



THE LIEBLER PROPERTY

GLASTONBURY, CONNECTICUT

Eastern Connecticut Environmental Review Team Report

Eastern Connecticut
Resource Conservation and Development Area, Inc.

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GLASTONBURY, CONNECTICUT

Environmental Review Team Report

**Prepared by the
Eastern Connecticut Environmental Review Team
of the Eastern Connecticut
Resource Conservation and Development Area, Inc.**

**for the
Community Development Office
Glastonbury, Connecticut**

March 2000

**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 Glastonbury Community Development Office to the Hartford County Soil and Water Conservation District (SWCD). The SWCD referred this request to the Eastern Connecticut Resource Conservation and Development Area (RC&D) Executive Council for their consideration and approval. The request was approved and the measure reviewed by the Eastern Connecticut Environmental Review Team (ERT).

The Eastern Connecticut 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 Thursday, December 9, 1999.

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** Individual responsible for Wildlife Resources section.

I would also like to thank John Rook, planner, Tom Mocko, environmental planner, Ray Purtell, parks and recreation, Judy Harper, conservation commission and Richard Johnson, town manager, 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 made separate or follow-up field visits and received additional information. 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 Eastern Connecticut RC&D Executive Council hopes you will find this report of value and assistance in reviewing the proposed master plan for this property.

If you require additional information please contact:

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P. O. Box 70

Haddam, CT 06438

(860) 345-3977

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INTRODUCTION

INTRODUCTION

The Glastonbury Community Development Office has requested assistance from the Eastern Connecticut Environmental Review Team in conducting an environmental review of the recently acquired Liebler Property. The town owned parcel is being considered for development of a town park.

The 44 acre site is located south of Welles Street, west of Main Street, with over 800 linear feet of frontage on the Connecticut River. Prior to town acquisition the parcel was primarily used for agricultural purposes. Most of the area was open cultivated fields with the frontage along the river being wooded with some steep embankments.

A Site Assessment and Master Plan for the Liebler Property was conducted and designed in 1998 by a group of consultants hired by the town working in consultation with a specially appointed planning committee. The major components of the plan include a community fairgrounds, a lighted baseball field, a soccer field, open fields for temporary parking and practice fields, a river walk with observation areas, pedestrian connections to Main Street and parking and access roads. Not included in the plan, but discussed at the field review meeting, was the use of a portion of the site along Welles Street for a senior center. The master plan chosen by the town committee represents a fairly significant recreational use of the project site.

OBJECTIVES OF THE ERT STUDY

The town requested the ERT to study the existing natural resources and conditions on the site. Also to discuss potential impacts and make recommendations regarding the proposed development so that the town can further evaluate the master plan and undertake any necessary modifications.

Specifically the town requested information on:

- the value of overall wildlife habitat;
- importance of the Connecticut River riparian corridor and buffer area;
- evaluation of the interior wetland areas; and
- evaluation of the site's resource protection needs.

Also requested was a discussion of the proposed project's potential environmental impacts such as:

- impact on the Connecticut River ecology and riparian buffer;
- recommendations on buffers;
- impacts and recommendations on wetland systems;
- recommendations regarding loss of agricultural land; and
- impact on the site's overall habitat.

THE ERT PROCESS

Through the efforts of the Community Development Office this environmental review and report was prepared for the Town of Glastonbury.

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

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 Thursday, December 9, 1999. 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

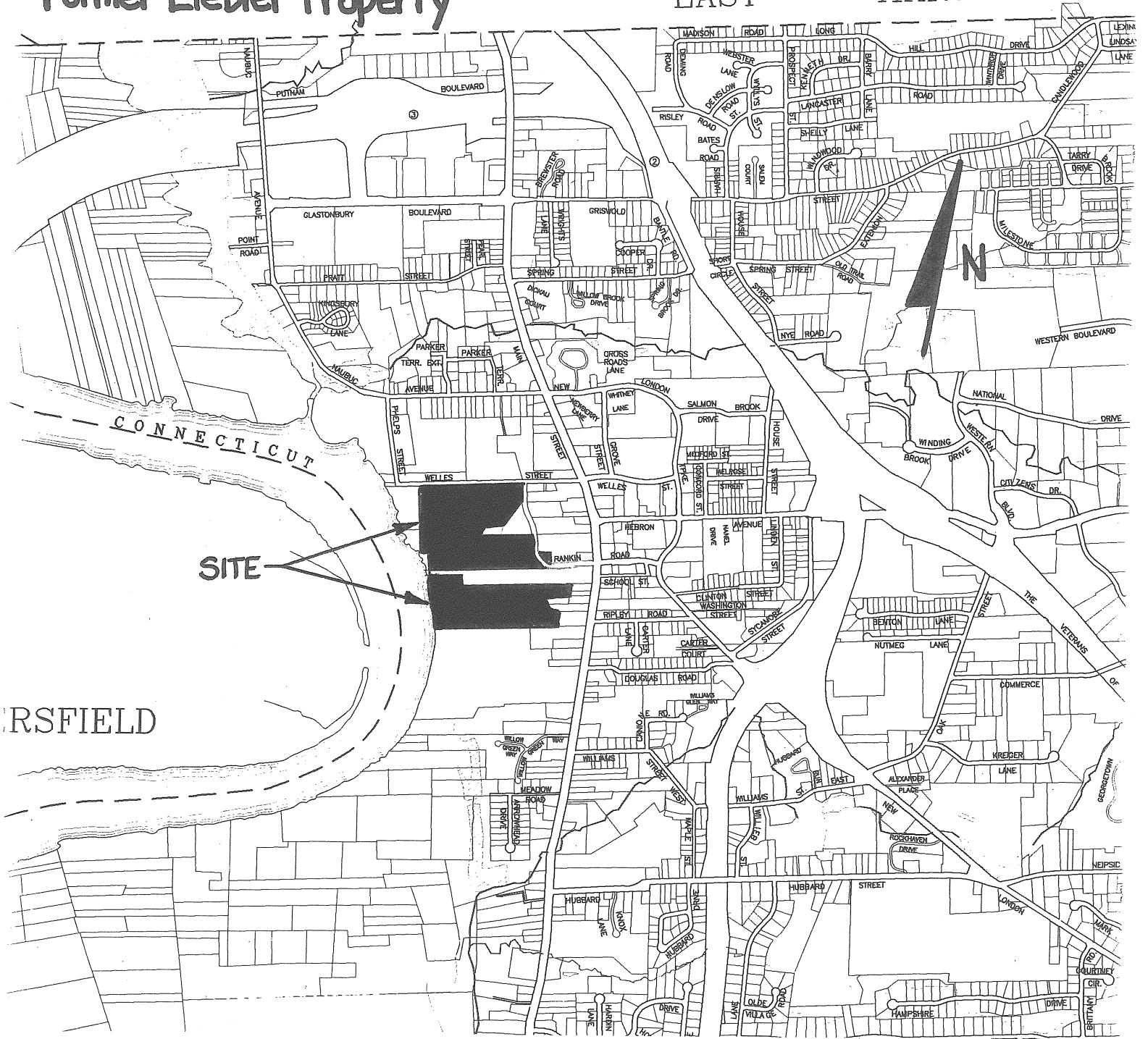
Scale 1" = 1500'



Town of Glastonbury Former Liebler Property

EAST

HARTFORD



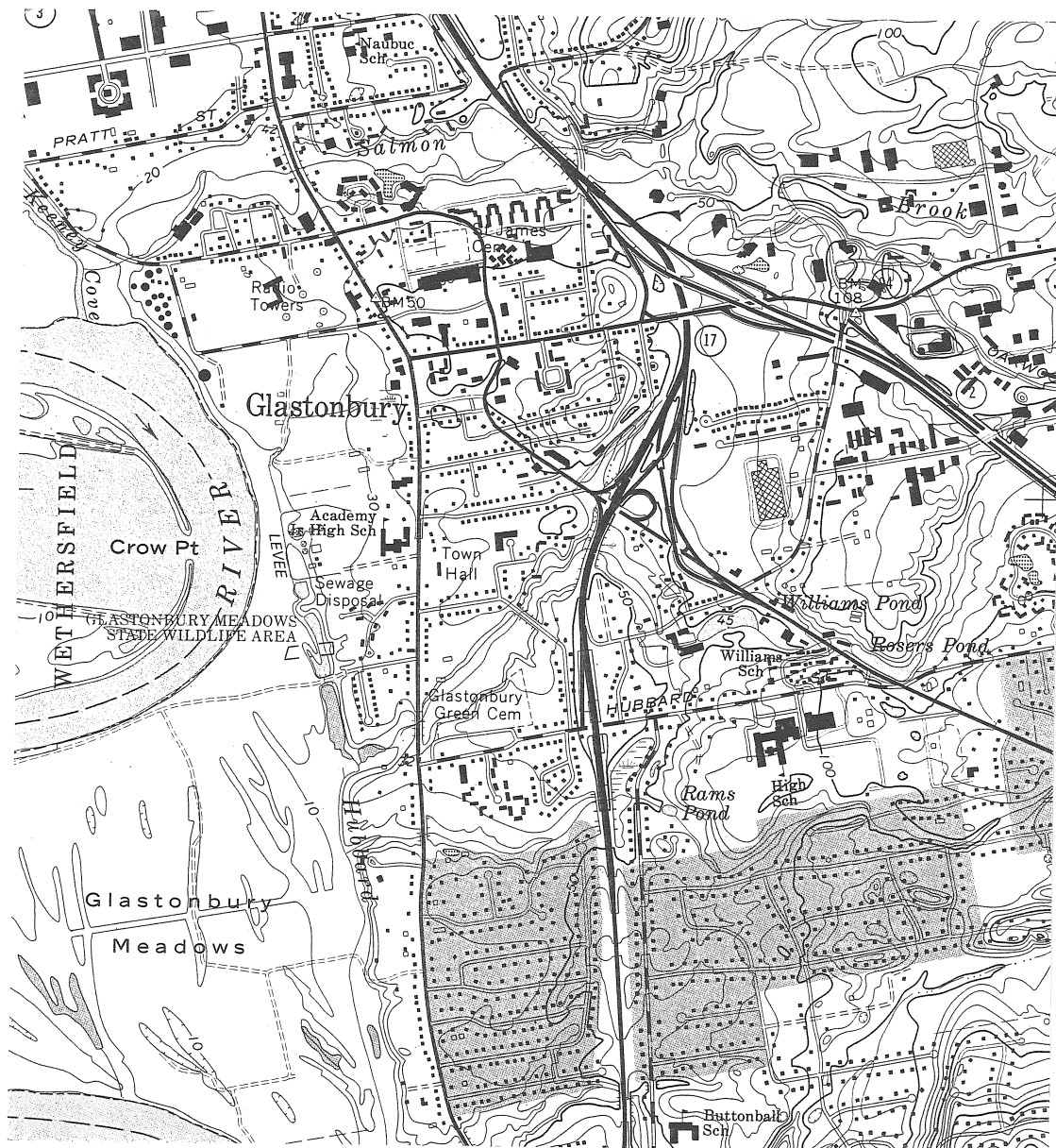
WINDSORFIELD

Figure 2.



Topographic Map

Scale 1" = 2000'



Site Assessment and Master Plan for the LIEBLER PROPERTY

Town of Glastonbury, Connecticut

November 12, 1998

Richter & Cegan Inc. • Master Planner - Landscape Architect

Bourne Consulting Engineers • Waterfront Engineer

Buck and Buck Engineers • Civil Engineer

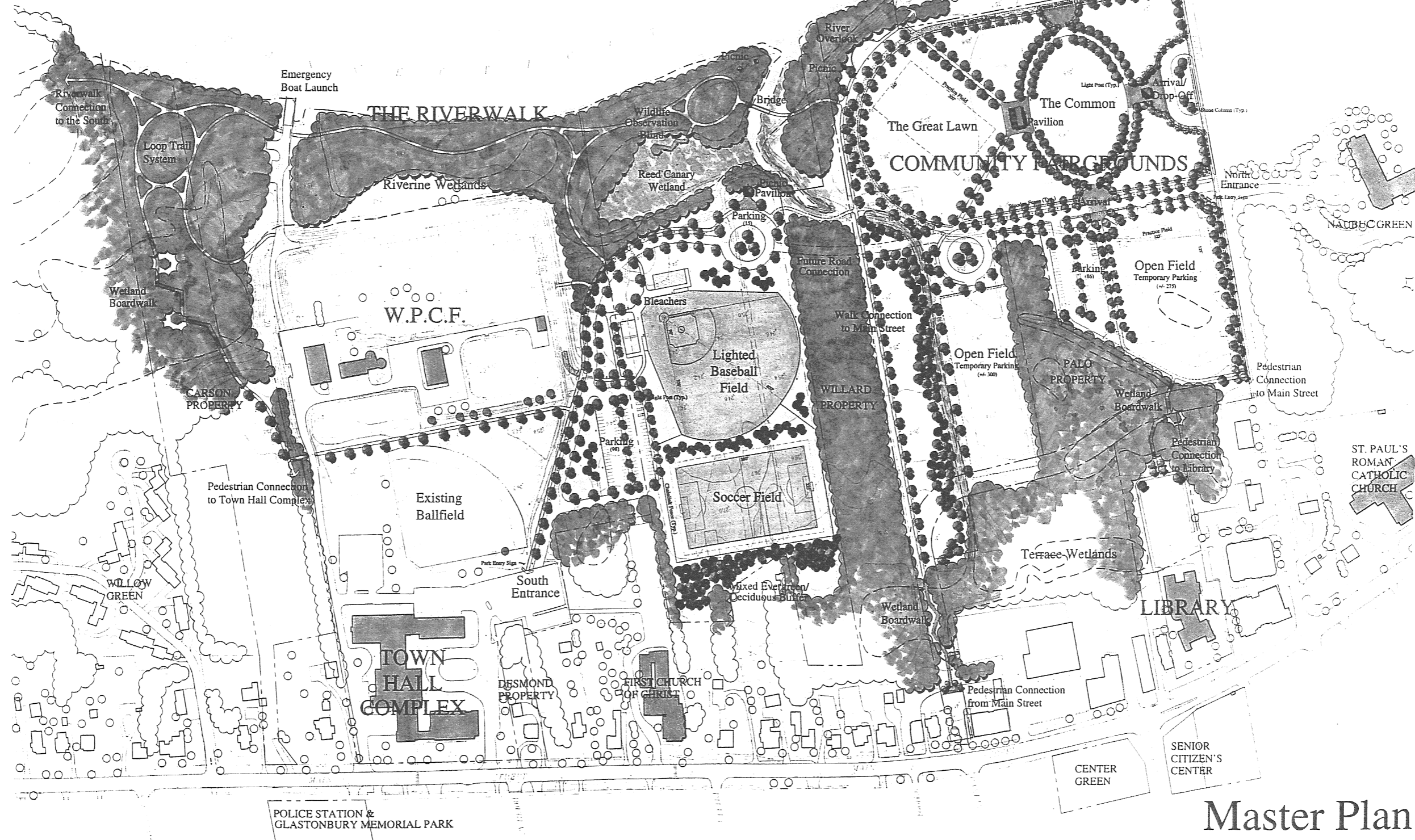
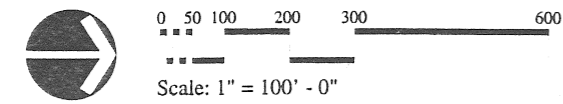
Environmental Planning Services • Environmental Planner - Soil Scientist

Purcell Associates • Traffic Engineer - Surveyor

Bemis Associates, L.L.C. • Electrical Engineer

White Engineering, Inc. • Irrigation Consultant

Figure 3.
Master Plan



Master Plan

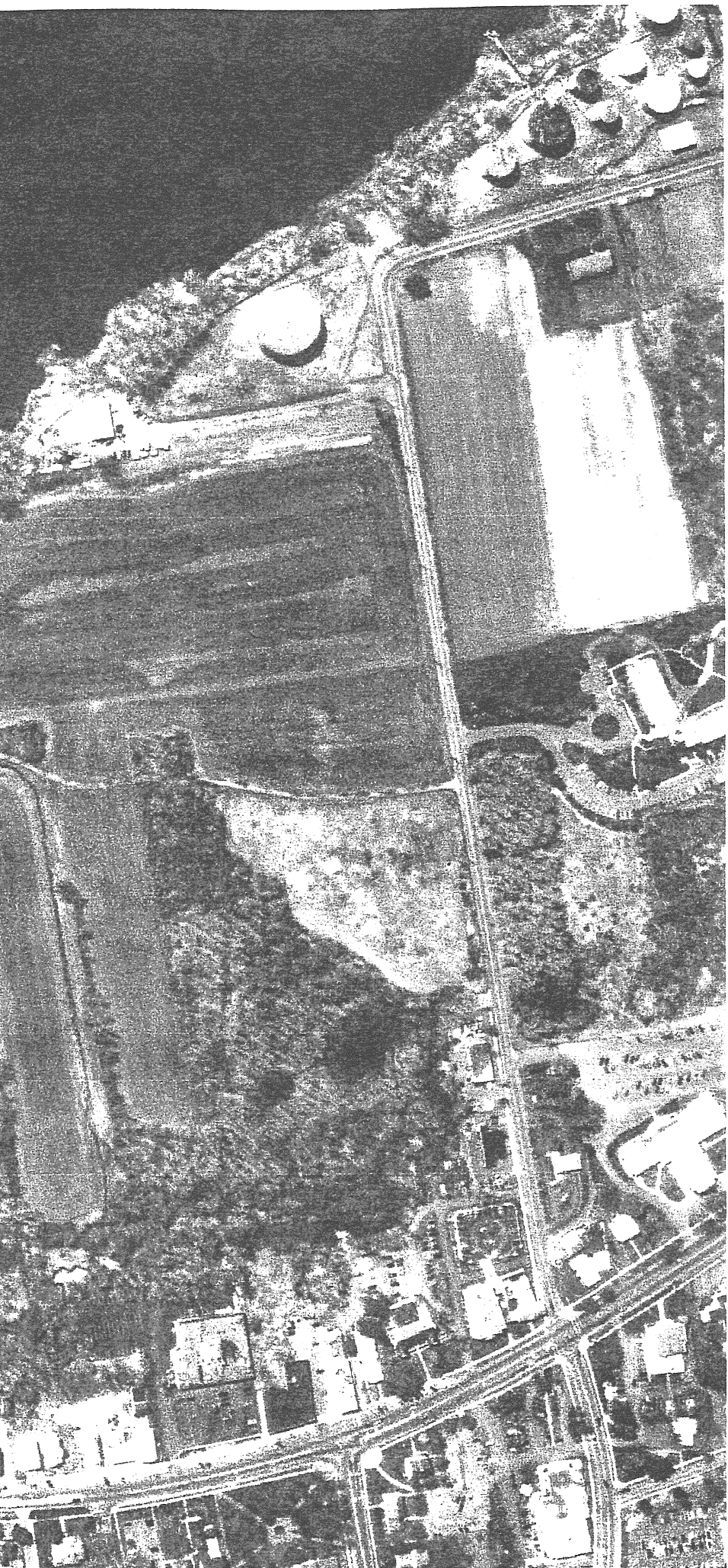


Figure 4.
Aerial Photograph

SOILS REVIEW

The soils on site were evaluated in detail by three soil scientists. Soils were examined with spade and auger to a depth of approximately 50 inches. They also examined the soil map of the property prepared by a soils consultant for the Town Master Plan and evaluated the presence or absence of both Connecticut state wetlands and Federal wetlands in the open land areas slated for possible development.

It appeared that some of the soil boundaries were not in the correct location on the town Master Plan soil map, particularly the Saco (SbA) unit in the western portion of the dissection. Also, the Walpole (WcA) unit in the field south of the channel was exaggerated. The Team soil scientists did not observe Walpole soils at all in this field.

The mapping on the Master Plan soil map matched the Hartford County Soil Survey report map nearly exactly. However, when the soil survey map was enlarged to the scale of the Master Plan map, the soil map units were in slightly different places than on the Master Plan. It is recommended that on-site soils investigations be performed throughout any portion of this site which is to be developed. These investigations should include the digging of deep test pits to evaluate the soil conditions thoroughly.

In the past, the northern portion of the site was also evaluated by several soil scientists regarding presence or absence of Federal and Connecticut wetlands. The small area on the Master Plan map of "possible Army Corps wetlands", (in the proposed Senior Center area), may or may not be a Federal wetland. The groundwater monitoring well has not been in the soil long enough to provide credible evidence that this area does not meet the hydrology criteria needed for Federal wetlands. If the well was installed during 1999, one of the driest growing seasons in recent history, low water table measurements during the growing season do not indicate non-wetland hydrology. Although the soil is somewhat poorly drained, it may meet one of the hydric indicators and therefore be a hydric soil. This field clearly needs to have a wetland delineation,(not determination), performed by a very experienced team of scientists. The hydric soils delineation would be

difficult because the soil is sandy and it is reddish in color. These types of soils do not exhibit the classic evidence of hydric soil morphology and intensive examination is necessary.

Also, there are possible wetlands in the areas proposed for parking and ballfields. The forested area adjacent to the Connecticut River is clearly state wetlands, because the soils are alluvial. Based on the Team soil scientists determinations and the findings of Kipen Kolesinskas, CT NRCS State Soil Scientist, (in December 1990), it is difficult to delineate the exact line between the floodplain and the non-floodplain on the Liebler property. The Agawam and Ninigret soils of the large field, (proposed fair site), may be subject to flooding. Thus, wetland delineations should be performed on the entire parcel.

The old farm fields (all the open land) are dominated by Agawam and Ninigret soils, which are prime farmland soils. The smaller areas of somewhat poorly drained Walpole soils are "additional farmland of statewide importance." All of these soils are sandy, and are underlain by silts and possible clays at depths of over ten feet (as seen in the deep ditch dissection). Water, fertilizers, herbicides, and insecticides move rapidly through the sandy soil and contamination of groundwater is possible. These soils are droughty and plants need irrigation during dry periods.

The following interpretive tables for the soils on this site may be found in the Appendix A:

- Soil Map Legend
- Prime Farmland List
- Physical Properties of the Soils Tables
- Building Site Development
- Wildlife Habitat Table
- Water Features Table
- Recreational Development Table
- Soil Features

In summary, a thorough wetland delineation of the entire property is recommended to ascertain exactly where both Connecticut and Federal jurisdictional wetlands are located. On site examination, (deep test holes), is necessary before any construction activities to determine the exact soil conditions at a location. Also, any structural development in the fields will reduce the amount of prime farmland in the Town of Glastonbury.

Site Assessment and Master Plan for the LIEBLER PROPERTY

Town of Glastonbury, Connecticut

November 30, 1998

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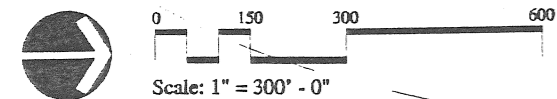


Figure 5.
Soils

Soils

Two soil associations, containing several soil series have been mapped at the site.

Alluvial Soils 11

These soils have developed in recent alluvium along the Connecticut River. They include Ondawa, Saco, and Winooski series.

- * On (Ondawa sandy loam) - this is a well-drained moderately coarse-textured soil found on floodplains of major streams. These soils are subject to inundation on an annual or less frequent basis. They are rapidly permeable and have a moderate moisture holding capacity. They are inland wetland soils in CT.
- * Sb (Saco silt loam) - this is a very poorly drained, fine-textured soil found on floodplains. The water table is at the surface for long periods in the winter and spring. They have a high moisture holding capacity. They are inland wetlands soils in CT.
- * Ww (Winooski silt loam) - this is a moderately well-drained fine textured soil found on floodplains of major streams. These soils are typically flooded about once a year. They have a seasonal high water table at about 8-20", and they have a high moisture holding capacity. They are inland wetlands soils in CT.

Outwash Soils

These soils are developed on the nearly level stream terrace that lies above the physiographic floodplain of the Connecticut River. They were deposited by glacial meltwater, and are typically underlain by stratified sand or sand and gravel.

Af (Agawam fine sandy loam) - this is a well-drained to somewhat excessively drained soil found on nearly level to gently undulating stream terraces. They are typically underlain by sand at a depth of about 36". They have a moderate moisture holding capacity.

Ag (Agawam very fine sandy loam) - this soil is very similar, with a slightly finer texture. Because of this it has a high moisture holding capacity.

Nn (Ninigret fine sandy loam) - this is a moderately well-drained, moderately coarse to medium textured soil overlying sands. They have a seasonal high water table at a depth of about 16-20".

Ns (Ninigret very fine sandy loam) - this is a moderately well to somewhat poorly drained, medium textured soil found on stream terraces. It has a seasonal high water table at a depth of about 12-18" and has a high moisture holding capacity.

* Se (Scarboro loam) - this is a very poorly drained soil developed on stream terraces, glaciofluvial, and glaciolacustrine deposits over coarse-grained stratified drift. The seasonal high water table is at or near the surface most of the year. The stratified material is typically encountered at a depth of about 22". They are inland wetlands soils in CT.

Wv (Windsor loamy fine sand) - this is an excessively drained, rapidly permeable soil. It overlies sand at a depth of about 24". It has a low moisture holding capacity.

* Wc (Walpole loam) - this is a poorly drained, medium textured soil developed from sandy or sandy and gravelly terrace deposits along streams. The seasonal high water table is typically within 8" of the surface. Sand or sand and gravel is encountered at a depth of about 22". They are inland wetlands soils in CT.

As noted, the alluvial soils are all inland wetland soils, regardless of their drainage class. The Ondawa and Winooski soils are physically capable of supporting community development. They may be constrained by other environmental factors such as the presence of floodplain forests, which are a diminishing habitat type in CT.

The outwash soils are all level or nearly level, and are underlain by sand or sand and gravel. they have a high capability of supporting community development. The Windsor soils are droughty, and the Agawam fine sandy loam is somewhat limited by moisture. These soils may require irrigation for development of athletic fields. The Agawam very fine sandy loam and the Ninigret very fine sandy loam have a high moisture holding capacity and would be suitable for athletic fields without irrigation most years.

UD (Udorthents) is a miscellaneous land type used to denote areas that consist primarily of man-made cut or fill areas, or areas that have been graded or leveled. The original soil profile can no longer be discerned. In filled areas, the fill is mostly earthen materials with minor amounts of other materials such as pieces of concrete, bricks, wood, metals, and glass. In cut areas, the natural soil has been excavated and the unconsolidated glacial deposit is exposed. At this site it encompasses the graded athletic fields, sewage treatment plant, levee, and sewer outfall.

The UR map unit is a miscellaneous land type used to denote areas of buildings, drives, and parking lots.

* indicates Inland Wetland Soils

Source : Hartford County Soil Survey, as modified by EPS field survey

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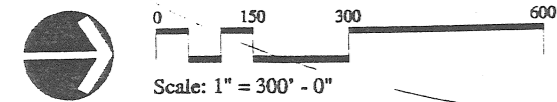


Figure 6.

Wetlands and Watercourses

Wetlands

12


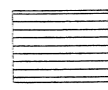
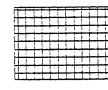
CT wetland limits were flagged by others on a small portion of the site (northeast corner), and the flagged wetlands have been transferred to the plans. Wetlands for the balance of the site were sketched by a soil scientist in the field. COE wetland limits were also sketched based on soils and biologic data. Several wetland types were identified:

- Floodplain Forest-nonhydric
- Floodplain Forest-hydric
- Deciduous Forested Wetland
- Wet meadow

The first is a CT jurisdiction wetland only by virtue of alluvial soils. They are well to moderately well drained and do not meet the soils portion of the multi-parameter test required to be considered Corps of Engineers wetlands. The other three wetland types are predominately CT and COE wetlands. There are two small areas of somewhat poorly drained wet meadow vegetation. The soils are hydric, but do not meet the CT definition (poorly drained, very poorly drained, floodplain or alluvial). They are COE wetlands only.

None of the wetland soils have a deep organic layer, although the Saco soil may have inclusions of shallow muck and the Scarboro may have a mucky surface. Consequently, they physically have the capacity to support community development if the water table were lowered or the surface raised. However, with two exceptions, they typically provide moderate to high quality values for typical wetland functions. The ditched watercourse that runs east-west in the northern portion of the site provides drainage conveyance functions only. The wet meadow northwest of the sewage treatment plant is dominated by Reed Canary Grass. This species forms a monoculture in most of this wetland area, which has a reduced biotic diversity and wildlife value.

Legend

-  CT Wetlands Only
-  COE Wetlands Only
-  Both CT & COE Wetlands

FLOOD REVIEW

This section reviews the floodplain, flooding, Stream Channel Encroachment Lines (SCEL) and FEMA's National Flood Insurance Program (NFIP).

There are SCEL on this site. The encroachment line flood in this location is the flood of record which is the 1936 flood, reduced to take into account the Connecticut River flood control reservoirs in upper New England. The SCEL flood is quite a bit above the 100 year flood insurance flood on the Connecticut River in Glastonbury. Any work undertaken in this area will require a SCEL permit through the State DEP. The comments of Cheryl Chase referenced on Page 24 of the *Site Assessment and Master Plan for the Liebler Property* are all valid and pertinent. The two thoughts of hers that deserve mentioning again are: "Balance cuts and fills below the 100 year flood elevation", and "Locate structures above the 100 year flood elevation, if not, then only primitive buildings will be acceptable."

The Team engineer doesn't understand how the flood lines can be adjusted for a new datum. The flood lines as delineated by the NFIP maps are adopted by the municipality. They would need to have a formal map revision to be changed. These NFIP maps reference a specific datum and both the water elevation and the ground elevation use this datum. If the datum changes, it would stand to reason that both the ground and water elevation would change by the same amount. However, the maps may need to be updated because of new topography gained through this site development process. So the changes are more related to the new topography and not as much related to the new datum. He can't tell.

The Team engineer agrees with the statement from the *Site Assessment and Master Plan* which says that even though most of the site is flooded for the 100 year flood, very little of the site is flooded for the 10 year flood. Most of the site is elevation 25-26 NGVD-29 or about elevation 24 or 25 NAVD 88. Since the NGVD-29 10 and 100 year flood elevations are 21.8 and 27.9 respectively, this is a very good point. This site may not be flooded for the 25 year flood event, but this

isn't given in the NFIP publication. Point is, it doesn't get flooded often, but still needs to meet the building requirements for floodplain development for safety reasons.

These requirements consist of the following: (1) have utilities located to prevent damage during flooding, (2) have backflow prevention valves on all water utilities, (3) the buildings should be made so as to not be moved during a flood, (4) the buildings need to be constructed of materials that are not damaged by water, (5) the buildings need to have openings in their shell that allows for the automatic equalization of flood waters. These are just a few of the requirements.

Comments on individual plans:

MASTER PLAN A

The bleachers are OK, the fences around the ball fields will need to be break away because they run perpendicular to the direction of flow. The concession stand will need to be flood proofed but will probably be acceptable for permitting.

MASTER PLAN B

Same comments as A, but the baseball fields and concessions will need more care in floodproofing, because they are about 3' lower and more prone to flooding.

PLAN C

This project is about half way between A and B and as such there is slightly more concern with respect to floodproofing the concession stand than in A but not as much as there is in B.

These ball fields and open areas are a good use of floodplain area for a plan that would preserve floodplain storage.

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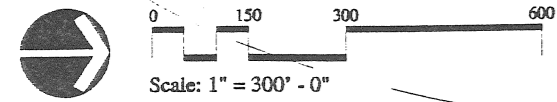


Figure 7.
River Regulations

- Legend
- Connecticut River Floodway Line
 - - - - - FEMA 100 Year Flood Line Adjusted to NGVD 1988
 - ==== Connecticut River Channel Encroachment Line
 - ===== Flood Zone Line taken from Glastonbury Zoning Map

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Flood Plains

Most of the property lies within the Connecticut River Flood Plain. Main Street lies at the edge of a large nearly level area that ranges in elevation from about 40 to about 50. From Main Street, the land drops fairly quickly to a nearly level area at about elevation 26. The 100 year Flood Plain, as defined by the FEMA study, is at elevation 28 (NGVD 1929), which corresponds to elevation 27.1 (NGVD 1988), which is the datum of the new topographic mapping by the Town of Glastonbury. The 100 year flood limit is shown with the legend "FEMA 100 YEAR FLOOD LINE ADJUSTED TO NGVD 1988."

Flood Zone

The Town of Glastonbury has a Flood Plain Zone, based on the FEMA study and earlier topographic mapping. The Zone Line is shown with the legend "FLOOD ZONE FROM ZONING MAP."

Other Floods

While most of the property lies below the FEMA 100 year flood level, it is interesting to note that most of the property lies above elevation 22 (NGVD 1988). This is significant because the FEMA study reports that the ten year flood level at this site is about 21.5 (NGVD 1929), or about 20.6 (NGVD 1988). Thus, while most of the property can be expected to be flooded once every 100 years, most of it will not be flooded once a decade. Development of the property for uses which can withstand very occasional inundation, such as rough buildings, sheds, athletic fields, etc., may be appropriate.

Channel Encroachment Lines

The Connecticut Water Resources Commission, predecessor of the current Department of Environmental Protection, established Channel Encroachment Lines along the Connecticut River. These lines approximately follow the 100 year flood limit, but they were established as a series of straight, surveyed, lines, which reflected land use at the time, property rights, and to a degree, political reality. Thus, the entire Welles Street frontage is outside the channel encroachment lines, although much of it is below the 100 year flood level. Any construction or re-grading within the channel encroachment lines requires a permit from the Department of Environmental Protection. Part of the Channel Encroachment Permit review process will be an evaluation of the impact, if any, of the proposed activity on the FEMA 100 year flood plain and the FEMA floodway.

Source: information provided by the engineering firm of Buck & Buck Engineers. Floodway Line taken from FEMA Floodway: Flood Boundary and Floodway Map, 1978.

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Connecticut River Channel Encroachment Line

Determination of lines. The commissioner, in establishing such encroachment lines, shall base their location on the boundaries of the area which would be inundated by a flood similar in size to one or more recorded floods which have caused extensive damages in such area or on a size of flood computed by accepted methods applicable generally throughout the state or a region thereof. The determination of the size of the flood and the boundaries of the inundated area shall take into consideration the effects of probable future developments. The position of the lines may vary from the boundaries of the inundated area so as to minimize the area of land to be regulated when a portion of the inundated area does not contribute to the flood-carrying capacity of the waterway. The position of the lines shall, insofar as practical, equitably affect riparian properties and interests depending upon existing topography and shall be interdependent throughout the reaches of the waterway, and shall conform with the requirements of the federal government imposed as conditions for the construction of flood control projects. When the existing waterway, because of natural or man-made constrictions, is such that such lines cannot be established by standard engineering methods, a channel may be adopted, whereby the removal of such constrictions may be anticipated so that reasonable lines can be established by methods applicable to the state generally. When the flood boundary falls along the channel banks, the lines shall be placed at the top of the bank.

Who must apply for a permit. Any person proposing to place an encroachment or obstruction riverward of the stream channel encroachment lines must obtain a permit. Activities which require a permit when conducted riverward of such lines include, the removal or deposition of material, any alteration of the land or watercourse or construction of structures, filling, dredging, clearing, grubbing, grading, piping, culverting, channelizing, diverting, damming, dewatering, construction of structures, and any other activity that temporarily or permanently alters the character of the floodplain or watercourse. Additionally, major repair of structures that existed before the stream channel encroachment lines were established may require a permit.

Flood Zone

(Flood-Prone Area Regulations)

Purpose. The purpose of this section is to apply special regulations to flood-prone areas in the Town. These special regulations are designed: (a) to prevent or minimize loss of life and injuries to persons and property and other losses, both private and public; (b) to promote the health, public safety and general welfare of the community; (c) to help control and minimize the extent of floods and reduce the impact and occurrence of flooding; (d) to preserve the floodplain as an environmentally, agriculturally, recreationally and aesthetically valuable resource; and (e) to comply with minimum federal floodplain management criteria and to qualify property within the Town for flood insurance.

Land and water areas shall be used and buildings or structures shall be erected, altered, enlarged or used only for one or more of the uses or use categories listed in the list below of Permit uses and Special Permit uses and indicated in the F column of the Table of Permitted Uses, subject to such standards as may be referred to in the list below or in the F column of the Table of Permitted Uses, in the Special Requirements column of said Table, and in accordance with other applicable criteria in these Regulations. All uses designated as Special Permit uses shall also be subject to the Design Review requirements of Section 12 of the Building Zone Regulations.

Flood-Prone Area Regulations (cont.)

Permit:

Agricultural

Farm (excluding a dwelling or premises used for the keeping of livestock)

Historic and Monumental Sites

Special Permit:

Parks

Aircraft Landing Fields

Golf Courses

Governmental Service

Public and Private Roads

Marina

Recreation Area: Nonprofit

Sewage and Solid Waste Disposal

Utility: Electric, Gas and Water

Bazaars, Carnivals and Similar Uses

Golf Driving Range

For further information regarding the Flood-Prone Area Regulations, see Section 4.11, Flood-Prone Area Regulations for the Town of Glastonbury, Connecticut.

DEP Review Policy

Telephone conversation with Cheryl Chase of the DEP Inland Water Resources Unit revealed the following general guidelines for review of Connecticut River applications.

Any application for activities within the flood plain must be accompanied by a hydraulic analysis to document the impact of the proposed activity.

If the proposed activity is within the floodway, the floodway analysis MUST be based on the FEMA base data. This may be very difficult (i.e. expensive) because of defects in the FEMA data.

If the proposed activity is outside the floodway, the floodplain analysis may be based on the applicant's data. This is usually an easier analysis since there is no need to conform to faulty FEMA analysis.

Activities within the floodway: No net fill below the one hundred year flood elevation. No increase in upstream water surface elevations.

Activities within the flood plain but outside the floodway: No net fill below the one hundred year flood elevation. No significant increase in upstream flood depths.

Attitude of DEP regarding Chain Link Fences within the flood plain: Generally chain link fences are permitted if they are parallel to the flow. If they are not parallel to the flow, they must be documented to have no significant adverse effect on upstream water surface elevations, when fully blinded by debris, or they must be a "break-away" design that will allow the passage of water.

Attitude of DEP regarding new buildings within the flood plain: They must either be of a "primitive" nature, with no storage or building features that will be damaged by flooding, or they must be floodproofed to above the 100 year flood elevation. All buildings must be firmly anchored to prevent their being dislodged and floated downstream.

INLAND WETLAND AND WATERCOURSES REVIEW

The concerns relative to wetlands and watercourses are 1) "importance of the Connecticut River riparian corridor and buffer areas" and, 2) "evaluation of interior wetland areas relative to wildlife habitats and association with the riverine ecology of the Connecticut River", as well as the potential impacts to these natural resources resulting from the proposed activities."

In general, the chosen Master Plan for the municipal park appears to have sensibly considered the potential impacts that this development may have on the inland wetland and watercourse resources on this property. The following recommendations and comments are meant to refine the conceptual plan as well as reduce potential impacts that the Town of Glastonbury may not, as of yet, have considered.

With the narrow exceptions of the limited "River Overlook" area on the northern portion of the Connecticut River shoreline, the "Emergency Boat Launch" on the southern portion of the shoreline and two small picnic areas, the current forest cover of Connecticut River riparian area is proposed to remain intact. Most literature recommends that at least a 200-foot wide riparian corridor be maintained for wildlife purposes. This forested "buffer area" was measured to be at least 200 feet in width and as much as 400 feet in the area of the "reed canary grass" wetland. The use of this riparian area as a possible roosting/feeding site for bald eagles is addressed in the Natural Diversity Data Base section of this report, yet it points to the high value that this type of habitat has for wildlife and flood control, as well as other significant functions/values such as shoreline anchoring, erosion and sedimentation control, nutrient retention, water quality maintenance, recreation and aesthetics.

The proposed human intrusions into this area as mentioned above, as well as the proposed network of walking trails, may be problematic if this area has been documented as bald eagle roosting/feeding habitat.

The bald eagle is skittish and can be easily disturbed by nearby human activity. Even without the presence of the bald eagle, the scale of these proposed recreational features should be kept in balance with the highly valuable natural systems in play here.

Another method to judge the adequacy with which the riparian corridor is being protected is to what extent the active floodplain is being degraded. One way to measure the active floodplain is to delineate the alluvial/floodplain soil map units of the area which has already been done as part of the site assessment. There does not appear to be any major alterations proposed for the area covered by these types of soils. (Please also refer to the Soils Review section.)

The "interior" wetlands located along the eastern boundaries of the subject parcel do not appear to have a strong existing or potential relation to the riparian corridor of the Connecticut River. The strongest connection a wetland can have with a particular riparian area would be of a hydrologic nature. Besides the intermittent, man-made ditch running through the center of the property that remotely connects one such wetland to the river (see the Riparian Zones and Riparian Buffers section of this ERT report for a discussion of this feature and Appendix B), the remaining interior wetlands are isolated and have no such surface connections, the closest of which is approximately 1000 feet from the river.

The only direct impacts proposed for these interior wetlands are for pedestrian boardwalks which will serve to provide connections to Main Street. Details for these structures should be included at some point prior to any inland wetlands and watercourses permit being issued. Indirect impacts to these wetlands include alteration of the valuable surrounding upland "buffer" in the case of the southernmost and the northernmost wetland areas, as well as the potential for stormwater runoff entering the northernmost wetland from the proposed, 75 space, parking lot.

At the time of the site visit, the northernmost wetland complex contained two areas of standing water that appeared to be characteristic of a "vernal pool", however, final determination of their status as a vernal pool can only be made during the springtime amphibian breeding season. There is also an additional potential vernal

pool north of Welles Street that is hydrologically connected to the two pools on this parcel.

Vernal pools are small, shallow, usually circular 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 ephemeral pools, making these areas very attractive to certain animals which would normally fall prey to these carnivorous fish. Rare and endangered amphibian species are commonly found in these pools. The amphibian life that use these pools as breeding grounds soon migrate into the surrounding uplands to live out their adult phase and return to the pools only to breed. Migration distances vary significantly between species. One literature search turned up figures ranging from a minimum of 200 feet and a maximum of 750' with an average migration of about 525'. The wood frog has a significantly larger dispersal range, known to be as far as one half mile from their host pool.

Another phenomenon peculiar to vernal pools is that they often exist, as in this case, in groups, which have been shown to cooperate as a functional whole, with some pools in the group serving as a genetic source producing amphibian stock, and others as a genetic sinks receiving this genetic stock. While research on this phenomenon is ongoing, it is suspected that the interplay between each pool in the group is crucial to their long-term survival.

Scientists have been documenting a general downward trend in amphibian species with one of the probable causes being upland habitat fragmentation. The wood frog is particularly susceptible to this fragmentation phenomenon. It has been shown in a Rhode Island study, that wood frogs require an unbroken territory of at least 100 acres and preferably over 1000 acres in order to proliferate.

Based on 1) what appears to be a very dynamic, multi-pool community of amphibians, 2) the developing evidence of declining amphibian populations, and 3) the studies which have documented the upland habitat requirements of these **wetland dependent** species present on

this site, it is suggested that the Town consider reconfiguring this portion of this proposal to allow for less development and less impact on this critical habitat. The buffer areas of these potential vernal pools have already been impacted as a result of the construction of the library parking lot and any additional impacts, such as maintaining the areas to the north of these pools as parking lots and any direct stormwater point sources into these wetlands should be avoided.

If these areas should prove to be vernal pools with their requisite amphibian populations, it is recommended that a certain portion of the open field to the west of this area (at least that portion which has wet meadow characteristics) be allowed to revert back to forest cover and that the corridor between these pools and the "Terrace Wetlands" to the south remain undeveloped as is currently proposed.

RIPARIAN ZONES AND RIPARIAN BUFFERS

The USDA Natural Resources Conservation Service defines riparian zones as *ecosystems that occur along watercourses or at the fringe of water bodies. They are distinctly different from the surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by free or unbound water in the soil. Typical examples would include floodplains streambanks and lakeshores.*

Indicators of riparian zones are:

- Vegetation - The kinds and amounts of vegetation will reflect the influence of free or unbound water from an associated watercourse or water body and contrasts with terrestrial vegetation.
- Soils - Soils in natural riparian areas consist of stratified sediments of varying textures that are subject to intermittent flooding or fluctuating water tables that may reach the surface.
- Water - Riparian areas are directly influenced by water from a watercourse or a water body.
- Riparian areas occur along natural watercourses such as perennial or intermittent streams and rivers, or adjacent to natural lakes. They may also occur along man-made watercourses or waterbodies such as ditches, canals, ponds, and reservoirs.

This definition is used by NRCS to provide technical assistance in riparian areas, and it is not intended for regulatory use.

Riparian vegetation performs many functions important to watercourses and water bodies. Riparian vegetation provides shoreline and streambank protection, water quality protection, fish and wildlife habitat, flood control, and scenic beauty. Human land uses within riparian zones often cause a reduction or loss of riparian vegetation, which usually results in the degradation of the impacted aquatic resource.

A riparian buffer is a section of a riparian zone or of an upland, which is kept undisturbed or vegetated in order to protect the adjacent water resource, and/or to maintain valued ecological attributes of the riparian zone.

The natural functions most commonly associated with riparian zones and riparian buffers are:

- *Moderation of stream temperatures* - During the summer streamside vegetation shades the stream. During winter streamside vegetation insulates the stream to reduce formation of anchor ice.
- *Streambank stabilization* - The roots and stems of streamside or shoreline vegetation stabilize banks by binding and shielding soil and by reducing the velocity of flowing water.
- *Source of organic matter to streams* - Leaves, fruits, and woody debris that fall into streams are a major source of food and shelter for aquatic organisms.
- *Wildlife habitat* - Riparian vegetation provides food and cover for both aquatic and terrestrial animals.
- *Filtering of pollutants* - Riparian vegetation filters nutrients and sediments that may otherwise reach water resources through surface and shallow subsurface flows.
- *Flood control* - Riparian zones are often subject to flooding. Maintaining riparian zones undisturbed usually reduces flooding problems.

Under the NRCS definition of riparian zones, wetlands can be considered watercourses, water bodies, and riparian areas. Generally, aquatic and riparian ecosystems can be divided at the point where the deep or open water habitats end and where the emergent wetland habitats begin. There are four perennial and intermittent surface water resources within and adjacent to the proposed project area, the Connecticut River, two potential vernal pools, and the eroding drainage ditch/watercourse.

Using the NRCS definition, the riparian area along this section of the Connecticut River is better defined by its active or alluvial flood plain. The areas mapped as alluvial soils in the USDA Soil Survey for the site should be considered part of the riparian area for this part of the Connecticut River. These areas are also mapped as flood plain forest, floodplain forest wetland, and one of the wet meadow/emergent areas

in the Site Assessment and Master Plan vegetation Map. A delineation of the riparian zone at this site could be extended into the river terrace topography, as the 100-year flood zone includes most of the property. Nevertheless, from an ecosystem perspective most of the river terrace area is not frequently flooded and can be considered more of an inland or upland habitat that is *not strongly influenced by free or unbound water in the soil*. Further investigation of the soils is recommended to determine additional frequently flooded areas.

The Connecticut River is a 6th order tidal stream with a meandering channel and a well-developed flood plain. The river usually has a prolonged spring flood as the snowpack in Northern New England melts and is released into the river and its tributaries.

According to the size (width and depth) and stream order of the Connecticut River it can be classified as a sediment-based river ecosystem. These streams receive most of their required nutrients from a combination of inputs from tributaries, internal photosynthesis, and the recycling of detritus. The nutrient input from streambank vegetation is only a small percentage of the total (MacBroom, 1998).

Mature large rivers have low velocities and limited turbulence. Nevertheless, over the last 300 hundred years this section of the Connecticut River has had major alignment changes. Today the banks are stabilized with armor placed by the US Army Corps of Engineers, however, this may not prevent future channel adjustment (MacBroom 1998).

The Connecticut River is home to several important fish species such as Atlantic salmon, American shad, river herring, and short nose sturgeon. The proposed project site is located on the fringe of Focus Area 12, Great Meadows, in the Silvio O. Conte National Fish and Wildlife Refuge (US FWS, 1995). This is described in the Conte Refuge plan as a medium priority area with value for federally listed species, rare species, wetlands, and waterbirds. The riparian zone in this site serves as a corridor between Glastonbury Meadows and Keeney Cove Marsh.

According to the 1987 Water Quality Classification Map of Connecticut, the surface water quality classification for this part of the

Connecticut River is SC/SB. This classification applies to coastal and marine coastal waters and denotes that due to point or non-point sources of pollution certain water quality criteria or one or more designated uses assigned to Class SB water are not being met. The water quality goal for this watercourse is achievement of Class SB water quality criteria and of Class SB designated uses. Class SB designated uses include marine fish and shellfish habitat, wildlife habitat, shellfish harvesting for transfer to a depuration plant or relay to approved areas for purification prior to consumption, recreation, industrial and other legitimate uses including navigation.

The Connecticut Non Point Source Pollution Assessment and Management Plan, published by CT DEP in 1989, lists combined sewer overflows as the major source of pollution to the Connecticut River. Unspecified nonpoint sources are identified as a moderate or minor pollution source to the river.

A preliminary outlook of the river and its riparian resources indicates that the most important functions performed by the natural riparian zone of this section of the Connecticut River are wildlife habitat and flood control.

The proposed development and land uses present some potential impacts to the Connecticut River and the riparian area. Potential impacts to the Connecticut River itself are mostly minor and in the form of potential water quality impacts. Nutrients from fertilized athletic fields and auto fluids from the parking areas can reach the river in surface runoff, subsurface flows, water captured in drain systems, and ground water. These impacts can be seen as minor considering the water quality goal for the river, the lack of nearby drinking water resources, and the size of the river and its watershed.

The proposed land use changing activities are mostly proposed in river terrace areas. Although these activities are within the FEMA flood zone, they fall outside the active geomorphic floodplain as defined by alluvial soils (please refer to the Soils Review section). Therefore, the proposed activities should have minimum impact on the flood control functions of the riparian zone. Nevertheless, the potential impacts on flood flows and levels within the river's channel encroachment lines should be evaluated.

More significant are the potential impacts to the wildlife habitat in the riparian area. The lights from playing fields, the proposed trail system, the loss of adjacent successional habitats (grasslands and old fields), and the overall increase in human activity can negatively impact the wildlife habitat value of the site.

Riverine floodplain forests are a significant biological habitat in the Connecticut River valley. Many of these floodplain forests have been lost to agricultural uses and more recently to urban and suburban development. Therefore, the principal function of a riparian buffer in this site should be to maintain valued ecological attributes of the forested floodplain.

The following table provides recommended wildlife riparian buffers width ranges for several wildlife species associated with riparian zones. The widths listed below include the sum of buffer widths on one or both sides of watercourses or water bodies and may extend beyond riparian boundaries. It should be noted that a heron was observed during the ERT site visit.

Species	Desired width or range in feet
• Wildlife dependent on wetlands and watercourses	30 to 600
Bald eagle, cavity nesting ducks, heron rookery	600
Pileated woodpecker	450
Beaver, dabbling ducks, mink	300
Deer	200
Lesser scaup	170
Amphibians and reptiles*	100 to 330
• Song Birds:	40 to 660
Cardinal	40
Blue jay, Black capped chickadee, Downy woodpecker	50
Brown thrasher, Hairy woodpecker, Red-eyed vireo	130
Red-bellied woodpecker, Warbling vireo	300
Scarlet Tanager, American Redstart, Rufous-sided towhee	660
• Cold Water Fisheries	100 to 300

*Vegetative buffers surrounded by incompatible habitat may be inadequate for sustaining populations of some amphibian species in wetland areas.

The flood plain forest within the project site ranges between 100 ft. at the north end and 700 ft. at the southern end. Taking into consideration that the land use on the opposite side of the river (Crow's Point) is mostly woodland, open water, and old field, maintaining the existing floodplain forest undisturbed could be considered an adequate riparian buffer for wildlife habitat functions. To enhance the wildlife habitat value of the site, and to protect some of the terrace land that could be considered riparian, some areas of old field or grassland habitats should be kept adjacent to the forested floodplain.

There were two potential vernal pools observed in the wooded area at the north end near the Palo Property. The riparian area around the potential vernal pools is comprised of the wetlands and uplands around the pools, and it is better defined by the hydrological and biological connection between the pools and the adjacent land. Unfortunately at this time there is not sufficient information to justify some type of delineation of a riparian area around these pools.

Vernal pools are important, but often overlooked, components of the forest community. Vernal pools are usually depressions or impoundments that temporarily fill with water between fall and spring, and are usually dry by mid or late summer. These pools are essential habitat for the life cycle of many insects, crustaceans, and amphibians. There are certain amphibian and macroinvertebrate species that rely entirely on vernal pools for breeding and early development. The spotted salamander, the Jefferson salamander (a species of special concern), the marbled salamander, the wood frog, and the eastern spadefoot toad (endangered species) are among the amphibians thought to be entirely dependent on vernal pools for successful breeding.

The role of vernal pools in the breeding and early development part of the life cycle of amphibians can be trivialized by the lack of adequate upland habitat for these amphibians to spend the rest of their lives. It is important to keep in mind that the vernal pool is an ecosystem within the larger forested ecosystem, and that the creatures that use the vernal pool also need the forested habitat to exist.

Proposed activities that could negatively impact these potential vernal pools include the planned wetland boardwalk/pedestrian access to Main

Street, the turf, open fields/temporary parking areas, and the permanent parking areas. The main impacts would be the loss of existing and potential habitat.

At this time a buffer should not be considered without further evaluation of amphibian activity within these potential vernal pools, the adjacent landscape, and nearby vernal pools. If amphibian activity is determined in the potential vernal pools and adjacent areas, a recommendation of a buffer several hundred feet wide is possible.

Before human manipulation, the existing drainage channel was probably an intermittent watercourse draining water from its headwater wetlands and from the town's storm water sewer system. The riparian zone for this watercourse is mostly composed of its banks or slopes, and its adjacent wetlands. Aside from the values of its headwater wetlands, this man-made watercourse is not performing significant ecological functions. A more significant issue concerning this watercourse is the existing erosion problem.

Past increases in the amount of water directed towards this ditch have resulted in erosion of the channel. Although erosion in most of the drainage ditch is minor, down-slope from the existing crossing it becomes a problem. The erosion presents several environmental and safety concerns including increased sediment loads to the Connecticut River, loss of flood plain forest habitat, loss of prime farmland, and potential instability of the proposed road and trail crossings shown on the Master Plan. Stabilization of this channel should be planned as part of the proposed project.

At the outlet of the 42 inch corrugated metal pipe discharging into the channel, a sediment trap/basin should be constructed to collect road sand and other sediments associated with urban runoff. On the upper part of the channel, a storm water treatment wetland can be created to further reduce storm water velocities and enhance water quality. The most severe erosion takes place down-slope from the existing crossing. A combination of hard armor and vegetative methods can be used to stabilize the channel (see Appendix B for a letter from Joseph Polulech, USDA-NRCS State Engineer).

RECOMMENDED MODIFICATIONS TO MASTER PLAN

- **1. Buffer the Connecticut River riparian zone:** The floodplain forest should be buffered from the proposed land uses to maintain its existing values for wildlife and flood control. An additional buffer zone 50 to 100 feet wide is recommended (CWP, 1995). Native grasses and wildflowers could be planted in this buffer zone to provide an aesthetically pleasing landscape, which requires little maintenance and provides valuable wildlife habitat. A trail could run through this buffer.
- **2. Trails and wildlife observation areas:** Maintain trails as simply as possible. Trails within the floodplain forest should be mostly footpaths. Keep main trail outside the floodplain forest (use previously recommended buffer zone for trail) and use loops to access interest spots such as wetlands and river overlooks. Reduce number of wetland boardwalks.
- **3. Reduce lighting as much as possible:** The intense lighting associated with playing fields can obstruct or disrupt the nocturnal activities of many wildlife species.
- **4. Stabilize eroding channel.**

REFERENCES

Center for Watershed Protection Inc. (CWP), 1995. *Environmental Land Planning Series; Site Planning for Urban Stream Protection (95708)*. Center for Watershed Protection Inc., Silver Spring, MD.

MacBroom J. 1998. *The River Book, The Nature and Management of Streams in Glaciated Terraces, DEP Bulletin 28*. Connecticut Department of Environmental Protection Natural Resources Center, Hartford, CT.

US Fish and Wildlife Service (US FWS), 1995. *Action Plan and Environmental Impact Statement for Implementing the Silvio O. Conte National Fish and Wildlife Refuge Act.*

Site Assessment and Master Plan for the LIEBLER PROPERTY

Town of Glastonbury, Connecticut

November 30, 1998

Richter Cegan Inc. • Master Planner - Landscape Architect

Bourne Consulting Engineers • Waterfront Engineer

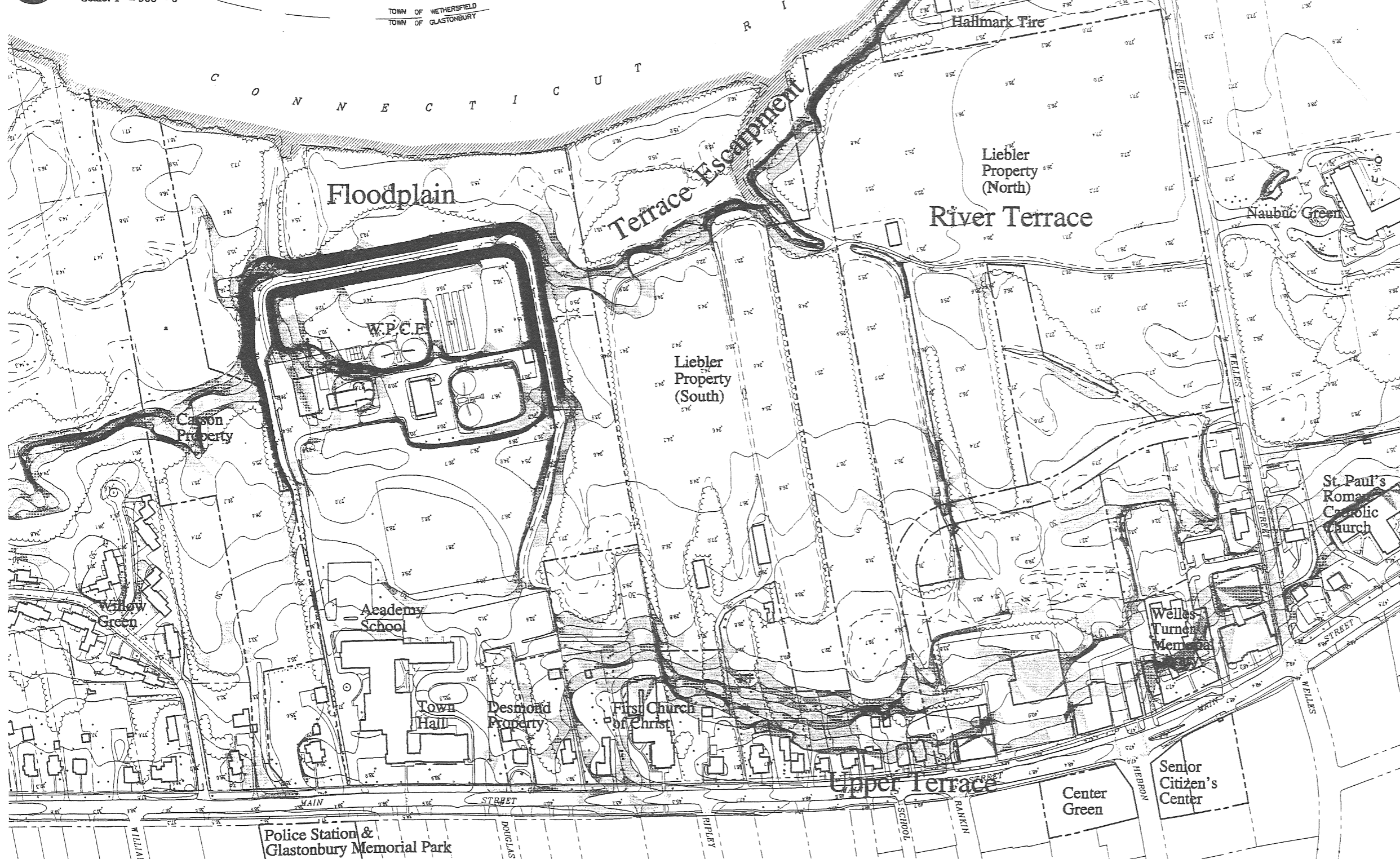
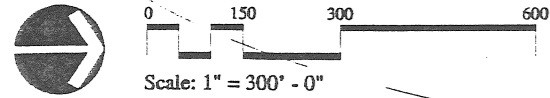
Buck and Buck Engineers • Civil Engineer

Environmental Planning Services • Environmental Planner - Soil Scientist

Purcell Associates • Traffic Engineer - Surveyor

Bemis Associates, L.L.C. • Electrical Engineer

White Engineering, Inc. • Irrigation Consultant



Legend

- 0 - 5 %
- 5 - 10 %
- 10 - 15 %
- 15 - 25 %
- 25 % +

Missing topographic information due to the high water level of the Connecticut River at the time of year when aerial survey was flown.

Figure 8.

Slopes and Landform

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 Federal and State Endangered Bald Eagles (*Haliaeetus leucocephalus*) documented in the vicinity of this project, Shortnose Sturgeon (*Acipenser brevirostrum*) and State Threatened Atlantic Sturgeon (*Acipenser oxyrinchus*) in the Connecticut River which is adjacent to this project.

Bald eagles regularly use the shoreline trees of the Connecticut River for perching and feeding from December - March. According to DEP Wildlife Division files there are no records of bald eagles using this site for extensive roosting, perching or feeding during the winter months.

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 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

GENERAL BACKGROUND

The 44 acre parcel of land owned by Glastonbury provides diverse wildlife habitat in an urbanizing area. The diversity of wildlife habitat is directly linked to the diversity of the plant communities located on the property. The wildlife utilizing the property are a reflection of the diversity in the plant communities and their proximity to each other.

WILDLIFE OBSERVATIONS/SITE INSPECTION

Wildlife observed utilizing the property were: northern cardinal (*Cardinalis cardinalis*), blue jay (*Cyanocitta cristata*), northern mockingbird (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), Canada goose (*Branta canadensis*), white-throated sparrow (*Zonotrichia leucophrys*), American goldfinch (*Carduelis tristis*), blackcapped chickadee (*Parus atricapillus*), mourning dove (*Zenaida macroura*), eastern meadowlark (*Sturnella magna*), red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperi*), ring-billed gull (*Larus delawarensis*), herring gull (*Larus argentatus*), gray squirrel (*Sciurus caroliniana*), eastern cottontail (*Sylvilagus floridanus*), and white-tailed deer (*Odocoileus virginiana*). Observed meadow vole (*Microtus pennsylvanicus*) activity in the field habitat. Also noted was American woodcock (*Scolopax minor*) sign (bill drilling holes in the mud) in woods edge. A more detailed review of the property during the four seasons of the year would, undoubtedly, reveal additional wildlife use of the property.

CURRENT CONDITIONS

REVERTING FARM FIELDS

Formerly plowed fields are growing into a tall meadow/shrubland community. As the abandoned farm fields get older and forest succession continues they will revert back to forested conditions. These young reverting fields are becoming less common in Connecticut. Wildlife associated with these early successional habitats are also becoming less common.

HAYFIELDS/GRASSLAND

The hayfield (Figure 9, Area 2) in the northeast section along Welles Street contains pockets of wet areas (being looked at as possibly regulated wetlands, refer to Soils Review section). The Team biologist observed an eastern meadowlark and two cottontail rabbits were flushed from this field during the site visit. Grassland habitats such as this are in decline throughout Connecticut. These habitats are in decline throughout Connecticut. Tightly manicured lawns do not support the same types of grassland wildlife that are supported here. Connecticut has lost many of its natural grasslands through filling and development over the course of history. Maintaining grassland communities such as this provides an opportunity for grassland species to be present in an urbanizing environment. These grasslands should be mowed infrequently to maintain optimal benefit to grassland wildlife. Mowing once a year in the late winter (March) or if hay is to be harvested it should be hayed after the first week in July to avoid major interruption of ground nesting. Species such as meadowlarks and bobolinks (*Dolichonyx oryzivorus*) and other meadow-thriving wildlife will benefit.

Along the northeastern wooded edge (on Palo Property) of this grassland is a wetland/pool which contains buttonbush (*Cephalanthus occidentalis*). This is significant because it may contain breeding populations of amphibians. Protection of this pool and other wetland pockets is warranted. Some obligatory vernal pool species require older forested areas for foraging during their adult stage. As the currently

abandoned farm fields grow older, they will increase in value as foraging areas for amphibians. A study is needed to determine the use by amphibians and the dispersal of emerging young from the pools. This may help to identify movement corridors and foraging habitat. Reptiles and amphibians are slower at moving between habitat types and are less tolerant of habitat alterations. Although paved areas are avoided in much of the proposed plan, removal and alteration of many of the existing habitat types will occur.

Traditional development of recreational fields involves removal of existing vegetation, grading, and planting of turf grasses. *The Site Assessment and Master Plan for the Liebler Property* dated November 30, 1998 states on page 33 that "...there is little site specific information available with respect to wildlife." More information on the use of the property by wildlife is warranted. For example: what are the value of the wetlands (including smaller ones) with respect to amphibian use? Are any functioning as vernal pools? Are there important travel corridors for amphibians from breeding site to foraging sites?

HABITAT CHANGES

CONVERSION OF PREDOMINANTLY WOODY PLANT COMMUNITIES TO OPEN AND MOWED HABITAT

In general, the conversion of predominantly wooded plant communities to open and mowed habitat will be detrimental to many forest, shrub, old field dwelling wildlife currently occupying the site. A predictable shift in the type of wildlife communities occupying the property will occur. Species such as Canada goose (*Branta canadensis*), ring-billed gull (*Larus delawarensis*), red fox (*Vulpes vulpes*), woodchuck (*Marmota monax*), Eastern cottontail (*Sylvilagus floridanus*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), brown-headed cowbird (*Molothrus ater*), and other generalists will benefit from the habitat changes. Wildlife that are considered specialists (i.e. neotropical migrants) which are more sensitive to the effects of development will be the most adversely affected by the proposed

development of manicured sports fields. Other wildlife that may be negatively affected from the proposed habitat changes will be the amphibians which thrive best in areas with abundant woody plant debris on the ground and unaltered wetlands.

DISCUSSION OF WILDLIFE SPECIES CHANGES WITH PROPOSED HABITAT CHANGES

The wildlife species that are likely to benefit from the open and mowed habitats of this proposed development are, today, considered nuisances in many parts of the state. In particular, the Canada goose has been associated with causing nuisance situations on mowed turf. They congregate in large numbers, feed on turf grasses, nest on open water ponds and leave large volumes of feces in and around golf course greens and waterbodies. Other detrimental wildlife species that benefit from open and mowed areas are brown-headed cowbirds which parasitize the nests of other birds which leads to lower recruitment of young especially for many area-sensitive songbirds that are already declining due to forest fragmentation. Also, meadow or grassland bird species will decline in tightly manicured lawn conditions.

BREEDING BIRD SURVEY NEEDED

Although many of the wildlife species on the property are common suburban species, biological survey information is needed to determine use of the property by less common wildlife which may only occur seasonally. A breeding bird survey of the property should be made to determine abundance and types of breeding birds. There are many scientific studies in wildlife ecology that indicate a strong relationship between small forests and high human use leading to declining function as meaningful reserves for area-sensitive (wildlife that require larger unbroken parcels) wildlife (Bond 1957, Levenson 1981, Hohne 1981, Askins et al. 1987). As forest and habitat sizes shrink in size, they are less viable as breeding places for interior birds and an increase in predation and parasitism of nests occurs (Blake and Karr 1985).

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 88 percent of the land in Connecticut, usually changes ownership and is not managed for wildlife for the long term. The proposed development will significantly alter or reduce the size of the natural habitat types found on this town-owned property. 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.

MANAGEMENT RECOMMENDATIONS

IMPACT #1

Large manicured lawn (Figure 1, Area 1) areas will not be hospitable to grassland wildlife. Much of the property is projected to be converted to lawn and turf.

RECOMMENDATION TO REDUCE IMPACT #1

The area designated as the "Great Lawn" will require multiple mowings to maintain in a lawn condition. If the goal of the "Great Lawn" area is to provide the citizens of Glastonbury with community grounds and fair grounds then the "Great Lawn" area could be mowed only once a year in the late summer before autumn festivals. This can help maintain the grassland habitat value for grassland species.

Another recommendation to reduce impact #1 is not to convert all the abandoned farm fields to lawn and maintain them in favor of grassland and/or early successional shrub stages as well.

During the site inspection on 12/9/99, town workers were mowing a path in area 3 (Figure 9) with a bobcat brush mower. If planned, this same machine can be used to manage vegetation with grassland wildlife in mind.

IMPACT #2

Location of lighted baseball field (Figure 9, Area 4) may have impact on wildlife use. The location of the proposed lighted baseball field may have a negative effect on wildlife use of adjacent wooded habitats.

RECOMMENDATION TO REDUCE IMPACT #2

Seek an alternative location for placement of a lighted baseball field in an area that is already suburbanized. Place unlighted fields in proposed location.

IMPACT #3

Removal of existing native vegetation and habitat.

RECOMMENDATION TO REDUCE IMPACT #3

Salvage existing native vegetation. Salvaging existing woody vegetation can be accomplished by digging and balling them for future planting in and around the property. Select plants can be dug during the dormant period (end of September through early April). Technical assistance is available from the Team biologist.

In addition to maintaining grassland habitat wherever practical and feasible, replanting areas with native trees, shrubs and wildflowers can help reduce negative impacts. Native plantings are more valuable to wildlife.

IMPACT #4

Loss of farmland (Figure 9, Areas 3 & 4) will occur if area is bulldozed and converted to ballfields. Although farmland such as tilled land or field crops has limited wildlife value, it is a habitat type in decline throughout most of Connecticut. Wildlife food sources associated with farming benefit some wildlife species such as deer, wild turkey, and mourning dove.

RECOMMENDATION TO REDUCE IMPACT #4

Maintain some of the farmland for future use or current use by leasing land to a farmer.

HABITAT MANAGEMENT AND PLANNING CONSIDERATIONS

The property should have a long term habitat management plan which includes plans to increase and maintain biodiversity. As properties are developed, natural areas are divided into smaller, isolated pieces. Land that is in public ownership can be managed for wildlife habitat for the long term. 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 as well as active recreation.

Controlling invasive non-native plants may become necessary and 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. The following is a partial list of non-native plants which **should not** be planted:

- **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 (*Ligustrum 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 of native trees, shrubs and wildflowers can enhance conditions for wildlife in the area. Diversifying the seasonal availability of food sources such as planting spring, summer, and fall food sources or winter persistent food sources is another way to enhance conditions for wildlife.

The following native plants can be used to diversify wildlife food and cover on 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*)
- Arrowhead viburnum (*Viburnum recognitum*)
- Common Elderberry (*Sambucas canadensis*)
- American Cranberry (*Viburnum trilobum*)
- Winterberry (*Ilex verticillata*)

- **Additional Native Plants** (not currently found on the property)
 - American Holly (*Ilex opaca*)
 - Bayberry (*Myrica pensylvanica*)
 - 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
Patchaug State Nursery
Box 23A, 190 Sheldon Road
Voluntown, CT 06384
Tel. 860-376-2513

OTHER RECOMMENDATIONS

INCREASE WOODED BUFFER

Additional wooded edge buffer may be necessary along wetlands to maintain water quality conditions and foraging habitat for amphibians. Currently, Area 2 (Figure 9) abuts the wetland boundary to the east. This field edge should be increased to at least 50 feet to allow more wooded buffer along the wetland line.

EDUCATIONAL VALUE OF TOWN-OWNED PROPERTY

Natural areas offer unique educational opportunities. This town-owned property has potential to be used for educational walks and natural science exploration by local schools. Nature trails and outdoor learning areas can be constructed throughout the various habitat types. A canoe launch site can be developed. Many of Connecticut schools are utilizing nearby or adjacent property in developing outdoor nature classrooms (Picone, personal observation).

INVASIVE NON-NATIVE PLANT MANAGEMENT

The management of invasive non-native plants may become increasingly necessary and should be addressed with the town open space maintainers. Several species of invasives are found on the property and timely removal or control is needed. The following plant species should be controlled as soon as possible: Japanese knotweed (*Polygonum cuspidatum*), Autumn olive (*Elaeagnus umbellata*), Privet (*Ligustrum spp.* - found along the river in riverine wetland area), and Asiatic bittersweet (*Celastrus scandens*).

WET MEADOW MANAGEMENT

The wet meadow/emergent area (#6 in the *Assessment and Master Plan for the Liebler Property* dated November 30, 1998, pg. 32) should be protected and maintained as such through appropriate mowing (during frozen conditions). These types of habitats are uniquely valuable to wildlife.

NESTBOX PLACEMENT

Placement of bluebird nesting boxes along field edges will benefit the Eastern bluebird as well as other cavity nesters such as tree swallows and house wrens. Further technical advice on placement and nestbox specifications is available upon request from the Team wildlife biologist.

DIVERSIFY PLANTINGS

Diversify plants in the reed canary grass wetland area. Plant list available upon request.

SUMMARY AND CONCLUSION

The manner in which the property's ground cover is managed on the property will dictate the impact to grassland wildlife species. Fields in Area 1, 2, 3 (see Figure 9) could be allowed to grow and be mowed or hayed once a year prior to community use. This periodic mowing/haying will maintain a grassland community and also benefit grassland wildlife species.

A greater wooded buffer is recommended for Area 2 (see Figure 9) along the northeast wetland border.

If fields are extensively developed and tightly manicured, it can be expected that nuisance wildlife species such as Canada geese and ring-billed gulls will increase in the immediate area. Grassland wildlife species such as meadowlarks are likely to decline on the property.

A balance needs to be struck between development of recreational fields and habitat conservation. Area 4 (Figure 9) is currently slated for the lighted baseball field. Intensive use such as lighted baseball fields need further review as to location (a location in an already urbanized setting would have less wildlife impact). An unlighted field would have less potential wildlife impact in this area.

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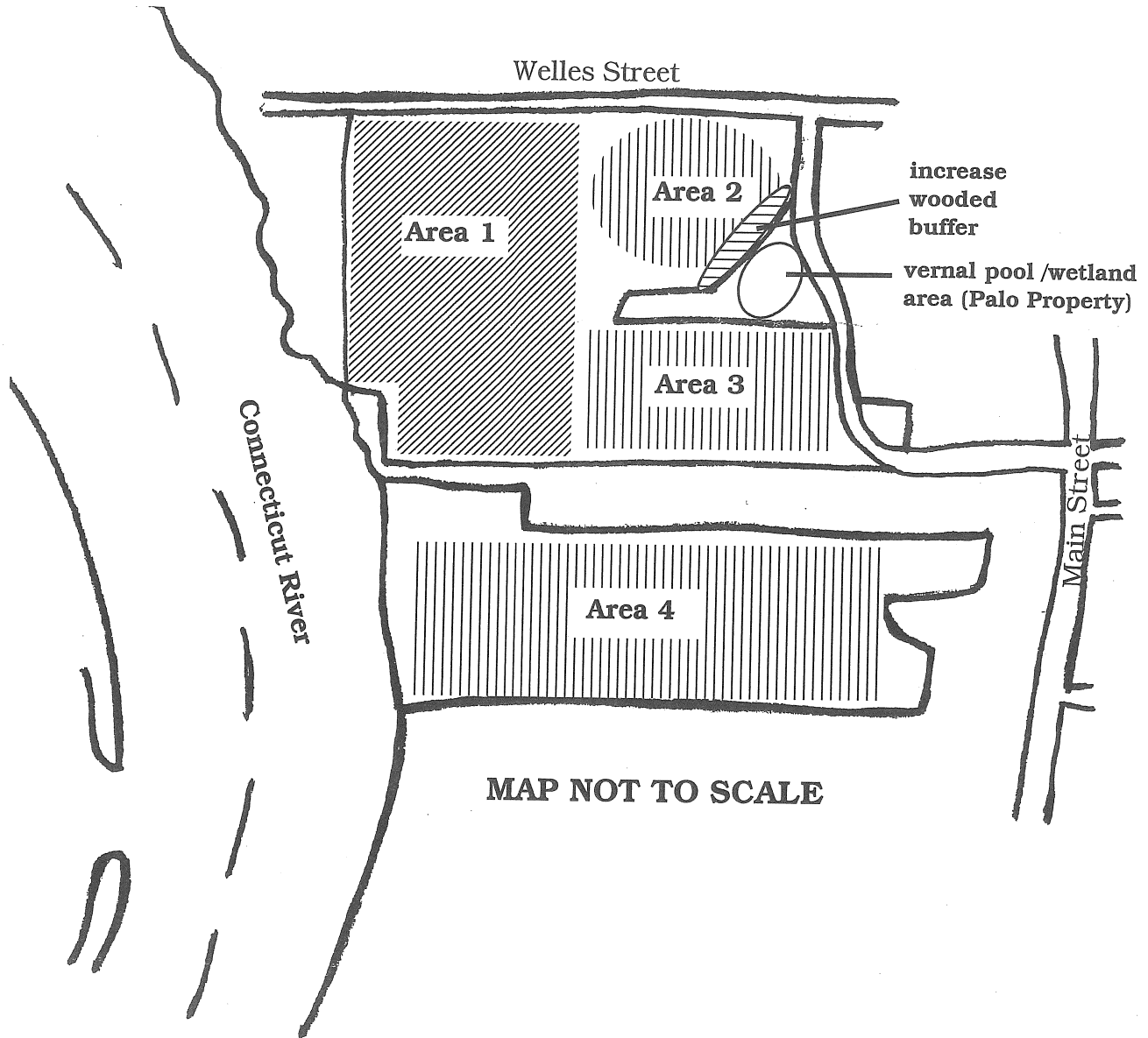
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Figure 9.

Wildlife Resources Section Map



ARCHAEOLOGICAL REVIEW

The Liebler Property occupies an extremely important archaeological area for the State of Connecticut. On the property itself the Office of State Archaeology (OSA) files indicate an area that is called the Liebler Prehistoric archaeological site #54-11, a late archaic to late woodland Native American village. It clearly indicates the high prehistoric archaeological sensitivity of the entire area. Numerous additional sites have been surveyed within the flood plain areas of the town of Glastonbury and further supports the study area's high sensitivity. In addition stone bulkheads and piers from Glastonbury's 19th Century dock listed with the OSA as site #54-102 have previously been identified within the project area.

In light of the extensive ground disturbance associated with the conversion of the agricultural fields to a recreational facility, a professional archaeological reconnaissance survey to identify, locate and evaluate all potential archaeological resources located within the project area should be a prerequisite planning requirement. If the Army Corps of Engineers or DEP Long Island Sound Program regulatory review is necessitated, archaeological studies are required pursuant to the National Historic Preservation Act and the Connecticut Environmental Policy Act. All archaeological studies should be undertaken in accordance with the *State Historic Preservations Environmental Review Primer* for Connecticut's archaeological resources.

In addition, the Liebler property is located in immediate proximity to the Glastonbury Historic District listed on the National Register of Historic Places. A portion of that nomination form may be found in Appendix C (one complete form has been given to the Community Development Office). The town recreation facilities should be designed to harmonize with the historic and architectural ambiance of this important area. In particular, landscape designs and planting schemes should be developed in order to minimize potential impacts from lighting, noise and traffic related changes to the Glastonbury Historic District.

development of the town park to have a minimal or no effect upon the archaeological resources in the area.

APPENDIX A

SOILS INFORMATION

For Appendix Information please contact the
ERT Office at (860)345-3977

ABOUT THE TEAM

The Eastern Connecticut Environmental Review Team (ERT) is a group of professionals in environmental fields drawn together from a variety of federal, state and regional agencies. Specialists on the Team include geologists, biologists, foresters, soil specialists, engineers and planners. The ERT operates with state funding under the supervision of the Eastern Connecticut Resource Conservation and Development (RC&D) Area — an 86 town region.

**The services of the Team are available as a public service
at no cost to Connecticut towns.**

PURPOSE OF THE TEAM

The Environmental Review Team is available to help towns and developers in the review of sites proposed for major land use activities. To date, the ERT has been involved in reviewing a wide range of projects including subdivisions, landfills, commercial and industrial developments, sand and gravel excavations, elderly housing, recreation/open space projects, watershed studies and resource inventories.

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 project site and highlighting opportunities and limitations for the proposed land use.

REQUESTING A REVIEW

Environmental reviews may be requested by the chief elected official of a municipality or the chairman of town commissions such as planning and zoning, conservation, inland wetlands, parks and recreation or economic development. Requests should be directed to the chairman of your local Soil and Water Conservation District and the ERT Coordinator. A request form should be completely filled out and should include the required materials. When this request is approved by the local Soil and Water Conservation District and the Eastern Connecticut RC&D Executive Council, the Team will undertake the review on a priority basis.

For additional information and request forms regarding the Environmental Review Team please contact the ERT Coordinator: 860-345-3977, Eastern Connecticut RC&D Area, P.O. Box 70, Haddam, Connecticut 06438.