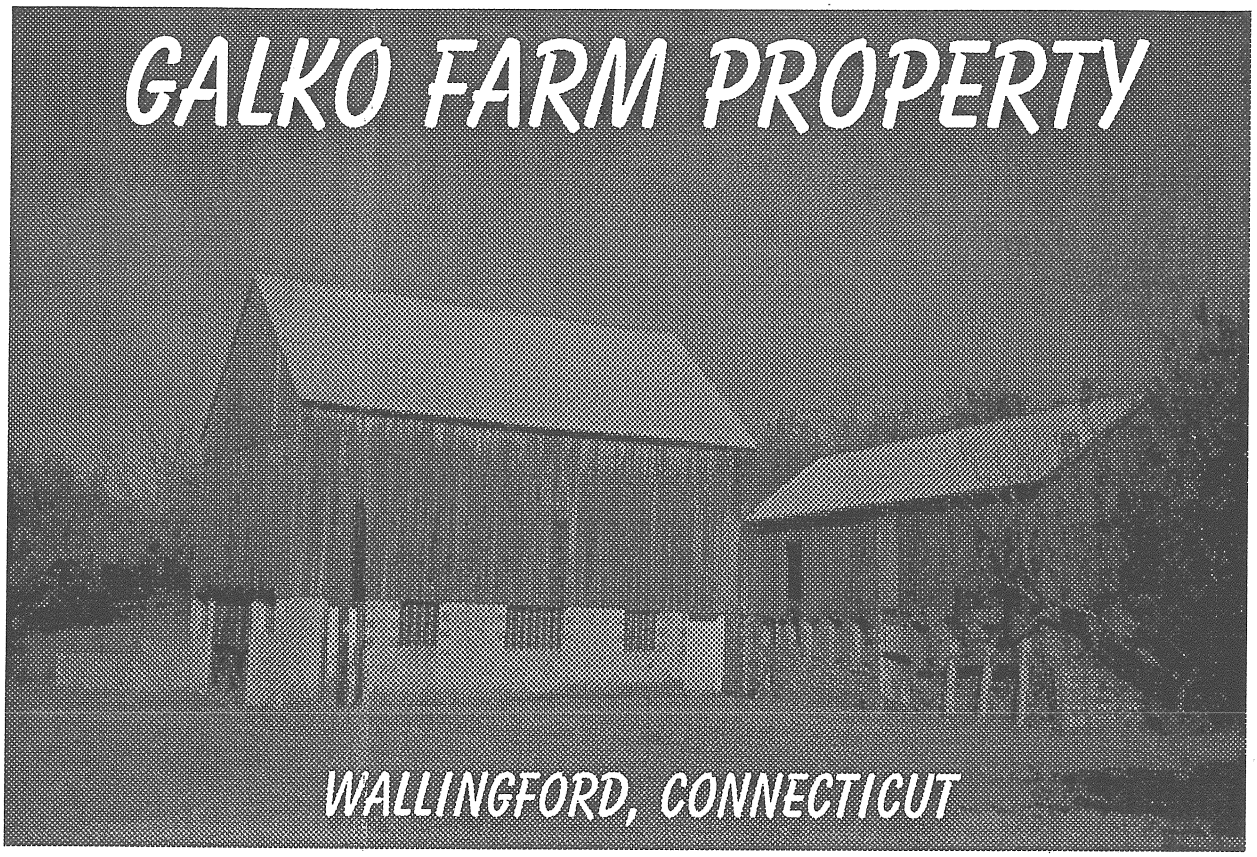
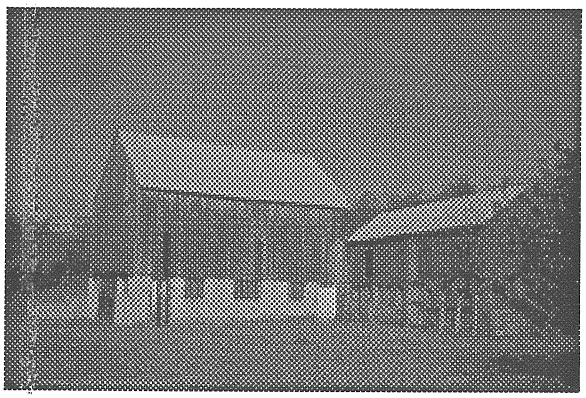


KING'S MARK ENVIRONMENTAL REVIEW TEAM REPORT

KING'S MARK RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

GALKO FARM PROPERTY

WALLINGFORD, CONNECTICUT



ENVIRONMENTAL REVIEW TEAM REPORT

PREPARED BY THE
KING'S MARK ENVIRONMENTAL REVIEW TEAM
OF THE KING'S MARK
RESOURCE CONSERVATION AND DEVELOPMENT AREA, INC.

FOR THE
CONSERVATION COMMISSION
WALLINGFORD, CONNECTICUT

MAY 2001

CT ENVIRONMENTAL REVIEW TEAMS
1066 SAYBROOK ROAD, P.O. BOX 70
HADDAM, CT 06442
(860) 345-3977

ACKNOWLEDGMENTS

This report is an outgrowth of a request from the Wallingford Conservation Commission to the New Haven County Soil and Water Conservation District (SWCD). The SWCD referred this request to the King's Mark Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the King's Mark Environmental Review Team (ERT).

The King's Mark Environmental Review Team Coordinator, Elaine Sych, would like to thank and gratefully acknowledge the following Team members whose professionalism and expertise were invaluable to the completion of this report.

The field review took place on Tuesday, January 30, 2001.

Nicholas Bellantoni	State Archaeologist Office of State Archaeology UCONN - CT Museum of Natural History (860) 486-5248
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I would also like to thank Jeff Borne, chairman, Wallingford Conservation Commission, Carl Arsenault, Wallingford Conservation Commission, Don Roe, state and federal program administrator, Linda Bush, town planner, Tom Dooley, recreation director, Brent Smith, environmental planner and Bill Dickinson, mayor, for their cooperation and assistance during this environmental review.

Prior to the review day, each Team member received a summary of the proposed project with location and soils maps. During the field review Team members were given additional information. Some Team members unable to attend the field review made visits on their own and others made additional field visits to the site. Following the review, reports from each Team member were submitted to the ERT coordinator for compilation and editing into this final report.

This report represents the Team's findings. It is not meant to compete with private consultants by providing site plans or detailed solutions to development problems. The Team does not recommend what final action should be taken on a proposed project - all final decisions rest with the town. This report identifies the existing resource base and evaluates its significance to the proposed use, and also suggests considerations that should be of concern to the town. The results of this Team action are oriented toward the development of better environmental quality and the long term economics of land use.

The King's Mark RC&D Executive Council hopes you will find this report of value and assistance in the review of this newly acquired town open space.

If you require additional information please contact:

Elaine Sych, ERT Coordinator
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EXECUTIVE SUMMARY

INTRODUCTION

- The 50 acre Galko Farm Property straddles Cheshire Road in southwest Wallingford. It is adjacent to Fresh Meadows Swamp which is the headwaters of the Mill River and source of water for Regional Water Authority.
- The property is a new acquisition of open space for the Town of Wallingford and the Conservation Commission requested assistance from the ERT to provide them with a natural resource inventory and guidelines and recommendations for the development of a stewardship/management for the property.
- The property contains 25 acres of open field, 10 acres of abandoned orchards and several acres of forestland, as well as several small ponds, marsh and wet meadows.
- Several areas of concern include: continued agricultural use of the farm, water quality and wetland impacts, wildlife and aquatic habitat, passive recreation and significance of natural and cultural resources.

TOPOGRAPHY AND GEOLOGY

- The major topographic feature of the Galko property is a large bedrock knoll on the north side of Cheshire Road.
- A large glacial erratic lies on a small till mound on the south side of Cheshire Road. It is presumed that this rock fragment was plucked from the top of the bedrock knoll by the last continental ice sheet and carried forward frozen in the ice to its resting spot.
- Two types of bedrock underlie the site: New Haven Arkose formation and West Rock intrusive.
- The surficial geology is made up of a thick layer of glacial till.

SOIL RESOURCES

- The wetland soil type on site is (Wr) Wilbraham. The non-wetland soils include (CsB) Cheshire, Holyoke-Rock outcrop, Watchaug soil, (WkB) Wethersfield and (YaB) Yalesville.
- 90% of the parcel contains soils that are regarded as either prime farmland (CsB, WcB, WkB, YaB) or additional farmland of statewide importance (Wr and YaC). Prime farmland has the best combination of physical and chemical properties for the production of food and fiber crops and is available for such uses, additional land of statewide importance is only slightly less suited to

crop production, but could produce yields similar to those of prime farmland if conditions are favorable.

- Given the rapid loss of prime farmland resources in recent years through the conversion to non-agricultural uses, many concerned land-users and decision makers now demonstrate a strong commitment to the long-term conservation of such valuable agricultural lands.
- Available records indicate that the property has over the years been managed in such a fashion as to help sustain soil productivity for the future.
- It has been the experience of the Team resource conservationist that current demand for productive agricultural land far exceeds the available supply. There should be no shortage of producers willing to lease such a parcel and abide by terms set by municipal officials and staff.
- It should be noted that there are several federal programs that may be able to assist the town in management and/or preservation of the property.

A WATERSHED PERSPECTIVE

- Recommendations in this section address water quality concerns from a watershed perspective, taking into account the cumulative impact of numerous activities within a given watershed which may effect water quality.
- The site is almost entirely within the Mill River subregional drainage basin. Wetlands drain to Fresh Meadows wetlands system, which is directly adjacent to the Galko Farm, and serves as the headwater to the Mill River and source of water supply to the Regional Water Authority.
- Surface water designation is "Class A", with the following designated uses: potential drinking water supply; fish and wildlife habitat; recreational use; agricultural, industrial supply and other legitimate uses, including navigation. Groundwater is mostly "Class AA" with the following designated uses: existing or potential water supply suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies; and to a lesser degree "Class A" with the following designated uses: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow for hydraulically-connected surface water bodies.
- Given the high classification for water quality in this area and the site's proximity to the headwater's of the Mill River, it is of the utmost importance to protect the site from direct and indirect development impacts that might adversely affect water quality.
- Best Management Practices (BMP's) to minimize nonpoint source pollution and BMP's for pesticide, herbicide and fertilizer application are also recommended.
- The Galko Farm represents a wonderful opportunity to demonstrate Integrated Pest Management (IPM) and Integrated Crop Management (ICM) which are programs sponsored by the University of Connecticut Cooperative Extension System. They are designed to educate farmers in the use of a variety

of pest control methods and fertilizer techniques designed to protect public health and the environment, and to produce high quality crops with the most judicious use of pesticides and fertilizer applications.

- IPM and ICM practices could be used whether the site is leased by commercial growers or used as a community garden and could serve to educate other farmers/growers in the region.
- Habitat restoration and enhancement could include:
    - restoring the ditched channel to a more natural looking stream
    - plantings of native shrubs and plants
    - planting or leaving an unmowed strip of vegetation around Lucky Pond if Canada geese are posing a water quality threat
    - demonstration projects could include pond and wetlands enhancement/creation for improved fish and wildlife habitat
    - a buffer to protect wetlands and watercourses is recommended. A vegetated buffer can range from 50 to 100 feet depending on a number of factors such as topography, erosivity of the soil and the value or sensitivity of the water resource.
- A trail system could be established that would connect the Galko parcel with Fresh Meadows depending on construction suitability of the soils.
- The Town may want to pursue creating a "greenway" that allows for additional regional opportunities for public access to the Mill River.
- The town's acquisition of this property will greatly ensure the protection and preservation of the area's water quality, wildlife habitat, and open space while providing local residents with new opportunities to view scenic surroundings, observe and/or participate in farming activities, learn more about best management practices and environmental management techniques, and simply enjoy the outdoors.

WETLAND RESOURCES

- The Galko farm contains 11 acres of regulated wetlands. The largest wetland is known as Lucky Pond which is just over an acre in size. Two other open water areas exist in the southeast and southwest corners.
- Other areas of wetlands includes wet meadows which have been used as corn and hay fields.
- All of these wetlands are important because they are at or near the headwaters of the Mill River drainage.
- Potential areas of concern with regard to wetlands include:
    - is there a connection between the small golf course pond and Lucky Pond, and does Lucky Pond or the waters that flow from it show signs of nutrient loading from fertilizers as well as pesticide runoff from the golf course?

  - agricultural use of the land (row crops and livestock) with regard to runoff concerns about localized fertilizer/nutrient and fecal coliform runoff impacting the AA water classification.
  - does Lucky Pond have nutrient loading problems from Canada geese?
  - during demolition of buildings a proper erosion and sedimentation plan should be in place to guard against disturbances to the wetlands.
- Guidelines and recommendations for management include:
  - a 100 foot buffer be employed around the mapped wetlands and the wetlands should be allowed to revert to natural hydrophytic vegetation.
  - Best Management Practices for agriculture should be applied that will restore impacted wetland areas, minimize impacts to water quality, and preserve their value and functions.
- Municipal ownership of the parcel offers an opportunity to keep the land in agriculture by lease arrangement and/or as an educational opportunity for schools and citizens.

THE NATURAL DIVERSITY DATA BASE

- According to the Natural Diversity Data Base maps and files there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the Galko Farm. There is a State Species of Special Concern, *Toxorhynchites rutilus* (a mosquito) that has been documented to the west of the Galko Farm. It is associated with freshwater wetlands and may also occur on the Galko property.

VEGETATION

- The parcel may be divided up into four broad vegetation categories: open/ agricultural fields, abandoned orchards, wetlands (open swamp/hardwood swamp), and mixed hardwoods.
- A number of areas (fields, orchards, and wetlands) on the property contain invasive exotic vegetation which is a concern because they can become major components of the ecosystem by outcompeting native species. In some areas the presence of these exotic species may preclude the establishment of more desirable native species. Mechanical removal or chemical control of these plants can be effective, but will become more difficult as they become more widespread.
- The abandoned orchards could be brought back to healthy fruit producing condition.
- The mixed hardwoods (4 acres) on the site range in age from about 30 to 100 years of age and they are reasonably healthy.

- The wetland areas vary greatly from open swamp and meadow to hardwood swamp with all ages and classes of trees represented. A few of the larger trees in the wetlands have cavities, which make excellent den sites for many species of wildlife.

WILDLIFE RESOURCES

- A list of 19 species of wildlife were observed either directly or indirectly on the Galko Farm during two site visits. It is expected that with a more thorough field investigation that the list would be quite large for the property.
- Habitat management needs:
    - open field/grassland/abandoned crop field
        - managing these field areas is important because reversion to forest can occur rapidly following abandonment
        - restore native grasses
        - mow or hay after July 15th to avoid killing nestlings or eggs of ground nesters
        - raise mower blades to 6 inches or more to avoid destroying nests or nestlings
        - burn fields in early spring to maintain grasslands and rejuvenate them
    - abandoned orchard
        - unmanicured orchards usually provide short-term benefit to area wildlife species. They usually produce for about 15 years and steadily decline as the trees decline in health and forest succession takes place.
        - abandoned orchards can be managed for wildlife in several ways depending on the goals of the landowner.
        - landowners interested in attracting white-tailed deer and turkey tend to manage abandoned trees for apple production, this involves pruning and removal of competing vegetation
        - because of time and monetary constraints some landowners allow orchards to gradually revert to forest and manage only a few trees for apple production
    - ponds and wetlands
        - with current trends for Canada geese showing an increase, a decrease in foraging sites is recommended around ponds
        - allowing native trees and shrubs to recolonize the perimeter of the ponds will discourage the geese
        - access areas for fishing can be maintained but they should be as small as possible to discourage geese
    - mixed hardwood forest
        - this small forest area combined with the orchards provides older trees and hard mast (acorns, nuts and seeds) for wildlife

- The property needs to have a long term management plan which encompasses goals and objectives for increasing and maintaining biodiversity, and a plan for recreational use. Management can include:
    - controlling invasive non-native plants
    - planting native trees, shrubs and wildflowers to enhance seasonal food sources and improve habitat conditions
    - planting evergreens which is a missing habitat component
    - nature trail development should be done carefully and not allowed to criss-cross the entire site
    - dogs should not be allowed on the property during nesting seasons
    - the presence or creation of snags (dead or dying trees) is encouraged, as well as adding artificial nesting boxes for bluebirds, tree swallows, house wrens, blackcapped chickadees and screech owls.
- Technical assistance is available from the Team wildlife biologist and the DEP wildlife division has developed a habitat demonstration area at their Session's Wood's property in Burlington which may be visited to view various habitat demonstrations.

AQUATIC RESOURCES

Unavailable at this time.

LAND USE PLANNING CONSIDERATIONS

- Access to the property would be via Cheshire Road.
- With the property split into two parcels north and south of Cheshire Road it lends itself to specific land use opportunities for each parcel. The southern parcel for limited agricultural use or natural resource protection and the northern section for agricultural uses.
- The creation of a diverse habitat sanctuary on the southern portion could be used as a "living laboratory" or "outdoor classroom." This could involve the local schools, as well as colleges and interested non-profits. This use would represent the least impact to wetlands. Farming use of the vacant fields and abandoned orchard in this section should be carefully explored.
- The northern portion could be used for agricultural purposes using the Town's Farm Lease Program.
- It is suggested that Lucky Pond be stocked and open to the public for fishing.
- Consideration should be given to rebuilding the greenhouse and using it for some kind of educational/botanical program.
- There is the opportunity for the establishment of a trail network from Fresh Meadows Swamp, through the southern portion to the forested bedrock knoll on the northern portion of the property.
- With the number of educational projects suggested the town may want to pursue any number of grants that would ensure that the Town does not incur

additional funding burdens. Various state, private and local agencies and organizations may want to be involved in partial management of projects for this property.

ARCHAEOLOGICAL REVIEW

- A review of the State of Connecticut Archaeological Site files and maps show no known archaeological sites in the project area.
- Undisturbed areas next to the Fresh Meadows Swamp do have a high sensitivity for undiscovered archaeological resources. Fresh Meadows does contain the topographic and environmental variables that allow for prediction of prehistoric utilization.
- The Office of State Archaeology recommends an archaeological survey for any areas in the southern portion of the farm adjacent to Fresh Meadows that may be proposed for ground disturbing developments.

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INTRODUCTION

Introduction

The Wallingford Conservation Commission has requested assistance from the King's Mark Environmental Review Team in reviewing a newly acquired parcel of town open space known as the Galko Farm (at the time of the field review the town did not yet own the property).

The Galko Farm Property is a 50 acre site that straddles Cheshire Road in southwest Wallingford. The property is adjacent to Fresh Meadows Swamp, headwaters of the Mill River and source of water supply to the Regional Water Authority, where the Town and the Wallingford Land Trust own a total of 67 acres. The farm, which dates back to the early twentieth century, has approximately 25 acres of open field, 10 acres of abandoned orchards (apple and pear), and several acres of forest land. The site also contains several ponds, marsh and wet meadows for a total of 11 acres of regulated wetlands. Buildings on the northern parcel include the farmhouse, a couple of barns, greenhouse, silo and smaller outbuildings in varying conditions. The town plans to remove most of the buildings.

Objectives of the ERT Study

The commission has asked for assistance in conducting a natural resource inventory which will assist the town in developing a stewardship plan for the property. The town is particularly concerned with options for continued agricultural use under the town's farmland lease program. Other issues of concern include: water quality, wetland impacts, wildlife and aquatic habitat, passive recreational use and the significance of natural and cultural resources.

III. The ERT Process

Through the efforts of the Wallingford Conservation Commission, this environmental review and report was prepared for the town of Wallingford.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the town. Team members were able to review maps, plans and supporting documentation provided by the applicant.

The review process consisted of four phases:

1. Inventory of the site's natural resources;
2. Assessment of these resources;
3. Identification of resource areas and review of plans; and
4. Presentation of education, management and land use guidelines.

The data collection phase involved both literature and field research. The field review was conducted on Tuesday, January 30, 2001. The emphasis of the field review was on the exchange of ideas, concerns and recommendations. Being on site allowed Team members to verify information and to identify other resources.

Once Team members had assimilated an adequate data base, they were able to analyze and interpret their findings. Individual Team members then prepared and submitted their reports to the ERT coordinator for compilation into this final ERT report.

Figure 1

⇑

Location Map

Scale 1″ = 2000′

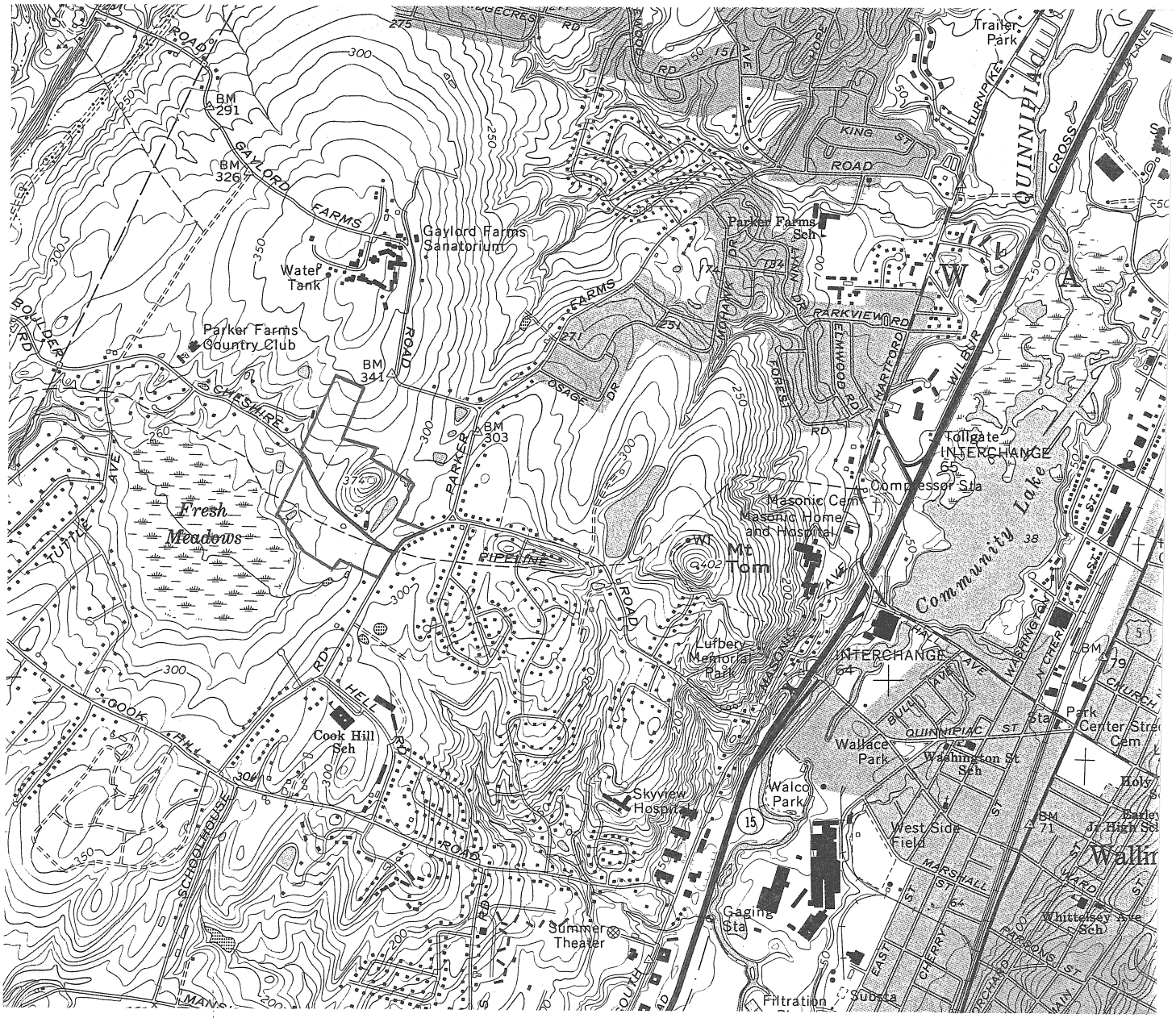
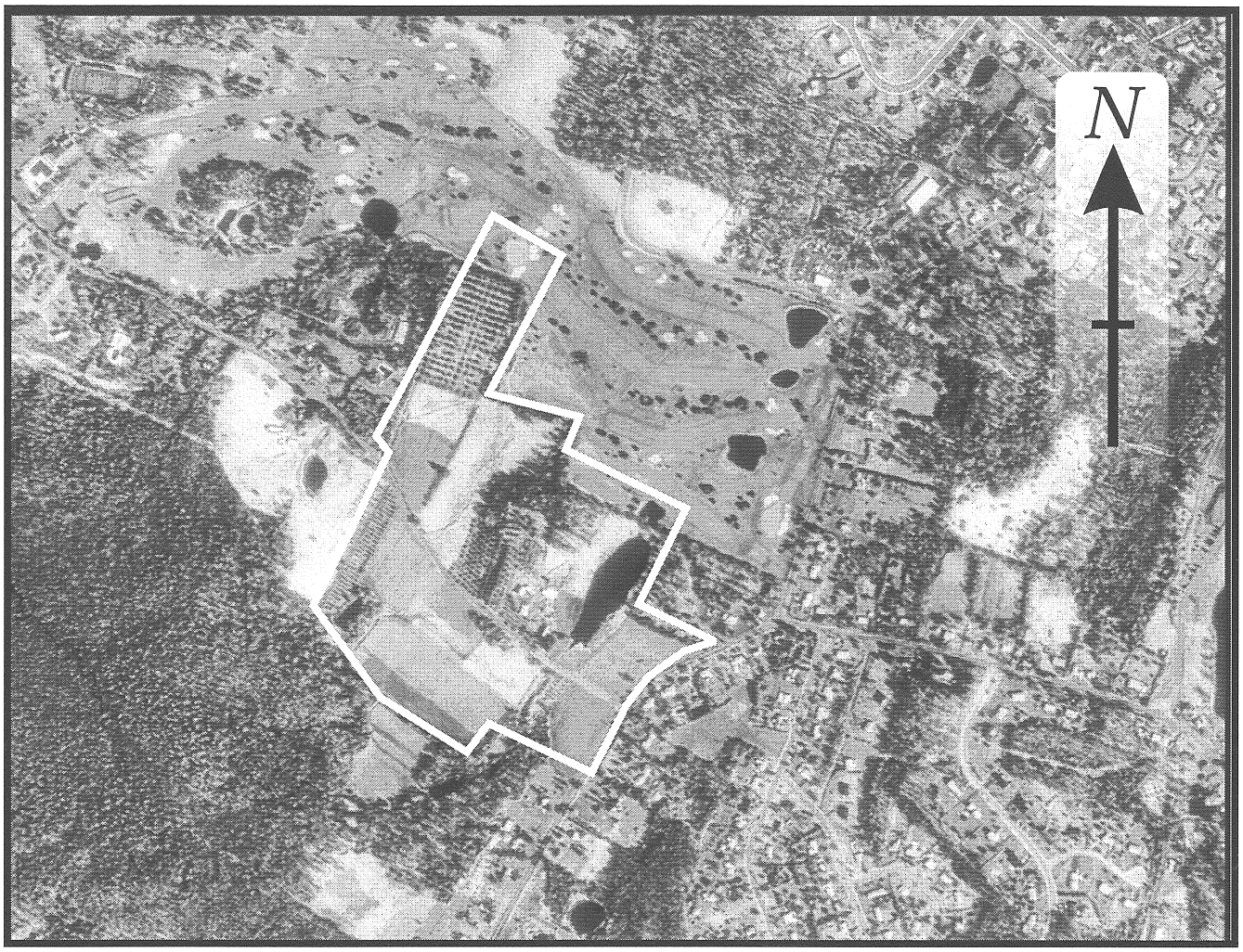


Figure 2



Galko Farm
Air Photo

TOPOGRAPHY AND GEOLOGY

The major topographic feature of the Galko Farm property is a 500 x 800 foot long, 30 foot high bedrock knoll. Two types of bedrock underlie the property; red colored shale and sandstones belonging to the Triassic New Haven Arkose formation (roughly 200 million years old) and dense, black colored diabase related to the Jurassic West Rock intrusive (approximately 190 million years ago). (See Figure 3) The diabase was intruded as a near vertical east-west dike roughly 300 feet thick that can be traced from West Rock ridge to Mt. Tom near exit 64 of the Wilbur Cross Parkway. The rock is massive and composed of tightly interlocking feldspar and pyroxene grains. It is much less susceptible to erosion than the friable red shales which were readily plucked by the thick glacial ice that flowed southerly across the region 30,000 - 15,000 years ago. The small hill north of Cheshire Road on the Galko property is held up by the resistant diabase. A large, loose (60 x 40 x 20 foot) block of this diabase lies on a small till mound on the south side of Cheshire Road. Presumably the block was plucked from the top of the bedrock knoll by the last continental ice sheet and carried southward some 100 - 200 feet frozen in the ice. Columnar cooling joints in the block, rather than being vertical, as in the diabase on the hill, are inclined at 30 degrees to the horizontal suggesting that the fragment, a glacial "erratic", came to rest on its side. The red shales do not outcrop on the farm, but are covered by a thick veneer of glacial till - poorly sorted ground-up rock fragments dragged along at the base of the ice sheet.

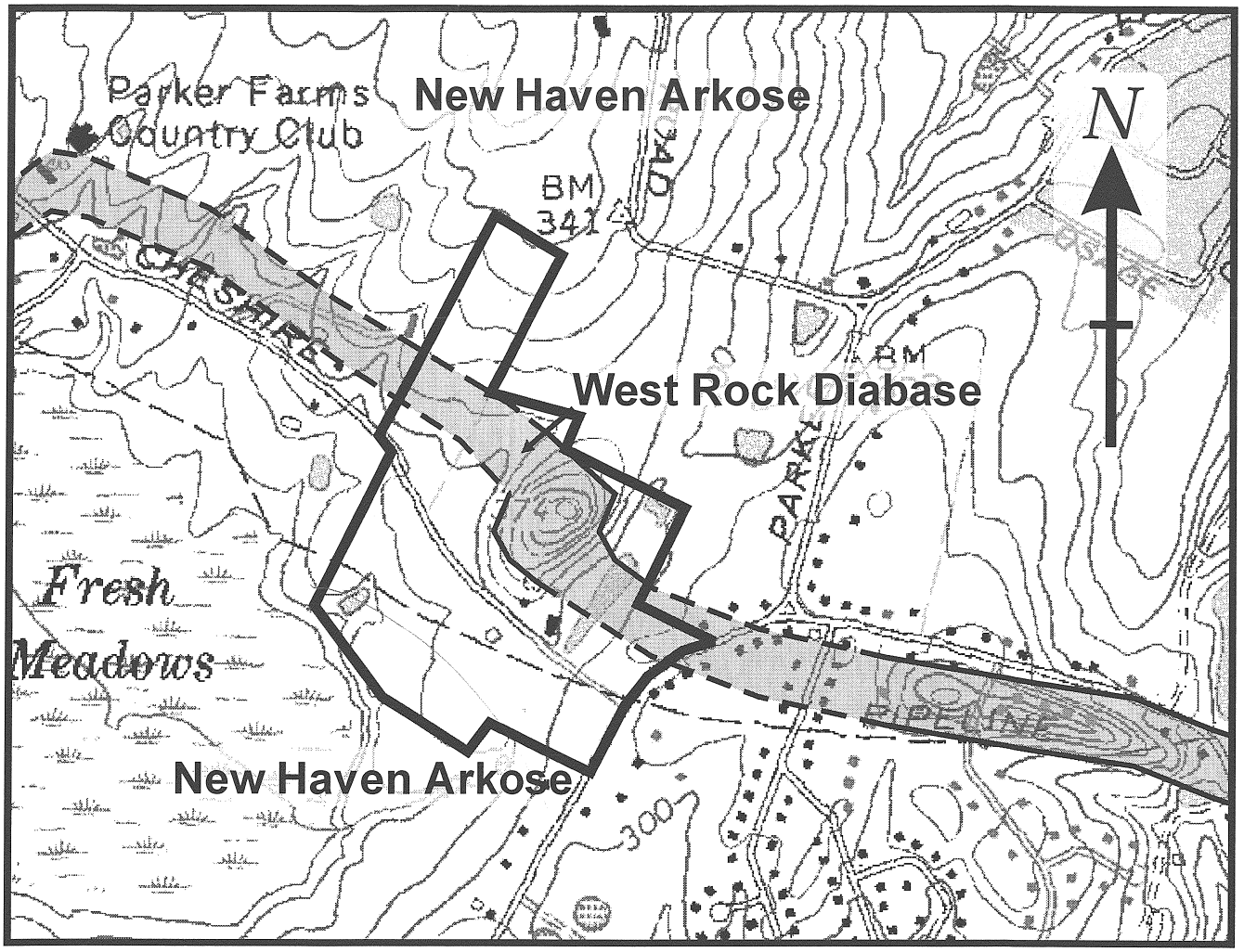
Information on the Surficial geology of the Wallingford Quadrangle can be found in:

Porter, Stephen C., 1960, The Surficial Geology of the Wallingford Quadrangle. QR-10, Connecticut Geologic and Natural History Survey .

The bedrock geology has not been thoroughly mapped on the quadrangle scale but the available information is included on the 1985 Bedrock Geological map of Connecticut.

Rodgers, John, 1985, Bedrock Geologic Map of Connecticut, 1:250000. Connecticut Geological and Natural History Survey.

Figure 3



Bedrock Geology

SOIL RESOURCES

The information in this report is based on the soils series descriptions and the mapping units descriptions as presented in the 1979 USDA Soil Survey of New Haven County, and on field observations.

The site can be found in sheet number 29 of the New Haven County Survey (see Figure 4).

Soil Descriptions

Wetland Soils

Map Unit Wr

The Wr map unit consists primarily of Wilbraham soils on 0 to 3 percent slopes. Wilbraham soils are very deep and very poorly drained soils that formed in compact glacial till, derived mainly from red Triassic rocks and some basalt. Typically they have a friable silt loam or loam surface layer and subsoil over a silt loam or loam, or fine sandy loam dense till substratum. Wilbraham soils have a perched watertable within 1.5 feet of the surface much of the year. These soils have low chroma mottles throughout the subsoil.

Non-wetland Soils

Map Unit CsB

The CsB map unit ccnsists primarily of Cheshire soils on 3 to 8 percent slopes. Cheshire soils are very deep, well drained soils formed in glacial till, derived mainly from red Triassic rocks. Typically they have a fine sandy loam, loam or

silt loam surface layer and subsoil over a friable sandy loam, fine sandy loam, or loam substratum that extend to a depth of 60 inches or more. Cheshire soils have a moderate erosion hazard. If cultivated for crops, cropping systems should utilize practices that employ grasses and legumes, cover crops and minimum tillage to reduce runoff and control erosion due to its close proximity to a pond, watercourse and a significant wetland. Adequate buffers should be used to protect wetlands and watercourses.

Map Unit HZE

The HZE - Holyoke-Rock outcrop complex consists of moderately steep to steep, well drained to somewhat well drained soils on uplands. Slopes range from 15 to 35 percent. The rock outcrop consists of exposures of hard rock, commonly basalt. The outcrops typically are on knobs, ledges and ridgelines.

Map Unit WcB

The WcB map unit consists primarily of Watchaug soils on 3 to 8 percent slopes. Watchaug soils are very deep and moderately well drained soils formed in glacial till, derived mainly from red Triassic rocks. These soils have a seasonally high watertable at 1.5 to 2.5 feet in the late Fall to early Spring. Typically, they have a fine sandy loam, loam or silt loam surface layer and subsoil, over a friable sandy loam, sandy loam, or loam substratum that extends to a depth of 60 inches or more. Watchaug soils have low chroma mottles within a 24 inch depth.

The erosion hazard is moderate. The cultivation of this soil requires conservation measures of minimum tillage, cover crops and the inclusion of grasses and legumes in the cropping system to reduce runoff and control erosion. An enhanced, well designed natural buffer should be utilized along the southwest boundary of the Galko property due to the sensitive nature of Fresh Meadows wetland preserve.

Map Unit WkB

The WkB unit consists of Wethersfield soils on 3 to 8 percent slopes. They are very deep, well drained soils that formed in compact glacial till, derived mainly from red Triassic rocks. Typically they have a friable loam or silt loam surface layer and subsoil over firm loam, silt loam, or fine sandy loam, dense basal till substratum. The surface layer and subsoil has moderate permeability and slow to very slow permeability in the substratum. This soil is very strongly acid or strongly acid in the surface layer and subsoil and very strongly acid to moderately acid in the substratum. This soil is well suited to certain tree crops, where productivity is moderately high. The eastern white pine, evergreens in general, sugar maple, northern red oak and yellow poplar are particularly well suited to this soil type.

Map Unit YaC

The map unit YaC consists of Yalesville soils on 8 to 15 percent slopes. This soil is moderately deep, well drained and formed in loose till, derived from red Triassic rocks. They have fine sandy loam textures overlying sandstone bedrock. The main limitations of the soil is its steepness of slope and its shallowness to bedrock bedrock which occurs within the depth range of 20 to 40 inches. This soil has a severe erosion hazard if utilized for cultivated crops. In controlling runoff and erosion, minimize tilling, use cover crops and utilize grasses and legumes in cropping system.

Figure 4

⇑

Soils Map

Scale 1″ = 1320′

Agricultural Use of Farmland

Roughly ninety per cent of the Galko parcel contains soils that are regarded as either prime farmland or additional farmland of statewide importance. This designation includes the Cheshire (CsB), Watchaug (WcB), Wethersfield (WkB) and Yalesville (YaB) mapping units, all of which qualify as prime farmland, and the Wilbraham (Wr) and Yalesville (YaC) mapping units, both of which qualify as additional farmland of statewide importance. Prime farmland is land that has the best combination of physical and chemical properties for the production of food and fiber crops and is also available for such uses. The soil quality, growing season and moisture availability within prime farmlands is such that sustained high yields of commercial crops can be produced economically when the soil resource is treated and managed in accordance with sound farming practices. Additional farmland of statewide importance is only slightly less suited to crop production than prime farmland, yet some soils may produce yields similar to those of prime farmland should conditions be favorable. Given the rapid loss of prime farmland resources over recent years through conversion to non-agricultural uses, many concerned land-users and decisionmakers now demonstrate a strong commitment to the long-term conservation of such valuable agricultural lands.

Available records also indicate that the property has over the years been managed in such fashion as to help sustain soil productivity for the future. Livestock manures have been applied annually at a rate intended to maintain soil organic matter content and moisture-holding capacity. Surface soils have been protected during the growing season by the main crop canopy and by annual cover crops during colder weather. Much of the parcel has also been managed in accordance with a conservation plan developed by the U. S. Department of Agriculture, Natural Resources Conservation Service. Thus it

appears that present soil quality, if maintained, should allow economical crop production well into the future.

It has been our experience that the current demand for productive agricultural land far exceeds the available supply. Growers have over the previous several years been searching far from their home farm for cropland necessary for expansion or to replace fields lost to development during the past year. There should be no shortage of producers willing to lease such a parcel and abide by terms set by municipal officials and staff.

It should also be noted that any one of several federal programs may be available to assist the Town in management and/or preservation of this parcel. The Conservation Reserve Program (CRP), managed by the U.S. Department of Agriculture, is the federal government's single largest environmental improvement program. This program encourages landowners to establish permanent vegetation in areas needing protection from erosion or where such vegetation can improve water quality or provide food and habitat for wildlife. Landowners must enter into contracts with U.S.D.A. for 10 to 15 years. In return, they receive annual rental payments, incentive payments for certain conservation practices and cost-share assistance to establish the necessary permanent vegetation. Should the Town decide to encourage agricultural uses of subject property, the filter strip and riparian buffer practices are only two of many conservation practices which may be established under CRP.

Other federal programs which may be of interest to the Town include the Wildlife Habitat Improvement Program (WHIP) and the Farmland Protection Program (FPP). Copies of informational pieces which discuss the major features of each program may be found in Appendix A.

A WATERSHED PERSPECTIVE

Background

After meeting at the town hall to discuss the site's history and town concerns, a field walk was conducted to review the site. The following recommendations may overlap with those of other ERT members who are dealing with more specialized aspects of the review (i.e. - fish and wildlife habitat, agriculture, historic/archaeological significance, etc.). In such cases, these recommendations are meant to support or supplement these specialized reviews, not to supplant them.

The Town is interested developing a stewardship plan for the property and is particularly concerned about options for continued agricultural use. In this regard, the following comments are based on the stated desire of the Town to maintain this property in an undeveloped state. Any other plans should be reevaluated for consistency with watershed best management practices and possible permitting requirements.

Introduction

These recommendations to the Wallingford Conservation Commission (Commission) are given from the perspective of improving water quality and maintaining and supporting designated uses of the waters of the State in accordance with Connecticut's Water Quality Standards[1]. These recommendations also reflect the DEP's growing commitment to address water quality concerns from a watershed perspective, taking into account the

[1] State of Connecticut, Department of Environmental Protection. Effective 1996 & 1997. Water Quality Standards. Bureau of Water Management - Planning and Standards Division. Hartford, CT.

cumulative impact of numerous activities within a given watershed which may effect water quality.

Site Location

The Galko Farm is a 50 acre farm bisected by Cheshire Road in southwest Wallingford. The site is located at the top, northeast corner of a 25 square mile watershed which ultimately drains to New Haven Harbor. It is almost entirely within the Mill River subregional drainage basin (number 5302) or watershed which is part of the South Central Western Regional Complex, though a small sliver on the north side of Cheshire Road drains to the Quinnipiac River subregional drainage basin (number 5200).

Site Description

The farm contains approximately 25 acres of open field, 10 acres of abandoned orchard, several acres of forestland, and approximately 11 acres of wetlands and watercourses. Surface waters at the site include a very small dug pond about 0.2 acre in size located on the south side of Cheshire Road near the swamp; a larger elongated pond named "Lucky Pond" approximately 1 acre in size located north of Cheshire Road on the eastern side of the property; and a ditched watercourse which flows across Cheshire Road in a southwesterly direction to Fresh Meadows. Fresh Meadows is an approximately 90 acre wetlands system which lies directly adjacent to the site and serves as the headwaters to the Mill River and source of water supply to the Regional Water Authority.

Water Quality Classification

The surface water quality designation in this area is Class A with the following designated uses: potential drinking water supply; fish and wildlife habitat;

recreational use; agricultural industrial supply and other legitimate uses, including navigation. The groundwater quality designation in this area is mostly Class GAA with the following designated uses: existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically connected surface water bodies; and to a lesser degree Class GA with the following designated uses: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow for hydraulically connected surface water bodies.

Best Management Practices

Given the high classification for water quality in this area and the site's proximity to the headwaters of the Mill River, Fresh Meadows Swamp, it is of the utmost importance to protect the site from direct and indirect development impacts that might adversely affect water quality. Obviously, the intent to keep this site as open space greatly reduces the potential threats typically associated with land development; i.e. clearing and grubbing, grading, sedimentation and soil erosion, stormwater collection, etc.. However, Best Management Practices are still recommended to minimize nonpoint source pollution. Examples are: pervious parking areas, curbless roads with reduced widths, vegetated drainage swales, maintaining land cover, and removing debris and litter from drainageways. In addition to minimizing land disturbances and promoting stormwater retention and infiltration, it is important to follow Best Management Practices for herbicide, pesticide, and fertilizer application if the site will continue to be used as an active farm or converted to a community garden. If livestock will be an attraction at the farm, it may be prudent to contact the USDA Natural Resources Conservation Service for guidance on housing the animals and manure handling to avoid and minimize contact with stormwater runoff. Contact USDA - NRCS Wallingford Service Center, North Farms Executive Park,

900 Northrop Road, Suite A, Wallingford, CT 06492, or call Tom Ladny at (203) 269-7509.

The Galko Farm presents an excellent opportunity for demonstrating Integrated Pest Management (IPM) and Integrated Crop Management (ICM). These programs sponsored by the University of Connecticut Cooperative Extension System are designed to educate farmers in the use of a variety of pest control methods and fertilizer techniques designed to protect public health and the environment, and to produce high quality crops and other commodities with the most judicious use of pesticides and fertilizer applications. Whether returned to an actively farmed parcel for commercial crops or operated has a community garden, the Galko Farm could be used to illustrate specific IPM or ICM practices for adoption by other farmers/gardeners in the region. For more information, contact Richard A. Ashley, Ph.D., IPM Coordinator, University of Connecticut, Storrs, CT, Department of Plant Science at (860) 486-3438.

Habitat Restoration/Enhancement

There are other activities that may dually serve as local demonstration projects that would not only improve fish and wildlife habitats but also serve to protect water quality. These may include restoring or enhancing the ditched channel to a more natural-looking stream based on a hydraulically engineered design using appropriate bank stabilization techniques, including biotechniques. Another environmental enhancement is the planting of native trees, shrubs and herbaceous plants to illustrate natural landscaping techniques that would benefit wildlife without introducing possibly invasive ornamentals. And if Canada geese are posing a threat to water quality at Lucky Pond, leaving a narrow strip of unmowed vegetation or planting tall, native grasses and thick shrubs (at least 3 feet high) will discourage them from entering the pond. Other, more complex demonstration projects could include pond and wetlands enhancement/creation

for improved fish and wildlife habitats. Consult the DEP for required permits and habitat improvement suggestions.

Buffers

The DEP supports and recommends the use of buffers to protect wetlands and watercourses from environmental impacts. Leaving a vegetated strip around surface water resources, including wetlands helps protect surface and groundwater quality, and fish and wildlife habitats from nonpoint source pollution. Buffers trap road sands, contaminants and other pollutants contained in stormwater runoff generated from roadways, parking lots, roof tops, and other impervious surfaces, as well as eroded sediments occurring from natural scour or land moving activities such as site development and other soil disturbances, including farming activities. A 50 foot vegetated buffer is typical, but widths can vary depending on such factors as topography, the erosivity of the soil, and the value or sensitivity of the water resource.

The riparian corridor is the area adjacent to a watercourse that typically contains wetlands and acts as a buffer to the watercourse. In addition to the benefits described above, riparian buffers help moderate the temperature of stormwater runoff before it enters the watercourse, thereby reducing thermal impacts on aquatic wildlife. Riparian wetlands may additionally provide valuable wildlife habitat, flood attenuation, water quality renovation, and groundwater recharge, so it is important to protect these areas from degradation.

To protect riparian buffers from noise, human encroachment, and other development impacts, including stormwater runoff, the CT DEP Fisheries Division recommends a 100 foot buffer zone along perennial streams, and a 50

foot buffer zone along intermittent streams[2] measured from the outer edge of any riparian wetlands. DEP Fisheries further recommends that this buffer zone remain in a naturally vegetated and undisturbed condition. If existing buffers at the site do not meet these criteria, consider providing native plantings to enhance or extend the buffer zones and/or adopting a no-mow zone to allow these areas to revegetate naturally. The USDA Natural Resources Conservation Service also has developed guidelines for planning and installing riparian buffers. For more information, contact USDA - NRCS Wallingford Service Center, North Farms Executive Park, 900 Northrop Road, Suite A, Wallingford, CT 06492, or call Tom Ladny at (203) 269-7509.

Open Space

Often existing beyond riparian corridors are wildlife corridors. These are typically wide, linear tracts of land which allow wildlife to move freely between natural habitats containing both wetlands and uplands. Urban and suburban development and roadways often segment these corridors resulting in wildlife habitat fragmentation. Efforts to preserve open space help maintain these corridors and can provide valuable "edge" habitat for wildlife. Open space may protect natural resources, preserve scenic landscape and historical resources or offer opportunities for recreation or nonmotorized transportation. It may also be used to connect existing protected areas and provide access to the outdoors. However, in the case of the Galko Farm, there appears to be limited opportunities to extend the open space corridor beyond Fresh Meadows to the south and the privately-owned Farms Country Club golf course to the north. Nevertheless, establishing this connection will further protect wildlife habitat while creating additional opportunities for providing public access.

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[2] CT Fisheries Division. 1991. Policy Statement - Riparian Corridor Protection; Position Statement - Utilization of 100 Foot Buffer Zones to Protect Riparian Areas in Connecticut.

Public Access

With regard to promoting public access, it may be appropriate to construct a trail system that connects the Galko Farm to the town-owned portion of Fresh Meadows, provided that the terrain and habitat are suitable for such use. A trail may be constructed simply for pedestrian access or multiple uses, such as equestrians, bicyclists, roller bladers, baby strollers, joggers/runners, etc.. Trail designs vary from at-grade stone dust paths to pavement of various widths and raised boardwalk crossings over wetlands and watercourses or as viewing platforms. The trail design and route must be conducive to the natural terrain. Given the very poorly drained, muck soils present at Fresh Meadows, trail construction may be severely limited in this area. Complementing nature trails with educational kiosks for animal tracks and sign, bird watching, and valuable/grand trees and shrubs, and natural geologic features offer additional attractions that may increase usage by individuals and educational groups. Future trail expansion is encouraged, but this may require lengthy and costly negotiations with adjacent property owners.

Greenways

The next level of corridor protection is the establishment of a greenway. In 1995, State legislation was adopted which allows municipalities to adopt plans for greenways protection and development into their "plans of conservation and development" (CGS Sec. 8-23). As defined by the State statute, "greenway" means:

> a corridor of open space that (1) may protect natural resources, preserve scenic landscape and historical resources or offer opportunities for recreation or nonmotorized transportation, (2) may connect existing protected areas and provide access to the

> outdoors, (3) may be located along a defining natural feature, such as a waterway, along a man-made corridor, including an unused right-of-way, traditional trail routes or historic barge canals or (4) may be greenspace along a highway or around a village (CGS Sec. 23-100).

This same legislation also established the Connecticut Greenways Council, that among other things, is "to advise and assist in the coordination of state agencies, municipalities, regional planning organizations and private citizens in voluntarily planning and implementing a system of greenways" (CGS Sec. 23-102).

If the Conservation Commission and Zoning Commission choose to pursue the option of creating a public open space and designating it as a greenway, the Commissions need to carefully consider the types of uses that would be allowed in this area. CT DEP would suggest that opportunities to protect and conserve natural resources values such as water quality, fisheries, wildlife habitat and unique plant communities be considered first.

Adoption of a greenway in this region may provide additional opportunities for public access to the Mill River, such as fishing and canoeing; however, these uses may necessarily be limited to minimize impacts on natural resources. For further guidance on establishing a greenway, the Commission should contact the Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC), Executive Director Ann Letendre at telephone (860) 896-4731 , e-mail "annletendre@aol.com", or CACIWC President Tom O'Dell of the Westbrook Conservation Commission, Westbrook Town Hall, telephone (860) 399-3044; or to reach the Connecticut Greenways Council, contact the DEP Greenways Assistance Center, Leslie Lewis at telephone (860) 424-3578.

Conclusion

The acquisition of the Galko Farm by the Town of Wallingford will greatly ensure the protection and preservation of the area's water quality, wildlife habitat, and open space while providing local residents with new opportunities to view scenic surroundings, observe and/or participate in farming activities, learn more about best management practices and environmental management techniques, and simply enjoy the outdoors.

WETLAND RESOURCES

Wetland Inventory

The Galko Farm property is dominated by mixed land use consisting of ±25 acres of open field, 10 acres of abandoned orchard, approximately four acres of forest and buildings/yards/corrals, and 11 acres of regulated wetlands.

The largest visually apparent wetland on the site is known as Lucky Pond, which measures just over 1 acre in size. It dominates the northeastern part of the parcel and is part of the largest wetland system on the property. Two other open water areas exist. One small pond is located in the southwest corner of the parcel and a smaller pond is located in the southeast corner. Both Lucky Pond and the smallest pond in the southeast are part of the same wetland system which ultimately drains into the 94.5 acre Fresh Meadows to the southwest. The pond in the southwest corner drains directly into Fresh Meadows.

Less obvious on the landscape are the mapped wetland soils that are wet meadows. Currently these are under hayfield north of Cheshire Road and hayfield and cornfield south of Cheshire Road. These areas are Wilbraham silt loam soil classified as poorly drained in Connecticut. At times, they are not easily recognizable on the landscape because they are under agricultural use. Depending on seasonal moisture they may appear on the landscape as wet meadows, more so than in dry years.

All of these wetlands are important because they are at or near the headwater areas of the Mill River drainage. As a result of their placement on the landscape they are functionally providing good water quality and quantity to the watercourses further down in the watershed.

Systematically, the major wetland system on the site drains to the large Fresh Meadows wetland southwest of the property. This wetland system incorporates Lucky Pond and has its flow beginning at or near the northern property boundary. Whether it begins north of the farm property in a small golf course pond or not could not be established on the site walk. From Lucky Pond (surface elevation ~293 feet) water flow passes under Cheshire Road continuing south, and downslope, as a narrow watercourse. South of Cheshire Road the wetland boundary of the south running stream bulges to the west to incorporate a wet meadow. The water course continues south flowing through at least one riffle pool before passing into the unnamed small pond in the southeast corner of the property (surface elevation ~ 283 feet). From here it continues south off the property where it turns west to flow into Fresh Meadows.

There are three wet meadow areas on the parcel. The first and largest sits north of Cheshire Road and runs north/south just west of the hillside orchard. The second largest occurs south of Cheshire Road as described above. The third and smallest runs diagonally across a field due south of the largest orchard on the property.

Wetland Assessment

The water quality for this 50 acre parcel shows classifications of all ground and surface waters as "AA." This is the highest classification that is mapped in the state. It has been mapped on the Connecticut DEP, Bureau of Water Management *Connecticut Water Quality Classifications map* (adopted February 1993).

The surface water for this class is described in the classifications as having Designated Use of: "existing or proposed drinking water supply; fish and wildlife

habitat; recreational use; agricultural industrial supply and other purposes (recreational uses may be restricted)."

The designated uses of AA groundwater are described as: "existing or potential public water supply of water suitable for drinking without treatment; base flow for hydraulically connected surface water bodies."

The Fish and Wildlife Service National Wetland Inventory (NWI) maps classify these wetlands on their NWI maps as Palustrine - the most frequently found of all the wetlands in the state. Due to the scale of NWI mapping 1:24,000, only the three ponds on the property were classified. All three are mapped as "Palustrine, open water, permanent." Only at the scale of the typical site plan, 1:480, can the work of the soil scientist come to light - in this case delineating both the wet meadows and the watercourses that connect the systems documented.

Potential Wetland Concerns

The potential concerns, or at least possibility of problems to be aware of, as management of this property begins, are mostly related to agricultural impacts on wetland and water quality. Discussions of improvements are based on the assumption that the managers of the property will preserve existing wetland systems and have no further deleterious impact on the wetlands.

- Due to the season and the weather at the time of the field review (snow cover and heavy rain) the Team did not investigate to the fullest degree some aspects of the parcel. One of the unresolved points was establishing if there is a hydraulic connection between the small pond on the golf course property just north of Lucky Pond and Lucky Pond itself. If there is a connection, an understanding of the runoff from the small pond would be helpful to establish if Lucky Pond, and the waters that flow from it, show signs of

nutrient loading from fertilizer, as well as pesticide runoff from the golf course.

- Another key issue will be the future resource management of the land. If the farmlands remain in agriculture, and if it has row crops and livestock, the same runoff (nonpoint pollution) concerns about localized fertilizer nutrient and fecal coliform runoff could easily be an issue impacting this previously described AA water classification.

- Because of the snow cover it was difficult to establish the nature of the shoreline of Lucky pond. From the aerial photographs of July, 1994 it appears that the fields are mowed or kept in grass all along the western shore. A change in the shoreline vegetation may be necessary if there is nutrient loading and its companion problems from Canada geese. These impacts are more fully explained in the Wildlife section of this report

- There was discussion at the time of the ERT meeting that there could be demolition of buildings when the town has the opportunity to manage the property. Again, regarding water quality of the wetlands and watercourses, a full erosion and sediment control plan should be submitted and approved to guard against the sedimentation and other disturbances from the demolition.

Wetland Guidelines/Recommendations

Municipal management of this parcel provides a great opportunity to ensure that any wetland degradation in the past has the opportunity to be rectified.

- Specifically regarding the wet meadows, and the water course that connects Lucky Pond with the small pond in the southeast corner, it is recommended that a 100 foot buffer be employed around the mapped wetlands and that the

wetlands be allowed to revert to natural hydrophytic vegetation. This may take several growing seasons depending on the nature of the vegetation that is currently there. But the transition from mowed grass to wetland vegetation will provide an excellent educational opportunity. It is recommended that the wet meadows not be planted with hydrophytes, but instead allow nature to take its course.

- Much of the parcel features soil that is recognized as prime farmland soils or additional statewide important farmland soils. The municipal ownership of this property offers the opportunity to keep the land in agriculture, possibly in a combination of leased field for area farmers and/or an educational opportunity of the local high schools.

- All on-site agriculture, whether through a vocational agriculture school or through a lease arrangement, should apply best management practices as outlined in the document *Manual of Best Management Practices for Agriculture,* (Connecticut DEP, 1996) to restore impacted wetland areas and minimize impacts on water quality.

- Additional documents such as *Guidelines: Upland Review Area Regulations Connecticut's Inland Wetlands and Watercourses Act;* Connecticut DEP, June 1997, and the Connecticut River Joint Commissions web site located at http://www.crjc.org (which offers much information on the importance and implementation of buffers) will be valuable tools to preserving the wetlands and restoring them to their full function and value capability.

- If the wetland buffers are observed, this property has the potential to offer wonderful educational opportunities. The variety of wetlands including open water, wet meadow, and the riparian area along the watercourse, when added to the proximity of the 94+ acre neighboring Fresh Meadows could provide numerous flora and fauna based stops for school children, or a self guided

walking trail for the public. Add to this the geologic history, which would include the bedrock outcrop "mountain", the split glacial erratic, and the recent agricultural history, the local educators should have plenty of food for thought regarding planning and educational use.

THE NATURAL DIVERSITY DATA BASE

The Natural Diversity Data Base maps and files regarding the project area have been reviewed. According to our information, there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question. However, our information indicates that a State Species of Special Concern *Toxorhynchites rutilus* (mosquito) has been documented to the west of this area.

This invertebrate species is associated with freshwater wetlands and may also occur on the project site. Please note, the Wildlife Division has not made an on-site inspection of the project area nor been provided with details or a timetable of any work to be done. Consultation with the Wildlife Division should not be substituted for on-site surveys required for environmental assessments.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. Please contact the Natural Diversity Data Base if you have further questions at (860) 424-3592 or Julie Victoria of the DEP Wildlife Division at (860) 642-7239.

Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

VEGETATION

The parcel may be divided into several broad vegetation categories. These include Open Fields/Agricultural fields, Abandoned Orchard, Wetlands, both open and wooded, and Mixed Hardwoods. Below are brief descriptions of each of these vegetation categories. The location and acreage of these areas were obtained from 1995 aerial photographs and are only approximate. They are depicted on the Vegetation Type Map (Figure 5). The field inventory of vegetation was conducted in January and February of 2001 with a snow cover present. A more comprehensive inventory of the herbaceous vegetation, which is present in each of these categories, should be made at different times throughout the year by a botanist.

Vegetation Type Descriptions

A. Open/Agricultural Fields

Approximately 23 acres of this property was recently abandoned from agricultural use. These fields are now vegetated with assorted grasses including, reed canary-grass* and foxtail. Goldenrod spp., milkweed, Queen Anne's lace, aster spp., lamb's quarters, evening primrose, common mullein, tall wormwood and ragweed are also present. Multiflora rose*, silky dogwood, smooth sumac and poison ivy have encroached into several of the fields.

B. Abandoned Orchard

Several apple orchards that were abandoned many years ago are present on this tract. They total approximately 13 acres. The neglected apple trees, although overgrown, could be brought back into a healthy fruit producing condition. Multiflora rose has become dense in many areas making access very difficult. Grasses, goldenrod, poison ivy, blackberry, wine berry* and many weed species

are present where the multiflora rose has not had a chance to become established.

C. Wetlands: Open Swamp/Hardwood Swamp

There are approximately 6 acres of wetlands present within this property. These wetland areas are somewhat variable ranging from open swamp or meadow near the ponds to hardwood swamp with all size classes and age classes of trees represented. The open areas are vegetated with grasses, sedges, garlic mustard*, poison ivy, curled dock, common reed*, autumn olive*, multiflora rose*, Japanese honeysuckle*, arrowwood, winterberry, elderberry, wine berry, black raspberry, wild grape, gray stemmed dogwood and silky dogwood. The vegetation that is present in the hardwood swamp areas include red maple, black willow, white ash, sugar maple, American elm, black cherry, red oak, flowering dogwood and mulberry. A few of the larger trees in these wetland areas have cavities, which make excellent den sites for many species of wildlife. Understory and herbaceous vegetation includes many of the species listed above in the open swamp areas.

D. Mixed Hardwoods

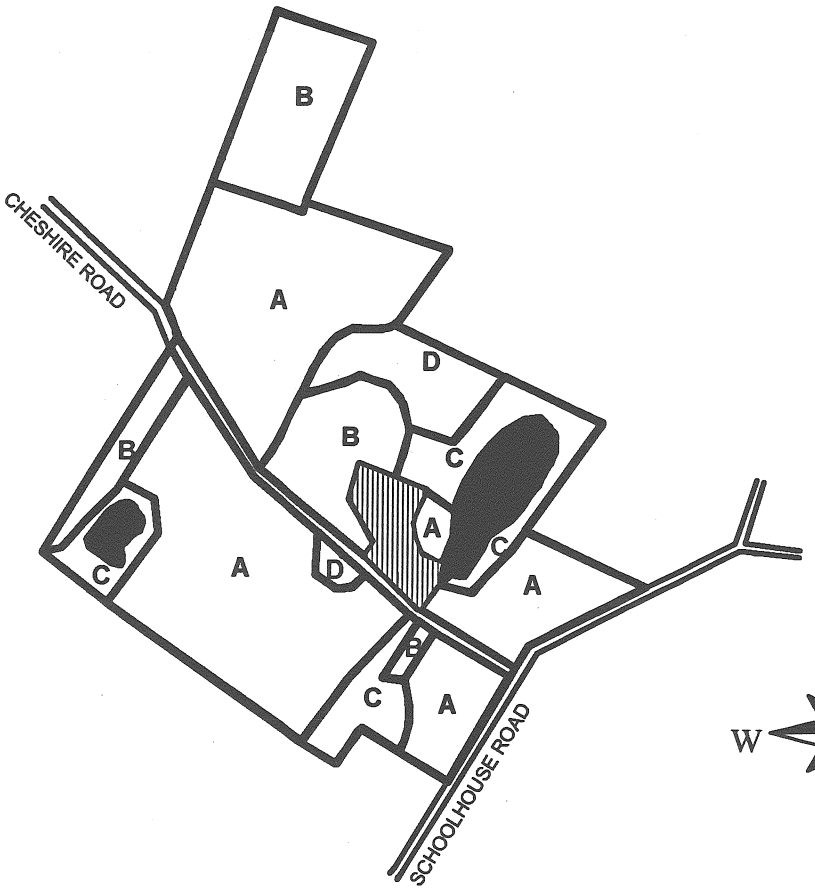
The mixed hardwood type totals approximately 4 acres and is located on the portions of this property that were not suitable for agricultural use due to rockiness and or steep slopes. Overall this vegetation type is made up of reasonably healthy small sawtimber size trees (11.1" in diameter at breast height (d.b.h.) and larger) and pole size trees (6.1" to 11" d.b.h.) which range from 30 to about 100 years of age. Black oak, red oak, black birch, eastern red cedar, red maple, bigtooth aspen and basswood dominate this area. Chinese chestnut, black walnut and butternut were planted along Cheshire Road. Understory vegetation includes hardwood tree seedlings, maple leaved viburnum, arrowwood, eastern hophornbeam, American hornbeam, witch-hazel and highbush blueberry. Ground cover vegetation includes poison ivy, Virginia creeper, green briar,

raspberry, wood aster, spotted wintergreen, club moss and many species of grasses, sedges and wild flowers.

**Invasive exotic vegetation has become established throughout much of the review site especially in openings. Of special concern are several invasive plant species, which have the potential to become major components of the ecosystem by out competing native species. These include multiflora rose, Japanese honeysuckle, garlic mustard, reed canary-grass, common reed, wine berry and autumn olive. Although some of these species provide wildlife with food and cover, they are aggressive competitors with native plant species. In some areas the presence of one or more of these species may preclude the establishment of other more desirable native plant species. Mechanical removal or chemical control of these plants is effective but will become more difficult as they become more widespread.*

Figure 5

Vegetation Types



0 500 1000 Feet

Legend

Property Boundary

Vegetation Type Boundary

Road

Ponds 2.5+- acres

Homestead 1.5+- acres

Vegetation Types

A.	Open Fields	23+- acres
B.	Orchard	13+- acres
C.	Wetlands	6+- acres
D.	Mixed Hardwoods	4+- acres

raspberry, wood aster, spotted wintergreen, club moss and many species of grasses, sedges and wild flowers.

**Invasive exotic vegetation has become established throughout much of the review site especially in openings. Of special concern are several invasive plant species, which have the potential to become major components of the ecosystem by out competing native species. These include multiflora rose, Japanese honeysuckle, garlic mustard, reed canary-grass, common reed, wine berry and autumn olive. Although some of these species provide wildlife with food and cover, they are aggressive competitors with native plant species. In some areas the presence of one or more of these species may preclude the establishment of other more desirable native plant species. Mechanical removal or chemical control of these plants is effective but will become more difficult as they become more widespread.*

WILDLIFE RESOURCES

This section will address the following current conditions for wildlife, recommendations for habitat management and enhancement, and planning for wildlife.

Current Conditions

The following wildlife were observed during two site visits (January 30, and February 26, 2001) either directly* or indirectly by identifying calls, tracks, scat or other sign: white-tailed deer *(Odocoileus virginianus)*, red *fox (Vulpes vulpes)*, cottontail rabbit *(Sylvilagus* spp.), *gray squirrel *(Sciurus carolinensis)*, *meadow vole *(Microtus pennsylvanicua)*, *mourning dove *(Zenaida macoura)*, *song sparrow *(Melospiza melodia)*, *American robin *(Turdus migratorius)*, *northern mockingbird *(Mimus polyglottos)*, *northern cardinal *(Cardinalis cardinalis)*, *bluejay *(Cyanocitta cristata)*, *dark-eyed junco *(Junco hyemalis)*, *cedar waxwing *(Bombycilla cedrorum)*, *tufted titmouse *(Parus bicolor)*, * black-capped chickadee *(Parus atricapillus)*, *American crow *(Corvus brachyrhynchos)*, *white-throated sparrow *(Zonotrichia albicollis)*, *red-winged blackbird *(Agelaius phoeniceus)* and *American black duck *(Anas rubripes)*. These are just a few examples of the types of wildlife that utilize the properties habitats. It can be expected, with more thorough field investigations, that the species list will be large for the property. Also observed were tracks of house cats.

Current Habitat Conditions and Habitat Management Needs

(See Forestry Section for Habitat Map, Figure 5)

1 - Open field / grassland / abandoned crop field

This comprises approximately 23 acres of the site. The abandoned crop fields are being taken over by wormwood, wild asters, lambs quarters, fox tail and other early colonizers of abandoned fields. The open fields that were not plowed and kept meadow through haying have a variety of grasses including reed canary grass and orchard grass. Meadow vole activity was evident throughout the unmowed fields, as well as, cottontail rabbit and deer sign. These fields may also provide seasonal habitat for meadowlarks and bobolinks.

Managing these field areas is important because reversion to forest can occur rapidly following abandonment. Connecticut is steadily losing much of its grassland habitats, especially in the Wallingford area. The following measures can be employed to enhance conditions for grassland birds:

- Restore native grasses to the land such as seeding in big bluestem, little bluestem, Indian grass, and switchgrass (plant in mixtures). These native seeds are termed "warm season" grasses which are more drought resistant, winter hardy, and adapted to less fertile soils. Because they form clumps of grass rather than dense stands, they create better conditions for ground nesters.
- Mow or hay after July 15 to avoid killing nestlings or eggs of ground nesters.
- Raise mower blades to 6 inches or more to avoid destroying nests or nestlings.
- *Burn fields in early spring (before mid May) to maintain grasslands and rejuvenate them (*may not be allowed in some towns, check with the local fire marshall).

2 - Abandoned orchard (about 13 acres)

Unmanicured orchards usually provide a short-term benefit to area wildlife species especially deer, wild turkey, cottontail rabbit, ruffled grouse, fox, coyote, and local shrubland song birds. They usually continue to produce apples for about 15 years and steadily decline as the apple trees decline in health and forest succession takes place. Abandoned orchards can be managed for wildlife in several ways depending on the goals of the landowner:

- Landowners interested in attracting white-tailed deer and wild turkey tend to manage abandoned apple trees for apple production. Revitalization of apple production requires pruning apple trees and removal of competing vegetation. See Appendix B for fact sheet on abandoned apple trees.
- Because of time and monetary constraints some landowners allow orchards to gradually revert to forest and manage only a few apple trees for apple production This option allows for reforestation to occur, yet maintenance of some apple trees for diversification of wildlife food availability for fall and early winter.

3 - Ponds (2.5 acres) and wetlands (6 acres)

The larger pond is surrounded by small strips of woods to the north and east. Meadow comprises most of the western, southern and southeastern boundaries. The smaller pond is bordered on all sides by a wooded buffer. With current trends for resident Canada geese showing an increase, reduction in foraging sites is recommended around ponds. Allowing native trees and shrubs to recolonize the perimeter of the ponds will discourage Canada geese. Access areas for fishing can be maintained, but should be as small as practicable to discourage geese.

4 - Mixed hard-wood forest (4 acres)

Although a small forest, this area provides a high point on property where deer beds were evident. Although a small forest now, combined with the abandoned

orchard areas, at this time it provides older trees and hard mast (acorns, nuts and seeds) for wildlife.

Open Space, Wildlife Habitat and The Future

Connecticut is the fifth most densely populated state in the United States. As urban areas become developed, habitats are divided into smaller and more isolated pieces. Land that is in public ownership can be maintained and managed for the long term. In contrast, private land, which makes up over 80 percent of the land in Connecticut, usually changes ownership and is not managed for wildlife for the long term. As forest fragmentation continues, town-owned natural areas will gain in importance as wildlife habitat and refugia. Retaining nature areas in close proximity to urban centers should be carefully planned and considered. Wildlife areas that are close to urban centers serve as refugia for wildlife and are also gaining in popularity nationwide.

Habitat Management and Planning Considerations

The property needs to have a long term habitat management plan which encompasses the goals and objectives for increasing and maintaining biodiversity. Also, in concert, with the habitat management, a plan is needed for utilizing the property for recreation. As properties are developed, natural areas are divided into smaller, isolated pieces. This publicly-owned property can be a place where habitat is improved and managed for wildlife for the enjoyment and learning experience of area citizens. Plantings of native trees, shrubs and wildflowers can enhance conditions for wildlife in the area.

Controlling invasive non-native plants will require a diligent application of mechanical removal by hand, pick and shovel, and tractor (back-hoe). Also, application of herbicides may be necessary for some invasives to prevent

resprouting of cut stumps (if herbicide use is a major concern - least environmentally sensitive compounds can be used). The need for controlling invasive non-natives outweighs the risks of utilizing herbicides.

Planting various trees, shrubs and wildflowers will enhance the seasonal food sources and improve habitat conditions. Plant materials should be of native sources as much as possible. Plant species which restore and enhance natural habitat conditions should be utilized and invasive non-native species avoided.

One missing habitat component that is evident on the property is the lack of evergreen cover. Evergreen cover provides valuable wildlife cover and shelter especially during harsh winter weather. Clustered plantings (5 feet by 5 feet spacing, an acre or more in size) of mixed evergreens such as white pine *(Pinus strobus)*, white spruce *(Picea glauca)*, and Norway spruce *(Picea abies)* is recommended for the property.

Diversifying the seasonal availability of food sources planting spring, summer, and fall food sources or winter persistent food sources. The following native plants can be used to enhance the pond perimeters (all the species are currently found on the property.

<u>Native shrubs:</u>

- Gray dogwood *(Cornus racemosa)*
- Silky dogwood *(Cornus amomum)*
- Arrowwood viburnum *(Viburnum recognitum)*
- Common Elderberry *(Sambucus canadensis)*
- American Cranberry Bush *(Viburnum trilobum)*
- Winterberry *(Ilex verticillata)*

Connecticut Native Tress and Shrubs Availability List, 10 pp.

Peter Picone

DEP Wildlife Division

P.O. Box 1550

Burlington, CT 06013

Meadow Environment Plantings

Encourage native wildflowers and grasses through selective mowing. Maintain herbaceous environment by mowing /burning fields at least once a year to prevent woody plant invasion. Plant/seed native wildflowers and grasses throughout the open field areas. Restore abandoned plowed fields with native grasses and perennial wildflowers.

Invasive Non-Native Plants

The following non-native invasive plants are found throughout the property and should be removed or managed:

- tree of heaven *(Ailanthus altissima)*
- winged euonymus *(Euonymus alatus)*
- autumn olive *(Eleaegnus umbellata)*
- tartarian honeysuckle *(Lonicera tartarica)*
- multiflora rose *(Rosa multiflora)*
- Japanese barberry *(Berberis thunbergii)*
- reed canary grass *(Phalaris arundinacea).*

These species are introduced plants which were not part of Connecticut's landscape prior to European settlement. These are particularly invasive and compete with many native species for growing space. Some may develop into monocultures which leads to a decline in biodiversity. A vegetation

management plan is needed to begin a program to reduce or remove invasive plant species to prevent their spread. DO NOT PLANT Invasive Non-Natives:

Invasive Non-Native Trees

- Norway Maple (Acer platanoides)
- Tree of Heaven *(Ailanthus altissima)*
- Catalpa *(Catalpa spp.)*

Invasive Non-Native Shrubs

- Autumn Olive *(Elaeagnus umbellata)*
- Russian Olive *(Elaeagnus angustifolia)*
- Winged Euonymus *(Euonymus alatus)*
- Burning bush *(Euonymus atropurpureus)*
- Privet (Lignustrum *spp.)*
- Tartarian honeysuckle *(Lonicera tatarica)*
- Common buckthorn *(Rhamnus cathartica)*
- Glossy buckthorn *(Rhamnus frangula)*
- Multiflora rose *(Rosa multiflora)*

Invasive Non-native Vines

- Asiatic bittersweet *(Celastrus orbiculatus)*
- Japanese honeysuckle *(Lonicera japonica)*

Native plant sources:

New England Wildflower Society, Inc.
Garden in the Woods
Hemenway Road
Framingham, MA 01701-2699
Tel. 617-237-924 or 877-7630

DEP Forestry Division
Seedling Program
Pachaug State Nursery
Box 23A, 190 Sheldon Road
Voluntown, CT 06384
Tel. 860-376-2513

Nature Trail Development and Planning Recommendations

If nature trails are consider, they should not be allowed to criss-cross the entire property. Trails should allow some parts of the property to remain as refugia where wildlife remain undisturbed by large volumes of foot traffic. Dogs should not be allowed on the property during the nesting seasons.

Other Habitat Improvements

Dead or dying wood is part of habitat for wildlife, especially woodpeckers and a whole host of secondary users such as screech owls *(Otus asio),* bluebirds (*Sialia sialis)* and flying squirrels. A minimum of 3-5 snags (dead or dying trees) per acre should be present or created per acre of forested area. Larger snags are more valuable, although snags as small as 3 inches in diameter are utilized by wildlife.

Snags can be created by cutting two complete bands through the bark with a chainsaw or ax (type of trees and technique information is available from the Team DEP forester or wildlife biologist). Adding in artificial nesting boxes for bluebirds, tree swallows, house wrens, black capped chickadees, and screech owls is also recommended (plans available upon request from the Team wildlife biologist).

Conclusions

The Galko property provides the town of Wallingford a unique opportunity to conserve and maintain valuable wildlife habitat and bring its citizens closer to nature. This report provides a few insights on managing such a property for wildlife. With the proper care and management this property will provide habitat for wildlife and enjoyment for citizens of Wallingford for the foreseeable future.

The Department of Environmental Protection's wildlife division has developed a habitat demonstration area at it's Sessions Woods property in Burlington. This area can be visited to view various habitat demonstrations.

For more information and further technical help please contact the Team wildlife biologist at DEP Wildlife Division, Sessions Woods Wildlife Management Area, Route 69, Burlington, CT 06013, Tel. (860) 675-8130.

AQUATIC RESOURCES

(Note: Field review conducted 6/8/01)

Site Description

There are four ponds on the 50 acre Galko Farm parcel. The ponds range in size from approximately 1/8 to 1 1/2 acres in surface area. The ponds are all artificial in nature, likely being constructed to provide a water supply source for the farm which had previously occupied the site. The ponds appear to be relatively shallow given their support of moderate growths of emergent and submergent aquatic vegetation.

Although the site has been subject to agricultural development, buffers of wetlands and/or second growth field occur adjacent to the Galko Farm's surface waters. This has provided an effective means of protecting aquatic habitats and surface water quality. The Department of Environmental Protection classifies the surface waters of the Galko Farm site as *Class A* surface waters designated uses for *Class A* surface waters are potential drinking water supply, fish and wildlife habitat, recreational use, agricultural and industrial supply, and other legitimate uses including navigation.

Aquatic Resources

With shallow water depths and moderate aquatic plant growth, the ponds on the Galko Farm site can be classified as a warm-water resources. Formal surveys have never been conducted to evaluate the resident fish population. Field review indicated the presence of bluegill *(Lepomis macrochirus)*, largemouth bass *(Micropterus salmoides)* and golden shiner *(Notemigonus crysoleucas)* in

the largest of the ponds and bluegill and golden shiner in the other ponds. These fish species are common to warm-water lakes and ponds in Connecticut.

Resource Impacts

As previously mentioned, the Galko Farm site has been subject to agricultural development conducted in a manner maintaining buffers of wetlands and/or second growth field adjacent to the site's surface waters which has subsequently provided an effective means of protecting aquatic habitats and surface water quality. Taken as a whole, maintaining the site as open space is not anticipated to produce a land use change which would adversely impact the aquatic resources.

Mitigative Recommendations

Should there be future land use change on the Galko Farm parcel, it is imperative that vegetated buffers be maintained around the ponds. The buffer should have a minimum width of 100 feet. Research has indicated that a buffer zone of this width prevents damage to aquatic ecosystems that are supportive of diverse species assemblages. Buffers absorb surface runoff, and the pollutants they may carry, before they enter wetlands or surface waters. Please refer to the attached documentation presenting Division policy and position regarding riparian buffers for additional information.

Of the four ponds on the Galko Farm open space parcel, the 1 1/2 acre pond (Lucky Pond) northerly off Cheshire Road offers the best opportunity to support recreational angling. Research has shown that ponds less than one acre in size are difficult to manage for angling as they either may not contain sufficient fish populations or have fish populations which may be drastically altered with even the slightest fishing pressure.

Largemouth bass and bluegill would be the target species for anglers fishing Lucky Pond. Anglers are required to adhere to State regulations for bass harvest of a 12 inch minimum length and a possession limit of six (6) fish. There are no regulations for the harvest of bluegill or other sunfish species in Connecticut. It should be noted that the Town of Wallingford can establish angling regulations which are more stringent than the State regulations.

AQUATIC RESOURCES

(Section to be added when completed by Team Fisheries Biologist)

DEPARTMENT OF ENVIRONMENTAL PROTECTION
INLAND FISHERIES DIVISION

POLICY STATEMENT
RIPARIAN CORRIDOR PROTECTION

I. INTRODUCTION, GOALS, AND OBJECTIVE

Alteration and exploitation of riparian corridors in Connecticut is a common event that significantly degrades stream water quality and quantity. Inasmuch as riparian ecosystems play a critical role in maintaining aquatic resource productivity and diversity, the Inland Fisheries Division (Division) recognizes that rigorous efforts are required to preserve, protect, and restore these valuable resources. Consequently, a riparian corridor protection policy has been developed to achieve the following goals and objective:

Goals

Maintain Biologically Diverse Stream and Riparian Ecosystems, and

Maintain and Improve Stream Water Quality and Water Quantity.

Objective

Establish Uniform Riparian Corridor Buffer Zone Guidelines.

II. DEFINITIONS

For the purpose of implementing a statewide riparian corridor protection policy, the following definitions are established:

Riparian Corridor: A land area contiguous with and parallel to an intermittent or perennial stream.

Buffer Zone: An undisturbed, naturally vegetated area adjacent to or contained within a riparian corridor that serves to attenuate the effects of development.

Perennial Stream: A stream that maintains a constant perceptible flow of water within its channel throughout the year.

Intermittent Stream: A stream that flows only in direct response to precipitation or which is seasonally dry.

III. RIPARIAN FUNCTION

Naturally vegetated riparian ecosystems perform a variety of unique functions essential to a healthy instream aquatic environment. The delineation and importance of riparian functions are herein described. Vegetated riparian ecosystems:

* Naturally filter sediments, nutrients, fertilizers, and other nonpoint source pollutants from overland runoff.

* Maintain stream water temperatures suitable for spawning, egg and fry incubation, and rearing of resident finfish.

* Stabilize stream banks and stream channels thereby reducing instream erosion and aquatic habitat degradation.

* Supply large woody debris to streams providing critical instream habitat features for aquatic organisms.

* Provide a substantial food source for aquatic insects which represent a significant proportion of food for resident finfish.

* Serve as a reservoir, storing surplus runoff for gradual release into streams during summer and early fall base flow periods.

IV. RIPARIAN CORRIDOR BUFFER ZONE GUIDELINES

Recognizing the critical roles of riparian corridors, the Division provides buffer zone guidelines that are designed to bring uniformity and consistency to environmental review. The guidelines are simple, effective, and easy to administer. The following standard setting procedure should be used to calculate buffer zone widths.

Perennial Stream: A buffer zone 100 feet in width should be maintained along each side.

Intermittent Stream: A buffer zone 50 feet in width should be maintained along each side.

Buffer zone boundaries should be measured from either, (1) edge of riparian inland wetland as determined by Connecticut inland wetland soil delineation methods or (2) in the absence of a riparian wetland, the edge of the stream bank based on bank-full flow conditions.

The riparian corridor buffer zone should be retained in a naturally vegetated and undisturbed condition. All activities that pose a significant pollution threat to the stream ecosystem should be prohibited.

Where the Division policy is not in consonance with local regulations and policies regarding riparian corridor buffer zone widths and allowable development uses within these areas, local authorities should be encouraged to adopt the more restrictive regulations and policies.

12/13/91
Date

James C. Moulton
Acting Director

POSITION STATEMENT
UTILIZATION OF 100 FOOT BUFFER ZONES TO PROTECT RIPARIAN AREAS IN CONNECTICUT

BY
BRIAN D. MURPHY
TECHNICAL ASSISTANCE BIOLOGIST
INLAND FISHERIES DIVISION

I. INTRODUCTION

One tenet of the Inland Fisheries Division Policy on Riparian Corridor Protection is the utilization of a 100 foot buffer zone as a minimum setback along perennial streams. The adoption of such a policy is sure to be controversial. Laymen, developers and natural resource professionals alike will ask questions such as: Why was a standard setting method adopted? What's magical about 100 feet? Will 100 feet be sufficiently protective, or will it be overly protective? In response, this paper outlines the ramifications of adopting a riparian corridor policy including the use of a 100 foot buffer zone.

II. STANDARD SETTING VERSUS SITE SPECIFIC BUFFER ZONES

There are two approaches for determining buffer zone width; standard setting and site specific. Standard setting methods define an area extending from the streambank edge or highwater mark to some landward fixed point boundary. Site specific methods utilize formulas that incorporate and consider special site specific land characteristics, hence, the calculation of a variable width buffer zone. In both case, buffers are employed to define an area in which development is prohibited or limited.

A major advantage of standard setting methods is that they are easy to delineate and administer, thereby improving the consistency and quality of environmental assessments. Furthermore, valuable staff time would not be required to determine site specific buffer zones along each and every watercourse of concern.

The exact width of a buffer zone required for riparian corridor protection is widely disputed (Bottom et al. 1985 and Brinson et al. 1981). Buffer width recommendations found in the literature vary from as little as 25 feet to as great as 300 feet (Palfrey et al. 1982). The 100 foot buffer is widely accepted in Connecticut having been adopted by numerous inland wetland and conservation commissions as an appropriate minimum setback regulation for streambelts. In addition, Division staff have been recommending the utilization of the 100 foot buffer zone to protect streambelts since the early 1980's. Scientific research has not been generated to dispute the adequacy of utilizing 100 foot buffer zones to protect Connecticut's riparian corridors. In fact, to ensure that riparian functions are not significantly altered, recent scientific information points towards maintaining buffer zones that would be at a minimum, 100 feet in width (see section III).

Site specific methods define buffer widths according to the character and sensitivity of adjacent streamside lands. These buffer widths, also referred to as "floating buffers," consider physical site characteristics such as slope, soil type, and vegetative cover. The advantage of site specific methods is that buffer widths are designed using site characteristics and not an arbitrary predetermined width. Unfortunately, there is no "one" universally accepted formula or model and none have been developed for use in Connecticut. Most formulas are based on the degree to which sediment can be removed or filtered by natural vegetation, thus, the primary useage is sediment control. Other weaknesses of site specific techniques are (1) all areas must be evaluated on a case-by case basis and, (2) the subjectivity of different techniques (i.e. if the evaluation technique is inadequate, the buffer width will also be inadequate).

Additionally, these formulas only concentrate on one specific riparian function at a time and do not take into account multiple riparian functions, especially those of inland fisheries values as discussed in Section III. Consequently, site specific formulas approach riparian function on a single dimension rather than taking a more realistic, holistic approach.

In the absence of a scientific model to determine buffer widths suitable to protect Connecticut's riparian corridors, the utilization of a standard setting method is environmentally and politically prudent.

III. RIPARIAN FUNCTION

To assess the efficacy of a 100 foot buffer zone, the literature was searched to identify studies which have applied a quantitative approach to buffer width determination. Literature was searched for studies which both support and dispute the 100 foot zone. The following is a summary "by riparian function" of quantitative studies which assess buffer widths.

Sediment Control

Width, slope and vegetation have been cited as important factors in determining effectiveness of buffer zones as sediment filters (Karr and Schlosser 1977). Wong and McCuen (1981), who developed and applied a mathematical model to a 47 acre watershed, found that a 150 foot zone along a 3% slope reduced sediment transport to streams by 90%. Mannering and Johnson (1974) passed sediment laden water through a 49.2 foot strip of bluegrass and found that 54% of sediment was removed from the water. Trimble and Sartz (1957) developed recommendations as to width of buffer areas between logging roads and streams to reduce sediment load. They determined a minimum strip of 50 feet was required on level land with the width increasing 4 feet for each 1% slope increase. Buffer widths as determined by Trimble and Sartz (1957) have been characterized as evaluated guesses rather than empirically defined widths (Karr and Schlosser 1977). Rodgers et al. (1976) state that slopes greater than 10% are too steep to allow any significant detention of runoff and sediment regardless of buffer width. After a critical review of the literature, Karr and Schlosser (1977) determined that the size and type of vegetative buffer strip needed to remove a given fraction of the overland sediment load cannot be universally quantified. Existing literature does suggest that 100 foot riparian buffers will assist with sediment entrapment, although efficacy will vary according to site conditions.

Temperature Control

Brown and Brazier (1973) evaluated the efficacy of buffer widths required to ameliorate stream water temperature change. They concluded that angular canopy density (ACD), a measure of the ability of vegetation to provide shading, is the only buffer area parameter correlated with temperature control. Results show that maximum angular canopy density or maximum shading ability is reached within a width of 80 feet. Study sites were 9 small mountain streams in Oregon that contained a conifer riparian vegetative complex. Whether or not maximum angular canopy density is reached within 80 feet in a typical Connecticut deciduous forest riparian zone is doubtful. Tree height in Connecticut riparian zones is smaller than in Oregon (Scarpino, personal communication), therefore buffers greater than 80 feet in width would be required for temperature maintenance in Connecticut.

Nutrient Removal

Nutrient enrichment is caused by phosphorous and nitrogen transport from, among other things, fertilized lands and underground septic systems. Most research on nutrient enrichment has focused on overland surface flow. Karr and Schlosser (1977) report that 88% of all nitrogen and 96% of all phosphorous reaching watercourses in "agricultural watersheds" were found to be attached to sediment particles; thus, successful nutrient removal can be accomplished through successful sediment removal. There are conflicting reports on the ability of buffer widths to remove nutrients with most research being tested on grass plots. Butler et al. (1974) as cited by Karr and Schlosser (1977) found that a 150 foot buffer width of reed canary grass with a 6% slope caused reductions in phosphate and nitrate concentrations of between 0–20%. Wilson and Lehman (1966) as cited by Karr and Schlosser (1977) in a

study of effluent applied to 300 m grass plots found that nitrogen and phosphorous concentrations were reduced 4 and 6%, respectively. Studies on subsurface runoff as cited in Clark (1977) found high concentrations of nitrates at 100 feet from septic systems with unacceptable levels at 150 feet. Clark (1977) recommended that a 300 foot setback be used whenever possible, with a 150 setback considered adequate to avoid nitrate pollution. Environmental Perspective Newsletter (1991) states that experts who commonly work with the 100 foot buffer zone set by the Massachusetts Wetlands Protection Act are increasingly finding that it is insufficient since many pollutants routinely travel distances far greater than 100 feet with nitrate-nitrogen derived from septic systems moving distances of greater than 1000 feet. Research indicates that the adoption of 100 foot buffer widths for Connecticut riparian zones will assist with the nutrient assimilation; albeit, complete removal of all nutrients may not be achieved.

Large Woody Debris

The input of large woody debris (LWD) to streams from riparian zones, defined as fallen trees greater than 3 m in length and 10 cm in diameter has been recently heralded as extremely critical to stream habitat diversity as well as stream channel maintenance. Research on large woody debris input has mainly been accomplished in the Pacific Northwest in relation to timber harvests. Murphy and Koski (1989) in a study of seven Alaskan watersheds determined that almost all (99%) identified sources of LWD were within 100 feet of the streambank. Bottom et al. 1983 as cited by Budd et al. (1987) confirm that in Oregon most woody structure in streams is derived from within 100 feet of the bank. Based on research done within old-growth forests, the Alaska region of the National Marine Fisheries Service, recognizing the importance of LWD to salmonid habitat, issued a policy statement in 1988 advocating the protection of riparian habitat through the retention of buffer strips not less than 100 feet in width (Murphy and Koski 1989). All research findings support the use of a 100 foot buffer zone in Connecticut for large woody debris input.

Food Supply

Erman et al. (1977) conducted an evaluation of logging impacts and subsequent sediment input to 62 streams in California. Benthic invertebrate populations (the primary food source of stream fishes) in streams with no riparian buffer strips were compared to populations in streams with buffer widths of up to 100 feet. Results showed that buffer strips less than 100 feet in width were ineffective as protective measures for invertebrate populations since sediment input reduced overall diversity of benthic invertebrates. Buffer strips greater than 100 feet in width afforded protection equivalent to conditions observed in unlogged streams. The ultimate significance of these findings is that fish growth and survival may be directly impacted along streams with inadequate sized riparian buffer zones. All research supports the feasibility of implementing a 100 foot buffer zone in Connecticut to maintain aquatic food supplies.

Streamflow Maintenance

The importance of riparian ecosystems in terms of streamflow maintenance has been widely recognized (Bottom et al. 1985). In Connecticut, riparian zones comprised of wetlands are of major importance in the hydrologic regime. Riparian wetlands store surplus flood waters thus dampening stream discharge fluctuations. Peak flood flows are then gradually released reducing the severity of downstream flooding. Some riparian wetlands also act as important groundwater discharge or recharge areas. Groundwater discharge to streams during drier seasonal conditions is termed low flow augmentation. The survival of fish communities, especially coldwater salmonid populations is highly dependent upon low flow augmentation (Bottom et al. 1985). Research, although documenting the importance of riparian zones as areas critical to streamflow maintenance, has not investigated specific riparian buffer widths required to provide the most effective storage and release of stream flows.

IV. OTHER POLICY CONSIDERATIONS

Measurement Determination

The proposed policy states that buffer zone boundaries should be measured from either the edge of the riparian inland wetland as determined by Connecticut inland wetland soil delineation methods or in the absence of a riparian wetland, the edge of the streambank based on bank-full flow conditions. This boundary demarcation is absolutely necessary to ensure that all riparian wetlands are protected. For example, if all measurements were to start from the perennial stream edge and extend landward for a distance of 100 feet, many riparian zones that contain expansive wetlands greater than 100 feet in width would be left unprotected.

Also, since boundary demarcation includes wetland delineation, the ultimate width of the buffer will vary according to site specific features. Consequently, buffer width determination as stated by Division policy is a "hybridization" of both standard setting and site specific methods. This hybridization of methods is advantageous since it acknowledges the sensitivity of streamside wetlands.

Home Rule

Where the Division policy is not in consonance with local regulations and policies regarding riparian corridor buffer zone widths, local authorities would be encouraged to adopt the more restrictive regulations and policies. This feature incorporates flexibility to acknowledge the importance of local "home rule" regulations or policies already in accepted practice. Conversely, towns and cities without accepted policies and regulations could choose to enact the Division policy.

Allowable Uses in Buffer Zones

The Division policy states that "the riparian corridor buffer zone should be retained in a naturally vegetated and undisturbed condition and that all activities that pose a significant pollution threat to the stream ecosystem should be prohibited." In essence, the buffer zone becomes an area where no development should be allowed. For this policy to be effective, there should be no exceptions, a blanket restriction of all uses would be recommended. Further clarification and more precise definitions of allowable uses will, however, be required in the future if the policy evolves into a departmental regulation.

Recently, the Connecticut Supreme Court has ruled that local agencies can prohibit specific development within buffer zones. The *Lizotte v. Conservation Commission of the Town of Somers, 216 Conn.320 (1990)* decision ruled that the construction or maintenance of any septic system, tank, leach field, dry well, chemical waste disposal system, manure storage area or other pollution source within 150 feet of the nearest edge of a watercourse or inland wetland's seasonal high water level can be prohibited (Wetlands Watch 1990). If this decision is a precursor of the future, Connecticut courts will continue to the support the use of buffers, especially those which restrict or prohibit detrimental activities.

V. CONCLUSIONS

The following actions are required to preserve, protect, and restore Connecticut's riparian corridors:

1. The Inland Fisheries Division needs to adopt and implement the proposed policy so that staff can use it as a guideline to assist cities, towns, developers and private landowners with making sound land use decisions. This policy will act to solidify a collective position concerning riparian corridor protection.

2. While the proposed policy in its "current form," represents a recommendation from the CTDEP Inland Fisheries Division, the ultimate goal of the Division should be to progressively implement this policy as either a CTDEP regulation or State of Connecticut statute.

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LAND USE PLANNING CONSIDERATIONS

Site Location

The Galko Farm was a family-owned farm prior to the town's purchase. It had been inactive for the last five to ten years. The site is located in a rural part of southwest Wallingford near the Cheshire town line, and it straddles Cheshire Road a short distance west of the Wilbur Cross Parkway.

Site Characteristics

This site includes many significant and noteworthy natural features. The property consists of two distinct pieces of land, which are separated by Cheshire Road. The parcel south of Cheshire Road directly abuts Fresh Meadows Swamp, a major portion of which is already owned by the Town of Wallingford and the Wallingford Land Trust. This portion of the property drains into the swamp and is also in the headwaters of the Mill River, one of the watersheds of the South Central CT Regional Water Authority (SCCRWA). Additionally, there is a small one-acre pond, several large open fields and an overgrown orchard located on this portion of the property. The section of the property north of Cheshire Road contains several buildings that are close to the road, including the farmhouse, a dilapidated greenhouse, silo and several barns. Other important features include a large pond and a vacant field on the eastern side of the parcel. The western side consists of a rocky, forested hill (with an elevation of 374 feet), several large vacant fields and two overgrown orchards. A Phase II study was completed and indicated the property has no identifiable environmental problems. As the Town considers demolishing the existing buildings, removal of derelict farm equipment should also be included. After a thorough evaluation of safety and

historical significance, town officials may want to consider the possibility of preserving one of the barns for storage and rebuilding the greenhouse for productive agricultural uses.

Traffic Circulation/Site Access

The site is located on Cheshire Road, a residential street connecting to Masonic Avenue and the Wilbur Cross Parkway. After field visits and subsequent review, it appears that practical access to the property would be via Cheshire Road. However, the road west of the property to the Cheshire town line is a narrow rural road.

Land Use Considerations

The predominant land use of the entire parcel is a nonworking farm. The area south and east of the parcel is low to moderate level density with detached single-family residential housing. West of the property is the Fresh Meadows Swamp, and a golf course is located to the north. In addition, south of property, off School House Road, is the Cook Hill Elementary School. The parcel is located in a Rural Residence District-40 Zone, which requires a minimum lot area of 40,000 square feet (approximately one acre lots). To preserve the environmental integrity of the Fresh Meadows Swamp, the town has been acquiring available property and anticipates the purchase of other property for this purpose. The field visit revealed an abutting property, also a nonworking farm, southwest of the site that should be considered for acquisition.

Agricultural and Passive Recreation Opportunities

The acquisition of this property by the Town of Wallingford provides an excellent opportunity for numerous agricultural uses and various recreational opportunities. Because the property is split into two separate parcels, it lends itself to specific land use opportunities for each parcel. Natural resource protection or limited farm production for the southern parcel (adjacent to the swamp) and agricultural uses for the northern parcel. Due to the environmental sensitivity of the Fresh Meadows Swamp and recognizing the concerns of water quality integrity of the Mill River from the SCCRWA, it is recommended the southern parcel be utilized as either a diverse habitat sanctuary or non-intensive farming. The creation and management of a sanctuary would build on the existing biota, eventually evolving into a habitat of diverse wildlife and vegetation that can be a springboard for establishing a "living habitat laboratory." This outdoor classroom can be a joint educational venture for involving the local schools and colleges, while working side by side with other not-for-profit organizations. Such a use would represent the least impact on adjacent wetlands. The utilization of this portion of the site for limited farming production, in particular farming the vacant fields and the orchard, is another opportunity that should be carefully explored, keeping in mind that the property drains directly into the swamp and the nearby subdivision. It is suggested that the northern parcel be used for agricultural purposes, utilizing the Town's Farm Lease Program. The program should encompass varying agricultural productions for the several large vacant fields and the orchards to the front and rear of the property. It is also recommended that the large pond be open to the public for fishing (Please refer to Aquatic Resources section). Another recommendation is to rebuild the greenhouse and enlarge it with the objective of involving an organization such as the UCONN Cooperative Extension System and the nearby schools in a joint botanical/educational

program. Another opportunity for both parcels is the establishment of a threefold trail network. The network would consist of the walking trails in the Fresh Meadows Swamp, the trail on the southern parcel and the hiking trail winding through the forested hill located on the northern parcel. This threefold connection would be a wonderful opportunity for the residents of Wallingford to take advantage of the beautiful vistas this property has to offer.

Management and Organization Issues

The purchase of this property by the Town, through the *DEP Open Space and Land Acquisition Grant*, requires it to be preserved in perpetuity: (1) predominately in its natural scenic and open condition or; (2) for the protection or provision of potable water; (3) or for agriculture. With the educational projects suggested, including the rebuilding of the greenhouse, the town may want to pursue any number of grants that would ensure the town does not incur an additional funding burden. A grant would ensure that funds would be dedicated to enlisting a project manager to develop a working relationship with local and statewide organizations to establish short-term objectives and long-term goals for the use of these two parcels. Agencies such as the Audubon Society, the Boy and Girl Scouts, state Department of Agriculture, the University of Connecticut Cooperative Extension Program, the Connecticut Greenhouse Growers, the SCCRWA, and the Wallingford Conservation Commission may want to be involved in the partial management of projects for this property. The trail network should be either managed by the Wallingford Conservation Commission or the Regional Water Authority. If this avenue is taken, town officials should ensure that Wallingford residents would have access to the trails without the need of a permit.

Land Use Plans

The Wallingford Plan of Development has classified this area to be low-moderate density residential (1/2 to 1 acre lots) and The Fresh Meadows Swamp is designated as Major Open Space. The Regional Plan encourages the acquisition of land to retain as agricultural uses and open space. The State Plan has designated this area as a "preservation area", meaning the town should avoid support of structural development because it represents significant resources that should be effectively managed in order to preserve the state's unique heritage.

ARCHAEOLOGICAL REVIEW

A review of the State of Connecticut Archaeological Site files and maps show no known archaeological sites in the project area. However, undisturbed portions of the property adjacent to Fresh Meadows contain a high sensitivity for undiscovered archaeological resources. Interior swamp areas were often used by Native Americans for thousands of years as places for winter encampments. Indian hunting and gathering economies required the movement of peoples through ecological territories on a seasonal basis. Swamps and marshes provide an abundance of natural resources for exploitation, as well as areas of protection from winter elements. Fresh Meadows contains the topographic and environmental variables that allow us to predict prehistoric utilization. An archaeological survey can locate the cultural resources and provide for specific and appropriate preservation mechanisms.

The Office of State Archaeology does, however, recommend an archaeological survey for any areas in the southern portion of Galko Farm adjacent to Fresh Meadows that may have proposed ground disturbing developments. The Office of State Archaeology is prepared to provide any technical assistance in conducting a survey for portions of the project area.

APPENDIX A

For Appendix Information A-B please contact
the ERT Office at 860-345-3977