Protection establishes similar protections. The Dutchess County Greenway Compact, which is signed by the Town of Union Vale, recommends a 60-foot stream corridor protection buffer and a 100- to 300-foot vegetated buffer where the stream corridor serves as a wildlife corridor.

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[9] Town Code of the Town of Union Vale, 2002. Chapter 90, p. 35.
[10] Town Code of the Town of Union Vale, 2002. Chapter 90, p. 70.
[11] Town Code of the Town of Union Vale, 2002.

Finally, the nationally recognized Center for Watershed Protection recommends protection of a 75-foot minimum buffer around water resources and protection of the entire 100-year floodplain.

Features and activities within the sensitive 100-year floodplain, including development, roads, removal of streambank vegetation, and many other human uses, can contribute to degradation of the water resource. Best management practices in this sensitive area focus on maintaining a healthy riparian forest which stabilizes streambanks, filters water pollution, regulates stream flow, and provides wildlife habitat.

The swimming pool, access road, trails, and some other recreation structures lie within the floodplain. Some of these existing uses might be prohibited by local and state regulations if constructed today. Parking areas near the Community Center are designed and graded in a way that promotes erosion, increases stormwater runoff, and allows polluted automotive runoff to quickly enter Fishkill Creek. Chemical application, particularly in the mowed areas within the floodplain, also has the opportunity to make its way quickly into the creek.

Riparian Forest

The riparian forest[12] is narrow north of the Gorge, and in some cases is only a single row of trees. The forested buffer is significantly wider through the Gorge, creating a more natural condition. The area surrounding Furnace Pond is heavily forested in most locations, except in certain areas due to roads and trails. Below the dam, the riparian forest is broad and mostly uninterrupted. However, roads and trails may be compacting soils, causing sedimentation, and degrading the forest plant communities.

Furnace Pond

Furnace Pond is an eight-acre in-stream impoundment in the main stem of Fishkill Creek. It provides wildlife habitat for a variety of wildlife and recreational enjoyment for park users.

The Furnace Pond dam was built in the late 1800's. The wide, artificial impoundment forms a sediment trap causing water velocity to slow as it enters into the pond. The effects of this are observed in the increasingly shallow north end of the pond where sediment has been slowly accumulating.[13] Additional results of damming include increased water

[12] The riparian forest is defined as the forested area surrounding water resources that contributes to the water filtration, streambank stabilization, flood control, and habitat functions of the stream corridor.
[13] Increases in sedimentation of the pond may be attributed to increased sediment loads in Fishkill Creek . This is often a result of land use changes upstream. Additional anecdotal evidence has suggested that sedimentation of the Furnace Pond increased dramatically during the period when McKinney Pond was dredged in the early 1970's.

temperature, restricted animal passage,[14] and changes to downstream channel flow. Warmer water temperatures, sedimentation, and restricted passage all negatively affect trout which require clear, cold water habitats.

The Furnace Pond dam leaks, resulting in decreased pond depth during drier months. The combination of decreased summer water levels and increased sedimentation has led to some interest in the town in repairing the leaking dam and dredging the pond.

Furnace Pond is a federally regulated wetland mapped on the National Wetlands Inventory. Furnace Pond is further regulated by the New York State Department of Environmental Conservation because it is on the main stem of Fishkill Creek, a NYSDEC-regulated stream. Activities including draining or dredging of Furnace Pond would require a permit from the Army Corp of Engineers and from the New York State Department of Environmental Conservation.

Slag Pile

It is possible that the slag pile south of Furnace Pond contributes pollutants that affect environmental quality. This should be assessed and, if necessary, a management plan implemented.[15]

Wetlands

Wetlands are a vital natural resource that provide a number of important services including flood storage, water filtration, unique wildlife habitat, and aesthetic value. They are also extremely sensitive to disturbance and the effects of surrounding land use changes. The Town of Union Vale regulates development within 100 feet of NYSDEC wetlands and requires a surrounding vegetated buffer of at least 50 feet.[16]

Tymor Park contains severally federally regulated wetlands which are mapped on the National Wetland Inventory and cannot be filled or dredged without an approved permit from the Army Corps of Engineers. These wetlands, identified in Figure 8, are located at Furnace Pond, near the swimming pool, along Duncan Road at the Equestrian Center entrance, and on the ridges along H trail. These features provide flood storage, water filtration, and wildlife habitat.

In addition to existing mapped wetlands, aerial photographs show potential wetlands in the meadows west of Duncan Road where intermittent streams drain towards the federally

[14] Particularly for aquatic, and migratory aquatic, species.
[15] The NYSDEC can provide guidance on this issue.
[16] Subject to additional restrictions and exceptions. Town Code of the Town of Union Vale, 2002.

recognized wetlands below the equestrian center.[17] This undelineated, potential wetland system appears roughly eight acres in size.[18] A smaller, potential wetland exists immediately northwest of the lower softball fields in an area of poorly drained soils. The possibility for additional wetlands exists throughout the park, particularly in the K and B Trail areas. Any unmapped wetlands within the park provide the same water quality and habitat benefits as mapped wetlands.

Conflicts in wetland management include the road and trail crossings near the equestrian center. In this area, hydrology has been altered in the federally recognized wetland to provide vehicle access to the equestrian center. South of the equestrian center, a wide area of potential wetland is mowed and included in a system of horse jumps. It is possible that trails, including B and K Trails, also cross small wetlands. Any infringement on wetlands may cause significant changes to these important natural systems.

Aquifer

Roughly half of Tymor Park lies over the "Zone 1" area of an important regional aquifer.[19] Residents in Union Vale and downstream of Union Vale rely on portions of this aquifer for water. The potential for contamination of this resource is high in the Zone 1 areas. Recognizing the importance and sensitivity of this resource, the Town of Union Vale regulates activities and development within aquifer and wellhead protection zones through the Environmental Resource Overlay District.[20] Potential park features and activities that could contribute to groundwater contamination include above and below ground fuel storage tanks, hazardous chemical use or application (including pesticides, herbicides, and fungicides), road treatment, and failing septic tanks.

Planning Implications

- Aspects of parking areas, roads, trail crossings, chemical applications, and frequent mowing in riparian zones, contribute to degradation of water resources, possibly conflicting with the nature conservancy role of the park.[21]

- Reforestation of areas not needed for active recreation would promote the historical watershed functions and controls provided by forests.

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[17] A wetland scientist could provide an official delineation of potential wetlands within the park. Such a delineation is based on the presence of wetland vegetation, hydrology, and soils.
[18] Estimated from aerial photographs.
[19] "Zone 1" indicates an area of permeable deposits directly over an aquifer.
[20] Town Code of the Town of Union Vale, 2002.
[21] See *Deeds of Covenance* analysis.

- Restoration and revegetation of the 100-foot riparian corridor would yield water quality and habitat benefits.

- Locating and protecting unidentified wetlands and other water resources would assist park management strategies.

- Furnace Pond and Furnace Pond dam maintenance strategies will have an effect on water quality above and below the pond.

- The Deeds of Covenance and the Union Vale Town Code both support active measures to protect and enhance water resources within the park.

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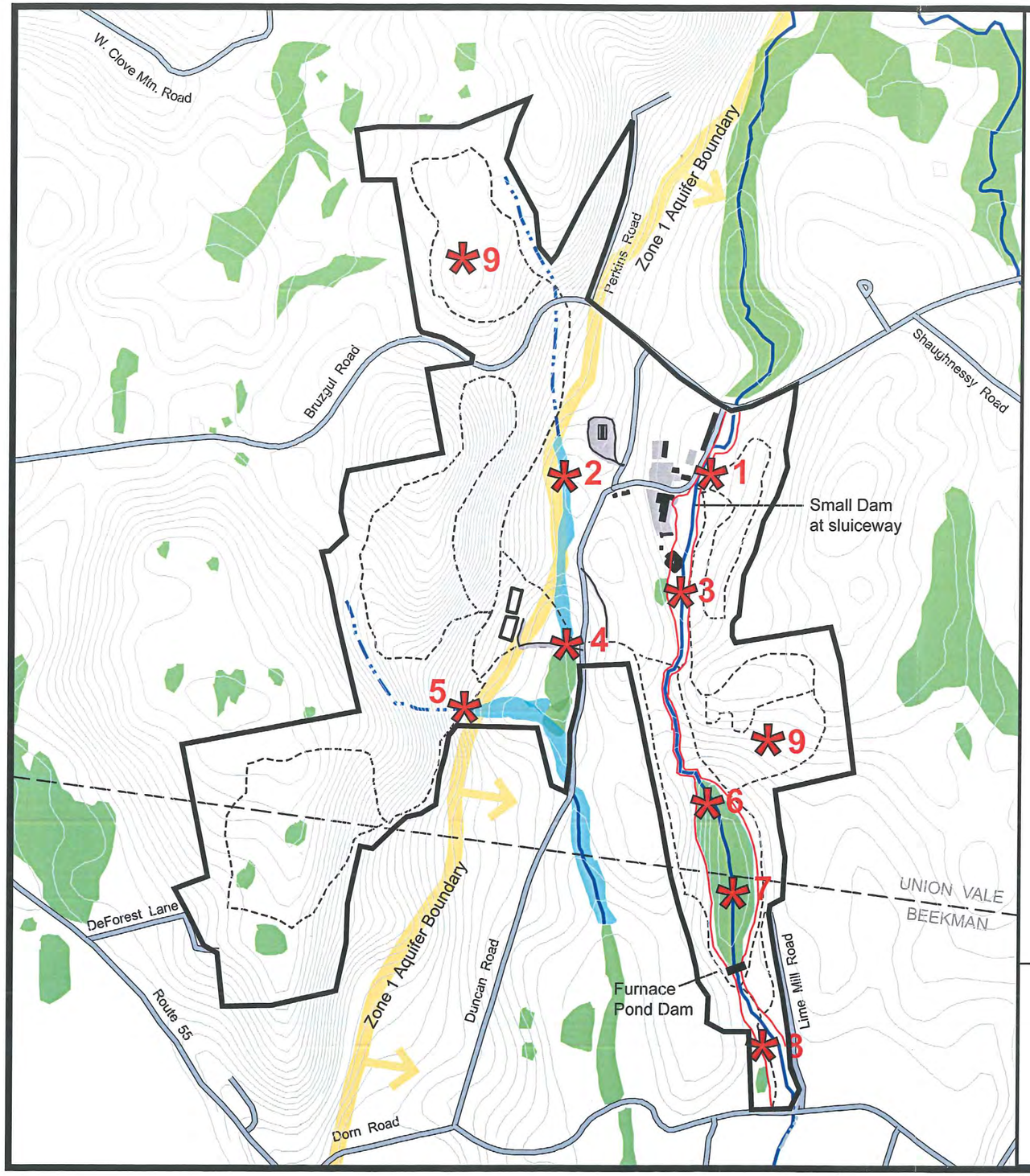

Management Considerations

1. Deforested floodplain: 100-year floodplain lacks substantial historical forested buffer.
2. Wetland and intermittent stream protection: wetlands are not mapped or fully identified. The historical tree and shrub structure is lacking.
3. Mowing of riparian area: this practice eliminates regeneration of native trees and shrubs which shade Fishkill Creek and control erosion.
4. Wetland crossing for access: Road crossing for Equestrian Center fragments and degrades wetland habitat.
5. Wetland disturbance by H Trail: hikers, bikers, and equestrians travel through this sensitive habitat.
6. Furnace Pond siltation: the dam decreases stream velocity flow causing sediment accumulation.
7. In-stream impoundment: large impoundment exposed to sun, which elevates water temperature.
8. Slag pile: a potential source of stream contamination.
9. Possible vernal pools not mapped.

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Town of Union Vale, New York

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April 2004

Figure 8

Water Resources Analysis

Summary: Water resources in Tymor Park include streams, wetlands, and groundwater aquifers. They provide wildlife habitat, natural resource services such as water filtration, and opportunities for aesthetic and recreational enjoyment.

LEGEND

- Federal or state wetland
- Possible wetlands
- Perennial stream
- Intermittent stream
- 100-year floodplain
- Zone 1 Aquifer boundary
- Management consideration

KEY

- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Trail locations are approximations, based on existing trail map and aerial photo interpretation

LAND COVER

Summary

A great diversity of land cover types, including forest, meadow, stream, wetland, and edge habitat, are found within the park. This diversity creates a rich landscape that serves a range of functions including habitat, forage, cover, shade, erosion control, aesthetic, and historical. Significant stressors affecting the integrity of land cover and habitat within the park include elevated deer populations, invasive plant and animal species, the health of the hemlock forest around Furnace Pond, habitat fragmentation, and human uses of the landscape.

Land Cover

Variations in land cover[22] at Tymor Park roughly follow variations in landform and reflect a complex relationship between geology, soils, drainage, aspect, slope, and land use history. Figure 10 delineates the land cover types in Tymor Park.

Sixty-three percent of the park is covered in hardwood forest, the vast majority of which is found in a contiguous corridor that runs north-south along the slopes of West Clove Mountain. Within the hardwood forest of the ridge are small, isolated pockets of conifers and a number of small, perched wetlands. The well-drained, shallow, acid soils of the uplands support a primarily oak-dominant hardwood mix. In contrast, the deeper, moist, limestone-derived soils of the lowlands support plant species unique to alkaline soils including bladdernut and walking fern.[23]

A greater diversity of cover types is found in the lowlands. A significant portion of the lowlands is currently maintained as open meadow through annual or biannual mowing and was historically used for agriculture and grazing. This cover type accounts for thirteen percent of the park. Another nine percent of the park, in and around high-traffic areas in the lowlands, is maintained as grass lawn.

Thirteen percent of the park, primarily in the southeast portion near Furnace Pond, is softwood forest. The softwood forest, particularly bordering Furnace Pond and the Gorge at Fishkill Creek, contains a significant stand of eastern hemlock (*Tsuga canadensis*). Hemlocks help maintain cool stream water temperatures, stabilize soil and prevent erosion on steep stream banks, and provide thermal insulation for wildlife during temperature

[22] The term "land cover" refers to the living and physical features that define the character of the earth surface, including forest, meadow, wetland, stream, water body, lawn, pavement, and development. This analysis focuses on natural and vegetative land cover categories. Land cover types such as pavement and development are addressed in subsequent analyses.

[23] See Appendix D for a partial list of plant species found in Tymor Park.

extremes of summer and winter. Hemlock stands provide unique habitat that more than 120 vertebrate species depend on.[24]

The remaining six percent of Tymor Park consists of streams and water bodies including federally recognized wetlands and additional probable, but undelineated, wetlands.[25]

Rare Plant Species

The New York State Natural Heritage Program documents the existence and location of endangered, threatened, and rare plant species in New York. Though currently undocumented, it is possible that some plant species on these lists may exist in Tymor Park.[26] Table 4 illustrates the number of the endangered, threatened, and rare plant species that are confirmed, probable, or possible in Dutchess County.[27]

	CONFIRMED	PROBABLE	POSSIBLE
Endangered	15	21	9
Threatened	26	17	7
Rare	1	1	-

Table 4. Dutchess County Protected Plant Species.

Invasive Plant Species

A history of intensive land use and disturbance is reflected in, among other things, an abundance of invasive exotic plant species within the park. Invasive species pose a significant threat to indigenous flora and fauna, are highly successful at outcompeting native plant species, and present a substantial management challenge due to their aggressive, persistent nature. In the United States, an area three times the size of Delaware is lost each year to invasive species.[28] The success of these species in their non-native

[24] Ward, date unknown.
[25] See *Water Resources* analysis.
[26] See the New York State Natural Heritage Program website for complete list of endangered, threatened, and rare plants of Dutchess County and New York State. (www.dec.state.ny.us/website/dfwmr/heritage)
[27] Plants on the New York State endangered species list are considered in danger of extirpation and requiring remedial action to prevent extinction. Plants on the New York State threatened species list are considered likely to become endangered in the foreseeable future. Plants on the New York State rare species list are believed to exist in only twenty to thirty five sites statewide.
[28] New England Wildflower Society.

range can lead to significant changes in species composition of entire ecosystems, resulting in habitat degradation and a corresponding decline in native fauna.

Several invasive, exotic plant species were documented during site visits between January and March of 2004 and it can be expected that additional species exist at the site.[29] Of particular significance are the following:

- **Japanese barberry** (*Berberis thunbergii*) cover is extensive in portions of the conifer forest northeast of Furnace Pond.
- Invasive **bush honeysuckle** (*Lonicera sp.*), **multiflora rose** (*Rosa multiflora*) and **common buckthorn** (*Rhamnus cathartica*) are abundant and widely distributed in the area surrounding Furnace Pond.
- **Tree of heaven** (*Ailanthus altissima*) is abundant along the forest edge between the West Clove Mountain hardwood forest and the meadows west of Duncan Road.
- Roughly one-third of the total wetland system south and west of Town Hall, and nearly all of the federally recognized wetlands in that area, are infested with **phragmites** (*Phragmites australis*).
- Significant stands of **Japanese knotweed** (*Polygonum cuspidatum*) exist along the banks of Fishkill Creek directly upstream from Tymor Park and smaller stands are observed in the lowlands within the park.
- **Purple loosestrife** (*Lythrum salicaria*) is reported to exist in the wetland system below the equestrian center and was identified in a recent photograph of the banks of Fishkill Creek near the small impoundment north of the Gorge.
- It is reported by local residents that Furnace Pond may be infested with **Eurasian milfoil** (*Myriophyllum spicatum*).

Habitat and Wildlife

While an official inventory of habitat or fauna of Tymor Park has not been conducted, casual observation indicates a wide range of habitat types including a variety of hardwood forest types, conifer forests, meadow, wetland, intermittent and perennial streams, pond,

[29] See Appendix G for background, identification and management information regarding the invasive plant species identified at Tymor Park.

and extensive edge habitat between each of these areas. Each of these habitat types has the potential to support a diversity of vertebrate and invertebrate animal species including amphibians, birds, and a range of predators[30]. Some areas within the park are particularly significant for the unique habitats they provide, including potential vernal pools, wetlands, meadows, the Gorge of Fishkill Creek, and significant wildlife corridors.

Wildlife Corridors

Wildlife corridors are vegetated areas that provide vital links for wildlife between important natural resources. Protection of wildlife corridors is a growing challenge as the natural landscape becomes increasingly fragmented and the barriers between natural features, such as roads and development, become increasingly more common.

Wildlife corridors within Tymor Park include the forested upland ridge of West Clove Mountain which provides a significant connection between forested lands to the north and south of the park. Vegetated stream and wetland corridors through unforested areas within the park also provide links between vital habitat types.

Fragmentation of wildlife corridors exists along wetland systems and streams where the vegetative buffer has been reduced or removed and where natural links between habitat types have been disrupted by roads, development, or human activities. Specifically, a connection between the wetlands below the equestrian center and the forests surrounding Furnace Pond has been severely fragmented by road crossings and open fields with little vegetative cover.

Rare and Protected Animal Species

The New York State Natural Heritage Program has no record of endangered or threatened animal species within Tymor Park; however, they have documentation of both the endangered Bog and Blanding's turtles within a few miles of Tymor Park. It appears that the park's wetlands may provide suitable habitat for one or both of these species and thus the possibility exists that they exist within the park. In addition to these turtles, it is possible that other, undocumented, rare or protected species exist within the park.

Invasive Animal Species

Mute swans and the brown-headed cowbird both exist in the area and are both known to have negative implications for native species. The mute swan is an introduced species which displaces native species and eliminates certain habitat required by native species. Several state and federal agencies have identified it as a priority to control mute swans and prevent their establishment.

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[30] See Appendix E for partial lists of species found in Dutchess County and Tymor Park.

The brown-headed cowbird is proliferating in areas outside of its native range in the American Midwest due to widespread land use changes, particularly forest fragmentation and increases in edge habitat. The cowbird is considered to contribute to the significant decline in migratory songbirds due to its strategy of laying eggs in other bird's nests. Cowbird offspring generally are much larger and more aggressive than the host bird's offspring, often resulting in the death of the host bird offspring. Cowbirds have been documented in Tymor Park and can be assumed to be parasitizing nests of other songbirds, resulting in decreased survivorship of host species.

Land Cover Health and Integrity

Land cover types within Tymor Park, and the habitats they provide, are experiencing pressure from a variety of different stressors including elevated deer populations, disease, exotic pest species, exotic invasive plant species, fragmentation, and human uses.

Deer

The deer population in DEC Wildlife Management Unit G3, which includes Tymor Park, is estimated at forty to sixty deer per square mile,[31] well above biological carrying capacity for the region. Figure 9 illustrates the location of Unit G3.

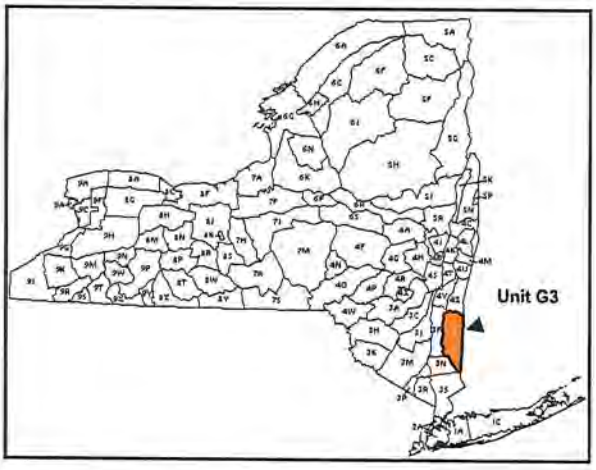

Figure 9. DEC Wildlife Management Unit G3. Unit G3 includes parts of Dutchess and Putnam counties. It is bounded to the east by the Connecticut-New York boundary, to the west by the Taconic State Parkway, to the north by Routes 44 and 199, and to the south by Interstate 84.

[31] Smith, 2004.

Reproductive rates of deer are linked to land use changes and increase significantly in areas with reduced forest cover, increased edge habitat, and increased amounts of horticultural plants associated with the suburban landscape. As a keystone species, deer have tremendous influence over the biodiversity of an ecosystem as indicated by the results of a recent ten-year USDA Forest Service study which suggested that elevated deer populations are jeopardizing the sustainability of eastern forests.[32] When deer populations exceed ten deer per square mile, the effects of deer browse significantly reduces regeneration of understory vegetation and a corresponding decline in songbird populations is observed.[33] When deer populations exceed twenty deer per square mile, no significant regeneration of hemlock occurs.[34]

The influences of the high deer population in Tymor Park have drastically reduced regeneration of typical native vegetation in all ecosystems, leading to significant changes to plant and animal communities within the park. Furthermore, the relationship between deer populations and invasive species proliferation is seen in areas including parts of the hemlock forest. In these areas, the understory is dominated by the exotic invasive Japanese barberry, one of the only local woody species deer will not eat.

Hemlock Health and Regeneration

The eastern hemlock (*Tsuga canadensis*) forest surrounding Furnace Pond is infested with both the woolly adelgid (*Adelges tsugae*) and the elongate hemlock scale (*Fiorinia externa*).[35] The woolly adelgid and the elongate hemlock scale, individually and in combination, lead to decline and death of hemlock stands. The future of the eastern hemlock in Tymor Park, and in the entirety of its native range, is threatened due to these pests. The eastern hemlock is expected to experience a complete, or near-complete, die-off within the next few decades if appropriate control methods are not developed. Controls are not possible at the forest-scale and infected trees often die within four to ten years. In Tymor Park, the hemlock stand has a life expectancy of less than ten years without effective control methods.

In addition to the pressure from woolly adelgid and elongate hemlock scale, regeneration of hemlock in the stand around Furnace Pond is severely compromised or non-existent due to the effects of heavy deer browse in the area.

Hardwood Health and Regeneration

Regeneration of tree species within the hardwood forest is severely altered, and non-existent for some species, due to the effects of heavy deer browse.

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[32] Horsley *et al*, 2003.
[33] Sauer, 1998.
[34] Rezendes, 1999.
[35] This diagnosis has been confirmed by the Cornell University Cooperative Extension. See Appendix F for lab test results.

Several hardwood species in Tymor Park are affected by pests and disease common to the area, including beech bark disease (*Neonectria galligena*), nectria canker *(Nectria galligena)*, and black knot (*Dibotryon morbosum*). Beech bark disease causes mortality of infected American beech trees (though resistance has been noted in some individuals). Nectria canker causes die-back of infected limbs of birch trees and may cause tree mortality. During site visits for the Master Plan, the fungus was observed to be affecting black birch stands on West Clove Mountain. Black knot causes die-back of infected limbs and occasionally leads to tree mortality. It was noted on black cherry on West Clove Mountain.

Invasive Plant Species

As noted above, the forest health and overall habitat value of cover types in Tymor Park are compromised by the proliferation of invasive plant species in the park. These species cause reduced regeneration of native species, changes in habitat cover and forage value for wildlife, and, in some cases, lead to long-term changes in soil properties.

Human Use Implications

Some human uses conflict with or degrade land cover types and habitat within the park. Development of facilities and active recreation areas within the park contributes to habitat fragmentation, diminished sizes of wildlife corridors, and increased edge habitat.[36] On- and off-trail use of non-developed areas within the park, including forested areas, meadows, and wetlands, can contribute to soil compaction, soil loss erosion, and habitat degradation.

Planning Implications

- Protection and enhancement of the range of cover types found within the park will preserve the many important functions they serve including vital habitat, forage, cover, shade, erosion control, and aesthetic and historical purposes.

- A thorough inventory of habitat types, flora, or fauna will be necessary for a complete understanding of the composition and requirements of the habitats and species within the park.

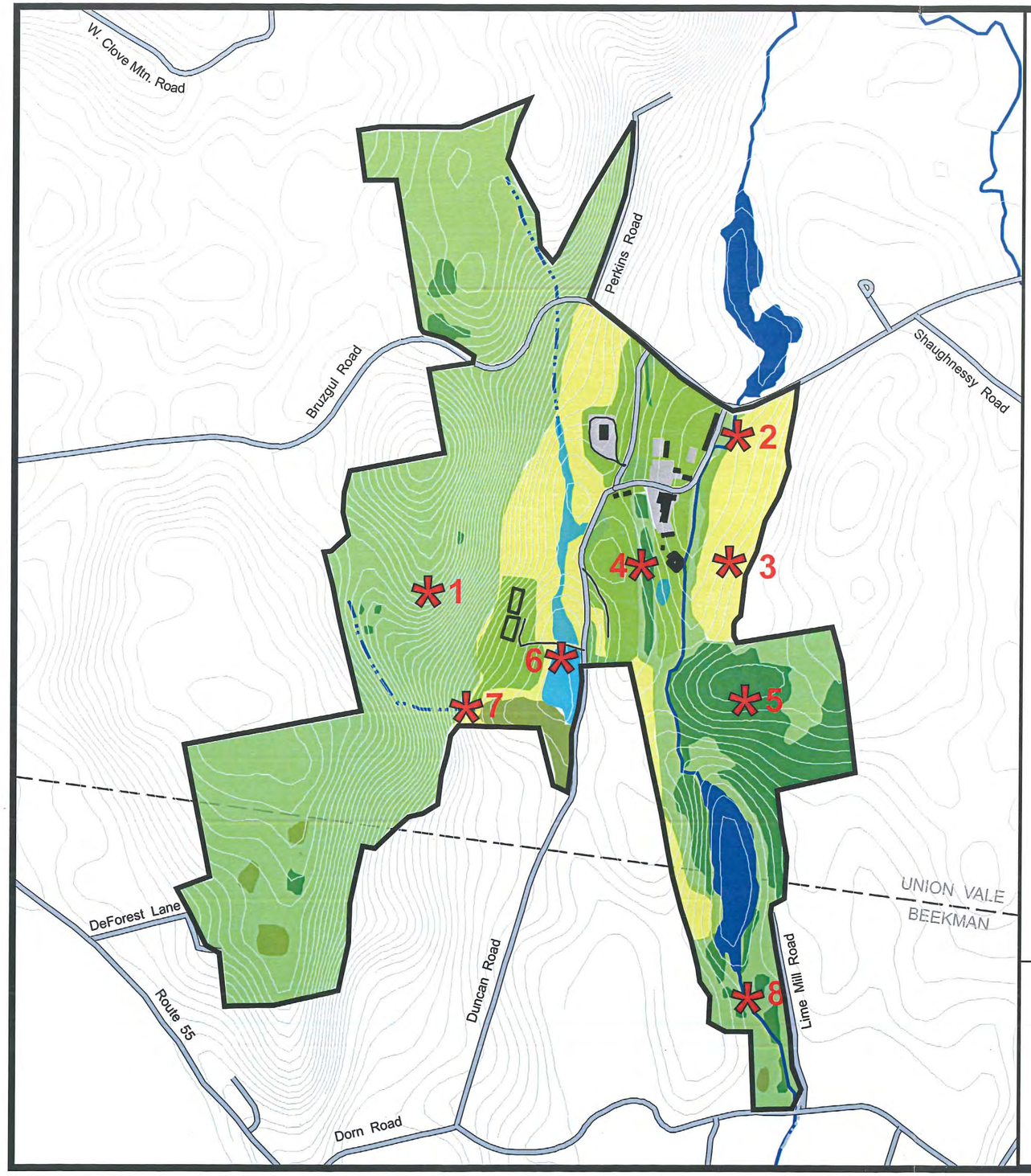
- Significant environmental stressors (including deer populations, invasive plant and animal species, pests and disease, the health of the hemlock forest, habitat

[36] While edge habitat is recognized for its important role in the landscape due to the great diversity of species it supports, the proliferation of edge habitat resulting from regional trends in land use has negative implications. These include decreased forest interior, increased penetration of invasive plant species into forest interiors, and increased predation of wildlife species that rely on forest interiors.

fragmentation, and human uses of the landscape) affecting the integrity of land cover and habitat within the park will degrade the nature conservancy value of the park if not addressed.

- The Deeds of Covenance and the original park management plans written by the donor support measures to protect and enhance the natural vegetative cover and wildlife habitats within the park. [37]

[37] See Appendix C.



Management Considerations

1. High deer population is preventing hardwood and softwood forests from regenerating. Native ground-covers are being degraded.

2. Invasive honeysuckle has invaded much of the stream corridor and is the dominating plant in some areas.

3. Meadows may be mown in conflict with ground-bird nesting cycles. Invasive shrubs are invading meadows.

4. Lawn is being mown to forest edge, allowing invasive species to more readily colonize into forest.

5. Hemlock stands infected with wooly adelgid and long-leaf scale. Hemlock forest will die within ten years without intervention.

6. Wetlands have been invaded by invasive phragmites. Native tree, shrub, and herbaceous species are being excluded.

7. Wetland has been invaded by Tree-of-Heaven.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 10
Land Cover Analysis

Summary: A great diversity of land cover types, including forest, meadow, stream, wetland, and edge habitat, are found within the park. Significant stressors affecting the integrity of land cover and habitat within the park include elevated deer populations and invasive plant and animal species.

LEGEND

- Hardwood forest
- Softwood forest
- Meadow
- Emergent/scrub wetland
- Forested wetland
- Water
- Mown lawn
- * Management consideration

KEY

- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Building footprint

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

NATURAL FEATURES ANALYSES SUMMARY

The natural features and resources of Tymor Park are what make it the valuable place it is for passive and active recreation, nature enjoyment, and nature conservancy. Analyses of these features illustrate some of the characteristics, opportunities, and limitations inherent to the site. They identify the great diversity of natural resources, including hardwood forests, softwoods forests, meadows, wetlands, and waterways, that define the natural context of the park, determine the functions of the natural systems within the park, and set the stage for appropriate use and enjoyment of the site.

Features that limit some park uses include sensitive water resources and wildlife habitats, areas of steep slopes and erosive soils, and certain local or state regulatory considerations. Due to these and other constraints, only certain areas within the site are physically or environmentally appropriate for development or high-intensity use.

Environmentally Sensitive Sites

To better understand the site's sensitivities to disturbance and use, an "Environmentally Sensitive Sites" Index was created (see Figure 11). This map layers each of the environmentally sensitive sites from the preceding analyses, including steep slopes and erosive soils, wetland and stream corridors, the hemlock forest, and wildlife corridors. The areas shaded darkest on the map show places where all four categories occur in the same location, indicating some of the most environmentally sensitive sites in Tymor Park. Successively lighter shaded areas indicate those places where three, two, or one environmentally sensitive areas occur.[38]

The Environmentally Sensitive Sites Index identifies areas where certain activities, particularly development and active recreation, may be inappropriate and where management strategies aimed at restoration, preservation, or enhancement are appropriate. In particular, the area along the Fishkill River including the Gorge and the banks of Furnace Pond are identified as extremely sensitive. The map also indicates that current development has been sited largely in appropriate areas with the exception of encroachment of some park structures into the Fishkill Creek floodplain.

[38]Areas on the map that remain unshaved should not be assumed to have little or no environmental sensitivity. They indicate places where none of the four identified high-sensitivity categories are documented, but all areas within the park should be considered to have environmental value and unique sensitivities.

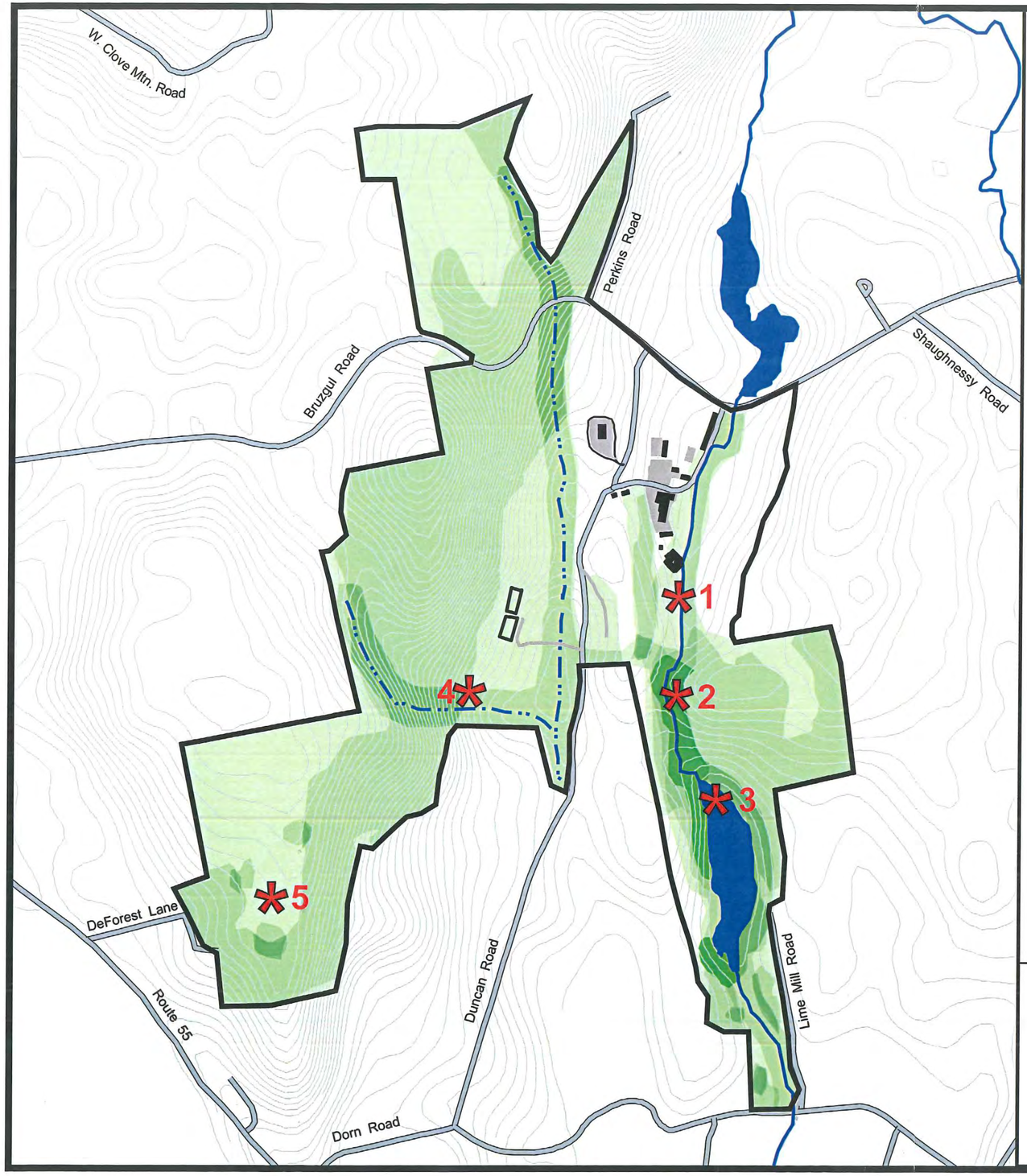
Planning Implications

- Site use is constrained by environmental sensitivities and other limitations which define appropriate and inappropriate locations for a range of park uses and activities.

- Prioritizing environmentally sensitive sites for appropriate protective measures, and for restoration and enhancement, will ensure that the park preserves its function as a nature conservancy while continuing to provide a variety of appropriately-sited, safe, and enjoyable human uses.

- The Deeds of Covenance and the early park management plans written by the donor support measures to protect environmentally sensitive sites within the park[39].

[39] See *Deeds of Covenance* analysis and Appendix C



Management Considerations

1. Floodplain and wildlife corridor create sensitive area that is currently heavily used for recreation at swimming pool and mown field.

2. Steep slopes in "The Gorge" intersect with the hemlock forest , Fishkill Creek, and a wildlife corridor to create a highly sensitive area. Multiple trails to the creek, and the access road create disturbances.

3. A wildlife corridor through hemlock stands. In addition, Furnace Pond is the site of proposed dredging.

4. Seasonal stream, wetlands, and a wildlife corridor are the site of mowing, equestrian obstacle course, and a multiple-use trail.

5. Wildlife corridors and small forested wetlands provide unique habitat and landscape features in an area of frequent ATV use.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
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Lizabeth Moniz
James Allison

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Figure 11

Environmentally Sensitive Sites Index

Summary: The Environmentally Sensitive Sites Index identifies areas where development and active recreation may be inappropriate and where management strategies aimed at restoration and preservation should be encouraged. The area along the Fishkill River including "The Gorge" and the banks of Furnace Pond are identified as extremely sensitive.

LEGEND

Four resource areas: Most sensitive

Three resource areas: Very sensitive

Two resource areas: More sensitive

One resource area: Less sensitive

Management consideration

KEY

Impervious or semi-impervious

Water

Contour (10 feet)

Park boundary

Town boundary

Roads

Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

SOCIAL ANALYSES

PURPOSE OF SOCIAL ANALYSES

This chapter includes analyses of the human history and uses that characterize Tymor Park including historical and cultural resources, park infrastructure, recreational use, scenic resources, zoning, surrounding land use, and the Deeds of Covenance. The analyses reveal the current and historical site uses as well as use-values and use-conflicts that define aspects of Tymor Park. The Master Plan recommendations are guided by the information from these analyses and from those in the previous section.

Each analysis in this chapter follows the same format as the previous chapter, including a graphic to illustrate site conditions and patterns, a brief summary of the analysis, a detailed description and interpretation of the analysis, and an outline of the planning implications suggested by the analysis. The planning implications represent those elements that will be considered and treated in developing the Master Plan. The final section of this chapter summarizes these site analyses.

Research for these analyses came from interviews, meetings, site visits, and surveys, town files, the Deeds of Covenance, the original park management plans written by the park's donor, minutes from Conservation Advisory Council meetings, newspaper articles and additional historical documentation, USGS topographic maps, Dutchess County Department of Planning and Development, and Geographic Information System (GIS) mapping tools.

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HISTORICAL & CULTURAL RESOURCES

Summary

Tymor Park and the surrounding communities of Union Vale and Beekman have a rich history of agriculture and mining. This legacy is reflected in the historical structures within Tymor Park including farm buildings, stone walls, and remnants of the iron mining and smelting industry that prospered in the region in the 1800's (see Figure 12). The historical markers within Tymor Park provide opportunities for both preservation and education.

Early European Settlement

Dutchess County was populated by Native Americans prior to the influx of the first Europeans who tried to buy land from natives as early as the 1680's. In the early eighteenth century, Palatines (from the Rhine River region in Germany), New Englanders, and people from Long Island began moving into the region. During this period, farming formed the basis of the economy.

Industry and Development

In the early 1800's deposits of iron ore were discovered in the region, stimulating a rapid shift towards a mining-based economy. The "Clove Beds," including those in the Tymor Park area, were opened in 1827. During the peak of the industry in the 1880's, several furnaces in Beekman operated twenty-four hours a day, seven days a week. During this time, nearly two hundred residents lived in the Clove Valley, working in and supporting the mining and smelting operations.[1]

Forests were logged during the winter and hundreds of cords of wood were burned in pits from April through October to make charcoal to run the nearby furnaces.[2] Heavy logging left the surrounding hillsides almost bare by the late 1800s.[3] In addition to iron ore, limestone was also mined for use in the smelting process. In the late 1800's, discovery of extremely pure iron ore deposits in the Mesabi Range in Minnesota led to the closing of Dutchess County mines. As mining declined, strip mines were dammed to form ponds,

[1] Iron Industry paper prepared by the Union Vale Historical Society
[2] Ghee, J.C., Spence, J. 2000.
[3] Iron Industry paper prepared by the Union Vale Historical Society

and farming increased in this still rural region.[4] Limestone continued to be mined, fired, ground and spread on pastures and fields to improve productivity.
Today, Tymor Park contains remnants of this history including Furnace Pond, the site of a former iron ore strip mine, portions of an iron smelting furnace just below the Furnace Pond dam, a lime quarry, and portions of a lime kiln. The dam that creates Furnace Pond was constructed from elements from the dismantled furnace.

Following the Civil War, the railroad provided New York City residents access to rural Dutchess County. Increasingly, people vacationed in the region, seeking the natural landscapes and opportunities to hunt and fish. The Clove Valley Rod and Gun Club, nearly adjacent to Tymor Park, was established in early 1895 by Glen Ford McKinney, a prior owner of Tymor Farm. Today, rod and gun clubs own thousands of acres in Union Vale and help maintain the rural character of the landscape.

In 1936, the Taconic Parkway reached Dutchess County and, coupled with a continual increase in automotive use, has led to an increase in suburban development, along with a corresponding decline of family farms and a loss of some of the rural character of the region.[5]

Tymor Farm

In 1934, Ralph and Jean Connor inherited Tymor Farm from Glen Ford McKinney and Jean Webster. The Connors operated the farm as a dairy farm, known internationally for its breeding operations and milk production.[6] The Tymor Farm herd of about two hundred cows pastured south of Bruzgul Road, on the east and west banks of Fishkill Creek. Cultivated land on the farm was dedicated to brome, alfalfa, and corn to feed the livestock operation. During this time a windmill and small piggery was located at the site of the current equestrian center west of Duncan Road.[7]

In addition to being a working dairy farm, the land also served the recreational needs of the Connor family, their friends, and the local scout troops. The creek and pond were used for fishing, and the boathouse was a gathering center for scout troops. During the second half of the twentieth century, little logging was conducted in the uplands of Tymor Farm and previously logged and grazed ridges reforested with native trees.[8]

[4] Ibid
[5] Ghee, J.C., Spence, J. 2000.
[6] Poughkeepsie Journal. August 6, 1971
[7] Clinton Greenwood, Tymor Farm Herd Manager, personal communication, 2/2004.
[8] Ibid

Tymor Park

Between 1971 and 1978, Ralph and Jean Connor donated roughly five hundred acres of Tymor Farm to the Town of Union Vale, in part to prevent its future development.[9] The Deeds of Covenance dedicated the land in perpetuity to the recreation and nature conservancy uses of the residents of Union Vale.[10] Since acquiring the park, the town has added recreational facilities including ball fields, a swimming pool, tennis and basketball courts, an equestrian center, and hiking trails. In the early 1990's the Union Vale Town Hall was built in Tymor Park.

Condition of Historical Structures

Farm Buildings

Most farm buildings were constructed in the lowlands near Fishkill Creek during the first half of the twentieth century though a few structures, like the long-barn, were built in the 1950's. Most of the farm structures are utilized for park services and appear to be well maintained. At least one silo has been dismantled and the town is currently investigating re-tiling the remaining silos. Two farm buildings are rented as residences, the large barn houses the community center and park offices, and other buildings serve as storage for park equipment.

Furnace Pond Dam

Most of the furnace below Furnace Pond was dismantled to build the Furnace Pond dam. In November 2003, the Dutchess County Soil and Water Conservation District recommended that the town drain the pond to conduct an inspection of the dam.[11] Currently the dam leaks and there are questions regarding its structural integrity.

Other Historical Structures

Some sections of the iron smelting furnace south of Furnace Pond dam remain but are potentially unstable. Parts of the nearby lime kiln are intact.

The upland forested areas of West Clove Mountain contain extensive, prominent stone walls. The Scenic Corridor Overlay District of the Union Vale Town Code identifies stone walls as scenic and historic resources to be protected.[12] Other historical structures,

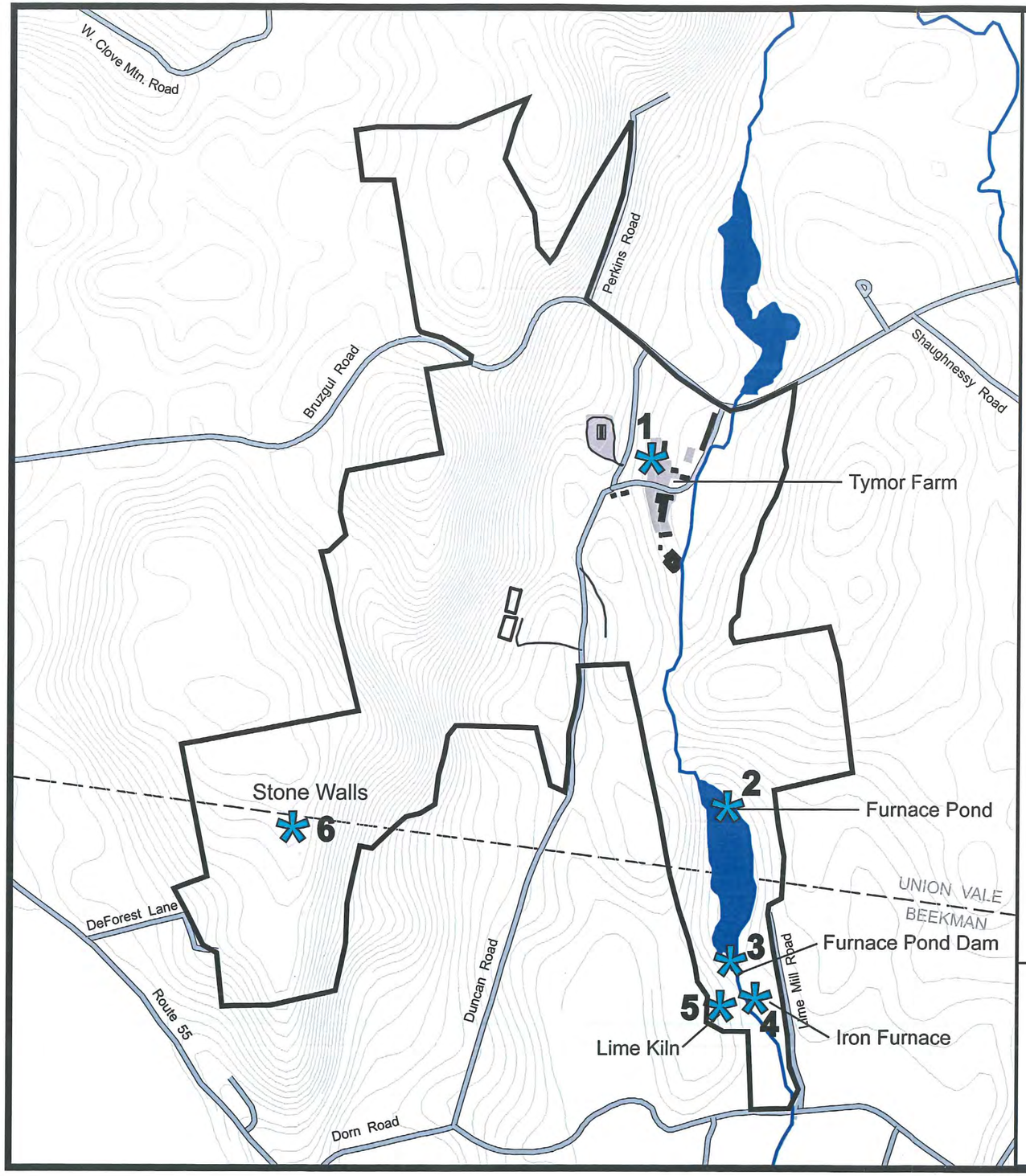
[9] Poughkeepsie Journal. Date unknown.
[10] See *Deeds of Covenance* analysis
[11] See Appendix I.
[12] Town Code of the Town of Union Vale, 2002.

remnants of which may still exist, include a windmill foundation at the site of the piggery, and a gristmill foundation along Fishkill Creek to the east of the park buildings.[13]

Planning Implications

- The rich and diverse history reflected in the many historical remnants at Tymor Park provides opportunities for preservation, restoration, and education.
- A complete inventory and assessment of historical structure at Tymor Park will be necessary to determine structural integrity and liability risks.

[13] Clinton Greenwood, Tymor Farm Herd Manager, personal communication, 2/04.



Management Considerations

1. Tymor Farm buildings include several barns, two houses, and two silos. Structures appear to be well-preserved, although at least one silo was removed. The town plans to maintain the remaining silos. Farm buildings are used for a community center, park storage, and park offices.

2. Furnace Pond is the site of a historical iron strip-mine. The creek was dammed to provide water for the several iron smelters downstream.

3. Furnace Pond Dam was constructed in the late 1800's. It leaks significantly.

4. Iron furnace was used to smelt iron into cannon balls used during the Civil war. Mining was the primary employment in Union Vale and Beekman during the mid-1800's.

5. Lime mill and lime kiln were used to mine limestone that was smelted with iron to extract the pure ore. Into the 1950's, limestone was mined and milled here to be used to improve local soils for cultivation.

6. Stone walls abound in the forests of West Clove Mountain, marking old enclosures and boundaries.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 12

Historical Resources Analysis

Tymor Park and the surrounding communities of Union Vale and Beekman have a rich history of agriculture and mining. This legacy is reflected in the historical structures within Tymor Park including farm buildings, stone walls, and remnants of the iron mining and smelting industry that prospered in the region in the 1800's. The historical markers within Tymor Park provide opportunities for both preservation and education.

LEGEND

Historical site

KEY

- Water
- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

DEEDS OF COVENANCE

Summary

Tymor Park consists of eleven parcels of land granted to the town in the 1970's for recreation and nature conservancy purposes (see Figure 13). The Deeds of Covenance for the parcels define the donors' intent for the park and stipulate the uses that are allowed or disallowed in each parcel. In general, the restrictions within the deeds appear to be upheld by current park use and management with a few exceptions, particularly surrounding types of vehicle use of certain parcels. An understanding and interpretation of the Deeds of Covenance is necessary to ensure that the town meets its legal requirements as outlined in the deeds and honors the donors' intent in granting this land to the town.[14] It will be necessary for the town to seek legal counsel for accurate interpretation of the deeds and their implications.

The Deeds of Covenance

Tymor Park was given to the Town of Union Vale by Jean McKinney Connor and Ralph L. Connor as a memorial to Glenn Ford McKinney and his wife Jean Webster. This gift of eleven contiguous parcels of land, consisting of approximately five hundred acres, was given to the town over an eight-year period, between 1971 and 1978. Six parcels are located in the Town of Union Vale, two parcels straddle the Union Vale-Beekman town lines, and three parcels are located entirely within the town of Beekman.

Seven separate Deeds of Covenance describe the covenants, conditions and restrictions that run with the eleven parcels that comprise Tymor Park. The language of these deeds defines the intended and allowed uses of the land and outlines uses that are restricted or not allowed.[15] Some of the language within the deeds is universal to each deed, while some language differs between the deeds. In each of the deeds, the donors expressly state that the purpose of the gift is to provide for recreation and nature conservancy for the residents of Union Vale. In general, the deeds restrict active recreational uses to the northern parcels, restrict snowmobile use to the western parcels, and highly restrict the use of motorized equipment and development not associated with nature conservancy or recreation programming throughout the park.

[14] An additional source for understanding the park donors' intents for the park are the original park management plans written by one of the donors, Ralph Connor, in 1972. See Appendix C.
[15] See Table 5 for a comparison of allowed and disallowed uses of the eleven parcels.

The following clauses are universal to each of the deeds for Tymor Park:

> "Said premises shall be part of a tract known as Tymor Forest,[16] a memorial to Glen Ford McKinney and Jean Webster, his wife, and shall be dedicated in perpetuity to the recreation and nature conservancy uses of the People resident in the Town of Union Vale."
>
> "Said premises shall be left in a natural state except for..." specific outlined uses or improvements which vary from deed to deed (see individual deeds below).
>
> "Firearms shall not be permitted to be carried or fired on said premises."
>
> "Said premises shall not be partitioned or subdivided."

Each deed, and the additional restrictions and conditions it outlines, are described below. Parcels are referred to according to how they are numbered in the deeds[17] and the acreage shown for each parcel is the acreage specified in each deed.[18]

Parcels 1,2,3,4, and 5

Acreage: 280
Town: Union Vale
Identification:
Parcel #'s 166469, 243418, 276475, 338262, 152180
Book: 1321 Page: 954

Parcels 1-5 were granted to the town in 1971. They represent the original gift given to the town and make up more than half of Tymor Park. The language dictating the use of these parcels includes the following:

"Said premises shall be left in a natural state except for trails, trail markers, swimming facilities, team sports fields, playground, camp site, buildings, structures and improvements in existence, replacements or additions thereto as necessary to the operation of recreation and nature conservancy programs;"

"All motorized equipment and vehicles of whatever nature shall be excluded from all roads, trails, ponds and streams within said premises:

[16] While the donor referred to the park as "Tymor Forest" in the deeds and elsewhere, today the town refers to it as "Tymor Park."
[17] Except in the case of Parcel 11, which is unnamed in the original deed and which is called "Parcel 1" in the 1994 modification to the original deed.
[18] The acreage shown on the town's tax maps differ from the deeds in some instances.

> EXCEPT for the right of public in and to the bed of the highway known as Duncan Road, for the right of utility companies to utility easements of records, for ingress and egress to camp site and parking lots, for maintenance, for snowmobiles operating under the rules and regulations of the park commission and only upon unplowed snow-covered trails designated for such use in order to prevent erosion, small tree damage, silting, fire and disturbance or wildlife habitat;"

"Said premises shall not be used for municipal dump or sewage disposal purposes."

In 1994, the original deed for Parcels 1-5 was modified, enabling the building of the Union Vale Town Hall on a seven-acre portion of this parcel called the "Improvement Site." Additional covenants and restrictions, including the following, were applied to the Improvement Site:[19]

> "The purposes of any building and accessory facilities that may be constructed upon the Improvement Site shall be to house the Union Vale Museum, to keep the Union Vale historic records, to provide a meeting hall for the residents of Union Vale, to make available meeting and office facilities for the government of the Town of union Vale and other purposes compatible with these activities;"
>
> "The lower story of the building, while conforming to the requirements of Building Code, shall be concealed as much as possible from view from the public roads;"
>
> "The Town Highway Garage shall not be located within Tymor Forest, including the Improvement Site."

Parcel 6

Acreage: 87.1
Towns: Union Vale and Beekman
Identification:
Parcel # 400028 (Union Vale portion)
Parcel # 394850 (Beekman portion)
Book: 1349 Page: 546

Parcel 6 was granted to the town in 1973. It includes Furnace Pond and straddles the Union Vale-Beekman town border. The language dictating the use of this parcel includes the following:

"Said premises shall be left in a natural state except for trails, trail markers, camp site, existing boat house or replacement thereof;"

"All motorized equipment and vehicles of whatever nature including

[19] See the Deeds of Covenance for additional covenants and restrictions applying to the Improvement Site and the Town Hall.

but not limited to automobiles, trucks, trail bikes, snowmobiles, boat motors but excepting emergency use of ambulance or maintenance vehicle shall be excluded from all roads, trails, ponds and streams within said premises;"

"Said premises shall not be used for municipal dump or sewage purposes."

Parcel 7

Acreage: 50.46 acres
Towns: Union Vale and Beekman
Identification:
Parcel # 099007 (Union Vale portion)
Parcel # 017944 (Beekman portion)
Book: 1327 Page: 671

Parcel 7 was granted to the town in 1972 and straddles the Union Vale-Beekman town border. The language dictating the use of this parcel includes the following:

"Said premises shall be left in a natural state except for trails, trail markers and fencing necessary to the operation of recreation and nature conservancy programs;"

"All motorized equipment and vehicles of whatever nature shall be excluded from premises herein conveyed; except for snowmobiles operating under rules and regulations of the park commission and then only upon unplowed snow-covered trails designated for such use in order to prevent erosion, small tree damage, silting, fire and disturbance of wildlife habitat;"

"Said premises shall not be used for municipal dump purposes."

Parcel 8

Acreage: 22.5 acres
Town: Beekman
Identification:
Parcel #016862
Book 1327 Page 675

Parcel 8 was granted to the town in 1972 and is located in the Town of Beekman. The language dictating the use of this parcel includes the following:

"Said premises shall be left in a natural state except for trails and trail markers, necessary to the operation of recreation and nature conservancy programs;"

"All motorized equipment and vehicles of whatever nature shall be excluded from premises herein conveyed, except for snowmobiles operating under rules and regulations of the park commission and then only upon unplowed snow-covered trails designated for such use to prevent erosion, small tree damage, silting, fire, and disturbance of wildlife;"

"Said premises shall not be used for municipal dump purposes."

Parcel 9

Acreage: 4.98
Town: Beekman
Identification:
Parcel #: 425738
Book: 1377 Page: 63

Parcel 9 was granted to the town in 1974 and is located in the town of Beekman. The language dictating the use of this parcel includes the following:

"Said premises shall be left in a natural state except for trails, trail markers, improvements necessary to the operation of recreation and nature conservancy programs;"

"All motorized equipment and vehicles of whatever nature shall be excluded from roads, trails, streams within said premises (including but not limited to automobiles, trucks, trail bikes, snowmobiles, boat motors) but excepting trucks entering for purpose of removing iron smelter slag stored on premises, emergency use of ambulance or maintenance vehicle;"

"Said premises shall not be used for municipal dump or sewage purposes."

Parcel 10

Acreage: 16.2
Town: Beekman
Identification:
Parcel #960870
Book: 1377 Page: 066

Parcel 10 was granted to the town in 1974 and is located in the town of Beekman. The language dictating the use of this parcel includes the following:

"Said premises shall be left in a natural state except for trails, trail markers, improvements necessary to the operation of recreation and nature conservancy programs;"

"All motorized vehicles of whatever nature shall be excluded from all roads, trails, ponds, streams within the area of said premises:

> Except for the purposes of maintenance, for snowmobiles operating under rules and regulations of the park commission and only upon unplowed snow-covered trails designated for such use in order to prevent erosion, small tree damage, silting, fire and disturbance of wildlife habitat;"

"Said premises shall not be used for municipal dump or sewage disposal purposes."

Parcel 11

Acreage: 3.3
Town: Union Vale
Identification:
Parcel # 422296
Book: 1485 Page: 402

Parcel 11 was granted to the town in 1978 and is located in the Town of Union Vale. The original deed was modified in 1994 to include the following language dictating the use of the parcel:

"[The parcel] shall be left in a natural state except for trails, trail markers, improvements necessary to the operation of recreation and nature conservancy programs;"

"All motorized equipment and vehicles of whatever nature shall be excluded from all roads, trails, ponds and streams within [the parcel];"

"[The parcel] shall not be used for municipal dump or sewage disposal purposes."

Adherence to Deeds

Park use and management appears to generally adhere to the covenants, conditions and restrictions established in the Deeds of Covenance. Exceptions to this include:

- **ATV use of park trails.** See *Recreation Supply and Demand* analysis.
- **Snowmobile use of Parcels 2, 9, and 11.** See *Recreation Supply and Demand* analysis.
- **Non-maintenance vehicle access of Parcel 2.** In particular, non-maintenance vehicles access Parcel 2 from the Community Center via Lime Mill Road when the gate is not closed.
- **Vehicle access to Parcel 11.** The Deed of Covenance exclude all motorized vehicles "of whatever nature" from this parcel. Currently vehicles access this parcel for multiple purposes including park events and mowing.

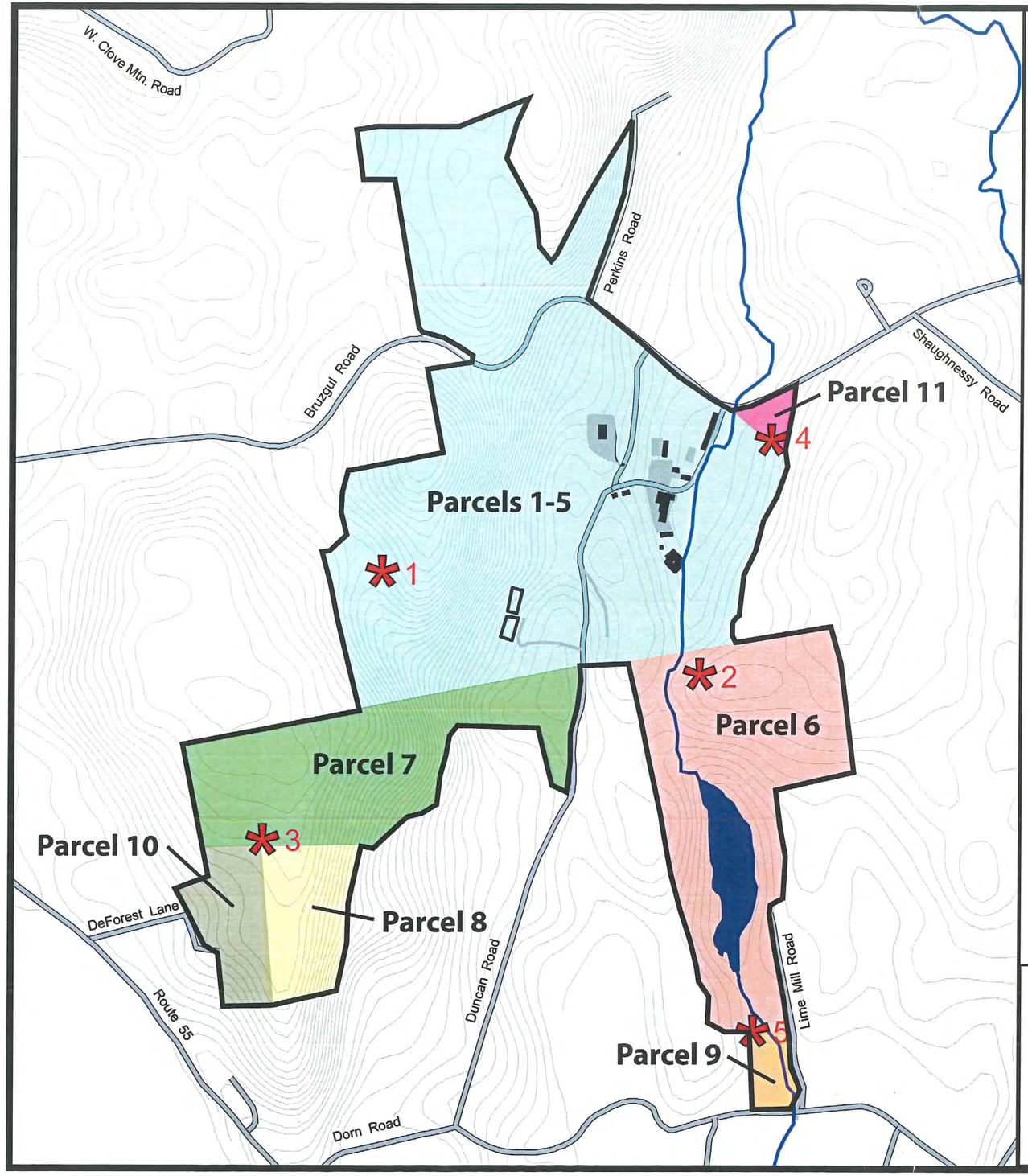
Planning Implications

- A full understanding of the Deeds of Covenance, with the assistance of legal counsel, is necessary to ensure that the intent of the donors will continue to be met into the future.
- The Deeds of Covenance stipulate that recreation and nature conservancy are the two purposes of Tymor Park. However, the deeds do not provide a definition for either term. Definition of the critical terms used in the deeds is necessary to ensure that the town's legal obligations, and the intentions of the donors, are being met.
- The dual uses of nature conservancy and recreation have some inherent and potential conflicts that must be recognized, weighed and addressed in decisions regarding park use and management.
- The wording of the deeds suggests an equal emphasis on recreation and nature conservancy uses. This balance is not necessarily reflected in current park management which appears to be weighted towards development and maintenance of active recreation facilities.
- Complete interpretation and understanding of the full implications of the Deeds of Covenance is not possible without the assistance of legal counsel.

	Parcel Number										
Parcel Use	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Nature Conservancy	A	A	A	A	A	A	A	A	A	A	A
Recreation	A	A	A	A	A	A	A	A	A	A	A
Trails	A	A	A	A	A	A	A	A	A	A	A
Trail Markers	A	A	A	A	A	A	A	A	A	A	A
Improvements[1]	A	A	A	A	A	N	N	N	A	A	A
Fencing	N	N	N	N	N	N	A	N	N	N	N
Swimming Facilities	A	A	A	A	A	N	N	N	N	N	N
Team Sport Facilities	A	A	A	A	A	N	N	N	N	N	N
Playground	A	A	A	A	A	N	N	N	N	N	N
Camp Site	A	A	A	A	A	A	N	N	N	N	N
Boat house	N	N	N	N	N	A	N	N	N	N	N
Improvements & Replacements to Buildings	A	A	A	A	A	N	N	N	N	N	N
Maintenance Vehicles	A	A	A	A	A	A	N	A	A	A	N
Ambulance	N	N	N	N	N	A	N	N	A	N	N
Snowmobiles	A	A	A	A	A	D	A	A	D	A	N
Trucks for Slag Removal	N	N	N	N	N	N	N	N	A	N	N
Highway & Utility Right-of-ways	A	A	A	A	A	N	N	N	N	N	N
Other Vehicles	D	D	D	D	D	D	D	D	D	D	D
Other Motorized Equipment	D	D	D	D	D	D	D	D	D	D	D
Firearms	D	D	D	D	D	D	D	D	D	D	D
Partition or Subdivision	D	D	D	D	D	D	D	D	D	D	D
Municipal Dump or Sewage Disposal	D	D	D	D	D	D	D	D	D	D	D

A Allowed by the Deeds of Covenance
N Not specified by the Deeds of Covenance (In most cases these uses appear disallowed by broader language within each deed.)
D Disallowed by the Deeds of Covenance
[1] "Improvements necessary to the operation of recreation and nature conservancy programs."

Table 5. Deeds of Covenance Comparison. Comparison of allowed and disallowed uses of the eleven Tymor Park parcels.



Management Considerations

1. Parcels 1-5, the "Original Lands," prohibits motorized vehicles on trails, except for snowmobiles west of Duncan Road. Although snowmobiles legally use this area, prohibited ATV use is common.

2. Parcel 6 restricts all vehicles except for maintenance and emergencies. Currently, snowmobiles, ATVs, and cars access Furnace Pond in conflict with the deeds.

3. Deed-prohibited ATV use is common on trails in Parcels 7, 8, and 10.

4. Deed for Parcel 11 restricts all roads and vehicles. This pasture area is mown by tractors.

5. Vehicle use on Parcel 9 is restricted to maintenance, emergencies, and slag-pile removal. ATVs enter the park at this parcel at Dorn Road.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 13

Deeds Analysis

Summary: Tymor Park consists of eleven parcels of land granted to the town in the 1970's for recreation and nature conservancy purposes. The Deeds of Covenance for the parcels define the donors' intent for the park and stipulate the uses that are allowed in each parcel. With a few exceptions, the restrictions within the deeds appear to be upheld by current park use and management.

LEGEND

- Parcels 1-5
- Parcel 6
- Parcel 7
- Parcel 8
- Parcel 9
- Parcel 10
- Parcel 11
- Management consideration

KEY

- Water
- Contour (10 feet)
- Park boundary
- Roads
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

PARK INFRASTRUCTURE ANALYSIS

Summary

Park infrastructure includes buildings, roads and driveways, parking areas, trails, recreational facilities, culverts, and dams. Currently, the park infrastructure appears to adequately serve the park's needs. The park's historical buildings are significant assets that provide space for recreation programming, staff offices, and storage. Multiple roads border the park, cut through the park, and cross wetlands and Fishkill Creek within the park. Most parking areas contribute increased erosion and stormwater runoff to surface waters. The swimming pool, septic systems, fuel storage, and parts of the barn are located in, or adjacent to, the Fishkill Creek 100-foot stream corridor and 100–year floodplain. The leaking Furnace Pond dam and siltation of Furnace Pond present significant financial and technical challenges. Figure 14 illustrates some of the management considerations related to the park infrastructure.

Buildings

The Town of Union Vale owns and manages all structures in Tymor Park. All buildings except the storage barns and boathouse have a septic system and a heating oil storage tank. Water is supplied to buildings from on-site groundwater wells. All structures appear to be well maintained and sound.

All buildings in Tymor Park, except the Furnace Pond boathouse, are located along the northern section of Duncan Road. In addition, all buildings except the Town Hall are close to Fishkill Creek and the 100-foot stream corridor. Table 6 identifies the buildings in Tymor Park and their current and historical uses.

STRUCTURE	HISTORICAL USE	CURRENT USE
Town Hall	(Built in 1994)	Town business
Community Center	Barn	Meetings, events, museum
Farm Manager's House	Residence	Rental residence
Duncan Road Home	Residence	Rental residence
Picnic Shelter	Created for park	Picnicking, gathering
Long Barn	Cow barn	Park maintenance equipment
Short Barn	Barn	Storage
Pole Barn	Hay	Boat storage
Boat House	Scout meetings	Environmental education
Silos	Grain storage	Not used

Table 6. Park buildings and uses.

Recreational Facilities

Recreational facilities and structures requiring ongoing maintenance and upkeep include basketball courts, tennis courts, the Equestrian Center, swimming pool, softball fields, soccer field, bandstand, and fitness trail. The study did not include evaluations of the physical condition of these facilities.

Roads

Tymor Park is accessible primarily from the north by Bruzgul Road and from the south by Dorn Road. The park is also informally entered from DeForest Lane and Lime Mill Road in Beekman which both dead-end at Tymor Park's boundary.

Duncan Road runs north-south through the park connecting with Bruzgul Road on the northern boundary of the park and with Dorn Road to the south of the park. This is the main artery of traffic into and through the park. Tymor Park Road also enters the park from Bruzgul Road and connects to Duncan Road west of the Community Center.

An abandoned section of Lime Mill Road is still evident in Tymor Park as the access road connecting the Recreation Center to Furnace Pond. The road is blocked with a gate southeast of the Community Center and a fence at the Union Vale-Beekman boundary. The Deeds of Covenance and the Park Rules and Regulations restrict vehicle use to park maintenance vehicles. However, the Lime Mill Road gate within Tymor Park is sometimes left open, allowing additional, unsanctioned vehicle access.

Parking

Formal parking lots are located at the Town Hall and at the Community Center. The Town Hall lot is evenly graded and paved. The Community Center lot slopes to the south and east, and is surfaced with dirt and crushed stone. During rain and snowmelt events, considerable sediment erodes and drains into Fishkill Creek. Most vehicle traffic that is not through-traffic generally heads towards parking at the Town Hall or Community Center.

Informal, less frequently used parking is provided at the soccer field, the trailhead for K Trail, and at the Equestrian Center during the summer months. Unofficial parking also occurs at the cul de sac on Lime Mill Road in Beekman.

Parking Conflicts and Constraints

Parking areas in general lack locational or informational signs and do not provide a clear sense of access or connectivity to some destinations (particularly passive use destinations). Safety may be a concern in the main parking lot at the Recreational Center in the high-traffic summer months.

The main parking area at the Recreation Center is not paved and creates a dust problem when it is dry and an erosion and stormwater management problem during rain events.

The K Trail parking area can be hazardous due to its location at a blind curve in Bruzgul Road.

The access roads and parking at the upper ball fields and Equestrian Center create erosion problems.

Dams

Furnace Pond

The dam at the south end of Furnace Pond was built near the end of the nineteenth century. Dutchess County Soil and Water Conservation District recently made an informal inspection of the dam to assess leaks and the potential for structural instability. Their report noted that the "leaks have not changed for years" but recommended that a formal structural inspection be conducted by an engineer to assess the risk to roads and homes below the dam.[20] A formal inspection will require that the pond be drained to provide adequate access to the dam.

Furnace Pond and the Furnace Pond dam, like most in-stream impoundments, together form a sediment trap. The pond is slowly silting in, to the point that the northern half of the pond becomes very shallow during dry months.

The Sluiceway

A smaller dam, referred to by some as "the sluiceway" is located on Fishkill Creek north of the Gorge and east of the Community Center. The condition of this dam is unknown though the impoundment can be assumed to act as a settling pond for sediment carried down that reach of Fishkill Creek.

[20] See Appendix I.

Culverts

There are approximately seven culverts in or bordering the park. Two are under Bruzgul Road, at Fishkill Creek and at the intermittent stream from the K Trail area. One culvert is under Dorn Road, where Fishkill Creek crosses the park's south boundary. Another culvert crosses under Duncan Road where an intermittent stream leaves the wetlands below the Equestrian Center and flows south.

There is a culvert that drains the wet area immediately northwest of the lower softball fields. Assumable, this culvert drains into Fishkill Creek. It is probable that there is a sixth culvert where the Equestrian Center access road crosses the wetlands to the east of the Equestrian Center. Finally, it is possible that there is a culvert south of the Equestrian Center where a wide mown trail intersects a low drainage area.

This study did not include assessment of the condition of culverts within the park.

Trails

There are eight main trails and multiple smaller trails throughout Tymor Park. There are no official trailheads and few trail signs, some use-group conflicts, and some inappropriate uses. Trail grade and trail alignment leads to environmental degradation in some areas. See the *Site Use* analysis for a detailed discussion of the trail system in Tymor Park.

Planning Implications

- Most park buildings and park structures are a historical legacy and are closely associated with the identity of the park. Removal, alteration, or utilization of these historical structures may change the character of the park.

- Park infrastructure elements near water resources may have significant negative effects on those natural systems.

- Mitigation or elimination of erosion and stormwater runoff associated with access roads and parking areas will increase the long-term usability of these features and preserve the nature conservancy values of the park.

- Interventions relating to the structural integrity of the dam and the siltation of Furnace Pond have significant financial, social, and environmental consequences. Consideration of the future of these structures provides an opportunity to examine the best use of that area within Tymor Park.

- Considerations for use, maintenance, and preservation of the park infrastructure overlap with and include issues of historical preservation, public safety, and environmental management.

- A system of signs and markers addressing park uses, rules and regulations, and amenities would enhance the user's experience of the park.

- Enhancing access to, and connectivity between, use areas will enhance the park user's experience.

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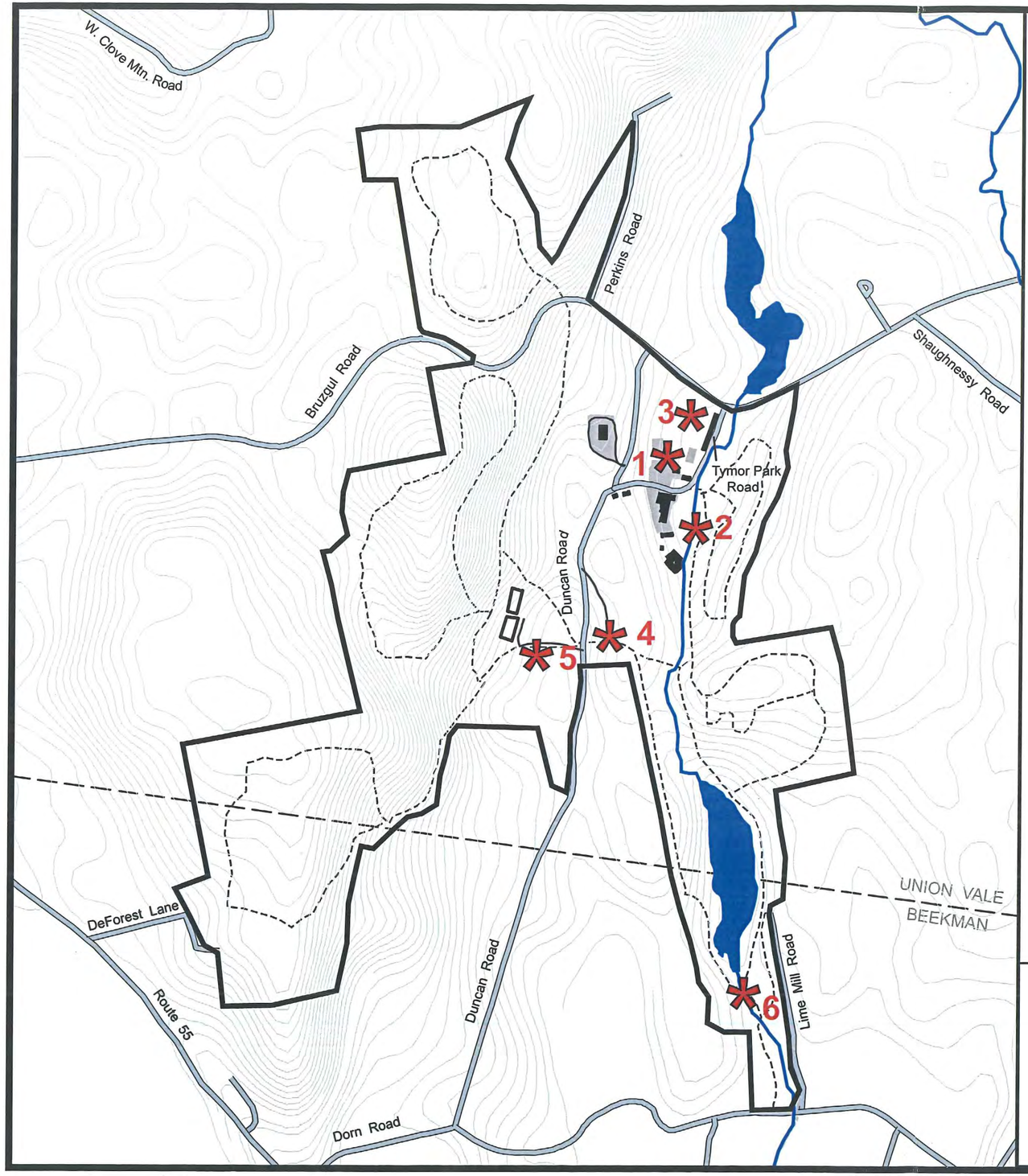

Management Considerations

1. Main parking area is dirt and crushed rock, and is graded toward Fishkill Creek, causing sediment to enter the creek during storm events.
2. Swimming pool, play equipment, and other structures in the 100-year floodplain.
3. Septic systems, oil and gas tanks, and chemicals used for park maintenance are close to Fishkill Creek.
4. Dirt access road and parking area for upper athletic fields is significantly eroding.
5. Dirt access road to Equestrian Center is eroding and rutted.
6. Furnace Pond Dam leaks significantly.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 14

Park Infrastructure Analysis

Summary: Park infrastructure includes buildings, roads and driveways, parking areas, trails, recreational facilities, culverts, and dams. Currently, the park infrastructure appears to adequately serve the park's needs.

LEGEND

* Management consideration

KEY

- Water
- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Trail locations are approximations, based on existing trail map and aerial photo interpretation.

SITE USE

Summary

Tymor Park provides a diverse range of passive and active recreation facilities. Facilities, access points, and programming are weighted toward active uses and are concentrated around the Community Center area. The outlying areas support moderate- and low-intensity uses. Access is generally adequate in high traffic areas but is lacking for some outlying areas. Site use conflicts and constraints include lack of clear signs and trail markers, lack of clear trailheads, user-group conflicts, natural hazards, and safety concerns. Environmental degradation has resulted from certain uses and some current user groups are in violation of the park rules and regulations. Classes and facilities which are open to non-residents may significantly increase facility use and wear. Figure 16 illustrates the general use areas in Tymor Park.

Use Groups

Tymor Park use groups include pedestrians, road and mountain bikers, horseback riders, snowmobilers, skiers, snowshoers, boaters,[21] fishers, ice skaters and ATVers. Summer is the peak season for the vast majority of park uses. However, with good snow cover, cross-county skiing, sledding, snowmobiling, and other winter sports are popular, especially during weekends.

Snowmobile Access

Snowmobiles use most of the hiking trails throughout the park, but their entrance and use of the east side of the park does not comply with the Deeds of Covenance and the Park Rules and Regulations.[22]

ATV Access

ATVs (all-terrain vehicles) enter the park from multiple road entrances and through-trails, especially including the Dorn Road trail access in Beekman and the DeForest Lane access on the west side of the park. Any ATV use within the park is prohibited by the Deeds of Covenance and the Park Rules and Regulations.

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[21] Boating on Furnace Pond is infrequent.

[22] See *Deeds of Covenance* analysis and Park Rules and Regulations in Appendix A.

Access by Non-Union Vale Residents

Tymor Park is officially open to use only by Union Vale residents and their guests. The current Park Rules and Regulations state that "Guests must be accompanied by a town resident."[23] However, multiple facilities and park programs provide opportunities for use by non-Union Vale residents. It is unclear how this relates to the above-stated park policy. Furthermore, non-Union Vale residents apparently enter the park at trails and entrances along the Beekman border.

Use Areas

High Traffic Areas

Areas of high circulation within the park are largely limited to the developed area in the northern part of the park which contains the Town Hall, the Community Center, and the majority of the active recreation facilities. Vehicle and pedestrian traffic is common in these areas.

Moderate Traffic Areas

Moderate traffic areas include the equestrian center and the upper ball fields. Vehicle and pedestrian traffic are common in these areas during the summer months. Horses are common around the equestrian center in the summer months and snowmobiles frequent the equestrian center in the winter.

Low Traffic Areas

Low traffic areas within the park include the undeveloped, outlying portions of the park which do not have direct or significant road access. These areas are used for passive recreation and by snowmobilers and ATVs.

Passive Recreation

Tymor Park's wide range of opportunities for passive recreation and appreciation of nature are based largely on an extensive trail system. Wide trails lead through meadow and forest landscapes with exceptional views. The current trail system reaches most areas within the

[23] *Tymor Park – Town of Union Vale – Parks and Recreation Book.* 2003.

park and appears to fulfill the current demand for passive recreation services. Passive recreation activities in Tymor Park are summarized in Table 7.

ACTIVITY	LOCATION(S)	LEVEL OF USE	NOTES
Hiking, walking, running	Throughout park, all trails	Low to medium	Six miles of main trails and many smaller trails
Mountain biking	Most trails	Low	Heavy during race events
Bird-watching, nature interpretation	Throughout park	Low	Birding best on A and B Trails and Furnace Pond
Fishing	Fishkill Creek and Furnace Pond	Low	Heavy during annual fishing derby
Viewing	Many locations throughout park	Medium	Many opportunities, few established destinations
Skiing/snowshoeing	Throughout park	Low	-
Boating	Furnace Pond	Low to none	-
Camping	Furnace Pond, lawn at swimming pool	Low	Heavy during annual events

Table 7. Passive recreation activities at Tymor Park

Trails

Within the park, there are eight main trails, totaling more than six miles. Each main trail is named with a letter of the alphabet. Trails A, B, C, and D are located to the east of Duncan Road and trails F G, H, and K are located west of Duncan Road. In addition to the main trails, multiple smaller trails have been created within the park, mostly by the park's mountain bikers. The named trails, and many of the smaller un-named trails, are depicted on a not-to-scale map available in the town hall and shown in Figure 15.

Pedestrians, bikers, horseback riders, cross-country skiers, snowshoers, snowmobilers, and ATVers use the park's trails which traverse varied terrain including open fields, wetlands, hardwood and softwood forest, and a range of slopes from relatively flat to exceedingly steep. Trail links between areas within the park are unclear, particularly between the west and east sides of the park across Duncan Road.

Several trailways exist in the surrounding area beyond the boundaries of Tymor Park. These include adjacent and proposed town trails, the Harlem Valley Rail Trail, the Appalachian Trail, and the (proposed) Mid-County Rail Trail. The opportunity exists to connect Tymor Park with surrounding trail systems as well as surrounding lands and nearby roads including Clove Mountain, West Clove Mountain Road, Bloomer Road, Blueberry Hill, Chestnut Hill, East Mountain, and Verbank. No formal links to any of these trails, roads or areas currently exist.

Trailheads and Trail Markers

Some trails are marked with signs providing the letter-name of the trail. Most trails and trail sections have no signs or markers. In general, where trail signs do exist they are old, faded, and inconsistent. For users without prior familiarity, it is unclear how to find and follow certain trails within the park.[24]

In a few locations near the equestrian center, signs warn trail users about potential use-conflicts between horseback riders and other trail users.

Non-vehicular access points, such as where trails begin at the Beekman border and along the north and western boundaries of the park, do not have signs informing users of park rules and regulations.

Interpretive Signs

In areas of the park, particularly on trails around Furnace Pond, interpretive signs explain some of the natural and historic features within the park. Many of these signs are old and faded to the extent that they are unreadable.

Aluminum tags on the trunks of several trees in the Furnace Pond area attempt to provide the tree species' names. However, many of these labels inaccurately identify the trees they are posted on.

Trail Use Conflicts and Constraints

In general, park management and facilities development and maintenance have been weighted towards active recreational facilities and this is reflected in the state of the passive facilities, primarily the trail system. Trail system features including clear trailheads, trail markers, and resting areas have not been developed. Throughout the park, much of the trail system lacks clear access points as well as a sense of connectivity and integration between trail areas.

Some trail uses, particularly horseback riding, mountain biking, snowmobiling and ATV use, create the potential for conflicts on trails. Although some trails are wide with long sight-lines, safety hazards exist where steep slopes, blind curves, and intersections create collision potential.[25] An increase in park use will increase the likelihood of collisions and other trail conflicts.

Certain trails (including C, E, G, H, and K) intersect steep slopes without employing necessary erosion control measures, leading to an increased potential for soil erosion. Over

[24] This is particularly true of the F, G, and H trails on the west side of the park.
[25] Particularly in locations on H and G Trails.

time, erosion of trails will reduce accessibility and usability of these trails and lead to degradation of the surrounding environment.

Certain trails (including B and K and access trails to F and H) cross, or potentially cross, apparent wetlands.[26] Soil compaction, culverting, or the addition of fill to wetlands to increase trail or road access causes degradation of a vulnerable natural resource.

Illegal snowmobile use of trails on the east side of the park and illegal ATV use throughout the park decrease user-safety and enjoyment for other use groups.

Active Recreation

Tymor Park contains level areas for ball fields, parking lots, and buildings for indoor recreation, education, and meeting space. Park structures and active recreation facilities are located primarily at the north end of the park in the Recreation Center, creating a high-use zone in the lowland area between Duncan Road, Bruzgul Road, and Fishkill Creek. Table 8 summarizes active recreation uses at Tymor Park.

ACTIVITY	LOCATION(S)	LEVEL OF USE	NOTES
Community Center	Recreation Center	High	Classes, Senior Center, indoor rec. facilities
Baseball	Rec. Center fields	High	Men's league, Beekman Little League
Softball	Rec. Center and Upper ball fields	High	Union Vale Women's League
Swimming	Pool	High	Open to public for fee
Soccer & Lacrosse	Upper fields	Low	-
Basketball	Rec. Center outdoor courts	Low	-
Tennis	Rec. Center outdoor courts	Low	-
Horseback Riding	Equestrian Center	Moderate	80 members in 2003
Weight training/fitness	Community Center	Low	-
Ice skating	Furnace Pond	Low	(Facility at basketball courts not functional)
Sledding	Hill below Duncan Rd.	Moderate	There are safety concerns at this location.

Table 8. Active recreation activities at Tymor Park

[26] Wetlands that have not been officially delineated by the state but which exhibit the flora and hydrology indicative of a wetland.

Classes and Activities Offered

In 2003, the Parks and Recreation staff provided the following summer activities and courses: Horseback Riding, T-ball, Pre-School Program, Lacrosse Clinic, Aquarobics, Counselor in Training, Tennis, Discover Tymor Forest, Canoeing, Art in the Park, Martial Arts, Swim Lessons, Swim Team, Water Safety, Golf (off-site), Athletic Program, Soccer Camp, History Program, Summer Day Camp, Teen Trek (off-site), and Birds of Prey.[27] The Winter Recreation Program for 2004 included Fall Aquatic Program (off site), Bingo, Women's Volleyball, Theater Workshop, Ski and Snowboard Clinic (off-site), Scrapbook Making, Holiday Crafts, holiday dances and parties (including Halloween, St. Patrick's Day) and movie nights.[28]

In addition to recreational amenities and programming, the town plans special events like community days, camping weekends, fireworks, and occasionally rents park facilities to non-resident group events.

Conflicts and Constraints

Conflicts or problems within active recreation areas appear minimal at this time. If demand for active recreation facilities increases in the future, facilities may reach capacity and management decisions will need to address this. A minimum of conflicts exists between active and passive recreation. However, views of active recreation facilities distract from the surrounding natural and agricultural views.

Limits to Development

Active recreation facilities appear to meet the current needs of local residents, sports teams, and senior citizens. Facilities are not utilized to capacity, but they may become so if the town continues to grow as projected in the 2001 Town Master Plan. Facilities may also become over-crowded if increasing numbers of non-resident individuals and teams utilize Tymor Park.

Currently, development within the park appears to have expanded beyond that proposed in the park donors' original management plan, and possibly beyond that described by language in the Deeds of Covenance. This is particularly true where active recreation facilities exceed the development envelope,[29] defying the cluster development approach recommended in the park's original management plan.[30] This expansion of facilities detracts from the passive recreation experience of the

[27] *Tymor Park-Town of Union Vale-Parks & Recreation Book.* 2003.
[28] *Tymor Park-Town of Union Vale-Winter Recreation.* 2004.
[29] This development envelope was identified in the *Natural Features Analyses Summary* of the preceding chapter.
[30] See *Recreation Management Plan for Tymor Forest* in Appendix C.

park and contributes to environmental degradation that lessens the park's nature conservancy value.

Other Local and Regional Facilities

The recreation facilities of Tymor Park appear able to accommodate modest population growth and a general increase in park use. Beyond Tymor Park, Union Vale residents can recreate at Godfrey Memorial Park as well as at private facilities and local schools, including a new high school and middle school nearby. A wide range of local and regional facilities offering active recreation opportunities takes a burden off of Tymor Park to meet growing demand for these facilities. Furthermore, development of additional active recreation facilities in Tymor Park would appear inconsistent with the Deeds of Covenance and the intent of the donors as expressed in the original park management plans.

Planning Implications

- Opportunities exist to create a more equal balance between active recreation and passive recreation facilities.
- Opportunities exist to enhance access points and connections between use areas.
- Mitigation of user conflicts, safety hazards, and environmental degradation would enhance the park user's experience and support the health of the park's sensitive natural systems.
- Local and regional resources beyond Tymor Park can provide a variety of current and future recreation facilities, ensuring that Tymor Park should not feel pressure to overdevelop or meet all recreational needs.
- Extensive use of Tymor Park by non-residents increases the rate at which facilities will reach maximum capacity and appears to violate the Park Rules and Regulations and possibly the Deeds of Covenance.
- Enforcement of existing park rules, including those related to snowmobile use and ATV use, will enhance the park user's experience and ensure that park use complies with the Park Rules and Regulations and the Deeds of Covenance.
- A system of signs and markers addressing park uses, rules and regulations, and amenities will enhance the user's experience of the park.

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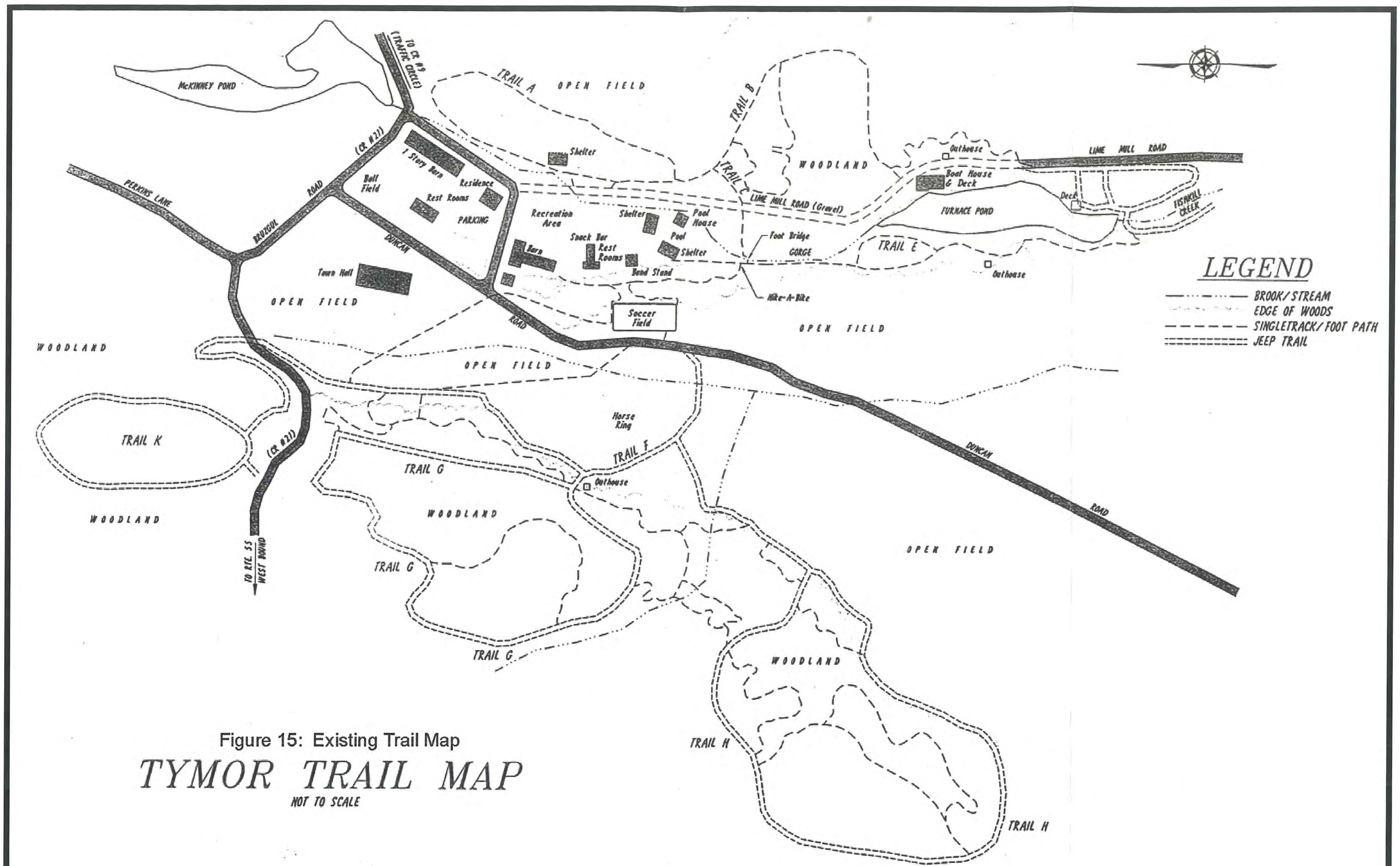
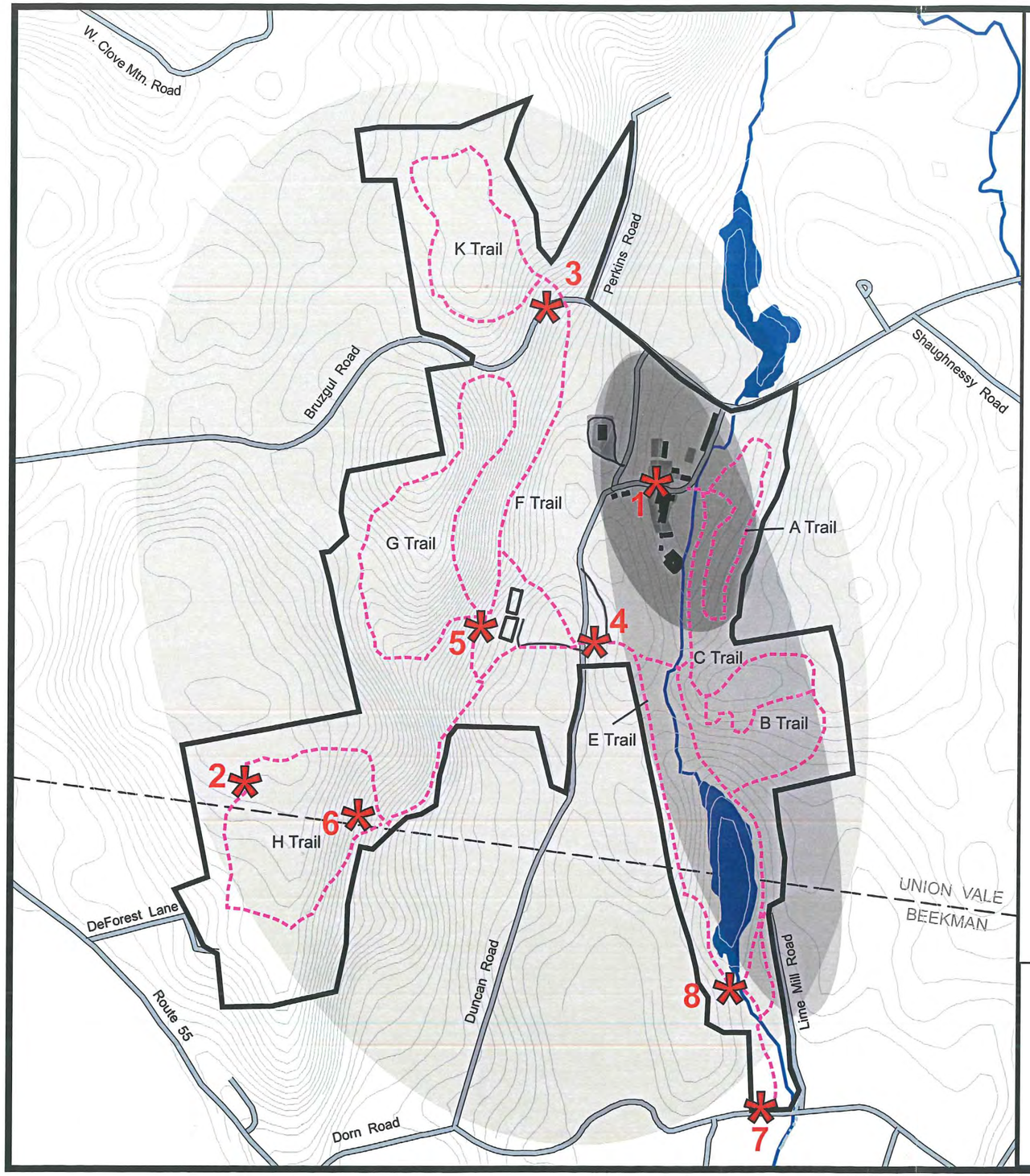


Figure 15: Existing Trail Map

TYMOR TRAIL MAP

NOT TO SCALE



Management Considerations

1. High-use area is disconnected from trails and passive recreation facilities
2. Snowmobiles, ATVs, and other vehicles use prohibited areas within the park.
3. Road Crossings for trails are not marked. F Trail to K Trail at Bruzgul Road lacks a cross-walk and trailhead.
4. Connections between trails and use areas are unclear. E Trail terminates at Duncan Road.
5. Trailheads, signs, and clear access lacking at the Equestrian Center and start of H Trail and G Trail
6. Steep slopes and intersections create potential hazard on multi-use trails like H Trail.
7. Multiple, uncontrolled access points fragment natural vegetation. ATVs illegally enter and utilize park trails.
8. Narrow, steep multi-use trails create conflicts between cyclists and hikers.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 16

Site Use Analysis

Summary: Tymor Park provides a diverse range of passive and active recreation facilities. Facilities, access points, and programming are weighted toward active uses and are concentrated around the Community Center area. The outlying areas support moderate- and low-intensity uses. Conflicts and constraints include lack of clear signs and trail markers, lack of clear trailheads, and user-group conflicts.

LEGEND

- Low use (passive recreation)
- Moderate use (passive recreation)
- High use (active recreation)
- Management consideration

KEY

- Water
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Trail locations are approximations, based on existing trail map and aerial photo interpretation

SCENIC RESOURCES

Summary

Tymor Park benefits greatly from the Town of Union Vale's preservation of its rural character. Sweeping panoramic views are available from many locations within the park as are more subtle vistas from vantage points along the wooded slopes of West Clove Mountain. These scenic resources add to the character and unique experience of Tymor Park. Opportunities exist to create destination sites for enjoyment of views from within the park, to mitigate view conflicts with vegetated buffers, and to identify and protect important viewsheds beyond the park boundary.

Scenic Resources

Major Viewsheds

The park experience is characterized by expansive views of the surrounding ridges, hills, valleys, historical buildings and historic ruins. Major viewsheds from within the park include views of East Clove Mountain to the east, West Clove Mountain to the west, upper Clove Valley and Clove Mountain to the north, and lower Clove Valley and Beacon Mountain to the south.

Several areas within the park, including Town Hall and the meadow south of the soccer field, allow for complete 360-degree views. Many other areas provide stunning views north and south into Clove Valley and east or west to the ridges that border the valley. Figure 17 depicts the major viewsheds surrounding the park and the most conspicuous viewing locations from within the park.

Short Views

Many areas in the park provide more specific, shorter views of equal value and importance. These include views into the Gorge of Fishkill Creek and views across Furnace Pond. Some of the best locations for these views are not accessible from trails or from established viewing locations. As a result, at areas such as at the Gorge, "rogue" trails have been created by users to achieve views which are not on existing trails.

Historical Sites

Historical farm buildings and stone walls both within and beyond the park boundaries are part of the viewshed from many areas. Less conspicuous are the historical remains of the iron furnace and lime kiln in the woods south of Furnace Pond.

Opportunities

Opportunities for enjoyment of the scenery from within the park abound. Prime view points provide opportunities to establish destination sites with amenities such as spur trails to view sites, benches, or picnic tables.

Conflicts

Development within Tymor Park, including the Town Hall, the Community Center, and the various recreation areas, are visible from many points within the park. In general, screening is not employed to conceal development. As noted in the Deeds of Covenance analysis, the deeds for the parcel on which the Town Hall was built stipulate that the lower story of that building "shall be concealed as much as possible from view from the public roads." This has not been achieved.

Union Vale and Beekman are projected to experience significant growth in the coming years, which may lead to significant development of many of Tymor Park's as yet undeveloped viewsheds. To date, Beekman has experienced more development than the town of Union Vale and this can be observed in the difference between park views up valley into Union Vale and down valley into parts of Beekman. Over time, more of the land surrounding Tymor Park may look like that in Beekman.

Specific view conflicts include a new house to be built on the height of land south of the soccer field and west of Furnace Pond. This house is expected to be visible from Furnace Pond and other locations within the park. A single row of young evergreen trees has been planted as a scenic buffer along a section of the property line between the park and the new house site.

Planning Implications

- The long-term preservation of one of the defining aspects of Tymor Park, its scenic resources, will rely on the protection of those resources.
- The park user's experience could be increased by access to, and amenities at, important view locations.

- The park user's experience could be increased by screening or buffers between significant viewing locations and view conflicts.

- Future subdivision and development within significant portions of Tymor Park's major viewsheds may change the nature of Tymor Park and lessen the park user's experience.

- Consideration of tools such as conservation easements may assist in restricting development in areas identified as significant viewsheds.

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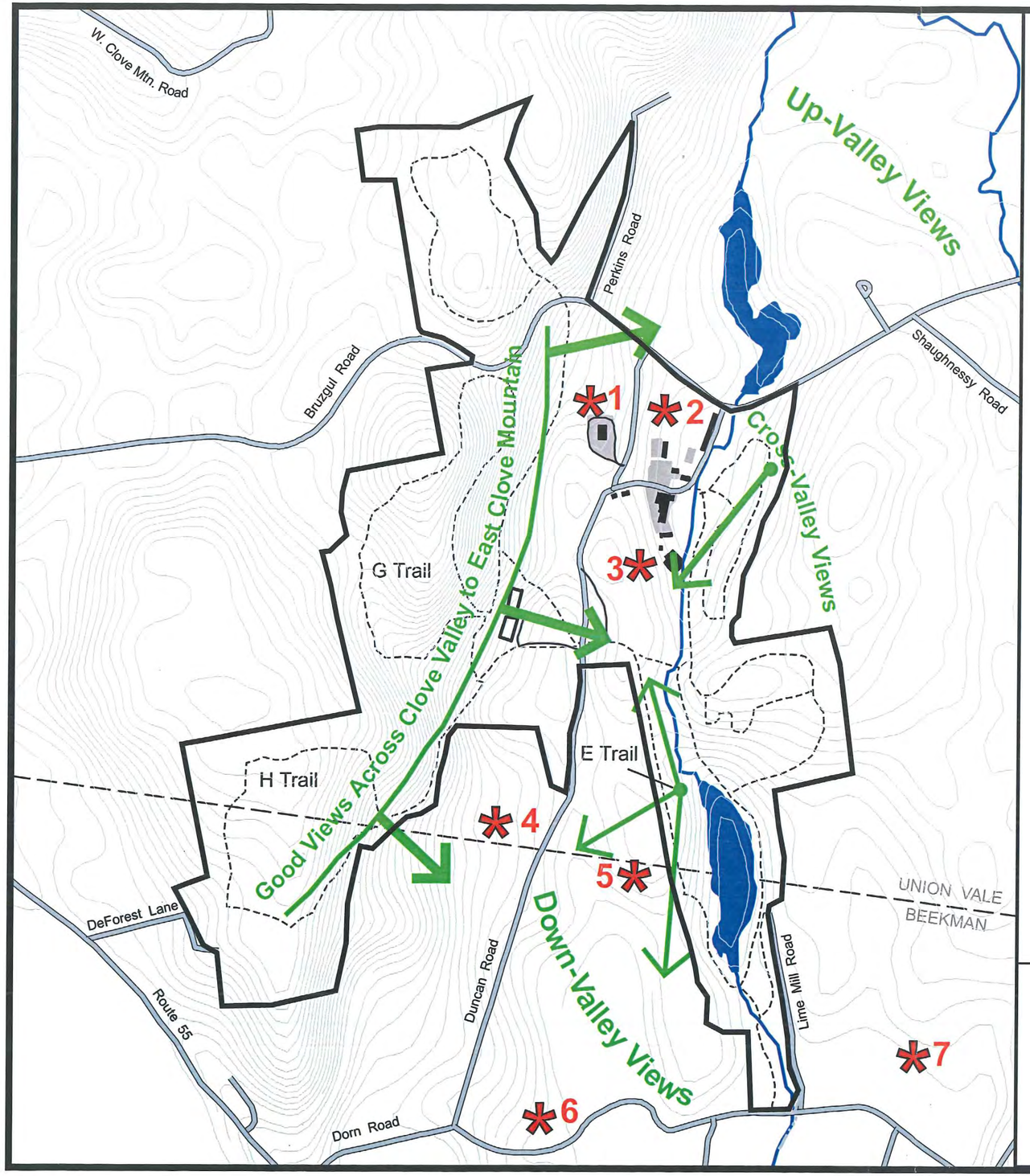

Management Considerations

1. Town Hall is a large structure, visible from many vantage points throughout the park.
2. Lower athletic fields seen from Bruzgul Road, Duncan Road and trails on the west side of the park.
3. Upper athletic field views from the Equestrian Center and trails on the west side of the park.
4. Private residence with significant structures and equipment are seen from G Trail, H Trail, and the Equestrian Center.
5. Private residence is planned and will be visible from E Trail and Furnace Pond.
6. Densely developed subdivisions in the Town of Beekman are visible from E Trail, H Trail, and the Equestrian Center.
7. View of East Clove Mountain will be less rural and less scenic if construction of residential subdivisions continues to occur in the Town of Beekman, and commences in the Town of Union Vale.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
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James Allison

April 2004

Figure 17

Scenic Resources Analysis

Summary: Tymor Park benefits greatly from the Town of Union Vale's preservation of its rural character. Sweeping panoramic views are available from many locations within the park as are more subtle vistas from vantage points along the wooded slopes of West Clove Mountain. These scenic resources add to the character and unique experience of Tymor Park.

LEGEND

- Good views
- * Management considerations

KEY

- Water
- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Trail locations are approximations, based on existing trail map and aerial photo interpretation

ZONING

Summary

Tymor Park is subject to the zoning regulations of the towns of Union Vale and Beekman. Within the park, zoning regulations are generally less restrictive than the park's Deeds of Covenance though zoning Overlay Districts affect park use and management, particularly around sensitive environmental, historical, and cultural resources. Development beyond the park's boundaries is generally restricted to relatively low-density development in the Town of Union Vale. However, in the town of Beekman, current zoning of surrounding lands allows for considerably higher density development.

Town of Union Vale Zoning

Town Zoning

The current zoning law for the Town of Union Vale was enacted in November of 2002. The nine zoning districts in the Town of Union Vale are shown in Table 9. Figure 18 illustrates the layout of these zoning districts.

SYMBOL	ZONING DISTRICT	MINIMUM LOT SIZE
RD 10	Rural Development	10 acres
RA5	Residential Agricultural	5 acres
RA 3	Residential Agricultural	3 acres
R1.5	Residential	1.5 acres
R1	Residential	1 acre
H	Hamlet	1.5 Acres
NC	Neighborhood Commercial	1 Acre
TC	Town Center	2 Acres
A	Airport	2.5 Acres

Table 9. Town of Union Vale Zoning Districts.[31]

[31] Town Code of the Town of Union Vale, 2002. Chapter 90: Zoning.

In the Town of Union Vale, Tymor Park falls within the Rural Development Zoning District. In general, the restrictions in the Deeds of Covenance regarding use and development of Tymor Park are more restrictive than the regulations for this district.[32]

Overlay Districts

The Town of Union Vale Zoning identifies four Overlay Districts which provide additional regulations for the areas they apply to.[33]

- The **Environmental Resource Overlay District** which is "intended to protect significant environmental resources, including the Town's wetlands, stream corridors, aquifers, historic and cultural sites, scenic areas and important farmlands from development that is considered incompatible on the basis of its scale, intensity or location."

- The **Flood Fringe Overlay District** which "encompasses that land designated by the Federal Management Agency as a 'flood plain area with special flood hazards that is likely to be flooded at least once every 100 years.'"

- The **Scenic Corridor Overlay District** which is "intended to recognize both roadways, if any, designated as 'scenic' by NYSDEC... and other roadways that have been deemed locally significant in the Town's Master Plan and/or... the Code of the Town of Union Vale. Within these designated roadway corridors, view protection regulations are imposed to preserve their overall rural character, the setting of historic properties along these routes and the irreplaceable scenic vistas they offer."

- The **Airport Overlay District** which is "intended to depict lands... the users of which should expect to routinely experience... noise and light associated with Airport operations."

Regulations in the Environmental Resource Overlay District, the Flood Fringe Overlay District, and possibly the Scenic Corridor Overlay District apply to portions of Tymor Park. Relevant restrictions within these overlay districts include that a minimum 50-foot vegetated buffer be maintained on either side of stream banks and around wetland boundaries and, generally, that no environmentally degrading activities occur within 100 feet of the same areas.[34] Additional restrictions applicable within these overlay districts are that historical buildings, cultural resources, stone walls, and other historical features be preserved.

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[32] See *Deeds of Covenance* analysis.
[33] Zoning Overlay Districts are not yet mapped by the Town of Union Vale.
[34] See *Town Code of the Town of Union Vale* for the specific regulations.

Landscape Standards

Union Vale zoning includes the following landscaping standards for parking lots, screening and buffer areas:[35]

- "Provide natural visual screening of parking areas and along property boundaries to preserve the existing visual quality of adjacent lands."
- "Reduce storm water runoff and minimize soil erosion through the natural filtering capability of landscaped areas."
- "Provide natural buffers that provide suitable habitat for wildlife and reduce noise and glare."
- "Moderate the microclimate of parking areas by providing shade, absorbing reflected heat from paved surfaces and creating natural windbreaks."
- "Enhance the overall visual quality of new development by providing a variety of indigenous plant materials that are consistent and compatible with the existing natural vegetation of the area."

In general, these standards are not implemented in Tymor Park's parking areas, buffer areas, or boundaries.

Town of Beekman Zoning

The five park parcels of Tymor Park that fall within the Town of Beekman are subject to Beekman's zoning regulations. The two parcels on the east are zoned "Residential 45," having a minimum lot size of 45,000 square feet. The three parcels on the west are zoned "Residential 90," having a minimum lot size of 90,000 square feet. As with parcels within the Town of Union Vale, the language in the Deeds of Covenance is generally more restrictive than the regulations for this zoning district.[36]

Zoning of Surrounding Lands

Within the Town of Union Vale, lands surrounding Tymor Park are zoned RD 10 to the north, RA5 to the east and west, and TC along the southwest corner. RD 10 and RA 5

[35] Town Code of the Town of Union Vale, 2002.
[36] See *Deeds of Covenance* analysis.

zoning districts are limited to minimum lot size of ten acres and five acres respectively. The zoning district TC allows for lot sizes as small as two acres and can be developed commercially.

Zoning of surrounding lands to the south, in Beekman, differs from the relatively low-density zoning surrounding Tymor Park in Union Vale. Land adjacent to Tymor Park in the Town of Beekman is zoned to minimum lot sizes of just over one and two acres, allowing for considerably more density of development in these adjoining areas.

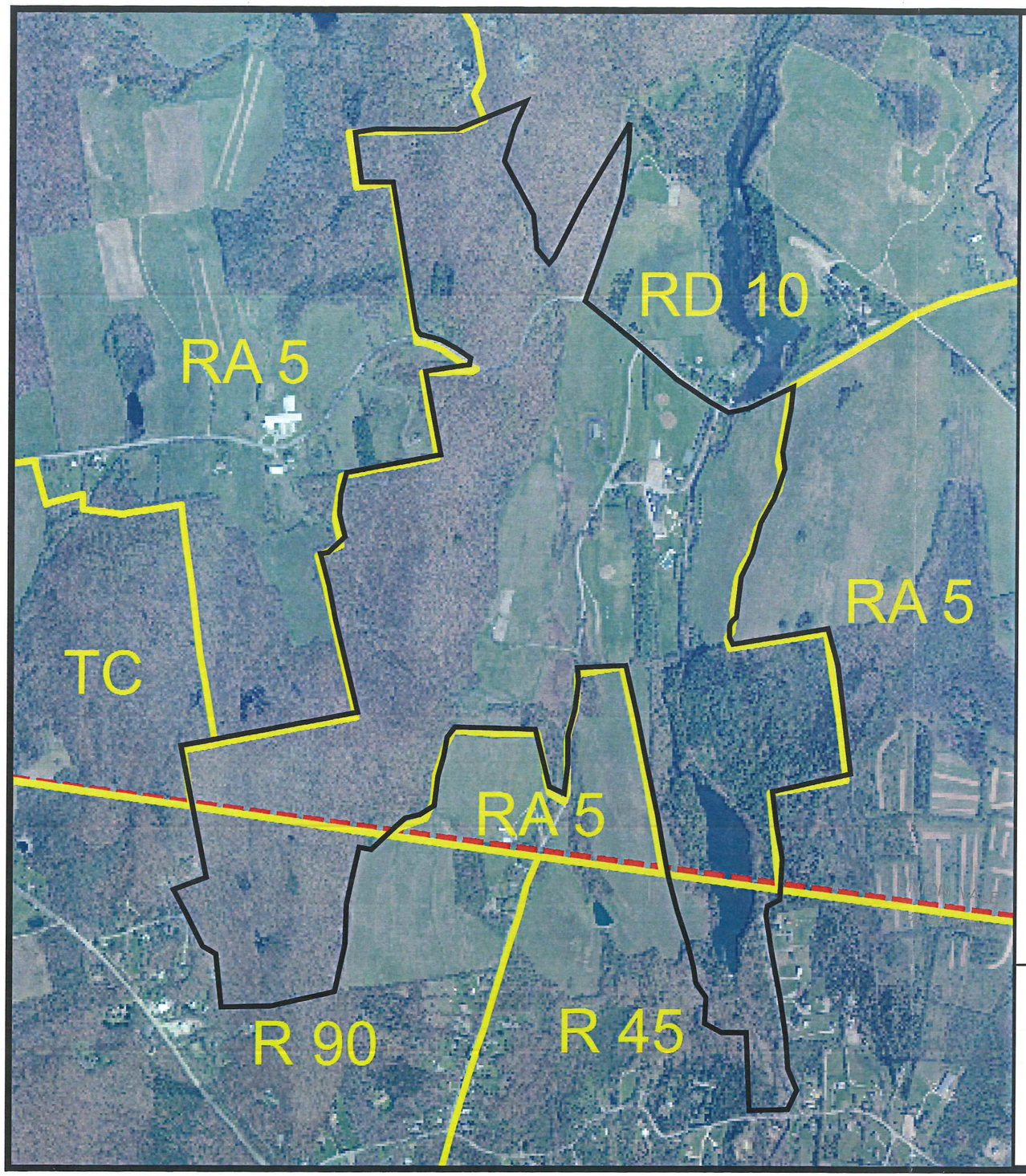
Planning Implications

- Union Vale and Beekman zoning regulations have little effect on development *within* Tymor Park as the Deeds of Covenance are generally more restrictive than the zoning regulations.

- Overlay districts within the park affect use and management, particularly regarding environmentally sensitive areas, historical sites, and cultural resources.

- Park landscaping would need to be enhanced to meet the objectives of the town's landscaping standards.

- Allowable development beyond the parks boundaries, particularly to the south in Beekman, may affect the park's views and sense of rural character.



Zoning Surrounding Tymor Park

Union Vale Zoning

RD 10:	Rural Development:	10-acre lots
RA 5:	Residential Agriculture:	5-acre lots
TC:	Town Center District:	2-acre lots

Beekman Zoning

R 45:	Residential:	45,000sf lots
R 90:	Residential:	90,000sf lots

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
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April 2004

Figure 18

Zoning Analysis

Summary: Tymor Park is subject to the zoning regulations of the towns of Union Vale and Beekman. Within the park, zoning regulations are generally less restrictive than the park's Deeds of Covenance. Development beyond the park's boundaries is generally restricted to relatively low-density development in the Town of Union Vale. However, in the town of Beekman, current zoning of surrounding lands allows for considerably higher density development.

Increased development in Beekman would decrease scenic views from Tymor Park. Subdivision and development in Union vale would increase runoff, erosion and siltation, and would further fragment wildlife habitat.

LEGEND

Zoning district boundary

KEY

Park boundary

Town boundary

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Town of Union Vale Town Code

SURROUNDING LAND USE

Summary

Large tracts of primarily forested and agricultural land surround Tymor Park to the west, north and east. For the short term, the landowners of most of these larger parcels have expressed no interests in subdivision or development of these lands. To the south, in Beekman, development pressure and higher density zoning has resulted in higher density residential development that is visible from locations within Tymor Park. This development trend is expected to continue in Beekman and to be mirrored, but to a lesser extent, in parts of Union Vale. Local development pressure resulting in land use changes in the areas immediately surrounding the park may, over time, change the character of the park and the user's experience of it.

Surrounding Land Use

The current land uses surrounding Tymor Park include agricultural, residential, and extensive tracts of forested land owned by local rod and gun clubs. Parcel sizes range from one-acre lots to the south in Beekman to parcels over 100 acres in Union Vale. Figure 19 depicts the sizes and land cover of parcels currently surrounding the park.

Immediately to the northeast and east of the park is a farm of substantial acreage and a parcel owned by the daughter of the park's donors. At this time, these landowners have no plans to subdivide or develop these parcels.

To the north and southeast, hundreds of acres are owned by the Clove Valley Rod and Gun Club. This is a private club that raises game birds and provides wildlife habitat and hunting for their members.

The parcel abutting the park boundary to the south of the soccer field and to the west of Furnace Pond has been sold to new owners who have plans to build a house that will be clearly visible from the park.

In general, land to the south of the park's boundary lies in Beekman and has the potential for relatively dense residential development, some of which is already visible from the park.

Land that abuts a small portion of the park's southwest border in Union Vale is zoned Town Center District (TC). Due to its zoning and close proximity to Route 55, this land has the potential to be developed residentially and/or commercially with office parks, light industrial parks, guest accommodations, and shopping centers.

To the west and northwest of the park is a large farm of at least 370 acres. Potential subdivision of this land could yield multiple 5-acre lots under current Union Vale zoning.

Future Land Use

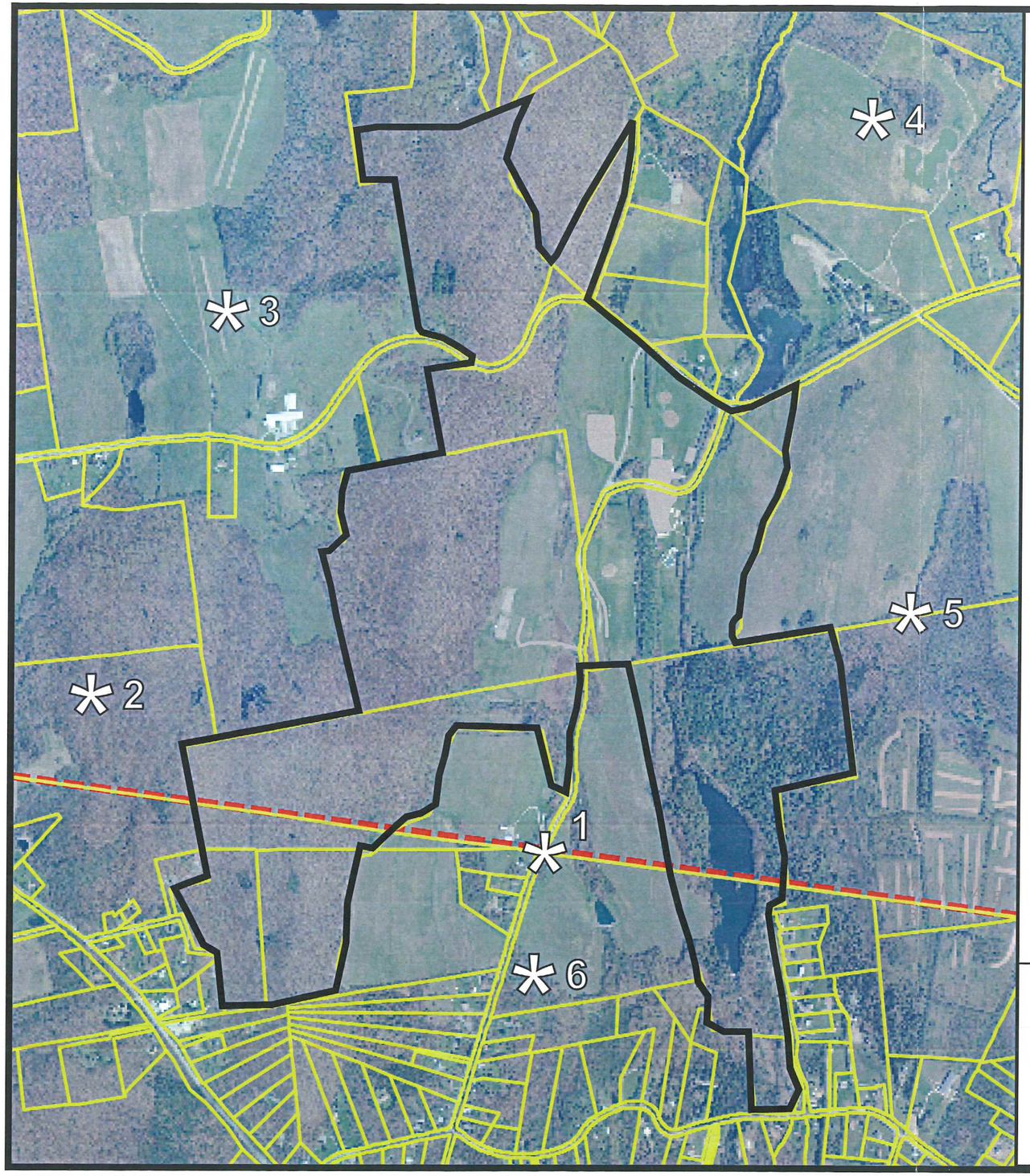
The recent build-out analysis completed for the Union Vale Town Master Plan[37] suggests the potential for increasing development in Union Vale. Furthermore, the Union Vale Master Plan identified much of the land within Union Vale that surrounds Tymor Park as "suitable for development." Recent changes in Union Vale zoning, particularly regarding minimum lot size, will serve to protect most land surrounding the park from particularly dense or commercial development. However, as lands change hands, and without protections such as conservation easements, increased subdivision and development of the parcels immediately abutting the park are likely to decrease the quality of wildlife habitat, increase stormwater runoff, and diminish scenic views. The 5- and 10-acre parcel sizes that would be allowed under current zoning are significantly smaller than the existing parcels and could result in a very different looking landscape.

In Beekman, smaller minimum lot sizes will allow some continuation of subdivision and development on lands to the south of the park.

Planning Implications

- Land use changes over time may affect the park character and the quality of user's experience of the park.
- Consideration of tools such as conservation easements may assist in restricting development of abutting parcels identified as important to the identity or experience of Tymor Park.

[37] *Town of Union Vale Master Plan*, 2001.



Management Considerations*

1. Ninety-five acres of pasture in five parcels is zoned for one- to five-acre lots.
2. 175 acres of forest and pasture in four parcels is zoned for two-acre lots.
3. 370-acre parcel of farm land bordering the park is zoned for five-acre lots.
4. Rod and gun clubs and several residences have ten-acre zoning. Little change is expected in this area unless clubs sell their land.
5. 245 acres of farm and forest is zoned for five-acre lots.
6. Northern Beekman, with one- to two-acre zoning near Tymor Park, is nearing build-out, but could become more dense near the town and park borders.

*** Acre figures are estimates based on GIS.**

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Town of Union Vale, New York

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Figure 19

Surrounding Land-Use Analysis

Summary: Large tracts of primarily forested and agricultural land surround Tymor Park to the west, north and east. To the south, in Beekman, development pressure and higher density zoning has resulted in higher density residential development that is visible from locations within Tymor Park. This development trend is expected to continue in Beekman and potentially in Union Vale. Higher density residential development in areas surrounding the park may change the character of the park.

LEGEND

- Potential for land-use change
- Property parcel boundary

KEY

- Park boundary
- Town boundary

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

SOCIAL ANALYSIS SUMMARY

The analyses of Tymor Park's human history, infrastructure, and uses help illustrate some of the characteristics, opportunities, and limitations inherent to the site. These analyses identify the diverse resources that make Tymor Park the unique and valuable asset it is. They also illustrate opportunities for enhancement, protection and development of resources to help meet underserved needs, mitigate for environmental degradation, and ensure adherence to the Deeds of Covenance.

The social analyses reveal a diversity of passive and active recreation opportunities available in the park though they also identified an imbalance toward development and maintenance of active recreation facilities within the park. The analyses identified the many historic and scenic resources within the park and the need to assure preservation of some of these defining features. They also identified opportunities to enhance the experience of Tymor Park by ensuring appropriate access to park amenities, addressing a limited and inconsistent system of park signs and markers, increasing connectivity between park amenities, mitigating environmental degradation, and ensuring appropriate limits to development.

Site-Use Limitations

A graphic similar to the Environmentally Sensitive Sites Index was developed to identify restrictions on park use and development restrictions. The resulting map of Site Use Limitations (see Figure 20) was created by layering environmentally sensitive sites, use-restrictions from the Deeds of Covenance,[38] and all areas over 5% slope.[39]

The shaded areas on the Site Use Limitations map indicate those areas which, based on the layering of use-limiting factors, are generally not appropriate for development or high-intensity use including active recreation. Park areas outside these development envelopes are generally appropriate for certain low- and moderate-intensity activities and nature conservancy uses including preservation, restoration, enhancement, education, and passive recreation enjoyment.

The areas that remain unshaded on the Site Use Limitations map define a "development envelope" within which all future development and high-intensity uses should be concentrated. It is important to note that, in general, most development within the park has been located within or immediately surrounding these development envelopes.

[38] See *Deeds of Covenance* analysis.
[39] Areas of 5% slope generally require significant grading to be made appropriate for development or high-intensity uses.

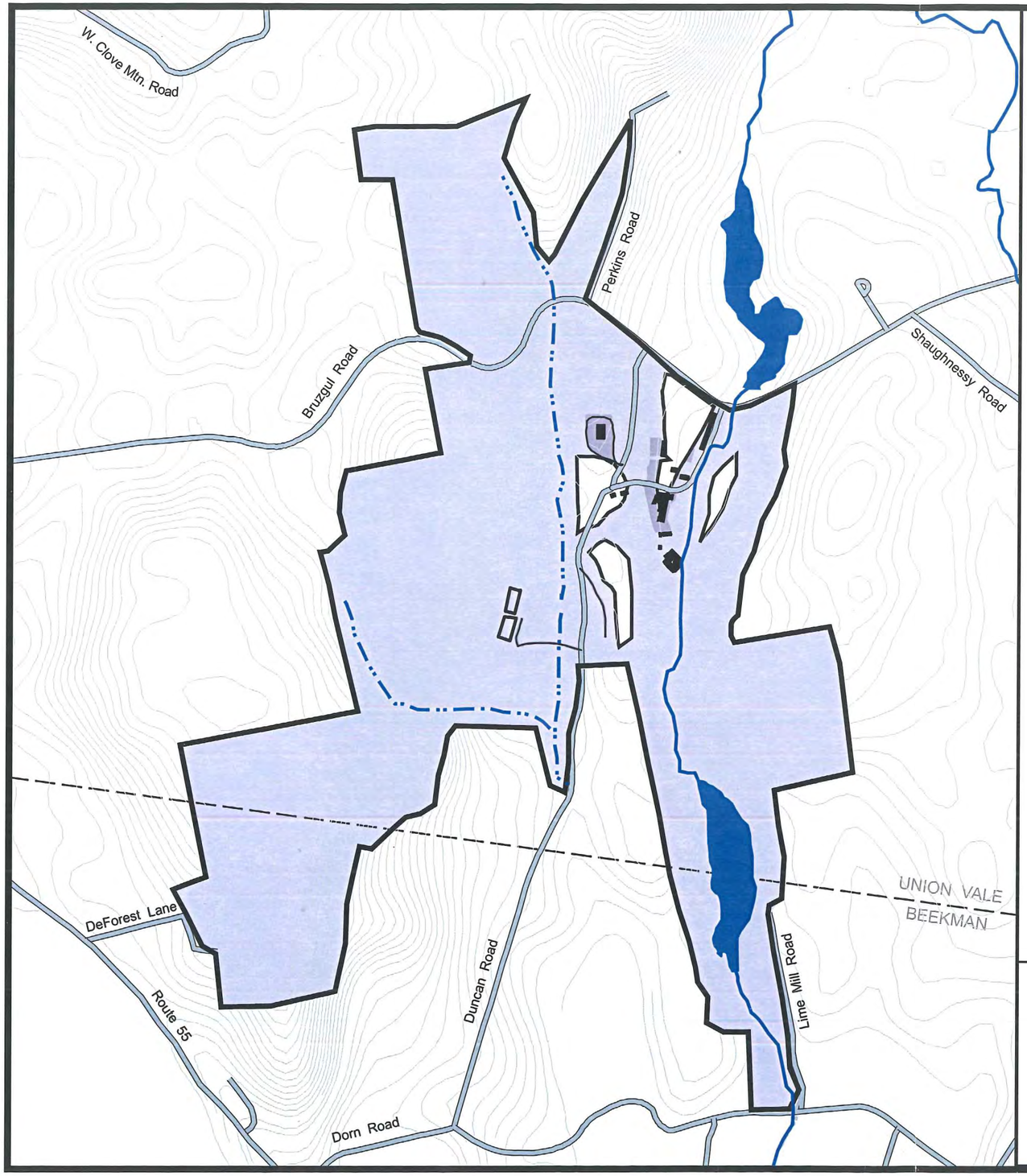
Planning Implications

- Site use is constrained by natural and cultural features which define appropriate and inappropriate locations for park uses and activities.

- High-intensity park uses and all future development should be contained within the site use development envelopes in order to provide appropriately-sited, safe, efficient, and enjoyable human uses while preserving the nature conservancy value of the park and adhering to the language in the Deeds of Covenance.

- A park use and management plan that clusters development within limited, site-appropriate areas is supported by The Deeds of Covenance and the early park management plans written by one of the park's donors.[40]

[40] See *Deeds of Covenance* analysis and Appendix C.



Management Considerations

- Site use is constrained by environmental sensitivities and other limitations which define appropriate and inappropriate locations for a range of park uses and activities.
- Management strategies that reflect an appreciation of site sensitivities and site use limitations will help preserve the nature conservancy value of the park while providing a variety of appropriately-sited, safe, efficient, and enjoyable human uses.
- Prioritizing environmentally sensitive sites for appropriate protective measures and for restoration and enhancement will ensure that the park preserves its function as a nature conservancy.
- The Deeds of Covenance and the early park management plans written by the donor support measures to protect environmentally sensitive sites within the park.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
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James Allison

April 2004

Figure 20

Site Use Limitations

The Site Use Limitations map was created by layering environmentally-sensitive site-use restrictions from the Deeds of Covenance and all areas with greater than 5 percent slopes.

The unshaded areas define a "development envelope" within which future development and high-intensity uses should be concentrated.

The shaded areas are appropriate for low- and moderate-intensity uses including passive recreation.

LEGEND

- Use limitation due to slopes, deeds, and/or environmental sensitivity
- "Development envelope" for active recreation and park development

KEY

- Impervious or semi-impervious
- Water
- Contour (10 feet)
- Park boundary
- Town boundary
- Roads
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

CONCEPT PLAN

CONCEPT DEVELOPMENT

The series of preceding analyses identify the natural features and human uses that define the physical, historical, and cultural setting of Tymor Park and the immediately surrounding area.

The natural features analyses reveal the diversity of Tymor Park's natural physical features and the range of functions they serve including wildlife habitat, flood water storage, erosion control, recreational uses, and aesthetic enjoyment. In addition, the analyses identify distinct vulnerabilities and sensitivities for each of the natural areas within the park. Similarly, the social analyses identify human uses and enjoyment of features within the park as well as areas of conflict between human uses and opportunities for enhancement of the park user's experience.

A conceptual framework for park management can be based on a summary of *opportunities* and *challenges* generated from these analyses.

Park Management Opportunities and Challenges:

- Protect and enhance existing historical, scenic, environmental, and recreational park resources.
- Adhere to the covenants, conditions, and restrictions in the language of the Deeds of Covenance.
- Acknowledge the goals and intents for park use and maintenance as expressed in the original park management plan written by the park's donors.
- Balance nature conservancy and recreation uses of the park.
- Define appropriate limits to park development.
- Reduce environmental stressors within the park.
- Restore and reconnect fragmented and degraded habitat within the park.
- Increase connectivity between use-areas within the park.
- Increase amenities in passive-use areas within the park.
- Improve access to outlying park areas.
- Address improper park use.

Based on information from the analyses and this broad list of opportunities and challenges, the planning process developed two concept plans for park management. The *Environmental Management Concept Plan* focuses on natural stewardship opportunities and the nature conservancy role of the park. The *Site Enhancement Concept Plan* identifies opportunities to address and improve human recreational uses of the site.

Each plan supports and augments the other and the two are intended to work in unison, addressing both aspects of the park's mandate as articulated in the Deeds of Covenance: *to provide "recreation and nature conservancy uses" for the residents of Union Vale.* Together, the Concept Plans provide the framework for the Master Plan's specific park management recommendations.

ENVIRONMENTAL MANAGEMENT CONCEPT PLAN

The Environmental Management Concept Plan identifies six *Environmental Management Areas* and establishes a framework of *Environmental Management Concepts* to guide the development of management plans for Tymor Park's natural resources. The Master Plan recommendations for each of the park's resource areas are based on these concepts.

Environmental Management Areas

- The **Hardwoods Management Area** includes all hardwood forests and significant stands of hardwood trees.
- The **Softwoods Management Area** includes all softwood (or conifer) forests and significant stands of softwood trees.
- The **Meadow Management Area** includes all areas maintained as open grassland (not including ball fields or other areas maintained as turf grass).
- The **Water Resource Management Area** includes all wetlands, wetland corridors, streams, stream corridors, and water bodies.
- The **Steep Slopes Management Area** includes all areas with slopes steeper than 25%, and all areas with slopes steeper than 10% where soils are categorized as severely or very severely erosive.
- The **Wildlife Corridor Management Area** includes all significant wildlife corridors between important natural resources within the park and between the park and surrounding natural areas.

Environmental Management Concepts

- Management of the park's natural resources will focus on the park's nature conservancy function and passive recreational uses.
- Management plans will preserve and enhance the significant functions that the park's natural resources provide including wildlife habitat, forage, shade, flood

control, erosion control, streambank stabilization, water filtration, groundwater recharge, recreational uses, and historical and aesthetic values.

- Management plans will address the known environmental stressors affecting Tymor Park, including human uses, elevated deer populations, invasive exotic plant and animal species, pests and diseases responsible for native species decline, increased stormwater runoff, siltation of aquatic habitats, and habitat fragmentation.

- Management plans will be based on an understanding of species composition and habitat types.

SITE ENHANCEMENT CONCEPT PLAN

The Site Enhancement Concept Plan identifies five *Site Enhancement Topics* suggested by park analyses and establishes a framework of *Site Enhancement Concepts* to guide the development of management plans for human use and recreation in Tymor Park. The Master Plan recommendations for protection and enhancement of the park's human use values are based in part on these concepts.

Site Enhancement Topics

- **Access** - Although Tymor Park provides diverse recreational opportunities for Union Vale residents, the social analyses identified an opportunity to increase the efficiency, safety, sustainability, and ease of access to certain amenities.

- **Connectivity** - Tymor Park presents a rare opportunity to spend hours exploring diverse landscapes and recreational amenities. A connected system of facilities and experiences will support enhanced and diverse recreational opportunities for park visitors.

- **Trails** - Tymor Park's six miles of trails provide an opportunity for a diversity of passive recreational opportunities. Creating an enhanced system of trails, trailheads, signs, and destination sites that provide access, connectivity, adequate information, a variety of experiences, and environmental sensitivity will enhance recreation opportunities while sustaining Tymor Park's natural systems.

- **Destinations Sites** - Destinations sites characterize many great parks, establishing significant points from which to view the landscape, reflect on historical and cultural remnants, and rest during physical activity.

- **Scenic Resources** - In Tymor Park, scenic resources exist at large and small scales, from a small wetland within a forest to a sweeping panorama of the ridges and valleys that surround the park. Identification and preservation of the park's scenic resources will ensure that Tymor Park retains those qualities which are so significant in defining the park experience.

Site Enhancement Concepts

- Ensure a system of safe, clear, and appropriate access to park amenities.
- Ensure parking lots and trailheads provide adequate information regarding each park use area, promote intended park uses, and prevent environmental degradation.
- Create a system of well-placed connections between park use areas to support the intentions of a multiple-use park and to integrate the purposes of recreation and nature conservancy.
- Encourage use of natural spaces and areas landscaped with native plants to create buffers and transitions between use areas.
- Align and grade trails to minimize environmental degradation and to decrease trail maintenance.
- Create a system of destination sites that provide visitors with increased recreational opportunities, promote appreciation and preservation of the park's scenic and natural resources, and reduce the need for rogue trails.
- Identify, protect, and enhance the unique and significant scenic resources within the park.
- Allow appropriate development in and outside of the park to continue while acting to preserve the rural character and scenic and environmental integrity of the area.

MASTER PLAN

MASTER PLAN

"Bold strategies are what produce exceptional results."

Ralph Connor, park donor[1]

Tymor Park represents a unique and special place. It provides a multitude of human recreational uses, protects a significant amount of open space and the natural systems contained within, and challenges its custodians to have the foresight and wisdom to protect and enhance a resource that will only become more valuable as time goes by. The Master Planning process was initiated to ensure the long-term preservation of the irreplaceable nature conservancy and recreation values of this special place. The Master Plan recommendations provide a framework and a starting place for addressing that goal.

The Master Plan is presented in two sections. The first section, Environmental Management, outlines management recommendations for preserving and enhancing the values of the park's natural features. The second section, Site Enhancement, outlines management recommendations for enhancement and protection of the facilities and human uses of the site.

In addition to the specific recommendations in each of the two Master Plan sections, there are a set of general Master Plan recommendations which apply to all aspects of park use and management.

General Master Plan Recommendations

Definitions of "Recreation" and "Nature Conservancy"

The Deeds of Covenance establish that Tymor Park was given to the Town of Union Vale to "...be dedicated in perpetuity to the recreation and nature conservancy uses of the People resident in the Town of Union Vale." As noted in the Deeds of Covenance analysis, these documents do not provide further definition for the terms "recreation" or "nature conservancy." Furthermore, there is apparent potential for conflict between these two stated uses.

[1] *Recreation Management Plan for Tymor Park*, 1972.

For the purposes of this document and the recommendations provided within, the term *recreation* is defined to include:

> ***Diverse active and passive recreational opportunities that do not conflict significantly with the intended additional use of the park as a nature conservancy.***

The term *nature conservancy* may be more difficult, and perhaps more contentious, to define. To provide the Master Plan with a necessary framework for understanding this important part of the park's mandate, the planning process relied on a standard dictionary definition of the term "conservancy." This definition best reflected the apparent intent at the heart of all definitions the planning team found and is perhaps the most neutral. For the purposes of this document and the recommendations provided within, *nature conservancy* is defined as:

> ***An intentional, planned, and thoughtful preserving of a natural resource to prevent exploitation, destruction or neglect.***

Future park management decisions should rely on the foundation of a clear understanding of an accepted definition of these terms-either adopting or modifying the definitions presented in this document.

Limits to Development

The Deeds of Covenance and the park's inherent site use limitations indicate that further development of active recreation in Tymor Park facilities may be inappropriate.

The park's original Recreation Management Plan, written in 1972 by the park's donors, recognized the inherent conflict created by attempting to provide for human uses and nature conservation.[2] Today, town residents express the concern that active recreation use and development have the potential to diminish Tymor Park's natural features and passive recreation opportunities. Ralph Connor, one of the park's donors, addressed this issue in the park's original management plans:

> **"How do we provide for public recreation, relaxation and learning without debasing an environment of tranquility and potentially great biological richness? The answer (or one answer), which may be a distasteful idea to some is this: simply do not develop a park with facilities and program that would**

[2] Ibid.

> **appeal to everyone. Those people who desire more action, larger crowds, greater conveniences, could be provided for elsewhere."[3]**

The original management plan recommends a "clustering" approach to concentrate active recreation facilities in a limited area. It identifies a planning strategy in which park uses are "kept rather simple (ie: primitive) and resource-oriented (ie: water, plants, scenery, wildlife)" and provide "compatible uses" that conflict as little as possible. Furthermore, it recommends that incompatible uses be located at other local and regional recreation facilities.[4]

The results of the site analyses of the current Master Plan support these original intentions and identify a set of site use limitations that define an appropriate development envelope beyond which development and high intensity use is not appropriate (see Figure 20).

In addition to limiting high-intensity uses and facilities to within this development envelope, Tymor Park should not yield to pressure to provide unlimited recreation services within that development envelope. A range of active recreation facilities and programs are, and can continue to be, developed in more appropriate locations elsewhere in the region. Future management considerations should resist pressure for further expansion of active recreation facilities within the park and, when possible, consider decommissioning outlying or underutilized facilities to ensure that the recreation and nature conservancy roles of the park are appropriately balanced equally. Ralph Connor, in his Recreation Management Plan for Tymor Forest, stated:

> **"Those people desiring more 'action,' larger crowds, greater conveniences, could be provided for elsewhere. That is, if the public-use facilities at Tymor are kept rather simple (ie: primitive) and resource-oriented (ie: water, plants, scenery, wildlife). Certain character-types would not be attracted. This philosophy is a ration al planning strategy..."**

Park Use by Non-Residents

The Deeds of Covenance establish Tymor Park for Union Vale residents and the Park Rules and Regulations state "Guests must be accompanied by a town resident." This suggests that park uses such as rental of facilities to non-residents may constitute improper uses of the park. These policies, their intended purpose, and their results must be examined.

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[3] *Recreation Management Plan for Tymor Forest*, 1972. See Appendix C.
[4] Ibid.

The park should examine its existing policy regarding non-resident use. As local and regional population increases, pressure to further develop park facilities will increase. Just as Tymor Park cannot provide unlimited recreation facilities, it must also be recognized that the park cannot serve all regional residents. Facilities development must be guided by the mandate to provide recreation and nature conservancy for the "residents in the town of Union Vale" as stated in the Deeds of Covenance.

Legal Interpretation of the Deeds of Covenance

The Deeds of Covenance establish a broad framework defining appropriate park use. The town should seek legal counsel for a thorough and accurate interpretation of these documents. This will ensure that park use and management decisions do not violate the town's legal obligations and respect the intent of the park's donors.

Shade and Lighting

The high-intensity use areas within the park will benefit from planting trees and vegetation along their perimeters for the shade and aesthetic values they provide. Shade trees in areas around active recreation facilities and parking lots will increase both the human use values and the nature conservancy values of the park.

Outdoor lighting around park facilities and the Town Hall should provide adequate lighting to meet basic requirements of safety and practicality. However, lighting elements must avoid providing more light than is needed to serve these functions. Light pollution is increasingly recognized as a problem in developed and developing locations. Excessive nighttime lighting reduces the ability to see and appreciate the night sky and detracts from the nature conservancy values of the park. Options exist for providing safe, efficient, practical outdoor lighting that do not contribute unduly to the problem of nighttime light pollution. Only light fixtures and lights that meet these requirements should be employed in the park.

Recreation Supply and Demand

The park should undertake a formal assessment of the recreation supply and demand within the Union Vale community. This assessment should include a

projection of future demand based on the build-out analysis in the 2001 Town of Union Vale Master Plan. An understanding of current and future trends should be used to make management decisions regarding appropriate facilities and programming development, establishing limits to facilities growth, and ensuring alternate local and regional venues to meet recreation needs not filled by Tymor Park.

Community Education

As a center of Union Vale community life and a significant environmental resource, Tymor Park is in a prime position to provide community education regarding natural systems and environmental stewardship.

The Conservation Advisory Council and a wide variety of local and regional sources are available to contribute to and participate in educational opportunities for park visitors and Union Vale residents to learn about the park's environmental systems and environmental management strategies. Community educational programming should focus on developing a base of skilled volunteers to assist in implementation of Master Plan recommendations by addressing such topics as native species and habitat inventories, native plant revegetation plans, deer management strategies, invasive species management, stream corridor restoration, water quality monitoring, and stormwater runoff management practices. Such programming will allow the park to develop a base of local volunteers able to assist in park environmental management initiatives and provide participants with new perspectives and skills that may be applied, on smaller scales, at their own homes.

Community programming at this level will assist in implementation of park management strategies, contribute to the success of environmental initiatives in the park, create an environmentally-informed citizenry, and develop Tymor Park as a model for appropriate stewardship of the land.

Environmental Management and Site Enhancement Plans

The preceding Master Plan recommendations apply to all aspects of park use and management. The following sections of this chapter address specific topics related to environmental management and human uses of Tymor Park. As with the Concept Development sections, these topics are addressed in two separate plans. The *Master Plan for Environmental Management* identifies management strategies for the natural resource areas identified in the *Environmental Management Concept Plan*:

- **Hardwoods Forest**
- **Softwoods Forest**
- **Steep Slopes**
- **Meadows**
- **Water Resources**
- **Wildlife Corridors**

The *Master Plan for Site Enhancement* identifies management strategies for the five management topics identified in the *Site Enhancement Concept Plan*:

- **Access**
- **Connectivity**
- **Trails**
- **Destinations**
- **Scenic Resources**

Each element in the Environmental Management and Site Enhancement Master Plans reflect an integration of human use and nature conservancy values, producing a Master Plan that serves to protect and enhance Tymor Park as a sustainable asset within the community and the landscape.

The sections of both plans follow a similar format including a definition of the management area or topic, a list of summarized management recommendations, a detailed explanation of the management recommendations, and a graphic illustrating aspects of the recommendations.

MASTER PLAN for ENVIRONMENTAL MANAGEMENT

The Master Plan for Environmental Management applies to the six different management areas identified in the Environmental Management Concept Plan (see Figure 21). next page Management strategies are recommended for each of these areas based on their unique functions and sensitivities and the management concepts established in the preceding chapter. A set of general *environmental management criteria* further guides the Master Plan's recommendations for all management areas. These management criteria are also intended to stand on their own as guidelines for future appropriate development and management of the park.

General Environmental Management Criteria:

- Sustain or improve the park's value as a nature conservancy.
- Ensure long-term preservation of the functions of the park's natural features, including habitat, forage, cover, erosion control, shade, recreation, and aesthetic values.
- Address environmental stressors including elevated deer populations, invasive plant species, pests and diseases, and human uses.
- Ensure an inventory of habitats and species composition before implementing significant management actions.
- Promote vegetation or revegetation of environmentally sensitive areas.
- Address proliferation of invasive exotic species.
- Assist native species regeneration and enhance native species abundance and diversity.
- Educate park users about the natural features within the park, including their function, importance, and sensitivities.
- Educate park users about the park's environmental management strategies, including their purposes, goals, and achievements.

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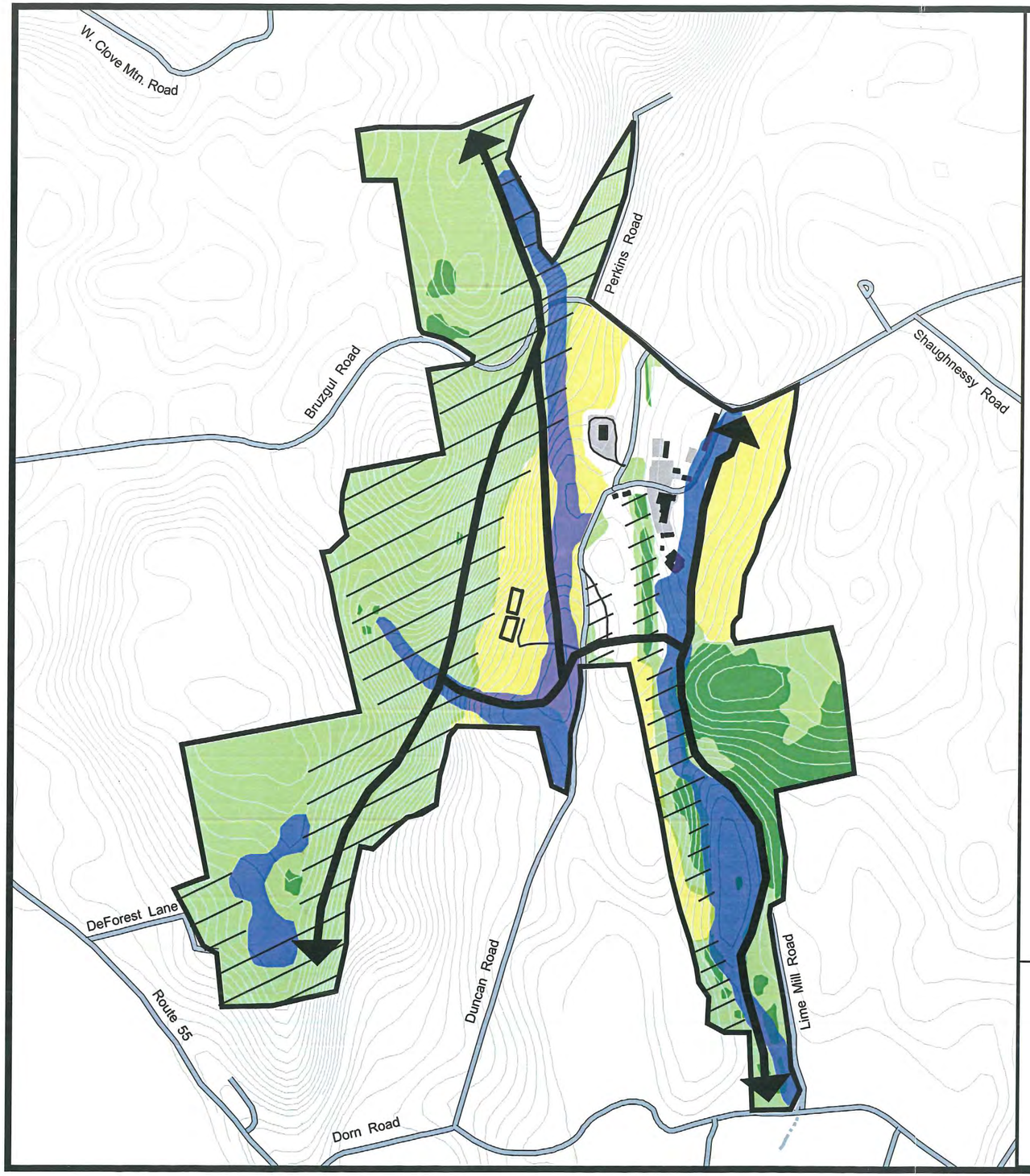

Environmental Management Criteria:

- Sustain or improve the park's value as a nature conservancy.
- Ensure long-term preservation of the functions of the park's natural features, including habitat, forage, cover, erosion control, shade, recreation, and aesthetic values.
- Address environmental stressors including elevated deer populations, invasive plant species, pests and diseases, and human uses.
- Ensure an inventory of habitats and species composition before implementing significant management actions.
- Promote vegetation or revegetation of environmentally sensitive areas.
- Address proliferation of invasive exotic species.
- Assist native species regeneration and enhance native species abundance and diversity.
- Educate park users about the natural features within the park, including their function, importance, and sensitivities.
- Educate park users about the park's environmental management strategies, including their purposes, goals, and achievements.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

Figure 21

Master Plan for Environmental Management

Summary: The Master Plan for Environmental Management applies to the six different management areas identified in the Environmental Management Concept Plan. Management strategies are recommended for each of these areas based on their unique functions and sensitivities and the design concepts established in the preceding chapter. Management criteria guide the recommendations and are intended to serve as guidelines for future appropriate development and management of the park.

LEGEND

- Hardwood forest
- Softwood forest
- Meadow
- Water resources
- Steep slopes
- Wildlife corridor

KEY

- Impervious or semi-impervious
- Contour (10 feet)
- Park boundary
- Roads
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council.

HARDWOODS MANAGEMENT

The Hardwoods Management recommendations focus on the preservation and enhancement of the park's hardwood forests and the natural and human values they provide. The recommendations address recreation and nature conservancy, species and habitat inventories, suitability for timber harvest, deer management, native species regeneration, invasive exotic species management, wildlife management, and park visitor education.

The primary area of hardwood forest within the park is located along West Clove Mountain. Additional, smaller sections of hardwood forest are found throughout the park, most notably bordering the softwood forest at Furnace Pond. Figure 21 delineates the hardwoods stands within the park to which the management considerations and recommendations of this section apply.[5] *Sources of Technical or Financial Support* in Appendix H provides resources to assist in implementation of the following recommendations.

Management Considerations

Recreation and Nature Conservancy

Management of the hardwood forests within the park must be approached from the dual recreation and nature conservancy perspectives established in the Deeds of Covenance. As specific areas within the park, particularly in the unforested developed lowlands, serve the active recreation and high-intensity uses of park visitors, management and use of the remaining hardwood forest areas should focus on the park's nature conservancy values while allowing passive, low-intensity recreational uses.

Species and Habitat Inventories

Before significant management steps are implemented, an inventory of animal and plant species and habitat types should be completed. Information gained from a thorough inventory will assure that management strategies can be fine-tuned to best reflect and support the unique character, function, and sensitivities of each area within the park. Grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

Unsuitability for Timber Harvest

[5] Stand delineation was based on aerial photo interpretation and site visits.

The primary area of hardwood forest lies along West Clove Mountain and includes significant areas with severe to very severe erosion hazards, excessively well drained soils, and/or steep slopes. Each of these factors makes a site unfavorable for timber harvest due to likely negative environmental consequences.

Excessively high deer populations in the region have led to no regeneration of preferred deer browse species, and dramatically reduced regeneration of other species. This lack of vegetation regeneration in the hardwood forest also makes the site inappropriate for timber harvest. A forest must be able to regenerate after harvest in order for removal of timber to be appropriate.

Finally, the park's mandate to serve a role as nature conservancy also suggests timber harvest may be inappropriate.[6] Timber harvest, even selective harvest, results in soil compaction, soil erosion, disruption to surrounding natural systems, and changes in stand composition due to species removal. Furthermore, the Massachusetts Audubon Society acknowledges that "the biological diversity of forests that are allowed to mature indefinitely is different in quality from that of forests that are subject to traditional forestry management."[7] The role of Tymor Park as a nature conservancy suggests that its forest management practices should at least consider allowing it to mature through natural processes, preserving for natural and human values what is becoming exceedingly rare: a type of relatively undisturbed forest.[8]

Deer Management

Deer management in Tymor Park is problematic because elevated deer populations are a regional, not local, problem and because firearms, the traditional tool for deer management, are prohibited from the park by the Deeds of Covenance. Despite these difficulties, some form of deer management must be implemented in order to mitigate the drastic negative effect elevated deer populations have on both the native plant and animal species and the natural systems within the park.[9]

Restoration of the natural systems affected by deer populations should be approached through a multi-pronged program focusing on decreasing deer populations, assisting native species regeneration, and educating the public about the implications of elevated deer populations.

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[6] Except, perhaps, in limited circumstances where necessary to redress previous human disturbance.

[7] It is recognized that a stand that includes a mix of timber sizes, ages and openings often supports a greater diversity of certain wildlife species, particularly larger mammals and birds. However, forests left to mature on their own may contain a greater overall richness in species when such organisms as fungi, mosses and insects are recognized. Leahy, 2004.

[8] The Deeds of Covenance establish that, in general, all motorized equipment is excluded from these areas of the park except snowmobiles and maintenance vehicles. This may present an additional reason why these lands are not suitable for timber harvest.

[9] In addition, as vectors for Lyme-disease carrying ticks, deer contribute to a human health concern.

Deer populations can be decreased and controlled through hunting[10] or through fertility control programs. While population control may be distasteful to individuals or communities for a number of reasons, this is the only management technique which will ensure wide-scale protection of the entire ecosystems on which imbalanced deer populations have drastic negative effects.

Hunting

A hunting-based approach to deer control could rely on bow hunting within the park, deer drives from the park onto adjoining lands where firearm hunting is permissible, and/or the use of special state permits[11] to assist in deer management strategies.

Fertility controls

Fertility control programs are being researched at various sites across the country and initial studies suggest the possibility for their significant long-term success at population reduction. It may be possible for Tymor Park to volunteer to become involved with current or future deer fertility control studies being carried out in New York State.

Education

Any deer population management strategy is likely to be controversial if not preceded with, and accompanied by, appropriate public education addressing the significant negative effects of current deer populations on natural communities, the future consequences of uncontrolled deer populations, the human land use changes that have caused elevated deer populations, and the goals of deer management strategies.

Native Species Regeneration

Native species regeneration in Tymor Park is inhibited by elevated deer populations in the region, invasive species, pests and disease, and human uses of the park. A priority should be placed on addressing the impact of deer on native species, as this is currently the primary factor limiting regeneration of plants.

Exclosures and Tree Shelters

In addition to reducing deer populations, several tools exist for assisting plant regeneration. Regional and state organizations can provide technical and financial assistance for acquisition and use of devices intended to protect individual plants or entire areas from deer browse.[12] The New York State Department of Environmental Conservation recommends the use of deer "tree shelters" and/or "deer exclosures." Tree shelters include a variety of lightweight structures which protect individually planted trees until they grow above deer-browse height. Deer exclosures employ types of fencing to exclude deer

[10] The Deeds of Covenance restrict the use of firearms within the park, but not the act of hunting; thus bow hunting can be used within the park as a deer population management tool.
[11] The NY State DEC issues a "Nuisance Permit" that is considered *technically* different from hunting. With such a permit, population reductions with the use of firearms might be technically acceptable in relation to the Deeds of Covenance. Further research and legal interpretation would be necessary.
[12] See *Sources of Technical or Financial Support* in Appendix H.

from small to medium-size areas, allowing plants to regenerate and grow, free from deer browse. Such exclosures can be relocated after vegetation has exceeded deer browse height to enable revegetation of additional locations.

Plantings

Regional and state organizations can also supply technical advice and cost share programs to assist in selection and purchase of native plant species for revegetation.[13] A management strategy should incorporate the planting of appropriate native species in areas identified as significant through biological or habitat inventories and in cases where exclosures do not produce results.

Because local genotypes of plant species are best for revegetation, a plan using exclosures or tree shelters to protect locally regenerating plants should be employed first. Revegetation with bought, non-local plants should only follow in instances where local regeneration with exclosures and tree shelters does not, on its own, yield the desired results. In all revegetation efforts, it will be necessary to ensure that desirable native species and not invasive exotic species are those revegetating an area (see *Invasive Exotic Plant Species Management* heading below).

Human Uses

Perhaps the easiest way to encourage native species regeneration is to manipulate human uses in areas where they have a negative effect on regeneration. Official spur trails to areas where users now create rogue trails will eliminate excessive trampling. This should be prioritized particularly at desirable scenic overlooks such as at the Gorge (see *Trails* section of the *Master Plan for Site Enhancement*).

Excessive mowing of sensitive areas also inhibits native species regeneration. Reduction of mowing in areas that are sensitive or do not receive high traffic will enable native species to regain a foothold. This should be prioritized in the most sensitive areas, including stream and wetland buffer zones (see *Water Resources* section of the *Master Plan for Environmental Management*).

Invasive Exotic Plant and Animal Species Management

The success of invasive, exotic plant species can lead to significant changes in species composition of entire ecosystems, resulting in habitat degradation and a corresponding decline in native fauna. Invasive exotic plant species that exist in the hardwood forests of Tymor Park include common buckthorn (*Rhamnus cathartica*), tree of heaven (*Ailanthus altissima*), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), and invasive bush honeysuckle (*Lonicera sp.*).[14]

[13] See *Sources of Technical or Financial Support* in Appendix H.

[14] See Appendix G for a description of each species and information on species-specific management techniques.

The first step in managing invasive species in Tymor Park is to complete a thorough inventory of invasive species diversity, abundance, and distribution throughout the park.[15] As with species and habitat inventories, grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

A management or eradication plan should be based on this inventory and should prioritize removal or management of invasive species identified as particularly problematic in the park as well as protection of areas identified as currently free from invasives and areas identified as environmentally unique or sensitive. Any management or eradication plan must ensure that any removal of invasive species is coupled with protection of bared soil, ideally with local leaf mulch, and revegetation with appropriate native species. Areas with newly disturbed soils are particularly vulnerable to invasive plant invasion.

Wildlife Management

The diversity of habitat provided within the hardwood forests of Tymor Park should be preserved and enhanced. Wetlands, seeps, steep slopes, streams, stream corridors, unique habitats, and pockets of conifers within the hardwood forests should be protected from overuse, fragmentation, or degradation. Native vegetation should be assisted and encouraged in order to provide the cover and forage necessary to support the diversity of species which rely on these areas. Assisting regeneration of native vegetation includes the use of plantings, deer exclosures, and tree shelters as mentioned above. Mast-producing trees such as oak and beech as well as snags and denning trees should be protected for the food and cover values they provide.

In all wildlife management considerations in Tymor Park, deer population control is of critical concern. Habitat values will continue to decline if deer populations continue at their current levels. Deer control or protection of vegetation from deer browse must be a first priority in improving the habitat value in the hardwood forests of Tymor Park.

Park Visitor Education

Park user awareness and appreciation of hardwood forests can be increased through a system of interpretive signs and observation areas. A system of informative signs can provide nature interpretation information, protect sensitive habitat, and advise park visitors of the park's natural resources management strategies.

[15] See *Sources of Technical or Financial Support* in Appendix H.

Management Recommendations Summary

- Inventory native animal and plant species and habitat types.
- Do not manage the hardwood forests for timber harvest.
- Reduce deer populations in the park and surrounding area.
- Utilize deer exclosures or tree shelters to assist native plant regeneration of native hardwood forest species.
- Inventory invasive exotic plant and animal species and create an invasive exotic species management plan.
- Protect sensitive areas within the hardwoods forests from overuse, fragmentation or degradation.
- Use the resources provided in *Sources of Technical or Financial Support* in Appendix H for assistance with implementation of the above recommendations.

SOFTWOODS MANAGEMENT

The Softwoods Management recommendations focus on the preservation and enhancement of the park's softwood (or conifer) forests and the natural and human values they provide. The recommendations address recreation and nature conservancy, species and habitat inventories, hemlock management, red pine planting management, additional small softwood stands, deer management, invasive exotic plant species management, wildlife management, and park visitor education.

The primary area of softwood forest within the park is located surrounding and to the northeast of Furnace Pond. Additional, smaller stands of softwood forest are found throughout the park, including between Duncan Road and the lower softball fields, along the eastern border of the soccer field, and in small pockets in the hardwood forest along West Clove Mountain. Figure 21 delineates the softwood stands within the park to which the management considerations and recommendations of this section apply.[16] *Sources of Technical or Financial Support* in Appendix H provides resources to assist in implementation of the following recommendations.

Management Considerations

Recreation and Nature Conservancy

As with the hardwood forests, management of the park's softwood forests must be approached from the dual recreation and nature conservancy perspectives established in the Deeds of Covenance. As other areas within the park serve the active recreation and high-intensity uses of park visitors, the management and use of the remaining softwood forest areas should focus on the park's nature conservancy values while allowing passive, low-intensity recreational uses.

Species and Habitat Inventories

Before significant management steps are implemented, an inventory of animal and plant species and habitat types should be completed. Information gained from a thorough inventory will assure that management strategies can be fine-tuned to best reflect and support the unique character, function, and sensitivities of each area within the park. Grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.[17]

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[16] Stand delineation was based on aerial photo interpretation and site visits.

[17] See *Sources of Technical or Financial Support* in Appendix H for additional resources.

Hemlock Management

Without intervention, the significant hemlock stand around and to the northeast of Furnace Pond will die in five to ten years. Current controls of the woolly adelgid and elongate hemlock scale may not be practical at the forest-scale that would be necessary to save the hemlocks in Tymor Park. A management approach suggested by the Cornell Cooperative Extension and others is to "buy time" for the hemlock stand in hopes that an appropriate, effective control may be developed before a complete die-off occurs. If the hemlock stand or individuals within the stand are kept alive until an appropriate control is available, it is possible that portions of the hemlock stand in Tymor Park could survive and thus contribute to the important current effort to preserve some of the genetic and regional diversity within the threatened eastern hemlock species.

Appropriate methods for "buying time" for an infected hemlock stand are debated but suggested management strategies include:[18]

- Remove severely infested individual trees to reduce the abundance of woolly adelgid and scale at the site.[19]
- Do *nothing* to fertilize or promote fertility within the hemlock stand.[20]
- Plant and /or protect hemlock saplings from deer browse with exclosures or tree shelters.
- Apply horticultural oil to hemlock saplings to treat for wooly adelgid and hemlock scale.

In the event that the hemlock stand or portions of the hemlock stand are lost, management strategies must be focused towards preserving the *functions* that the hemlock stand provides. This is best achieved by facilitating revegetation with species having the most similarity to eastern hemlock. Unfortunately, no native conifer species has the same unique qualities as eastern hemlock, but potential native species which may serve some of the functions of the hemlock stand include eastern white pine (*Pinus strobus*), eastern red cedar (*Juniperus virginiana*), northern white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), Fraser fir (*Abies fraseri*), Atlantic white cedar (*Chamaecyparis thyoides*), and white spruce (*Picea glauca*).[21]

A possible non-native replacement for eastern hemlock is western hemlock (*Tsuga heterophylla*). Because it is not native to the region, further inquiry into the appropriateness of its introduction would be necessary. However, the species is resistant to the woolly

[18] Additional methods including soil and tree injections of insecticides and aerial micro-nutrient spray may be investigated as part of a plan for "buying time." However, these methods are more costly-both environmentally and financially.
[19] This approach is controversial as removal of a large tree infested with either of these pests is likely to temporarily assist their spread.
[20] This promotes woolly adelgid vigor.
[21] Ward, date unknown. These species differ in their soil, exposure, and moisture requirements. A successful revegetation plan must fit appropriate species to specific site conditions.

adelgid and may provide the habitat value most similar to eastern hemlock of all the alternatives.

When considering hemlock revegetation, special consideration must be given to the steep slopes along Fishkill Creek that are currently vegetated with hemlock. Loss of these trees will lead to soil erosion, increased water temperatures, and degradation of water quality in the creek and downstream. These areas should be prioritized for hemlock retention methods and, if unsuccessful, for appropriate revegetation.

Seedlings planted as part of a hemlock revegetation plan will require protection from the deer, using exclosures or tree shelters, until the seedlings have grown past deer browse level[22]. This step will be crucial to effective forest regeneration. In order to preserve softwood stand composition, hardwood competition must be controlled during this stage as hardwoods may overtop conifer seedlings. Competing hardwoods must be removed until the conifer seedlings have become well-established.

Red Pine Planting Management

Vines should be removed from the red pines lining the east side of Duncan Road (between the Town Hall and the lower ball fields) to ensure the health of these trees.

Once the vines have been managed, additional tree species should be planted along this portion of Duncan Road under and around the red pines. A diversity of ages and sizes of trees in this area will ensure that if and when the red pines are lost, the shade and aesthetic values the red pines currently serve will continue to be met.

Additional Small Softwood Stand Management

The additional small softwood stands throughout the park should be preserved and protected for the diversity and habitat values they provide.

Deer Management

Because hemlock is a preferred deer food source, there is currently little to no hemlock regeneration in Tymor Park. Deer management and native species regeneration initiatives are necessary to counter the significant influence deer have in the softwood forests of Tymor Park. These include consideration of management strategies for reducing deer populations and techniques for protecting native species growth from deer browse. The *Deer Management* and *Native Species Regeneration* portions of the preceding *Hardwoods Management* section provide specific management recommendations on this topic.

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[22] See the *Native Species Regeneration* in the preceding *Hardwoods Management* section of the *Master Plan for Environmental Management.*

Invasive Exotic Plant and Animal Species Management

The success of invasive, exotic plant species can lead to significant changes in species composition of entire ecosystems, resulting in habitat degradation and a corresponding decline in native fauna. Several invasive exotic plant species exist in and surrounding the softwood forests in Tymor Park including Japanese barberry (*Berberis thunbergii*), multiflora rose (*Rosa multiflora*), and invasive bush honeysuckle (*Lonicera sp.*)[23]. Japanese barberry is of particular concern in the softwood forest to the northeast of Furnace Pond where it is one of the only understory species present in some areas.

Similar to the recommendations in the *Hardwood Management* section, an inventory of invasive species diversity, abundance, and distribution must be completed. As with species and habitat inventories, grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

A management or eradication plan should be based on this inventory and should prioritize removal or management of invasive species identified as particularly problematic in the softwoods forest as well as protection of areas identified as currently free from invasives and areas identified as environmentally unique or sensitive. Any management or eradication plan must ensure that any removal of invasive species is coupled with protection of bared soil, ideally with local leaf mulch, and revegetation with appropriate native species. Areas with newly disturbed soils are particularly vulnerable to invasive plant invasion.

Wildlife Management

The diversity of habitat provided within the softwood forests of Tymor Park should be preserved and enhanced. Native vegetation should be assisted and encouraged to provide the cover and forage necessary for the diversity of species which rely on these areas. Snags and denning trees should be protected for the food and cover values they provide.

In particular, the significant wildlife habitat value of the threatened hemlock forest must be addressed. If the hemlock stand experiences a partial or complete die-off, a unique and significant habitat within the park will be severely compromised or lost. Management strategies should attempt to compensate for this by identifying the habitat functions those portions of the softwood forest serve and attempting to recreate them. Appropriate softwood species should be considered for revegetation of the area. As mentioned above, western hemlock may be one of the best candidates for revegetation. It is resistant to the woolly adelgid and provides perhaps the most similar values to wildlife and humans of any other softwood. However, since western hemlock is not native to the area, further consideration may be warranted.

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[23] See Appendix G for a description of each species and information on species-specific management techniques.

Park Visitor Education

Park user awareness and appreciation of softwood forests can be increased through interpretive signs and observation areas. A system of informative signs can provide nature interpretation information, protect sensitive habitat, and advise park visitors of the park's natural resources management strategies.

Management Recommendations Summary

- Inventory native animal and plant species and habitat types.
- Reduce deer populations in the park and surrounding area.
- "Buy time" for the hemlock stands while waiting for an appropriate woolly adelgid and elongate hemlock scale control.
- Consider removal of individual hemlock trees severely infested with woolly adelgid and elongate hemlock scale.
- Encourage and assist hemlock regeneration through the use of deer exclosures and/or tree shelters, treatment of saplings for the woolly adelgid and elongate hemlock scale, and through additional plantings of hemlock saplings as necessary.
- Ensure, through a softwoods revegetation plan, that the *functions* of the hemlock stand around and to the northeast of Furnace Pond will continue to be met if the hemlock stand itself dies off.
- Inventory invasive plant and animal species and create an invasive species management plan.
- Do not manage the softwood stands for timber harvest.
- Use the resources provided in *Sources of Technical or Financial Support* in Appendix H for assistance with implementation of the above recommendations.

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MEADOW MANAGEMENT

The Meadow Management recommendations focus on the preservation and enhancement of the park's meadows and the natural and human values they provide. The recommendations address recreation and nature conservancy, species and habitat inventories, mowing, burning, native vegetation, invasive exotic plant management, woody oldfield management, and park visitor education.

The meadows in Tymor Park are located to the east of the West Clove Mountain hardwood forest and to the north of the softwood forest surrounding Furnace Pond. Figure 21 delineates the meadows within the park to which the management considerations and recommendations of this section apply.[24] *Sources of Technical or Financial Support* in Appendix H provides resources to assist in implementation of the following recommendations.

Management Considerations

Recreation and Nature Conservancy

Management of the park's meadows must be approached from the dual recreation and nature conservancy perspectives established in the Deeds of Covenance. The meadows surround areas of active recreation and high-intensity use but are themselves used primarily for passive recreation. The management and use of the park's meadows should maintain this trend and focus on the park's nature conservancy values and on passive, low-intensity recreational uses.

Species and Habitat Inventories

Before significant management steps are implemented, an inventory of animal and plant species and habitat types should be completed. Information gained from a thorough inventory will assure that management strategies can be fine-tuned to best reflect and support the unique character, function, and sensitivities of each area within the park. Grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

[24] Meadow delineation was based on aerial photo interpretation and site visits.

Meadow Management

Meadows provide unique and vital habitat to an array of species, particularly grassland birds, butterflies, small mammals, and their predators. The meadows within Tymor Park should be managed to optimize habitat for the array of species which use them, while retaining the human values they currently serve.

Meadow management strategies general rely on fire or mowing to keep them open and to inhibit the growth of woody species. The following recommendations suggest meadow management techniques using either or both of these strategies.[25]

Mowing

Areas currently maintained as open meadow should be mowed every one to three years to maintain the fields in grasses and to prevent growth of woody vegetation. The following mowing practices will help maintain and enhance quality habitat for a variety of rare and more common species:

- **Mow meadows only after August 15th** so as not to interfere with local breeding and nesting of grassland bird species which occurs May through July. (The exception is for periodic maintenance of regularly used meadow trails.)

- **Employ a rotational system of mowing** to create a mosaic of grass heights and structure. Meadow species prefer a variety of different habitat types. To achieve this effect, mow one third to one half of the meadows each year or, alternately, mow the meadows in two- to four-meter-wide strips each year.

- **Raise the mower blade six to twelve inches from the ground** to preserve small mammal habitat.

- **Use flushing bars on haying equipment** to flush birds and small mammals hiding in the grass.

Burning

Periodic controlled burning is a meadow maintenance tool used as an alternative to mowing. It more closely mimics natural disturbance cycles, reduces the buildup of dead vegetation, inhibits the spread of woody species, adds nutrients to the soil, and rejuvenates plant growth. Burning should be done every two to six years, in early spring (before mid-May), with careful planning, appropriate permits, and under the guidance and assistance of the local fire department and organizations familiar with this management tool.

[25] An additional source for meadow management strategies is the Massachusetts Audubon Society booklet entitled "Conserving Grassland Birds," available for free at www.massaudubon.org.

Native Vegetation
Conversion from agricultural species to native meadow species will increase the diversity and wildlife value of the meadows in Tymor Park. Methods include removal of individual exotic plants and replacement with native plants (appropriate for larger, woody species) or patch skinning and seeding with native plant seed.[26] Portions of the meadows may be planted with a mixture of native wildflowers, encouraging an increased diversity of species including butterflies.

Bird Boxes
Nesting boxes could be provided to encourage species such as wrens, swallows, and bluebirds.

Invasive Exotic Plant and Animal Species Management

The success of invasive, exotic plant species can lead to significant changes in species composition of entire ecosystems, resulting in habitat degradation and a corresponding decline in native fauna. Several invasive species exist in and surrounding the meadows in Tymor Park including tree-of-heaven (*Ailanthus altissima*), multiflora rose (*Rosa multiflora*), and invasive bush honeysuckle (*Lonicera sp.*).[27]

Of particular concern is the meadow to the south of the soccer field which is no longer maintained through mowing. One of the predominant woody species revegetating that area is multiflora rose. Without active management, this area will become heavily, if not primarily, vegetated with this and other invasive species and provide a new seed source for regional spread of invasive plants by visiting bird species.

Similar to the recommendations for the other environmental management zones, an inventory of invasive species diversity, abundance, and distribution must be completed in the meadow areas. As with species and habitat inventories, grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

A management or eradication plan should be based on this inventory and should prioritize removal or management of invasive species identified as particularly problematic in the park as well as protection of areas identified as currently free from invasives and areas identified as environmentally unique or sensitive. Any management or eradication plan must ensure that any removal of invasive species is coupled with protection of bared soil and revegetation with appropriate native species. Areas with newly disturbed soils are particularly vulnerable to invasive plant invasion.

[26] See Appendix H for sources of native meadow species seed.
[27] Appendix G provides a description of each species and information on specific management techniques.

An initial spring fire regime of controlled patch burns or general burns for several years will inhibit woody growth in the meadow areas and encourage native meadow species. If burning is undesirable or not practical, spot treatment with herbicides may be applied to individual newly cut invasive or woody shrub stems.

Woody Oldfield Management

The meadow to the south of the soccer field is no longer being mowed, with the intention that it will revert back to forest.[28] Without active management, this area will become vegetated with significant quantities of the woody invasive exotic species already present in the park. An abundance of multiflora rose has already been noticed in the area.

Management strategies for this area must include identification and removal of invasive species. Simultaneously, desirable native species must be identified, mulched around, and protected from deer browse. Planting of appropriate, native woody species is desirable if natural regeneration is not adequate. As with other areas, any planting will need to be protected from deer browse. These methods of assisting native regeneration will help speed the succession process, thus reducing the need for long-term, intensive invasive exotic plant management.

Management strategies to promote meadow succession are in keeping with Ralph Connor's recommendations in the 1972 park management plan *Preliminary Nature Trails Plan for Tymor Forest.* This document suggested "[managing] plant succession to encourage a diverse array of oldfield (successional) fruit and berry producing shrubs and associated animal life (particularly songbirds)."

Water Resources

Meadows in Tymor Park border water resources including wetlands, intermittent streams, Fishkill Creek, and Furnace Pond. A no-mow zone should be implemented within a 100-foot buffer adjacent to these areas. Native woody and herbaceous species should be allowed to revegetate these areas to support the health of these sensitive resources, support the critical functions they serve in our landscape, provide aesthetic value, and preserve the nature conservancy values of the park.

Park Visitor Education

Park user awareness and appreciation of grasslands can be increased through interpretive signs and observation areas. A system of informative signs can provide nature interpretation information, protect sensitive habitat, and advise park visitors of the park's natural resources management strategies. Sensitive nesting habitat can be protected from

[28] An historical meadow, in the process of reverting back to forest is termed a "woody oldfield."

disturbance with "Grassland Bird Nesting Area" signs and by appropriate placement of trails.

Management Recommendations Summary

- Inventory native animal and plant species and habitat types.
- Mow all meadows once every one to three years.
- Mow meadows only after August 15th.
- Employ a rotational mowing system, mowing one third of each meadow each year, or mowing meadows in two- to four-meter-wide strips.
- Consider burning as a more natural meadow management alternative to mowing.
- Assist native woody plant revegetation of the meadow that is being left to revert to forest to speed succession and discourage the spread of invasive plants.
- Inventory invasive plant and animal species and create a management plan.
- Control invasive species in the meadow that is being left to revert to forest.
- Revegetate a 100-foot buffer of native plants on either side of water resources.
- Use the resources provided in *Sources of Technical or Financial Support* in Appendix H for assistance with implementation of the above recommendations.

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WATER RESOURCES MANAGEMENT

The Water Resources Management Zones recommendations focus on the preservation and enhancement of the water resources within the park and the natural and human values they provide. The recommendations address recreation and nature conservancy, water resources inventory, species and habitat inventories, invasive exotic plant species management, 100-foot riparian buffer, potential contamination sources inventory, Fishkill Creek management, Furnace Pond dam, the slag pile, roads, driveways and parking facilities, culverts and stream crossings, stormwater runoff "Best Management Practices", and park visitor education.

Water resources include the streams, wetlands, vernal pools, and aquifers that exist throughout the park and provide vital functions and recreational opportunities in Tymor Park and downstream. Figure 21 delineates water resources within the park to which the management consideration and recommendations of this section apply.[29] *Sources of Technical or Financial Support* in Appendix H provides resources to assist in implementation of the following recommendations.

Management Considerations

Recreation and Nature Conservancy

Management of the park's water resources must be approached from the dual recreation and nature conservancy perspectives established in the Deeds of Covenance. A strategy that balances appropriate human access and recreation uses with an environmentally sensitive and sustainable management plan will allow for ongoing human enjoyment while minimizing or eliminating associated degradation of these resources.

Water Resources Inventory

All water resources within the park should be identified and delineated. A complete understanding of the amount, significance and location of all park water resources will help in accurate identification of appropriate park use and management strategies. Of particular significance are undelineated wetlands. A certified wetland scientist should be hired to identify and delineate the park's wetlands.

[29] Water resources delineation was based on aerial photo interpretation and site visits.

Species and Habitat Inventories

Before significant management steps are implemented, an inventory of animal and plant species and habitat types should be completed. Information gained from a thorough inventory will assure that management strategies can be fine-tuned to best reflect and support the unique character, function, and sensitivities of each area within the park. Grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

Invasive Exotic Plant and Animal Species Management

The success of invasive, exotic plant species can lead to significant changes in species composition of entire ecosystems, resulting in habitat degradation and a corresponding decline in native fauna. Invasive exotic plant species documented in the water bodies of Tymor Park include phragmites (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and possibly Eurasian milfoil (*Myriophyllum spicatum*).[30]

Similar to the recommendations for the other environmental management zones, an inventory of invasive species diversity, abundance, and distribution must be completed in the park's water resources. As with species and habitat inventories, grants may be available to fund this activity which may be hired out to an independent organization or completed by interested local volunteers with technical guidance or assistance provided by local or regional organizations.

A management or eradication plan should be based on this inventory and should prioritize removal or management of invasive species identified as particularly problematic in the park as well as protection of areas identified as currently free from invasives and areas identified as environmentally unique or sensitive.

100-Foot Riparian Buffer

A variety of local, regional, state and national agencies and organizations recognize the importance of protecting buffer areas around water resources.

The Environmental Overlay Districts established by the Union Vale Town Code regulate development within a 100-foot buffer around water resources and require a 50-foot vegetated buffer around these resources. The New York State Department of Environmental Protection establishes similar protections. The Dutchess County Greenway Compact, which is signed by the Town of Union Vale, recommends a 60-foot stream corridor protection buffer and a 100- to 300-foot vegetated buffer where the stream

[30] See Appendix G for a description of each species and information on species-specific management techniques.

corridor serves as a wildlife corridor. Finally, the nationally recognized Center for Watershed Protection recommends protection of a 75-foot minimum buffer around water resources and protection of the entire 100-year floodplain.

Following the regulations and suggestions established by these agencies and organizations, Tymor Park water resources should receive significant protection within the sensitive 100-foot buffer area and 100-year floodplain. Within a 100-foot buffer on either side of all water resources, development of structures (excluding trails and some bridge crossings) should be prohibited.[31] This critical area should be allowed to revegetate with native herbaceous and woody plants to provide shade, erosion control, and serve wildlife habitat functions. The portions of these areas which are particularly sensitive, contain unique habitats, or have been disturbed by roads, trails, or other uses should be prioritized for revegetation.

In high traffic areas, where a 100-foot buffer is impossible, a minimum 50-foot vegetated buffer should be established and maintained. When native revegetation does not occur naturally, plantings of appropriate species should be considered. As with other revegetation measures, protection from deer browse will be required (see *Native Species Regeneration* in the *Hardwoods Management* section of the *Master Plan for Environmental Management.*)

Revegetation of the stream corridor is supported by the *Trout Stream Restoration and Management Project for Tymor Forest* written in 1972 by Ralph Connor. That document describes a management plan for re-establishing the stream channel's natural structure and meander pattern and improving riparian vegetative cover.

> **"The total floodplain will be managed ecologically to demonstrate proper integrated landuse... It will be managed to improve the aesthetic appeal of the total floodplain environment in which man, the visitor, can recreate and learn. Vegetation management will include the culture of meadows to create attractive wild floral displays."**

Human access to water resources should be directed to the least environmentally sensitive areas through the implementation of established access points (see *Stream Access* below).

Inventory of Potential Contamination Sources

The locations and integrity of potential contamination sources within the park should be inventoried and assessed. Potential sources include septic systems, above and below ground oil and gas tanks, and the storage or use of chemicals within the park.

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[31] Existing structures such as the swimming pool will remain in the stream corridor. Other temporary or movable structures, such as play equipment and picnic benches, should be assessed for relocation into less sensitive areas.

Pesticide use, including herbicides and fungicides, should be eliminated in Tymor Park except as necessary on a very limited basis in conjunction with an invasive plant species management plan. Other fertilizer and chemical use should be evaluated with a risk-benefit analysis that addresses implications for water quality and human health. No fertilizers or chemicals should be applied in the 100-foot buffers surrounding water resources or in the 15-foot buffer surrounding stormwater runoff swales (see *Artificial Swales and Drainages* below).

Fishkill Creek

Fishkill Creek provides important wildlife habitat and human recreational values. Management strategies must consider these values, restoring the most sensitive parts of the historic floodplain and stream channel morphology, while identifying and preserving appropriate recreational uses at less sensitive areas.

Stream Access

Stream access points should be located at specific sites identified as having the lowest degree of environmental sensitivity. Determination of these locations should be based on a thorough assessment of the entire stream corridor. Areas maintained specifically for the purpose of human access will ensure ongoing human use and enjoyment of this resource while preventing an unnecessary proliferation of access points and accompanying disturbances to the streambank.

See the *Destination Sites* section of the *Site Enhancement Master Plan* for discussion of placement of resting and viewing destination sites along the stream corridor.

Stream Restoration

The Natural Resources Conservation Service or similar agency can assist in developing a plan for recreating the historical structural complexity of Fishkill Creek. Large woody debris, rock, and other natural riparian structures in the channel and on the stream banks provide habitat for aquatic species and create the structural complexity that slows moving water, decreasing erosion and channel degradation.[32]

Water Quality Monitoring

Fishkill Creek water quality monitoring stations only exist downstream of Tymor Park. The opportunity exists to involve local students or volunteers in establishing water quality monitoring stations at points along the creek in Tymor Park.

[32] Channel and bank restoration techniques should be designed by an experience practitioner and must be permitted by New York State Department of Environmental Conservation (DEC).

Furnace Pond Dam

The Furnace Pond dam restricts wildlife movement and creates unnaturally warm summer water temperatures that decrease wildlife habitat value. Long-term maintenance of the pond will involve significant ecological and financial costs associated with dredging the pond and restoring the leaking dam. Ecological stresses include extreme aquatic habitat alteration and degradation as well as the potential for downstream transport of significant amounts of sediment.[33]

Removing the dam and restoring Fishkill Creek to its historical path may be the most ecologically and financially sound option for Furnace Pond. Inquiry into this option must include an assessment of the habitat values provided by Furnace Pond, the potential existence of endangered or threatened species or habitats in Furnace Pond, and the potential that the sediment held in Furnace Pond may be polluted. Benefits of removing the dam and allowing the creek to reestablish its historical path include significant increases in the health of the Fishkill Creek stream and stream corridor, increases to water quality, improvements to wildlife habitat, and passage for aquatic species, such as trout.[34] Removal of the dam is supported by a nationwide trend of small dam removal and stream restoration.

If the town decides to maintain the dam and pond, it should consider not dredging Furnace Pond. This should not significantly compromise human use values associated with the pond as swimming is prohibited and boating recreation is not sought after by the community. From the nature conservancy perspective of the park, dredging causes habitat degradation, has severe implications for potentially sensitive, threatened or endangered species, and may contribute significantly to siltation of downstream water resources.

The small dam in the upper reach of Fishkill Creek should also be considered for removal. Particularly in conjunction with removal of the Furnace Pond dam, this action will allow for more natural stream flow and sediment conveyance while significantly increasing wildlife habitat values including the opportunity for fish passage. If the Furnace Pond dam is not removed, and dredging of Furnace Pond is considered, the town should seek professional assistance to determine whether the small dam may be of value as a settling pond. This use may be appropriate if it is determined that it can significantly reduce sediment transport into Furnace Pond while having significantly less environmental and financial cost than regular, long-term dredging of Furnace Pond.

Slag Pile

It is possible that the slag pile south of the Furnace Pond dam contributes pollutants that affect environmental quality. This should be assessed and, if necessary, a management plan

[33] A permit for dam repair and pond draining would be required by the New York State Department of Environmental Conservation (NYSDEC). A dredging permit would be required by the United States Army Corps of Engineers.

[34] See *Source of Technical and Financial Support* in Appendix H for additional resources.

implemented. The NYSDEC suggests the environmental implications of slag piles may include elevated levels of iron and lowered pH. The NYSDEC will be able to provide further information to assist in assessing this issue.

Roads

Furnace Pond access road (previously Lime Mill Road) diminishes the quality of the forested area near the stream and contributes to sedimentation of Fishkill Creek and Furnace Pond. Use of this road by non-maintenance vehicles is prohibited by the Deeds of Covenance. Strict enforcement of regulations regarding the vehicle use of this road is required to ensure adherence to the Deeds of Covenance and to enhance the health of the aquatic systems it parallels.

The unused road below Furnace Pond Dam is not needed for vehicle access as vehicles other than trucks for slag removal are prohibited by the Deeds of Covenance.[35] Reforesting this road will increase shade and groundwater recharge, while decreasing soil erosion and habitat fragmentation.

Driveways and Parking Facilities

The parking areas around the Community Center should be re-graded to direct drainage into water quality retention and/or detention areas. This practice will contribute to decreased flooding, erosion, and pollution of downstream waterways.

Public parking at the upper ball fields presents a significant erosion problem and should be eliminated. The access road to this area should be maintained for maintenance vehicle access only. Public parking for events at the upper ball fields must be directed to the main parking areas at the Community Center. Elimination of this parking area is also in following with the park donor's original park management plans which established that active and high-intensity uses should be clustered in one area on the park's perimeter and not infringe on the interior of the park.[36]

Parking at the Equestrian Center contributes to soil erosion and degradation of the surrounding wetland systems. Parking should be strictly limited to park maintenance vehicles and Equestrian Center-related traffic. Parking for access to the west side trails should be directed to the Community Center or Town Hall parking areas.[37]

[35] Prior to reforestation of this road, the slag pile's potential for contamination of water resources should be evaluated and, if necessary, a management plan should be implemented.
[36] See *Recreation Management Plan for Tymor Forest* in Appendix C.
[37] See *Trails* section of the *Master Plan for Site Enhancement.*

Culverts and Stream Crossings

The condition and function of all culverts and stream crossings should be mapped and assessed. Failing culverts should be converted to natural-bottom structures and should be sized to promote adequate stream flow and wildlife passage. Stream crossings should be minimized or rerouted wherever possible.

not on my map!

The access road to the Equestrian Center bisects a federally regulated wetland. This crossing should be inspected to ensure adequate flow between the upper and lower portions of this wetland.

The section of the trail leading from the Equestrian Center to the H Trail bisects a potential wetland system to the south of the Equestrian Center. This crossing is currently being mown and maintained for horse jumps and trail access.[38] Management of this area should be altered to allow for recreational passage *through* the area, but not for direct recreation *in* the riparian zone.

Stormwater Runoff "Best Management Practices"

Many human activities and land uses contribute to degraded water quality. "Best Management Practices" (BMP's) have been identified to reduce transport of pollutants into water resources via infiltration and stormwater runoff. The Fishkill Creek Watershed Committee recommends that stormwater management practices be employed within the watershed.[39]

Herbicide, pesticide, and fertilizer use should be eliminated[40] and road salting should be reduced where possible. Above and below-ground fuel tanks should be assessed and retrofitted or replaced as necessary.

All existing swales and drainages in managed areas should be identified and mapped. These swales should be managed as water quality facilities, retrofitted with check-dams to create longer periods of stormwater detention, and should employ a 15-foot no-mow buffer on either side to increase their pollution filtering capacity. Chemicals should not be applied near swales or drainages.

Park Visitor Education

Park user awareness and appreciation of water resources can be increased through interpretive signs and observation areas. A system of informative signs can protect

[38] This crossing may currently employ a culvert.
[39] Fishkill Creek Watershed Committee, 2004.
[40] Except in limited cases as part of an invasive species management plan.

sensitive habitat, provide nature interpretation information, and advise park visitors of the park's natural resources management strategies.

Management Recommendations Summary

- Identify and delineate all water resources within the park.
- Establish a 100-foot vegetated buffer around all water resources.
- Identify and assess the location and use of potential contamination sources.
- Position clear human access and crossing points to minimize degradation of water resource functions while providing site-appropriate recreation.
- Inventory native aquatic animal and plant species and habitat types.
- Inventory invasive exotic plant and animal species and create an invasive species management plan.
- Assess the impact of culverts, impoundments, and crossings on natural flows and wildlife passage and implement changes as necessary.
- Assess the long-term implications of the slag-pile on water quality.
- Ensure parking facilities do not contribute increased pollution or stormwater drainage into water resources.
- Establish water quality monitoring stations on Fishkill Creek.
- Use the resources provided in *Sources of Technical or Financial Support* in Appendix H for assistance with implementation of the above recommendations.

STEEP SLOPES MANAGEMENT

The Steep Slopes Management recommendations focus on protecting those areas within the park which are particularly vulnerable to soil loss through erosion. They include all areas of greater than 25% slope and all areas with soils rated in the NRCS Dutchess County Soil Survey as having severe or very severe erosion potential.

Steep slopes in Tymor Park are located primarily on the east face of West Clove Mountain. Additional steep slopes are located between Duncan Road and the soccer field, on the forested slope west of the soccer field, west of Furnace Pond, and southwest of the dam at Furnace Pond. Figure 21 delineates the steep slopes within the park to which the management considerations and recommendations of this section apply.[41] *Sources of Technical or Financial Support* in Appendix H provides resources to assist in implementation of the following recommendations.

Management Considerations

Recreation and Nature Conservancy

Management of areas of steep slopes within the park should focus on the nature conservancy goals of the park. Areas of steep slopes are generally not appropriate for recreational uses or development due to the severe erosion potential and to safety concerns.

Steep Slopes Management

donot

The Deeds of Covenance acknowledge the necessity to avoid activities that induce soil erosion. Areas of steep slope are particularly inappropriate for activities or development due to their high erosion potential. Pre-existing trails in these areas should be redirected into adjacent areas or employ significant erosion control measures.[42] Switchbacks, while common, are not desirable because of the frequent proliferation of shortcuts which increase erosion potential.

Vegetation plays a significant role in preventing erosion of slopes. While all slopes should remain vegetated, a priority must be placed on protecting vegetation on *steep slopes* which should be heavily vegetated with native plants to prevent severe erosion.

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[41] Slope delineation was based on GIS and USGS topographic map interpretation and site visits.
[42] See *Trails* section of the *Master Plan for Site Enhancement.*

Table 10 describes the appropriate uses of the various slope categories in Tymor Park.

PERCENTAGE	STEEPNESS	APPROPRIATE USES
0-5%	Flat	Active recreation and development.
5-10%	Moderate	Ideal for trails.
10-25%	Steep	Must be vegetated to minimize erosion. Outer limit for trails with erosion control measures.
25%+	Extremely Steep tell the deer!	Must be heavily vegetated to minimize erosion. Not appropriate for new uses or development. Existing trails must be re-routed or employ significant erosion control measures.

Table 10. Appropriate Uses for Slope Categories.

Management Recommendations Summary

- All steep slopes should remain/be heavily vegetated with native vegetation.
- Existing activities within steep slopes should be moved or modified to incorporate significant erosion control measures.
- Trails and all other human uses should avoid areas of greater than 25% slope.
- Human uses of Tymor Park should conform to the guidelines presented in Table 10, "Appropriate Uses for Slope Categories."

WILDLIFE CORRIDORS

The Wildlife Corridor Management recommendations focus on preserving and protecting the links between natural areas within and through Tymor Park.

The primary wildlife corridor in Tymor Park is the forested ridge of West Clove Mountain which provides a significant, unfragmented link connecting undeveloped lands to the north and south of the park. More fragmented corridors providing critical links within the park include the wetland system that runs north to south through the meadows west of Duncan Road, the Fishkill Creek stream corridor, and the fragmented connection from the wetlands east of the Equestrian Center to the forest north of Furnace Pond. Figure 21 delineates the Wildlife Corridors within the park to which the management considerations and recommendations of this section apply.[43]

Management Considerations

The goal in preserving and establishing wildlife corridors is to maintain the necessary links between the different natural areas used by wildlife species and to support broader initiatives aimed at preserving entire natural systems and the wildlife species they support. Protection of each of the corridors identified in Tymor Park includes creating or maintaining a greenbelt of native vegetation 100 to 300 feet wide between the natural areas that the corridors connect.[44] In addition to preserving and reestablishing wildlife corridors within the park, efforts should be made by the town to ensure the continuance of significant park wildlife corridors beyond park boundaries.

West Clove Mountain Corridor

This significant corridor runs the length of West Clove Mountain and provides a critical link between multiple natural resources relied on by many species of wildlife. A priority should be placed on preserving this corridor in its entirety. Park use and management strategies should involve no encroachments that reduce the width of this corridor or further fragment it.

[43] Wildlife corridor delineation was based on aerial photo interpretation and site visits.
[44] A 100- to 300-foot-wide vegetated buffer for wildlife corridors is recommended by the Dutchess County Greenway Compact which is signed by the Town of Union Vale.

Wetlands System Wildlife Corridor

This corridor connects the hardwood forest of West Clove Mountain to the federally protected wetlands east of the Equestrian Center. A 100- to 300-foot-wide vegetated buffer should be established and protected along this corridor. This corridor complements the management strategies that the Master Plan identified for this wetland system in the Water Resources Management section of this chapter.

Fishkill Creek Wildlife Corridor

This corridor connects McKinney Pond (to the north of Tymor Park) to Furnace Pond via Fishkill Creek. A 100- to 300-foot-wide vegetated buffer should be established and protected along this corridor. This corridor complements the management strategies that the Master Plan identified for the Fishkill Creek stream corridor in the Water Resources Management section of this chapter.

East-West Connection Corridor

This corridor connects the west and east sides of the park by enhancing the fragmented link between the wetlands east of the Equestrian Center and the forests surrounding Furnace Pond. This corridor will complete the critical network of connections between each of the significant habitat areas within and surrounding the park. A 100-300 foot wide vegetated buffer should be established starting at the wetland to the east of the Equestrian Center, continuing east between the southern boundary of the park and the soccer field, and connecting with the forest to the northeast of Furnace Pond.

A vegetated corridor established along this link will also help meet the recommendations of the *Scenic Resources* Master Plan section by creating a visual buffer between areas of the park and the site of the future house development south of the soccer field.

Culverts and Impoundments

All culverts and impoundments along water resources within the park should be assessed to determine the degree to which they restrict the movement or migration of aquatic species. As culverts fail or need replacement, they should be replaced with natural bottom structures that allow for adequate animal passage. Impoundments should be considered for removal or for replacement with structures that allow for adequate passage of aquatic species.

Park Visitor Education

Park user awareness and appreciation of wildlife corridors can be increased through a system of interpretive signs and observation areas.

Management Recommendations Summary

- Preserve and enhance critical remnant and historic wildlife corridors within the park.
- Establish a 100- to 300-foot-wide vegetated buffer along the wetland system in the meadows to the west of Duncan Road.
- Establish a 100- to 300-foot-wide vegetated buffer along the Fishkill Creek Stream corridor.
- Revegetate the boundary of the park at the southern end of the soccer field to recreate an historical link between the west and east sides of the park.
- Ensure that newly created or enhanced wildlife corridors are composed of native plant species.
- Assess the impact of culverts, impoundments, and crossings on wildlife passage and implement changes as necessary.
- Use the resources provided in *Sources of Technical or Financial Support* in the Appendix H for assistance with implementation of the above recommendations.

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MASTER PLAN for SITE ENHANCEMENT

The Master Plan for Site Enhancement provides recommendations for preserving and enhancing the recreational uses of Tymor Park by addressing the five concepts identified in the Site Enhancement Concept Plan: Access, Connectivity, Trails, Destinations, and Scenic Resources (see Figure 22). A set of general *site enhancement criteria* provide guidelines for the management strategies of the site enhancement plan. These criteria form the foundation of a recreation system that maximizes the experience of all park visitors, while integrating provisions for nature conservancy. They also provide a framework that can be used to help guide future appropriate development and management of the park.

General Site Enhancement Criteria:

- Sustain or improve the park's human use values.
- Provide recreational opportunities consistent with the guidelines outlined in the Deeds of Covenance.
- Provide active and passive recreational opportunities suited to different users.
- Ensure safe and practical access to recreation areas.
- Balance active and passive recreation programming.
- Locate active recreation facilities and intensively managed areas within the development envelope identified in the Social Analyses Summary.
- Protect and promote the park's scenic, cultural, and historic resources.
- Create adequate buffers between actively managed areas and the park's natural and scenic resources.
- Develop a system of signs and markers that informs and educates park visitors.

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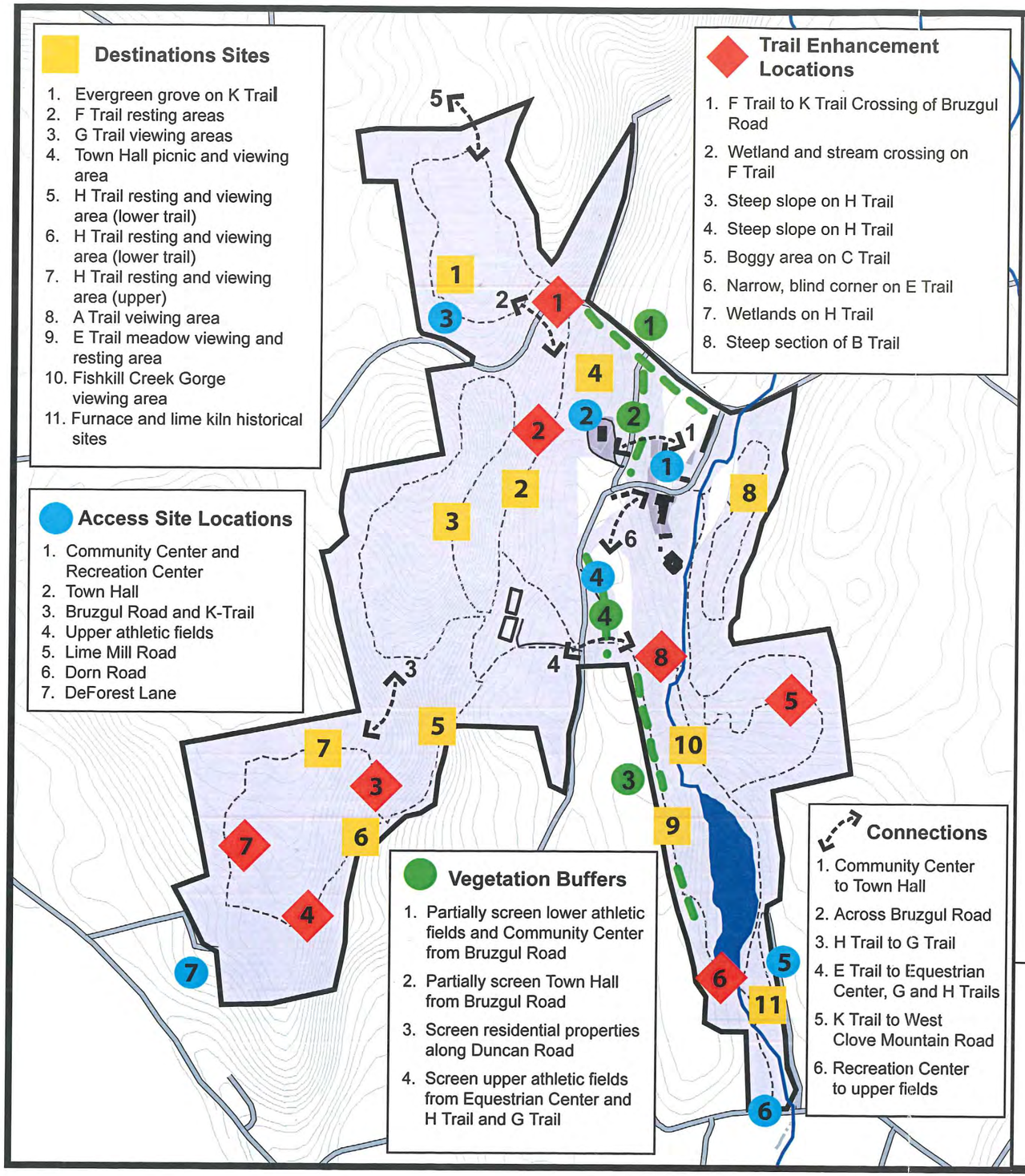
Figure 22

Master Plan for Site Enhancement

The Master Plan for Site Enhancement provides recommendations for preserving and enhancing the recreational uses of Tymor Park by addressing the five concepts identified in the Site Enhancement Concept Plan: Access, Connectivity, Trails, Destinations, and Scenic Resources.



Site Enhancement Criteria:

- Sustain or improve the park's human use values.
- Provide recreational opportunities consistent with the guidelines outlined in the Deeds of Covenance.
- Provide active and passive recreational opportunities suited to different users.
- Ensure safe and practical access to recreation areas.
- Balance active and passive recreation programming.
- Locate active recreation facilities and intensively managed areas within the development envelope identified in the Social Analyses Summary p111
- Protect and promote the park's scenic, cultural, and historic resources.
- Create adequate buffers between actively managed areas and the park's natural and scenic resources.
- Develop a system of signs and markers that informs and educates park visitors.

Tymor Park Master Plan
Town of Union Vale, New York

Conway School of Landscape Design
Robin MacEwan
Lizabeth Moniz
James Allison

April 2004

LEGEND

- Use limitation due to slopes, deeds, and/or environmental sensitivity
- "Development Envelope" for active recreation and park development
- Destination Site
- Trail Improvement
- Access Site
- Trail Connection
- Vegetation Buffer

KEY

- Water
- Contour (10 feet)
- Park boundary
- Roads
- Trails
- Building or structure

0 500 1000 2000 Feet

N

Data Source: Dutchess County, Dutchess County Environmental Management Council. Trail locations are approximations, based on existing trail map and aerial photo interpretation.

ACCESS

The Master Plan recommendations for enhancing *access* to park amenities identify specific strategies to facilitate access to diverse, safe, informed, and intended recreation at Tymor Park. The recommendations address parking, trailheads, and signs.

Figure 22 illustrates the specific locations within the park to which the Master Plan recommendations and considerations of this section apply.

Management Considerations

Although Tymor Park provides diverse recreational opportunities for Union Vale residents, the analyses identified an opportunity to increase the efficiency, safety, sustainability, and ease of access to certain amenities. Table 11 illustrates the components and functions of well-planned access points. The following recommendations ensure that these functions are served at each of the park's access points: Recreation Center, Town Hall, Upper Ball Fields, Equestrian Center, Lime Mill Road, Dorn Road, DeForest Lane, Bruzgul Road, and K Trail.

Component	Functions
Parking areas	Provide clear, safe, practical starting point for recreational amenities.
Signs	Inform visitors of parking, crosswalk, and facility locations. Provide park rules, park use, safety, and educational information.
Trailheads	Provide obvious trail access points with information about distances, terrain, destinations, safety, and intended uses.

Table 11. *Access* components and functions.

Parking

Each access point should have an appropriate parking facility that is clearly marked from the road. A sign should state the specific recreation facilities accessible from this parking area. Access points at which parking is inappropriate should have signs which clearly state this.

Community Center

The parking areas at the Community Center should be re-graded to direct drainage into water quality control retention and/or detention areas. This will decrease erosion, flooding, and pollution of downstream waterways.

Reducing or eliminating vehicle traffic and parking around the west and south sides of the Community Center should be assessed. Restricted vehicle access (other than delivery and maintenance vehicles) around the sides and back of the Community Center would centralize parking in the front, main parking area and decrease safety concerns.

Upper Ball Fields

Public parking at the upper ball fields presents a significant erosion problem and should be eliminated. The access road to this area should be limited to maintenance vehicles only. Public parking for events at the upper ball fields should be directed to the main parking area at the Community Center and a well marked path should be provided between the two areas. Elimination of this parking area is in following with the park donor's original park management plans which established that active and high-intensity uses should be clustered in one area on the park's perimeter, to avoid infringing on the park's interior.[45]

Equestrian Center

Parking at the equestrian center contributes to soil erosion and degradation of the surrounding wetland systems. Parking should be strictly limited to park maintenance vehicles and equestrian center-related traffic. Parking for access to west side trails should be directed to the Community Center or Town Hall parking areas.[46] The town should consider surfacing the access road and parking area with crushed stone or another permeable surface to prevent ruts and erosion and their associated environmental land maintenance costs.

K Trail

A potential safety conflict is created by fast-moving traffic on the curved section of Bruzgul Road where K Trail parking is located. This safety hazard may be partially mitigated with signs and painted pavement. Bruzgul Road is a Dutchess County road so coordination with the county will be necessary. As an alternative, trailheads from Perkins Road may be explored; however, this option is severely limited by the steep slopes immediately west of Perkins Road.

Lime Mill Road Cul De Sac

Work with the Town of Beekman and Lime Mill Road residents to reduce park access through use of the Lime Mill Road cul de sac as an unofficial Tymor Park parking area.

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[45] See *Recreation Management Plan for Tymor Forest* in Appendix C.
[46] See *Trails* section of the *Master Plan for Site Enhancement*

Signs and Markers

A park-wide system of clear and informative signs should be developed and implemented.

Community Center
A main informational kiosk in front of the Community Center should provide visitors with information about all park activities, facilities, destinations, and access points.

Trail Signs
A coordinated system of tail signs should provide information on trail names, distances, destination sites, appropriate uses, and possible conflicts or hazards. See *Trails* section of the *Site Enhancement Master Plan* for additional recommendations.

Educational Signs
Opportunities exist throughout Tymor Park, especially along its extensive trail system, for a system of signs that enhance the park visitor's experience through providing details about the park's natural features, historic resources, and environmental management strategies.

Trailheads and Information Centers

Consistent trailheads that provide users with adequate information about recreational facilities must be developed. Maps, distances, landforms, locations of destinations, average hiking time, potential hazards and conflicts, and intended/restricted uses should be clearly posted at each trailhead.

East Side Trailhead
A clearly marked trailhead to the park's east side trails (A, B, C, and E Trails) should be developed adjacent to the Community Center parking area or at the Community Center Informational Kiosk. Trail system maps and clear directions to each trail should be provided.

West Side Trailhead
A west side trailhead at Town Hall will provide convenient access to F Trail which joins all other west side trails. Similar to the east side trailhead at the Community Center, the west side trailhead at the Town Hall should provide trail system maps and clear directions to each of the west side trails.

K Trail
A trailhead at K Trail should provide trail system maps and clear directions to the other west side trails via the F Trail connection across Bruzgul Road.

Informal Trailheads
Potentially inappropriate trail access currently exists from points on DeForest Lane, Dorn Road and Lime Mill Road. These park entry points are located in the Town of Beekman

and none provide official parking. Primary use of these access points appears to be Beekman residents, including ATV users and snowmobilers. Access recommendations for this location focus on preventing ATV and snowmobile entry and minimizing the creation of new, unofficial access points. The park should consider the reasons for maintaining access at these locations and establish whether such access is in following with park policies. The park should also consider whether attempting to prevent access from these points may encourage vandalism of gates or fences and the creation of new, unofficial access trails.

If the park decides to maintain access at these locations, then informational signs should be provided and restricted access structures, which allow human entrance but restrict ATV and snowmobile access, should be implemented. An informational trailhead should boldly highlight park rules and include prohibited uses. In general, illegal ATV use on park property must be discouraged through the use of posted signs and the threat of prosecution of those found violating this rule. The park may consider fencing the park boundary in these areas to reduce the creation of new, unofficial trails and ATV access points.

Management Recommendations Summary

- Develop access points that promote responsible and intended uses.
- Create barriers to access in areas susceptible to improper use.
- Create deterrent to improper or illegal park uses.
- Create clear, safe, and practical parking access.
- Develop informative signs and trailheads.
- Restrict access and parking along Dorn Road, Lime Mill Road, and DeForest Lane.
- Use structures and fencing where necessary to reduce ATV access to the park and snowmobile access to the east side of the park.
- Develop relationships with residents who border the park to reduce unintended uses and prohibited activities.
- Use *Best Management Practices* to reduce negative implications of stormwater runoff.

CONNECTIVITY

The Master Plan recommendations for enhancing *connectivity* identify strategies to facilitate cohesive and safe experiences for park visitors by providing clear connections between the park's recreational facilities. Recommendations cover crosswalks, trail connections, transition areas, and facilities integration.

Figure 22 illustrates the specific locations to which the Master Plan recommendations and considerations of this section apply.

Management Considerations

At five hundred acres, Tymor Park presents a rare opportunity to spend hours exploring diverse landscapes and recreational amenities. A connected system of facilities and experiences supports diverse recreational opportunities for park visitors while sustaining, improving, and enhancing the natural systems that characterize Tymor Park. Table 12 outlines the components that facilitate increased connectivity.

COMPONENT	FUNCTIONS
Crosswalks	Create clear, identifiable, and safe pathways to destinations and across roads and parking areas.
Trail Connections	Connect Tymor Park's six miles of main trails and allow for alternate routes and variable distances for loop hikes.
Transition Areas	Use native plants to minimize abrupt transitions between different use areas, increasing diversity and interests for park users.
Facilities Integration	Create multiple-use areas to allow for more diverse uses within an area where appropriate. For example, integrating play equipment and picnic facilities within ball field complex will facilitate greater use by families by satisfying the differing recreation needs of various users.

Table 12. Connectivity components and functions.

Crosswalks

Trails and other connections should provide safe crossings of roads, driveways and parking areas. Road signs should be posted to alert drivers of pedestrian crossings and to alert park visitors that trails and other park facilities continue across roads or through other use areas. Crosswalk signs may include maps of park features to assist park visitors.

Recreation Center
A well-marked crosswalk should be provided across Tymor Park Road between the main parking area and the Community Center.

Town Hall Connection
A path should connect the Recreation Center to the Town Hall to allow safe foot traffic from the main parking lot, across Duncan Road, and to the Town Hall. Where this path crosses Duncan Road, a crosswalk should be indicated to pedestrians and vehicles by signs and painted crosswalk stripes.

E Trail Connection
Where the proposed E Trail connection crosses Duncan Road between the upper ball fields and the Equestrian Center, a crosswalk should also be clearly indicated with signs and painted crosswalk stripes.

K Trail
K Trail allows for a continuation of the West Side Trail system, but requires a crossing of Bruzgul Road. At the Bruzgul Road a crosswalk should be clearly indicated to pedestrians and vehicles by signs and painted stripes.

Trail Connections

H & G Trails
An official connection between H and G Trails should be established. A thorough assessment of the area will be necessary to determine the most appropriate location for this connection which must ensure protection of the stream and steep slopes in the area.

East-West Connection
Connecting the park's east side trails (A, B, C, and E) to the park's west side trails (F, G, H, and K) will connect over six miles of main trails through Tymor Park.

The E Trail should provide a clear link through the upper athletic fields and across Duncan Road to connect with the F Trail at the Equestrian Center. The trail connection should be aligned to follow the recommended vegetated scenic buffer and wildlife corridor on the boundary south of the soccer fields. The trail crossing at Duncan Road should be indicated with signs and painted crosswalks.

Connections to Local and Regional Trails
Connecting Tymor Park trails to surrounding areas will increase recreational opportunities. Connections to nearby roads including West Clove Mountain Road, Bloomer Road, Blueberry Hill, Chestnut Hill, East Mountain, and Verbank, should be prioritized for consideration. Adjacent and proposed town trails, the Harlem Valley Rail Trail, the Appalachian Trail, and the (proposed) Mid-County Rail Trail provide opportunities to

connect Tymor Park with surrounding areas and trail systems. These connections will expand passive recreation opportunities to residents throughout Union Vale.

Transition Areas

Native plants and other natural elements can help to minimize abrupt transitions between use areas -- from forest to ball fields for example. Trail crossings through multiple-use areas should utilize visual cues including plantings, signs, consistent surfaces, and logical alignments to create clear and appropriate transition areas.

Facilities Integration

Multiple-use areas will allow for a diversity of uses within an area. Where appropriate, facilities can be integrated to satisfy different recreational needs of different users and maximize use within a space.

Establishing benches, plants, play equipment, and other amenities around the main parking area and lower ball fields will create an integrated, multiple-use area connecting the parking area, ball fields and a recommended Town Hall footpath. This will facilitate greater use by families by simultaneously satisfying individual's differing needs.

Management Recommendations Summary

- Provide clear connections between all major park trails to establish a continuous trail system.
- Use clear, consistent signs to alert park visitors to connections and continuations of trails.
- Establish safe, well-signed road crossings that are visible to both pedestrians and drivers.
- Ease transitions between use areas with native plants.
- Incorporate trails, benches, and plants into the areas surrounding ball fields and other active recreation facilities.
- Consider easements, rights-of-ways, or land acquisition to create trail connections to surrounding areas.

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TRAILS

The Master Plan recommendations for enhancement of the park's *trails* identifies specific strategies to facilitate their safe, informed, and intended uses through creating a hierarchy of uses, implementing a consistent system of signs and markers, providing appropriate erosion control, and minimizing or eliminating environmental degradation. The recommendations cover signs and markers, destination sites, trail grades, trail alignment, and trail improvements.

Figure 22 illustrates approximate locations for trail enhancements within the park to which the Master Plan recommendations and considerations of this section apply.

Management Considerations

Trails within the park serve multiple uses and must do so in a manner that is safe, enjoyable, informative, environmentally appropriate, and in adherence with the Deeds of Covenance and the Park Rules and Regulations. The careful design and placement of trails, trailheads, trail signs, and trail destination sites will facilitate enjoyable recreation experiences and intended uses, while sustaining Tymor Park's natural systems.

Before implementing the following recommendations, the park should inventory all trails, assessing their value and condition and their environmental sensitivities. A comprehensive park trail plan should be created based on that inventory. Table 13 illustrates components and functions of a well-planned trail system.

COMPONENT	FUNCTIONS
Signs and Markers	Signs provide information on distances, destination points, appropriate uses, and possible conflicts or hazards. Interpretive signs enhance the educational and recreational experience on the trail.
Destination Sites	Resting areas increase recreational use and the value of the trails and the park to the community by providing amenities such as benches and seats which allow for frequent resting, viewing, and picnicking.
Trail Grade	Trails must be graded properly to provide access and recreational challenge for a variety of skill levels and to reduce erosion and the need for more trail maintenance.
Trail Alignment	Properly located trails provide appropriate access to park features and prevent or reduce environmental degradation and the proliferation of "rogue" trails and short-cuts that degrade habitat and the aesthetic values.

Table 13. Trail system components and functions.

Signs and Markers

A system of consistent signs and markers should be implemented throughout the Tymor Park trail system and provide the following information:

- **Trail names**
  All park trails should be given a name that is meaningful to the history, natural context, or human use of the park.

- **Hierarchy of use**
  Multiple-use trails require an established *hierarchy of use* system to inform trail users about trail safety. Given the current Tymor Park trail users, a hierarchy of use system should establish two general principles:

  - All trail users yield to horses.
  - Mountain bikers yield to all trail users.

- **Trail distances, directions, and intersections**
  This information allows trail users to choose and follow trails appropriate to their abilities and interests.

- **Trail hazards**
  Safety concerns such as steep slopes and blind turns should be communicated to avoid collision risk between trail users, particularly horses and bikers.

- **Park boundaries**
  Park boundaries should be clearly posted and should provide information regarding park rules and regulations.

- **Points of interest**
  A system of interpretive or educational signs should provide information regarding the park's interesting historical sites, natural features, and environmental management strategies.

Destination Sites

Frequent resting areas and destination sites can become a signature of a trail system by providing opportunities for users to rest, enjoy a scenic view, or appreciate a unique feature of the park. See the *Destinations* section of the *Master Plan for Site Enhancement* for specific recommendations.

Trail Grade

A variety of slopes creates the most interest for walkers, bikers, and other users. Drainage, erosion, safety, and maintenance are all primary considerations in determining trail grades. Trails should meet the following criteria:

- All trails should have a cross-slope of 5% or greater to facilitate appropriate drainage.
- Trails should be concentrated in areas of 5-10% slope.
- Trails in areas of greater than 10% slope must employ measures to control runoff and prevent erosion.
- Trails should avoid areas of greater than 25% due to the severe erosion hazard in these areas.

Trail Alignment

Trails may create significant disturbances to sensitive natural systems due to erosion, soil compaction, or disturbance to sensitive species. Trail alignment should avoid sensitive and unique habitats such as wetlands, stream banks, and steep slopes. Existing trails in such areas should be realigned or modified to minimize their disturbance.

Trails should be located and constructed to minimize the need for switchbacks which encourage shortcutting, increasing erosion potential. Official spur trails should provide appropriate access to significant park features, reducing the potential proliferation of "rogue" trails.

Trail Improvements

A Trail

Removing the relatively unused fitness trail structures on A Trail and converting the trail into an interpretive nature trail would provide a pleasant and educative loop with increased value to current trail users. Seats and benches should be placed along the trail to provide areas for resting and scenic viewing. Native trees should be planted at these locations to provide shade in this otherwise open meadow. Following the recommendations in the *Meadows* section of the *Master Plan for Environmental Management*, birdhouses and a system of informative signs will provide walkers the opportunity to enjoy and learn about meadow environments and the park's meadow management strategies.

B Trail

In some areas, the B Trail needs to be realigned or modified to avoid wet, poorly drained areas. Crossings through such areas are an inconvenience to trail users and may degrade sensitive habitat.

Along this trail, rock outcrops should be used to create interesting and environmentally appropriate resting areas. The trail design should be integrated with the hemlock management plans and incorporate a system of informative signs that educate hikers about the softwoods environment and related park management strategies.

E Trail

South of Furnace Pond, a sharp bend in the trail needs to be realigned to address safety and erosion concerns. At this location the trail is sloped, narrow, and curved and without changes presents safety concerns and will require frequent maintenance.

One or two destination sites with seats or benches should be established in the meadow area of this trail to take advantage of prime, 360-degree views.

F Trail

The F Trail provides access to all other trails on the west side of the park and provides a relatively flat, easy hike with exceptional views. Destination sites with sitting areas should be provided at intervals along this trail to provide pleasing rest areas and to take advantage of the surrounding views.

An official connecting trail from the Town Hall to the F Trail should be developed and clearly marked with signs. This connecting trail should begin at the recommended west side trails trailhead at Town Hall.

As with the A Trail, there is an opportunity to integrate passive recreational use of this trail with meadow management strategies. Bird houses and a system of informative signs will provide trail users the opportunity to enjoy and learn about meadow environments and the park's meadow management strategies.

The F Trail crosses an intermittent stream and/or potential wetland west of Town Hall.

G Trail

Steep sections of this trail should be realigned to take advantage of more moderate grades where available. Appropriate erosion control measures should be employed to decrease erosion and maintenance.

Destination sites should be developed above and below steep sections of this trail. If possible, these should be located to take advantage of vistas into the Clove Valley.

As with other trails, a system of informative educational signs should be implemented and include such features as the sugar bush on the west side of the G Trail.

H Access Trail

The H Access Trail that connects the F Trail to the H Trail follows the park's property boundary south of the Equestrian Center. It is unclear whether the trail is currently inside the park's boundary. The boundary location should be clearly determined and, if necessary, this trail should be relocated or appropriate easements should be secured.

The H Access Trail currently bisects a perennial stream or potential wetland just south of the Equestrian Center. A sensitive crossing should be developed in this area and horse jumps should be removed from this area.

H Trail

Steep sections of the H Trail should be realigned to take advantage of moderate grades. Currently, the excessively steep slopes that the H Trail climbs will cause significant erosion, decreasing trail value and creating ongoing trail maintenance needs.

The wetlands that surround H Trail on top of West Clove Mountain are sensitive areas that provide unique viewing and educational opportunities. The H Trail should create viewing and resting opportunities at the top of the trail and near the wetlands, but minimize trails and disturbance in close proximity to the wetlands.

K Trail

Erosion control measures should be employed in all areas of greater than 10% slope to decrease soil erosion, sedimentation of waterways, and trail maintenance needs.

See the *Destinations* section of the *Master Plan for Site Enhancement* for recommendations about creating destination sites on K Trail.

Management Recommendations Summary

- Establish a consistent sign system that communicates *hierarchy of use* guidelines, distances, trail names, trail directions, hazards, intersections, park boundaries, and points of interest.
- Establish rest areas in environmentally appropriate areas of interest.
- Ensure a variety of trail types for walkers, bikers, and other users, while addressing environmental and maintenance concerns where trails intersect steep slopes and sensitive areas.
- Realign trails where possible to avoid sensitive and unique habitats.

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DESTINATION SITES

The Master Plan recommendations for *destination sites* identifies opportunities to establish a system of amenities along the trails within Tymor Park to provide unique recreational opportunities and allow visitors to fully appreciate the unique historical and natural features of Tymor Park. The Master Plan recommendations focus on developing three types of trail destination sites: scenic viewpoints, historical sites, and resting areas.

Figure 22 illustrates approximate locations for destination sites within the park to which the Master Plan recommendations and considerations of this section apply.

Management Considerations

Destinations characterize many great parks, increasing the value of the trails and the park to the community by providing amenities such as benches and seats at well chosen locations. In addition to natural features and scenic beauty, destinations establish significant points from which to view the landscape, reflect on historical and cultural remnants, and rest during physical activity. These amenities, typically connected and integrated into the trail system, highlight the unique and specific attributes of a place, encourage appropriate trail use, and transform a simple trail into a meaningful, contextual system of experiences. Incorporation of destination sites into the Tymor Park trail system is supported by the 1972 *Preliminary Nature Trails Plan for Tymor Forest* written by Ralph Connor. This document states that the park's trail system should access "the most interesting features (biological, scenic, etc.) of the property."

A series of destinations within the trail system in Tymor Park will allow for the fullest enjoyment of the site, encourage the intended use and preservation of its resource, and become a signature of the park. Such areas provide opportunity for quiet enjoyment of the park's diverse natural and historical features and, if well placed, will reduce the proliferation of rogue trails created by trail users attempting to create their own access to such resources.

Destination sites should be implemented along trails as well as integrated within the developed facilities of the Recreation Center. Destination sites should incorporate natural and inconspicuous seating materials that encourage trail users to spend time enjoying the special character of the park. In all places, specific care must be taken to ensure that destination sites do not invite or lead to degradation of sensitive natural or historical features.

Table 14 illustrates the types and functions of well-planned destination sites.

TYPE	FUNCTION
Scenic viewpoints	Scenic destination sites take advantage of the park's significant scenic resources. Establishments of viewpoints will encourage more residents to use trails and will convert a good trail system to a regionally unique recreation site.
Historical sites	Historical destination sites incorporate significant historical features into the passive recreation system, blending historical and natural features into special park signatures. They convey appreciation for a landscape and its history while providing opportunities for resting, picnicking and reflecting.
Resting areas	Stopping points along trails create a more usable system for the park's diverse visitors and provide increased access to natural areas in the park.

Table 14. Destination site types and functions.

Town Hall

Town Hall provides elevated views of the historic farm and the Clove Valley. A viewing and picnic area integrated with the proposed west side trailhead could be used by park visitors and town employees.

Recreation Center

The Recreation Center serves many active recreational needs and is the starting point for destinations throughout the park. There is an opportunity to integrate picnic facilities and other resting areas at the lower ball fields and to implement historical interpretation of the old farm buildings.

The Gorge

A destination site for resting and viewing should be provided on each side of the Gorge at Fishkill Creek. A single spur trail to each of these sites will provide controlled access and reduce the proliferation of rogue trails. A well developed destination area will provide benches or seats for resting and viewing and ensure that visitors are safe while they appreciate the creek's dramatic path through this natural feature.

Fishkill Creek

Destination sites with benches or seats should be provided near the creek's banks at the locations of current landmarks such as bridge crossings. These sites are generally already more heavily affected by human traffic and enhancing them will avoid environmental degradation of other areas. For the same reasons, these sites will be well located to suit a large number of trail users.

Iron Furnace and Lime Kiln

The historical iron furnace, lime kiln, and lime quarry south of the Furnace Pond dam offer serene resting areas with opportunities for interpretation. Picnic and expanded historical interpretation facilities should be provided in this location. All historical sites should be assessed to determine their structural integrity and potential maintenance needs.

Trails

A Trail

The A Trail provides open, scenic views of Fishkill Creek, historic farm buildings, and the forested West Clove Mountain.

Destination sites for resting and scenic viewing will take advantage of this trail's cross-valley views, open meadow views, and educational opportunities relating to meadow ecosystems and meadow management. (See the *Trails* section of the *Master Plan for Site Enhancement* and the *Meadow Management* section of the *Master Plan for Environmental Management.*)

E Trail

Destination sites for resting and viewing should be provided at the prime viewing locations in the meadow west of Furnace Pond and where the E Trail passes the upper ball fields.

West Clove Mountain Trails

Multiple opportunities exist to establish resting and scenic viewing sites along the level F Trail and H Access Trail.

Destination sites for resting and viewing should also be provided along the G Trail and H Trail, particularly at the tops of steep ascents, locations with scenic views across the Clove Valley, historical sites including stone walls, and natural features including the wetlands on H Trail. As with other historical and natural features, care should be taken to ensure that a destination site provided near a wetland on H Trail does not contribute to degradation of this sensitive feature.

From the H Trail, an opportunity exists to create a spur trail to the south to a height of land offering a potential prime scenic viewing location.

K Trail

At the K Trail, there is the opportunity to create resting areas and interpretive sites at the conifer stand in the southwest section of the parcel and on the many level areas through that parcel. Potential opportunities for scenic viewing areas may exist along the southeast parts of K Trail. Specific care needs to be taken to identify potential wetlands in the area and to assure that destination sites do not contribute to degradation of these features.

Management Recommendations Summary

- Create a diverse system of destination sites with seats and benches along all main trails to allow and encourage viewing, resting, and natural and historical interpretation.

- Ensure that destination sites do not increase traffic to or through environmentally sensitive areas.

SCENIC RESOURCES

The Master Plan recommendations for Tymor Park's Scenic Resources identify strategies for preservation and enhancement of the park's scenic resources. These actions will help to ensure that Tymor Park retains its significant and inspiring scenic value. The recommendations address viewshed inventory, scenic buffers, and viewshed protection tools.

Figure 22 illustrates the locations of opportunities for scenic resource preservation and enhancement to which the Master Plan recommendations and considerations of this section apply.

Management Considerations

Tymor Park is, in part, defined by the rural character of the surrounding landscape and the unique qualities that it lends to recreation opportunities in the park. Opportunities to identify, preserve, and enhance the views within the park and significant surrounding viewsheds are important to the preservation of the park's unique character.

Table 15 outlines methods for enhancing and protecting Tymor Park's scenic resources.

COMPONENT	FUNCTIONS
Viewshed Inventory	Creates a specific inventory of important views to be protected and enhanced. An inventory allows for a proactive approach to decision-making within the park and to confronting potential changes beyond, but within view of, the park.
Scenic Buffers	Allows desirable existing and proposed developments in and outside of the park to continue while still retaining scenic integrity and continuity
Viewshed Protection tools	Conservation easements and other tools provide opportunities to collaborate with surrounding landowners to preserve open space, rural character, and scenic resources.

Table 15. Methods for protecting scenic resources.

Viewshed Inventory

The park should develop a comprehensive inventory of its scenic resources, significant viewsheds and prime viewing areas. This inventory should begin with the scenic resources analysis presented earlier in this document and use public input and site visits to complete

an inventory that identifies the park's significant scenic resources and any specific conflicts or potential future conflicts that could diminish the resource.

Viewsheds of particular interest include north Clove Valley and the western slopes of East Clove Mountain. Views into these areas are significant from locations within Tymor Park; however, the land is not protected from development in perpetuity. The potential for land-use changes in these areas should be assessed and the town should consider establishing a "Viewshed Protection Area" and employing tools to preserve significant viewsheds.

Viewshed Protection Tools

Conservation easements, acquisition of land, zoning changes, collaboration with surrounding towns and landowners, and other strategies are all possibilities for establishing permanent and sustainable protection of scenic resources and the rural landscape. These tools may be implemented to allow desirable existing and proposed development to continue while ensuring preservation of the rural character and scenic integrity of the area.

The 2001 Town of Union Vale Master Plan supports further preservation of open space in Union Vale, stating that "The limited review of Tymor and Godfrey Parks and the hamlet of Verbank suggest that other acquisitions of easements may be desirable in Union Vale."[47] Appendix I of that document presents some of the tools and strategies for open space preservation that may be available to the town.

Scenic Buffers

Complete or partial screening of views of residential development, roads, and parking lots will enhance recreation experiences within the park. Native plants should be used to create scenic buffers that screen less desirable views and increase the park's rural aesthetic.

Recreation Center

Native trees and shrubs should be planted to partially conceal and shade the main parking area at the Community Center. Structures like backstops, goals, and storage facilities at the upper and lower ball fields should be partially screened with plantings of native trees and shrubs to visually blend these recreation facilities into the historically agricultural region.

Town Hall

Screening the Town Hall and the Town Hall parking lot with additional native trees and shrubs will help it appear less of a dominant feature within the park. This will also assist the town in conforming with language in the Deeds of Covenance and with the Town of Union Vale Town Code landscaping standards.[48]

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[47] *Town of Union Vale Master Plan*, 2001. p. 63.

[48] See *Deeds of Covenance* analysis and *Zoning* analysis.

Bruzgul Road
Modest plantings of native trees and shrubs along Bruzgul Road will lessen the visual effect of this feature in the landscape.

Duncan Road Properties
At least two residential properties diminish rural views from Furnace Pond, E Trail, and the H Access Trail. Native trees and shrubs planted to screen this development from prime view locations will enhance the rural experience from those areas.

Development in Beekman
Subdivision development is visible from E Trail, F Trail, and H Access Trail. Views of this development could be minimized by judicious planting of native plant material at prime viewing locations.

Management Recommendations Summary

- Inventory and document viewsheds and their potential for future development.
- Investigate viewshed protection strategies for preservation of open space, rural character, and scenic resources.
- Use native plants to create scenic buffers between prime viewing locations and potential view conflicts.
- Allow desirable existing and proposed development to continue while acting to ensure preservation of the rural character and scenic integrity of the area.

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IMPLEMENTATION PLAN

IMPLEMENTATION PLAN

The Implementation Plan is designed to assist town and park staff in implementation of the Master Plan. It prioritizes Master Plan recommendations and establishes a series of realistic steps to achieve those goals while maximizing the efficient use of financial and human resources.

Who?

Implementation of the Master Plan recommendations should be assisted by a range of individuals and organizations. In addition to the park manager and park staff, the Conservation Advisory Council, Town Government, volunteer residents, and appropriate local and regional organizations provide a variety of skills and resources valuable to the process of developing and implementing the Master Plan recommendations.

The Conservation Advisory Council (CAC) may be the most appropriate town body to assist in developing and implementing the recommended environmental management strategies. In the past, a Tymor Park Board oversaw use and management decisions. A similar body might be considered in the future to oversee recreation and site enhancement aspects of park management. This would complement the CAC's role in park environmental management.

How?

A wide range of local, regional, and state organizations exist that may provide technical and financial assistance for implementation of Master Plan recommendations. A partial list of these resources is provided in Appendix H.

When?

The Implementation Plan suggests a sequence for implementation of recommendations from the Master Plan. *Phase I* initiates a series of inventories and assessments, develops priority management plans, and implements the initial stages of long-term management strategies. *Phase I*'s inventory and assessment activities ensure that management strategies will be fine-tuned to meet the park's needs most efficiently and effectively.

Following initiation of inventory and assessment, *Phase II* continues the development of management plans and implements strategies with the highest priorities for action.

Phase III continues ongoing management strategies, implements additional management plans, and begins the process of monitoring and assessing the results of management strategies. Monitoring is a critical element of all management plans, ensuring their appropriateness and effectiveness. A management strategy should be continually revised or fine-tuned as necessary based on monitoring and assessment.

Each aspect of each phase need not happen before moving on to the next phase. Development and implementation of different recommendations may overlap chronologically as different recommendations necessarily require different amounts of time for implementation.

Phase I

Inventory:

- Native plant and animal species and habitats
- Invasive plant and animal species
- Trails and other uses within environmentally sensitive areas
- Scenic resources

Assessment:

- Options for hemlock stand management
- Trail realignment and erosion control needs
- Eroding areas and steep slopes requiring revegetation
- Structural integrity of Furnace Pond Dam
- Priority locations for Fishkill Creek streambed and stream-bank restoration
- Condition of culverts in relation to wildlife passage
- Locations for possible destination sites
- Opportunities for connections to roads and trails beyond park boundaries
- Resources for preservation of surrounding lands and significant viewsheds
- Need for shade trees and shrubbery around high-use areas and parking lots
- Value, condition, and environmental sensitivities of all trails

Plan Development:

- Deer management strategy
- Native plant regeneration strategy
- Meadow maintenance plan
- Park-wide system of signs and markers
- Plans for new and existing access points
- Recreation Center parking lot redesign
- Historical resources preservation plan
- Scenic buffers planting plan
- Strategy to address inappropriate park uses
- System of coordinated educational/interpretive signs
- Community education regarding park management strategies
- Strategy for analysis of recreation supply and demand
- Comprehensive trail system plan including trailhead and trail signs

Implementation:

- No-mow zones within 100-foot water resource buffers
- No-mow zones in wildlife corridors
- Cost/benefit analysis of dam removal and stream restoration vs. dam repair and maintenance
- Collaboration with local schools or organizations to develop water quality monitoring stations on Fishkill Creek
- Legal assistance in defining the town's obligations regarding the Deeds of Covenance
- Community education regarding park management strategies

Phase II

Plan Development:

- Invasive plant removal strategy
- Stream restoration plan
- Environmental management strategy for protecting water resources from pollution (pesticides, oil tanks, septic, etc.)
- Local and regional trail connections strategies

Implementation:

- Priority invasive plant removal strategies
- Deer management
- Hemlock stand management
- Trail realignment and erosion control measures installation
- Eroded and steep slope area revegetation
- System of trail signs and trailheads
- Connection of trails within Tymor Park
- System of coordinated educational and interpretive signs
- Access control measures at problem access points
- Destination sites on lower trails
- Scenic buffers
- Viewshed protection strategies
- Water quality monitoring program
- Shade tree plantings around high use areas and parking lots

- Recreation supply and demand analysis
- Ongoing community education
- Improvements to Recreation Center parking area

Monitoring and Assessment:

- Revegetation in 100-foot water resource buffers
- Revegetation of wildlife corridors
- Native plant revegetation in no-mow areas
- Inappropriate park uses and related management strategies
- Community education efforts
- Results of recreation supply and demand analysis

Phase III

Implementation:

- Ongoing invasive plant removal
- Ongoing deer management
- Ongoing hemlock stand management
- Ongoing viewshed protection
- Planting plan as needed to assist revegetation in 100-foot water resources buffers and wildlife corridors
- Stream and wetland restoration projects
- Additional parking area improvements as needed
- Destination sites at viewing locations on more remote trails sections
- Local and regional trail connections

Monitoring and Assessment:

- Deer management strategy
- Invasive plant management strategies
- Erosion control measures on steep slopes
- Effects of use activities in environmentally sensitive areas
- Revegetation in 100-foot water resource buffers
- Revegetation of wildlife corridors

- Inappropriate park uses and related management strategies
- Community education efforts
- System of informational and educational park signs and markers
- Water quality monitoring program
- Destination site enhancements

CONCLUSION

CONCLUSION

Tymor Park represents a unique and special place. It provides a multitude of human recreational uses, protects a significant amount of open space and the natural systems contained within, serves as a reminder of the generosity of the generations that have gone before us; and challenges its custodians to have the foresight and wisdom to protect and enhance a resource that will only become more valuable as time goes by. The Tymor Park Master Plan provides recommendations for management strategies to ensure the long-term preservation of this special place. The Master Plan recommendations take into account the unique nature of the park's resources, the long- and short-term needs of the community, and the intent of the donors, as expressed in the Deeds of Covenance and the park's original management plans.[1]

Analyses of the park's natural features identify its great diversity of natural resources, its many passive and active recreational opportunities, and the historical and aesthetic qualities which help define the park. The analyses also identify threatened and degraded natural resources, conflicts between recreational uses and natural resources protection, the need to assure preservation of the park's defining historical and scenic qualities, and an imbalance between development and maintenance of the park's passive and active recreation facilities.

The Tymor Park Master Plan addresses the opportunities and challenges which characterize this important place by providing recommendations for enhancing human recreational use and enjoyment of the site, integrating and balancing the park's nature conservancy and recreation values, protecting the park's natural heritage, and preserving the historical, cultural, and scenic resources which help define the park. These recommendations establish the framework for an ongoing, dynamic park management process of inventory, assessment, planning, implementation, and monitoring that will ensure that Tymor Park provides as much or more for future generations as it does for the residents of Union Vale today.

[1] See Appendix C.

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REFERENCES

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APPENDIX A

Tymor Park Rules & Regulations

Contents:

- Tymor Park 2003 Rules & Regulations

TYMOR PARK 2003 RULES and REGULATIONS

1. Our parks are for the enjoyment of the residents of the Town of Union Vale. Rowdyism or any other action which prevents others from enjoying the Park will not be tolerated and result in suspension of admission. All rules will be enforced.

2. No littering. Refuse must be put in the proper containers.

3. The Town is not responsible for loss of or damage to any personal property.

4. All rules of sanitation and health as prescribed by law for public places must be observed.

5. Horses under saddle and dogs are allowed on the west side of Duncan Road. They are the only animals allowed in the Park.

6. No motor bikes, scooters or ATV's allowed in the Park.

7. Persons under the influence of alcohol or drugs will not be admitted.

8. Membership for swimming, tennis, and the Equestrian Center can be obtained from the Town Clerk, in person or by mail, (249 Duncan Rd., LaGrangeville, NY 12540). Current proof of residency is required. (A copy of your 2003 land tax bill is fine). Town Clerk hours – 9am-4pm, Monday thru Friday.

9. Guests must be accompanied by a town resident. Residents are responsible for the conduct of their guests. Parents will be held responsible for damage done by their children.

10. Wood cutting is allowed, but you must first obtain a permit from the Park Manager. He can inform you of the best places to find dead or downed trees.

11. Snowmobiling is allowed on the west side of Duncan Road.

12. A New York State law effective June 1, 1994 mandates that all children under 14 years of age must wear protective headgear while riding their bicycles. We seek your help as we strive for compliance with the above law on all town owned property.

APPENDIX B

Master Plan Public Participation

Contents:

- Tymor Park Master Plan Survey
- Results of Master Plan Survey
- Public Meeting Input

TYMOR PARK MASTER PLAN SURVEY

During the Master Planning process, Union Vale residents were invited to respond to the following survey.

The Town of Union Vale is currently developing a Master Plan for Tymor Park. The purpose of this plan is to determine the existing use patterns of Tymor Park, and to assist in developing guidelines for long-term management decisions for the future of the park. There is no need to sign this form. Thank you for your time and interest.

Completed surveys may be returned to Town Hall, brought to the public meeting (at 7pm, Tuesday February 10, at the Town Hall), or returned by mail to:

Supervisor Hitsman
Town of Union Vale
249 Duncan Road
LaGrangeville, New York 12540

1. What aspects of Tymor Park do you consider an important asset to your community?

2. How many times a year do you visit Tymor Park?

3. What activities do you enjoy at Tymor Park? At what time of year?

4. What additional amenities or programs would you like to see developed at Tymor Park?

5. Do you have interest in seeing a horse stable at Tymor Park?

6. What would be the best way to publicize Tymor Park events, classes, and activities to reach the most residents?

7. How do you get to the park (e.g. bike, walk, car)?

8. How close do you live to the park?

9. Check which activities you engage in at the park:

- ☐ Fishing
- ☐ Boating
- ☐ Camping
- ☐ Biking
- ☐ Picnicking
- ☐ Swimming
- ☐ Horseback-riding
- ☐ Bird-watching
- ☐ Softball
- ☐ Movies
- ☐ Senior center
- ☐ Nature center
- ☐ Cross-country skiing/snowshoeing
- ☐ Tennis

- ☐ Hiking, walking
- ☐ Snowmobiling
- ☐ Jogging
- ☐ Other _____
- ☐ Special events
- ☐ Bingo
- ☐ Other _____

10. What role does Tymor Park play in the Town of Union Vale?

11. How should the park be managed as Union Vale grows in population?

12. Do you think current access to facilities, including trails, the pond, and other areas, is adequate?

13. How long have you lived in Union Vale?

14. Is there any history, special place, or information about Tymor Park that you feel would be helpful for us to know?

15. Additional Comments:

RESULTS of MASTER PLAN SURVEY

1. What aspects of Tymor Park do you consider an important asset to your community?

"Large meeting/playing rooms, day camps ball fields, swimming facilities"
"Entire park, amount of undeveloped "natural" land"
"Great place to gather for events"
"Free place to walk, picnic, walk dog, ski"
"Green space, private, residents only"
"Pool, ball park, playground, trails"
"Pool, quiet nature paths, pond, pavilion"
"All-outdoor recreation, pool, picnic, fishing, indoor activities, scheduled activities"
"Beauty, trails, extraordinary resource"
"Open space, lake, pool, fields, children's programs, gym"
"Promotes family activities"
"Gathering place for families, outdoor activities"
"Forever open space, community/family activities"
"Open space, it maintains a rural setting"
"Recreation and cultural center for our town"
"Day camp, pool, hiking trails"
"Its' unspoiled, open and historic aspects"
"Hiking trails, open space, ball fields"
"Walking trails"
"Community day, associated days and events"
"Trails, pool, beautiful view"
"Diversity, size, convenience, facilities available"
"Open space"
"Pool, pavilion"
"Size, meeting rooms, beauty"
"Equestrian center"
"Availability of many sorts of recreational activities"
"Open space, quietude, serenity of the lake"
"Swimming"
"All, especially open, undeveloped space"
"Old growth forest, unspoiled nature"

2. How many times a year do you visit Tymor Park?

50+	8
25-50	9
10-25	7
1-10	9

3. What activities do you enjoy participating in while at Tymor Park? What time of year?

Fall

Hiking (2)
Mountain biking
Tennis
Swimming

Winter

Cross-country skiing (2)
Sledding
Festival of Lights (2)
Hiking
Sleigh riding

Spring

Picnicking
Hiking
Walking
Dressage

Summer

Swimming (8)
Playground (3)
Concerts
Camping
Baseball
Tennis
Hiking (6)
Picnicking (2)
Dressage
Family Day
Basketball
Fishing (4)
Camp programs
Walking
Picnics
Boating

Year-round

Hiking (4)
Birding
Town events
Walking (3)
Family dinners
Horseback riding
Fishing (2)
Tours

4. What additional amenities/programming would you like to see developed at Tymor Park?

None / Leave natural (4)
Ice skating
X-country ski trail
Bike track
Ice skating rink (2)
Indoor pool
Town horseback riding program
Group trail rides
Paved parking lot (2)
Scenic overlooks with benches
Night swims
Fitness program
Expand swimming facility
Hiking trails
Adult evening programs/singles club
Running/walking track
More playground equipment
Hot-tub
Groomed cross-country skiing
Sculling
Community garden
Improved trails, markers on trails
Private campsites
Improve trails around Furnace Pond
Jogging ring
Indoor swimming pool

More outdoor concerts
More tracked cross country trails
More campouts, day activities, fairs
Protect the scenery
Canoeing, boats
Bow hunting
Improve rental areas and barns for flea markets, car shows, craft shows

5. Do you have interest in a horse stable at Tymor Park?

No - 21
Yes - 5
Undecided - 3

6. What would be the best way to publicize events/classes/activities that are offered at Tymor Park to reach the most residents?

Poughkeepsie Journal
Mailed flyer
Web site
Main kiosk
Recycling Center
Bulletin board on Route 55 property
Firehouse signs
The Millbrook Round Table
Radio
Local radio stations
Town cable channel
Leaflets
The Tymor Park recreation guide
Email list
Signs in Park
Mountain Heritage magazine
PBS TV

7. How do you get to the park?

Car 32
Walk 2
Bike 2

8. How close do you live to the park?

0-3 miles 11
3-5 miles 14
5+ miles 7

9. Check which activities you engage in at the park:

Fishing	15	**Bird-watching**	14
Boating	8	**Softball**	4
Camping	6	**Movies**	8
Biking	6	**Senior center**	4
Picnicking	16	**Nature center**	6
Swimming	17	**Cross-country skiing/snowshoeing**	9
Horseback-riding	5	**Tennis**	4
Hiking, walking, jogging	28	**Special events**	9
Snowmobiling	2	**Bingo**	0

Other: Easter Egg Hunt, Christmas Party, Union Vale Community Day, parties, sledding, photography, playground with toddlers, Family Day, rented hall for weddings, walk dog, enjoying the views, relaxing, doing nothing

10. What role does Tymor Park play in the Town of Union Vale?

"I do not know"
"It makes a very good location for Community Day, etc."
"It's the best park in the best town in the county…in the state!"
"The center of all activities."
"I believe a big part especially for the children."
"It is a great asset."
"Important community asset"
"Best place to relax"
"Gives every citizen opportunity to live as though they had 25 acres of their own."
"Social/gathering place for families. Recreational activity."
"It is an exceptional natural resource that should be preserved"
"Recreation, gathering place, civic (voting, senior center, museum)"
"It serves to unite the community"
"Recreation and social role"
"Different role for different folks but I think we're all proud of it"
"With people in different school districts, we have "park" friends"
"It is one in the same-joined together will make them both great"
"Children/family weekend activities"
"Get-togethers"
"Sense of community"
"A major role for us. If the equestrian facilities did not exist we'd relocate"
"High priority, open space is vanishing too fast"
"It's Union Vale's "Town center". It is the unifying feature of the Town"
"Great help to youth"
"Physical activities-ability to see friends and neighbors-positive community activities-educational"

11. How should the park be managed as Union Vale grows in population?

"As is"
"As a nature preserve it should require minimal management"
"Committee appointed by Board with 2 Councilpersons on it"
"Focus on a few things and do them well"
"In house"
"Committee, volunteer"
"Involve the residents more"
"Not to make money-but to preserve"
"Maintain rural setting and open space"
"If possible, attract more Union Vale residents to use the park, therefore decreasing the need to attract large organizations to use it."
"Resist the urge for commercialization"
"As it is-seems to be working"
"Preserve natural beauty, further develop historic information about the area."
"Maintain open space"
"Must initiate membership basis for admission"
"Expanded as need arises in areas of interest"
"Don't know"
"Enforce uses by town residents only, make sure ATVs don't use parking"
"More things to do for all ages"
"Keep it natural and undeveloped!"
"Perhaps best by volunteers under the direction of paid staff"
"Very conservatively - passive recreation"

12. Do you think current access to facilities, including trails, the pond, and other areas, is adequate?

Yes - 22
No - 1

Other:
Small boat ramp
Improved, interconnecting trail system
More riding trails
Parking is far from most activities
Better parking access trails G, H, and F
More signs, maps, flyers, directions to trails and attractions
Information on boat rental
Connect mountain bike trails
Information about various access points

13. How long have you lived in Union Vale?

0-5 years	1
5-10 years	4
10-20 years	16
20+ years	12

14. Is there any history, special place, or information about Tymor Park that you feel would be helpful for us to know?

"No"
"Probably none that you do not already know"
"No"
"Last summer there was a horrible motor cycle event that prevented residents from enjoying the park."
"No"
"More about Furnace Pond and activities there"
"Don't know"
"No-I read the activities bulletin that I get in the mail"

15. Additional Comments:

"Glad to see this planning activity is underway."

"Our family loves Tymor Park and we feel it's a positive, wonderful benefit of living in Union Vale."

"Please preserve this treasure! Allow ATV and recreational vehicles to use the park. Create a trails system or oval course."

"We are very fortunate to have Tymor Park. Let's keep it rural and beautiful."
"Love this town. Keep it undeveloped."

"Another future suggestion-creation of a small nature center museum. (There may be one upstairs in the boat house). Consider new names for trails-perhaps to honor some historical town figures."

"I know the Connor family was and is committed to the quiet, peaceful enjoyment of the park in its' natural condition. I would like to see snow mobiles prohibited."

"I think it's important to keep the focus on nature and hiking/walking."

"Tymor Park is the nicest community recreation park and facility of any place I have lived. It is what I/we will miss most when we move from the area."

"We love it here. Park is a major reason why, as well as the rural character of the town in general."

"Tymor Park is as asset to the community. Its beauty is unmatched in Dutchess County."

"Love the park - Please continue to allow dogs on the other side of the park as long as they are leashed."

"It would be helpful to have flyers available outside-near entrance gate-to give visitors direction and let them know what is available, how to get to it and certain rules and regulations. Where are the camp grounds, how do you rent boats, where is the pond, nature trails, jogging trails, etc."

"I believe it is in the best interest of the town to resist the temptation to develop Tymor Park into a "commercial" park. The current combination of ball fields, courts, swimming pools, picnic areas, and natural land is about right. As the population of Union Vale continues to grow I'm afraid there will be pressure to turn the park into a softball/ little league/ soccer complex that will bring hundreds of cars into the park on any given weekend. I do not think this was the intended use of this land and I hope this park does not end up that way."

PUBLIC MEETING INPUT

"Top Goals and Visions for Tymor Park" [1]

Attendees of the first public meeting were asked to list and rank their top three goals and visions for Tymor Park.

4 Votes:

- Maintain what we have

3 Votes:

- Resist urge to commercialize
- Trail management/improvements
- Conservation/Preservation as main management approach

2 Votes:

- Plan to restore/fix Furnace Pond
- Create scenic overlooks/viewpoints
- Evergreen forest management (adelgid & understory)
- "Forest management"

1 Vote:

- Recognize value of original gift
- Stay the same
- Plantings for wildlife
- Maintain native trees and shrubs
- Reduce number of activities
- Senior/Handicap use
- Temporary ice rink
- Specific trails for specific uses
- Maintain and preserve buildings
- Heated children's pool
- Forest management for fire protection, safety, and revenue

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[1] Tymor Park Master Plan Public Meeting, 2/10/04.

"Tymor Park's Most Important Role"[2]

Attendees of the first public meeting were asked to state what they believe to be the most important role that Tymor Park serves in the Union Vale community.

"Tymor Park is a place of incredible natural beauty that can be enjoyed through both quiet, close, individual contemplation and in groups of healthy recreation."

"A wonderful natural gift to be passively enjoyed by town residents and their families."

"The natural beauty of the Park is so impressive and should be preserved ad maintained. Stay true to the intent of the donors of the Park."

"1) Asset for the residents where they can enjoy getting close to nature without driving far. 2) Place to meet and get to know neighbors. 3) A place to bring town residents together to give them a sense of community and make them feel they belong here."

"I spend a lot of time walking in the park. I may live closer than anybody else at this meeting. I enjoy the solitude and interaction with nature. I would really not like to see more development."

"Recreation (Programs: summer camp, swimming… and Personal: hiking, picnics, biking, fishing)"

"Keep the park a natural scenic place so one can return to nature when modern like has gotten to you!"

"Opportunity to experience nature unspoiled through walking/hiking year-round."

"1) A natural area to be enjoyed by foot or bike or horses… or to be viewed from the Town Hall area. 2) Meeting other residents at Town Hall, Community Day, family dinners."

"A place to go – no phones, no noise, no people."

"A place to go birding and walking."

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[2] Tymor Park Master Plan Public Meeting, 2/10/04.

APPENDIX C

Original Tymor Park Management Plans

Contents:

- *Recreation Management Plan for Tymor Forest,* Ralph Connor, 1972.
- *Trout Stream Restoration and Management Project for Tymor Forest.* Ralph Connor, 1972.
- *Preliminary Nature Trails Plan for Tymor Forest.* Ralph Connor, 1972.

4/72

RECREATION MANAGEMENT PLAN
for
TYMOR FOREST

Introduction

The time worn adage "You can please some of the pople some of the time, but you can't please all the people all the time" is necessarily appropos to proper park management. In otherwords, to protect a park's natural amenities, to minimize conflicts between visitor-types, and to encourage respectfulness among visitors, it is obviously necessary to develop park standards and establish use-regulations. A basis for standards and regulations is, of course, study and planning relative to the Park's ecology.

Within certain basic guidelines, the best use-regulations and density standards (eg: number of picnic tables) may, in the case of Tymor, be evolved through experience, ie: try something and see how it works. One guideline that may be appropriate here, is to start small and inconspicuously because it is usually easier, in terms of public-acceptance, to enlarge or add-on, rather than having to cut-back due to excessive management problems caused by early developmental "over-ambitiousness." As pointed out in the Preface our problems and concerns are complicated by the fact that the Park is to have two basically different purposes, ie: 1)general recreation, 2)nature education.

In terms of Park design and planning, two fundamental problems, which have great bearing on the Park's future overall quality, must be satisfactorily resolved. These concerns are 1)the concept of "clustering" and 2)traffic flow.

Clustering: One way to resolve the inevitable user-conflicts

(eg: fisherman vs. swimmer)[1] that will arise in a multi-purpose park is through planned developments termed "activity clusters." This procedure groups (concentrates) those activities of "a similar bent" together in one general area or zone, as opposed to a design which scatters or mixes diverse activities throughout a park landscape. The zoning concept of clustering brings about spatial separation of people and resources with differing objectives and values so that they do not, in effect, come into contact. Thus, no contact--no conflict--and everybody can "do their thing" with a minimum of disturbance. And of course, the seasonal nature of many activities precludes many possible user-conflicts.

With regard to Tymor, the task is essentially to "segregate" the Natural Environment Area (NEA) from the Intensive Use Recreation (IUR) area. An example of how this could be achieved is shown in Fig. 1. Here the IUR area is clustered in the vicinity of Furnace Pond where presumably most general recreationists would prefer to be anyway.

The discussion so far has dwelt upon people and their temperments. Another argument for cluster development, of no less importance, is its usefulness in landscape preservation and management per se. Careful attention to the juxtaposition of habitat and resource types can insure the preservation, enhancement and utility of irreplaceable natural communities. It promotes the somewhat subtle concept of landscape continuity or "continuity-of-layout." These aspects can be discussed more fully later.

Traffic Flow: Visitors should have easy uncongested access to the Park, plus adequate parking and turn-around space. This does not mean,

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[1] See attached list for activity groupings.

however, that the Park should be interlaced with roads. The idea of driving to within a few feet of every available facility should be discouraged. Tymor is a small Park and its ability to absorb the amenity-disruptions associated with the "4-wheeled monster" is obviously limited. (Let's leave the drive-ins, motor noise and congestion in town!). At the Park people should be encouraged to walk, to exercise, and have the opportunity to do so within a serene environment.

How then do we solve this traffic flow-serenity problem? It is suggested that adequate roadways and parking be made available at several points around the Park's perimeter. One of these vehicular access areas would be located close to the IUR area at Furnace Pond. Access to the Park's interior would be by comfortable walking trails (bicycles permitted on some trails). The specifics are as follows (also examine Fig. 1):

A) ~~Close off the little used and unneeded Duncan Rd. Construct a small parking lot at the closed-off end of the road (at the Park's border). The remainder of Duncan Rd., as it presently exists, could then become an excellent bicycle-way and park-~~ maintenance road.

B) ~~It is suggested that the main Park entrance should be along Lime Mill Rd. from Dorn Rd. in the Town of Beekman. Funds currently earmarked for extending Duncan Rd. over to Bruzgul Rd. could be used for restoring this section of Lime Mill Rd. This new Park entrance road would extend to the vicinity of Furnace Pond where, with the purchase of 3-5 additional acres (owned by Harris ?), most of the IUR activities would be clustered.~~

BOLD STRATEGIES ARE WHAT PRODUCE EXCEPTIONAL RESULTS.

C) Duncan Rd., from Bruzgul Rd. into the barn area, would be a secondary entrance and parking area, mainly for NEA users.

D) Lime Mill Rd. (now closed off) from the barn area into Furnace Pond would be seeded to grass and clover and kept mowed, thereby becoming an excellent walking trail. Bicycles would be a compatible use of this trail.

It is worthwhile to raise one other important issue. This pertains

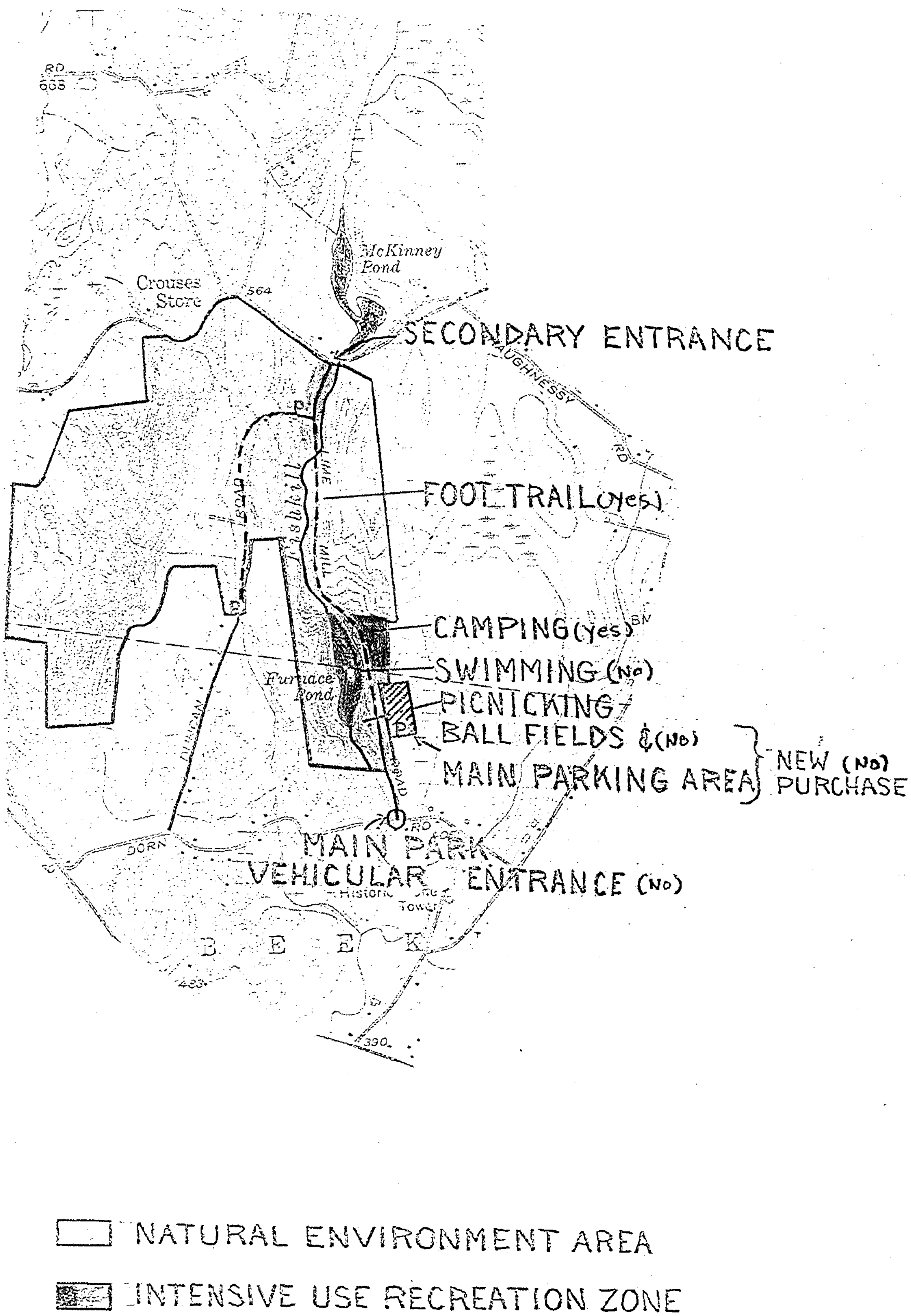
to planning strategies for attaining and maintaining a desirable mood for Tymor Park overall. How do we provide for public recreation, relaxation and learning without debasing an environment of tranquility and potentially great biological richness? The answer (or one answer), which may be a distasteful idea to some is this: simply do not develop a park with facilities and programs that would appeal to <u>everyone</u>. Those people desiring more "action," larger crowds, greater conveniences, could be provided for elsewhere. That is, if the public-use facilities at Tymor are kept rather simple (ie: primitive) and resource-oriented (ie: water, plants, scenery, wildlife), certain character-types would not be attracted. This philosophy is a rational planning strategy and is basically like that expressed in the new plan for Minnewaska State Park prepared by the U.S. National Park Service. To quote:

> "By making a natural resource just a little bit difficult to get to, a form of discrimination (based on effort) was legitimatized. By requiring only a little effort [and appreciation] on the part of the user, the casual, incidental, or uncaring visitors would be filtered out. Thus, only those people who are willing to work for a given experience would receive it, and in doing so would gain much more from the visit."

To further evaluate the feasibility of this Recreational Plan the following two steps are recommended at this time:

1) Examine Furnace Pond for its suitability for locating a swimming area thereon.

2) ~~Begin negotiations with Town of Beekman Officials concerning use of Lime Kill Rd. as the Park's main entrance. In return for this right, Beekman residents could use Tymor Park's Natural Environment Area (NEA)--but not the IUR facilities generally. Special privileges might be granted to Dorn Rd. and Duncan Rd. residents who live adjacent to the Park and are within walking distance of it.~~



RD
668
Crouses
Store
564
McKinney
Pond
SECONDARY ENTRANCE
FOOT TRAIL(yes)
CAMPING(yes)
SWIMMING (No)
PICNICKING
BALL FIELDS &(No)
MAIN PARKING AREA
NEW (No)
PURCHASE
Furnace
Pond
MAIN PARK
VEHICULAR ENTRANCE (No)
DORN
DUNCAN
ROAD
B E E K
483
390
NATURAL ENVIRONMENT AREA
INTENSIVE USE RECREATION ZONE

Fig. 1

ACTIVITIES LIST
and their
SUSPECTED SUITABILITY FOR UNION VALE PARK

General Outdoor Recreation[1]	Natural Environ. Area Uses[2]	Non-Conflicting Uses	Incompatible Uses
Swimming	Hiking	Nut-berry gathering	Horseback Riding[3]
Picnicking	Bird-watching	Bicycling	Snowmobiles[3]
Camping	Photography	Ice-skating	Hunting
Rowboating	Nature Study	Sledding	Shooting
Canoeing	Stream Fishing	4-H Farm	Dog-training
Softball**	Ice Fishing	Small Concession*	Minibikes
Pond Fishing	Snow-shoeing		Motorboats
	Cross-country skiing		
Facilities Needed	Skiing		
	School Field Trips		
Parking Lot (x cars)	Field Research		
Boat launch area	Landuse Demonstrations		
Campsites	Nature Interpretation		
Pump well			
Trash barrels			
Outdoor grills			
Picnic tables			
Privy			
Small rustic bathhouse[4]			
Small beach			
Toddlers fence			
Buoys			
Ballfield (for Park users)			

[1] Activities limited to Town residents and guests. Annual purchase of car stickers required.

[2] Activities open to all--by permit and/or appointment only.

[3] Activities permitted on leased overland trails leading to Park.

[4] With some remodeling, would the present boathouse serve this purpose?

* Activities having little or nothing to do with nature-oriented recreation.

4/72

TROUT STREAM RESTORATION AND MANAGEMENT PROJECT for TYMOR FOREST[1]

Introduction

One great issue in fisheries management, indeed of all wildlife ecology, is the problem of effective communication of knowledge regarding biologically sound management practices. Further, much needs to be learned on ways to achieve the actual implementation of recommendations, and what the realistic long term benefit/cost ratio of such stream fisheries management programs are compared to those that might be judged "unsound" biologically.

At the core of sound fisheries management is to develop the understanding among the various publics that a productive natural fish population depends upon the protection or development of a quality stream HABITAT, and that this is directly related to man's proper stewardship of the watershed, and his knowledge of ecological relationships. With this approach, nature will respond and the stream environment can produce wild trout--genuine products of the land. The planting of generally inferior, but expensive, hatchery stock is then unneeded.

The primary objectives of this Proposal are: 1)the creation of a superb demonstration of trout stream habitat management. Such a "show me" area is the most effective way of communicating knowledge and

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[1] A one year study is needed to evaluate the feasibility of this recommendation.

information, and also, of convincing skeptics who might take a contrary view of resource management, 2)this field demonstration will also function as an extraordinary educational and teaching exhibit, 3)research designed to ecologically and economically evaluate all phases of the restoration would be a key element of the project, and 4)last, but not least, area anglers would "reap the harvest" in terms of more and larger wild trout to pursue.

Procedures

Where: On Fishkill Creek between McKinney Pond and Furnace Pond. If the one year feasibility study indicated that this section lacks critical environmental requirements (eg: spawning gravels, groundwater seepage), then the project could probably be conducted through landowner agreement, on another more suitable stream in the Clove Valley.

Reason for Site Selection: Small streams are among the most suitable of dynamic natural systems for habitat management. In contrast to lakes or impoundments, improvements are readily visible and the results easily seen. Further, since many of our region's small streams have been damaged by landuse practices (such as bank trampling by cattle), gradually restoring a productive stream environment can be a dramatic educational demonstration.

Major Features of Project: (An artist's rendition of how the meadow habitat phase of the restoration might look is shown in Fig. 1):

1)Re-establish the stream channel's natural meadow-meander pattern.

2)Improve cover and water-flow characteristics of the stream by:
   a)planting willow along stream banks
   b)seeding suitable cover and food producing grasses (ie: Reed canary grass) along certain sections.
   c)construct several naturalistic current (wing) deflectors and sodded bank-overhangs. Such structures narrow and deepen channels and increase current velocity. Deflectors generate pool-forming backwashes and eddies.

d)place large boulders and rocks in stream channel. Besides enhancing the stream aesthetically, they improve current characteristics and provide trout cover.

3)The total floodplain area will be managed ecologically to demonstrate proper integrated landuse (ie: fishing, recreation, livestock pasturing, etc.). It will be managed to improve the aesthetic appeal of the total floodplain environment in which man, the visitor, can recreate and learn. Vegetation management will include the culture of meadows to create attractive wild floral displays.

4)Proper public and livestock use of the floodplain area will be achieved by the use of pasture fence, fence crossing stiles, cattle watering gates, foot-trails, interpretative signs. Trout harvests and angling pressure will be regulated in order to sustain an abundant population of wild trout.

5)To maintain needed cool water temperatures in summer (65-75 F) and warm terperatures (ie: 33-35 F) in winter, it <u>may</u> be advisable to alter the overflow discharge from McKinney Pond. This would entail converting from the present top-release (water flowing over the top of the dam) to bottom release. Drawing water from the pond's bottom would probably result in more favorable water temperatures downstream.

6)The entire renovation project would be carefully documented and monitored through photographs and scientific measurements. Such records would be assembled into charts, graphs, before-after picture displays, and publications, to be used as instruction and communications materia.

<u>Project Consultants:</u>

William Kelly and Maurice Otis, New York Department of Environmental Conservation.

Robert L. Hunt, Wisconsin Conservation Department

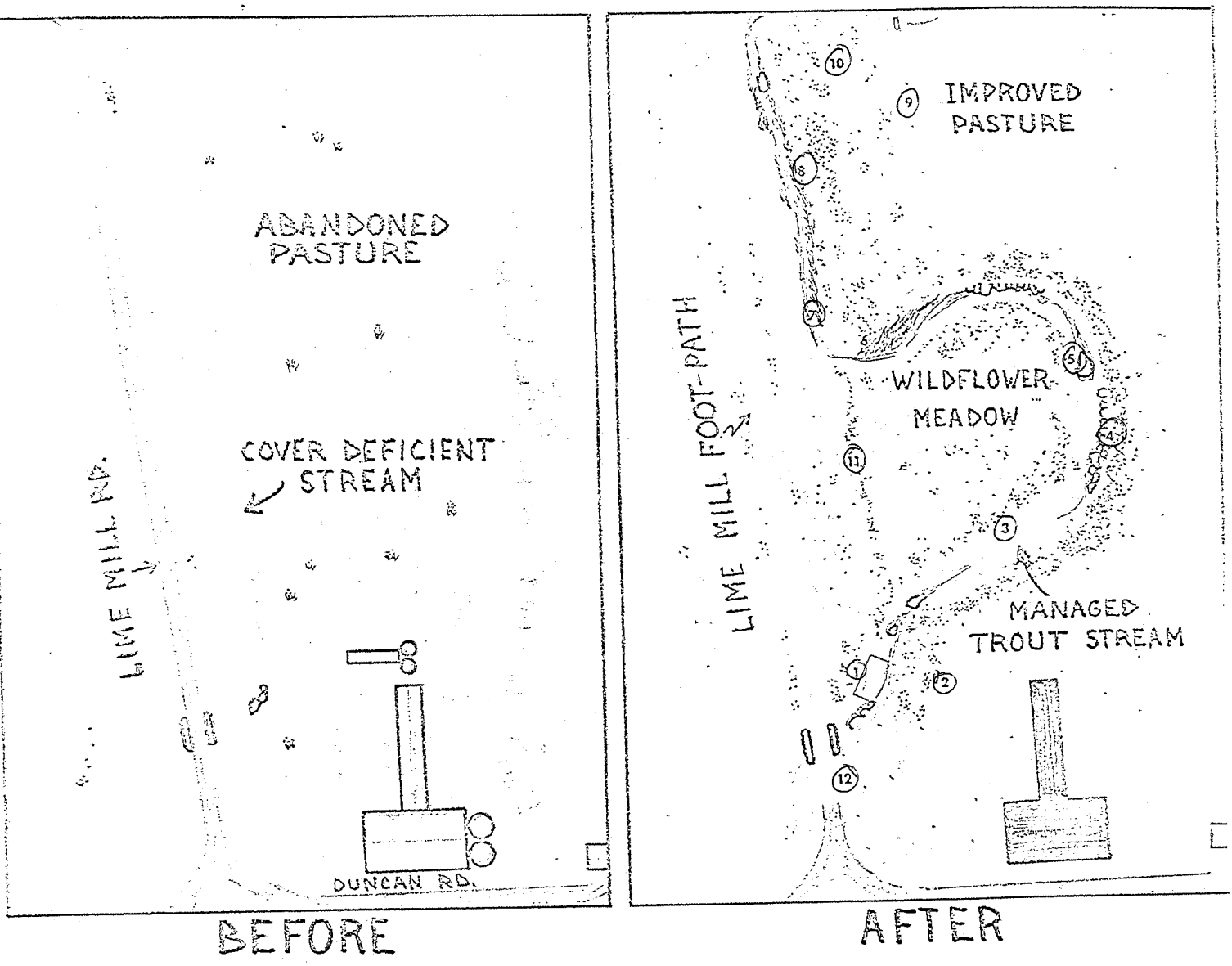
John Porter, U.S. Soil Conservation Service.

<u>Possible Sources of Funds</u>

Trout Unlimited

National Science Foundation

U.S. Department of Agriculture (Rural Environmental Assistance Program, REAP)



A TROUT STREAM HABITAT RESTORATION PROJECT-A
DEMONSTRATION OF ECOLOGICALLY SOUND LANDUSE

A COOPERATIVE UNDERTAKING
Union Vale Conservation Advisory Council
N.Y. Dept. Environmental Conservation
U.S. Dept. of Agriculture

ELEMENTS OF PROJECT

1. Cattle Watering Gate
2. Fence Crossing Stile
3. Willow Planting
4. Rip-rap--Bank Stabilizer
5. Boulder
6. Naturalistic Wing Deflector
7. Channel Narrowed & Deepened
8. Reed Canary Grass Seeding
9. Pasture Fence
10. Walking Path
11. Old Channel--Filled In
12. Interpretative Sign

Figure 1

4/72

PRELIMINARY NATURE TRAILS PLAN
for
Tymor Forest

Introduction

A program which expertly interprets[1] the natural history of the Clove Valley to interested persons seems most feasible and appropriate for Tymor Park due to the area's outstanding diversity of natural and man-created habitats. As a necessary supplement to the trail system itself, a quality information-packed self guide tour booklet should be prepared. The nature trail concept and its utility in public programs has been aptly described.[2]

> "Briefly, the purpose of a trail is to provide a pleasant and friendly way of approaching an outdoor subject--a relaxed kind of informal firsthand study. A trail is also a planned and fixed pathway for moving visitors about a given land area. The two ideas expressed in this definition are important. First, the trail is a planned way of arousing and sustaining a visitor's interest and of presenting organized information. Second, the trail is fixed at any given time. It may change directions as circumstances dictate. It may even ramble through woods and fields, but it is clearly laid out so that it can be followed easily. This fixed position of the trail gives direction and purpose to the movement of visitors. It reduces idle rambling and gives incentive to enjoyment and learning."

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[1] Defined as that branch of communication which has to do with "explaining" things out-of-doors in meaningful terms to man--be it the world of nature, certain aspects of natural resources or man's history. The process is both art and technique. Closely involved are the processes of education and enlightment (NAS 1968).

[2] Trail Planning and Layout, Pg.-10. Information-Education Bull. No. 4. By B.L. Ashbaugh. 1965. National Audubon Soc. Nature Centers Div. 104 pp.

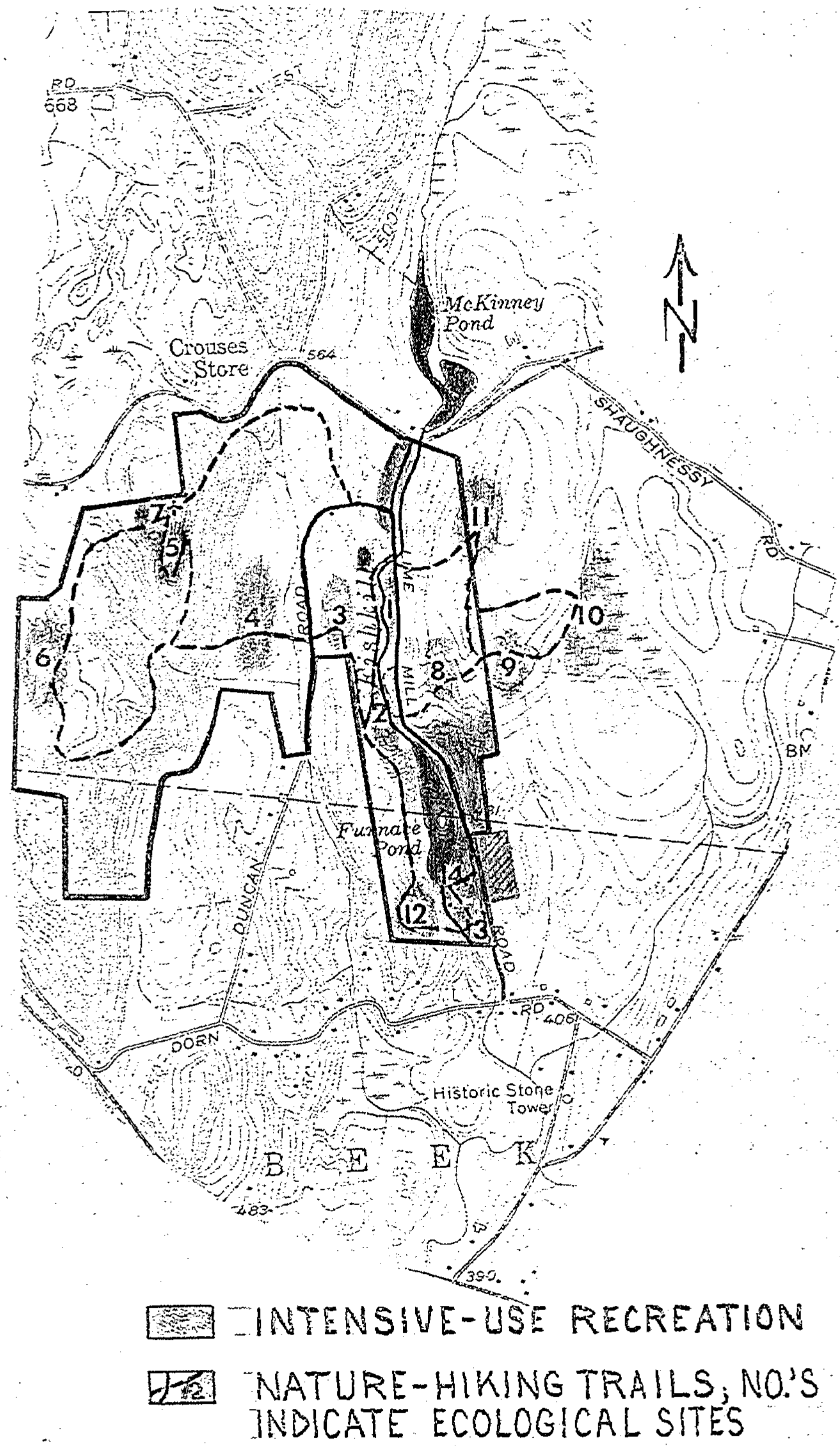
RD
668
McKinney
Pond
Crouses
Store
564
SHAUGHNESSY
RD
ROAD
MILL
Furnace
Pond
DUNCAN
ROAD
DORN
RD 406
Historic Stone
Tower
B E E K
483
390
BM
INTENSIVE-USE RECREATION
NATURE-HIKING TRAILS, NO.'S
INDICATE ECOLOGICAL SITES

Figure 1

HYPOTHETICAL KEY TO TRAIL NUMBERS IN FIGURE 1

Site No.

1. Floodplain wildflower meadow with naturalistically managed trout stream. Unit also demonstrates livestock pasturing integrated with trout stream values.

2. Moist shaded hemlock gorge formed by a plunging brook. Interesting geology and bryophyte (moss, ferns, liverworts) communities.

3. Scenic hilltop meadow providing fine view of Clove Mountain. Environmental amenities at this site include an uncluttered view of sky and mountain scenery, wildflowers, butterflies, fragrant breezes, songbirds, etc.

4. Managed plant succession to encourage a diverse array of oldfield (successional) fruit and berry producing shrubs and associated animal life (particularly songbirds)--see attached reprint for some shrub descriptions.

5. Rugged, rocky hillside terrain. Special plant and animal adaptions; land management precautions stressed.

6. Typical Mid-Hudson second growth oak-hickory forest community. Develop demonstration of silvicultural practices for improving timber and wildlife production on such sites.

7. "Treetops" wildlife observation tower and view of Clove Valley. Excellent for viewing migrating canopy dwelling warblers.

8. Protective conifer woods--valuable deer yarding habitat.

9. Late successional vegetation ("thick brush")--managed through the selective application of herbicides for a diversity of successional species.

10. Hardwood swamp habitat.

11. Spectacular panoramic scenery viewed from upland wildflower meadow. Guide booklet would provide a geological interpretation of the Clove Valley landscape. It is my judgment that the scenery, in and by itself, which can be enjoyed from the uplands of Tymor Forest, would attract and impress most Park visitors--especially urban visitors seeking a contrast to (and relief from) "the concrete jungle."

12. Mature mixed deciduous woodland. Construct an observational soil pit.

13. Remnants of a former Valley industry, the old iron works; a

nostalgic recall of days past and the influence of this industry upon the cultural and natural history of the region.

14. View and interpretation of Furnace Pond and its plant and animal life.

A possible trail layout for Tymor is shown in Fig. 1. A very brief description of some of the main attractions that now exist, or could be developed along this trail system are given in the accompanying Table. For a trail system to be most effective several considerations are paramount: 1)There should be access to the most interesting features (biological, scenic, etc.) of the property, 2)It should encompass the full array of landscape diversity, 3)It should not be partitioned by disruptive man-made developments or activities, 4)The trails, trail markers and interpretative signs should be unobtrusive, ie: blend well with the natural landscape.

U.S. Forest Service photo

"I follow nature as the surest guide, and resign myself with implicit obedience to her sacred ordinances."—Cicero

APPENDIX D

Tymor Park Flora

Contents:

- Partial List of Tymor Park Flora

PARTIAL LIST of TYMOR PARK FLORA[1]

Woody Species

Apple
Ash, white
Aspen, big-toothed
Barberry, Japanese
Basswood
Beech, American
Birch, black
Birch, gray
Birch, paper
Bittersweet, oriental
Blackberry, northern
Bladdernut
Blueberry, highbush
Blueberry, late low
Brambles
Buckthorn, common
Butternut
Buttonbush
Cherry, black
Creeper, Virginia
Dogwood, flowering
Dogwood, red-osier
Hemlock, eastern
Hickory, shagbark
Honeysuckle (invasive)
Hornbeam
Ironwood
Larch, European
Locust, black
Maple, Norway (?)
Maple, red
Maple, sugar
Oak, chestnut
Oak, red
Oak, white
Pine, white
Raspberry, black
Rose, multiflora
Spruce, Norway
Sumac, staghorn
Sycamore, American
Tree of heaven
Willow
Witchhazel

Herbaceous Species

Anemone, rue
Aster
Bedstraw
Bugloss, viper's
Columbine
Dodder, common
Fern, Christmas
Fern, maidenhair spleenwort
Fern, walking
Ginger, wild
Goldenrod
Harebell
Hepatica, roundleaf
Loosestrife, purple
Mullein, common
Pink, Deptford
Poison Ivy
Pokeweed
Polypody, rock
Pussytoes
Queen Anne's lace
Ragweed
Reed, common (Phragmites)
Rock cress, lyre-leaved
Rock cress, smooth
Rush, scouring

[1] Sources: Jane Geisler, personal communication, 2004.
Master Plan site visits, 2004.

Ironweed
Jewelweed
Knotweed, Japanese
Lily, Canada
Lobelia, great
Saxifrage, early
Thistle, Canada
Vetch, crown
Yarrow

APPENDIX E

Tymor Park Fauna

Contents:

PARTIAL LIST OF DUTCHESS COUNTY FAUNA[1]

Fish

Largemouth bass
Rock bass
Brown bullhead
Black crappie
White crappie
Yellow perch
Pumpkinseed
Gold shiner

Amphibians

Leopard frog
Spring peeper
Bullfrog
Green frog
Pickerel frog
Wood frog
Tree toad, eastern gray
American toad
Fowler's toad
Four-toed salamander
Alleghany mountain salamander
Spotted salamander
Eastern newt (red-spotted)
Red-backed salamander
Slimy salamander
Northern two-lined salamander
Dusky salamander
Northern spring salamander
Jefferson salamander
Marbled salamander
Mud puppy

Reptiles

Snapping turtle
Eastern painted turtle
Eastern box turtle
Wood turtle
Spotted turtle
Five-lined skink
Northern brown snake (DeKay's)
Northern red-bellied snake
Eastern garter snake
Eastern smooth green snake
Northern black racer
Black Rat Snake
Eastern milk snake
Northern water snake
Northern ringneck snake
Eastern hognose snake
Eastern worm snake
Eastern ribbon snake

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[1] Sources: Jane Geisler, personal communication. 2004.
1975. The Cary Arboretum. *Wilcox Park: Analysis of Resources and Recommendations for Recreational and Educational Development.* Millbrook, NY.

Invertebrates

Earthworm
Leech
Water boatman
Water-strider
Cicada
Adelgid, hemlock woolly
Caddisflies
Deer tick
Dobsonfly
Black swallowtail butterfly
Daddy longlegs
Mussel, freshwater

Mammals

Woodchuck
Striped skunk
Raccoon
Eastern gray squirrel
Red squirrel
Flying squirrel
Opossum
Little brown bat
Keen bat
Indiana bat
Silver-haired bat
Big-brown bat
Red bat
Hoary bat
Rock vole
Bog lemming
Short-tailed shrew
Masked shrew
Water shrew
Smoky shrew
Least shrew
Whitetail deer
Eastern cottontail

Muskrat
Mink
New York weasel
Least weasel
Bonaparte's weasel
Red fox
Gray fox
Eastern chipmunk
Meadow mouse (vole)
Meadow jumping mouse
Woodland jumping mouse
House Mouse
White-footed (deer) mouse
Pine mouse
Norway rat
Eastern wood rat
Black rat
Eastern mole
Star-nosed mole
Hairy-tailed mole

FISH SPECIES IN FISHKILL CREEK 1.6 MILES DOWNSTREAM FROM TYMOR PARK[1]

Longnose dace
Tessellated darter
Cutlips minnow
Creek chub
Common shiner
Rock bass
Blacknose dace
White sucker
Golden shiner
Brown bullhead

[1] Source: Stevens, *et al.* 1994.

BIRDS of UNION VALE[1]

Great Blue Heron
Green Heron
Turkey Vulture
Canada Goose
Wood Duck
Mallard
Red-tailed Hawk
American Kestrel
Ring-necked Pheasant
Wild Turkey
Killdeer
Spotted Sandpiper
Rock Dove
Mourning Dove
Great Horned Owl
Chimney Swift
Ruby-throated Hummingbird
Downy Woodpecker
Hairy Woodpecker
Northern Flicker
Pileated Woodpecker
Eastern Wood-Pewee
Acadian Flycatcher
Willow Flycatcher
Least Flycatcher
Eastern Phoebe
Great Crested Flycatcher
Eastern Kingbird
Yellow-throated Vireo
Warbling Vireo
Red-eyed Vireo
Blue Jay
American Crow
Tree Swallow
Northern Rough-winged Swallow
Bank Swallow
Barn Swallow
Black-capped Chickadee
Tufted Titmouse
White-breasted Nuthatch
Brown Creeper
House Wren
Blue-gray Gnatcatcher
Eastern Bluebird
Veery
Wood Thrush
American Robin
Gray Catbird
Northern Mockingbird
Brown Thrasher
European Starling
Cedar Waxwing
Blue-winged Warbler
Yellow Warbler
Black-throated Green Warbler
Prairie Warbler
Black-and-white Warbler
American Redstart
Worm-eating Warbler
Ovenbird
Louisiana Waterthrush
Common Yellowthroat
Scarlet Tanager
Eastern Towhee
Chipping Sparrow
Field Sparrow
Savannah Sparrow
Song Sparrow
Swamp Sparrow
Northern Cardinal
Rose-breasted Grosbeak
Indigo Bunting
Red-winged Blackbird
Eastern Meadowlark
Common Grackle
Baltimore Oriole
Purple Finch
House Finch
American Goldfinch
House Sparrow

[1] Source: NYSDEC

BIRDS of TYMOR PARK[1]

Notation: yyyymm cc/dd, where yyyy=year mm=month cc=count dd=date
Example: "200310 2/10" means 2 birds were seen on Oct 10, 2003

Included are counts/dates that were explicitly mentioned in the club records database. The records in the database are a condensation of the reports sent in each month. Birds that are widely reported will not have an explicit mention of Tymor Park, so the most common birds have the fewest specific records. To adjust for this, the list is annotated with "regular" or "common" to indicate the status of the species in the park.

The "birdiest" trail in Tymor Park is Trail B. Walking down the lane to Trail B, following Trail B back out to the lane and taking the trail down to the stream and then back out to the lane passes a good variety of habitat for finding different kinds of birds. The area at the far end of Trail B, where brush and stumps are dumped, is a good spot... an open area surrounded by thick bushes.

Canada Goose Nest on Furnace Pond regularly.
Mute Swan Nest on McKinney Pond, a few seen at other seasons.
Wood Duck A few found in October 3 times.
American Black Duck One in Sept and Oct 2002.
Mallard On Furnace Pond and in stream.
Ring-necked Duck 200103 3/20.
Bufflehead Saw one once on the stream.
Hooded Merganser 199602 2/29, 199907 1/13, 200006 2/15, 200102 3males/28, 200103 2pr/10-20 McKinney Pond, 200311 2 females/16 .
Common Merganser 199602 30+/27, 199904 4/7, 200311 pr/30 McKinney Pd.
Ruddy Duck 199703 5/13.
Ring-necked Pheasant Any seen are presumed to be escapes from the gun clubs.
Ruffed Grouse No reports, but good habitat here. They have been declining.
Wild Turkey 199907 1/8, 200310 1/15 Regular.
Pied-billed Grebe 199904 1/7, 200210 1/23.
Great Blue Heron 200210 1/23 Regular.
Black Vulture 200110 1/25 Becoming more regular.
Turkey Vulture 199810 12/3; 200110 4/25; 200210 8/23 Seen regularly overhead.
Bald Eagle No reports from Tymor, but seen several times in the Clove Valley.
Osprey 199610 1/2 .
Northern Harrier 199210 1/28; 200310 1/15.
Sharp-shinned Hawk 199703 1/13; 199505 1/22; 200210 1/23.
Cooper's Hawk 199907 3yng/13 on Trail B near white pine grove.
Red-tailed Hawk Regular, nests - seen always along Trail H.

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[1] From Ralph T. Waterman Bird Club records, 1990-2003. Compiled by Barbara Butler, February, 2004.

Rough-legged Hawk 199301 1/6; 200312 1/20.
Golden Eagle 199704 1/23 Immature.
American Kestrel Occasionally.
Killdeer 199606 3/29; 200204 5/10 Regular.
American Woodcock No records, but there is good habitat for them here.
Rock Pigeon In the silos? But do not have any reports.
Mourning Dove Regular, breeds.
Yellow-billed Cuckoo 199506 1/19, 199507 1/5 .
Eastern Screech-Owl 200101 1/3 & 1/26 Red-morph roosted in tree next to parking lot, 199804 1/1 found dead, caught in fish line.
Great Horned Owl 199504 1/7 & 1/15, 200104 1/11 On nest along Trail B in white pine grove.
Barred Owl 199603 2/24 Calling mid-afternoon. 199804 1/1 Heard. 199406 1/20 Seen on Trail B.
Chimney Swift Regular, breeds.
Ruby-throated Hummingbird Regular.
Belted Kingfisher 200001 1/21 Regular.
Red-bellied Woodpecker Common, breeds.
Yellow-bellied Sapsucker 199504, 199806 1/9 & 1/17, 200210 3/23.
Downy Woodpecker Common, breeds.
Hairy Woodpecker Regular, breeds.
Northern Flicker Regular, breeds.
Pileated Woodpecker 199907 1/13, 199410 1/19 Regular, breeds.
Eastern Wood-Pewee 199907 5/13 Common in summer, breeds.
Willow Flycatcher 199905 2/31, 199405, 199605 1/26, 199706 1/10, 199406 1/23 Usually found in marsh by Equestrian Center entrance, breeds.
Least Flycatcher 199806 1/9 & 4/17, 199706 1/10 & 15, 200006 2/15, 199506 1/19, 199606 2/28, 199907 3/8, 1/13 Usually found along Trail B near white pine grove, breeds.
Eastern Phoebe 200104 6/11, 199907 3/13, 200210 3/23, 200310 1/15 Common, nest under bridges.
Great-crested Flycatcher 199907 1/13 Regular, breeds.
Eastern Kingbird 199905 1/1, 199907 3/13 Common in summer, breeds.
White-eyed Vireo 199805 1/19, 199105 1/17, 199706 1/15 Found near "dump" on Trail B.
Yellow-throated Vireo 199506 1/19, 199606 1/28, 199907 6/13 Regular in summer, breeds.
Blue-headed Vireo 199406 1/20, 199106 3/5,3/27, 199507 1/5, 199510 1/18, 199410 2/19, 200210 1/23, 199610 1/2 Breeds.
Warbling Vireo 199907 1/13 Regular, breeds.
Red-eyed Vireo 199606 10/28 & 3/29, 199907 6/13, 199610 1/2 Common, breeds.
Blue Jay 199806 2/9, 200210 15/23 Common all year, breeds.
American Crow 199806 5/17, 200006 45/15 Common all year, breeds.
Tree Swallow Regular, breeds.
Northern Rough-winged Swallow 200306 4/29, 199006 1/20 Nest near bridge by McKinney Pond dam.
Barn Swallow 199905 2/1, 199907 2/13 Common, nest in buildings.
Black-capped Chickadee 199907 4/13 Common, breeds.
Tufted Titmouse 199907 2/13 Common, breeds.
Red-breasted Nuthatch 199802 2/8, 199804 2/1, 200104 1/11, 199405 1/7.
White-breasted Nuthatch 200103 5/20, 199806 1/9, 199907 2/13 Common, breeds.
Brown Creeper 199301 1/6, 199804 3/1, 200104 2/11, 199705 2/22, 199605 1/23, 199806 2/17, 199706 2/15, 199006 2/20, 199606 1/28, 200110 1/25, 199610 1/2 Regular, breeds.
Carolina Wren 199703 1/13.
House Wren 199810 1/28 Regular, breeds.

Winter Wren 200104 1/11.
Golden-crowned Kinglet 199702 3-4/16, 199703 4/13, 200103 3-5, 199904 2/27, 200004 4/12, 199504 1/5, 200104 4/11, 200204 2/10, 200210 20/23.
Ruby-crowned Kinglet 199705 1/22, 200210 10/23.
Blue-gray Gnatcatcher 199504 2/26 Built nest. 199006 1/20 Regular, breeds.
Eastern Bluebird Regular, breeds. Tymor has good places for bluebird nest boxes.
Veery 199506 2/15 & 19, 199606 5/29, 199907 7/13, 199507 6/5 & 1/11 Regular, breeds.
Swainson's Thrush 199410 1/19, 199510 1/18, 199605 2/26 Seen during migration. In 94 and 95, the one at Tymor was the only one reported in the county.
Hermit Thrush 199403 1/2, 199904 2/7, 199704 1/23, 200004 4/12, 199405.1/8 1/29, 199406 1/23, 199510 Usually found along Trail H, probably breeds.
Wood Thrush - 199806 5/9, 199606 10/29, 199507 10/5, 200210 1/23 Common, breeds
American Robin - 199702 15/16, 199810 70/28, 200210 50/23, 200310 100/15 Common, breeds - flocks in fall and winter.
Gray Catbird Very common, considerable good catbird habitat, breeds.
Northern Mockingbird Common, love the multiflora rose, breeds.
European Starling Very common, especially around the barns.
Cedar Waxwing 199006 8/20 Nesting. 199907 1/8, 200210 100/23, 200310 16/15, 199811 5/1 Regular, breeds.
Blue-winged Warbler 199406 1/11 Regular.
Nashville Warbler 199705 1/24
Yellow Warbler 199504 1/19, 200304 6/29, 199406 1/11 & 4/20, 199907 3/8 Tymor Park, BB - common, breeds. The area around the bridge and down the lane past the pool seems to be Yellow Warbler heaven. They are always there in numbers (Apr-July) and seem to arrive earlier than most other places in the county.
Chestnut-sided Warbler 199706 2/15, 199606 3/28 & 1/29 Regular, breeds.
Magnolia Warbler 199805 1/19 Regular during spring migration.
Yellow-rumped Warbler 200103 2/2, 200204, 199805 1/19, 199507 1/11, 200310 10/15 Common in migration.
Black-throated Green Warbler 199406 2/20 Regular in migration.
Blackburnian Warbler 199805 1/19 A few in migration.
Pine Warbler 200004 3/12, 199405 1/7, 199806 1/17, 200006 1/15 Find them off Trail B. Think they nest there, but haven't proved it yet. Only a few Pine Warblers breed in the county.
Palm Warbler 199804 1/1, 199704 1/23, 200004 2/12, 200204 1/10, 199905 2/1, 200310 18/15 Regular in migration.
Blackpoll Warbler 199605 1/26 Occasional in migration.
Black-and-white Warbler 199704 1/23, 199706, 199506 1/15, 199606 1/29 Regular, breeds here.
American Redstart 199907 1/13, 199507 2/11 Common, breeds here.
Worm-eating Warbler199705 1/24, 199405, 199806 1/9, 199706 1/20, 199506 1/15, 199606 2/29, 199507 1/5 They nest on the steep hillside on Trail H.
Ovenbird199506 4/15 & 1/19, 199606 1/28 & 3/29, 199907 1/8, 2/13, 199507 2/5 Common, breeds here.
Northern Waterthrush 199006 1/20.
Louisiana Waterthrush 199804 1/18, 199704 1/23, 199905, 200006 1/15, 199507 1/11 Regular, breeds here.
Common Yellowthroat Common, breeds.
Hooded Warbler 200006 2/15, 199907 1/13 .
Canada Warbler 199705, 199106 2/3 & 25.
Scarlet Tanager 199907 4/13, 199610 1/2 Regular, breeds here.

Eastern Towhee 199904 1/7, 199606 2/28 & 3/29 Regular, breeds here.
American Tree Sparrow 199811 2/1, 200312 20/22 Nearby (down Duncan Rd) - regular in winter.
Chipping Sparrow 199606 2/29, 199907 1/8 Common, breeds here.
Field Sparrow 199406 1/11, 199907 1/13 Regular, breeds here.
Fox Sparrow 200204 1/10, 199810 1/28, 199410 1-2/19, 199110 1/23.
Song Sparrow 199907 4/13, 200210 4/23 Common, breeds here.
Swamp Sparrow 199806 2/9, 199406 1/23, 199606 1/29, 199907 2/13, 199510 1/18 Regular in wet area along Duncan Rd by Equestrian Center. Breeds.
White-throated Sparrow 200210 6/23, 200312 10/22 Nearby down Duncan Rd. Common, except in summer.
White-crowned Sparrow 199610 1/2 Immature.
Dark-eyed Junco 200103 18/20, 199510 20/29, 200210 12/23 Common except in summer.
Northern Cardinal Regular, breeds here.
Rose-breasted Grosbeak Regular, breeds here.
Indigo Bunting Regular, breeds here.
Bobolink Not recorded at Tymor, but found "over the hill" along Shaunessey Rd.
Red-winged Blackbird Very common, breeds.
Eastern Meadowlark 199603 2/24, 199704 3/23, 200004 1/12, 200204 3/10 Regular, usually seen on top of the workout circuit hillside. Probably breeds in the field on the other side of the fence.
Common Grackle 199907 2/13 Common, breeds.
Brown-headed Cowbird Common, breeds.
Baltimore Oriole 199006 1/20 nest found, 199907 1/13 Common, breeds.
Purple Finch 199301 1/6, 200006 3/15, 199110 4/23, 200310 10/15 Regular, breeds.
House Finch Common, breeds.
American Goldfinch 199410 20+/19 Common, breeds.
House Sparrow Common, breeds.

APPENDIX F

Hemlock Management

Contents:

- Hemlock Woolly Adelgid USDA Pest Alert
- *Hemlock Wooly Adelgid*, The Connecticut Agricultural Experiment Station, 2004
- Elongate Hemlock Scale USDA Pest Alert
- Cornell Extension Elongate Hemlock Scale Lab Test Results

Pest Alert

United States Department of Agriculture

Forest Service

Northeastern Area
NA-PR-03-94

Hemlock Woolly Adelgid

The hemlock woolly adelgid, *Adelges tsugae,* has been in the United States since 1924. This introduced insect, believed to be a native of Asia, is a serious pest of eastern hemlock and Carolina hemlock. In the eastern United States, it is present from the Smoky Mountains, north to the mid-Hudson River Valley and southern New England.

White cottony sacs of the base of the needles are good evidence of a hemlock woolly adelgid infestation. These sacs resemble the tips of cotton swabs. They are present throughout the year, but are most prominent in early spring.

The hemlock woolly adelgid feeds during all seasons with the greatest damage occurring in the spring. It is dispersed by wind, birds and mammals.

By sucking sap from the young twigs, the insect retards or prevents tree growth causing needles to discolor from deep green to grayish green, and to drop prematurely. The loss of new shoots and needles seriously impairs tree health. Defoliation and tree death can occur within several years.

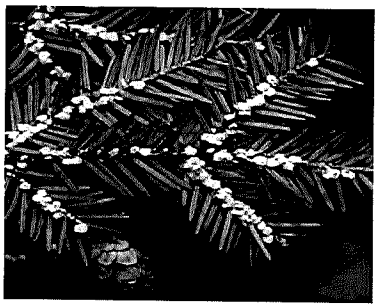

Photo 1. Egg masses produced by overwintering adults.

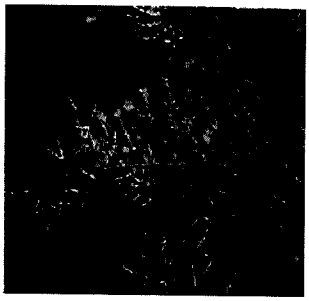

Photo 2. Discolored foliage and twig dieback caused by feeding nymphs.

Photo 3. Hemlock stand heavily damaged by hemlock woolly adelgid.

Technical Advisor, photo credits: Mark McClure, Connecticut Agricultural Experiment Station

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The Connecticut Agricultural Experiment Station
founded 1875
"Putting Science to work for society"

EN012[6/98]

Hemlock Woolly Adelgid, *Adelges tsugae* (Annand)

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What it is and How to Stop It

Hemlock woolly adelgid (HWA) is a small aphid-like insect from Japan that has become a serious pest of eastern hemlock, *Tsuga canadensis*, in the eastern United States. Even though an adelgid is smaller than a period at the end of this sentence, it is easily recognized on the young hemlock twigs by the presence of a dry, white woolly substance that covers its body and its egg masses. HWA injures hemlock by sucking sap and by injecting a toxic saliva while feeding. This causes the needles on infested branches to desiccate, turn a grayish-green color, and then drop from the tree usually within a few months. Most buds are also killed, so little if any new growth is produced on infested branches. Death of major limbs usually occurs within two years and progresses from the bottom of the tree upwards, even though the infestation may be evenly distributed throughout the tree. Trees often die within four years, but some survive longer in a severely weakened condition with only a sparse amount of foliage at the very top of the crown. These weakened trees are unsightly and have little chance for recovery. They often fall victim to wood-boring insects and diseases and are readily broken and thrown by wind.

HWA can not be managed in the forest at this time. However, hemlocks growing in nurseries and ornamental landscapes can be saved by carefully monitoring for the presence of the adelgid, by implementing various cultural practices to enhance tree vigor and to discourage pest invasion, and by using mechanical and chemical measures as needed to control adelgids.

Biology

HWA is parthenogenetic (all individuals are females) and completes two generations of development each year. During March and April, adults of the overwintering generation lay about 100 eggs each in a cottony mass on the young twigs. Nymphs (called crawlers) hatch from these eggs during a period of several weeks during April and May. Within a few days, they either disperse from the tree or settle on the twigs near the base of the needles where they insert their piercing and sucking mouth parts. There they feed and remain throughout their development. This spring generation matures by the middle of June. Some of the adults produced at this time are winged individuals that are unable to reproduce on hemlock. Therefore, they leave the hemlock tree is search of spruce, and because no suitable spruce host is available in the eastern United States, they soon die. Other adults produced at this same time are wingless and are able to reproduce on hemlock. In the middle of June these wingless adults lay about 100 eggs each in a cottony mass on the twigs. Crawlers which hatch in early July settle on the new growth and soon thereafter become dormant until the middle of October when feeding resumes. Nymphs feed and develop during the winter and mature by spring.

How to Monitor the Pest

Because HWA can damage trees so quickly, it is important to detect infestations early. Frequent visual inspection is the most effective means of determining whether or not a hemlock is infested. For most of the year the dry, white "wool" produced by the adelgid on the twigs is quite conspicuous contrasted against the dark green needles. It is particularly noticeable in spring on the undersides of the young twigs. Further evidence of HWA infestation is the thinning or grayish-green (not red or yellow) color of the needles on some branches. Usually by the time these symptoms appear, the tattered "wool" of a previous adelgid generation is also present on the branches.

Cultural Control Methods

Reducing invasion by adelgids: Because birds, squirrels and deer are important dispersal agents, any effort to discourage these animals from visiting hemlocks will reduce the risk of those trees becoming infested. Care should also be taken when moving plants, logs, firewood, or bark chips from infested areas onto an non-infested property, especially from March through June when adelgid eggs and crawlers are abundant. Cleaning vehicles, clothing, etc. after visiting forests, recreational areas, parks or other properties with infested hemlocks is also advisable during this period. Infestations of HWA often start on large outstanding hemlocks that intercept the prevailing wind or that are especially attractive to birds and other wildlife. When such a tree becomes heavily infested, it can serve as an effective "launch pad" for adelgid eggs

and crawlers. Selective removal of these heavily infested reservoir trees from the immediate vicinity will retard the establishment of new infestations

Improving tree health: HWA infests and kills hemlocks of all sizes and ages, even in habitats with seemingly optimal growing conditions. However, trees that are growing in poor sites or experiencing stress from drought and other agents succumb to adelgid attack more quickly. Therefore, maintaining good growing conditions can play an important role in the survival of hemlock. Because hemlock is a shallow rooted tree, it is particularly prone to stress when precipitation is abnormally low. Therefore, during periods of drought, trees should be watered as often as needed to ensure that they receive 1 inch of water per week (including rainfall) over the area beneath the drip line of the crown. Water should be applied slowly so that the roots will be soaked thoroughly. Pruning may also be of some value in improving the health of hemlock. Removing dead and dying branches and limbs from hemlock will promote new growth by allowing more light to reach the foliage, and will reduce the likelihood of attack by insect pests and diseases. Although applying fertilizer may improve the growth and vigor of non-infested trees, fertilizing infested hemlocks with nitrogen also enhances adelgid survival and reproduction. As a result, a fertilized hemlock becomes more heavily infested and more severely injured than an unfertilized one. Although nitrogen fertilizer should not be applied to an infested hemlock, fertilizing a tree after adelgids have been controlled may encourage growth and stimulate recovery. The potential risks and benefits of applying fertilizers which do not contain nitrogen to adelgid-infested hemlocks are unknown.

Mechanically removing adelgids: Eggs and crawlers of HWA are readily dislodged from the young hemlock twigs by wind and rain. Most of these individuals are unable to find their way back onto the tree and die. Therefore, intentionally dislodging eggs and crawlers by directing a strong stream of water at infested branches periodically during April through June may be of some value in reducing HWA numbers. Clipping the more heavily-infested twigs from hemlock branches will also reduce adelgid density on a given tree. However, extensive clipping may have undesirable effects on the general appearance and health of the tree.

Planting resistant hemlock species: Two Japanese hemlock species, *Tsuga diversifolia* and *T. sieboldii*, and two western North American hemlock species, *T. heterophylla* and *T. mertensiana*, are resistant to HWA. Although HWA infests these resistant species, it rarely reaches high enough densities to cause injury. Therefore, planting these resistant hemlocks should reduce the impact of HWA in the ornamental landscape. Of the four species, *T. heterophylla* is most similar to eastern hemlock in appearance, growth form, and utility. However, the likelihood for long term success of these hemlocks in the eastern United States in unknown.

Chemical Control Methods

Deciding whether or not to use pesticides: The use of chemical pesticides is an essential component of any control program for HWA. Even though cultural control measures can significantly reduce adelgid numbers on hemlock, infested trees are usually unable to survive for more than a few years unless chemical pesticides are applied. It is important to understand at the outset that hemlocks will need to be protected from the woolly adelgid as often as necessary until the danger has passed. This may be for a period of several years until all the unprotected hemlocks in the vicinity have died and can no longer serve as a source for re-infestation. Therefore, the initial decision on whether or not to use chemical control measures should consider the value of the trees relative to the anticipated cost of protecting them over the long term. It may be advisable to identify individual trees or groups of trees that have special value or significance on the property and to concentrate control efforts on those trees. This may be more successful than the overly ambitious approach of trying to save everything at first, only to lose it all when the resources have been depleted a few years hence.

What you need to know about pesticides: Several pesticides are registered for HWA. Some are available for homeowner use, while others are available for commercial use only by a licensed arborist. Because each of these pesticides has a relatively short life in the environment, treating an non-infested tree with pesticide offers little or no protection from invasion by hemlock woolly adelgid. Therefore, hemlocks should be treated only when an adelgid infestation is known to be present. Before applying any pesticide, read the product label very carefully. It will provide important information on safety, toxicity, and methods and rates of application.

Applying pesticide sprays: The most common and effective method for controlling HWA on ornamental hemlocks is to thoroughly drench infested trees with horticultural oil, insecticidal soap, or any one of numerous petrochemical insecticides that are specifically labeled for this use. Oil and soap are used most often because they are highly effective in killing adelgids, and yet they are relatively safe to the applicator, to beneficial insects, and to the environment. Unlike the petrochemical insecticides which kill by contact or ingestion, the oil and soap selectively kill soft-bodied insects, such as adelgids, by "suffocation" rather than by poisoning. *It is essential that all parts of the infested hemlock be drenched thoroughly with insecticide.* This precludes control on very large trees (usually those greater than about 80 feet tall) and those in forest settings. A backpack or garden hose sprayer may be sufficient to drench trees less than 30 feet tall, but taller trees may require the services of a professional arborist using a hydraulic sprayer. Fortunately, it is unnecessary to target a particular life stage of the adelgid for control; all are equally susceptible. Therefore, pesticide sprays can be applied any time during the year, weather permitting. One thorough application each year may be enough, if there are no other infested hemlocks within 100 yards from which adelgids could readily disperse. However, two spray treatments each year are usually necessary for most situations. If two applications each year are needed, an effective strategy is to spray in early April and again during the first half of June.

Another option is to substitute a spray during the last half of September for the April treatment. Either of these schedules will target both adelgid generations and minimize the impact of immigration. Because hemlock adelgid propagates and injures hemlocks so quickly, it is advisable to spray as soon as a new infestation is detected, and then to adopt one of the maintenance schedules described above if necessary.

Applying pesticides by stem injection and implantation: Introducing concentrated chemical pesticides into the stem of infested hemlocks by injection or implantation can control HWA on trees that are very tall or growing in areas inaccessible to spray equipment, or where spraying is undesirable such as near waterways and in recreation areas. The injection technique involves drilling small shallow holes into the root flares at the base of the tree and inserting into these holes pressurized plastic capsules containing liquid pesticide. The pesticide moves into and up the tree to where it is intercepted by the feeding adelgids. The implantation technique involves drilling larger, deeper holes in a spiral around the trunk of the tree and inserting in these holes a plastic cartridge containing a powdered pesticide within a gelatin capsule. The sap flow dissolves the capsule and the pesticide and carries it throughout the tree. These techniques, when applied in mid-May, have controlled adelgids for up to six months. Although stem injection and implantation provide alternatives to spraying for control of HWA, several considerations may limit their use. Both of these procedures require the pesticide to move in the sap flow. Therefore, they may be effective only on newly-infested, uninjured trees, because feeding by HWA quickly restricts the tree's ability to uptake and distribute water. The degree of wounding of the tree involved in the ongoing use of these drilling techniques is also of concern. Furthermore, because the injection method involves the use of highly concentrated liquid pesticides, its availability to the homeowner may be restricted.

Applying pesticides by soil injection and drenching: Introducing systemic insecticides into the roots of infested hemlocks in May is another alternative to protecting trees that can not be sprayed thoroughly. The soil beneath the tree's crown can either be drenched or injected with a hydraulic injection needle. The pesticide is then taken up by the roots and distributed throughout the tree where it can control HWA for five months or more. Unlike stem injection and implantation, these soil treatments do not wound the tree. However, as was the case with the stem treatments, trees must have a healthy sap flow for these soil techniques to be effective.

Evaluating the effectiveness of chemical controls: One of the most difficult tasks confronting the homeowner is to evaluate the effectiveness of efforts to control hemlock woolly adelgid. Unfortunately, the "wool" can persist on the twigs for several months after the adelgid has been killed. Therefore, the presence of "wool" is not necessarily indicative of living adelgid and an unsuccessful control effort. The simplest way to determine if further control measures are needed is to disregard the tattered, off-color "wool" on the older twigs, and to look for the production of fluffy, white "wool" only on the very youngest twigs.

Biological Control Methods

Hope on the horizon: Several native insects, including beetles, flies, and lacewings, are occasional predators of HWA in North America. Unfortunately, none of these has had a significant impact on adelgid populations or has shown much potential for biological control. In Japan, however, there are several effective natural enemies. Two species in particular, an oribatid mite (*Diapterobates humeralis*) and a ladybird beetle (*Pseudoscymnus tsugae*), are especially effective at locating and destroying infestations of HWA in Japan. We are now evaluating the potential of these arthropods as biological control agents in the eastern United States in the hope that someday they can be part of an integrated program for managing HWA in our forests, nurseries and ornamental landscapes.

Summary

Hemlock woolly adelgid, *Adelges tsugae*, is a small aphid-like insect from Japan that has become a serious pest of eastern hemlock, *Tsuga canadensis*, in the eastern United States. It can not be managed in the forest at this time. However, hemlocks growing in nurseries and ornamental landscapes can be saved by carefully monitoring for the presence of the adelgid, by implementing various cultural practices to enhance tree vigor and to discourage pest invasion, and by using mechanical and chemical measures as needed to control adelgids.

Pest Alert

United States
Department of Agriculture

Forest Service

Northeastern Area
NA-PR-01-02

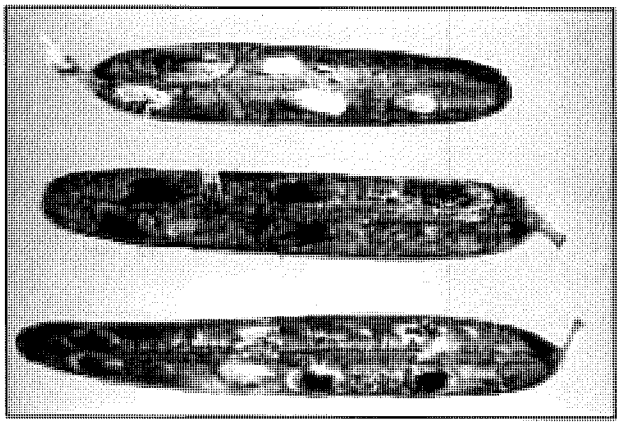
Elongate Hemlock Scale

The elongate hemlock scale, *Fiorinia externa* Ferris, native to Japan, is a pest of eastern hemlock, *Tsuga canadensis*, and Carolina hemlock, *T. caroliniana*, in the Eastern United States. It has been found in the District of Columbia and in nine states from Virginia to southern New England and west to Ohio. *F. externa* attacks the lower surface of the hemlock needle, where it removes fluids from the mesophyll cells through piercing and sucking mouthparts. Elongate hemlock scale sometimes occurs with two other exotic pests — a circular hemlock scale, *Nuculaspis tsugae* (Marlatt), and the hemlock woolly adelgid, *Adelges tsugae* Annand. Mixed infestations of scales and adelgids can greatly hasten hemlock decline.

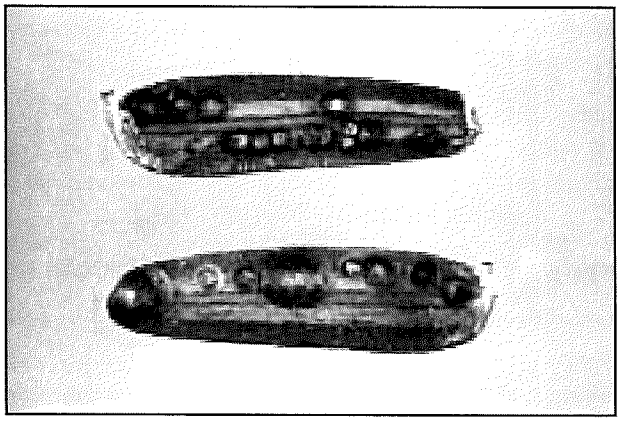
Hosts: Elongate hemlock scale is known to develop and reproduce on 43 species, representing 7 genera of native and exotic conifers, including 14 species that are native to the United States. Spruce and fir tend to be even more susceptible than hemlock, although it has not yet spread into the natural ranges of these other native conifers.

Description: Adult females are soft-bodied, legless, wingless, and are enclosed in an elongate, parallel-sided cover that is light yellow to brown, translucent, and about 2mm long. The male cover is elongate, white, and about 1.5mm long. Adult males are light brown, about 1.5mm long, have legs and wings, but are feeble-flying insects. Crawlers are legged first-stage nymphs that hatch from translucent eggs within the female cover. Crawlers are soft bodied, lemon-colored, and about 0.1mm long. Second-stage nymphs are enclosed in an oval, amber-colored cover, and are soft bodied, sedentary, and vary in size from 0.1mm to 1.0mm.

Life History: The elongate hemlock scale completes two generations each year in the Southern and Mid-Atlantic States, but usually only one in the Northeast. Its life stages are broadly overlapping everywhere, so crawlers can be found throughout the spring and summer. Crawlers are the only stage capable of dispersing and establishing new infestations. Dispersal between trees is primarily by wind and birds. Females have three stages of development after the egg, while males have five. Within a day or two after hatching, crawlers of both sexes settle beneath the thin waxy cuticle on the lower surface of the youngest hemlock needles and begin to feed. The first-stage nymph for both sexes secretes a cover around itself as it grows. It then molts into a second feeding stage, continues to grow and add to its cover. The second-stage female then molts into the adult feeding stage. The second-stage male molts into a non-feeding prepupa and spins a cocoon, where it pupates before it emerges as an adult. The adult male mates with the female and dies soon thereafter without feeding. The adult female lays about 20 eggs within her cover. When crawlers hatch, they exit through a small opening at the posterior end of the cover. Elongate hemlock scale usually overwinters, either as an egg or as an inseminated adult female.



Nymphs and adults of elongate hemlock scale, *Fiorinia externa*, on the lower surface of hemlock needles.

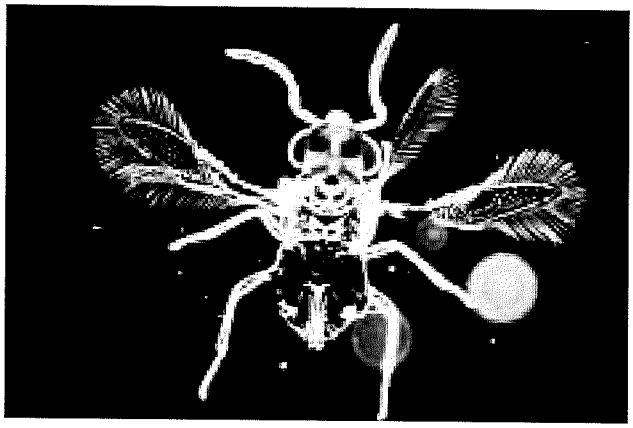


Nymphs and adults of circular hemlock scale, *Nuculaspis tsugae*, on the lower surface of hemlock needles.

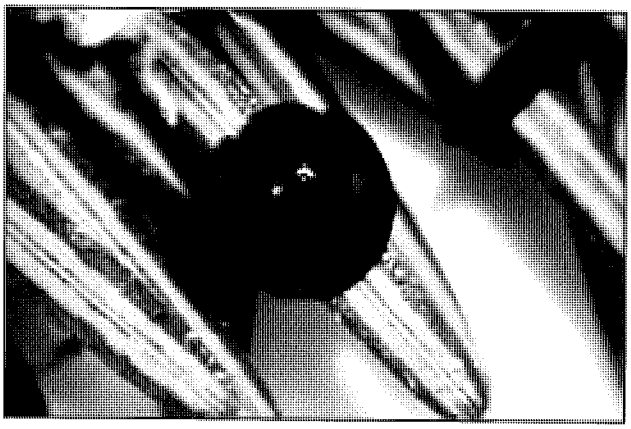
Damage to Hemlock: Scale populations build slowly on healthy trees, but much more quickly on stressed ones. Feeding by elongate hemlock scale causes foliage to turn yellow and drop prematurely. Dieback of major limbs, which progresses from the bottom of the tree upwards, usually occurs after scale density reaches about 10 individuals per needle. Trees often die within the next 10 years, but some survive longer in a severely weakened condition with only a sparse amount of foliage at the very top of the crown. These weakened trees are unsightly and have little chance for recovery. They often fall victim to secondary pests, such as hemlock borer and *Armillaria* root diease, and are readily broken and thrown by wind.

Damage to hemlock caused by elongate hemlock scale.

Control: Outbreaks of elongate hemlock scale often intensify following infestations of hemlock woolly adelgid, drought, or other stresses that have weakened the trees. Therefore, maintaining trees in healthy condition will discourage the buildup of scale populations. For example, hemlock have shallow roots and are consequently susceptible to drought, so ornamental trees should be watered during dry periods. However, applications of nitrogen fertilizer and broad-spectrum insecticides can exacerbate the pest problem. Nitrogen enhances the survival, development rate, and fecundity of *F. externa*, which results in higher scale densities on fertilized trees than on untreated ones. Also, inadequate pesticide application can cause resurgence in scale populations by eliminating natural enemies. The aphelinid parasitoid, *Aspidiotiphagus citrinus* Craw, consistently kills more than 90 percent of each generation of elongate hemlock scale in Japan. In the northeastern United States rates of parasitization are inconsistent (5-96 percent) because the life cycles of *A. citrinus* and *F. externa* are not synchronized. Two coccinellid beetles, the twice-stabbed ladybird beetle, *Chilocorus stigma* (Say), and *Microweisea misella* (LeConte), also attack *F. externa* in North America, but not frequently enough to control scale populations. Nevertheless, when broad spectrum or poorly applied pesticides eliminate these enemies, scale populations often rebound dramatically.



Adult of the aphelinid parasitoid, *Aspidiotiphagus citrinus.*



Adult of the twice-stabbed ladybird beetle, *Chilocorus stigma.*

Control of elongate hemlock scale is not possible in forests, but in ornamental plantings it can be controlled by thoroughly drenching trees with horticultural oil during early spring, when trees are dormant, and again, if needed, during the growing season. In forests, declining hemlocks should be salvaged to prevent buildup and spread of scale populations.

Photos and text by Mark S. McClure, The Connecticut Agricultural Experiment Station, P.O. Box 248, 153 Cook Hill Road, Windsor, CT 06095

For additional information, contact:

USDA Forest Service
Northeastern Area
Forest Health Protection
180 Canfield Street
Morgantown, WV 26505
(304) 285-1542

USDA Forest Service
Northeastern Area
Forest Health Protection
271 Mast Road
Durham, NH 03824
(603) 868-7600

COOPERATIVE EXTENSION
CORNELL UNIVERSITY

paid with check 932 send receipt back

DIAGNOSTIC CHECKLIST

17426

1. a. Referred by:
Name
Address
Phone: ( )

1. b. For ☐ grower ☐ homeowner:
Name Robin Macewan
Address 11 Highland Ave
Northampton, MA 01060
Phone: 413-584-0701
robintm@earthlink.net

1. c. Location of Problem:
~~out of state~~ Dutchess
county
city/township
UTM coordinates

1. d. DATE COLLECTED 2/11/04

1. e. DESCRIBE NATURE AND EXTENT OF PROBLEM:
extensive scale coverage of underside of hemlock needles, throughout, about 5 acre hemlock stand in Union Vale, NY

2. INSECTS
f. Do you want ☒ ID? ☒ Control Recommendation?
g. LIFE STAGE SENT: ☐ egg ☐ larva/immature ☐ adult

h. Host (Plant, animal, food, etc.) Hemlock tree, Tsvga Canadensis

i. IF HOST IS PLANT: growth stage; size of planting (Complete Section 3 below)
j. IF HOST IS ANIMAL: age of host; size of herd/flock
k. IF HOUSE/BUILDING: where found—rooms/floors

3. PLANTS
l. ID Hemlock tree
scientific or common name — variety/cultivar

m. DISEASE SYMPTOMS
☐ wilting
☐ yellowing
☐ galls
☐ dieback?
☐ rot
☐ marginal burns
☐ leaf drop
☐ leaf spots
☐ streak
☐ mosaic
☐ blight
☐
☐

4. FOR PLANT IDENTIFICATION:
Do you want: ☐ Control Recommendation?
☐ ID? ☐ Know if it is poisonous?

n. FOR PLANT DISEASES:
When did problem first occur? unknown
Is problem getting worse? assumably
How long have you owned the plant?
Age of plant(s)?
When transplanted last?
How often watered?

o. PLANT PART(S) AFFECTED
☐ stems
☐ roots
☐ leaves
☐ flowers
☐ fruit
☐

p. DISTRIBUTION OF PROBLEM
☐ entire field
☐ edge of field
☐ random
☐ high areas
☐ low areas
☐ wet area
☐ dry area
☐ sunny area
☐ shaded area
☐ next to drive ____ feet away
☐

q. CHEMICALS & FERTILIZERS Rate and date applied
Received 2/17/04

r. Acres or number of plants affected?
Percent loss?

s. CROPPING HISTORY

t. PLANTING
☐ field
☐ nursery
☐ yard
☐ orchard
☐ greenhouse
☐ forest
☐ indoor
☐

u. SOIL TYPE
☐ sandy
☐ loam
☐ potting mix
☐ clay
☐ mulch

v. DRAINAGE
☐ good
☐ fair
☐ poor
☐

DIAGNOSIS AND RECOMMENDATIONS

DO NOT WRITE IN THE SPACE BELOW.
FOR OFFICE USE ONLY (Attach a separate letter)

Diaspididae: (slide mounted scales)
Fiorinia externa Ferris
= Elongate hemlock scale. Please find enclosed additional info on this scale and current management recommendations.

Carolyn Klass — 2/24/04 — Sr. Extension Associate — Entomology
DIAGNOSTICIAN SIGNATURE — DATE — TITLE — DEPARTMENT

GROWER / HOMEOWNER COPY (SEND WITH SAMPLE)

APPENDIX G

Invasive Exotic Plant Species Identification and Management

Contents:

- Bush Honeysuckles
- Common Buckthorn
- Common Reed (Phragmites)
- Eurasian Watermilfoil
- Japanese Barberry
- Japanese Knotweed
- Multiflora Rose
- Oriental Bittersweet
- Purple Loosestrife
- Tree-of-Heaven

Invasive Alien Plant Species of Virginia

Bush Honeysuckles: Belle's honeysuckle (*Lonicera x bella* Zabel), Fragrant honeysuckle (*L. fragrantissima* Lindley & Pax), Amur honeysuckle (*L. mackii* (Rupr.) Maxim), Morrow's honeysuckle (*L. morrowi* A. Gray), Tatarian honeysuckle (*L. tatarica* L.), European fly honeysuckle (*L. xylosteum* L.)

Description

Bush honeysuckles are upright, generally deciduous shrubs that range from 6 to 16 feet in height. The opposite, simple leaves are usually oval to oblong in shape and range in length from 1 to 2.5 inches. Flowering occurs from May to June (February to April for fragrant honeysuckle) with the fragrant, tubular flowers borne in pairs. Flower color ranges from creamy-white in most species to pink or crimson in varieties of Tatarian honeysuckle. Whitish flowers become yellow with age. The fruit is a many-seeded, red to orange berry. Exotic bush honeysuckles can be confused with our Virginia native fly honeysuckle (*Lonicera canadensis*), but this seldom-seen species is restricted to high elevation mountainous terrain. Consult an appropriate guidebook or a natural resource expert for proper identification.

Habitat

In Virginia bush honeysuckles occur most often along roadsides and in forest edges, pastures and abandoned fields. Grazed and disturbed woodlots may also be invaded by some bush honeysuckle species. Although bush honeysuckles are most common in upland habitats, Morrow's honeysuckle is known to invade fens, bogs and lakeshores in portions of the northeastern United States.

Distribution

The invasive bush honeysuckles in Virginia are natives of Europe, eastern Asia or Japan. Most species have been cultivated as ornamentals in the eastern United States since the mid-1800s. Also, some varieties were developed and planted widely for wildlife food source. At present, bush honeysuckles are distributed locally in Virginia, particularly in northern and central regions, although their ranges appear to be expanding.

Threats

Bush honeysuckles can rapidly invade and overtake a site, forming a dense shrub layer that interferes with the life cycles of many native woody and herbaceous plants. Exotic bush honeysuckles can alter habitats they invade by decreasing light availability and depleting soil moisture and nutrients. Some species may also release chemicals into the soil that inhibit the growth of other plant species. The fruit of bush honeysuckles is fed upon by many kinds of

Morrow's honeysuckle *(L. morrowi)*

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL AND RECREATIONAL RESOURCES
1500 E. Main Street, Suite 312, Richmond, VA 23219
(804) 786-7951

Virginia Native Plant Society
P.O. Box 844, Annandale, VA 22030

Invasive Alien Plant Species of Virginia

Bush Honeysuckles

birds. The birds then spread the seed throughout the landscape.

Control

Light infestations may be cleared by hand with a shovel or grubbing hoe provided the entire root is removed. Severe infestations may be controlled by repeated treatments of cutting, burning or applying herbicide.

Brush cutting plants should be done during the growing season. Generally two cuts per year are recommended, one in early spring followed by one in the late summer or early autumn. Cuts made in the winter while the plant is dormant will only encourage vigorous resprouting.

The application of an herbicide is also an effective control method. Glyphosate herbicides are recommended because they are biodegradable. They will begin to break down into harmless components on contact with the soil. A glyphosate herbicide may be applied to the leaves or freshly cut stumps late in the growing season. Timing is important to insure effectiveness. Application near the end of the growing season when the plant is transporting nutrients to its roots will result in the highest rate of kill.

In some areas, prescribed burning may be used to control bush honeysuckles. Burns conducted during the growing season will top-kill shrubs and inhibit new shoot production. These burns will favor warm-season grasses and perennial forbs increasing species diversity and productivity.

Treatment of any severely infested areas usually requires management for a period of three to five years to inhibit growth of new shoots and eradicate target plants. Consult a natural resource specialist or an agricultural extension agent for more information on these control methods.

Written by Dr. Charles E. Williams, Department of Biology, Clarion University

References

Field, R. J. and W. A. Mitchell. 1988. Bush honesuckles (Lonicera spp.). Section 7.5.5. U.S. Army Corps of Engineers Wildlife Resources Management Manual. Technical Report EL-88-4.

Harvill, A. M., Jr., et al. 1992. Atlas of the Virginia Flora, 2nd ed. Virginia Botanical Associates, Farmville, Va.

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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Virginia Native Plant Society
P.O. Box 844, Annandale, VA 22030

Common Buckthorn

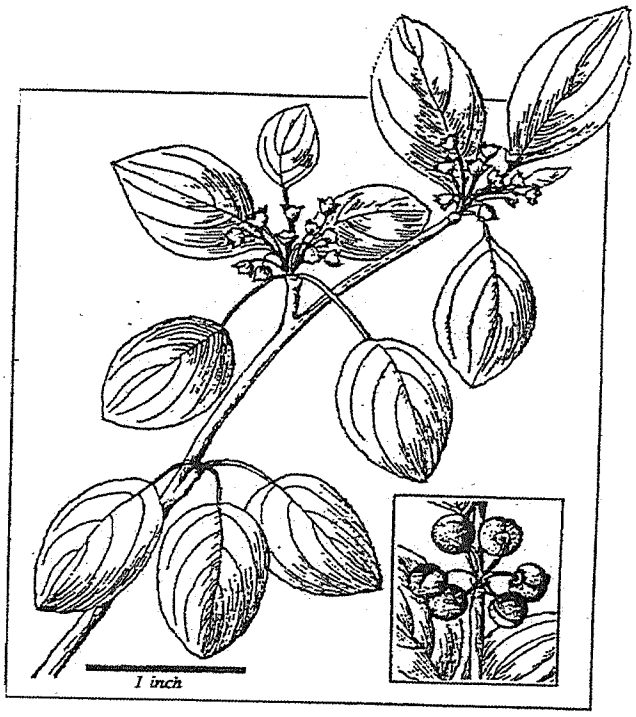
Rhamnus cathartica
Buckthorn Family (Rhamnaceae)

Invasive Plant Information Sheet

Status: Invasive in Connecticut.

Description: Common buckthorn is a deciduous perennial shrub or small tree that reaches up to 20 feet in height. The leaves are mostly opposite, smooth, dull green and one to two-and-a-half inches in length. Flowers are fragrant with four greenish-yellow petals, and stems that appear to originate from the same point to form a flat or rounded umbrella-shaped cluster (umbel). Gray-black bark and twigs have prominent raised areas (lenticels), and twigs may be tipped with sharp, stout thorns.

Buckthorn can establish dense stands, choking out native shrubs and herbaceous plants.



Inset shows berries. (Illustration courtesy of the New York Botanical Garden, from the "New Britton and Brown illustrated Flora of the United States and Adjacent Canada")

Preferred habitat: Common buckthorn occurs in a variety of habitats, including woodland buffers and wet areas. It has a preference for neutral or alkaline soils, and can be found in limestone wetlands.

Seasonal cycle: Buckthorn has a long growing season, with leaf-out in late April to mid-May, prior to most woody deciduous species. Each shrub typically bears either male or female flowers May through June. The female plants produce rounded black fruits, each with three or four grooved seeds, that ripen in August through September. Buckthorns retain their leaves late into the fall, and stems persist through the winter, as does much of the fruit. Seeds are spread by birds and mice, which eat the fruit.

Distribution: In North America, common buckthorn has naturalized from Nova Scotia to Saskatchewan, south to Missouri and east to Virginia.

Other points of interest: Native to Europe and Asia, common buckthorn was probably introduced to North America before 1800 and became widespread and naturalized in the early 1900s. It was cultivated for hedges, forestry uses, and wildlife habitat.

Control: Control methods include cutting/mowing, girdling, excavation, and chemical control. Seedlings or small plants may be pulled by hand or- removed with a grubbing hoe. Excavation is most useful in areas with low density invasions. Repeated cutting, which reduces plant strength, is recommended twice each season for two or three successive years. Girdling may be done all winter, does not disrupt the soil, and does not affect sensitive wetlands. Combining cutting with herbicide use may also be effective; it is

recommended the stems be cut in the spring at leaf expansion and again in August or September, at which time a 20% solution of glyphosate can be applied to the stump. (Glyphosate is a non-selective herbicide and great care must be taken when using it in order to not harm native plant species.)

Diagnostic information: *Leaves:* ovate-elliptic or subovate, glabrous and minutely serrate. I" to 2-1/2" in length. *Flowers:* 2-6 fragrant. yellowish-greenish. 4 petals, perfect, in axillary or supra axillary umbels. *Fruit:* black. berry with 3-4 separate seed-like nutlets of cartilaginous texture, seeds with a deep and dorsal groove. *Stem and branches:* spine-tipped long shoots and branches, gray-black bark. twigs have prominent lenticels.

Additional information sources:

Common Buckthorn and Glossy Buckthorn Element Stewardship Abstract. C.K. Converse. Unpublished report of The Nature Conservancy, 1984.

Experiment Finds Less Herbicide Needed to Control Buckthorn (Wisconsin) S. Glass. Restoration & Management Notes, 12:1, Summer 1994.

The *New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada.* Fifth printing. H. Gleason. Haffner Press, New York, 1974.

H. Bmnelle and B. Lapin / Revised April 18, 1996

The Nature Conservancy

The Nature Conservancy Connecticut Chapter 55 High Street Middletown, CT 06457

Department of Environmental Protection Geological & Natural History Survey Natural Diversity Data Base 79 Elm Street, Hartford, CT 06106

Invasive Alien Plant Species of Virginia

Common Reed (*Phragmites australis*)

Description

Common reed is a tall perennial wetland grass ranging in height from three to thirteen feet. Strong leathery horizontal shoots, called rhizomes, growing on or beneath the ground surface give rise to roots and tough vertical stalks. These stalks support broad sheath-type leaves that are one-half to two inches wide near the base, tapering to a point at the ends. The foliage is gray-green during the growing season, with purple-brown plumes appearing by late June. The plant turns tan in the fall and most leaves drop off, leaving only the plume-topped shoot. Big cordgrass (Spartina cynosuroides), a non-invasive species, is sometimes confused with common reed. It can be distinguished from common reed by its sparse flowering structure and long narrow leaves.

Habitat

Common reed thrives in sunny wetland habitats. It grows along drier borders and elevated areas of brackish and freshwater marshes and along riverbanks and lakeshores. The species is particularly prevalent in disturbed or polluted soils found along roadsides, ditches and dredged areas.

Distribution

Found throughout the temperate regions of North America, common reed is widespread in eastern Virginia and also can be found in some western areas of the state. It is strongly suspected that a non-native, aggressive strain of the species was carried to North America in the early 20th century.

Life History

Common reed spreads to a new area by sprouting from a rhizome fragment or from seed. New upright stems grow from the rhizome each spring. Rhizomes spread horizontally in all directions during the growing season. Flowering begins in late June, and seeds are formed by August. In early autumn, food reserves move from leave and stems to the rhizome system. The leaves die and fall off, with only the dead brown vertical shoots remaining. The accumulation of dead leaves and stems, as well as the pervasive rhizome system, prohibits the growth of desirable plant species.

Threats

Common reed has become a destructive weed in Virginia, quickly displacing desirable plants species such as wild rice, cattails, and native wetland orchids. Invasive stands of common reed eliminate diverse wetland plant communities, and provide little food or shelter for wildlife.

Prevention

Minimizing land disturbances and water pollution helps deter this invasive species. Land management practices that guard against erosion, sedimentation, fluctuating water levels and nutrient loading in wetlands are the best long-term protection.

Control

Once established, common reed is very difficult to completely eradicate.

However, careful planning and long-term management can yield varying levels of control. Herbicide use in combination with burning has generally proven to be the most effective means of control, and results in minimal disturbance to wetlands. Only a biodegradable herbicide that is licensed for use in wetlands and non-toxic to animals can be used. Because a healthy wetland ecosystem is generally resistant to invasive species, long-term control of common reed depends upon restoration of the health of the ecosystem.

For more information on native plant conservation, contact the Virginia Native Plant Society at the address below. For information on Virginia's natural areas and natural heritage resources, contact the Virginia Department of Conservation and Recreation's Division of Natural Heritage (see address below).

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL AND RECREATIONAL RESOURCES

217 Governor Street, Richmond, Virginia 23219
(804) 786-7951
http://www.state.va.us/~dcr/vaher.html

Virginia Native Plant Society
Blandy Experimental Farm
400 Blandy Lane, Unit 2
Boyce, Virginia 22620
(540) 837-1600
http://www.vnps.org

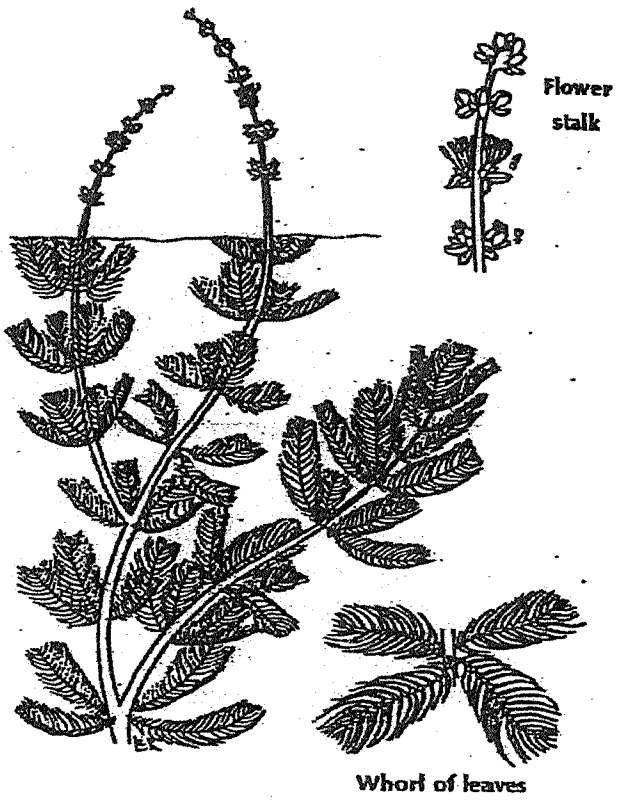
VERMONT INVASIVE EXOTIC PLANT FACT SHEET

Eurasian Watermilfoil

Myriophyllwn spicatum L.

Watermilfoll Family

Description: Eurasian watemillfoil is a submersed, perennial aquatic plant with leaves arranged in whorls of four around the stem. Each leaf is finely divided into many paired leaflets, giving the plant a delicate, feathery appearance. The plants are rooted in the bottom and usually branch heavily as they reach the water surface, forming a dense mat. The tops of Eurasian watermilfoil plants frequently have a reddish color. Erect flower spikes rise above the water surface. Flowers are small and are reddish in color. The spread of Eurasian watermilfoil can occur through seeds but is most frequently a result of vegetative fragmentation. Eurasian watermilfoil is similar in appearance to several species of native watermilfoils.



(Aquatic plant drawing is the copyright property of the University of Florida Center for Aquatic Plants (Gainesville). Used with permission.)

Habitat: Eurasian watermilfoil can be found in lakes, ponds, reservoirs, rivers, canals, and drainage ditches. Eurasian watermilfoil grows in shallow shoreline areas as well as in deeper water, 25 feet deep or more. It is tolerant of a wide range of environmental conditions.

Threats: Eurasian watermilfoil is highly invasive and competes aggressively with native aquatic plant species, thereby reducing biodiversity. *Dense* milfoil infestations can severely impair swimming, boating, and fishing activities. When the plant grows in dense amounts, water quality and fish abundance and distribution can also be affected.

Distribution: Eurasian watermilfoil is native to Europe and Asia. It was first introduced into North America in the mid 1940s. The first sighting of the plant was in a pond in Washington D.C. Since then it has spread to at least 40 states and three Canadian provinces. The quick spread of Eurasian watermilfoil across the country has been attributed mainly to boat traffic, where plant fragments have been transported accidentally from one site to another on motorboat propellers and trailers.

Distribution continued: The dumping of aquaria has also been the suspected source of some new populations. Eurasian watermilfoil infests 41 lakes and several rivers throughout Vermont. including the Connecticut River.

Control: Eurasian watermilfoil is controlled through various mechanical, chemical, biological, and physical methods. Mechanical methods include harvesting, hydro-raking, diver-operated suction harvesting, and dredging. Some aquatic herbicides, such as fluridone, triclopyr, and 2,4-D can be effective. Biological methods include the use of the herbivorous Asian fish known as the grass carp (not currently legal in Vermont) and a milfoil-eating weevil *(Euhrychiopsis lecontel)* native to North America. The use of the wee-vil is experimental at this time but it has shown some promise. Other techniques used for milfoil control are overwinter drawdowns (lowering lake water levels to expose milfoil to drying and freezing), bottom barriers (mats anchored to the bottom that kill plants by blocking out sunlight), and handpulling.

References:

Myriophyllum spicatumin North America. Richard Couch and E. Nelson. In: Proceedings of the First International Symposium on Watermilfoil and Related Haloragaceae Species. Vancouver, British Columbia, Canada. July 23-24, 1985.

Aquatic Vascular Plants of New England: Part 6. Trapaceae, Haloragaceae, Hippuridaceae. G.E. Crow and C.B. Hellquist. New Hampshire Agricultural Experiment Station, University of New Hampshire, Durham, New Hampshire. Station Bulletin 524. June, 1983.

The Nature Conservancy OF VERMONT

FISH & WILDLIFE

VERMONT AGENCY OF ENVIRONMENTAL CONSERVATION

For more information about Vermont's invasive exotic plant species or if you would like to know how you can help. Please contact:.

The Nature Conservancy of Vermont, 27 State Street, Montpelier, VT 05602 Tel: 802-229-4425

Vermont Department of Environmental Conservation, 1035. Main St., Bldg. 10 North, Waterbury, VT 05671-0408 Tel: 802-241-3777

Vermont Department of Fish. and Wildlife, 103 S. Main St.. Bldg. 10 South, Waterbury, VT 05671-0501 Tel: 802-241-3715

Invasive Plant Information Sheet

Japanese Barberry

Status: Common and invasive in Connecticut.

Description: Japanese barberry is a compact, woody shrub with arching branches. Most commonly it is two or three feet high, but can grow to six feet in height. On the stems, there is a single spine below each rosette of wedge-shaped, untoothed leaves.

The yellow flowers are bisexual, have four sepals (modified leaves below the petals), and the sepals and petals are similar in appearance. The flowers produce small, oblong red berries that are borne singly or in clusters from the stem. The inner bark and roots of Japanese barberry are yellow.

Preferred habitat: It is found along roadsides, fences, old fields, and open woods

Seasonal Cycle: Japanese barberry flowers in May and the fruits hang from the shrubs during the fall and into the winter. In autumn, the leaves of Japanese barberry turn varying shades of orange, red, and crimson. The woody stems of this shrub persist through the winter. Reproduction may be primarily through seeds, although there are reports of resprouting from roots remaining in the ground.

Distribution: Japanese barberry is native to Asia. Its range in North America extends from Nova Scotia south to North Carolina, and west to Montana.

Other points of interest: Japanese barberry was discovered in the mountains of Japan and sent to St. Petersburg Botanic Gardens by the Russian botanist Carl Maximowicz in 1864. About 1875, seeds from St. Petersburg were received at the Arnold Arboretum in Massachusetts and, from there, introduced to North America. Japanese barberry has been extremely popular for ornamental hedges because of its scarlet fruit, fall leaf color, and ease of cultivation. As its fruits are often eaten by birds, the plant has easily naturalized.

Common barberry *(Berberis vulgaris)* is another invasive plant that is less common than Japanese barberry in Connecticut. Similar in general appearance to Japanese barberry, common barberry has toothed leaves. and spines that are double- or triple-branched.

Control: Mechanical removal of the plant is recommended because it is effective and minimally intrusive. In early spring, this is one of the first plants to leaf out and can be distinguished easily from other shrubby vegetation. The use of a hoe, weed wrench, or mattock is suggested to uproot the entire bush and associated roots; gloves will help protect hands from the spines. The uprooted shrubs can be piled as cover for small animals. Plants growing in rock piles, which are difficult to dig out, can be treated with the herbicide glyphosate. Because it is a non-selective herbicide, great care must be taken when using it in order not to harm native plants.

Diagnostic information: *Leaves:* abovate to spatulate, usually obtuse, entire, narrowed at base to a short petiole, about 1/2" long in whorls or clusters. Leaves of the shoots metamorphosed into simple spines, bearing fascicles of small foliage leaves in their axles. *Stems:* woody, slender, with straight single spines; yellow wood and inner bark. *Flowers:* yellow, 1/4" wide, in elongate racemes, contracted umbel-like clusters, or sometimes solitary. *Petal:* six, usually smaller than the sepals and with two glands at the base of each. *Fruit:* berries ellipsoid, scarlet, 1/2" long.

Additional information sources:

Plants Invasive in Rhode Island. L.L. Gould and I. H. Stuckey. The Rhode Island Wild Plant Society.

Gray's Manual of Botany. Eighth edition, corrected printing. M. Fernald. D. Van Nostrand Company, New York, 1970.

The Barberry Family. American Horticulturist 64: April 1985.

The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada. fifth printing. H. Gleason. Haffner Press, New York, 1974.

H. Brunelle and B. Lopin / Revised April 1996

The Nature conservancy

The Nature Conservancy Connecticut Chapter 55 High Street Middletown, CT 06457

Department of Environmental Protection Geological & Natural History Survey Natural Diversity Data Base
79 Elm Street, Hartford, CT 06106

Invasive Alien Plant Species of Virginia

Japanese Knotweed (*Polygonum cuspidatum*)

Description

Japanese knotweed is a herbaceous perennial in the buckwheat family. It can grow three to nine and a half feet in height. It is sometimes called Mexican bamboo because of its stout, round, hollow stems and formations of dense clumps. It forms rhizomes which can reach forty-five to sixty feet in length. The leaves are two to six inches long and two to five inches wide, flattened at the base, and taper to a point at the end. The greenish-white flowers occur in clusters along the stem. Flowers bloom from August to September. The three-sided seeds are shiny black-brown. Its primary mean of reproduction appears to be vegetative. Rhizome fragments readily give rise to new plants. Japanese knotweed closely resembles giant knotweed, another member of the buckwheat family. Giant knotweed is taller and has larger leaves with a rounded leaf base. Consult a field guide or natural resource specialist for accurate identification.

Habitat

Japanese knotweed is found in moist open habitats. It has been reported from riverbanks and islands, wetlands, along roadways, hillsides, and disturbed areas in a variety of soil types. It does poorly in a forested understory.

Distribution

Native to Asia, Japanese knotweed came to the United States as an ornamental via England about a century ago. It has since spread in the wild and is now found from Nova Scotia to North Carolina. Japanese knotweed is widely scattered in Virginia.

Threats

Japanese knotweed emerges in early spring and grows rapidly to heights of six to nine feet. It forms dense, nearly pure stands which crowd out native plants. It reproduces almost solely from rhizomes. The rhizomes can regenerate from very small fragments. Fragments are transported to new sites by water and by humans moving soil as fill dirt. The deep roots enable it to outcompete other plants for water and nutrients. Once established, Japanese knotweed is very difficult to eradicate.

Control

Although not yet a serious pest in Virginia natural habitats, the presence of Japanese knotweed is of great concern. Experience in other states where it is a serious pest suggests that the best control method is prevention of establishment. The plant should be eradicated as early as possible upon its appearance. Cutting the stalks as often as three times during the growing season will offset growth of the rhizomes. Cutting followed immediately by application of a glyphosate herbicide has been found to be most effective. This should be done in late August through September when plants are translocating material to their root system for the winter. Several years of treatments may be needed to ensure that the rhizomes have been exterminated.

Japanese Knotweed (*Polygonum cuspidatum*)

Illustration from *Newcomb's Wildflower Guide*, by Lawrence Newcomb, Little, Brown and Company. Used with permission.

12/97

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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Blandy Experimental Farm
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Boyce, Virginia 22620
(540) 837-1600
http://www.vnps.org

Invasive Alien Plant Species of Virginia

Multiflora Rose (*Rosa multiflora* Thunberg)

Description

Multiflora rose is a perennial, thorny shrub of medium height. Its arching or trailing stems can root at the tip, forming dense thickets. The compound leaves alternate along the stems; each leaf has 5-11 oval leaflets, the edges of which are toothed. In late spring, multiflora rose blooms in tapering clusters of white flowers. As in other rose species, the fruits are small, red hips. The seeds found in the hips of multiflora rose are sought after by many different bird species during winter.

Habitat

Usually found in fields, pastures and along roadsides, multiflora rose can also appear in dense forest where fallen trees have opened a gap in the forest canopy. It is adaptable to a wide range of environments but is not found in standing water or in extremely dry habitats.

Distribution

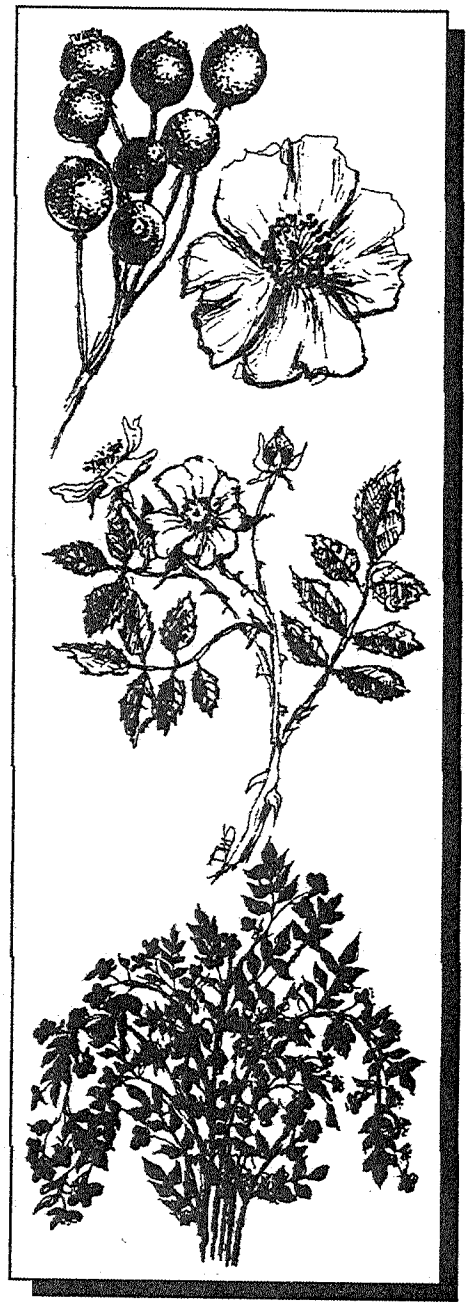
Multiflora rose is native to Asia and was brought to the United States from Japan in the 1880s by horticulturists. Later, wildlife managers planted it for wildlife food and cover. Once used for control of soil erosion and on highway medians to reduce headlight glare, multiflora rose is now found throughout most of the United States. It has established itself in all but a dozen counties of Virginia. The Virginia Department of Agriculture and Consumer Services has listed this plant as a noxious weed.

Threats

Multiflora rose forms dense thickets which can choke out native plant species. These thickets act as living fences, impenetrable by man or large animals. Results from studies done on multiflora rose suggest it is highly competitive for soil nutrients.

Control

Lightly infested areas may be cleared with a shovel or grubbing hoe provided the entire root is removed. Severe infestations of multiflora rose are effectively controlled by mowing or cutting. However, this treatment must be repeated 3-6 times a year for 2-4 years. Applying a glyphosate herbicide directly to freshly cut stumps helps insure kill of the root system. This method is most effective if done late in the growing season. Foliar application of a glyphosate herbicide will also kill multiflora rose. Glyphosate herbicides are recommended because they are biodegradable. However, glyphosate is a nonselective, systemic herbicide and will affect all



***Multiflora Rose* (Rosa multiflora *Thunberg*)**

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL AND RECREATIONAL RESOURCES
217 Governor Street, Richmond, VA 23219
(804) 786-7951; *http://www.state.va.us/~dcr/vaher.html*

Virginia Native Plant Society
Blandy Experimental Farm
400 Blandy Farm Lane, Unit 2
Boyce, VA 22620
(540) 837-1600
http://www.vnps.org

Jim Gilmore, Governor • John Paul Woodley, Jr., Secretary of Natural Resources • David G. Brickley, Director, Department of Conservation and Recreation

Invasive Alien Plant Species of Virginia

Multiflora Rose (*Rosa multiflora* Thunberg)

green vegetation. To be safe and effective, herbicide use requires careful knowledge of the chemicals, appropriate concentrations, and the effective method and timing of application. Consult a natural resource specialist or agricultural extension agent for more information before attempting any herbicide control program.

In some situations, a prescribed burn during the early growing season may be an appropriate method for controlling severe infestations of multiflora rose. As with mechanical control methods, follow-up burn treatments may be necessary for several years to remove plants sprouting from stems or seed. Seek the advice of an agricultural extension agent or natural resource specialist before implementing this control method.

Suggested Alternatives

Some native shrubs with attractive flowers and/or fruit production useful to wildlife include Carolina rose (*Rosa carolina*), high-bush blueberry (*Vaccinium corymbosum*), black haw (*Viburnum prunifolia*), winterberry (*Ilex verticillata*) and American holly (*Ilex opaca*) (dioecious, female plant for fruit). These species should be available at most large nurseries and garden centers.

References

Evans, J. and N. Ekhardt. 1987. Element Stewardship Abstract: Rosa multiflora. The Nature Conservancy, Minneapolis.

Szafoni, R. 1990. Vegetation Management Circular: Multiflora rose. Illinois Nature Preserves Commission, Charleston.

Harvill, A., et al. 1992. Atlas of Virginia Flora. Virginia Botanical Association, Burkesville.

Illustration by Donna Smith

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For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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http://www.vnps.org

Invasive Alien Plant Species of Virginia

Oriental Bittersweet (*Celastrus orbiculatus* Thunb.)

Description

Oriental bittersweet is a deciduous, twining vine with alternate, nearly round, glossy leaves. Small, greenish flowers occur in clusters in the axils. The leathery capsule surrounding the seed ripens to a bright orange. The native species, American bittersweet (*Celastrus scandens*), differs from the invasive by its leaves, which are somewhat longer than wide, and the terminal panicle of flowers. Consult a natural resource specialist for an accurate identification.

Habitat

This species grows in alluvial woods, roadsides, thickets and old home sites. From there it may spread to undisturbed mesic or dry-mesic forests.

Distribution

Oriental bittersweet, a native of Asia, was brought to the United States for cultivation during the middle of the nineteenth century. It is now naturalized in 21 of the 33 states where it was introduced, a region extending from Maine south to Georgia, and west to Iowa. Oriental bittersweet is found in over half the counties of Virginia.

Threats

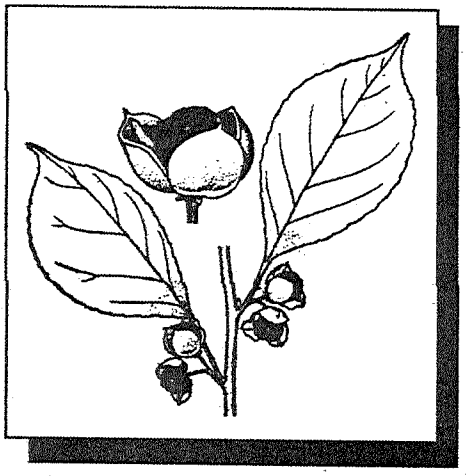
This plant can overrun natural vegetation in much the same way as kudzu (*Pueraria lobata*), over-topping all other vegetation and forming thick, nearly pure stands. It can strangle shrubs and tree limbs, and weaken a tree by girdling the trunk and weighting the crown, making the tree more susceptible to wind and ice damage. There is some evidence that it can hybridize with American bittersweet, thus threatening genetic integrity of the native species.

Control

Light infestations of a few small plants can be controlled by cutting the vines and handpulling the roots. Dense infestations can be treated by cutting the vines followed immediately by application of a glyphosate herbicide to the stumps. Merely cutting vines without removing or killing the roots will only stimulate vigorous re-growth. To ensure rootkill, a late-season foliar application of herbicide may be necessary. Glyphosate herbicides are recommended because they are biodegradable. However, glyphosate is a nonselective, systemic herbicide that affects all green vegetation. To be safe and effective, herbicide use requires careful knowledge of the chemicals, appropriate concentrations, and the effective method and timing of their application. Contact a natural resource specialist for more information about controlling invasive plant species.

Alternative Plants for Cultivation

Many native species of vines are available through local nurseries or mail order. American bittersweet (*Celastrus scandens*) is our native bittersweet and does not exhibit the invasive tendencies of Oriental bittersweet. Crossvine (*Bignonia capreolata*), trumpet honeysuckle (*Lonicera sempervirens*), and trumpet creeper (*Campsis radicans*) are all climbing vines which produce bright red-orange flowers attractive to hummingbirds. Virgin's bower (*Clematis virginiana*) is a climbing vine which blooms in clusters of fragrant white flowers. Virginia creeper (*Parthenocissus quinquefolia*) grows well in the shade and its cluster of dark purple berries are an important food for birds. For more information on native plants for cultivation contact the Virginia Native Plant Society (see address below).



***Oriental Bittersweet* (Celastrus orbiculatus *Thunb.*)**

Illustration from *New Britton & Brown Illustrated Flora of the Northeast U.S. and Adjacent Canada*, by H.H. Gleason, New York Botanical Gardens Scientific Publications. Used with permission.

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For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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Invasive Alien Plant Species of Virginia

Purple Loosestrife (*Lythrum salicaria* L.)

Description

Purple loosestrife is an herbaceous perennial characterized by long showy spikes of magenta flowers. Usually under 4 feet in height, the plant may reach up to 10 feet tall in nutrient-rich habitats. Purple loosestrife has flowers with 5 to 7 petals which occur in dense clusters on terminal spikes and which bloom from June to September. The leaves are usually opposite or in whorls of 3, lance-shaped, and without teeth. The plant is a member of the loosestrife family (Lythraceae) and may be confused with other members of that family, particularly with the native winged loosestrife (*Lythrum alatum*), which is rare in Virginia. Winged loosestrife, however, is generally smaller in height, averaging about 2 feet, has alternate leaves on the upper portion of the stem, and has fewer, more widely-spaced flowers. Purple loosestrife is virtually indistinguishable from another Eurasian species, *Lythrum virgatum*, and its cultivars.

Habitat

Purple loosestrife occurs in a variety of wetland habitats, including wet meadows, marshes, river banks, and the edges of ponds and reservoirs.

Distribution

A native of Eurasia, purple loosestrife was introduced into the northeastern U.S. and Canada in the early 1800's. The plant has subsequently spread westward and southward through most of temperate North America. Purple loosestrife is infrequent but widespread in Virginia, where it is known from 32 counties.

Threats

According to most reports, purple loosestrife crowds out native wetland vegetation, such as cattails, grasses, sedges, and rushes. The plant thrives in disturbed wetlands but also invades natural wetland communities. It often forms extensive monospecific stands in place of a diverse mixture of native species which provide the food and shelter required by many species of native wildlife. Purple loosestrife itself is of little or no value to wildlife. Purple loosestrife may have achieved its widespread distribution due to its lack of natural predators in North America, as well as its reproductive capabilities. A single stalk may produce as many as 300,000 seeds, and densities of up to 80,000 stalks per acre have been reported. The species also readily reproduces from stem or root segments. Cultivars of *Lythrum salicaria* and the closely related Eurasian *Lythrum virgatum*, are widely sold by commercial nurseries. Many of these cultivars are advertised as being sterile. The results from research have shown that these commercial cultivars are highly fertile both when crossed among themselves and with wild purple loosestrife populations. Thus, these cultivars can be contributing to the spread of purple loosestrife in the wild, although this has not been conclusively demonstrated.

Purple Loosestrife (Lythrum salicaria *L.*)

Control

Accurate identification through field guides or a knowledgeable person

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Invasive Alien Plant Species of Virginia

Purple Loosestrife (*Lythrum salicaria* L.)

should be made before control measures are begun. Early detection of the plant is important as small populations are more successfully controlled than large, entrenched populations. Small populations of purple loosestrife may be removed by hand pulling. This method should be avoided after flowering so as not to scatter seed. Pulled plants should be bagged at the site so that fragments are not dropped along the exit route. Burning is the preferred method of disposal. Follow-up treatments may be needed in subsequent years to remove new plants which sprout from seed persisting in the ground. Digging plants out is not recommended as this creates disturbance, which may favor the spread of the species. Where mechanical removal is not feasible, purple loosestrife may be removed by spot application of glyphosate herbicide to individual plants. As glyphosate is a nonselective herbicide, it should be used sparingly to avoid contact with desirable species which may grow beneath the loosestrife. These species will be important for recolonizing the area after loosestrife has been removed. As with mechanical control methods, follow-up treatments may be needed in subsequent years to remove new plants which have sprouted from the seed bank.

Suggested Alternatives for the Garden

A growing interest in ecologically-informed gardening has brought about greater commercial availability of native plants suitable for the garden. Some species which are similar in appearance to purple loosestrife but are not invasive to natural areas include the following: obedient plant (*Physostegia virginiana*) produces flowers shaped like dragon heads and the seed are a source of food for songbirds. The pink flowers of spiked blazing star (*Liatris spicata*) and button blazing star (*Liatris squarrosa*) provide food for butterflies and hummingbirds, and the seeds are eaten by songbirds. Whenever buying native species of plants, check that they are nursery-grown from seed and not taken from the wild. Collecting plants from the wild for resale can damage ecological communities and assist further spread of invasive species.

References

Anderson, N.O. and P.D. Ascher. 1993. Male and female fertility of loosestrife (Lythrum) cultivars. Journal of the American Society of Horticultural Science 118 (6): 851-858.

Benedict, J. 1990. Purple loosestrife control in Voyagers National Park. Park Science 10 (3): 21-22.

Heidorn, R. 1990. Vegetaion management guideline: purple loosestrife (Lythrum salicaria). Illinois Department of Conservation.

Thompson, D.Q., R.L. Stuckey, and E.B. Thompson. 1987. Spread, impact and control of purple loosestrife (Lythrum salicaria) in North American wetlands. Fish and Wildlife Research 2.

Rawinski, T.J. 1982. The ecology and management of purple loosestrife (Lythrum salicaria L.) in Central New York. M.S. thesis, Cornell University, Ithaca, N.Y.

Illustration by Nicky Staunton.

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For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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Boyce, VA 22620
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Invasive Alien Plant Species of Virginia

Tree-of-Heaven (*Ailanthus altissima* (Miller) Swingle)

Description

Tree-of-heaven is a small to medium-sized tree in the mostly tropical Quassia family. It has smooth gray bark. Leaves are compound, alternate, odd-pinnate, with 11-25 lanceolate leaflets. Most leaflets have one to three course teeth near their base. Tree-of-heaven leaves may be confused with those of sumac or black walnut. Flowers occur in panicles at the ends of branches; male flowers produce a strong odor which has been described as "the smell of burnt peanut butter." The leaves when crushed also produce this distinctive, offensive odor. Seeds are centered in a papery sheath called a samara. The samaras are slightly twisted or curled, and twirl as they fall to the ground. They can be borne on the wind great distances from the parent plant.

Habitat

Tree-of-heaven establishes itself readily on disturbed sites. These include vacant lots of the inner city, railroad embankments, highway medians, fence rows and roadsides. In naturally forested areas, disturbance created by severe storms or insect infestations can open the way for tree-of-heaven infestation.

Distribution

Tree-of-heaven is native to a region extending from China south to Australia. It was imported into the United States in 1784 by a Philadelphia gardener. In the western states it was brought over by Chinese immigrants who use it for medicinal purposes. Due to its rapid growth and prolific seed production, it quickly escaped from cultivation.

Threats

One tree-of-heaven can produce up to 350,000 seeds in a year. Seedlings establish a taproot three months from germination. Thus they quickly outrace many native plant species in competition for sunlight and space. Tree-of-heaven also produces a toxin in its bark and leaves. As these accumulate in the soil, the toxin inhibits the growth of other plants. This toxin is so effective it is being studied as a possible source for a natural herbicide. These factors combine to make tree-of-heaven a very aggressive invasive plant able to displace native tree and herb species. Furthermore, the root system is capable of doing damage to sewers and foundations.

Control

Tree-of-heaven is very difficult to remove once it has established a taproot. It has persisted in certain areas despite cutting, burning and herbiciding. Therefore, seedlings should be removed by hand as early as possible, preferably when the soil is moist to insure removal of the entire taproot. Larger plants should be cut; two cuttings a year may be necessary, once in the early growing season and once in the late growing season. Initially, this will not kill the plant; it will vigorously resprout from the roots, but seed production will be prevented and the plants will be lowered in stature. If continued over a period of several years, cutting during the growing season stresses the plants and may eventually kill them.

Tree-of-Heaven *(Ailanthus altissima)*

A glyphosate herbicide, either sprayed onto the leaves or painted onto a freshly cut stump will kill the plant. However, to insure the herbicide gets into the root system, it is best to apply this herbicide in the late

For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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1500 E. Main Street, Suite 312, Richmond, VA 23219
(804) 786-7951

Virginia Native Plant Society
P.O. Box 844, Annandale, VA 22030

Invasive Alien Plant Species of Virginia

Tree-of-Heaven

growing season while the plant is translocating nutrients to its roots. Glyphosate herbicides are recommended because they are biodegradable, breaking down into harmless components on contact with the soil. However, glyphosate is a nonselective, systemic and will affect all green vegetation. To be safe and effective, herbicide use requires careful knowledge of the chemicals, appropriate concentrations, and the effective method and timing of their application. Consult a natural resource specialist or agricultural extension agent for more information before attempting herbicide control of tree-of-heaven.

References

Hoshovsky, M. 1986. TNC Element Stewardship Abstract: Ailanthus altissima and Ailanthus glandulosa. The Nature Conservancy, San Francisco.

Hu, S. 1979. Ailanthus. Arnoldia 39(2):29-50.

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For more information, contact the Department of Conservation and Recreation or the Virginia Native Plant Society.

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APPENDIX H

Resources

Contents:

- Sources of Technical or Financial Support
- Native Plant and Seed Sources

SOURCES of TECHNICAL or FINANCIAL SUPPORT

- *Center for Watershed Protection* (Ellicot City, MD)
  www.cwp.org/stormwater_mgt.htm
  Best Management Practices for water resources protection
  Watershed planning and restoration

- *Cornell Cooperative Extension Dutchess County* (Millbrook, NY)
  Hemlock management

- *Dutchess County Department of Planning & Development* (Poughkeepsie, NY)
  Technical and financial assistance through the Greenway Compact Program

- *Dutchess County Environmental Management Council* (Millbrook, NY)
  Natural resources management and protection

- *Dutchess Land Conservancy* (Millbrook, NY)
  Land conservation

- *Ernst Conservation Seeds* (Meadville, PA)
  Native plant and seed source
  Reclamation and conservation planting advice

- *Forest Land Enhancement Program* (NYSDEC)
  Native species regeneration
  Invasive species management

- *Hudsonia, Ltd.* (Annandale, NY)
  Inventory assistance
  Water quality monitoring assistance

- *Institute of Ecosystem Studies* (Millbrook, NY)
  Inventory assistance
  Deer management
  Forest management perspectives

- *Invasive and Exotic Plant Species Compendium* (CD ROM)
  A compendium of articles on the biology and control of invasive species
  $32 from Natural Areas Association, PO Box 1504, Bend, OR 97709

- *Invasive Plant Atlas of New England* (http://invasives.eeb.uconn.edu/ipane/)
  Invasive plant species identification, inventory, and management

- *New York Natural Heritage Program* (NYSDEC)
  Rare plant and animal inventory assistance

- *New York State Department of Environmental Conservation* (New Paltz, NY)
  (www.dec.state.ny.us)
  Deer management
  Meadow management
  Wildlife management
  Forest management
  Invasive plant species management

- *Northeast Aquatic Nuisance Species Panel* (www.NEANS.org)
  Invasive aquatic plant species management

- *Paul Curtis* (Cornell University)
  Deer management and deer fertility control research

- *Prairie Nursery* (Westfield, WI)
  Meadow management

- *Trout Unlimited: Small Dams Campaign*
  (www.tu.org/small_dams/about_small_dams.html)
  Small dam removal and stream restoration

NATIVE PLANT & SEED SOURCES

Amanda's Garden
8410 Harpers Ferry Rd
Springwater, NY 14560
Ph: (716) 669-2275
Email: EFolts4826@aol.com
Retail, wholesale, and mail-order nursery

Broken Arrow Nursery
13 Broken Arrow Road
Hamden, CT 06518
Ph: (203) 288-1026
Fax: (203) 287-1035
Retail, wholesale, and mail-order nursery specializing in shrubs and trees

Ernst Conservation Seeds
9006 Mercer Pike
Meadville, PA
Ph: (800) 873-3321
(814) 336-2404
Fax: (814)-336-5191
Web: www.ernstseed.com
Plant and seed source, technical advice, reclamation and conservation planting

Laughton Nursery
31 Lowell Rd
Westford, MA 01886
Ph: (978) 692-7752
Fax: (978) 692-5887
Retail and wholesale nursery specializing in grasses, trees, and shrubs

National Heirloom Flower Seed Exchange
113 Plain Rd
Wayland, MA 01778
Ph: (508) 358-4438
Seed company

Native Son Natural Landscapes
101 Gun Hill Road
New Preston, CT 06777
Ph: (860) 868-2268
Fax: (860) 868-2268
Nursery specializing in wildflower seeds

New England Wildflower Society/Garden in the Woods
180 Hemenway Rd
Framingham, MA 01701-2699
Ph: (508) 877-7630
Fax: (508) 877-3658
www.newfs.org
Business specializing in grasses, shrubs, trees, cacti, succulents, and wildflowers

Northeastern Ferns & Wildflowers
PO Box 292
74 Bald Hill Rd., Newmarket
Newfields, NH 03856
Ph: (603) 659-8979
Retail and wholesale business

Prairie Nursery
PO Box 306
Westfield, WI 53964
Ph: (800) 476-9453
Web: www.prairienursery.com
Plant and seed source, technical advice

Rolling Green Nursery
PO Box 4093
Portsmouth, NH 03802
Ph: (603) 436-2732
Fax: (603) 436-2309
Email: rgln@rcn.com
Retail nursery specializing in grasses, shrubs, and trees

Roslyn Nursery
211 Burrs Lane
Dix Hills, NY 11746
Ph: (631) 643-9347
Fax: (631) 427-0894
roslyn@roslynnursery.com
www.roslynnursery.com
Retail and mail-order nursery specializing in grasses, shrubs, and trees

Treehaven Evergreen Nursery
981 Jamison Rd
Elma, NY 14059-9569
Ph: (716) 652-4206
Wholesale and mail-order nursery specializing in shrubs and trees

Tripple Brook Farm
37 Middle Rd.
Southampton, MA 01073
Ph: (413) 527-4626
Fax: (413) 527-9853
www.tripplebrookfarm.com
Retail and mail-order nursery specializing in grasses, shrubs, trees, cacti, and succulents

Vermont Wildflower Farm/American Meadows, Inc.
PO Box 5, Route 7
Charlotte, VT 05445-0005
Ph: (802) 425-3500
Fax: (802) 425-3504
Retail, wholesale, and mail-order seed company specializing in wildflowers

Wildginger Woodlands
PO Box 1091
1297 Mill Creek Run
Webster, NY 14580
Email: bcmmin@frontiernet.net
Retail and mail order nursery specializing in wildflowers

APPENDIX I

Furnace Pond Dam

Contents:

- Letter from Dutchess County Soil and Water Conservation District

DUTCHESS COUNTY SOIL AND WATER CONSERVATION DISTRIC
2715 Route 44, Suite 3
Millbrook, NY 12545
Phone (845) 677-8011 ext. 3 Fax (845) 677-8354

November 6, 2003

Lisette Hitsman, Union Vale Supervisor
2 Duncan Road
LaGrangeville, NY 12540

Re: Tymor Park, Furnace Pond Dam Inspection

Dear Mrs. Hitsman,

On November 4, 2003, Brian Scorlick and Craig Vogel accompanied you on a site inspection of the Furnace Pond Dam. The dam is 18-20' high, mostly laid stone blocks with concrete mortar and a concrete cap and spillway. The concrete is in good condition but the stone face has two small leaks between the stones near the bottom. The large stone blocks in the dam have been carefully set between notched bedrock. The east side of the dam has a 24 inch steel pipe that led to the iron ore mill. The east side also has a drain that is controlled by a wheel valve that has not been moved for years. There is a water leak on the east side that could be coming through the shale bedrock or through the stone dam blocks. The leaks have not changed for years. The safety fence is adequate. The tree trunks that collect on the dam spillway are pulled off or fall over the top in high flow times.

This office recommends that the dam be inspected by an engineering firm that specializes in dam inspection and repair. There is a liability to roads and homes below Dorn Road that should be protected by a professional inspection. Dams over 10 feet high are considered a high hazard structure.

The 9 acre Furnace Pond and Island have sediment build up that reduces the recreation potential. The pond will need to be drained for the dam inspection. This would be a good time to remove some of the sediment. The sediment should be core tested by an NYS Department of Conservation Laboratory to determine its qualification for various uses. Soil particial size, nutrient content, organic content, heavy metals, pesticides and hydrocarbons determine how soil can be used.

Sincerely,

Craig Vogel

Craig Vogel, District Technician