Bittner Park

Guilford, Connecticut

King's Mark Environmental Review Team Report

King's Mark Resource Conservation and Development Area, Inc.

Bittner Park

Guilford, 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
Guilford, Connecticut

September 2002

CT Environmental Review Teams
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Acknowledgments

This report is an outgrowth of a request from the Guilford 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, June 11, 2002.

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I would also like to thank Bill Johnson, chair, Guilford Conservation Commission, Jennifer Allcock, member, Guilford Conservation Commission, Leslie Kane, environmental planner, and Rick Maynard, park and recreation director, 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 reports and information. Some Team members made individual or additional visits to the project 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 potential development, 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 reviewing development plans for Bittner Park.

If you require additional information please contact:

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Introduction

Introduction

The Guilford Conservation Commission has requested assistance from the King's Mark Environmental Review Team in conducting a natural resource inventory of Bittner Park with review of a new master plan.

The 117 acre Bittner Park was acquired in 1972 through a HUD open space program. The property is located between Long Hill Road and Route 77. The West River flows through the property on the eastern side. The town has since acquired two additional contiguous parcels. The Cushing Property is a 14 acre parcel between Bittner Park and the Baldwin Middle School on the west side, and the Hull Property, a 6.5 acre piece on the east side, contiguous to the west River.

The development strategies for the property have changed over the years. Phase I was constructed in the late 1970's, it included a bridge over the West River from Route 77, and access to four ballfields, a soccer field, a small playground, a park building and a parking lot. In the early 1980's a phased master plan was developed that recommended limited development to the west accessed by a minimal entrance road at Long Hill Road. A new master plan was developed in December 2001. Another separate study conducted at the same time was exploring the feasibility of developing a middle school campus adjacent to the Bittner Park property at the existing Baldwin Middle School site. Linkage to the park would provide additional recreational opportunities.

Recommendations in the new master plan include:

- a wildlife corridor and passive multi-use nature trail system
- multi-use skate facility (under construction at the time of the ERT field review)
- warming house/nature center/outdoor stage/restroom facilities
- sledding hill
- more playing fields
- parking
- roadway extension
- town pool

Objectives of the ERT Study

The Guilford Conservation Commission is interested in an update of the previous natural resource inventories/assessments and a review of how the new master plan will impact these resources. Their major concern is with development of new ballfields, access roads, parking and a pool facility. The ERT report will provide a brief natural resource inventory, discussion of potential impacts from various uses, and guidelines and recommendations for the development and protection of the natural resources.

The ERT Process

Through the efforts of the conservation commission this environmental review and report was prepared for the Town of Guilford.

This report provides an information base and a series of recommendations and guidelines which cover the topics requested by the commission. Team members

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, June 11, 2002. Some Team members made individual and/or additional site visits. 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.

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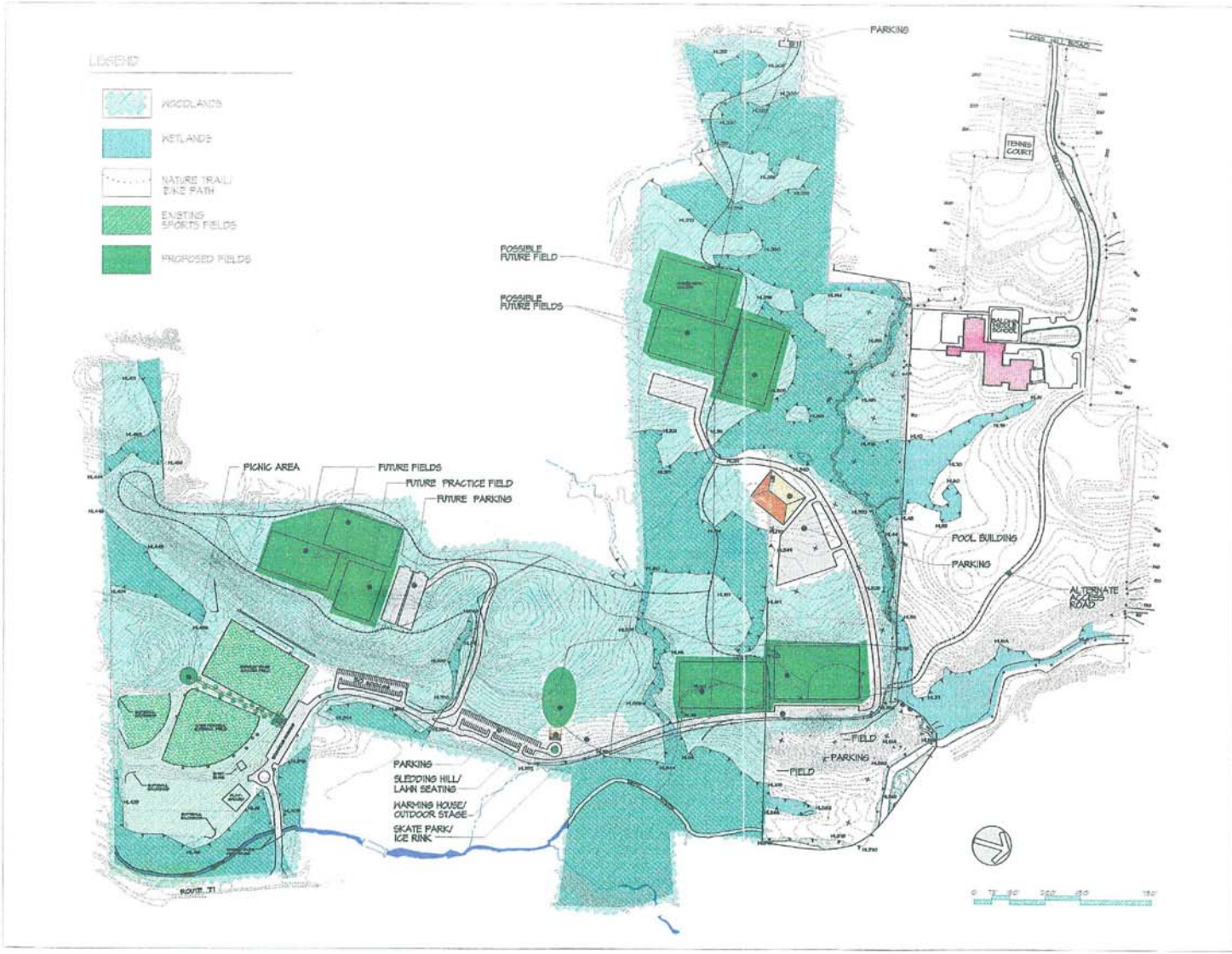
Location and Topographic Map

Scale 1″ = 2000′



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Bittner Park

OWNER

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Figure 2.

MASTER PLAN

scale N.T.S.
date 1/1/01
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appr WBA
Plan 30-37

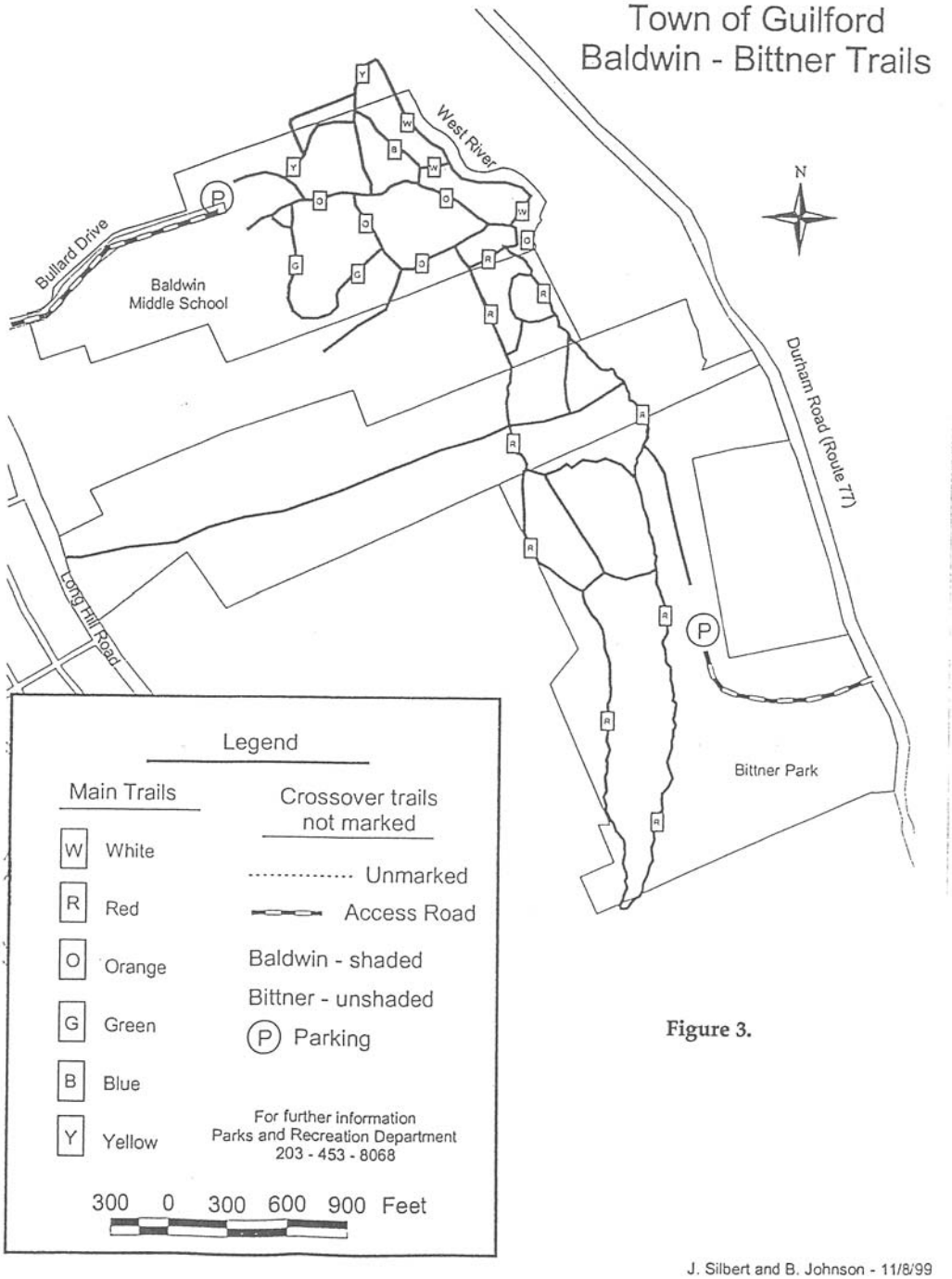


Figure 3.

J. Silbert and B. Johnson - 11/8/99

Soils Resources

This section applies to a 138 acre parcel known as Bittner Park, which includes the recently acquired Cushing, and Hill properties located in the central portion of Guilford. The parcel is bounded by Long Hill Road to the west, Route 77 to the east and abuts the Baldwin Middle School to its north. The soils information offered in the 1975 USDA SCS report is covers the natural resources for 117 acres of the Bittner Park portion quite well. This report will focus on the new parcels, their resources and the impacts from existing land uses as well as the proposed uses of the entire park and contiguous properties.

The report will be based on the soil series descriptions and the soils mapping units as presented in the 1979 USDA Survey of New Haven County and on field observations. The site can be found in sheets 55 and 62 of the New Haven County Survey.

Wetlands

1. Map Unit Ra - Raynham silt loam

The Ra map unit is comprised of Raynham soils on 0 to 3 percent slopes. These soils are very deep and poorly drained. They formed in silty lacustrine deposits. Raynham soils are composed of stratified silt loam materials to a depth of 60 inches or more. These soils have a seasonal high water table within 20 inches of the soils surface during the months of November to May.

Concerns:

- Water Quality - The trail system and minor trails in the southwest access point from Long Hill Road traverse the watercourse in a number of

uncontrolled points. Evidence of direct crossings from mountain bikes, hiking and ATV's have destabilized the sides of drainageways and intermittent streams by accelerating erosion, eliminating vegetative cover and exposing soils to the elements. Turbid water and sediments have been introduced to the watercourse and transported down stream. A strategically placed, bridged or armored stream crossing with re-vegetated banks would reduce use impacts.

2. Rb - Raypol silt loam

The Rb map unit consists primarily of Raypol soils on 0 to 3 percent slopes. Raypol soils are very deep, poorly drained soils, formed in loamy over sandy and gravelly glacial outwash deposits. These soils have a watertable of 1.5 feet of the surface much of the year. Typically, they have a silt loam, very fine sandy loam, or fine sandy loam surface layer and subsoil over a stratified sand and gravel substratum that extends to a depth of 60 inches or more. This soil is located in along the southern most border of the Bittner Park section and has a section of the trail system coursing through it.

Concerns:

- Active uses such as mountain biking and ATV use can accelerate erosion and destroy important stabilizing vegetation.
- Minimize the footprint of the trail system and reduce or eliminate active use in this area.

3. Ru - Rumney is now Ro - Rippowam fine sandy loam.

The Ro unit is a nearly level, poorly drained soil on flood plains of major streams and their tributaries. This soil ranges to a depth of 60 inches or more. It is subject to frequent flooding and has a seasonal high watertable of about 6 inches

from fall until late spring. This soil is located by the entrance of the park on Route 77 and in the floodplain of the river.

Concerns:

- Streambank stabilization - Evidence of eroding banks should be stabilized to reduce the introduction of sediment downstream which will reduce water quality, a-grade the stream and destroy aquatic habitats.
- Remediation of banks with bio-engineering techniques will allow for immediate stabilization and the establishment of vegetative cover along the banks.

4. RN - Ridgebury, Leicester and Whitman extremely stony fine sandy loams.
Consists of nearly level to gently sloping, poorly drained soils in drainageways and depressions on glacial uplands. The Ridgebury and Leicester soils have slow or very slow permeability in the substratum, and the Leicester soils have moderate to moderately rapid permeability in the substratum. Runoff is very slow.

Soils in this unit have poor potential for community development. They are limited mainly by their seasonal high water table and stoniness. The Ridgebury and Whitman soils are limited by a slowly permeable substratum.

Concerns:

- The trail system traverses these soils several times in the northwest and central portion of this parcel. These crossings are in need of stabilization to reduce impacts from erosion and sedimentation.

5. Wa-Walpole
The Wa map unit is composed primarily of Walpole soils, which are nearly level. Walpole soils are very deep, poorly drained soils formed in glacial

outwash deposits. Typically, they have a fine sandy loam or sandy loam surface layer and subsoil over a substratum of stratified loamy sand and gravel. Walpole soils have watertable within one foot of the surface from late fall to late spring.

Concerns:

- The majority of these soils are along the flanks of the river and the western side of the park. Several trails have been made into the wetlands to gain access to the river for fishing and active recreation in the form of mountain bikes and motorized vehicle traffic. The ever expanding width of the trails and their proximity to the wetlands has stripped vegetation, accelerated erosion and caused siltation within the wetlands. Buffers to these areas need to be established and a redesign of the trail layout and access points should be entertained.
- Exposed soils should be reduced and stabilized with ground cover.
- Crossings or access points need to have their footprint minimized be adequately armored. Provide crossings that do not obstruct the floodplain and minimize wetland disturbance.

Non-Wetland

6. CfB 3-8 percent slopes and CfC 8-15 percent slopes-Charlton fine sandy loams. This is a well drained soil on the side slopes of hills and ridges and at the foot slopes of steep slopes. Permeability is moderate or moderately rapid. Runoff is moderate to rapid. This soil has a **fair** potential for community development. It is limited mainly by steepness of slopes.

Concerns:

- The "C" slope map unit is found on the northeast portion of the parcel along the river. The steeper slopes increase the erosion hazard of these soils.

Increased active uses from ATV's, mountain bikes and general foot traffic has reduced vegetative cover and exacerbated the affects of erosion along several trails in this area. Reduce the footprint of these trails.

- Provide runoff diversions to vegetated areas to reduce runoff volumes and velocities.
- Stabilize trailsides with ground covers.
- The blazing of new trails atop of steeper sections should be discouraged.

7. ChC 8-15 percent slopes. Charlton very stony fine sandy loam.

This sloping well drained soil is on the side slopes of hills and ridges and at the foot slopes of steep slopes where the relief is affected by underlying bedrock. Permeability is moderate or moderately rapid. Runoff is rapid. This soil has **fair potential for community development.** It is limited mainly by steepness of slope and stoniness. **This soil has a severe erosion hazard.** Intensive conservation measures are needed to prevent excessive runoff, erosion and siltation during periods of construction projects.

Concerns:

- This soil type is found in the northeast section (Area I) of the parcel and north of the upper parking lot of Bittner Park (Area II).
- The northeast sector with this soil is bisected by a myriad of trails going up / down slope and traversing an intermittent stream a minimum of 4 places.
- Reduce the number of trails on these steeper slopes.
- Provide waterbars to divert runoff concentrations to vegetated areas.
- Minimize footprint of trail and discourage expansion of trails by enthusiasts.
- Re-establish ground covers in highly erosive areas around crossings and streambanks.

Area II: Proposed use of this area is a skate board park and sliding hill.

• This area has been clear-cut of trees and vegetation with no erosion and sedimentation measures employed on site. This activity has occurred up-slope from wetlands and the major watercourse. Erosion and sedimentation controls should be a high priority to reduce potential impacts to water quality in this area.

- Two temporary diversions that direct runoff to separate sedimentation basins should be installed at the base of the slope to allow for detention and infiltration of runoff.
- Properly installed and maintained silt fence should have been in place prior to the clearing and grubbing operation. This measure should be enhanced with trenched and staked haybales along its length.
- Stumps and slash material should be disposed of properly off-site.

8. CnC 3-15 percent slopes / CnD 15-35 percent slopes-Charlton extremely stony fine sandy loam.

This gently sloping to sloping, well drained soil is on broad hilltops, ridgetops, glacial till plains and at the foot of steep slopes where the relief is affected by underlying bedrock. This soil has moderate to moderately rapid permeability. Runoff is medium to rapid. This soil has **fair potential for community development.** It is limited mainly by stoniness and the steepness of slope. **The "D" slope designation on this soil unit has poor potential for community development because of the steepness of slope and stoniness.** This soil with its steep slope is found along the northeast border with a couple of established trails running through it. This soil has a **severe erosion hazard** when disturbed. Intensive conservation measures are necessary to prevent excessive runoff and erosion. Diversions, mulching and temporary vegetation of disturbed soils are required.

Concerns:

- The steepness of slopes makes this area next to impossible to control.
- Trails should be eliminated in this area and re-vegetated.

9. CrC 3-15 percent slopes-Charlton-Hollis fine sandy loams.
These are well drained soils located at the foot and side slopes of hills where the relief is affected by the underlying bedrock. These areas have a rough surface with bedrock outcrops and a few intermittent drainageways and small wet depressions. This complex has a **fair potential for community development** limited by its relatively steep slopes. Runoff is medium to rapid. During construction activity, conservation measures such as temporary vegetation and siltation basins are frequently needed to prevent excessive runoff, erosion and siltation.

The Hollis component has a **poor potential for development** and is limited by the depth to bedrock at a depth of 10 to 20 inches. Excavations are difficult due to this attribute. The Charlton and Hollis soils have moderate or moderately rapid permeability. Runoff is rapid. Included soils in this complex are moderately well drained Sutton soils and poorly drained Leicester soils.

Concerns:

- This soil type is found throughout the site and imparts restrictions to development due to bedrock. Careful consideration in siting proposed dwellings atop of these soils would be prudent.
- Several areas have perched watertables and exhibit evidence of a significant numbers of vernal pools. These areas should be investigated and inventoried prior to any further consideration of development.
- Several trails bisect these soils. Maintenance and footprint minimization of the trails would be of great benefit to protecting wetlands, watercourses and critical habitats such as vernal pools. . Water diversions coupled with erosion and sedimentation controls should be employed on these trails.

10. CyC - Cheshire Holyoke complex, 3-15 percent slopes.

This map unit complex consists primarily of two dominant soils that are so intermingled on the landscape that they could not be separated on the map. Both soils have medium to rapid permeability. The first soil named Cheshire is a well drained, very deep to bedrock soil. Typically, they have a fine sandy loam, loam or silt loam substratum that extends to a subsoil over a friable sandy loam, fine sandy loam, or loam substratum that extends to a depth of 60 inches or more. This soil has moderate permeability. The Holyoke component is limited by its depth to bedrock and has a **severe erosion hazard.** This soil unit is located on the east side of Long Hill Road in the southwest corner of the parcel.

Concerns:

- The trail system bisects this map unit and has accelerated erosion along its length.
- Narrowing the paths footprint, re-vegetating trail side and providing water-bars that divert concentrated flows to vegetated outfalls would reduce potential impacts to wetlands and watercourses.

11. HkA - 0-3 percent slopes / HkB - 3-8 percent slopes. Hinckley gravelly sandy loam.

This map unit has good to fair potential for community development. The soil has rapid permeability and is limited by its droughtiness. **The erosion hazard is moderate.** Intensive conservation measures may be needed to prevent excessive runoff, erosion, and siltation during construction. Currently, these soils have a number of recreational fields placed atop of them.

Concerns:

- The close proximity of these manicured fields to the river plus the rapid permeability of the soil and subsoils should prompt the implementation of

stringent management practices in fertilization, herbicide and pesticide applications in this area.

12. HpE - Hollis-Charlton-Rock Outcrop complex, 15-35 percent slopes.
This complex has a poor potential for development. One soil is named Hollis. Hollis soils are shallow and well drained. They have a fine sandy loam textures overlying consolidated bedrock at a depth of 10-20 inches. The other soil is named Charlton. Charlton soils are very deep well drained soils formed in loose glacial till. Typically, they have fine sandy loam textures to a depth of 60 inches or more.

The rock outcrop consists of exposures of consolidated crystalline bedrock located on knobs and ledges. The Hollis soil dominates the area, followed by the Charlton and rock outcrop components. Runoff is rapid in both the Hollis and the Charlton type soils. It is limited mainly by steepness of slopes, shallowness to bedrock, rock outcrops and stoniness. **There is a hazard of effluent seeping into cracks in the bedrock and polluting the groundwater.** These highly erodable slopes must employ intensive conservation measures such as the use of diversions, vegetative cover, mulching and siltation basins are frequently needed to prevent excessive runoff, erosion and siltation.

Concerns:

- This soil type is located in the south central portion of the site and has trails running through it.
- The aforementioned conservation measures will control runoff and reduce the transport of materials into other down-slope environs within the parcel.

13. HrC - Hollis-Rock Outcrop complex, 3-15 percent slopes.
This soil is somewhat excessively drained and rock outcrop. This map unit has **poor potential for community development.** It is mainly limited by its shallowness to bedrock and rock outcrops.

14. HSE - Hollis - Rock outcrop complex, 15-35 percent slopes.
This map unit consists of moderately steep to steep, somewhat excessively drained soils on upland areas of rock outcrop. The relief is affected by underlying bedrock. The Hollis soil has moderate or moderately permeability above the bedrock. Runoff is rapid. This map unit has **poor potential for community development.** It is limited mainly by steep slopes, shallowness to bedrock, rock outcrops and stoniness. Hollis soils are also droughty. This soil type is located along the west side of the soccer field at Bittner Park and trends to its south.

15. LpB - Ludlow silt loam, 3-8 percent slopes.
This LpB map unit consists primarily of Ludlow soils. They are very deep, moderately 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 a firm loam or silt loam dense basal till substratum. Ludlow soils have a seasonal high water table at 1.5 to 2.5 feet from late fall to spring. This soil type is found on the parcels southwest border fronting Long Hill Road and serves as one of the access points to the trail system.

16. Nn-Ninegret fine sandy loam. 0-3 percent slopes.
This is a nearly level, moderately well drained soil in slightly depressional areas of broad outwash terraces and narrow steam valleys. Typically, they have a fine sandy loam surface and subsoil layer, overlying sand and gravel to a depth of 60 inches or more. Ninegret soils exhibit low chroma mottles with a depth of 24 inches. These soils have a seasonally high watertable at 1.5-2.5 feet from late fall to early spring. **This soil has poor potential for community development.**

17. SvB-Sutton fine sandy loam. 3-8 percent slopes.

The SvB map unit is composed of Sutton soils. These soils are very deep and moderately well drained. They form in depressions on glacial till plains and near the base of slopes on glacial uplands where the relief is affected by the underlying bedrock. Typically, Sutton soils have fine sandy loam textures to a depth of 60 inches ore more. Depths to the seasonally high watertable range from 1.5 to 2.5 feet during the months of November to April. Low chroma mottles occur within a depth of 24 inches. The soil has a moderate to moderately rapid permeability. Runoff is medium to rapid.

This soil has a **fair potential for community development.** It is limited mainly by its seasonal high watertable. The erosion hazard is moderate. Exposed soils require moderate conservation measures to prevent excessive runoff, erosion and siltation.

Concerns:

- The headwaters of an intermittent watercourse wind its way through this soil from the southwest border running parallel with Long Hill Road and trends south exiting the parcel. Active use trails cut across this soil and its watercourse causing erosion and siltation.
- Evidence of disturbances caused by mountain bikes and motorized vehicles has accelerated erosion and siltation along the trail and on denuded streambanks.
- Install controlled / armored or bridged crossings.
- Stabilize streambanks and trail sides with ground cover and conservation measures, which will reduce the threat to water quality and reduce siltation of downstream environments.

Erosion and Sedimentation Measures

- Traversing of watercourses and filling of wetlands should be reduced and relocated to less sensitive areas. Crossings should employ bridges to minimize impact on wildlife corridors, reduce wetland filling and preserve the wetland hydrologic regime.
- Trails should employ water bars and other diversions at the top of slopes to reduce slope length, volumes and velocities of runoff.
- Develop a trail maintenance plan.

Alternate Configuration

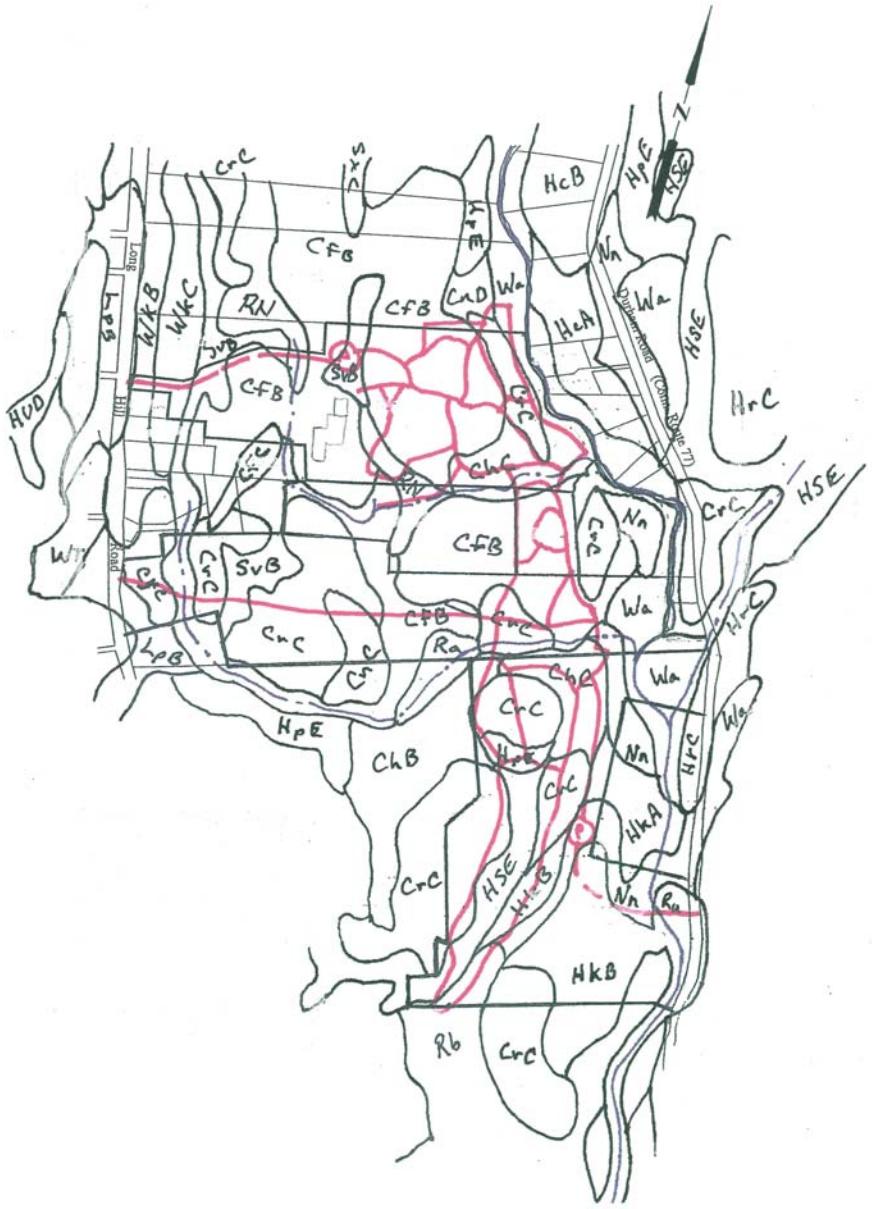
- A reconfiguration of the site that minimizes impervious surfaces, and places buildings, pools and pavilions in regions of the parcel that are already on disturbed soils may prove to be an option that reduces concentrated traffic on Long Hill Road, reduces further fragmentation of aquatic and terrestrial habitats and minimizes the impacts to soil and water resources. (See layout provided Figure __)
- Entertain soft-siding the road systems with vegetated swales to diffuse runoff concentrations and allow for greater infiltration and recharge within the sub basin.
- The trail system should limit the use of wooden (pressure treated products) structures in and through the wetlands. They should be soft trails with low maintenance; narrow trails on the fringe of the wetland setbacks that employ unintrusive trail observation points that bring the public closer to the wetlands and watercourses.

Recommendations

Developing a comprehensive long-range plan that conserves and preserves natural resources, protects critical habitats, reduces environmental impacts and manages public access on this property would be of great benefit to the Town of Guilford. The plan should address and promote sound stewardship, reduce the disturbance of highly erodable soils on steep slopes, perform streambank stabilization maintenance, and enhance habitat corridors. Eliminate areas or gain greater control of in-stream crossings by utilizing footbridges or wooden bridges that invite access for the public without jeopardizing the health of these resources.

Currently, the property is abused by overzealous and illegal active users that are damaging many elements of the Bittner park property. Permitted use with annual fees would support timely reparation of damage, which would maintain and enhance the trail system while controlling the amount of active use. Possibly provide a separate town parcel for motorized recreational vehicles that doesn't have high quality terrestrial and aquatic habitats, such as an existing brown-field area or a defunct sand and gravel operation

Figure 4.
Soil Mapping Units and Trail System



Bittner Park

Figure 5.

Alternate Site Configuration

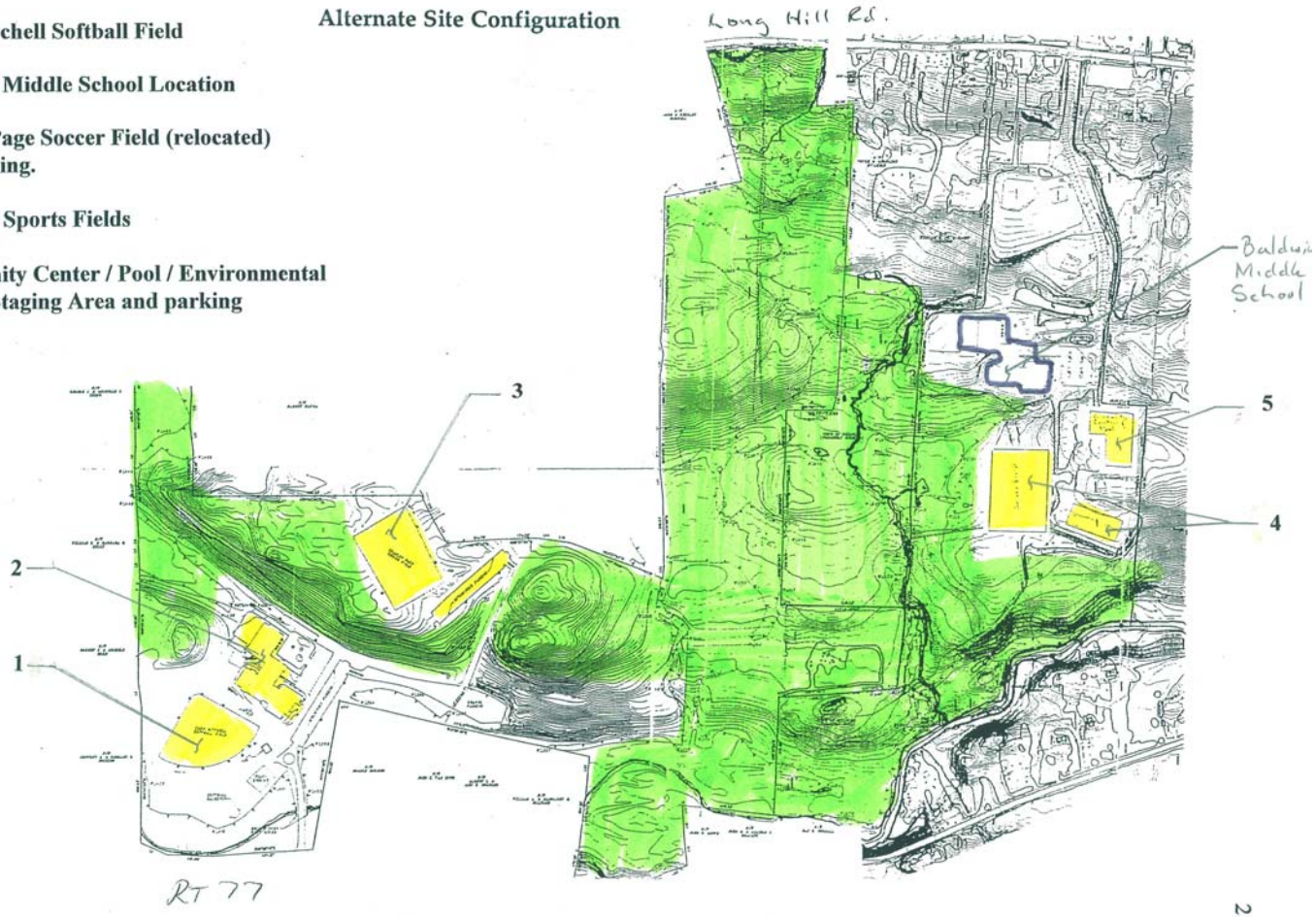
1) **Cash Mitchell Softball Field**

2) **Potential Middle School Location**

3) **Stanley Page Soccer Field (relocated) and parking.**

4) **Potential Sports Fields**

5) **Community Center / Pool / Environmental Studies Staging Area and parking**



Wetland Resources

Site Overview

This 117 acre municipal property is located just west of center in Guilford. On the north it abuts the Baldwin Middle School property. Private property surrounds it to the south, east and west. Elevations range from as high as over 210 feet at Long Hill Road to about 85 feet where the parcel abuts the West River. This west to east drop in average elevation yields a slope of 3.4%.

Two tributaries of the West River flow generally west to east across the property. At the time of the field visit both streams were running with visually similar flows. The southernmost stream was approximately five feet wide and as much as ten inches deep. The bottom material (streambed) was comprised of coarse sand to eighteen inch boulders. Reportedly the stream is intermittent and prone to flashiness which may explain some of the larger rocks in its flow path.

The northern of the two streams was quite similar to the southern with similar dimensions, though it featured a somewhat faster flow. Since the topographic relief is variable there are faster runs on both these tributaries and slower runs where the streambeds level off enough to support a silty bottom.

National Wetland Inventory Classification

The U.S. Fish and Wildlife Service has mapped and classified the wetlands and watercourses using a system of codes for all the topographic maps in the state.

This parcel occurs on the Guilford quadrangle, 1:24,000 scale National Wetland Inventory (NWI) map. Because of the scale of mapping, the inventory classifies wetlands that are the largest or most conclusively observed on the aerial photography.

At this location all the wetlands observed, which in this case were only the watercourses, are mapped as palustrine wetlands. Palustrine is defined as: *of or pertaining to a swamp; marshy.*

Within the palustrine classification two wetland types were distinguished on this property. These are PFO1E and PEME. The descriptions of these are as follows: palustrine (P), forested (FO), mixed broad leafed deciduous (1), seasonally saturated (E): this classification applies to the two unnamed tributaries and the main stem that abuts the West River. Palustrine (P), emergent (EM), seasonally saturated (E) applies to the West River on the school property.

Palustrine is used for these smaller watercourses. The riverine classification is held for rivers such as the Connecticut and Housatonic.

Water Quality

The surface water quality (which includes the wetlands and watercourses) of the area surrounding the parcel have been mapped by the Department of Environmental Protection as being Class A. Assumptions are made on many of the classifications over the extent of the map and not all surface water gets quality tested. However, with no known sources of major pollutants the wetlands on the site can be assumed to have the water quality classification of A.

In addition, the groundwater classification for the area is also A for the same reasons listed above. The descriptions of these classifications are:

Class A

Designated uses: potential drinking water supply; fish and wildlife habitat; recreational use; agricultural and industrial supply and other legitimate uses including navigation.

Discharge restricted to: same as allowed in AA (i.e.: Discharge restricted to: discharges from public or private drinking water treatment systems, dredging and dewatering, emergency and clean water discharges.).

Class GA

Designated uses: existing private and potential public supplies of water suitable for drinking without treatment; base flow for hydraulically connected surface water bodies.

Discharge restricted to: same as for GAA (i.e.: discharges limited to: treated domestic sewage, certain agricultural wastes, certain water treatment wastewaters) and discharge from septage treatment facilities subject to stringent treatment and discharge requirements, and other wastes of natural origin that easily biodegrade and present no threat to groundwater.

Source: Protection Summary of the Water Quality Standards and Classifications (1997), Connecticut Department of Environmental Protection, Bureau of Water Management.

Soils

The wetland soil information for this parcel included in this section of the report was taken from Natural Resources Conservation Service (NRCS) mapping which was completed in the 1990s. The wetland areas delineated on this mapping are shown on the attached sheet. However, it should be noted that the

Team had a reduced-in-size map for the field walk that had the wetland mapping in far more specific detail. Depending on the source of this work, this is likely the best wetlands base map for planning purposes.

The wetlands the Team visited on the field walk were all forested wetlands with a full overstory of trees and a mixed, often thin, understory of shrubs and herbs. The wetland vegetation is dominated by red maples and a wide variety of wetland shrubs and herb layer vegetation.

Five soil types make up these NRCS mapped wetlands. They are:

- Raynham Silt Loam soils

The Raynham series consists of very deep, poorly drained soils that formed in silty glaciolacustrine deposits on glacial lake plains and terraces. The Raynham soils are level to strongly sloping soils. They are in depressions and drainageways and on side slopes of swells and knolls.

- Raypol Silt Loam soils

Raypol soils are nearly level to gently sloping soils in drainageways and low-lying areas on terraces and plains. The soils formed in loamy over sandy and gravelly glaciofluvial materials derived mainly from acid crystalline and sedimentary rocks.

- Ridgebury, Leicester and Whitman soils complex

This soils complex is extremely stony; and with a varied rating of poorly drained and very poorly drained within the complex. These soils, along with the alluvial soils, are dominant on the parcel.

- Rippowam Fine Sandy Loam soils

Rippowam soils are nearly level on flood plains along rivers and streams. They are in relatively low areas. Slope ranges from 0 to 3 percent. The soils formed in recent alluvium derived mostly from granite, gneiss, and schist.

- Walpole Sandy Loam soils

This soil occurs under the West River as it flows along the eastern border of the property. It consists of very deep, poorly drained sandy soils formed in outwash and stratified drift. they are nearly level to gently sloping soils in low-lying positions on terraces and plains.

Comments Regarding the Site

- There is a great diversity of trees on this parcel. The area appears to be in a secondary stage of successional growth since it was abandoned from use as farmland. Thus, the cedars that grew in the abandoned fields are now being shaded out by taller, full crowned deciduous trees. The tree population now includes red and sugar maple, white and red oak, black locust, ironwood, cottonwood, hickory, beech and cedar.

- Wetland flags: At times in the field walk the Team was not always sure of its exact location. This was often due to the fact the wetland flags had been put in place so long ago. Typically the flags allow Team members to be more exact about their location and comments they make, but on this walk this was not always the case.

- The watershed: the West River passes along, and forms a portion of, the eastern property boundary. It has its headwaters about six and half miles upstream from this location. At its highest point, near the top of the

watershed, it has an elevation of 720 feet above sea level. The northern third of the West River watershed above the park is dominated by woodland, and comes into a large percentage of agricultural land use as the topography becomes less steep. The middle third of the watershed above the Park is a fairly even blend of agriculture, residential and woodland uses. The southern third, below Route 77, is dominated by forest cover with some agriculture and residential along the main thoroughfares. Where the two tributaries flow into the West River the elevation is ~95 feet.

Two unnamed tributaries flow east across the park area. The northern of the two tributaries is about 8/10 of a mile in length.

- Known Pollutants: The DEP has not mapped any Leachate and Wastewaters sources in the watershed above the study site. However, there is an historic site that seems to have stabilized regarding pollutant outflow (see "The Dump" below). As noted above the water quality of the West River and its tributaries is quite good.

- The Dump: along the northern tributary, to the south of the school, is a dump. The dump dates from the 1940's and contains a wide variety of materials including automobiles, broken plates, shoes, bottles, metal cable, etc. There is a question as to whether the dump should be removed. Upon inspection it became clear that the unsettling nature of the removal process might be more disruptive to the stream and wetlands than the dump is now. The location could be used as a "what not to do" stop on an educational nature trail and/or part of the dump that is readily hand removable could be taken away for safety and aesthetic purposes.

- Vernal Pools: on the portion of the parcel that runs west to Long Hill Road there is much wetland soil mapped. As mentioned above these wetlands are

far more than what is included on the attached NRCS maps. Within the confines of these wetland boundaries are many areas that appear to be vernal in nature. Vernal pools are small, isolated, seasonally saturated ponded wetlands with no permanent inlet or outlet. They frequently exist in a forested setting with a treed overstory and shrub and herb layer present, sometimes prolifically so.

Typically vernal pools are small, shallow, circular or oblong depressions in the landscape which fill with water during the wetter periods of the year (spring and late fall) and become drier during the warmer summer months. True vernal pools also support unusually diverse and dynamic assemblages of wildlife. Much of this wildlife is solely dependent on these areas for one or more periods of their life cycle. Because of the absence of permanent water, fish do not live in these pools, making the pools attractive to certain breeding animals that would normally fall prey to carnivorous fish.

The impacts of proposed development on the vernal pool wildlife assemblage could be significant. The amphibian life that use the pools as breeding grounds soon migrate into the surrounding uplands to live out their adult phase and return to the pools only to breed. Modification of these adjacent upland areas therefore could have a significant impact on the associated wetlands and their functions as breeding pools.

Migration distances vary significantly between species. One literature search turned up figures ranging from a minimum of 200 feet and a maximum of 750 feet with an average of about 525. The wood frog has a significantly larger dispersal range, known to be as far as half a mile from their host pool.

Due to the fact that these pools have no inlet or outlets and rely on groundwater and accumulated surface water for their hydrology they may be very susceptible to changes in their water quality. Therefore it is not

recommended that stormwater outlets be directed to, or nearby, or that septic leaching fields be discharged towards these pools.

That vernal pool species need a great deal of upland for their habitat was borne out in the field walk. Wood frogs, recognized as an obligate vernal pool species, were seen in various wet areas. Some of these were in, or quite close to the areas of, the potential pool parking lot and the three playing fields west of that site. It was clear from these observations that a) the area has vernal pools and b) the uplands are home to adult the adult phase of life for these populations. Another wetland teeming with amphibian life at the time of the field visit was where the sharp bend in the road occurs between the proposed pool building and the parking lot to the west of it.

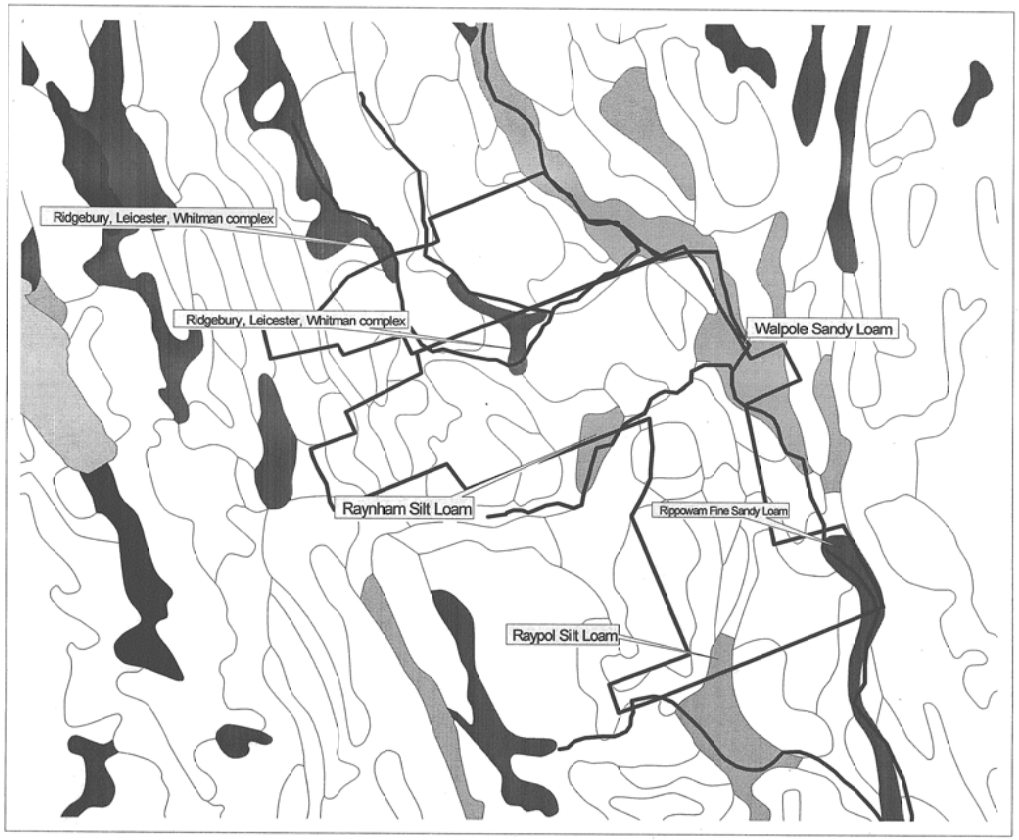
- Ball fields west of pool parking: While it was stated that these may never get built, one consideration to be carefully reviewed will be the value of the wetlands they impact. In Guilford wetland setbacks are 50 feet and 100 feet for significant wetlands. Based on the above comments about vernal pools, it may be worth further study to establish what areas within the wetlands or, specifically, which pools are the breeding pools for vernal pool species; and what, if any, functions do the non-breeding pools serve in this dynamic.

- Water Quality if recreational facilities/parking is built: thus, the primary concern after proximity to wetlands regarding this proposal is the issue of runoff. Any impervious surface drainage will have to be monitored in the planning stages to ensure that the drainage is kept away from the wetlands in general and breeding wetlands specifically. The goal is not to impact the water quality upon which the pools are often dependent.

- Education value: since these wetlands and watercourses are in close proximity to a school, the opportunity for a variety of subjects to teach is at hand. Some of the subjects are:
    - tree diversity
    - wetlands
    - wetland plants
    - vernal pools
    - amphibians and reptiles
    - poor land use practices (the dump)
    - the succession of old field growth to mature forest
    - invasive species
    - the South tributary is small enough to do a watershed study
    - the nature of sediment transport in the streams.

  All of these items individually and collectively lend value to this diverse location. The opportunity exists to study the ecology of the area, that is, the interaction of all the species.

Guilford Bittner Park Soils



All parcel boundaries are estimated

Figure 6.
Wetland Soils

Fisheries Resources

West River

The West River is an important recreational resource, which supports a mixed coldwater/warmwater fish community. It is annually stocked with over 1,580 adult (9-12") brook, brown and rainbow trout in the Town of Guilford. Other stream finfish which have been found to reside in this watercourse include: common shiner, white sucker, fallfish, blacknose dace, and longnose dace.

The West River in Guilford is a moderate size meadow stream with a gravel bottom. The river is formed by the outlet of Quonnipaug Lake. The stream has amber color and is generally clear. There is a moderate amount of instream cover for adult trout but deeper pools and large woody debris habitats are generally lacking in areas adjacent to Bittner Park. Although the West River has abundant shade, summer water temperature may limit trout survival (N. Hagstrom, Personal Communication).

Unnamed Tributaries to the West River on the property do not support resident fish communities, except in the areas immediately adjacent to their confluence with the West River. One of the more important functions of these watercourses is to provide cold, clean and unpolluted waters to downstream areas of the West River watershed that support an increased diversity of aquatic organisms.

Recommendations

- Stream Crossings and Fish Passage

West River

It is recommended that any new crossing of the West River be accomplished with a clear span bridge. A clear span bridge will ensure unimpeded fish passage through this area of the West River and protect existing instream habitat features. It is important that the hydraulic integrity of the area is maintained, e.g. do not widen the stream and minimize the placement of riprap that might be required for abutment scour protection. As a best management practice, any unconfined instream work within the West River should be restricted to the period from June 1 to September 30, inclusive. A June 1 through September 30 timeframe can be utilized as an effective mitigation measure for construction related disturbances due to the following reasons: (1) timeframe will serve to protect the spawning, egg incubation, and fry development of resident fishes, (2) timeframe does not interfere with seasonal migratory behaviors, and (3) timeframe coincides with historic low rainfall levels in Connecticut in a period in which instream construction activities such as dewatering, excavation, trenching, and cofferdam placement are most effective.

Unnamed Tributaries to the West River

Since the unnamed tributaries do not support fish communities in the areas of the existing road crossings, any future road rehabilitation which requires the installation of cross culverts will not have to consider fish passage.

- Riparian Zone Protection

It is highly recommended that a 100 foot wide riparian buffer zone be maintained along the West River and its tributaries. A riparian buffer is one of the most natural mitigation measures to protect water quality and fisheries resources. No construction and alteration of existing habitat should be allowed in this zone.

- Instream Habitat Enhancement

The West River's best instream fish habitat is mainly located in deeper pools, greater than 2 feet in depth and where a tree (termed large woody debris) has fallen in the stream which helps create velocity refuges, overhead cover and facilitates the collection of small woody debris. Unfortunately, there is a lack of these habitat types adjacent to Bittner Park. If the Town is interested in exploring instream habitat enhancements in the West River, the Team's fisheries biologist is willing to further evaluate and assist with such opportunities.

- Interpretive Trail and Environmental Education

The West River, its tributaries and its surrounding wetlands serve as valuable ecological study areas for students and the general public as well. The Town and local schools should consider installing interpretive signs along the trail system to explain the types and values of various stream, wetland and upland habitats along with identifying local flora and fauna.

The Natural Diversity Data Base

The Natural Diversity Data Base maps and files have been reviewed regarding the project area. 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.

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.

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.

Wildlife Resources

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

Current Conditions, Field Observations and Notes

The 100+ acres of Bittner Park contains a variety of conditions and habitat types and provides habitat for a variety of wildlife. The area offers many opportunities for nature education and recreation. The following wildlife were observed during the field visit of June 11, 2002 either directly or indirectly by identifying calls, tracks, scat or other sign: whitetail deer *(Odocoileus virginianus)*, eastern coyote *(Canis latrans)*, gray squirrel *(Sciurus carolinensis)*, eastern chipmunk *(Tamias striatus)*, American robin *(Turdus migratorius)*, wood thrush *(Hyocichla mustelina)*, veery *(Catharus fuscescens)*, gray catbird *(Dumetella carolinensis)*, northern cardinal *(C. cardinalis cardinalis)*, mourning dove *(Zenaida macroura)*, American crow *(Corvus brachyrhynchos)*, bluejay *(Cyanocitta cristata)*, downy woodpecker *(Picoides pubescens)*, red-bellied woodpecker *(Melanerpes erythroecphalus)*, red-eyed vireo *(Vireo olivaceus)*, song sparrow *(Melospiza melodia)*, scarlet tanager *(Piranga olivacea)*, ovenbird *(Seirus aurocapillus)*, eastern towhee *(Pipilo erythrophthalmus)*, blue-winged warbler *(Vermivora pinus)*, yellow warbler *(Dendroica petechia)*, black-capped chickadee *(Parus atricapillus)*, tufted titmouse *(Parus bicolor)*, eastern phoebe *(Sayornis phoebe)*, gray tree frog *(Hyla versicolor)*, green frog *(Rana clamitans melanota)* and wood frog *(Rana sylvalica)*. Several dogs (domestic) offleash were also observed.

Planning for Wildlife

As urbanization of the surrounding landscape continues, land holdings of 100 or more acres will become scarce. Several wildlife species which are adversely effected by urbanization and fragmentation are present on the property (i.e. ovenbird, red-eyed vireo, scarlet tanager, and veery). Publicly owned lands are valuable when managed for the long term benefit of wildlife. Large parcels of land such as the Bittner property can be places that provide active and passive recreation. Bittner Park is situated near urbanized areas and can be a place for active sports and also a place to enjoy the natural environment in relatively close proximity to where they live. In a survey of urban residents in five metropolitan areas of New York State, 93 percent of the respondents indicated that it was important for their children to learn about nature and 73 percent were interested in wildlife in the backyard or neighborhood area (Brown et al. 1 979).

The challenge that faces Guilford's town leaders is attempting to balance the need for active sports and their facilities and to conserve wildlife habitat. To develop areas such as Bittner Park in a prudent and feasible manner requires careful planning and a reduction of potential environmental impacts. This report will discuss potential wildlife impacts and give examples of wildlife management practices that may reduce wildlife impacts.

Athletic Field Facilities Report

According to the Athletic Field Facilities Report prepared by the Guilford Standing Fields Committee (January 1999), Guilford was cited as experiencing an increase in sports teams and in need of developing more fields to accommodate

this growth. This report is a good starting point for the town to assess field usage and future needs. Without a map of the field locations and their juxtapositions, it was difficult for the reader to get a feel for where the fields are and the feasibility of using alternative fields for various sports. To its credit, however, it helps the reader understand the need for more fields.

Forest Ecology and Wildlife

The distribution and combination of various of vegetative types and tree size classes are important to consider when managing forest land for the long term. In general, the greater the range of tree size classes present, the greater the potential that more wildlife species will be present (Degraaf et al. 1992). Important to wildlife habitat is the quantity and quality of plants and their vertical and horizontal structural diversity. The vertical layering of the trees, shrubs, vines, herbs and thallophytes (lichens and mosses) and the horizontal diversity (known as "patchiness") of the forest are important to consider to encourage diverse wildlife habitat conditions. Professionally applied modern forestry operations can be utilized to manage and enhance wildlife habitat by encouraging plant diversity and vertical and horizontal structural.

The identification and removal of invasive plants from the property can help improve habitat conditions for wildlife. Without due diligence in removing invasives and managing their populations, invasives can create large entanglements which are more difficult to reduce once they've established themselves. Park maintenance crews should be trained to identify and eradicate invasives whenever feasible.

How Much of Guilford is Forested ?

Guilford's land base (30,282 acres) is covered with 72.54 percent forest (DEP Land Use Statistics using Geographic Information Systems, 1996). The State of Connecticut average for forestland statewide is about 59 percent.

Guilford Land-Use Data

Total area size: 30,282 acres = 47.32 square miles

Land -use category	Percent of Total Area	Acres
1 - impervious surfaces	.18	54.52
2 - high density res/commer	1.05	316.65
3 - medium density residential	8.13	2,461.33
4 - roof surface	.02	5.13
6 - turf grass	.54	162.10
7 - soil/grass/hay	2.34	708.22
8 - grass/hay/pasture	6.52	1,974.04
9 - soil/corn	.25	76.18
10 - grass/corn	.11	33.79
13 - forest - deciduous	65.19	19,739.74
14 - forest - coniferous	3.83	1,160.14
15 - water -deep	1.17	354.75
16 - water - shallow	1.78	537.81
17 - wetland - nonforested	.10	29.13
18 - wetland - forested	3.52	1,064.82
19 - barren land	.64	195.04
20 - bare soil	.37	112.70
21 - marsh lo marsh	2.30	696.53
25 - major roads	1.92	582.77

Potential Wildlife Impacts

Wildlife Impact #1.
Removal of interior forest cover to create ballfields.

Forest dwelling wildlife species such as ovenbird, veery, woodthrush and wood frogs found in Bittner Park will experience habitat loss and degradation by the development of lawn/field conditions. Forest fragmentation and shrinking forest sizes due to human development are considered major wildlife conservation issues in the northeastern United States (Whitcombe et al. 1981, Askins et al. 1987). The wildlife species that are likely to benefit from the open and mowed habitats are the generalists like Canada geese which have been associated with causing nuisance situations on mowed turf. They congregate in large numbers, feed on turf grasses, and leave a large volume of feces on lawns and in waterbodies. Other detrimental wildlife species that benefit from open and mowed areas are European starlings *(Sturnus vulgaris)* and house sparrows *(Passer domesticus)* which compete with native cavity nesters such as Bluebirds. There is likely to be an increase in Brown-headed cowbirds *(Molothrus ater)*, they parasitize the nests of other birds which leads to lower recruitment especially for many area-sensitive songbirds that are already declining due to forest fragmentation.

Reducing Wildlife Impact # 1.
Placing ball fields on the fringes of the forest versus the middle of the forest with shorter access roads.

Ballfields that are placed along the edges of forest reduce the intrusion of cowbirds (parasitic bird species) and maintain more interior forest for interior forest wildlife.

Wildlife Impact #2.
Land moving, regrading, filling and changing contours in close proximity to wetlands, vernal pools or riparian habitat.

Conversion of forest land to ballfields requires significant soil moving and landscaping to create flat well drained surfaces for playing sports. Properties such as Bittner Park which has undulating soils and pocket wetlands can be more adversely affected than other areas in Guilford with flatter terrain. Bulldozing near areas with wetlands and other riparian habitat can present a challenge to the developer.

Reducing Wildlife Impact #2.
Choose areas with flatter terrain and further away from wetland fringes and buffers.

Look for areas to develop fields that don't require a lot of cutting and filling or wetland buffer impacts.

Wildlife Impact #3.
Introduction of fertilizers, herbicides and insecticides to an area of Class A and GA water in order to maintain fields.

The maintenance of ballfields requires prudent use of fertilizer, herbicide and insecticide and the proposed fields will be placed in forested areas now considered Class A for surface water and Class GA for groundwater. Increased use or misuse of fertilizers, herbicides and insecticides may adversely affect wildlife in vernal pools and other surface waters in the area. What will the creation of

ball fields in Bittner Park do to these water classifications? What are the future drinking water needs of the town of Guilford?

Reduction of Wildlife Impact #3.
Placing ballfields on other town land with lower water quality status.

Reducing the use of fertilizers, herbicides and insecticides by using organic materials and methods (check current knowledge and technology for use of organic supplements).

Wildlife Impact #4.
Increased human and vehicular traffic and use will lead to wildlife and habitat quality degradation.

With the increased human use of a natural area comes unleashed dogs, litter, soil compaction, noise, and leaky vehicle fluids such as oil and antifreeze.

Reduction of Impact #4.
Have a central parking area with walking paths to fields with emergency vehicle and maintenance road access only.

Place parking areas at least 100 feet away from riparian buffers. Ban dogs from Bittner Park during bird nesting season (March 1 5th through September 1st) to prevent unleashed dogs from destroying ground nests or interrupting nesting birds.

Wildlife Impact #5. Increased maintenance of forest edges in a "park-like" manner.

Traditional management of parks includes the removal of understory vegetation and the tight manicuring of vegetation. This leads to habitat loss and degradation

to wildlife. As Bittner Park gets further developed the "park-like" environment will increase in size.

Reduction of Wildlife Impact #5.
Leave more diverse forest edges.

Encourage edge development by not removing the understory vegetation and increasing the size of the edges by leaving a strip of unmowed area (10 -20 feet buffer) along forest edges. These unmowed edges can be mowed once a year with brushmowers in the early spring of the year. Plant in a variety of native trees, shrubs, wild flowers and grasses to enhance the edges of the forest.

Nature Education Use of Property / Habitat Improvement

With a school adjacent to Bittner Park, there are many opportunities for use of the property as an outdoor classroom/outdoor laboratory to learn about the natural sciences. Throughout Connecticut, schools are utilizing the outdoors for developing nature trails, habitat enhancement, and connecting it to the school's existing curriculum. The Bittner Park property would lend itself well as an outdoor learning area.

Improving Habitat for Wildlife

Plantings for improving seasonal food sources and cover can be accomplished in Bittner Park and especially on Baldwin Middle School grounds. The school can adopt a natural area within Bittner Park and plant a variety of fruiting shrubs and wildflowers. Further technical assistance is available from the Team wildlife

biologist. All plantings should not be invasive non-natives. The following plants *should not* be planted (see appendix for invasives list):

Trees

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

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)*

Vines

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

Plantings should be utilized that strive to be complimentary to the existing habitat and species which occur in the particular habitat area. Careful observation of plant communities and plant succession of a particular area will help formulate species lists for enhancement or restoration.

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. Plantings of native trees, shrubs and

wildflowers can enhance conditions for wildlife in the area. Planting should strive to diversify the seasonal availability of food sources such as planting spring, summer, fall, or winter persistent food sources. Enhancement of seasonal food sources benefits resident wildlife as well as migratory species which may come through in spring and fall periods. The following is a select list of native plants which can be used to enhance the property:

Native trees

Flowering dogwood *(Cornus florida)*
Black Cherry *(Prunus serotina)*
Pin Cherry *(Prunus pensylvanica)*
White pine *(Pinus strobus)*
Eastern Red Cedar *(Juniperus virginiana)*

Native shrubs

Gray dogwood *(Cornus racemosa)*
Silky dogwood *(Cornus amomum)*
Arrowwood viburnum *(Viburnum recognitum)*
Nannyberry viburnum *(Viburnum lentago)*
Common Elderberry *(Sambucus canadensis)*
Winterberry *(Ilex verticillata)*

Additional native plants (not currently found on property)

American Holly *(llex opaca)*
Bayberry *(Myrica pensylvanica)*
American Cranberry Bush *(Viburnum trilobum)*
Sweet pepperbush *(Clethra alnifolia)*
Hackberry *(Celtis occidentalis)*

Meadow environment plantings

Encourage native wildflowers through selective mowing. Maintain herbaceous environment by mowing fields at least once a year to prevent woody plant invasion. Plant/seed native wildflowers throughout the open meadow areas.

Native Plant Sources

New England Wildflower Society, Inc.
Garden in the Woods
Hemenway Road
Framingham MA 01701 -2699
Tel. 617-237-4924 or 877-7630

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

Connecticut Native Trees and Shrubs Availability List
10 pp.
Peter Picone
DEP Wildlife Division
P.O. Box 1550
Burlington, CT 06013
Tel. 860-675-8130

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. Care should be exercised to not leave tall snags in high human traffic areas for safety reasons.

Nestboxes which mimic cavities in dead wood can be erected along the trail. Nestboxes for gray squirrels, screech owls, bluebirds, black-capped chickadees, house wrens, wood ducks, can be placed in appropriate habitats and serve as

demonstrations for trail users. The Team wildlife biologist is available for consultation on placement of nestboxes. Also, building plans are available upon request.

Nature Trail Development

The property can be utilized to teach students and residents how to recognize various habitat components and have some "take home" messages or ideas on how to manage their own properties; big or small. Nature trails, however, 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. The trail system can serve to point out the varying habitat types and other points of interest on the property. The various components and points of interest can be identified by trail markers or signs. Also, a trail guide can be developed which corresponds to numbers along the trail. This can reduce the maintenance of signage and requires trail users to pick up a guide from a centralized trail head, school property or town hall.

Practical Wildlife Censusing Techniques

Counting or documenting the presence or absence of wildlife along the trail can be both fun and educational for the trail users. It also teaches the importance of record keeping and identification of wildlife (directly or indirectly).

- Locate nests and other wildlife occurrences
- seasonally locate nests and plot locations on maps
- find den trees and natural cavities in trees and find out what animal is using it.

- Owl hooting Survey
- play and owl hooting tape and listen for response
- Bird Count
- document their seasonal presence
- Snow tracking
- following a light snowfall (2-3 inches), animal tracks can be identified and followed to see where they are traveling to and from. Also, they may detect what the animal is doing or eating.

Discussion/Conclusion

This report has enumerated several potential wildlife impacts and recommendations for reducing or eliminating those impacts. The proposed locations for creating ballfields at Bittner Park may present a challenge for town officials to reduce wildlife impacts. Proximity of construction activity to wetlands and rough topography may preclude full development of the proposed facilities. Alternative sites in the Town of Guilford should be looked at that contain flatter terrain and fewer wetland resources. Having a class A and class GA water designations on the Bittner Park forestland makes it a potential valuable resource for future drinking water needs and this water need should be assessed regionally. Although an Athletic Field Facilities Report helps elucidate the need for more field facilities, the town may also want to explore the options of creating lighted fields to increase use of existing fields or other alternatives such as purchasing properties with flatter terrain and fewer wetlands.

Literature Cited

Askins, R. A., Philbrick, M. J., and Sugeno, D. S ., 1987. Relationship between the regional abundance of forests and the composition of forest bird communities, Biol. Conserv. 39: 129- 152.

Brown, T.L., C.P.Dawson, and R. L. Miller. 1979. Interests and attitudes of metropolitan New York residents about wildlife. Tran. of North American Wildlife and Natural Resource Conference. 44:289-297.

DeGraaf, R. M.;Yamasaki, M,; Leak, W. B.; and J.W. Lanier. 1992. New England Wildlife: Management of Forested Habitats, General Technical Report NE-144, U.S. Government Printing Office, Washington, D.C., 272pp.

DEP Connecticut landuse statistics, Geographic Information Systems. 1996. On file, DEP Sessions Woods Wildlife Management Area, Urban Wildlife Program, Burlington, CT 06013. Tel.860-675-8130.

Whitcomb, R.F.; Robbins,C.S.; Lynch,J.F.; Whitcomb,B.L.; Klimkiewicz, M.K.; Bystrak,D. 1981. Effects of forest fragmentation on avifauna of eastern deciduous forest. In: Burgess, R.L.; Sharpe, D.M. (eds). Forest island dynamics in man-dominated landscapes. Springer-Verlag, New York.

Archaeological Review

A review of the State of Connecticut Archaeological Site files and maps show no known archaeological site in the project area. Field review indicates that topographic and environmental features of the project area suggest a moderate sensitivity toward undiscovered archaeological resources.

While our knowledge of archaeological sites on the project area is limited, the project area does possess stone structural and landscape patterns that can be used to provide an understanding of past cultural use of the land. For example stonewalls provide a glimpse of the historical use of the project area associated with 19th century farming activities. In addition, the western portion of the park along the West River contains areas very likely to have prehistoric Native American sites. Unfortunately, due to the invisible nature of most archaeological sites we would not be able to identify the specifics of these sites without excavation. In addition, it is recommended that the conservation commission contact the Guilford Municipal Historian and the Historical Society for any information about the property.

The Office of State Archaeology and the State Historic Preservation Office are prepared to offer the town of Guilford any technical assistance in identifying any cultural resources within Bittner Park. We believe that these resources may offer important educational opportunities for the community to learn about past cultural adaptations and historic land use.

Appendix

KEY

LIFEFORMS

T = tree
S = shrub
V = vine
H = herbaceous plant
G = grass
A = aquatic

HABITATS

U = uplands (all upland habitats including closed-canopy forests, second-growth woods, fields, grasslands, ridge tops, sand barrens, pitch pine scrublands etc.)
O = open areas (fields, grasslands, sand barrens, dry meadows etc.)
W = wetlands (swamps, marshes, wet meadows, fens, bogs, flood plains, flood plain forests, pond and stream shores)
L = lakes (ponds, in impounded water)
R = rivers (streams, in running water)
C = coast (sand dunes, rocky headlands, upper edges of salt water tidal marshes)

This List and the Criteria for listing were developed by the George Safford Torrey Herbarium, University of Connecticut, in conjunction with the State Geological and Natural History Survey of Connecticut and the Connecticut Invasive Plant Working Group. For a copy of the Criteria, please visit the Invasive Plant Working Group web page at **http://www.eeb.uconn.edu/invasives**

CENTER FOR CONSERVATION & BIODIVERSITY
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CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

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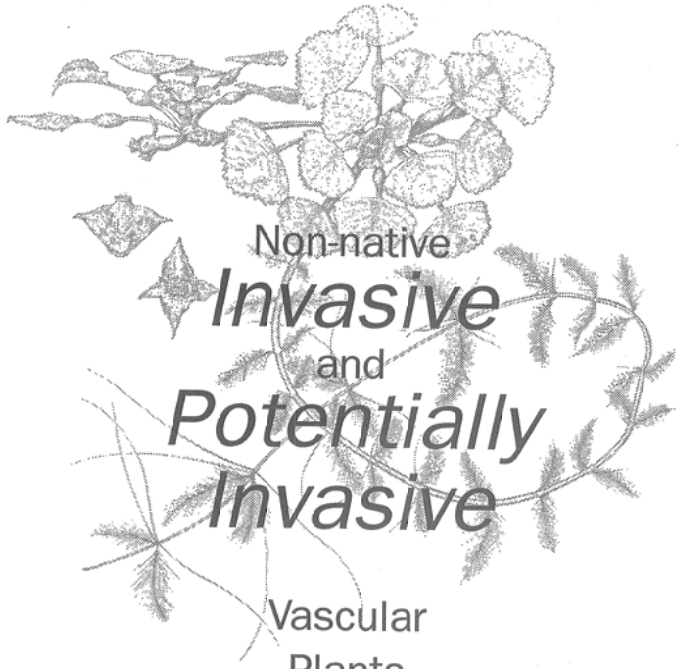

Non-native *Invasive* and *Potentially Invasive* Vascular Plants in Connecticut

JANUARY 2000

WIDESPREAD AND INVASIVE

SCIENTIFIC NAME	COMMON NAME	LIFEFORM	HABITAT
Ailanthus altissima (Mill.) Swingle	Tree-of-heaven	T	U
Alliaria petiolata (Bieb.) Cavara & Grande	Garlic Mustard	H	U
Berberis thunbergii DC.	Japanese Barberry	S	U
Celastrus orbiculatus Thunb.	Asiatic Bittersweet	V	U
Centaurea maculosa Lam.	Spotted Knapweed	H	O
Elaeagnus umbellata Thunb.	Autumn Olive	S	O
Euonymus alatus (Thunb.) Sieb.	Winged Euonymus	S	U
Euphorbia cyparissias L.	Cypress Spurge	H	O
Frangula alnus Mill.	European Buckthorn	S	U
Hesperis matronalis L.	Dame's Rocket	H	U
Lonicera X bella Zabel	Bella Honeysuckle	S	U, W
Lonicera japonica Thunb.	Japanese Honeysuckle	V	U, W
Lonicera morrowii A. Gray	Morrow's Honeysuckle	S	U, W
Lythrum salicaria L.	Purple Loosestrife	H	W
Nasturtium officinale R. Br.	Watercress	H	W
Phragmites australis (Cav.) Trin.	Common Reed	G	U, W
Polygonum cuspidatum Sieb. & Zucc.	Japanese Knotweed	H	U, W
Potamogeton crispus L.	Crispy-leaved Pondweed	A	R, L
Rhamnus cathartica L.	Buckthorn	S	U
Robinia pseudoacacia L.	Black Locust	T	U
Rosa multiflora Thunb.	Multiflora Rose	S	U
Vincetoxicum nigrum (L.) Moench	Black Swallow-wort	H,V	U
Vincetoxicum rossicum (Kleo.) Barb.	Swallow-wort	H,V	U

RESTRICTED AND INVASIVE

SCIENTIFIC NAME	COMMON NAME	LIFEFORM	HABITAT
Ampelopsis brevipedunculata (Maxim.)	Porcelain berry	V	U
Cabomba caroliniana A. Gray	Fanwort	A	L, R
Cardamine impatiens L.		H	U
Egeria densa Planchon	Brazilian Water-weed	A	L, R
Froelichia gracilis (Hook.) Moq.	Cottonweed	H	O
Humulus japonicus Sieb. & Zucc.	Japanese Hops	H,V	W, U
Hydrilla verticillata (L. f.) Royle	Hydrilla	A	L, R
Iris pseudacorus L.	Yellow Iris	H	W
Lepidium latifolium L.	Tall Pepperwort	H	C, O
Lysimachia vulgaris L.	Garden Loosestrife	H	W
Microstegium vimineum (Trin.) A. Camus	Japanese Stilt Grass	G	U
Myriophyllum heterophyllum Michx.	Variable Water-milfoil	A	L, R
Myriophyllum spicatum L.	European Water-milfoil	A	L, R
Rubus phoenicolasias Maxim.	Wineberry	S	U
Trapa natans L.	Water Chestnut	A	L, R
Tussalago farfara L.	Coltsfoot	H	U, W

This list has been developed using criteria created for this purpose. Species on the list are either potentially invasive or invasive. Invasive species are either widespread or have a restricted range in Connecticut. These two terms are geographic descriptors and do not imply degree of invasiveness. The list is intended to be an educational tool. This list is not static and will be reevaluated in December 2000. A species as listed here includes all subspecies, varieties, forms and cultivars. Life forms and broad habitat descriptors for habitats that are primarily threatened are noted.

POTENTIALLY INVASIVE

SCIENTIFIC NAME	COMMON NAME	LIFEFORM	HABITAT
Acer ginnala L.	Amur Maple	T	U
Acer platanoides L.	Norway Maple	T	U
Acer pseudoplatanus L.	Sycamore Maple	T	U
Aegopodium podagraria L.	Goutweed	H	W
Aira caryophyllea L.	Silver Hairgrass	G	O
Allium vineale L.	Wild Garlic	H	U
Amorpha fruticosa L.	False Indigo	S	W
Arthraxon hispidus (Thunb.) Makino		G	O, W
Berberis vulgaris L.	Barberry	S	U
Bromus tectorum L.	Drooping Brome-grass	G	O
Butomus umbellatus L.	Flowering-rush	H	W
Callitriche stagnalis Scop.		A	R, W
Cirsium arvense (L.) Scop.	Canada Thistle	H	O
Datura stramonium L.	Jimson-weed	H	C
Elaeagnus angustifolia L.	Russian Olive	S	U
Elsholtzia ciliata (Thunb.) Hylander	Elsholtzia	H	U
Euphorbia esula L.	Leafy Spurge	H	O
Geranium nepalense Sweet	Nepalese Crane's-bill	H	U
Glechoma hederacea L.	Gill-over-the-ground	H	W
Kochia scoparia (L.) Schrader	Summer Cypress	H	C
Ligustrum obtusifolium Sieb. & Zucc.	Border Privet	S	U
Ligustrum ovalifolium Hassk.	California Privet	S	U
Ligustrum vulgare L.	European Privet	S	U
Lonicera maackii (Rupr.) Maxim.	Amur Honeysuckle	S	U
Lonicera tatarica L.	Tatarian Honeysuckle	S	U
Lonicera xylosteum L.	European Fly-honeysuckle	S	U
Lychnis flos-cuculi L.	Ragged Robin	H	O
Lysimachia nummularia L.	Moneywort	H	W
Marsilea quadrifolia L.	Water Shamrock	H	L
Miscanthus sinensis Anderss.	Eulalia	G	O
Myosotis scorpioides L.	Forget-me-not	H	W
Myriophyllum aquaticum (Vell.) Verdc.	Parrotfeather	A	L
Nelumbo lutea (Willd.) Pers.	American Water Lotus	A	L
Najas minor Allioni	Eutrophic Water-nymph	A	L
Ornithogalum umbellatum L.	Star of Bethlehem	H	U
Paulownia tomentosa (Thunb.) Steudel	Empress-tree	T	U, C
Phalaris arundinacea L.	Reed Canary-grass	G	W
Poa compressa L.	Canada Blue-grass	G	U
Polygonum cespitosum Blume		H	U
Polygonum perfoliatum L.	Mile-a-minute Vine	V, H	U
Populus alba L.	White Poplar	T	U
Pueraria lobata (Willd.) Owhi	Kudzu-vine	V	U
Ranunculus ficaria L.	Lesser Celandine	H	U, W
Rosa rugosa Thunb.	Japanese Rose	S	C
Rumex acetosella L.	Sheep Sorrel	H	U
Silphium perfoliatum L.	Cup-plant	H	U
Solanum dulcamara L.	Climbing Nightshade	H, V	U, W
Valeriana officinalis L.	Garden-heliotrope	H	U
Veronica beccabunga L.	Brooklime	H	W

About the Team

The King's Mark Environmental Review Team (ERT) is a group of environmental professionals drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, soil scientists, foresters, climatologists and landscape architects, recreational specialists, engineers and planners. The ERT operates with state funding under the aegis of the King's Mark Resource Conservation and Development (RC&D) Area - an 83 town area serving western Connecticut.

As a public service activity, the Team is available to serve towns within the King's Mark RC&D Area - *free of charge*.

Purpose of the Environmental Review Team

The Environmental Review Team is available to assist towns in the review of sites proposed for major land use activities or natural resource inventories for critical areas. For example, the ERT has been involved in the review of a wide range of significant land use activities including subdivisions, sanitary landfills, commercial and industrial developments and recreation/open space projects.

Reviews are conducted in the interest of providing information and analysis that will assist towns and developers in environmentally sound decision making. This is done through identifying the natural resource base of the site and highlighting opportunities and limitations for the proposed land use.

Requesting an Environmental Review

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of an administrative agency such as planning and zoning, conservation or inland wetlands. Environmental Review Request Forms are available at your local Soil and Water Conservation District and through the King's Mark ERT Coordinator. This request form must include a summary of the proposed project, a location map of the project site, written permission from the landowner/developer allowing the Team to enter the property for the purposes of a review and a statement identifying the specific areas of concern the Team members should investigate. When this request is reviewed by the local Soil and Water Conservation District and approved by the King's Mark RC&D Executive Council, the Team will undertake the review. At present, the ERT can undertake approximately two reviews per month depending on scheduling and Team member availability.

For additional information regarding the Environmental Review Team, please contact the King's Mark ERT Coordinator, Connecticut Environmental Review Team, P.O. Box 70, Haddam, CT 06438. The telephone number is 860-345-3977.