WETLAND INVENTORY REPORT

For Manchester, New Hampshire

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Prepared by: Bobbie Jean Weiler
Wetland Scientist and Municipal Environmental Specialist

WEST ENVIRONMENTAL INC.

122 Mast Road, Suite 6, Lee, NH 03824
603-659-0416 ♦ Fax 603-659-0418 ♦ westenv@lobo-software.com

City of Manchester, New Hampshire
Wetlands Inventory

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INTRODUCTION

Purpose

These wetland evaluations were conducted for the purpose of compiling a comprehensive wetland inventory for the City of Manchester, New Hampshire. This information can be used for future planning, resource protection, and public education.

Initial criteria for selecting these forty eight wetlands was determined by the New Hampshire Code of Administrative Rules ("Rules") Wt 701.02, Identification of Wetlands for Consideration as Prime (Appendix A). This section of the "Rules" requires that the wetlands be two acres or greater. Wt 701.04, Selection of Designated Prime Wetlands states that wetlands being considered for prime also have the presence of hydric soils, hydrophytic vegetation and wetland hydrology. These wetlands must also have at least 50% hydric A soils with the remainder having hydric B soils. There are currently no designated prime wetlands in Manchester, New Hampshire. The State "Rules" base criteria were used should the City of Manchester chooses to designate some of these wetlands as prime.

West Environmental, Inc. evaluated forty eight wetlands and ranked them from low to high based on their function and value. These wetlands ranged in size from three to one hundred twenty acres. Many of these wetlands were high functioning and ecologically healthy systems. There were six wetlands with large Atlantic white cedar, (*Chamaecyparis thyoides)* stands. Some of these Cedar wetlands also had black gum, (*Nyssa sylvatica)* trees and rhododendron, (*Rhododendron maximum)* disbursed within the wetland. This is an uncommon species composition for the State of New Hampshire. Southern New Hampshire is the northernmost portion of the growing range for Atlantic white cedar. During the field evaluation process, a large (11 nests) blue heron, (*Ardea herodias)* rookery was discovered on the Northwest side of town in the Hackett Hill area. Some of the remaining wetlands evaluated had historic disturbances or current degradation. Most of these wetlands with degradation have potential for restoration.

Need

Historically, wetlands have been considered marginal land areas with low value. Loss of wetlands and their functions over time has made us realize their importance to the environment and their economic value; however, wetlands continue to be filled and impacted in New Hampshire. The need for extra protection for wetlands in southern New Hampshire has been clearly shown by the rapid development and wetland degradation that has occurred over the past fifteen years. The initial stage in protecting wetlands is the evaluation process. The evaluations can be further used for prime wetland designation, city regulation changes, public education and the planning process. Manchester, New Hampshire has experienced this growth and its impact to the wetlands; therefore, need has been established for further wetland protection

METHODOLOGY

Prior to the field inspection and evaluation of these wetland sites, several pre-field background research steps were taken. The first was to size the wetlands in Manchester. The 1990 National Wetlands Inventory map was used for this information. The dot-grid system was used initially to size the wetlands. Final wetland size will be measured and determined when the aerial photographs are mapped. The next step was to consult the Hillsborough County Soil Survey for soil type and drainage class. The United States Geological Survey ("USGS") maps were then consulted to find wetland topography and its association with any streams or rivers. The City of Manchester watershed boundaries map was then consulted to determine the watershed drainage system the wetland was located in.

The New Hampshire Code of Administrative Rules (Appendix A) was then reviewed, criteria checked and a field evaluation form created that met the requirements of Wt 701.03, Selection of Evaluation Criteria. Seven functions and three values were evaluated; therefore, meeting the requirements of Wt 701.03. These functions were: groundwater recharge/discharge, flood flow alteration, sediment/toxicant/pathogen retention, nutrient removal/retention transformation, production export, sediment/shoreline stabilization and wildlife habitat. The values evaluated were: recreational value, uniqueness/heritage value, and educational/scientific value. The definition of each of these functions and values can be found in Appendix B.

An aerial photograph interpretation was then done using aerial photography taken April 29, 2000, and purchased from James W. Sewall Company of Old Town Maine. This photography is at a scale of 1"=660' (scale is important to know for degree of clarity of photograph). Janis Stone performed the aerial photograph interpretations and provided supporting reports (Appendix G). The interpretation included wetland boundaries, hydrologic connections and Cowardin wetland classification. This information was then verified in the field.

The field evaluation (Appendix C) included confirmation of wetland boundaries, hydrologic connections and presence of hydric A and B soils. The soils were checked by observation and from soil cores taken with an auger. Vegetation type, its density and diversity were observed in the field. Any signs of wildlife was also made note of. The field evaluation form was filled out after walking the site and taking photographs.

Each wetland was ranked based on the evaluation. The three ranking categories include high, medium and low. This evaluation data was put into a summary table and this report was written to summarize the findings and to make recommendations on how to use this information. Other recommendations on potential projects pertaining to natural resource protection have been made in this report at the request of the Conservation Commission.

Report Setup

Due to the large volume of data for these forty-eight wetlands, it seemed most prudent to summarize the wetland evaluations in a table format to make the report friendlier for its users. The table is broken into categories of wetland identification, classification, ranking, size and important features. The appendices contain all the information that supports the summary table. This includes the Department of Environmental Services Wetlands Bureau's "Rules" regarding prime wetland designation, definitions of terms used in the evaluation and summary table, a packet for each wetland, which includes the evaluation form, the wetland classification, a copy of the aerial photograph and photographs for each site (Appendix C). This information is then followed with the references used (Appendix D), Natural Resources Conservation Service information (Appendix E), a copy of the Natural Heritage Map and species listing for Manchester (Appendix F).

FINDINGS

Forty-eight wetlands were evaluated pursuant to the Chapter Wt 700 Prime Wetlands regulations. The results are based on background data and field evaluation. The wetland evaluation results are summarized in the following table:

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
1	PFO1E PUBHx PSSIE PEM1Ed	High	3	▪ Complex of smaller wetlands ▪ Lack of 50% Hydric A soils in Southern Portion ▪ Some ditching ▪ Potential restoration (see evaluation)
2	LIUBHh PFO1E PEMB	High*	50	▪ Pine Island Pond ▪ Ponded area and associated wetlands ▪ Hydrologic connection to Cohas Brook ▪ Wildlife habitat & corridor ▪ Recreation-Park ▪ Urban quality of life ▪ Flood flow alteration ▪ Water quality ▪ Potential restoration (North side/buffer) ▪ *Lacusterine portion may not qualify
3	PSSIE PFO1E PEM1C R3UBH	High	22	▪ Lower portion of Cohas Brook & associated wetlands ▪ Connection to Pine Island Pond ▪ Excellent wildlife habitat ▪ Diverse system ▪ NHI/rare plant community ▪ Flood flow alteration

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
3 (Cont.)				▪ Water quality and treatment ▪ Potential restoration (see evaluation)
4	PUBF PFO1E PFO1E	High	120	▪ Large Diverse System ▪ Largest system evaluated ▪ Rare reptile and plant community ▪ Waterfowl Habitat ▪ Part of Cohas Brook System ▪ Important flood flow function ▪ Long wildlife corridor ▪ Excellent wildlife habitat
5	PFO4/1E PSS1E PEM1E	High	20	▪ NHI/rare plant community ▪ Hydrologic connection to Crystal Lake ▪ Hydrologic connection to Cohas Brook ▪ Recreation ▪ Urban quality of life
6	L1UBH PSS1E PEM1E	High	20	▪ Crystal Lake ▪ Recreation/camp ▪ Education/camp ▪ Water quality ▪ Excellent wildlife habitat/diverse ▪ Wildlife corridor ▪ Potential restoration (see evaluation) ▪ Lacusterine portion may not qualify
7	PSS1/FO4E PUBF	High*	3	▪ Confirmed turtle habitat ▪ Potential vernal pool ▪ Waterfowl habitat ▪ Potential restoration (see evaluation) ▪ *Need to check digitized size to qualify
8	L1UBH PEM1E/FO4E	High	9	▪ Long Pond ▪ Hydrologic connection to #10 ▪ Recreation/camp ▪ Education/camp ▪ Cohas Brook watershed/water quality ▪ Wildlife Corridor ▪ Potential restoration (see evaluation)
9	PFO1E PSS1Eb PUBFb PEM1/FO5Fb	High	12	▪ Cohas Watershed ▪ Diverse system ▪ Wildlife Habitat ▪ Education/near camp ▪ Beaver influenced hydrology
10	PFO4/1E	Low	3	▪ Small degraded system ▪ Does not meet 50% Hydric A soils ▪ Education/near camp

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
10 (Cont.)				▪ Urban quality of life ▪ Potential restoration (see evaluation) ▪ May be protected under DOT bank mitigation/confirmation needed
11	PFO1E PEM1Ed PSS1E	Medium	7	▪ Cohas Brook Watershed Drainage ▪ Hydrologically connected to #10 ▪ Thick vegetation ▪ Wildlife habitat ▪ Production export ▪ Ditching, possible tiling-impacted hydrology
12	PFO1C PSS1E	Med./High*	8	▪ *Degradation present (erosion from pools, tire dump) ▪ Cohas Brook drainage basin ▪ Nutrient removal ▪ Urban quality of life ▪ Flood flow ▪ Potential restoration (see evaluation)
13	PFO1C R2UBH PEM1E PSS1E	High	12	▪ Cohas Brook & associated wetland ▪ Aquifer recharge potential ▪ Abuts high quality floodplain ▪ Intact buffer in most areas ▪ Nutrient removal ▪ Many berry producing shrubs ▪ Wildlife habitat & corridor ▪ NHI/rare reptile habitat ▪ Some degradation ▪ Potential restoration (see evaluation)
14	PEM1E PUBF PEM1F	Low	10	▪ Surrounded by Highways 93 &293 ▪ Cattail dominant ▪ Impacted hydrology
15	PSS1/3B PEM1E PSS3Ba	High	4	▪ Broadleaf evergreens present ▪ Hydrologic restrictions ▪ Degradation ▪ Berry and mast production ▪ NHI/rare reptile habitat ▪ Potential restoration (see evaluation)
16	R2UBHx PSS1E PFO1/SS1E PEM1F	High	3	▪ Connected to Cohas Brook ▪ Diverse system ▪ Wildlife habitat & corridor ▪ Hydrologic connection to #13 ▪ Potential restoration (see evaluation)

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
17	PSS1E PFO1E	High*	5	▪ Aquifer recharge potential ▪ *Wetlands associated with Massabesic Lake/City water supply ▪ *Water quality ▪ *NHI/rare plant community ▪ Diverse system ▪ Buffer to Massabesic ▪ Transition zone to Lake
18	PEM1F/E PUBHh PSS1E PFO5Fb	High*	10	▪ *NHI/rare plant community ▪ *Heron feeding site (confirmed) ▪ *Associated with Hogg Brook ▪ *Water quality ▪ Urban quality of life
19	PEM1Fd PUBF PUBGx PSS1E	High*	15	▪ *NHI/rare bird & plant community ▪ *Headwaters of Hogg Brook ▪ Aquifer recharge potential ▪ Hydrologic restrictions ▪ Impacted by industry
20	PSS1/EME PFO1E PUBGh	High*	15	▪ *NH/rare bird & reptile habitat ▪ Urban quality of life ▪ Potential restoration (see evaluation)
21	PEM1Ed PSS1E PFO1E PEM1Fb	High*	8	▪ *Confirmed turtle habitat ▪ Recreation trail ▪ Large mammal migration culvert ▪ *Diverse system ▪ Water quality ▪ *NHI/rare plant community ▪ Urban quality of life ▪ Some degradation (power line, road)
22	PEM1E PSS1E PUBFx	High*	6	▪ Potential aquifer discharge ▪ Degradation present, ditched ▪ Snags (dead trees) present ▪ *NHI/rare plant community ▪ Potential restoration (see evaluation)
23	PUBH PFO1E PEM1/SS1E	High*	10	▪ *Stevens Pond & associated wetland ▪ *Diverse system ▪ *NHI/rare plant community ▪ Hydrologic connection to #24 ▪ Water quality ▪ Recreation ▪ Urban quality of life

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
23 (Cont.)				▪ Potential restoration (see evaluation)
24	PFO1Ed PUBG PSS1/FO5E PEM1Eh	High*	5	▪ *Hydrologic connection Stevens Pond ▪ *NHI/rare plant community ▪ *Diverse system ▪ Urban quality of life
25	PEM/SSS1E PUB/PFO	High	11	▪ NHI/rare birds & reptiles ▪ Hydrologically connected to Massabesic ▪ Hydrologically connected to Bald Brook ▪ Parking at Youngsville Park ▪ Some degradation (power line)
26	PFO1E PEM1/SS1E	Medium	4	▪ NHI/rare birds & reptiles ▪ Potential restoration (see evaluation)
27	PUB/FO5Fb PSS1/Fb PEM1/FO1E	High*	3	▪ *if it can meet size in Manchester ▪ Diverse system ▪ Water quality ▪ Flood flow ▪ Degradation (road/shoreline) ▪ High potential restoration site (see evaluation & photolog) ▪ Restricted hydrology ▪ NHI/rare bird & reptile habitat
28	PUBH PEM1E PSS1E	High	8	▪ Dorrs Pond ▪ Aquifer recharge potential ▪ Wildlife habitat ▪ Water quality ▪ Nutrient removal ▪ Education/near Livingston Park ▪ Restoration potential (see evaluation)
29	PFO1/SS1E	High	10	▪ Hydrologic connection to Merrimack River ▪ NHI/rare plant community ▪ Wildlife habitat and corridor ▪ Water quality ▪ Adjacent Intervale Country Club ▪ May receive runoff from course ▪ Potential restoration (see evaluation)
30	PUBFb PFO1E PFO4/1E PEM1Eb	High	10	▪ Associated with Milestone Brook ▪ Recreation/trails present ▪ Diverse system ▪ Waterfowl habitat ▪ Wildlife habitat & corridor ▪ Does receive some runoff from Hackett Hill Parking Lot

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
30 (Cont.)				▪ NHI/rare plant community ▪ Nature Conservancy Protected ▪ Potential restoration (see evaluation)
31	PFO1/4E PEM1Fb	High	12	▪ NHI/rare plant community ▪ Blue Heron Rookery (confirmed) ▪ Wildlife habitat & corridor ▪ Recreation (bird watching) ▪ Very high function system ▪ Intact buffer
32	PFO1/4E	High	6	▪ NHI/rare plant community(Black Gum, Cedar) ▪ High production export ▪ Berry and Mast producing vegetation ▪ Wildlife habitat and corridor ▪ Recreation (trails present) ▪ Education ▪ Intact buffer ▪ May not meet 50% Hydric A soils ▪ Development nearby
33	PFO4B PFO1E PFO3/4	High	3	▪ NHI/rare plant community ▪ Mature Cedars and Black gum stands ▪ Rhododendrons ▪ High production export ▪ Berry and Mast producing vegetation ▪ Development nearby ▪ Potential vernal pool under power line
34	PFO4/1/3 PEM1/SS1B	High	15	▪ NHI/rare plant community ▪ Rhododendron (*Rhododendron maximum*) S2 classified/imperiled community ▪ Road/electrical infrastructure present (creates high development potential)
35/36	PFO4Ba PFO4B PSS4Ba	High*	6	▪ *NHI/rare plant community ▪ Wildlife habitat & corridor ▪ Thick understory of berry producing shrubs ▪ Water seep (important winter water) ▪ Road and electrical infrastructure present (creates high development potential) ▪ Berry producing shrubs ▪ Snags present ▪ Intact buffer

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
35/36 (Cont.)				▪ 35 & 36 are the same wetland
37	PUBHx PUBGh PSS1E PSS1Fh PFO1E PFO1/4E PEM1Fh	High*	20	▪ *This wetland is CRITICAL for water quality treatment ▪ *Hydrologic connection with #38 (Black Brook) ▪ Downstream from capped landfill ▪ Toxicant Retention ▪ Water quality(connects to Black Brook and Black Brook to Merrimack River) ▪ Diverse system (despite degradation) ▪ Excellent Restoration/enhancement area for water quality treatment (potential) between wetland 37 & 38. See classification sheet for wetland 37 ▪ Diverse system, unsure of water quality due to landfill, potential for phytoremediation ▪ Waterfowl habitat ▪ NHI/rare bird and plant communities
38	PSS1Eh PUBGh PEM1Eh PUBFh	High*	5	▪ Maxwell Pond ▪ Former gravel pit to water table ▪ Potential aquifer recharge site ▪ *Diverse system ▪ *Flows into Merrimack River ▪ Connected to Black Brook ▪ *High quality flood plain (in areas)
39	R3UBh L1UBHh	Low	7	▪ Riverine, does not qualify for Prime ▪ Connects with Piscataquog River ▪ Does have some restoration/mitigation potential (see note on evaluation & photolog)
40	Forested (formerly)	Low	0	▪ Wetland has been filled is now Valley West apartment or condo complex
41	PFO1Ed PEM1/SS1Ed PEMEd PSS1/Ed	High*	3	▪ *NHI/rare plant community ▪ *Rare mussel community ▪ *Connected to Piscataquog River ▪ Surrounds Piscataquog River Park ▪ Educational potential ▪ Recreation potential ▪ Waterfowl habitat ▪ Wildlife habitat & corridor ▪ Some degradation (tire dumping)

Wetland ID #	Wetland Classification	Wetland Candidate Ranking	Size (Ac)	Important Features
41 (Cont.)				▪ Restoration potential
42	PEM1F PUB1/EM1F PFO1E	High*	4	▪ Maqueston Pond ▪ *Hydrologically connected to Merrimack River ▪ *This wetland is critical for water quality treatment ▪ Restoration potential (see notes on evaluation)
43	PUBH PSS1E PFO1E	Medium*	8	▪ Nutt Pond and associated wetland ▪ NHI/rare bird habitat ▪ Near Precourt Park (parking) ▪ Education potential ▪ Recreation (bird watching) ▪ Waterfowl habitat ▪ *Water treatment ▪ *Urban quality of life ▪ Moderate degradation ▪ Potential restoration site
44	PFO1E	Low	4	▪ Does not meet 50%VPD soil requirement ▪ NHI/rare reptile habitat
45	PFO1E	Low	2	▪ Does not meet 50% VPD soil requirement or size requirement
46	PFO1Cd	Medium*	5	▪ Red Rock Pond & Huse Pond ▪ *NHI/rare reptile habitat ▪ Ditched system ▪ Altered Hydrology ▪ Recreation (trail, birding) ▪ Songbird habitat ▪ *Urban quality
47	PEM1E PSS1/EM1E PFO1E	Low	4	▪ Wet meadow Cattail swamp ▪ Low functioning system ▪ Potential restoration site
48	PFO1E PFO1B	Med/High	3	▪ *NHI/rare reptile habitat ▪ *Urban quality of life ▪ *Water quality treatment ▪ Severe hydrologic restriction ▪ Potential restoration site

DISCUSSION AND RECOMMENDATIONS

As shown in the table above, there are several exemplary wetlands within Manchester's boundaries. These wetlands include 30, 31, 32, 33, 34, 35 and 36 and are located in the northwest portion of Manchester (Hackett Hill area). These wetland communities all have Atlantic white cedar. Some of the Atlantic white cedars in these wetlands form large mature stands with black gum, mountain laurel and/or rhododendron interspersed. Wetland 31 also has a large blue heron rookery. The Nature Conservancy (TNC) does provide some protection to the wetland behind the Hackett Hill University of New Hampshire buildings (Wetland 30). If exact protection by TNC is not known by the Conservation Commission, this should be determined.

Another high function system is Cohas Brook and associated Hogg Brook and Pine Island Pond. Each of these systems is a valuable multi-functioning system. Collectively they all support better water quality of the water that ultimately flows into the Merrimack River. These systems are diverse and support rare plant, bird and reptile communities (see Appendix F).

The wetlands on the west side of Lake Massabesic all merit additional protection to preserve water quality of runoff and flow going into this drinking water source.

Each of these wetlands deserves immediate higher protection status. ***Prime wetland designation*** is what West Environmental Inc., strongly recommends at this time. This status can be attained through the Department of Environmental Services Wetlands Bureau. To do this, the Conservation Commission would have to review the wetland inventory and determine which wetlands they would like to designate as prime. An environmental consultant would then confirm that each wetland meets the State requirements (most of this has been done). Specifically at this point field work would involve closer examination of the soils to be certain they meet the 50% hydric A requirement and confirmation there are no changes since the 2000 field inspections and evaluation. Based on further criteria then set by the Conservation Commission (e.g. only rare community wetlands or wetlands that improve water quality), the consultant would make recommendations as to which wetlands meet the Conservation's criteria as well as the State's "Rules". At this point, the Conservation Commission may choose to do a site walk of the final candidates. Prime wetland candidate boundaries would need to be digitized from the aerial photos and reproduces on City Tax Maps. A report would be written by the environmental consultant with supporting maps. This information would be presented to Manchester's citizens through a public hearing. The public hearing process determined by City and State regulations. After all City requirements are made, the zoning amendments would then go to public vote (this may vary depending on Manchester regulations and government type). Once the citizens approve, the report, maps and any supporting data go to the Wetlands Bureau with a request for prime wetland status. The Wetlands Bureau then determines if the wetlands qualify for prime and the designation is complete and becomes a part of the City Regulations and the mapping supports those regulations.

It should be noted that prime wetland designation does not guarantee the wetlands will not be impacted; however, prime designation does require the Wetlands Bureau to examine applications for work in or adjacent to prime wetlands with closer scrutiny.

Because the wetlands in the northwest part of the City are exemplary, ***protection through conservation easement*** or protection through the Nature Conservancy or another like-minded conservation group should be actively pursued. This would be a large and lengthy (time-wise) endeavor; however, this avenue would provide perpetuity in protection. If this option is chosen, it is recommended that prime designation still be pursued. The reason being; State prime designation "Rules" require that work *near or adjacent to* prime wetlands go through the same permitting process and scrutiny as a prime wetland; therefore, providing protection *near or adjacent to* the prime wetland. If the City does go ahead with prime wetland status, the zoning regulations have to be amended to include special setback and protection criteria for prime wetlands. The designation process can be phased over time or all the desired prime wetlands candidates can be applied for in a one time process. Typically budget and political atmosphere determines if phasing is chosen.

West Environmental, Inc. also recommends ***reviewing the City subdivision regulations regarding wetlands and other natural resources.*** Well written subdivision regulations that pertain to wetlands and other natural resources, can help prevent the degradation of these resources during the construction process as well as for the life time of the project being constructed. Some examples of areas that could be rewritten typically include aquifer protection, erosion control measures, regular monitoring of erosion controls, and water quality protection. The subdivision regulations should also require Environmental Impact Assessment and *detailed and specific* criteria that would trigger an assessment. The criteria would be based on the zoning regulations and the natural resources in the City. Project size or acreage is not enough to determine if an assessment is needed. West Environmental, Inc. can provide more detailed specifics and examples if desired.

Other natural resources to inventory and protect include vernal pools and wildlife habitat. Vernal pools are obligate ecosystems for some species to reproduce. Knowing where vernal pools are located and using better land management around them can help preserve their function and integrity. For example, if a vernal pool is located near a road, that stretch of road could be a "no/low salt zone". A significant wildlife habitat inventory based on "Identifying and Protecting New Hampshire's Significant Wildlife Habitat, A Guide for Towns and Conservation Groups," NH Fish and Game Department, would be a step in the right direction in terms of being able to protect significant habitats (this would include vernal pools). Considering that Manchester has so many rare natural heritage rare communities and species habitat areas, this too is worth pursuing. The existing wetlands inventory could be used in one component of a habitat study.

Data from this inventory can also be used to determine potential wetland restoration sites as well as potential mitigation sites. Many of these ***potential restoration***

projects could be done rather inexpensively and with relative ease. Some of the restoration could even be done on a volunteer basis, such as litter clean up and removal of tires from wetlands, unclogging of culverts to restore hydrology, etc. Some recommended restoration would include wetland and stream buffer plantings. This again can be done relatively inexpensively if volunteer labor is utilized. Shrubs and plants can sometimes be obtained from the county cooperative extension service for less cost than from a nursery. There are also landowner grant programs for improving wildlife habitat through the Natural Resources Conservation Service (see Appendix E).

The potential restoration sites can also be targeted for ***mitigation*** for projects that will impact a natural resource but do not have space on site to mitigate. For example: a subdivision of thirty houses is proposed and road installation will impact 3,000 square feet of wetland. There is no place within the subdivision to mitigate so as an alternative the developer agrees to fund the restoration of one of the city's degraded wetlands. Specifics would then be worked out.

Lastly, the ***aerial photographs*** used for this inventory are quite recent (year 2000) and can be used for other resource inventories, and determination of wetland violations. At the end of this project the aerial photographs will be turned over to the Conservation Commission. These were an expensive item (approximately $2,000) and are a great resource for the Conservation Commission and Planning Department. West Environmental, Inc. recommends keeping tight control and track of this resource.

SUMMARY

Manchester, as the most populated city in the state, is fortunate to have a diverse collection of wetland systems. These are resources all worth protecting through various means. With just the recommendations above, there appear to be many options. It is recommended that careful thought, the Conservation's vision and the public's desire all be taken into account when determining which alternatives to pursue. West Environmental, Inc. has provided a thorough inventory and recommendations and hope this is helpful to the Conservation Commission.

West Environmental, Inc. commends the City of Manchester Conservation Commission for having the insight to find out what their natural resources are. This is the beginning of being able to better protect them.

Questions regarding the evaluations, ecological integrity of each wetland, or any recommendation can be addressed to Mark West or Bobbie Jean Weiler of West Environmental.

Appendix A

Chapter Wt 700 Prime Wetlands

Prepared by:

WEST ENVIRONMENTAL

Nontidal Wetlands in New Hampshire (1991), or Method for the Evaluation and Inventory of Vegetated Tidal Marshes in New Hampshire (Coastal Method) (1993). If an alternative method is used the cited reference shall be identified and the reasons for using the alternative method shall be explained.

Source. #1825, eff 10-5-81; ss by #2512, eff 10-19-83; ss by #2924, eff 12-11-84, EXPIRED 12-11-90

New. #5028, eff 12-20-90; ss by #5486, eff 10-14-92; ss by #6498-B, eff 4-23-97

Wt 701.03 Selection of Evaluation Criteria.

(a) The municipality shall utilize ten of the following fourteen wetlands functions in their evaluation of the identified wetlands in designating the wetlands as prime:

(1) Ecological integrity;

(2) Wildlife habitat;

(3) Finfish habitat;

(4) Educational potential;

(5) Visual/aesthetic quality;

(6) Water based recreation;

(7) Flood control potential;

(8) Ground water use potential;

(9) Sediment trapping;

(10) Nutrient attenuation;

(11) Shoreline anchoring and dissipation of erosive forces;

(12) Urban quality of life potential;

(13) Historical site potential; and

(14) Noteworthiness.

(b) Up to three additional functions may be added if the municipality provides justification for these additions.

Source. #5486, eff 10-14-92; ss by #6498-B, eff 4-23-97

Wt 606.17 Part Taking Precedence. Wt 606 shall supersede Wt 402 when projects are located in coastal wetlands. Projects exceeding or violating these criteria shall not be classified as minimum impact.

Source. #2923, eff 12-10-84, EXPIRED 12-10-90

New. #5028, eff 12-20-90; EXPIRED 12-20-96

New. #6429, INTERIM, eff 1-18-97, EXPIRES: 5-18-97; ss by #6498-B, eff 4-23-97

PART Wt 607 - REPEALED

Source. #2923, eff 12-10-84, EXPIRED 12-10-90

New. #5028, eff 12-20-90; rpld by #5185, eff 7-23-91 (See Revision Note at chapter heading of Wt 600)

CHAPTER Wt 700 PRIME WETLANDS

PART Wt 701 CRITERIA AND EVALUATION

Wt 701.01 Purpose. The purpose of these rules is to provide criteria to municipalities for use to designate wetlands of significant value that are worthy of extra protection because of their uniqueness, fragility and/or unspoiled character pursuant to RSA 482-A:15.

Source. #2924, eff 12-11-84, EXPIRED 12-11-90

New. #5028, eff 12-20-90; ss by #5486, eff 10-14-92; ss by #6498-B, eff 4-23-97

Wt 701.02 Identification of Wetlands for Consideration as Prime.

(a) All wetlands greater than 2.0 acres in size in the municipality shall be identified. Wetlands smaller than 2.0 acres may be identified and included in the functional ranking.

(b) After wetlands have been identified, the municipality may set threshold conditions for one or more measurable functions, such as size. A wetland that does not meet or exceed the threshold conditions shall be dropped from further consideration unless it can be shown to support a rare species, provide critical wildlife habitat, or have known historical significance.

(c) Identified wetlands that have not been eliminated by threshold conditions shall be ranked for each of the adopted functional values. Evaluation shall be done using the Method for Comparative Evaluation of

Wt 701.04 Selection of Designated Prime Wetlands.

(a) Selection of prime wetlands shall be based on the ranking of relative functional values described in Wt 701.02 and Wt 701.03 except as provided in (b) below.

(b) Prime wetlands designated by the municipality pursuant to RSA 482-A:15, II prior to July 1, 1993 may be based on the wetlands rules that were in effect on January 1, 1992 provided field evaluation of wetlands was initiated prior to January 1, 1992.

(c) In addition to their relative ranking, wetlands designated as prime shall meet the following minimum criteria:

(1) The wetlands shall have the presence of hydric soils, hydrophytic vegetation, and wetlands hydrology; and

(2) At least 50% of the prime wetland shall have hydric A soils and the remaining soils shall be hydric B soils.

(d) Designated prime wetlands boundaries shall be walked and verified by the municipality or its authorized agent where landowner permission can be obtained.

Source. #5486, eff 10-14-92; ss by #6498-B, eff 4-23-97

PART Wt 702 SUBMISSION

Wt 702.01 Report. The municipality, or its authorized agent, shall prepare a report which shall correlate each prime wetland by name or number to a map or maps, describe the methodology used, and present the specific evaluation data for each wetland.

Source. #1825, eff 10-5-81; ss by #2512, eff 10-19-83; ss by #2924, eff 12-11-84, EXPIRED 12-11-90

New. #5028, eff 12-20-90; ss by #5486, eff 10-14-92; ss by #6498-B, eff 4-23-97

Wt 702.02 Map Format.

(a) The map scale shall be such that 1" equals 1000 feet or less.

(b) The map or maps shall delineate each prime wetland with an exterior outline defined to an accuracy of +/- 100 feet in location and property boundaries shall be shown.

(c) The most accurate maps available to a municipality shall be utilized.

(d) Map sheets submitted to the department shall not exceed a size of 28 inches by 40 inches and shall have a one-inch border and title block with scale and legend.

(e) State coordinate reference points shall be marked on the map.

Appendix B

Definitions

Prepared by:

WEST ENVIRONMENTAL

Definitions
of Terms Used in the Manchester, New Hampshire
Wetland Inventory Summary Table

Buffer/Riparian Buffer: An area of trees and/or other vegetation in areas adjoining upland and wetlands/surface waters which intercepts surface runoff, wastewater, subsurface flow and deeper groundwater flows from upland sources. These buffers remove or buffer the effects of upland associated inputs of nutrients, sediment, organic matter, pesticides or other pollutants prior to entry into surface waters and groundwater recharge areas.

Beaver Influence: Hydrology that is historically or currently affected/changed by beaver activity.

Corridor: A forested or vegetated area that provides cover for animals to migrate from one area to another with moderate safety and comfort. A corridor typically links two large tracts of land or suitable wildlife habitat.

Deep marsh: This class applies to wetlands with an average water depth between six inches and three feet during the growing season.

Discharge Site: An area where it appears to show water discharging from a groundwater aquifer. Discharge sites serve as an important winter source of water to wildlife.

Educational/Scientific Value: This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

Emergent Wetland: A wetland that has emergent plants (plants that protrude for the water/wetland) as primary source of vegetation. Some examples of these types of vegetation are cattails, rushes, and sedges.

Floodflow Alteration: This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for polonged periods following precipitation events.

Forested Wetland: A wetland that has trees (taller than 20 feet) as its most dominant vegetation. Forested wetlands are typically seasonally flooded with the water table at or near the ground surface during much of the year.

Functions: are self-sustaining properties of a wetland ecosystem that exist in the absence of society and result from both living and non-living components of a specific wetland. Functions relate to the ecological significance of wetland properties without regard to subjective human values.

Groundwater Recharge/Discharge: Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge relates to the potential for the wetland to serve as an area where ground water can be discharged to the surface.

Harmonious with Larger Landscape: This term takes into account the relationship of the wetland relative to surrounding land, land under conservation and wetlands. For example: a proposed prime wetland that has moderate value and function, but when looked at from a WHOLE landscape perspective, the value of the wetland increases due to its surroundings, perhaps creating a greenbelt.

Headwaters: The drainage area that is the beginning point of a stream.

Mast: Seed and nut producing trees, shrubs or plants.

Nutrient Removal/Retention/Transforamtion: This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries. The removal or transformation process occurs in the vegetated buffer, soils and water column.

Production Export: This function relates to the effectiveness of the wetland to produce food or usuable products for human, or other living organisms.

Rare Plant Community: A rare plant community is one that has been identified by New Hampshire Natural Heritage. Information on the exact location of the site and the particular species is not available to the public. So these are approximate site locations.

Pit and Mound Topography: Soil that shows small pockets and hills. The importance of pit and mound topography is the potential for diverse vegetation due to wet and dry areas.

Recharge Site: An area in the landscape that appears to be receiving water that flows into the ground and eventually feeds into an aquifer; thus, replenishing the supply of water in the aquifer.

Recreation (consumptive and non-consumptive): This value considers the effectiveness of thewetland and associated watercourses to provide recreational opportunities such as canoeings, boating, fishing, hunting, birding, walking and other active or passive recreational activities.

Riparian Buffer: This is the vegetated buffer along a stream, body of water or wetland that performs nutrient uptake, sediment trapping and provides shade.

Riverine Wetland System: A wetland consists of a stream, or river that has associated wetlands or floodplain along its edges.

Scrub Shrub: A wetland that has shrubs/saplings (less than 20 feet in height) as its predominant vegetation (e.g. highbush blueberry, alder, winterberry).

Sediment/Toxicant/Pathogen Retention: This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens.

Shallow Marsh: Having an average water depth less than six inches during the growing season. This community is usually dominated by robust or narrow-leaved emergents.

Shoreline Stablilzation: This function relates to the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

Snag: A dead tree that provides nesting or food source to birds or small mammals.

Uniqueness/Heritage: This value relates to the effectiveness of the wetland or its associated waterbodies to produce certain special values such as

archeological sites, unusual aesthetic quality, historical events unique or rare plants, animals or geologic features.

Urban Quality of Life: This term identifies a wetland that may otherwise not have received a moderate or high rating; however, due to its position in an urban area it receives higher status because of the element of nature it brings into the area.

Values: Values are benefits that derive from the characteristics associated with a wetland. Value is based on human judgement of worth, merit, or quality.

Wet Meadow: A wet meadow has little standing water but still is dominated by herbaceous plants (sedges, rushes, iris) and is considered a marsh.

Wildlife Habitat: This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species are considered. This function also considers endangered species habitat and presence of endangered or rare species (via Natural Heritage Inventory).

Appendix C

Wetland Evaluations, Field Notes and Supporting Data

Prepared by:

WEST ENVIRONMENTAL

WETLAND 1

Figure 1: Wetland 1. This photograph shows the Palustrine scrub shrub in foreground with Palustrine forested wetland in the background. The red shrub is winterberry, a favored winter food for many birds and small mammals.

Figure 2: Wetland 1. The background of this picture shows the Palustrine unconsolidated bottom portion of this wetland. Due to the dry year, this area had no standing water in it at the time of the photograph.

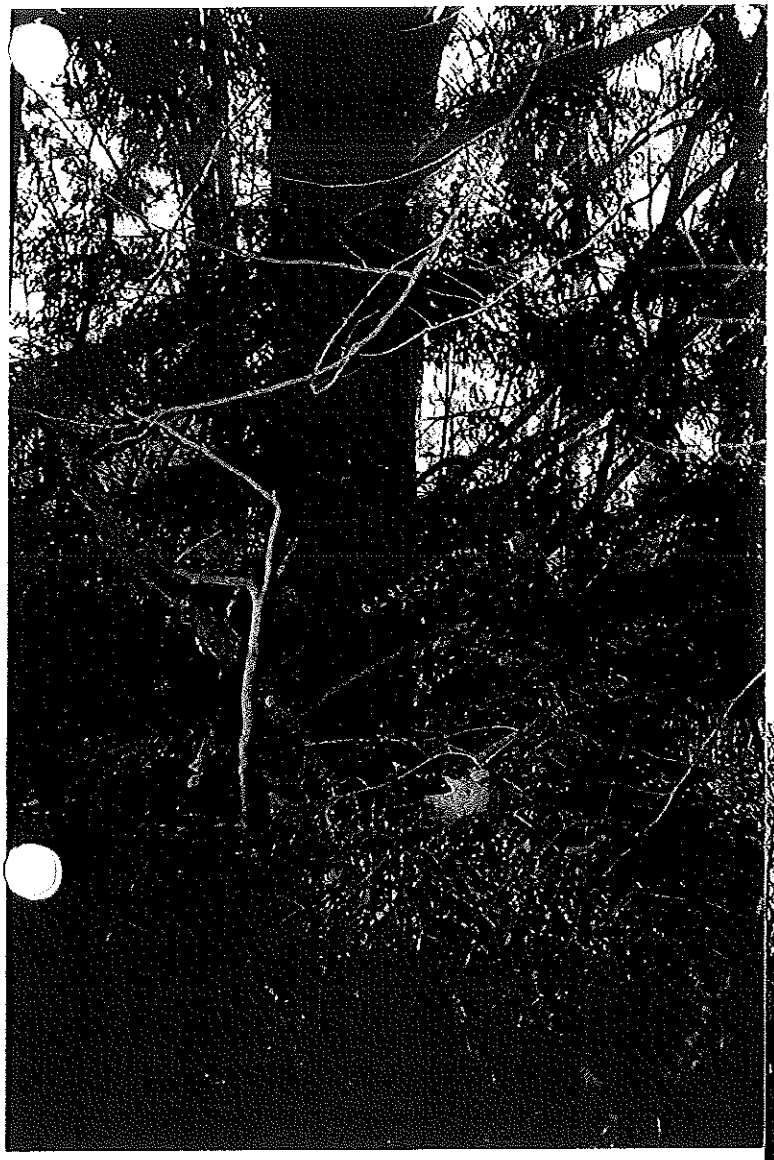


Figure 3: Wetland 1. The forested section of this wetland had a small thick stand of mature Hemlocks. The thick understory affords a year round source of cover, overwintering and foodsource for many mammals birds and moths (larval food plant).

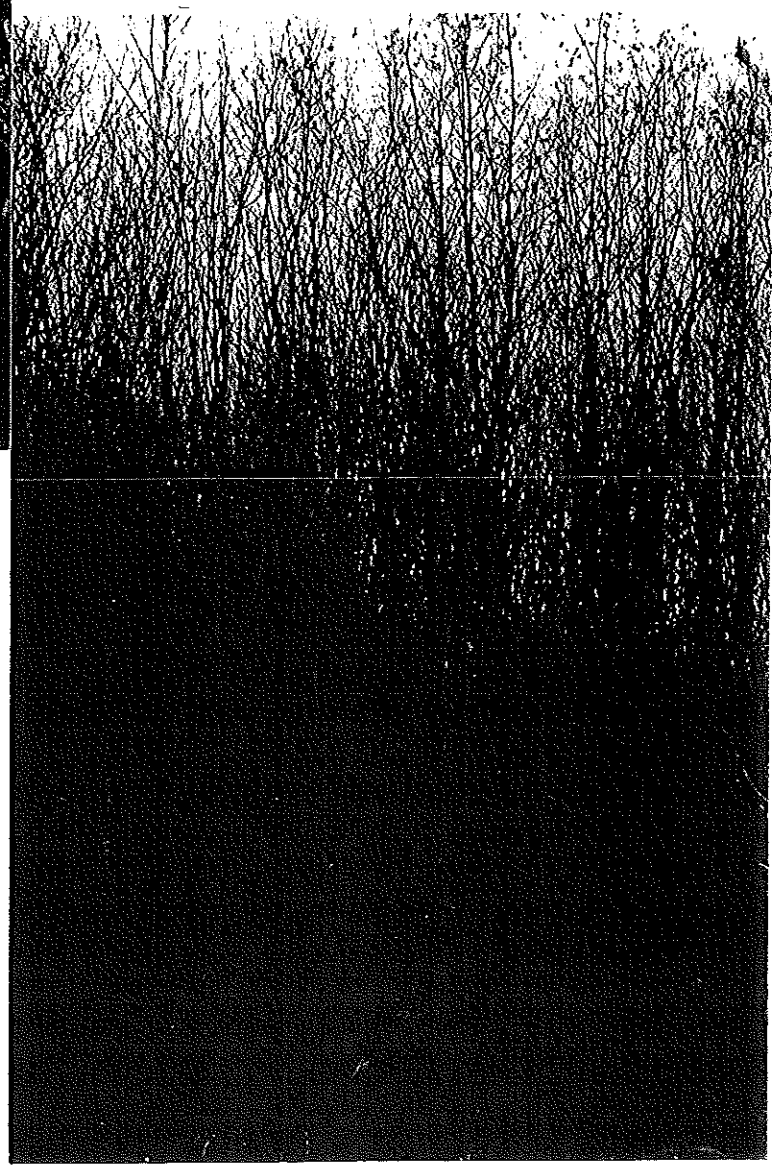


Figure 4: Wetland 1. The photograph shows a thicket of speckled alder and red maple saplings. These types of thickets afford a year around source of cover, nesting, and over wintering for mammals and birds.

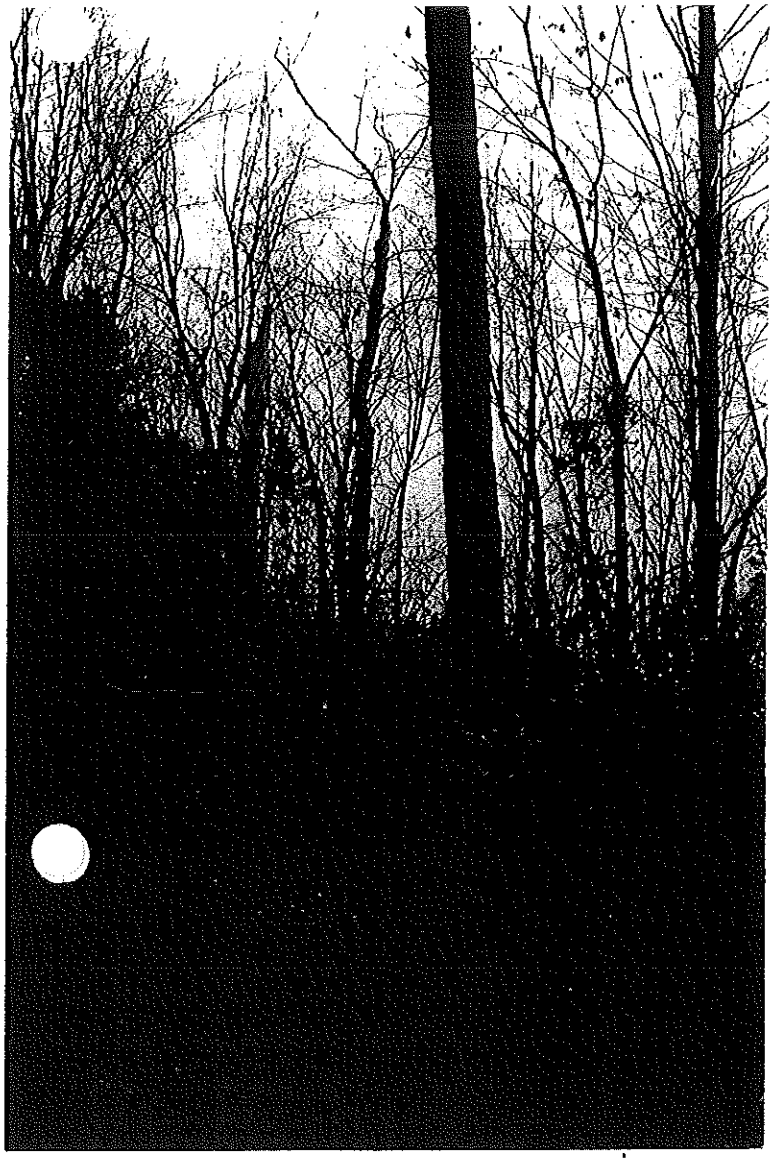
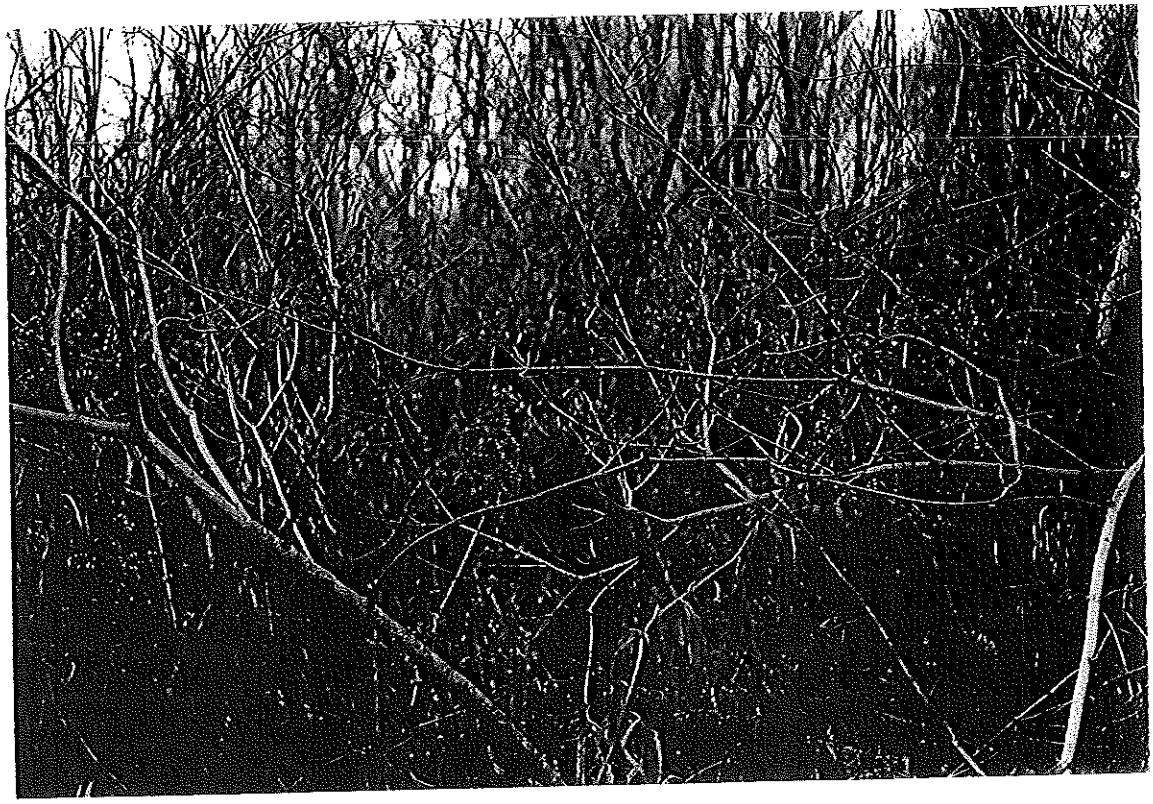


Figure 5: Wetland 1. In the background of this photograph is a snag (standing dead) tree. Snags serve as nesting sites for birds, den sites for small mammals, and feeding sites for insect eating birds and mammals.

Figure 6: Wetland 1. The photograph shows a small song bird nest.

Figure 7: Wetland 1. This photograph shows the hydrologic connection between a scrub shrub portion and forested portion of the wetland. It also shows a trail system and wetland impact from motorized vehicles crossing in this area.

Figure 8: Wetland 1. This photograph shows the vine bittersweet. Although attractive, this vine is an invasive species and can eventually choke out other vegetation (typically trees) due to its aggressive nature.



MO PD too
size/small
~~southern portion~~
no. portion
wetter
meets 50%

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 1 Size: ~2 ac Date: 11/02 WEI Project # 01-066NH
Classification: PFO1/SS/Ed PFO1Ad PSS1E PUBG, PEM1Ed
Film Roll #: 15 Photograph #: 1 - 9 Aerial Photograph #: 42 - 27

Wetland Functions

Groundwater Recharge/Discharge Potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	Perm. rapid
Subsoil type sand		Variable water levels observed	y (n)	avail H_2O cap low
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) No

PD

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed nearly level		
Watershed position	H M (L)	Topography of wetland nearly level		
Other catchment storage	(y) n	Constricted outlet	(y) n	ditched in portions
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

also floodplain upland

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y (n)	Upstream sources of pollution	(y) n	
Broad boundary transition	y (n)	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

- trails
- old pit

Nutrient Removal/Retention Transformation

Hydrology		Transformers	
Open water present	(y) n seasonal	Organic soils	y (n)
Slow moving water	(y) n	Aquatic vegetation	(y) n PUB (seasonal)
Nutrients upslope	(y) n	Abundant vegetation	(y) n
Function Present	(y) n		(Yes) No

Production Export

Vegetation		Export	
Density	(H) M L	Detritus	(y) n
Interspersion	(H) M L	Aquatic plants	(y) n
Diversity	(H) M L	Berry producing shrubs	(y) n
Food source	(y) n	Nectar sources	(y) n
Function Present	(y) n	Seed/mast sources	(y) n (Yes) No

Photos floodplain

- large Hemlocks / PFO
- SS
- winterberry
- snag
- SS/FO
- bittersweet

- PUB (drainage)
- connection H_2O

yellow birch
Rm
Red Oak
White Oak
grey birch
Dogwood
bittersweet

mulberry
Hemlock (large)
~~winterberry~~
Cinn. fern
alder
no: arrowwood

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present	y n
High seasonal flows	y n
Channelized flow	y n
Open water fetch	y n
Function Present	y n

Description of Bank

Bank present	y n
Bank vegetated	y n
Bank eroded	y n
Steep bank	y n
Stabilized Bank	y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat	y n
Amphibian habitat	y n
Fisheries habitat	y n
Cavity trees	y n a couple
Vernal pool	y n
Defined stream channel	y n
Food sources	y n
Cover/nesting sources	y n
Function Present	y n

Connections

Corridor	y n
Wetland connections	y n
Upland connections	y n
Islands	y n

potential to need

small mammals
birds

Yes No

Buffer

Type SS, FO, lawn

Width 0' > 50'

Buffer stream or wetland y n

Does buffer provide shade y n

Degradation

Present y n

Type litter (lawn mower) leaf/grass clippings

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

hiking
birding

Restoration Stabilization Potential

y n

Restoration area size:

- bittersweet/invasive
- stabilize trail at wetland crossing (see photo)

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

Value due to location in dense residential subdivision
only upper portion (no) would meet 50% VPO hydric soils

4-29-60
23660-42-27

WETLAND 2

Figure 9: Wetland 2. This photograph shows Pine Island Pond with its bordering forested wetland along the fringes.

Figure 10: Wetland 2. This photograph also shows the forested wetland and the hydrologic connection between wetland two (Pine Island Pond) and wetland three.

Pine Island Pond
+ Forested bordering wetlands
yes/high
is lacustrine
may not qualify
4/29/00

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 2 Size: ~50 AC Date: June 2002 WEI Project # 01-066NH
Classification: L1UBHh, PFO1Eh (edge)
Film Roll #: 2 Photograph #: 7, 8, 9, 10 Aerial Photograph #: 42 31

Wetland Functions

Groundwater Recharge/Discharge

Principal Function

Geology
Restrictive layer present (y) n
Subsoil type Windsor Sands
Other geologic features
Function Present (y) n
possible recharge area

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n shoreline water marks
Springs or seeps observed y (n)
Contains only inlet or outlet y (n) Yes (No)

Floodflow Alteration

Watershed Information
Land cover in catchment area?
Watershed position H (M) L
Other catchment storage (y) n wetlands
Watercourse associated (y) n
Contains hydric soils (y) n VPD
Function Present (y) n

Topographic Information
Topography of watershed sloping
Topography of wetland gently sloping
Constricted outlet (y) n under highway
High degree of impervious surfaces in wetland watershed (y) n roads, airport
Land uses downstream protected by this wetland (y) n (Yes) No

onnects
/Cohas Br.
+ wetland

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n
Broad boundary transition (y) n * in places
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution (y) n
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n (Yes) No

es into
iver
under road

Nutrient Removal/Retention Transformation

Hydrology
Open water present (y) n
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n
(Yes) No

Production Export

Vegetation
Density riparian H (M) L
Interspersion H M (L)
Diversity riparian H (M) L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n (Yes) No

in riparain areas
HBBB
jewel weed

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent yes

Characteristics of Stream Pond

Elevation change present (y) n
High seasonal flows (y) n
Channelized flow (y) n inlet/outlet
Open water fetch (y) n

Function Present y n

Description of Bank

Bank present (y) n
Bank vegetated (y) n
Bank eroded y (n)
Steep bank (y) n moderate in areas > 8%
Stabilized Bank (y) n

(Yes) No

Wildlife Habitat

Diversity

Aquatic insect habitat (y) n
Amphibian habitat (y) n
Fisheries habitat (y) n
Cavity trees riparian (y) n
Vernal pool y (n)
Defined stream channel (y) n
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor (y) n
Wetland connections (y) n
Upland connections (y) n
Islands y (n)

(Yes) No

Buffer

Type forested/residential
Width large to narrow ≥ 15'
Buffer stream or wetland (y) n
Does buffer provide shade (y) n

Degradation

Present (y) n
Type houses/residential on North side

(Yes) No

Wetland Values

Recreational Value

Parking available park (y) n
Watercraft access (y) n
Fishing available (y) n
Hunting permitted y (n)
Walking/biking trails (y) n
Value (H) M L

Pine Ls. park urban quality

Restoration Stabilization Potential

(y) n
Restoration area size: along north side – buffer vegetative plantings along shoreline

Educational/Scientific Value

Unique habitats/plant species y (n)
Diverse wildlife habitat (y) n
Parking/access (y) n
Value H (M) L

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species birds (y) n
Archaeological sites y (n)
Stonewalls present y (n)
Historic sites unknown y n
Ecological health/vigor (y) n
** Value (H) M L

** Value of open water in urban setting

Comments/Wildlife Notes

- saw fish jump
- *houses on north side
- *south side - park, appears to have a larger forested buffer
- red maple (dominant)
  white/grey birch
  hemlock (dominant)
  arrow-wood
  various shrubs, native + ornamental along shoreline
  pickerel weed

4-29-00
23660-42-31

WETLAND 3

Figure 11: Wetland 3. This photograph shows the open water with emergent vegetation with the scrub shrub wetland in the background. This photograph also shows a snag tree.

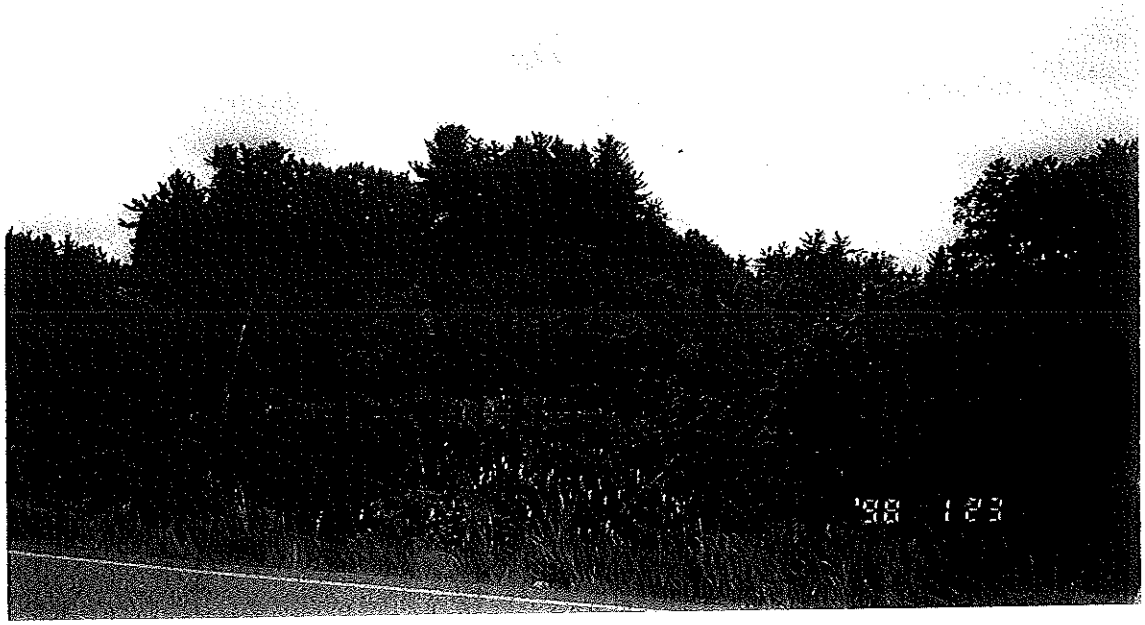


Figure 12: Wetland 3 This photograph shows the deep marsh with the forested wetland in the background.

Figure 13: Wetland 3 This photograph shows the beaver dam. This area is still populated with beaver.

Figure 14: Wetland 3 This photograph shows a large inlet culvert (left) which carries runoff from the airport. The large culvert on the right allows hydrologic connection.

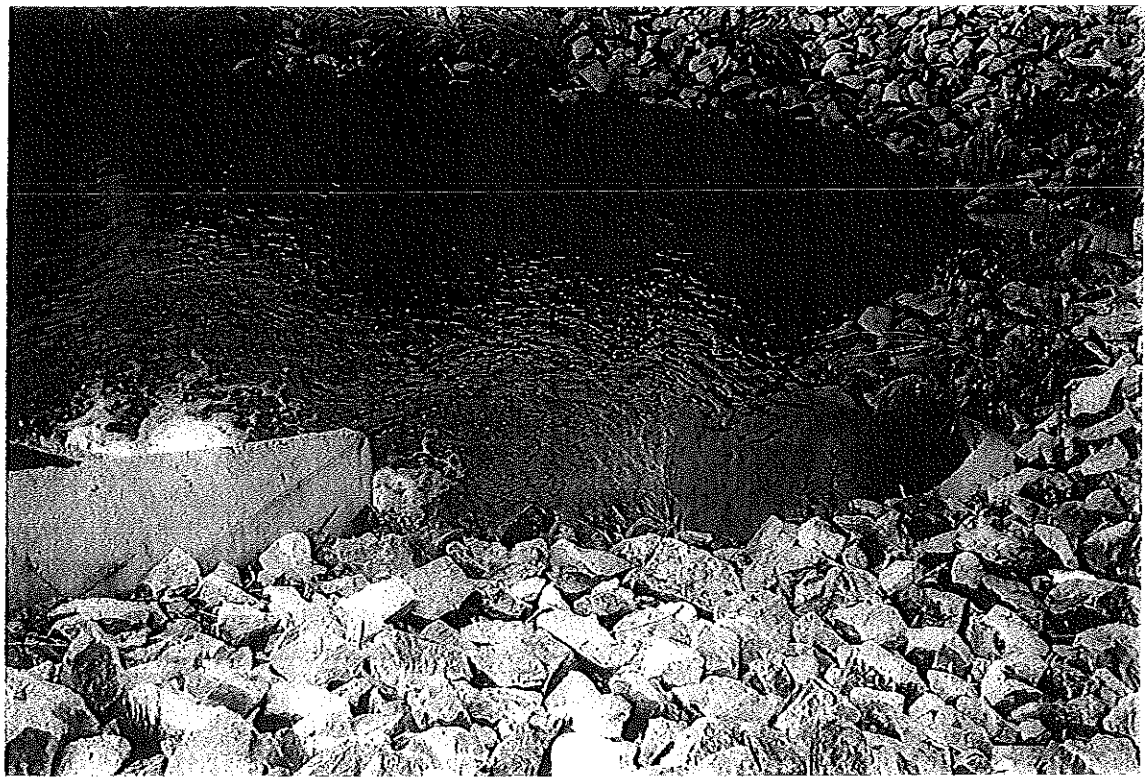
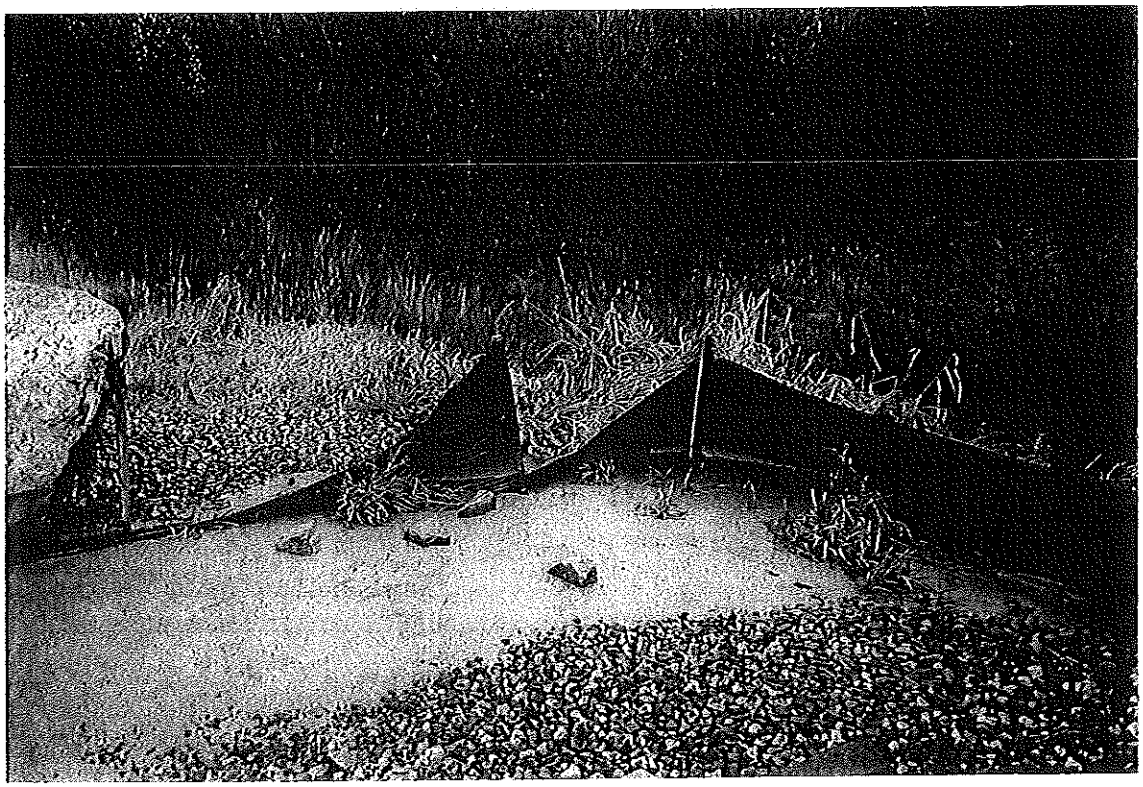


Figure 15: Wetland three. This photograph shows a large area of exposed soils on the banks of the airport runway. This area has already started to erode into wetland three. The rill in this banking leads directly into the culvert shown in figure 14.

Figure 16. Wetland three. This photograph shows eroded material that flowed across the road from the airport and the improperly installed silt fence. The point of this picture is to emphasize the need for regular environmental monitoring of construction projects in or near wetlands, streams or waterbodies.



Pollution Sensitive Brook leaf litter, seasonally flood
NWI says seasonally flooded Palustrine
Check ✓ seasonally flooded
✓ hydrologic connection / beaver flowage
✓ boundaries
active / inactive

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 3 Size: 22.2 ac (complex hydrologically connected) Date: 6/12/02 WEI Project # 01-066NH
Classification: PSS1C, R3UBH, PEM1E, PSS1E, PF01/E
Film Roll #: 2 Photograph #: 11, 12, 13, 14, 15 Aerial Photograph #: 42-31 4/29/00

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n) no indicators present	
Subsoil type glacial outwash plains		Variable water levels observed	(y) n surface flooding	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	Yes (No)

Possible recharge / hydric soils

Floodflow Alteration

large culvert from airport (runoff) at bot on. ting beaver area
water quality
erosion potential

Watershed Information		Topographic Information	
Land cover in catchment area? veg + roads		Topography of watershed	some steep areas (from airport) to gently sloping
Watershed position	H (M) L	Topography of wetland	gently sloping 0-2%
Other catchment storage	(y) n PI Pond	Constricted outlet	(y) (n) culvert (beaver area) +
Watercourse associated	(y) n Cohas Br.	High degree of impervious surfaces in wetland watershed	(y) n airport/road
Contains hydric soils	(y) n A & B		
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils VPD BpA (Borohemists)		Setting & Hydrology	
Organic Soils >12"	(y) n	Upstream sources of pollution	(y) n airport/roads
Broad boundary transition	(y) n	Erosion/sedimentation observed	(y) (n) potential w/airport expansion
Vegetation		Difuse flow/slow moving water	(y) n did see severe erosion in ball / airport construction
Herbaceous vegetation	(y) n	Does wetland flood	(y) n
Dense vegetation	(y) n	Long water retention	(y) n (Yes) No
Function Present	(y) n		

Ponded area

Nutrient Removal/Retention Transformation

Hydrology		Transformers	
Open water present	(y) n	Organic soils	(y) n deep
Slow moving water	(y) n	Aquatic vegetation	(y) n
Nutrients upslope	(y) n	Abundant vegetation	(y) n
Function Present	(y) n		(Yes) No

Production Export

Vegetation		Export	
Density	(H) M L	Detritus	(y) n
Interspersion	(H) M L	Aquatic plants	(y) n
Diversity	(H) M L	Berry producing shrubs	(y) n
Food source	(y) n	Nectar sources	(y) n yellowweed
Function Present	(y) n	Seed/mast sources	(y) n (Yes) No

along / off perimeter Rd.
wetlands associated
w/Cohas Br.

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent Cohas Stream connected to Tinkerville Pond

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n none of concern along Cohas
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n warm spp	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n more observed		
Defined stream channel	y n		
Food sources	y n veg, berries, nectar		
Cover/nesting sources	y n		
Function Present	y n		Yes No

good habitat for small mammals, birds, reptiles, amphibians, herps/migrations & habitat

Buffer		Degradation	
Type shrub, some young forest		Present	y n (potential)
Width range 50' — >100'		Type runoff culvert from airport	
Buffer stream or wetland	y n both		
Does buffer provide shade	y n in some areas		Yes No

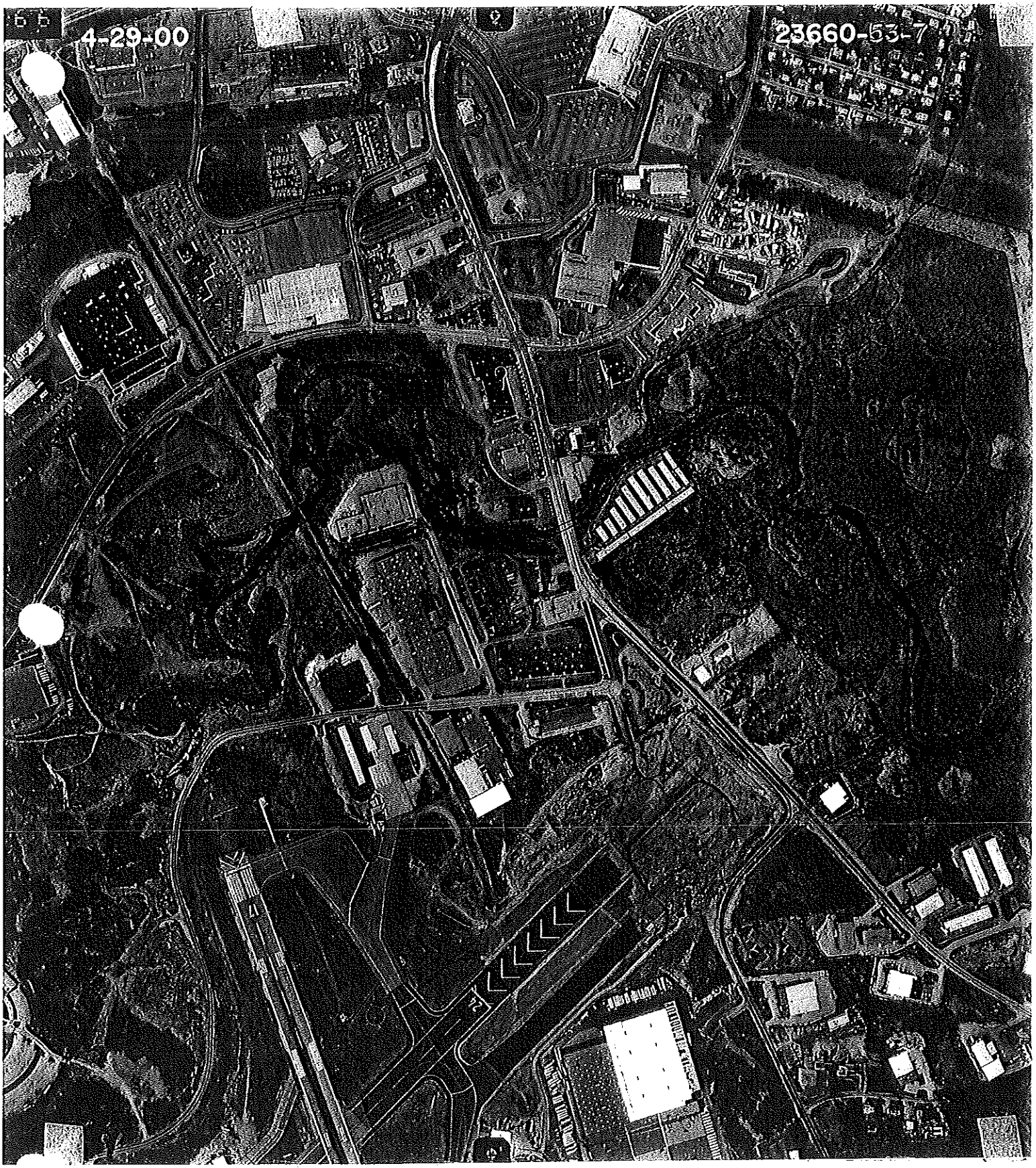
Wetland Values

Recreational Value		Restoration Stabilization Potential	
Parking available	y n	y n catchment trtmt basin for airport runoff	
Watercraft access	y n	Restoration area size:	
Fishing available	y n	stabilize steep banking across from wetland	
Hunting permitted	y n		
Walking/biking trails	y n		
Value	H M L		

good birding site

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n → plant comm. according to NHI	
Diverse wildlife habitat	y n open water, stream, SS, young trees	
Parking/access	y n limited parking, but areas where parking could be created	
Value	H M L	

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n see NHI comment above
Archaeological sites	y n — unknown
Stonewalls present	y n
Historic sites	y n - unknown
Ecological health/vigor	y n
Value	H M L excellent riparian buffer to Cohas + H_2O quality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23660-53-7

WETLAND 4

Figure 17: Wetland 4. This photograph shows the emergent portion of this wetland. There is a large section in the background that has invasive Phragmities. This area of the wetland has a lot of snags.

Figure 18: Wetland 4. This photograph shows duck weed, an indicator plant of water with high levels of phosphorous and nitrogen. Duck weed serves as a good water filtration system due to its high uptake of these nutrients. Duckweed also provides superior cover for turtle hatchlings and frogs.

Figure 19: Wetland 4. This photograph shows the emergent, scrub shrub and forested portions of this wetland. The foreground shrub with the red berries is winter berry.

Figure 20: Wetland 4. This photograph shows a scrub shrub and emergent component of the wetland. The shrubs in the foreground are button bush. Button bush fruits, twigs, leaves and wood are eaten by Muskrat, Beaver and Whitetail Deer. Several birds species nest and hide in these shrubs.

Figure 21: Wetland 4. This photograph shows the forest wetland component of this wetland. The foreground of this photo shows a highbush blueberry shrub. This shrub species is a very important food source to large mammals, small mammals, song birds and also serves as a nectar source for bees.

Figure 22: Wetland 4. This photograph shows the presence of the gas pipeline impact.

connects w/3 high
Cohas Brook System
large system

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 4 Size: 120AC Date: WEI Project # 01-066NH
Classification: PFO1E, PSS1E, PEM1/SS1B, PUBF, R3UB1
Film Roll #: 15 16 Photograph #: 10-26 1-3 Aerial Photograph #: 54-7, 54-3, 54-5, 53-7

Wetland Functions

Groundwater Recharge/Discharge Potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	mod. perm.
Subsoil type	mucky peat	Variable water levels observed	(y) n	avail H_2O cap high
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed	nearly level	
Watershed position	H (M) L	Topography of wetland	nearly level	
Other catchment storage	(y) n	Constricted outlet	(y) n	
PUB Watercourse associated	(y) n Cohas	High degree of impervious surfaces in wetland watershed	(y) n	impact
Contains hydric soils	(y) n			
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No pipeline ([illegible])

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology			Transformers		
Open water present	(y) n	stream	Organic soils	(y) n	
Slow moving water	(y) n	PUB	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n		Abundant vegetation	(y) n	
Function Present	(y) n				(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

EM/SS
FO
Phragmites *
Cattails *
duckweed

HBBB
FO
Button Bush
EM/SS/FO

RM
RO
WO
Greybirch
WP
button bush
winterberry

silky dogwood
alder
bittersweet *
cinnamon fern
cattail
gold thread

if go for prime status
[illegible] / reconfirm
[illegible] boundaries

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent Cohoes Br.

Characteristics of Stream

Elevation change present (y) n slight
High seasonal flows (y) n
Channelized flow (y) n
Open water fetch y (n)

Function Present (y) n

Description of Bank

Bank present (y) n in areas
Bank vegetated (y) n
Bank eroded y (n)
Steep bank y (n)
Stabilized Bank (y) n

(Yes) No

Wildlife Habitat

Diversity

Aquatic insect habitat (y) n
Amphibian habitat (y) n
Fisheries habitat y (n)
Cavity trees (y) n
Vernal pool y (n)
Defined stream channel (y) n
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor (y) n
Wetland connections (y) n
Upland connections (y) n
Islands (y) n

(Yes) No

Buffer

Type FO, SS, lawn,
Width 10' – >100'
Buffer stream or wetland (y) n
Does buffer provide shade (y) n

Degradation

Present (y) n
Type fill leaves, rubbish

(Yes) No

Wetland Values

Recreational Value

Parking available in some areas (y) n
Watercraft access y (n)
Fishing available y (n)
Hunting permitted resid. y (n)
Walking/biking trails y (n)
Value H M (L)

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

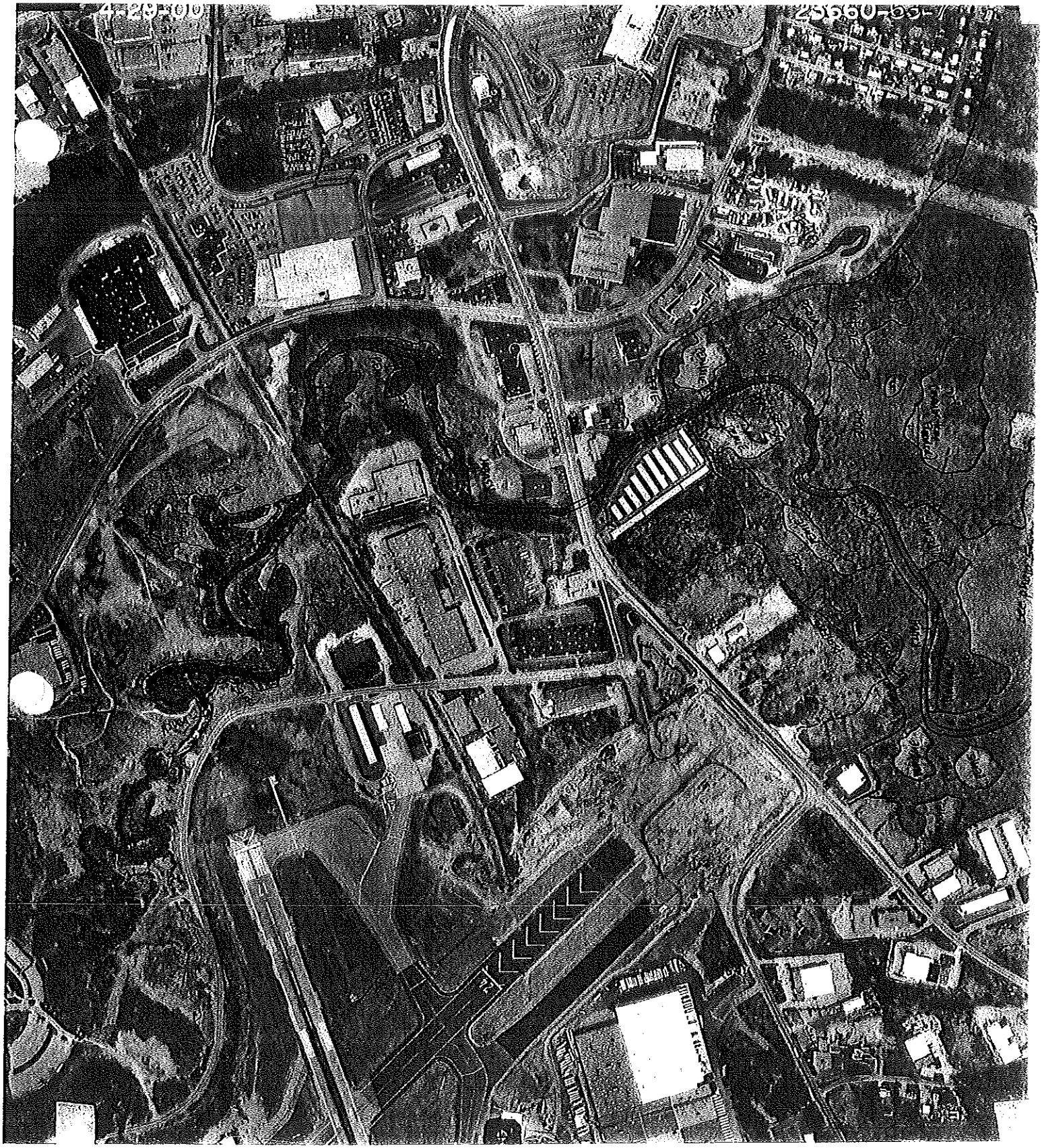
Unique habitats/plant species (y) n plant, reptiles
Diverse wildlife habitat (y) n
Parking/access (y) n in some areas
Value H (M) L

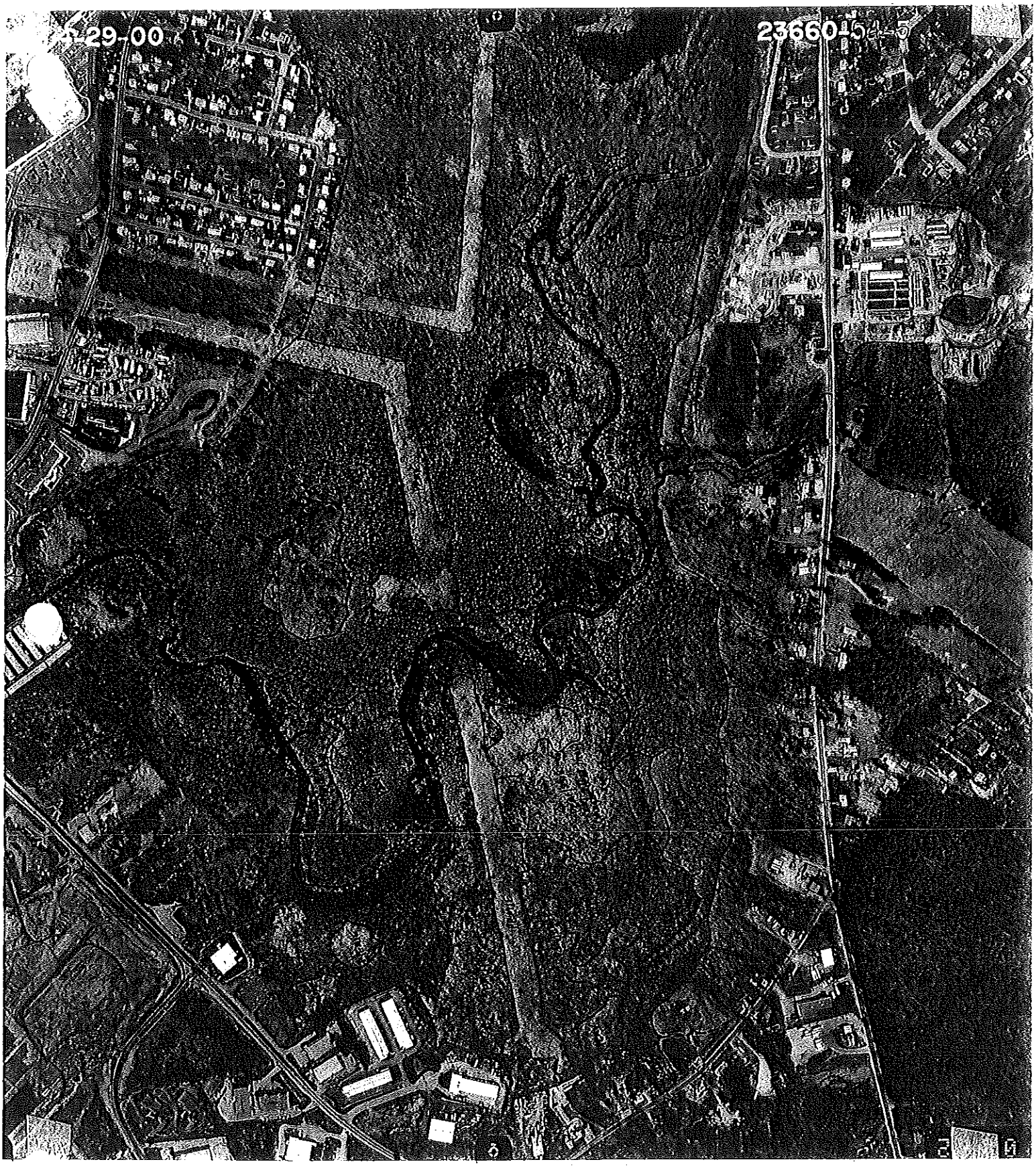
Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species (y) n plant, reptile
Archaeological sites y n ?
Stonewalls present y (n)
Historic sites y n ?
Ecological health/vigor (y) n moderate
Value (H) M L

large system in urban area w/ endangered reptiles + plants

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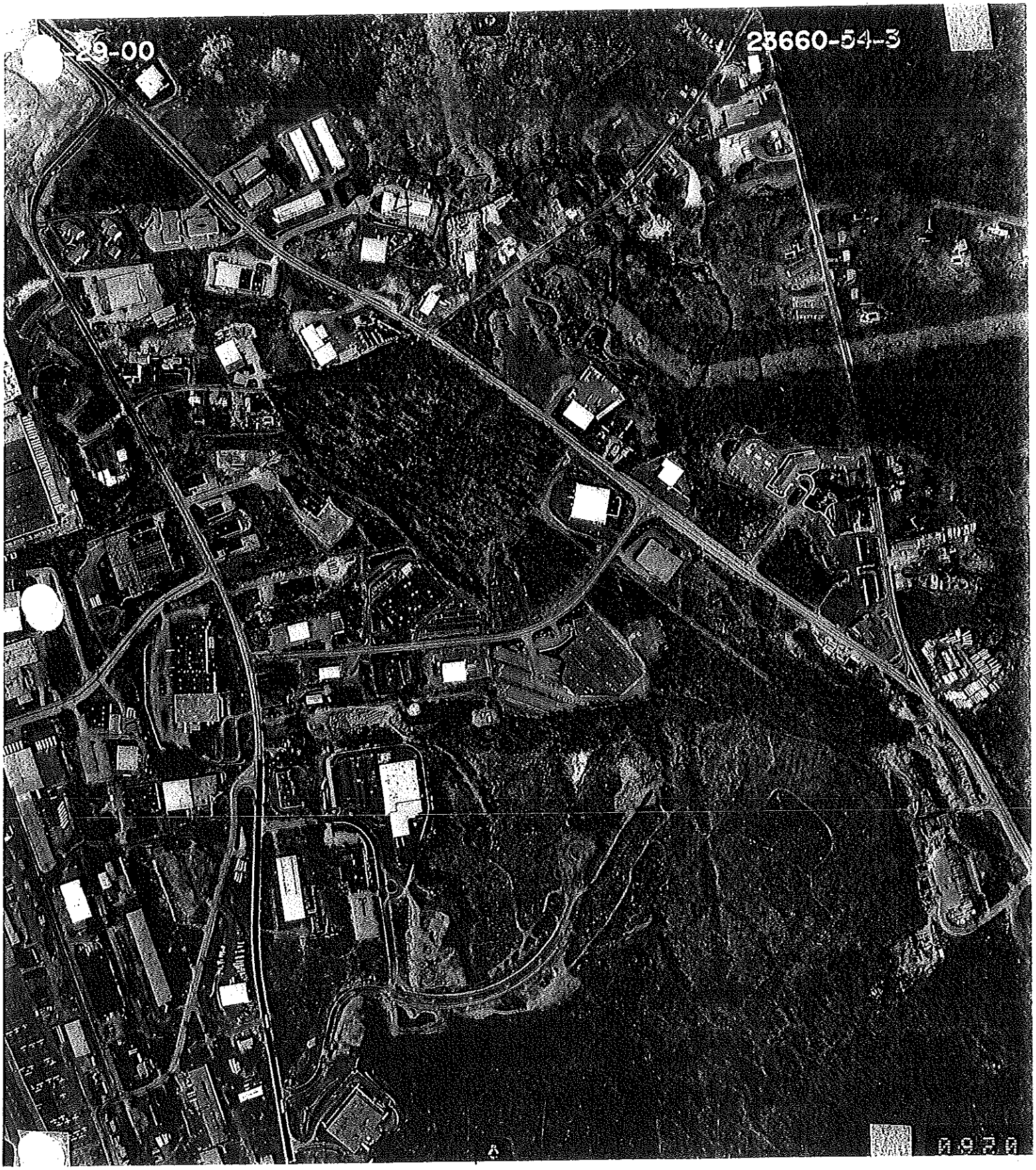
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WETLAND 5

Figure 23: Wetland five. This photograph shows the emergent, scrub shrub and forested componet of the wetland. The background of the photo shows a large snag tree.

Figure 24: Wetland five. This photograph shows the dense scrub shrub portion with the forested component in the background.

Connected to Crystal Lake
+ Cohas Brook
high

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 5 Size: ~20ac Date: 6/02 WEI Project # 01-066NH
Classification: PFO4/1E, PFO4E, PFO1E, PSS1E PEM1E
Film Roll #: 2 Photograph #: ~~#,#,#~~ 19, 20 Aerial Photograph #: 55-5 4/29/00

Wetland Functions

Groundwater Recharge/Discharge

Principal Function

Geology
Restrictive layer present (y) n muckey Peat
Subsoil type muckey peat
Other geologic features
Function Present y (n)

Hydrology
Groundwater relationship present y (n)
Variable water levels observed (y) n
Springs or seeps observed y (n)
Contains only inlet or outlet y (n) Yes (No)

Floodflow Alteration

Watershed Information
Land cover in catchment area?
Watershed position H (M) L
Other catchment storage (y) n crystal Lake
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present (y) n

eventually connects w/ Cohas Br.

Topographic Information
Topography of watershed quite level/gentle slope
Topography of wetland quite level
Constricted outlet y n
High degree of impervious surfaces in wetland watershed y n
Land uses downstream protected by this wetland y n (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution (y) n residential campus
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n (Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present y (n)
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n
(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

~18 camp

Export
Detritus (y) n
Aquatic plants (y) n in areas
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n (Yes) No

19 weird veg area (cattails)
3 SS/FO Residential probably historic fill

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no stop), Perennial or intermittent connects w/Crystal Lake

Characteristics of Stream

Elevation change present	y n
High seasonal flows	y n
Channelized flow	y n
Open water fetch	y n
Function Present	y n

Description of Bank

Bank present	y n
Bank vegetated	y n
Bank eroded	y n
Steep bank	y n
Stabilized Bank	y n

Yes No

Wildlife Habitat

in open H2O areas

Diversity

Aquatic insect habitat	y n
Amphibian habitat	y n
Fisheries habitat	y n
Cavity trees	y n
Vernal pool	y n
Defined stream channel	y n
Food sources	y n
Cover/nesting sources	y n
Function Present	y n

Connections

Corridor	y n
Wetland connections	y n
Upland connections	y n
Islands	y n

Yes No

Buffer

Type forested / residential

Width ≥ 15' → >100'

Buffer stream or wetland y n

Does buffer provide shade y n

Degradation

Present y n residential

Type residential / roads

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

residential Birdwatching

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

good bird small mammal, reptile ~~to~~ habitat

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

because of urban setting & buffer to Crystal lake

WETLAND 6

Figure 25: Wetland six. This photograph shows the Day Camp with Crystal Lake in the background. The parking available at the camp and presence of the camp make this system a good educational site.

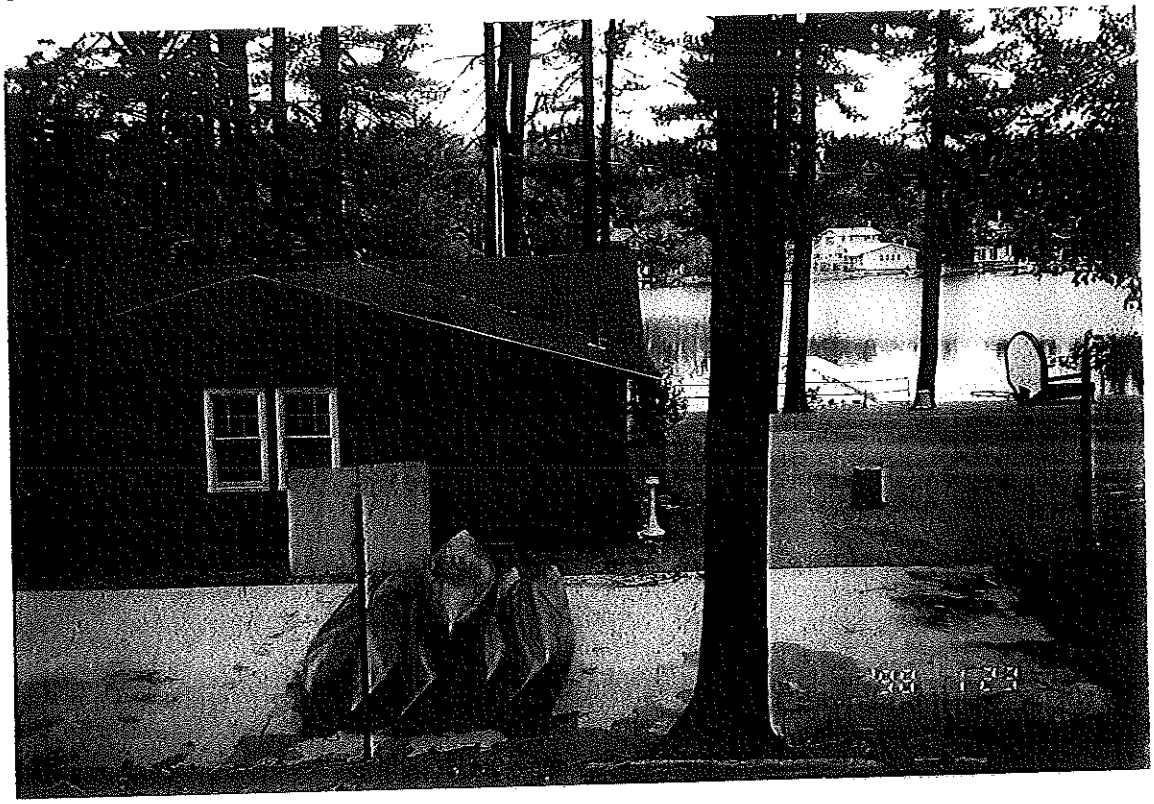
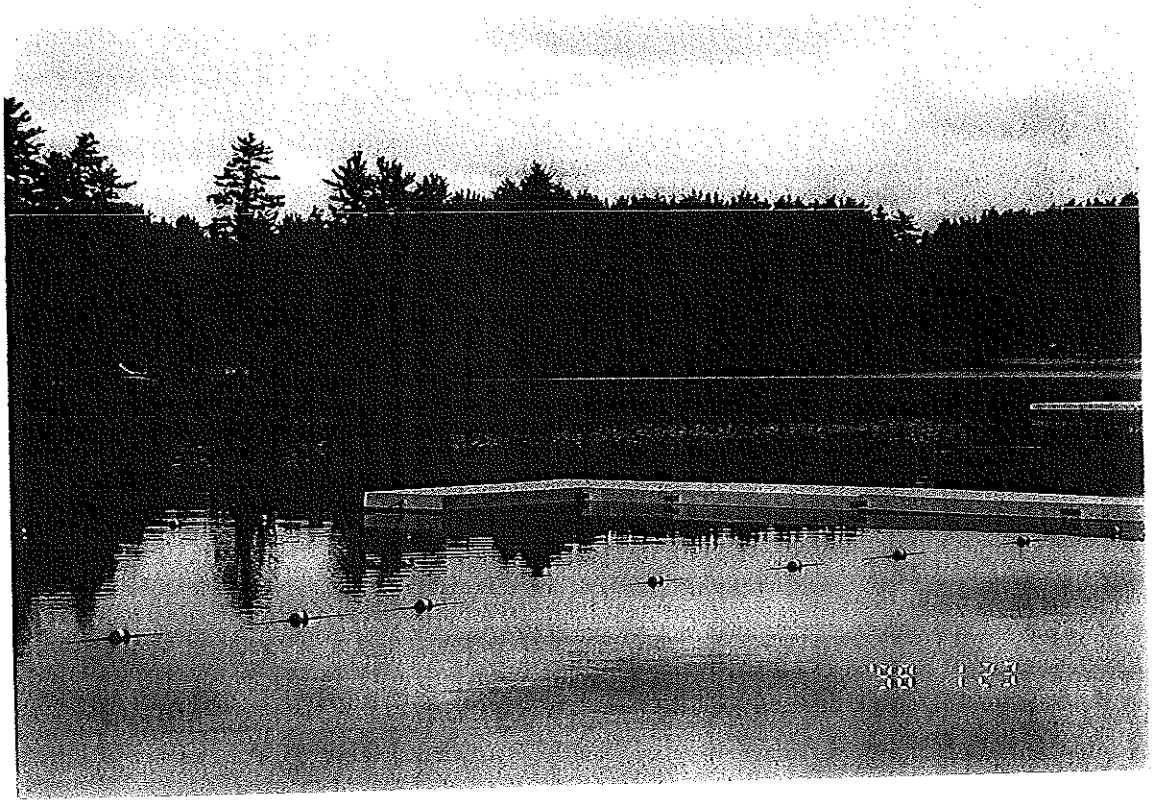


Figure 26: Wetland six. This photograph shows the scrub shrub wetland in the background.



Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank in areas y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees few y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n

Yes No

Buffer

Type forested + residential
Width >100' – 20'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present lawn, beach y n beach acts as sand erosion source
Type

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n area along camp
Value H M L

Melody Pines Day Camp

Restoration Stabilization Potential

y n
Restoration area size: beach area – create – veg. buffer to eliminate sand to water contact
– plant shrubs along camp area shoreline

Educational/Scientific Value

Unique habitats/plant species y n – unique to urban area
Diverse wildlife habitat y n – hard + small mammal probably occasional deer activity
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n
Archaeological sites y n
Stonewalls present y n
Historic sites y n
Ecological health/vigor y n
Value H M L

Crystal Lake
Cohas Brook watershed
drainage basin
high

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 6 Size: ~20ac Date: 6/02 WEI Project # 01-066NH
Classification: L1UBH L2ABG/F
Film Roll #: 2 Photograph #: 16, 17, 18 Aerial Photograph #: 55-5

Wetland Functions

camp pond beach rafts

Crystal Lake

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	y (n)	
Subsoil type fine sand		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?	forested + res.	Topography of watershed	gently sloping	
Watershed position	(H) M L	Topography of wetland	gently sloping	
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n inlet	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n residential / roads	
Broad boundary transition	(y) n most areas	Erosion/sedimentation observed	y (n) → potential w/ beach sand	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
houses — Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	H (M) L	Detritus	(y) n	
Interspersion inlet	(H) (M) L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

4-29-00
23660-55-5

WETLAND 7

Figure 27: Wetland seven. This photograph shows the Palustrine unconsolidated bottom portion of this wetland. There is a painted turtle sunning itself on the log.

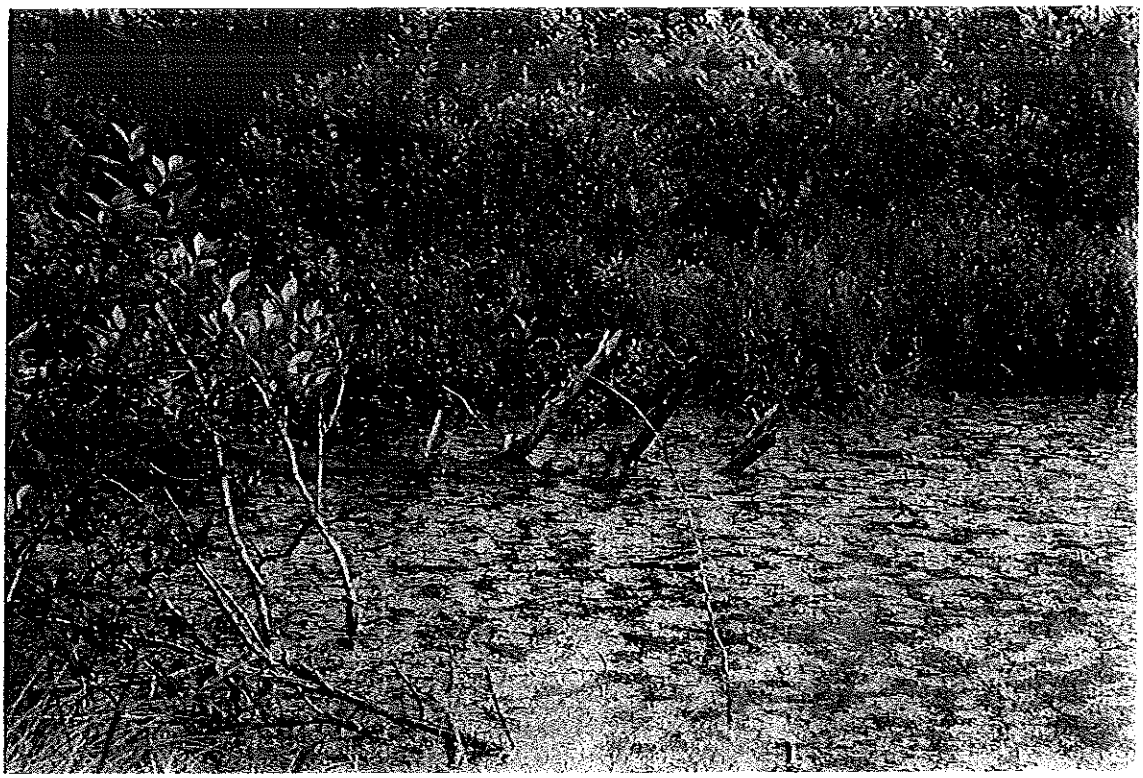


Figure 28: Wetland seven. This photograph shows the nice interspersion of the unconsolidated bottom, scrub shrub and forested wetland layers.

- high
mowed side
open H_2O, turtle habitat
potential VP habitat

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 7 Size: ~3 AC. Date: 6/02 WEI Project # 01-066NH
Classification: PSS/FO1/4E PUBF
Film Roll #: 5 Photograph #: 1, 2, 3, 4, 5, 6 Aerial Photograph #: no photograph

Wetland Functions

Groundwater Recharge/Discharge

Geology
Restrictive layer present (y) n
Subsoil type muckey Peat
Other geologic features
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n
Springs or seeps observed y (n)
Contains only inlet or outlet y (n)

Principal Function: pond (Yes) No

Floodflow Alteration

Watershed Information
Land cover in catchment area? FO
Watershed position H (M) L
Other catchment storage y (n)
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present y n

Topographic Information
Topography of watershed gently sloping/sloping
Topography of wetland gently sloping
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed y (n)
Land uses downstream protected by this wetland (y) n

(Yes) No

inter. across rd

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution y (n)
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n

(Yes) No

road runoff

Nutrient Removal/Retention Transformation

Hydrology
Open water present * (y) n
Slow moving water (y) n
Nutrients upslope (y) n residential
Function Present (y) n
* small pond

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n

(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n

(Yes) No

HBBB
alder
no arrowwood
RM

sedges
grasses
duckweed
grey birch

2 turtles
all photos

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent Pond

Characteristics of Stream

Elevation change present (y) n
High seasonal flows (y) n
Channelized flow y n
Open water fetch y (n)

Function Present y n

Description of Bank

Bank present (y) n
Bank vegetated (y) n
Bank eroded y (n)
Steep bank y (n)
Stabilized Bank (y) n

Yes (No)

Wildlife Habitat

Diversity

Aquatic insect habitat (y) n
Amphibian habitat (y) n
Fisheries habitat (y) n
Cavity trees (y) n
Vernal pool y (n)
Defined stream channel y (n)
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor (y) n
Wetland connections (y) n
Upland connections (y) n
Islands (y) n

saw 2 turtles sunning on log

Yes No

Buffer

Type SS / FO
Width 10' – >100'
Buffer stream or wetland (y) n
Does buffer provide shade (y) n

Degradation

Present y (n)
Type

(Yes) No

Wetland Values

Recreational Value

Parking available y (n)
Watercraft access y (n)
Fishing available y (n)
Hunting permitted (y) n probably
Walking/biking trails y (n)
Value H M (L)

Restoration Stabilization Potential

(y) n

Restoration area size: short area along road ~ 40' could have shrubs planted to protect pond

no salt area recommended

Educational/Scientific Value

Unique habitats/plant species (y) n-turtles
Diverse wildlife habitat (y) n
Parking/access y (n)
Value H (M) L

Comments/Wildlife Notes

potential vernal pool habitat

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species (y) n
Archaeological sites ? y n
Stonewalls present y n – possibly up stream
Historic sites ? y n
Ecological health/vigor (y) n
Value *(H) M L

potential vernal pool habitat

portion of wetland in Londonderry

WETLAND 8

Figure 29: Wetland eight. This photograph shows the emergent and lacaustrine portions of the wetland in the foreground. The background of the photo shows the scrub shrub and forested component of this wetland.

Figure 30. Wetland eight. This photograph shows the forested buffer to this wetland.

Figure 31: Wetland eight. This photograph shows the thick aquatic vegetation along the shoreline.

Figure 32: Wetland eight. This photograph shows the parking lot going directly to the water's edge. This area would be a good buffer restoration site. Some wetland shrubs along the shoreline would help prevent erosion, create habitat and help filter runoff before it reaches the water.

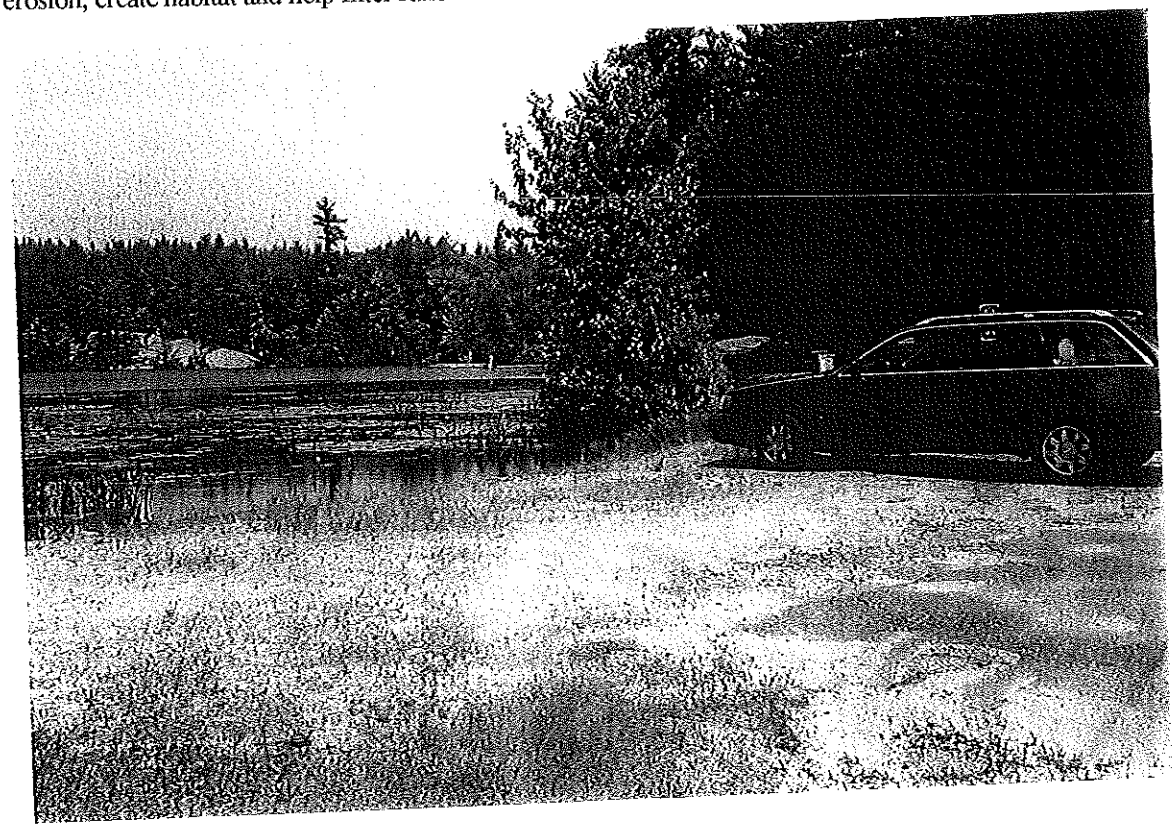
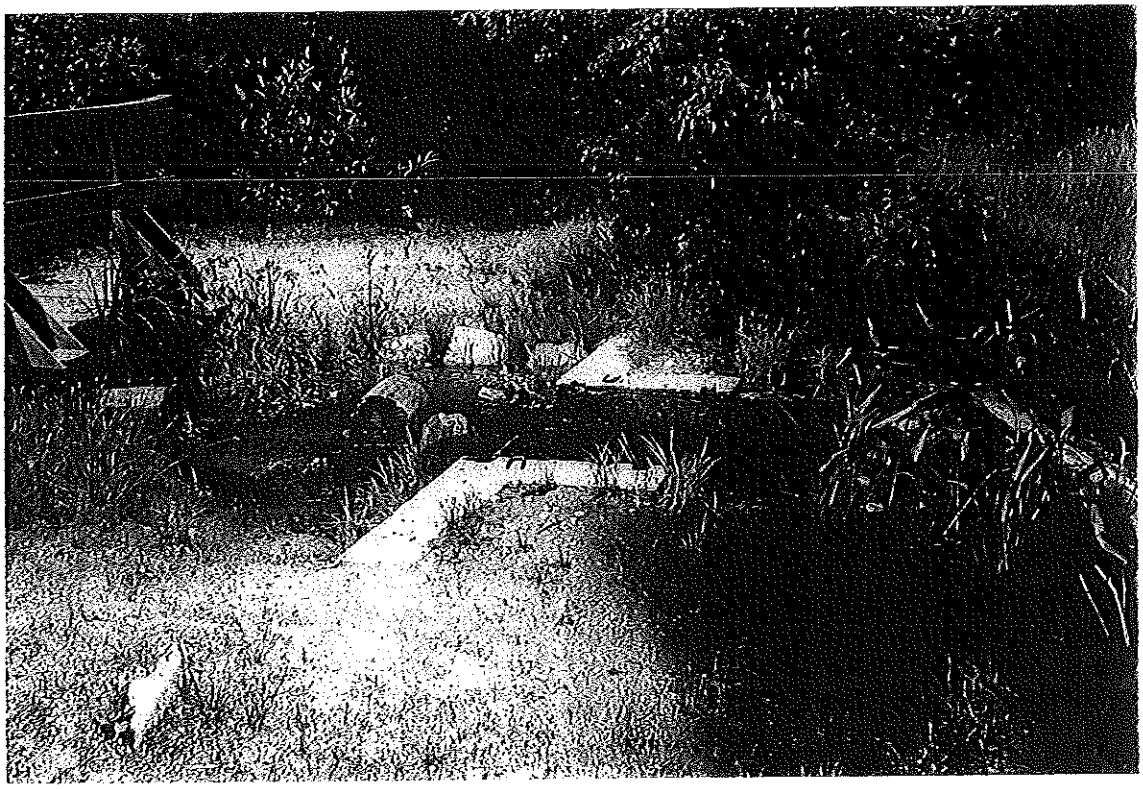


Figure 33: Wetland 8. This is the sign showing that the site of this pond is a camp site. This site is a potentially good educational site due to its proximity to the camp.

Figure 34: Wetland 8. This shows the constricted outlet of the wetland. The orange brown color of the water is from tanic acids. This photograph was taken after a heavy rain that leached the acid from leaf litter into the water.



Long Pond
Camp Carpenter
Connected to
#10/hydrologic

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 8 Size: Date: WEI Project # 01-066NH
Classification: L1UBH PSS1/EM1E PFO1E RAOXd
Film Roll #: 4A Photograph #: 9-15 Aerial Photograph #: 56-5

Wetland Functions

Groundwater Recharge/Discharge

Geology
Restrictive layer present (y) n
Subsoil type stony muck/mucky peat
Other geologic features stone outcrops
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n
Springs or seeps observed y (n)
Contains only inlet or outlet y (n)

Principal Function (Yes) ~~No~~

most likely difficult to determine w/out extensive hydrologic study of H_2O Budget
In − Out = storage
In − Out ≠ storage
have recharge discharge

Floodflow Alteration

Watershed Information
Land cover in catchment area? FO/SS
Watershed position H (M) L
Other catchment storage (y) n
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present (y) n

Topographic Information
Topography of watershed gentle slope
Topography of wetland nearly level
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed y (n)
Land uses downstream protected by this wetland (y) n

(Yes) No

Sediment/Toxicant/Pathogen Retention

Potential

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution y (n)
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n

(Yes) No

some ditching

Nutrient Removal/Retention Transformation

Hydrology
Open water present (y) n
Slow moving water (y) n
Nutrients upslope y (n)
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n

(Yes) No

Production Export

Vegetation
Density H (M) L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n

(Yes) No

stone structures

4-29-00
23660-56-5

Figure 35. Wetland nine. This photograph shows the unconsolidated bottom, and scrub shrub components of this wetland.

Figure 36: Wetland nine. This photograph shows the dense scrub shrub layer and the forested wetland in the background.

4-29-00
23660-56-3

Long Pond Brook
Connected to #8 Long Pond
high

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 9 Size: 12 ac Date: 7/02 WEI Project # 01-066NH
Classification: PSS1Eb, PUBEmi Fe PSS1Ed, PFO4E PFO5
Film Roll #: 4A Photograph #: 17, 18 Aerial Photograph #: 56-3

Wetland Functions

Groundwater Recharge/Discharge

Principal Function

Geology
Restrictive layer present (y) n
Subsoil type mucky peat
Other geologic features ~5' to bedrock
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n tree lines/staining
Springs or seeps observed y (n)
Contains only inlet or outlet y (n) Yes (No)

Floodflow Alteration

Watershed Information
Land cover in catchment area? 1.7
Watershed position H (M) L
Other catchment storage (y) n Long Pond
Watercourse associated (y) n " " B1
Contains hydric soils (y) n PD
Function Present (y) n

Topographic Information
Topography of watershed gentle slope/nearly level
Topography of wetland nearly level
Constricted outlet (y) n outlet into stream
High degree of impervious surfaces in wetland watershed y (n) yes - residential/roads
Land uses downstream protected by this wetland (y) n (Yes) No

Sediment/Toxicant/Pathogen Retention potential

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution y (n)
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n (Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present (y) n
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n potential

Transformers
Organic soils y (n)
Aquatic vegetation (y) n
Abundant vegetation (y) n SS1E marsh areas
(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n bew
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n (Yes) No
nuts
cones
-tush seeds

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n (minimal)
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n (warm water species)
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n Connects w/ Long Pond & BR
Wetland connections y n
Upland connections y n
Islands y n gravel strips

deer tracks in riparian area

** Yes No

Buffer

Type FO/SS
Width >100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n some dirt bike trails in buffer
Type

Yes No

beaver influence
some ditching

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n near camp
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

Unique habitats/plant species y n saw lady slipper plant riparian area
Diverse wildlife habitat y n
Parking/access y n Camp
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n lady slipper/see photograph
Archaeological sites ? y n
Stonewalls present y n
Historic sites ? y n
Ecological health/vigor y n
Value H M L → MHT list, education, habitat, H2O quality, recreation

WETLAND 10

Figure 37: Wetland ten. This photograph shows the forested wetland.

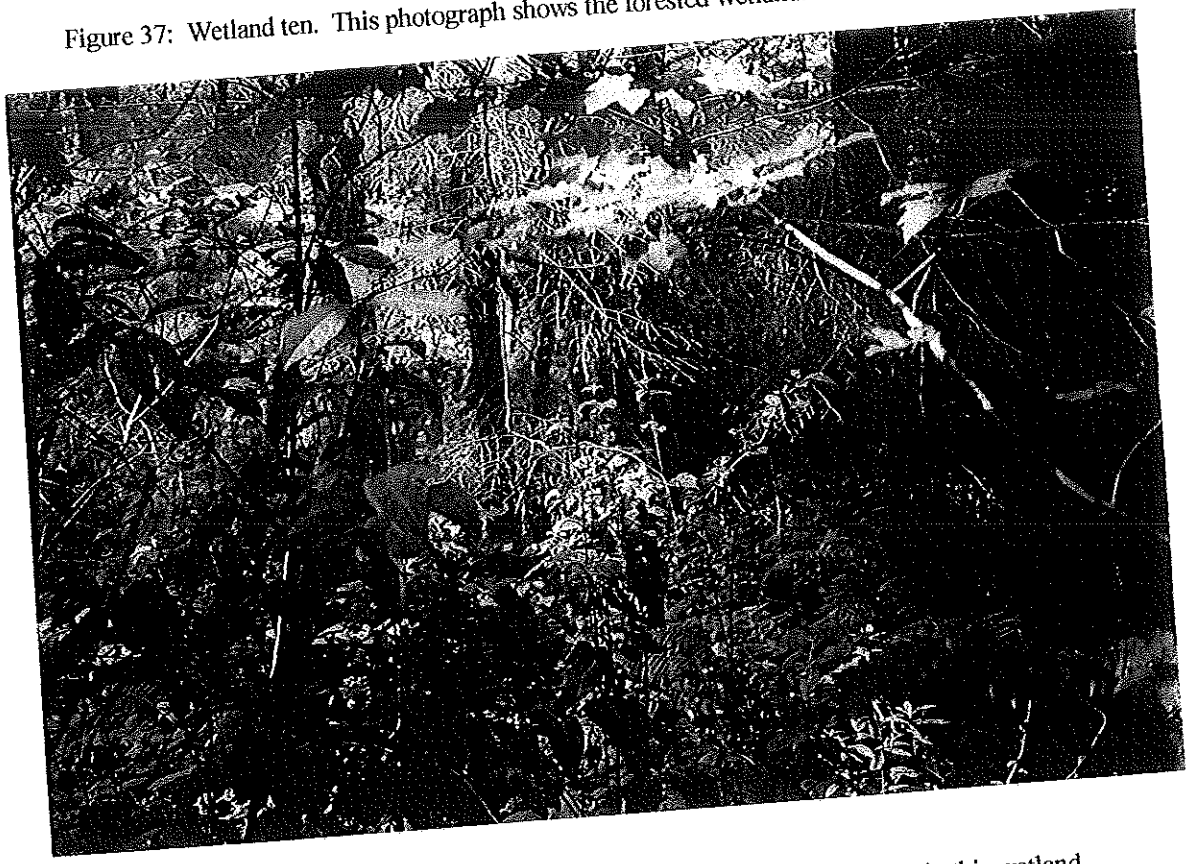


Figure 38: Wetland ten. This photograph show the dense vegetation (trees) in this wetland.

in subdivision on Southern end

med.

hydrologically connected [FO # 8 Long Pond]

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 10 Size: ~3 AC Date: 7/02 WEI Project # 01-066NH
Classification: PFO4/1E
Film Roll #: 4 Photograph #: 1, 2 Aerial Photograph #: 56-3
FO & closeup forest

Wetland Functions

Groundwater Recharge/Discharge

Geology
Restrictive layer present (y) n muck
Subsoil type mucky loamy sand
Other geologic features mucky peat
Function Present (y) n

Hydrology
Groundwater relationship present (y) n probably ↑ avail. H_2O Capacity
Variable water levels observed y (n)
Springs or seeps observed y (n)
Contains only inlet or outlet (y) n

Principal Function: (Yes) No

Floodflow Alteration

Watershed Information
Land cover in catchment area? FO
Watershed position (H) M L
Other catchment storage (y) n u, cohco
Watercourse associated y (n)
Contains hydric soils Gw (y) n deeping.
Function Present y (n)

Topographic Information
Topography of watershed gentle slope
Topography of wetland nearly level/gentle slope
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed y (n)
Land uses downstream protected by this wetland (y) n

(Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils Some (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution (y) n residential
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water y (n)
Does wetland flood y (n)
Long water retention through saturation (y) n

Yes (No)

does not meet 50% hydric A

Nutrient Removal/Retention Transformation

Hydrology
Open water present y (n)
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n nutrients retained in tree mass.
Aquatic vegetation y (n)
Abundant vegetation (y) n

(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

Export
Detritus y (n)
Aquatic plants y (n)
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n

(Yes) No

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections		
Aquatic insect habitat	y n	Corridor	y n	small mammals
Amphibian habitat	y n	Wetland connections	y n	bird, reptile, amp.
Fisheries habitat	y n	Upland connections	y n	habitat
Cavity trees	y n	Islands	y n	
Vernal pool	y n			
Defined stream channel	y n			
Food sources	y n			
Cover/nesting sources	y n			
Function Present	y n			Yes No

Buffer		Degradation	
Type	FO,	Present	y n
Width	20' → >100'	Type	fill leaves, grass clippings
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

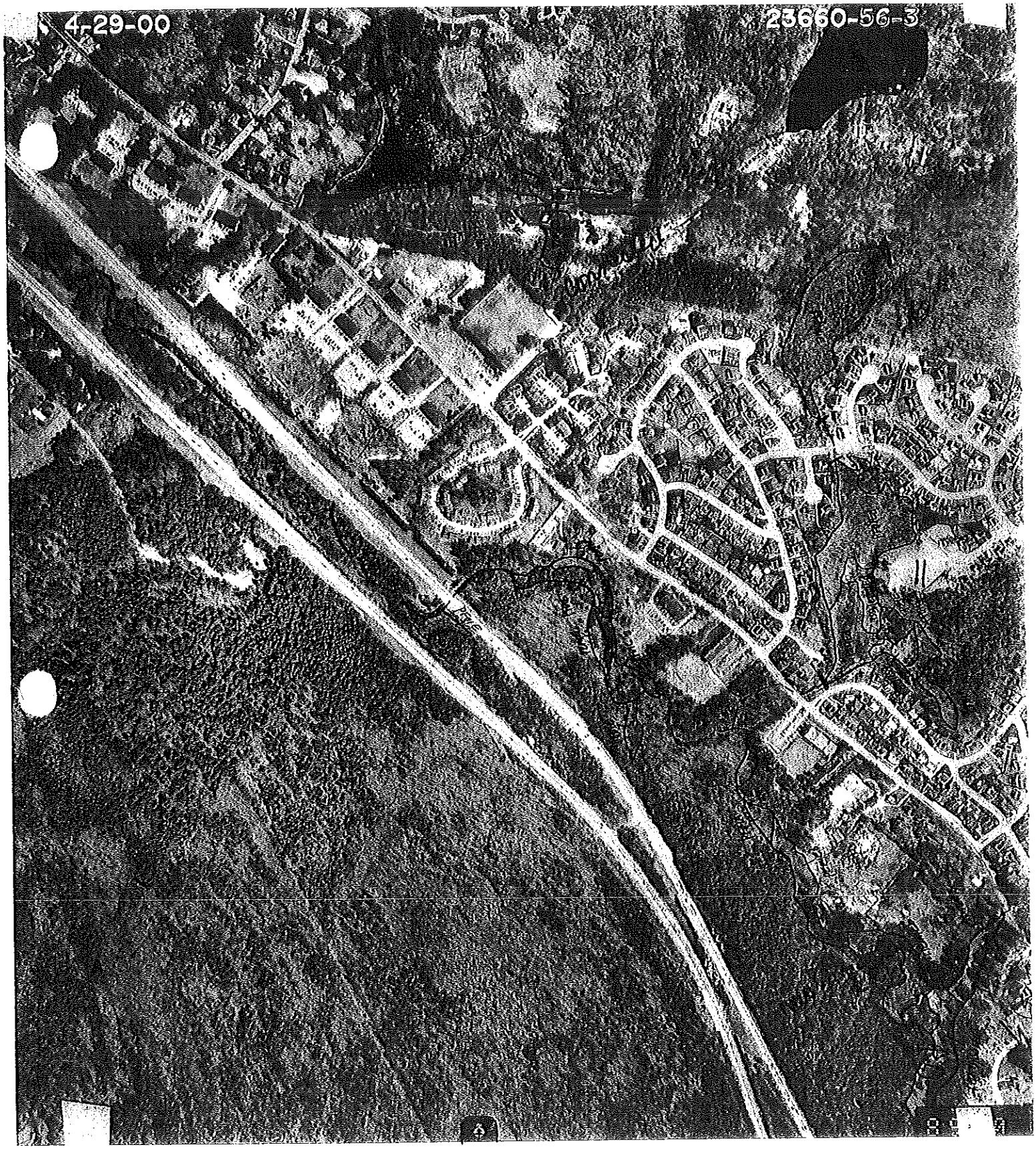
Wetland Values

Recreational Value		Restoration Stabilization Potential	
Parking available roadside	y n		y n
Watercraft access	y n	Restoration area size:	clean out dumped fill
Fishing available	y n		
Hunting permitted	y n		
Walking/biking trails	y n short trails		good birding, walking area for subdivision residents
Value	H M L		

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	
Diverse wildlife habitat	y n	proximity to camp
Parking/access	y n	
Value	H M L	increases educational potential

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

value due to rapidly developing area, urban quality proximity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23660-56-3

WETLAND 11

Figure 39: Wetland eleven. This photograph shows the forested component of this wetland. Note the thick understory.

Figure 40: Wetland eleven. This photograph shows the forested wetland in the background, the scrub shrub layer and then the emergent layer in the foreground. This area does have some purple loosestrife, an invasive species.

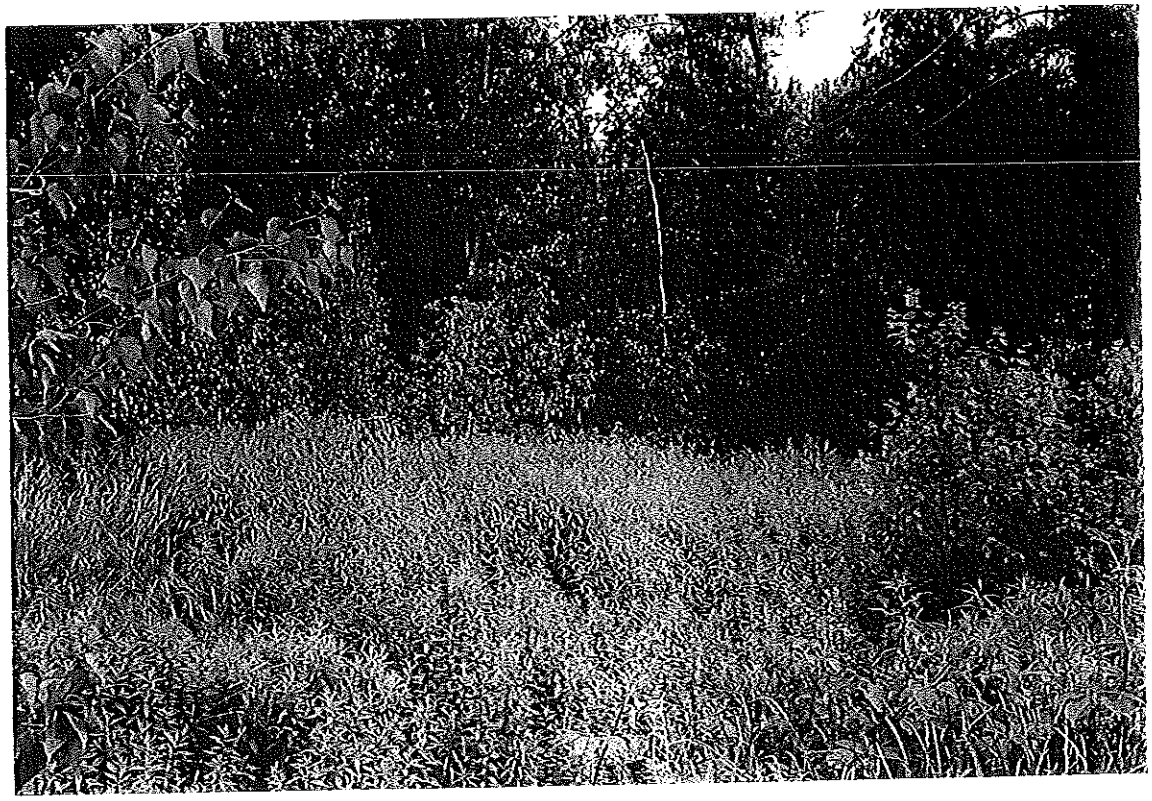


Figure 41: Wetland 11. This photograph shows the hydrologic link with wetland ten. Again, notice the thick understory. This makes good small mammal and songbird habitat.

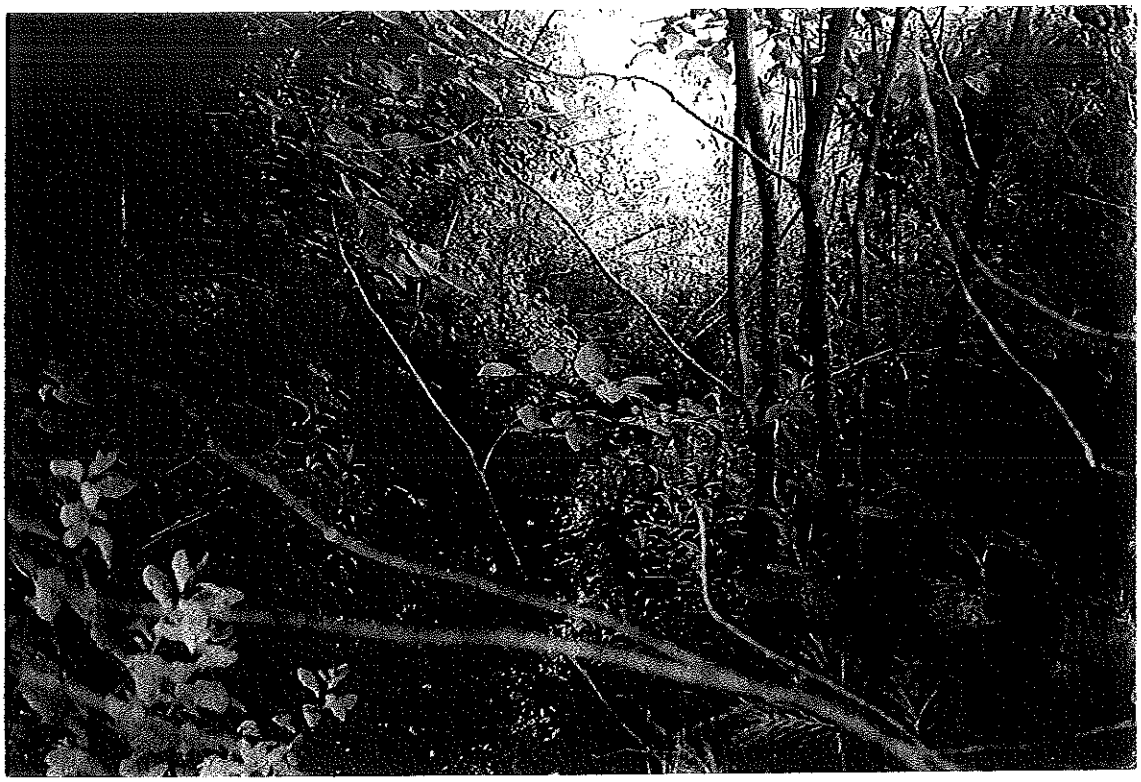


Figure 42: Wetland 11. This photograph shows illegal dumping of grass clippings. A small garter snake is sunning itself on this grass filled area.

medium due to connection to Cohoes, [illegible] may not meet 50% UPD

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 11 Size: 7AC. Date: 7/02 WEI Project # 01-066NH
Classification: PFO1Ed PSS1/EM1Ed PFO1E PFO1A
Film Roll #: 4A Photograph #: 18, 19, 20, 21, 22, 23 Aerial Photograph #: 56-3
4 → 1,

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	
Subsoil type mucky loamy sand		Variable water levels observed	(y) n	
Other geologic features 25' to bedrock		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? FO, Residential		Topography of watershed	gentle slope	
Watershed position	H (M) L	Topography of wetland	gentle slope	
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n w/10	High degree of impervious surfaces in wetland watershed	(y) n	streets, roofs
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n	Erosion/sedimentation observed	(y) n	from ~~[illegible]~~ swimming pool drain
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n channels	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	in stream
Interspersion	(H) M L	Aquatic plants	y n	a few in ditches/stream
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

connects to 10 under road
historic farming ditches throughout system

Red maple, white pine, hemlock, yellow birch, grey birch, no. arrowwood, silky dogwood, maleberry, black cherry, cin. fern, royal fern, sensitive fern, sphagnum, iris, ~~[illegible]~~ elm, beech, musclewood, HBBB, ironwood, white oak, sedges, rushes, grasses

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

ditches

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	(y) n	Corridor	(y) n
Amphibian habitat	(y) n	Wetland connections	(y) n 10 / cohas
Fisheries habitat	y (n)	Upland connections	(y) n
Cavity trees	(y) n	Islands	y (n)
Vernal pool	y (n)		
Defined stream channel	(y) n ditches		
Food sources	(y) n		
Cover/nesting sources	(y) n		
Function Present	(y) n		(Yes) No

Buffer		Degradation	
Type	FO/SS	Present	(y) n ditched, possibly tiled historic ag. see So. Soil classification
Width	20 → >100'	Type	roads/residential illegal dumping of grass clippings/branches etc. (Yes) No
Buffer stream or wetland	(y) n		
Does buffer provide shade	(y) n		

Wetland Values

Recreational Value

Parking available residential	(y) n roadside y (n)
Watercraft access	y (n)
Fishing available	y (n)
Hunting permitted	y (n)
Walking/biking trails	(y) n abut. trails
Value	H (M) L

Restoration Stabilization Potential

Restoration area size:

FO wetland does provide area for residents to walk, birdwatch + bicycle (edges).

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

- historic ditching (ag.)
- connects under road to Cohas System
- Connects " " " #10 wetland
- dogwood, jewelweed, cin. ams. bladder sedge, RM, WP, bl cherry, No. arrowwood

Uniqueness/Heritage

Urban upland/proximity	(y) n
Rapid development upland	(y) n
Critical habitat/threatened or endangered species	y (n) none listed by NHNI
Archaeological sites	y n ?
Stonewalls present	(y) n
Historic sites	y n ? probably farm land (ditches)
Ecological health/vigor	(y) n
Value	H (M) L

↳ due to its position in developing residential area

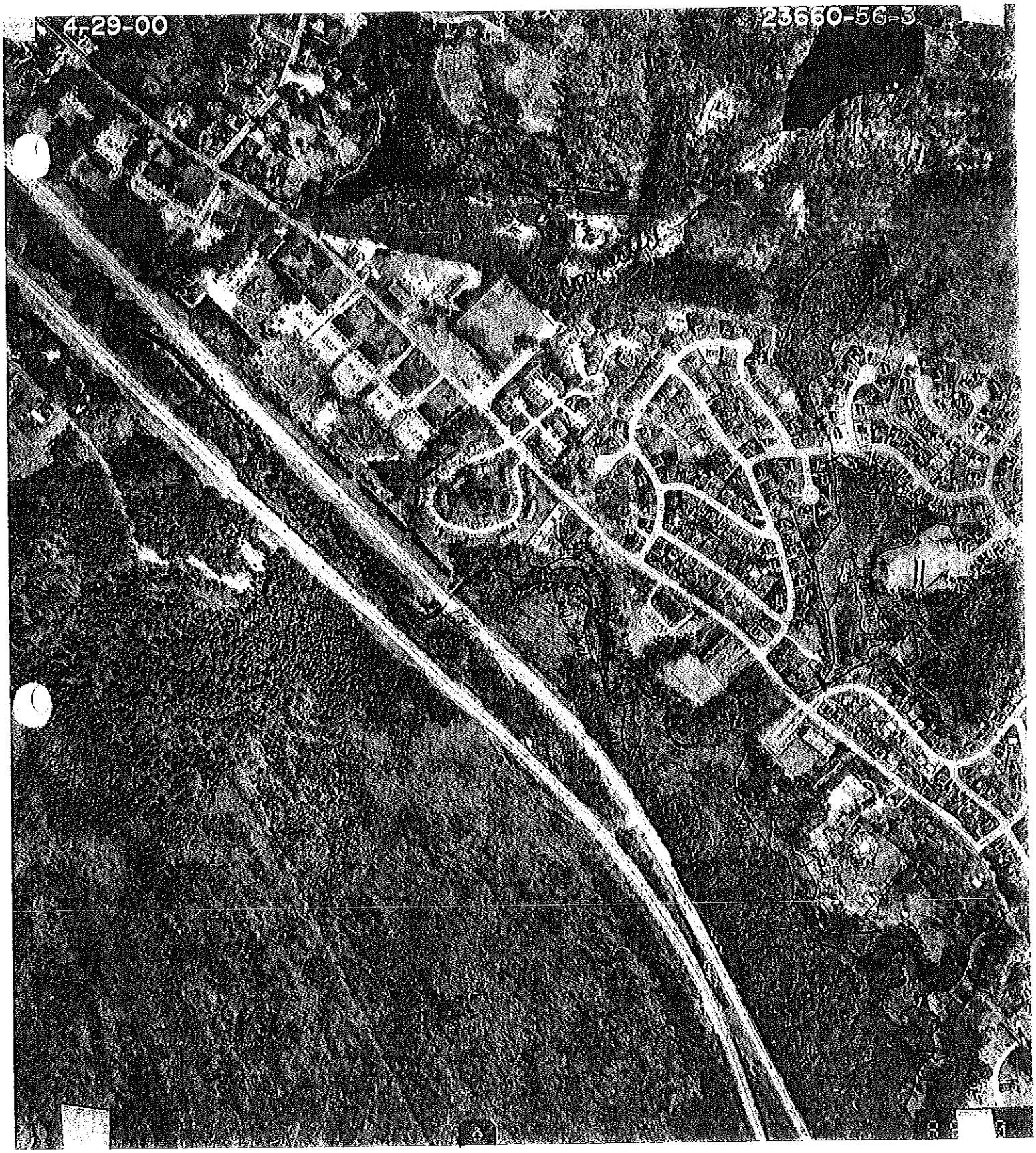

4-29-00
23660-56-3

Figure 43: Wetland twelve. This photograph shows the forested component in the background and the scrub shrub component in the foreground. The silt fence should be removed to allow better small mammal movement.

Figure 44: Wetland twelve. This photograph shows the dense scrub shrub layer.

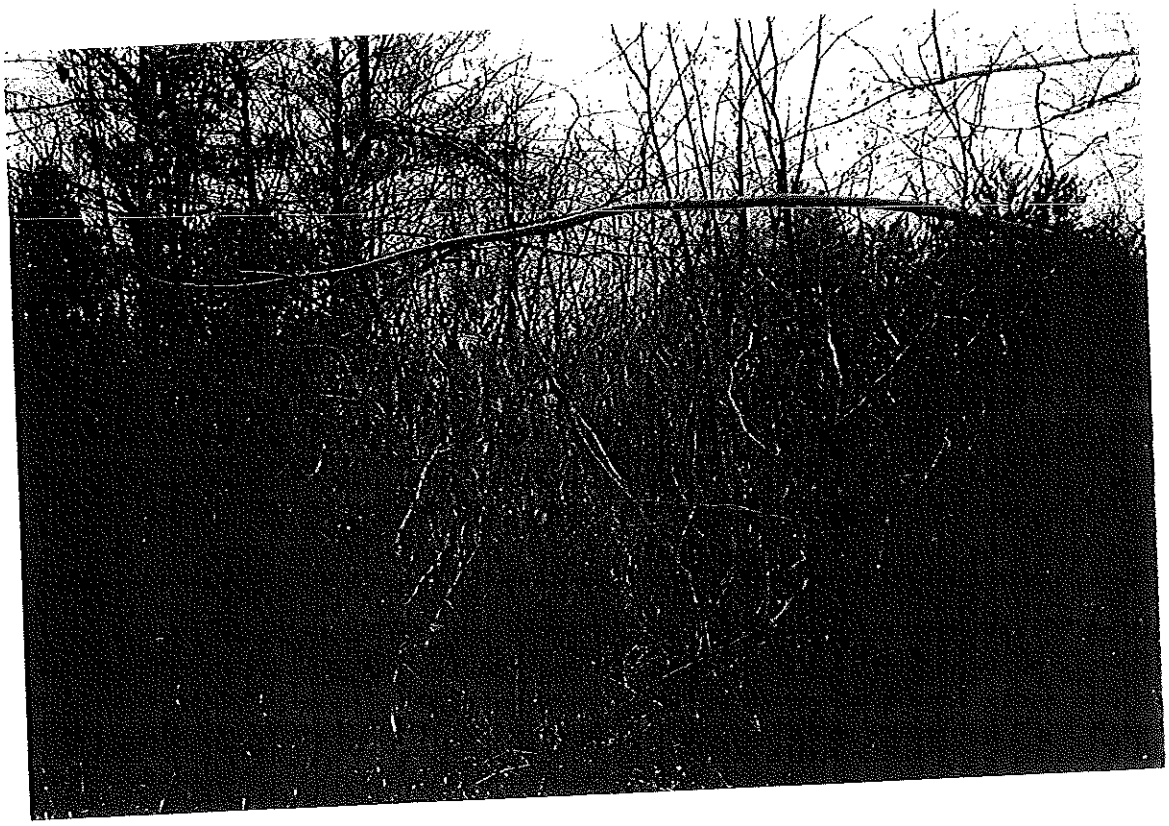


Figure 45: Wetland 12. This photograph shows the illegal dumping/fill of automobile tires in the wetland.

Figure 46: Wetland 12. This photograph shows a culvert that carries street runoff and sediment directly into the wetland.

med/high
(some degradation
soils?)

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 12 Size: 8 AC Date: 7/02 WEI Project # 01-066NH
Classification: PFO4E PSS1E
Film Roll #: 16 Photograph #: ~~[illegible]~~ S 6, 7, 8, 9 Aerial Photograph #: 55-5

Wetland Functions

Ties, SS, FO, inlet road runoff ~~[illegible]~~ sediment

Groundwater Recharge/Discharge potential

Principal Function

Geology
Restrictive layer present (y) n
Subsoil type mucky peat
Other geologic features deep organic
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n tree lines
Springs or seeps observed y (n)
Contains only inlet or outlet (y) n (Yes) No

Cu avail
H_2O cap.
mud perm.

Floodflow Alteration

Watershed Information
Land cover in catchment area? FO, SS, Res.
Watershed position H (M) L
Other catchment storage (y) n
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present (y) n

Cohas Br

Topographic Information
Topography of watershed sloping
Topography of wetland nearly level/gentle slope
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed (y) n roads, roof tops
Land uses downstream protected by this wetland (y) n (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution (y) n
Erosion/sedimentation observed (y) n behind houses where pools are drained
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n (Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present (y) n pockets
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n
(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity (H) M L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n (Yes) No

24 culvert
23 ferns
22 forested area
21

silt fence

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n — from pool drain
Steep bank y n
Stabilized Bank y n in most areas

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees few y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands upland island y n

Yes No

Buffer

Type FO, SS
Width 10' > 100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type homes draining pools into system causing erosion & addition of Cl⁻ pollution
buffer to Cohas

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size: — remove site fence to allow small mammal movements
— detention basin construction
— remove bus

bird watching

Educational/Scientific Value

Unique habitats/plant species y n
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

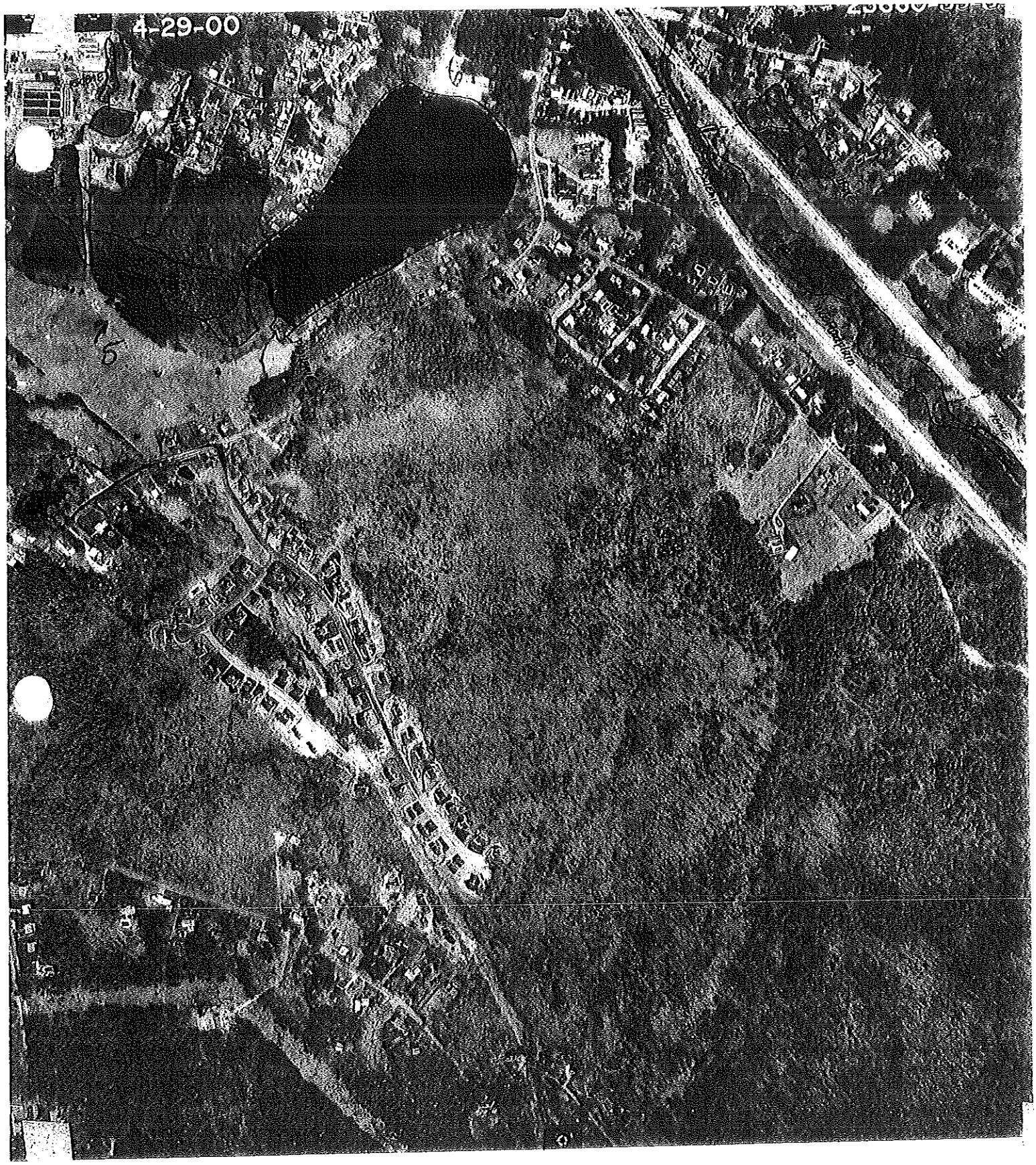
RM, HBBB, no arrowwood
WP, p. ivy, cin. royal fern, cattail
Dogwood, Sumac, Sedges

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n reptiles
Archaeological sites y n?
Stonewalls present y n
Historic sites y n?
Ecological health/vigor y n ~~moderate~~ fair (tires, sedimentation ~~erosion~~)
Value H M L

due to proximity of residential/urban area + reptiles.

Red maple	no arrowwood	grasses	sensitive fern
alder	maleberry	sedges	partridgeberry
elm	dogwood	rushes	Canada mayflower
winterberry	white pine	cin fern	


4-29-00

WETLAND 13

Figure 47: Wetland 13. This photograph shows the forested and scrub shrub component of this wetland. Notice the floodplain area associated with the stream.

Figure 48: Wetland 13. This photograph shows a constricted area of Cohas Brook. This photograph was taken by the Pumping Station on Old Cohas Avenue.

Figure 49: Wetland 13. This photograph shows the emergent and riverine component of this wetland. There is a small powerline that runs through the back portion of this wetland.

Figure 50: Wetland 13. This photograph shows the thick vegetation (background) of the emergent component and also shows the presence of purple loosestrife.

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 23 Size: [illegible] Date: 10/[illegible] WEI Project # 01-066NH
Classification: [illegible]
Film Roll #: 8 Photograph #: 7 - 13 - 14 Aerial Photograph #: [illegible]

Wetland Functions

Groundwater Recharge/Discharge — Principal Function

Geology
Restrictive layer present (y) n
Subsoil type [illegible]
Other geologic features
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n
Springs or seeps observed y (n)
Contains only inlet or outlet y n — (Yes) No

Floodflow Alteration

Watershed Information
Land cover in catchment area?
Watershed position H (M) L
Other catchment storage (y) n
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present (y) n

Topographic Information
Topography of watershed [illegible]
Topography of wetland [illegible]
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed (y) n
Land uses downstream protected by this wetland (y) n — (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

Setting & Hydrology
Upstream sources of pollution (y) n Highway
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n — (Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present (y) n Pond
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n — (Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion (H) M L
Diversity H M L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n — (Yes) No

Ag [illegible]
Arrow
Pond lily
[illegible]
[illegible]

aster
elm
asphodel
[illegible]
[illegible]

Red Oak
[illegible]

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

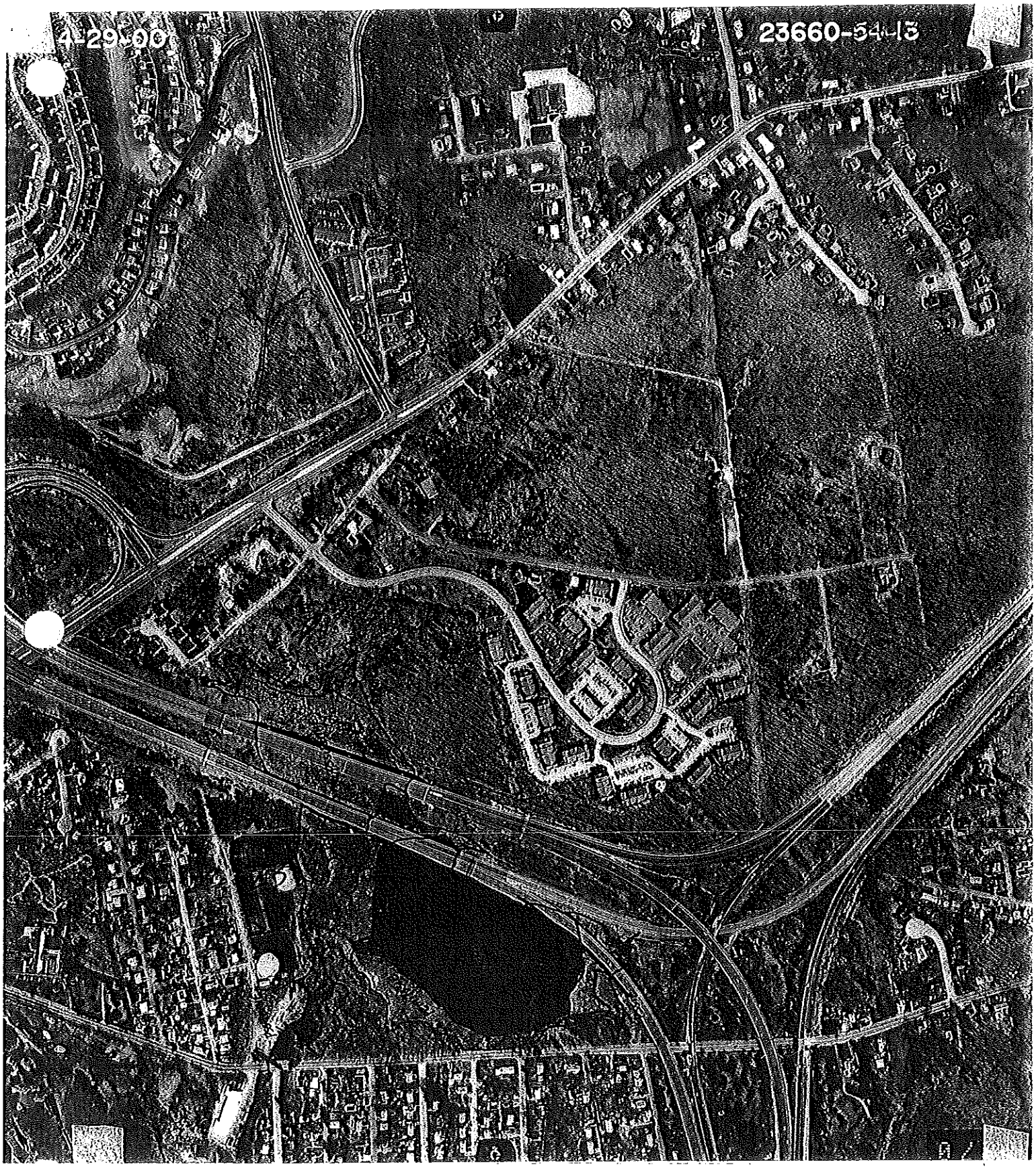
Buffer		Degradation	
Type	FO/SS	Present	y n
Width	~50	Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value		Restoration Stabilization Potential	
Parking available	y n		y n
Watercraft access	y n	Restoration area size:	
Fishing available	y n		
Hunting permitted	y n		
Walking/biking trails	y n		
Value	H M L		

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	
Diverse wildlife habitat	y n	
Parking/access	y n	
Value	H M L	

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n
Stonewalls present	y n
Historic sites	y n
Ecological health/vigor	y n
Value	H M L


4-29-00
23660-54-13

WETLAND 24

Figure 85: Wetland 24. This photograph shows the unconsolidated bottom, and emergent components of this wetland.

Figure 86: Wetland 24. This photograph shows the scrub shrub and forested parts of this wetland. There are several small snag trees on the right side of the photo. Purple loosestrife has invaded small areas of this wetland.

Connects to Stevens Pond

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 24 Size: 5AC Date: 11/02 WEI Project # 01-066NH
Classification: PFO1Ed PUBG PSS1/FOSE PSS1/EM1Eh PFO1Ad
Film Roll #: 16 Photograph #: -22 Aerial Photograph #: 54-11

Wetland Functions

~~Dry~~, EM, Snag
SS PUB backgrounds

Groundwater Recharge/Discharge

Potential

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	(y) n	Peat muck
Subsoil type	muckypeat	Variable water levels observed	(y) n	Gravel H2O cap ↑
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed	nearly level	
Watershed position	H M (L)	Topography of wetland	nearly level	
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n in area	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n PUB	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

- bittersweet invasives
- dirt pile at edge/boundary of wetland (Stevens)

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present (y) n
High seasonal flows (y) n
Channelized flow (y) n
Open water fetch y (n)

Function Present (y) n

Description of Bank

Bank present (y) n in some areas
Bank vegetated (y) n
Bank eroded y (n)
Steep bank y (n) low bank
Stabilized Bank (y) n

(Yes) No

Wildlife Habitat

Diversity

Aquatic insect habitat (y) n PUB
Amphibian habitat (y) n
Fisheries habitat (y) n
Cavity trees (y) n
Vernal pool y (n)
Defined stream channel (y) n
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor (y) n
Wetland connections (y) n
Upland connections (y) n
Islands (y) n

(Yes) No

Buffer

Type FO, SS
Width 25' — >100'
Buffer stream or wetland (y) n
Does buffer provide shade (y) n

Degradation

Present y (n)
Type

(Yes) No

Wetland Values

Recreational Value

Parking available y (n)
Watercraft access y (n)
Fishing available y (n)
Hunting permitted y (n)
Walking/biking trails y (n)
Value H M (L)

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

Unique habitats/plant species (y) n reptiles
Diverse wildlife habitat (y) n plants
Parking/access y (n)
Value H (M) L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species (y) n reptiles
Archaeological sites y n ?
Stonewalls present y (n)
Historic sites y n ?
Ecological health/vigor (y) n
Value (H) M L

due to reptiles plants + urban location
upland islands

4-29-00
23660-5-11

4-29-00
23660-54211

WETLAND 25

Figure 87: Wetland twenty five. This photograph shows the emergent and fringes of the scrub shrub wetland.

Figure 88: Wetland twenty five. This photograph shows the scrub shrub portion of this wetland and several large snag trees.

4-29-00
23660-56-11

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 25ABC Size: 1½ AC Date: 7/6 WEI Project # 01-066NH
Classification: ~~PEM1/SS1E~~ PEM1/SSIE, PUB/EMIF, PFO 1A
Film Roll #: 7 Photograph #: 21-24 Aerial Photograph #: 55-13 + 56-11

Wetland Functions

Snag SS, FO island

Groundwater Recharge/Discharge

Principal Function: Potential

Geology
Restrictive layer present (y) n
Subsoil type mucky peat/organic deep
Other geologic features
Function Present (y) n

Hydrology
Groundwater relationship present (y) n
Variable water levels observed (y) n
Springs or seeps observed y (n)
Contains only inlet or outlet y (n)
(Yes) No

mod. permeability
↑avail H_2O cap.
permeable
runs through back

Floodflow Alteration

Watershed Information
Land cover in catchment area?
Watershed position H (M) L
Other catchment storage (y) n
Watercourse associated (y) n
Contains hydric soils (y) n
Function Present (y) n

connects to Lake old Hill

Topographic Information
Topography of watershed nearly level
Topography of wetland nearly level
Constricted outlet (y) n
High degree of impervious surfaces in wetland watershed (y) n
Land uses downstream protected by this wetland (y) n
(Yes) No

Sediment/Toxicant/Pathogen Retention

Soils
Organic Soils (y) n in areas
Broad boundary transition (y) n
Vegetation
Herbaceous vegetation (y) n
Dense vegetation (y) n
Function Present (y) n

VPD
PD*

Setting & Hydrology
Upstream sources of pollution (y) n highway
Erosion/sedimentation observed y (n)
Difuse flow/slow moving water (y) n
Does wetland flood (y) n
Long water retention (y) n
(Yes) No

Nutrient Removal/Retention Transformation

Hydrology
Open water present y (n)
Slow moving water (y) n
Nutrients upslope (y) n
Function Present (y) n

Transformers
Organic soils (y) n
Aquatic vegetation (y) n
Abundant vegetation (y) n
(Yes) No

Production Export

Vegetation
Density (H) M L
Interspersion H (M) L
Diversity cattail H (M) L
Food source (y) n
Function Present (y) n

Export
Detritus (y) n
Aquatic plants (y) n
Berry producing shrubs (y) n
Nectar sources (y) n
Seed/mast sources (y) n
(Yes) No

* does not meet 50% hydric #1

Bald Hill Br. Lake

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n mud → low
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n helps diffuse flow into Lake
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

Buffer		Degradation	
Type	FO/SS	Present	y n
Width	10' – >100'	Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

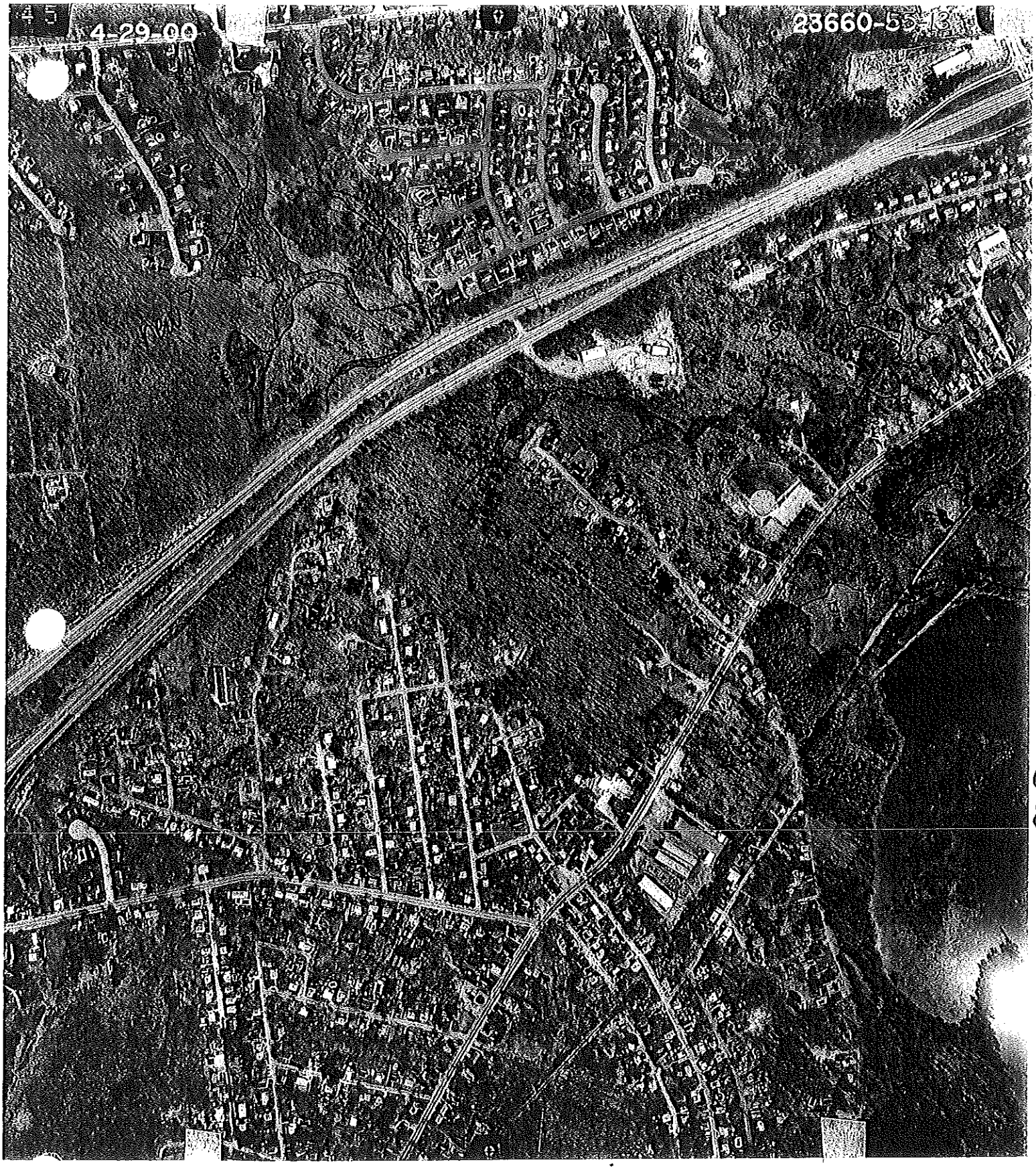
Recreational Value		Restoration Stabilization Potential	
Parking available	y n		y n
Watercraft access	y n	Restoration area size:	
Fishing available	y n		
Hunting permitted	y n		
Walking/biking trails	y n		
Value	H M L		

Youngsville Park

Birding

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	birds/reptiles
Diverse wildlife habitat	y n	
Parking/access	y n	Youngsville Park
Value	H M L	

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n birds/reptiles
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L due to birds/reptiles

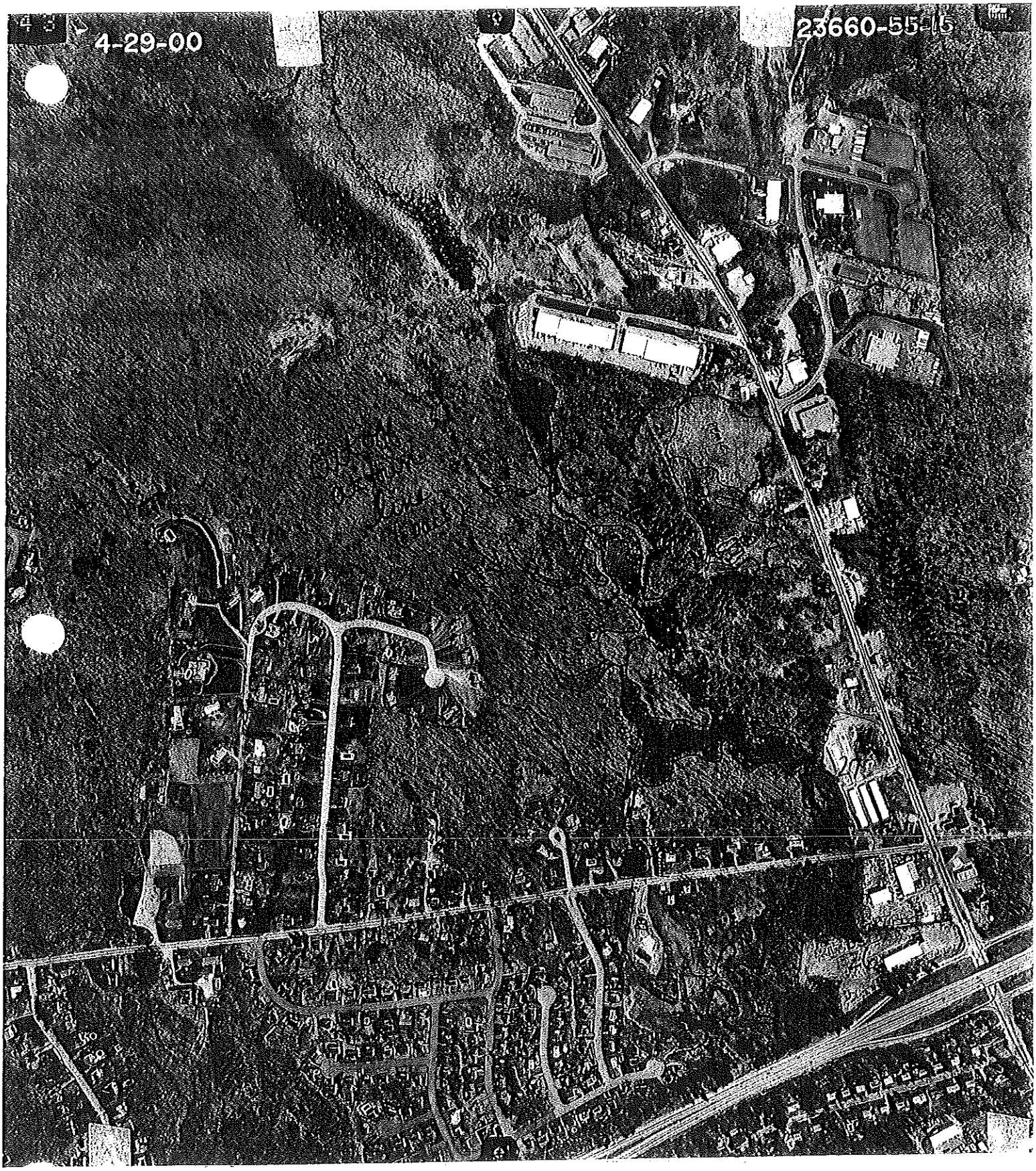


RDE 56-11

WETLAND 26

Figure 89: Wetland 26. This photograph shows the emergent, scrub shrub and forested components of this wetland.

Figure 90: This photograph shows fill in the forested part of the wetland. This fill is on the west side of wetland 26.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23660-55-15

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 26 Size: 3 Ac Date: 7/02 WEI Project # 01-066NH
Classification: PFO1E, PEM1/SS1E
Film Roll #: 7 Photograph #: 25, 21, 27 Aerial Photograph #: 55-15
4 5 6 7

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	
Subsoil type Sand		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? FO, SS, PAVE		Topography of watershed gently sloping		
Watershed position	(H) M L	Topography of wetland gently sloping		
Other catchment storage	(y) n	Constricted outlet	y (n)	
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	(y) n	moderate
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	Yes (No)
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y (n)	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

PO*

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y (n)	Organic soils	y (n)	uptake from veg.
Slow moving water	(y) n	Aquatic vegetation	y (n)	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	H (M) L	Detritus	(y) n	
Interspersion	H (M) L	Aquatic plants	y (n)	
Diversity	H (M) L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

moderate

* may not meet hydric A soil requirements

loosestrife
bittersweet
Buckthorn Olive (buffer)

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present	y n
High seasonal flows	y n
Channelized flow	y n
Open water fetch	y n
Function Present	y n

Description of Bank

Bank present	y n
Bank vegetated	y n
Bank eroded	y n
Steep bank	y n
Stabilized Bank	y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat	y n
Amphibian habitat	y n
Fisheries habitat	y n
Cavity trees	y n
Vernal pool	y n
Defined stream channel	y n
Food sources	y n
Cover/nesting sources	y n
Function Present	y n

Connections

Corridor	y n
Wetland connections	y n
Upland connections	y n
Islands	y n

small mammals + song bird habitat

Yes No

Buffer

Type FO, SS

Width 750'

Buffer stream or wetland y n

Does buffer provide shade y n

Degradation

Present y n

Type lawn clippings

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size: [illegible]

Educational/Scientific Value

Unique habitats/plant species	y n birds, reptiles
Diverse wildlife habitat	y n moderate
Parking/access	y n
Value	H M L due to unique spp's.

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n birds, reptiles
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L due to bird, reptiles

Cattails
HBBB
Cin fern
Royal Fern
sensitive fern
arrowwood
ironwood
elderberry
RM
white oak
sedges

Figure 91: Wetland 27. This photograph shows the open water of the unconsolidated bottom portion of the wetland as well as the emergent wetland.

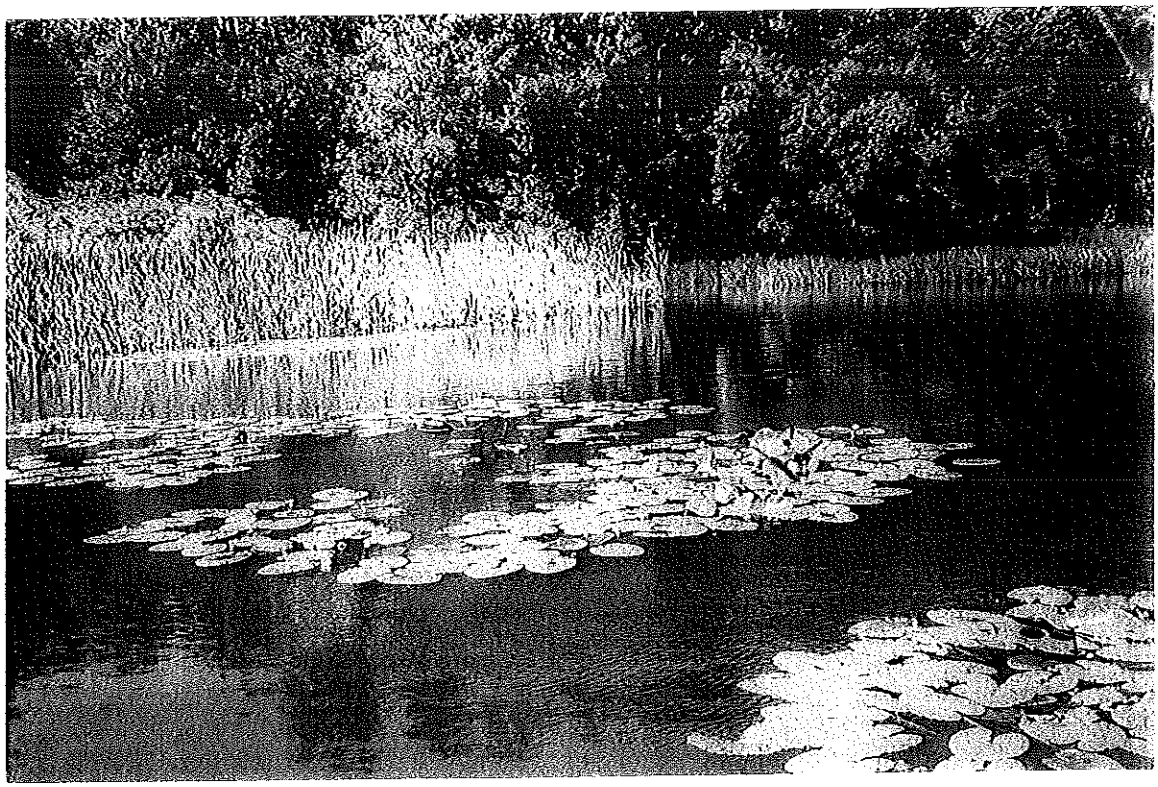


Figure 92: Wetland 27. This photograph shows fill along the shoreline of this wetland. This wetland runs along Wellington Road near the City line.

WETLAND 27

Figure 93: Wetland 27. This photograph shows the constricted outlet of this wetland. This culvert runs under Wellington road and connects this wetland to wetland twenty six.

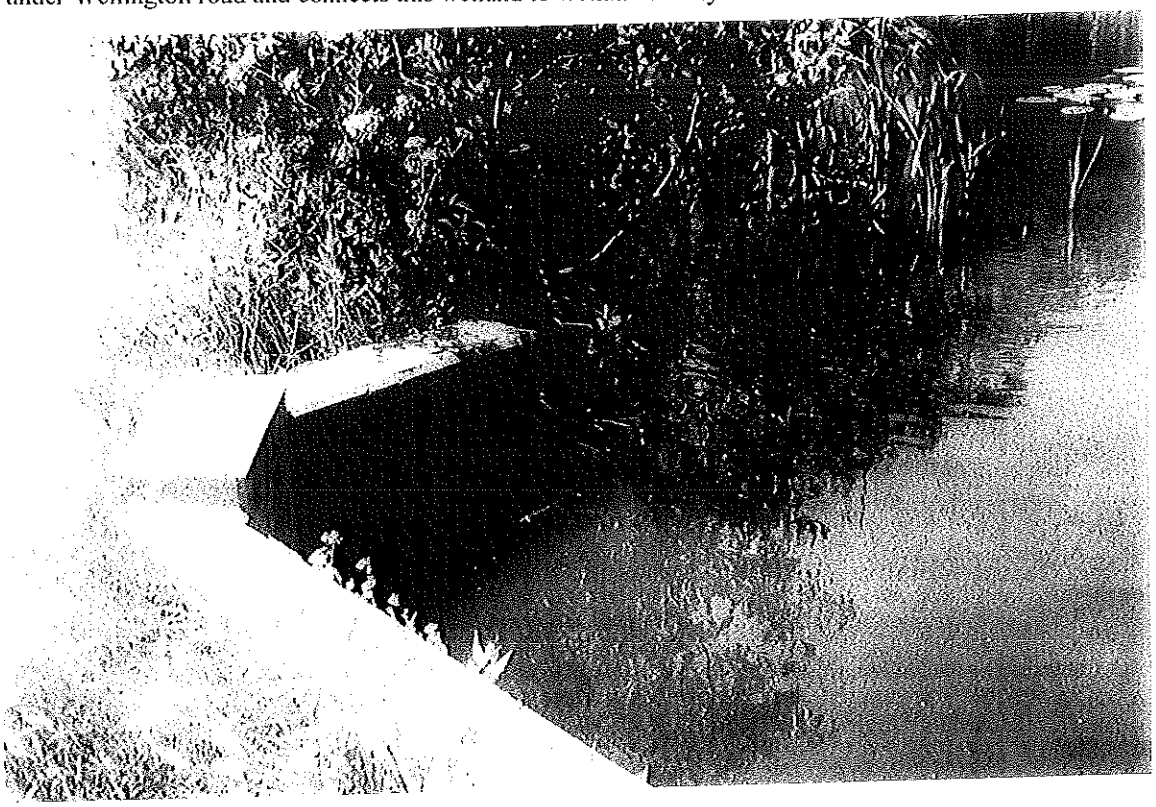


Figure 94: Wetland 27. This photograph shows the forested and scrub shrub component of this wetland.

high if meet [illegible]

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 27 Size: 3AC Date: 7/02 WEI Project # 01-066NH
Classification: PUB/FO5Fb, PSS/Fb, PEM1/FO1E
Film Roll #: Photograph #: Aerial Photograph #: 55-15

Wetland Functions

Groundwater Recharge/Discharge potential — **Principal Function**

Geology		Hydrology			
Restrictive layer present	(y) n	Groundwater relationship present	(y) n		
Subsoil type muck peat		Variable water levels observed	(y) n		
Other geologic features		Springs or seeps observed	y (n)		
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes)	No

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area? FO, SS, Rock		Topography of watershed gently sloping			
Watershed position	(H) M L	Topography of wetland gently sloping			
Other catchment storage	(y) n	Constricted outlet	(y) n		
Watercourse associated	(y) n upstream	High degree of impervious surfaces in wetland watershed	(y) n moderate		
Contains hydric soils	(y) n				
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes)	No

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	(y) n	Upstream sources of pollution	(y) n		
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)		
Vegetation		Difuse flow/slow moving water	(y) n		
Herbaceous vegetation	(y) n	Does wetland flood	(y) n		
Dense vegetation	(y) n	Long water retention	(y) n	(Yes)	No
Function Present	(y) n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	(y) n	Organic soils	(y) n		
Slow moving water	(y) n	Aquatic vegetation	(y) n		
Nutrients upslope	(y) n	Abundant vegetation	(y) n		
Function Present	(y) n			(Yes)	No

Production Export

Vegetation		Export			
Density	(H) M L	Detritus	(y) n		
Interspersion	(H) M L	Aquatic plants	(y) n		
Diversity	(H) M L	Berry producing shrubs	(y) n		
Food source	(y) n	Nectar sources	(y) n		
Function Present	(y) n	Seed/mast sources	(y) n	(Yes)	No

Jewelweed
Cattail
soft rush
lilypads
elderberry
Mo. arrowwood
winterberry
Cinn fern

can. mayflower mayflower
sphagnum
RM
W. Oak
Red Oak
W. pine
hemlock

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	(y) n gentle	Bank present	(y) n in areas
High seasonal flows	(y) n	Bank vegetated	(y) n
Channelized flow	(y) n upstream	Bank eroded	y (n)
Open water fetch	y (n)	Steep bank	y (n)
		Stabilized Bank	(y) n
Function Present	(y) n		

(Yes) No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	(y) n	Corridor	(y) n
Amphibian habitat	(y) n	Wetland connections	(y) n
Fisheries habitat	y (n)	Upland connections	(y) n
Cavity trees	(y) n few	Islands	(y) n
Vernal pool	y (n)		
Defined stream channel	(y) n upstream		
Food sources	(y) n		
Cover/nesting sources	(y) n		
Function Present	(y) n		

(Yes) No

Buffer

Type FO, SS, road

Width 0 → >100'

Buffer stream or wetland (y) n

Does buffer provide shade (y) n

Degradation

Present (y) n

Type homeowner landscaped (see photos) to side of PUB area. (Yes) No

roadside runoff - no buffer

Wetland Values

Recreational Value

Parking available commercial (y) n

Watercraft access y (n)

Fishing available y (n)

Hunting permitted (y) n

Walking/biking trails y (n)

Value H (M) L

Restoration Stabilization Potential

(y) n

Restoration area size: 1000 sq ft

landscaped area & create narrow vegetated buffer area along road

Educational/Scientific Value

Unique habitats/plant species (y) n

Diverse wildlife habitat (y) n

Parking/access commercial (y) n

Value (H) M L

Comments/Wildlife Notes

birds, reptiles

due to birds/reptiles

Uniqueness/Heritage

Urban upland/proximity (y) n

Rapid development upland (y) n

Critical habitat/threatened or endangered species (y) n

Archaeological sites y n ?

Stonewalls present y (n)

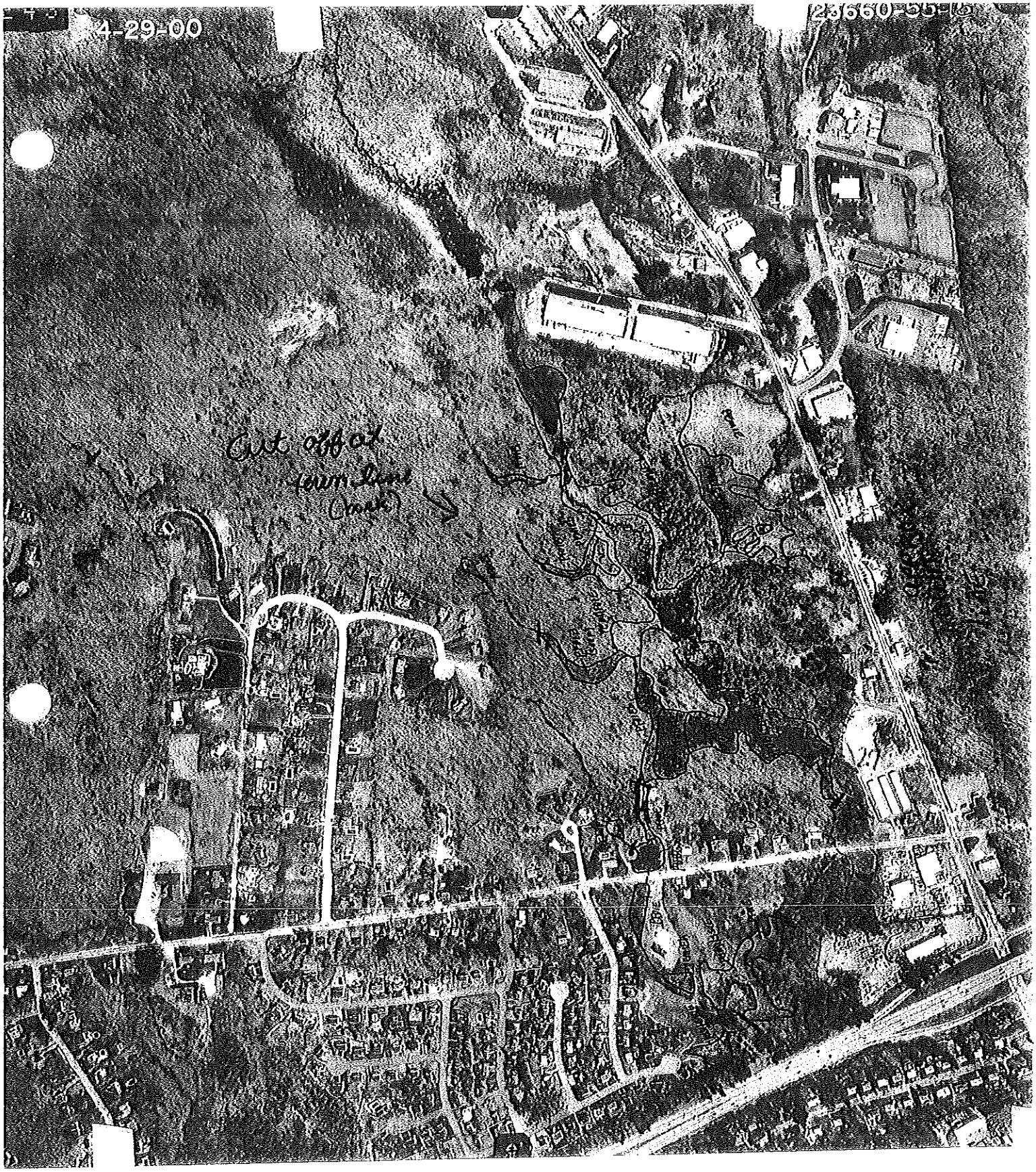
Historic sites y n ?

Ecological health/vigor (y) n

Value (H) (M) L

nice mixture wetland types

some degradation (road)


4-29-00
23660-55-15
Cut off at
town line
(mark)

WETLAND 28

Figure 95: Wetland 28. This photograph shows the Dorr's Pond wetland. The fringes of the pond are emergent/ scrub shrub wetland areas.

Figure 96: Wetland 28. This photograph shows an inlet to the Pond. This inlet carries water from the upland street(s) runoff which can include road salt, gasoline, antifreeze, oil and other chemicals. This is a source of pollution to the water.

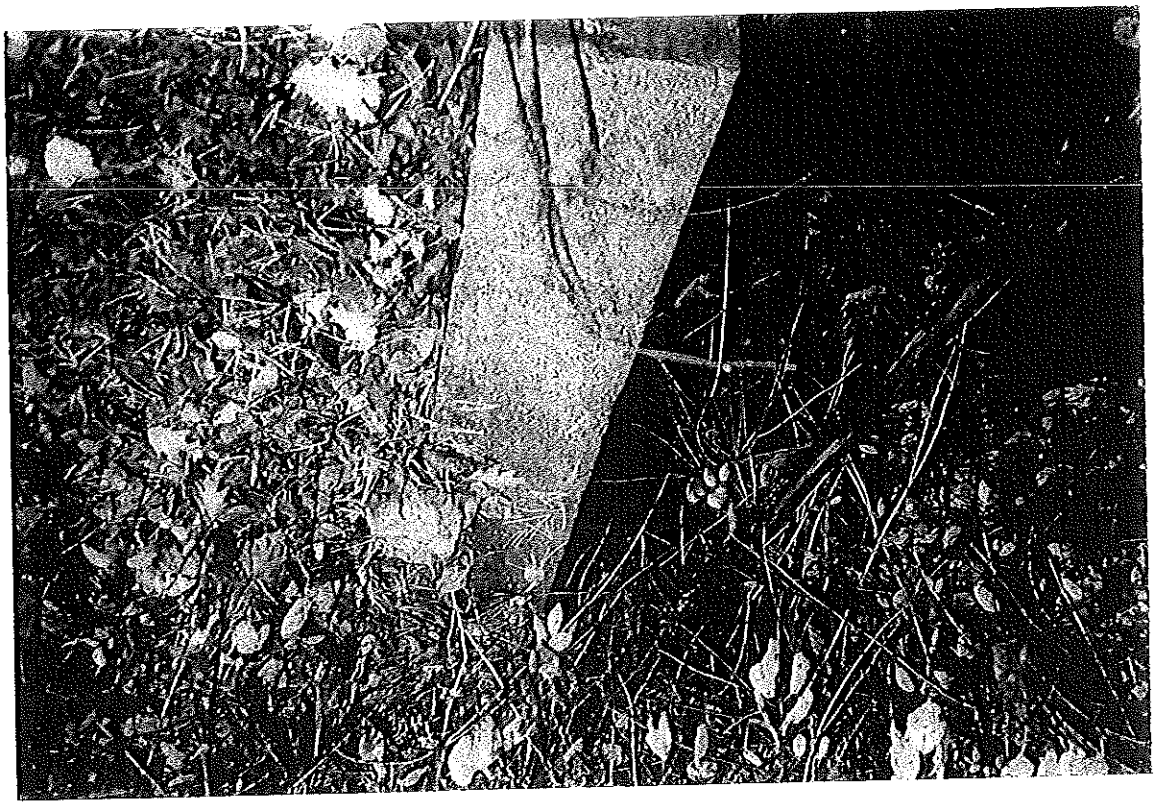
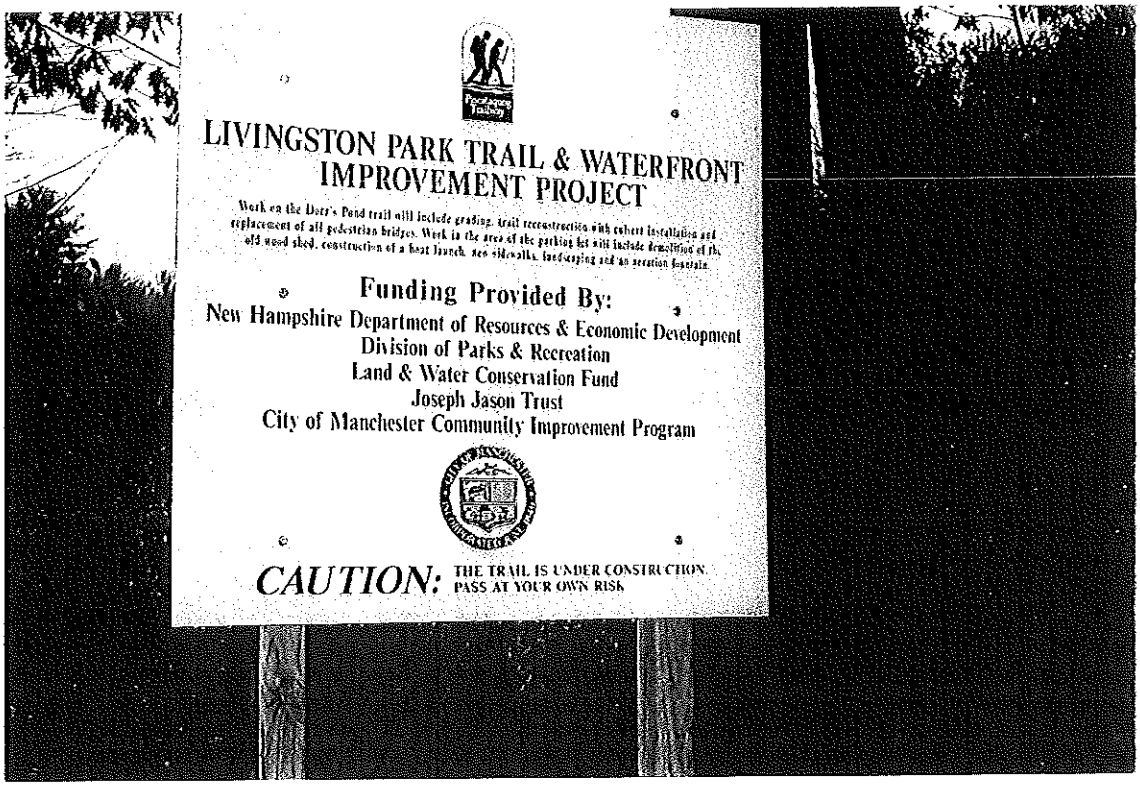


Figure 97: Wetland 28. This photograph shows the invasive species, purple loosestrife. There were only a few purple loosestrife plants seen at this site.

Figure 98: Wetland 28. This is the sign indicating the presence of a trail system (proposed) to go around the pond and wetland areas. It is important that all future construction around the pond use Best Management Practices in erosion control and soil stabilization.



Livingston Park + Trail
Doris Pond

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

no aerial available

Wetland ID: 28 Size: 8 AC Date: 11/02 WEI Project # 01-066NH
Classification: Emergent Pond PUBH, PEM1E, PSS1E
Film Roll #: 16 Photograph #: 23, 24 Aerial Photograph #: no aerial photo

inlet culvert, Pond, P. loosestrife sign

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	Permis rapid avail H2O cap low
Subsoil type sand		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed nearly level		
Watershed position	H M (L)	Topography of wetland nearly level		
Other catchment storage	y (n)	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n			
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n in areas	Erosion/sedimentation observed	y (n)	Ponded
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

aquatic & shoreline

Vegetation		Export		
Density	H (M) L	Detritus	(y) n	
Interspersion	H (M) L	Aquatic plants	(y) n	
Diversity	H (M) L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

invasives
purple loosestrife

Red Maple
Red Oak
White Oak
Hemlock
white pine
grey birch

alder
cattail
loosestrife
No. arrowwood
witch hazel

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent Pond

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n urban	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

Buffer		Degradation	
Type	FO, SS, lawn	Present	y n
Width	25' – >75'	Type	dumping leaves
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value

Parking available	limited y n
Watercraft access	canoe y n
Fishing available	warmspp y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

- trash basins
- swales

birding
canoeing
walking

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n moderate
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

due to urban location

WETLAND 29

Figure 99: Wetland 29. This photograph shows the unconsolidated bottom, emergent and scrub shrub portions of this wetland.

Figure 100: Wetland 29. This photograph shows areas with minimal wetland buffer, such as around fairway one of Intervale Country Club.

Figure 101: Wetland 29. This photograph shows the constricted outlet of this system. This wetland is connected via this culvert to the Merrimack River.

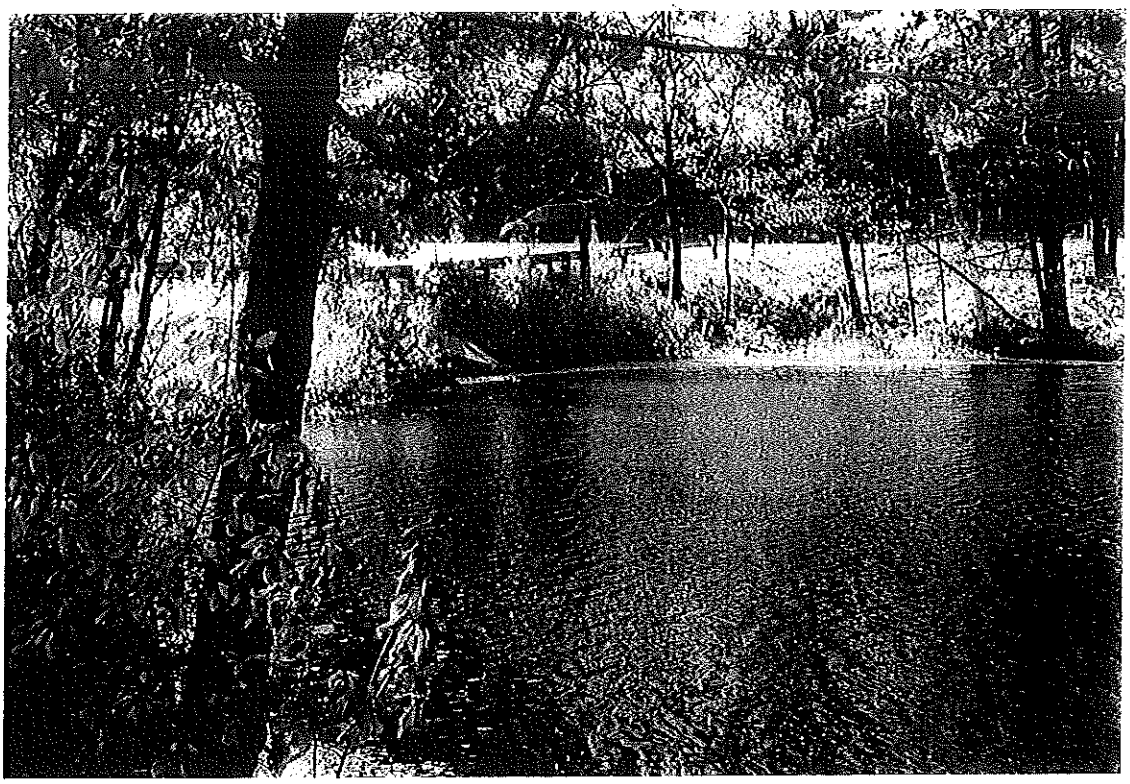


Figure 102: Wetland 29. This photograph shows the inlet stream, Milestone Brook and associated flood plain area and forested wetland.

Connects w/ Merrimack River

golf course

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 29 Size: Date: 10/02 WEI Project # 01-066NH
Classification: ~~PSS~~ PFO1/SS1E PUBH PEM1
Film Roll #: 10 Photograph #: 1—~~8~~ 9 Aerial Photograph #: 40-43
PUB, SS, FO, floodplain stream (d)

Wetland Functions

Groundwater Recharge/Discharge

Potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	Perm - mod - rap.
Subsoil type silty loam		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	Yes No

avail H_2O cap ↑

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? golf course FO, road		Topography of watershed gentle sloping		
Watershed position	H M (L)	Topography of wetland nearly level		
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n			
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No

Sediment/Toxicant/Pathogen Retention

* Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	golf course/road
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

* Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

RM, elm, alder, Buckthorn
hay scented fern hemlock
silky dogwood w. pine
cubol grass

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop) Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n in areas
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n warm water species
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n — small pockets
Upland connections y n
Islands y n

saw mallards ~6 birds

small mammal
reptiles
Seng birds

Yes No

Buffer

Type FO, SS, lawn
Width 5' → 7.5'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type golf course (hole 1)

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size:

near hole 1
possible planting
of buffer shrubs

~~navigation~~ ~~shrub~~ along

Educational/Scientific Value

Unique habitats/plant species y n plant
Diverse wildlife habitat y n small mammals
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

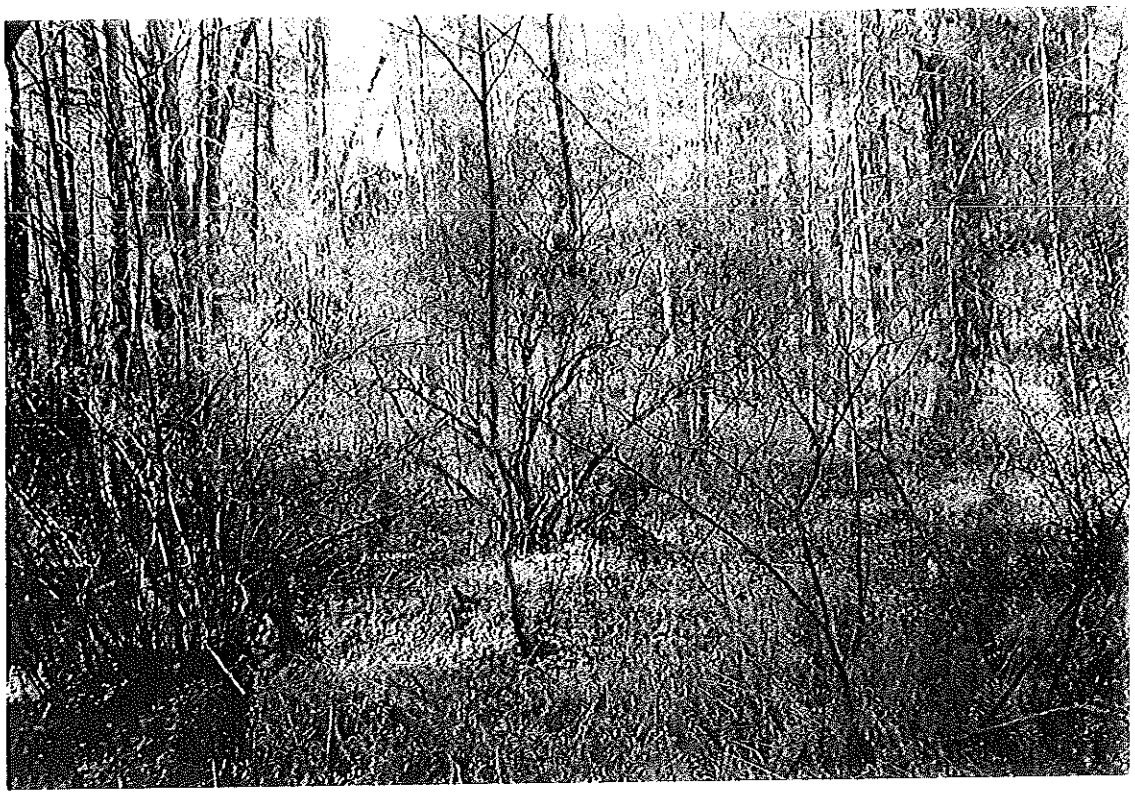
Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n plants
Archaeological sites y n ?
Stonewalls present y n
Historic sites y n ?
Ecological health/vigor y n
Value H M L

4-30-00
23660-40-45

WETLAND 30

Figure 103: This photograph of wetland thirty shows the open water, emergent and scrub shrub components of this wetland. This wetland is hydrologically impounded by a dam.

Figure 104: This photograph shows the scrub shrub understory. This area of wetland thirty has many berry producing shrubs.



high Hackett Hill UNH Campus

Milestone Br

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Portions are protected by Nature Conc.

Wetland ID: 30AB Size: 0.4AC Date: 10/02 WEI Project # 01-066NH
Classification: PFO1E PUB/EM1Fb PSS1/EM1Eb
Film Roll #: 13 Photograph #: ~~[illegible]~~ 24/End roll Aerial Photograph #: 40-45

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	
Subsoil type Sand		Variable water levels observed	(y) n	↑ Permeability
Other geologic features		Springs or seeps observed	y (n)	↓ avail H_2O cap
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? Fo Some Res		Topography of watershed sloping		
Watershed position	H (M) L	Topography of wetland gently sloping		See photograph
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n Milestone Br.	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	Yes (No)
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention (Potential)

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	unit lot
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	run off
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	Yes (No)
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n potential	Abundant vegetation	(y) n	
Function Present	(y) n unit lots + residential runoff			Yes (No)

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	Yes (No)

RM
W. oak
W. pine
Alder
Cattail
Willows

rushes
witch hazel
black cherry
grey birch

Cin fern
royal fern
silky dogwood
purple loosestrife (in small areas along edge)

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n warm
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n

Yes No

Buffer

Type FO
Width >100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present parking y n'
Type lot runoff from UNH

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n

Restoration area size:

vegetated stone swale from UNH parking lot

Educational/Scientific Value

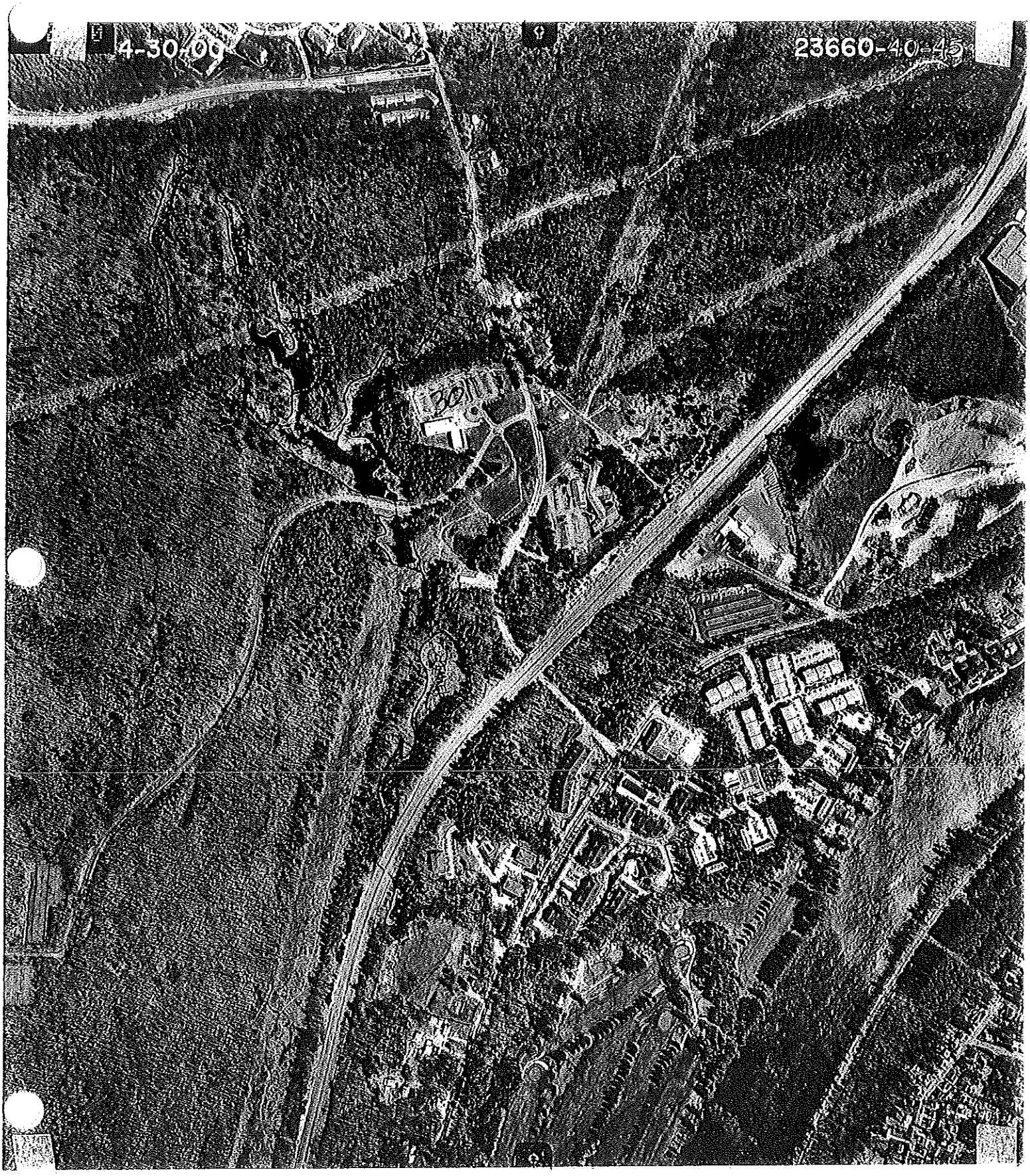
Unique habitats/plant species y n Rhodo ~~[illegible]~~
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n
Archaeological sites y n ?
Stonewalls present y n ?
Historic sites y n ?
Ecological health/vigor y n
Value H M L

Protected land by Nature Conservancy


4-30-09
23660-40-45
30

WETLAND 31

Figure 105: This photograph of wetland 31 shows a Blue Heron rookery within this wetland. Eleven large nests were seen.

Figure 106: This photograph of wetland 31shows the open water, snags and the beaver dam in the background. This wetland is a diverse wetland that supports wildlife such as waterfowl, aquatic mammals, and amphibians.

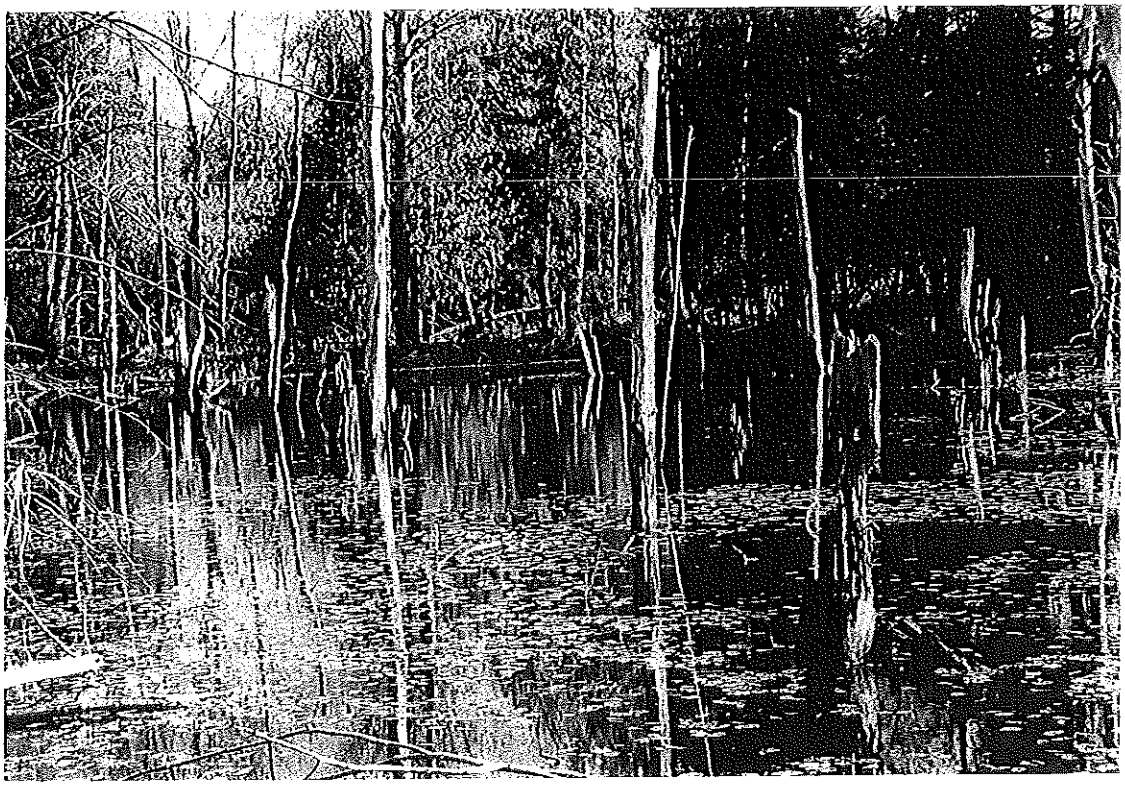
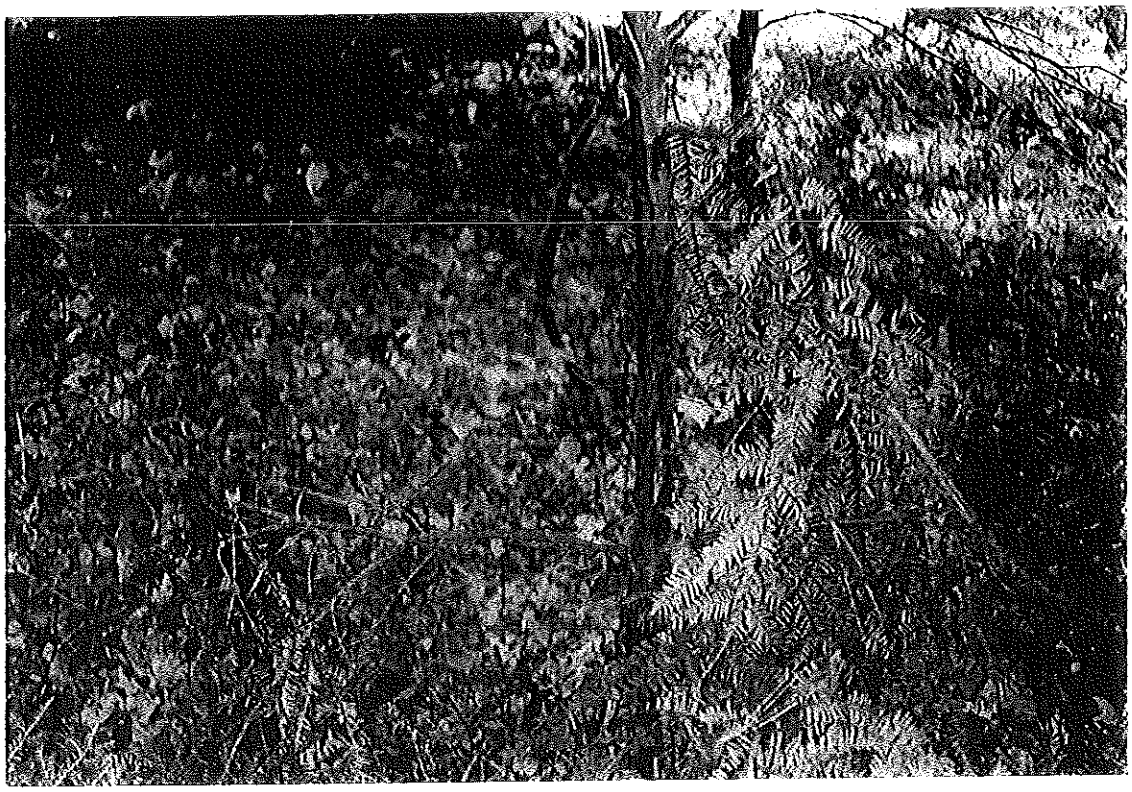


Figure 107: This photograph shows recent gnawing activity of beaver (wetland 31).

Figure 108: This photograph shows a recent antler rub area of a male deer. This photograph was taken in the buffer area adjacent to wetland 31.



high functioning wetland
heron rookery

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 31 Size: large 30c Date: 10/02 WEI Project # 01-066NH
Classification: PFO5F6, PFO5/EM1Fb PFO5/EM1Fb
Film Roll #: 10 Photograph #: 10? - 24 Aerial Photograph #: 39-41

Wetland Functions

Groundwater Recharge/Discharge Potential

				Principal Function
Geology		**Hydrology**		
Restrictive layer present	(y) n	Groundwater relationship present	(y) n	mod perm.
Subsoil type		Variable water levels observed	(y) n	↑ avail H_2O ccp
Other geologic features	boulder outcrops	Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) No

Floodflow Alteration

Watershed Information		**Topographic Information**		
Land cover in catchment area? FD		Topography of watershed	sloping	
Watershed position	(H) M L	Topography of wetland	gentle slope	
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	woods (y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		**Setting & Hydrology**		
Organic Soils	(y) n	Upstream sources of pollution	y (n)	
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	Yes (No)
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		**Transformers**		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	y (n)	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		**Export**		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

Photos
moose scat
deer scat
nests
old, new > beaver

length w.l.
wool grass emerg.
deer scrapes
antlers

red maple
witch hazel
white oak
beech
HBBB
l.B BB
iris

sphagnum
mt. laurel
dwarf wk

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Function Present y n

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n warm H_2O
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n

- saw several large bird nests / blue heron rookery (all photos)
- beaver activity tree scrape
- deer/moose scat

Yes No

Buffer

Type FO
Width 7100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n potential birdwatching/hunting
Value H M L

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

Unique habitats/plant species y n plant
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

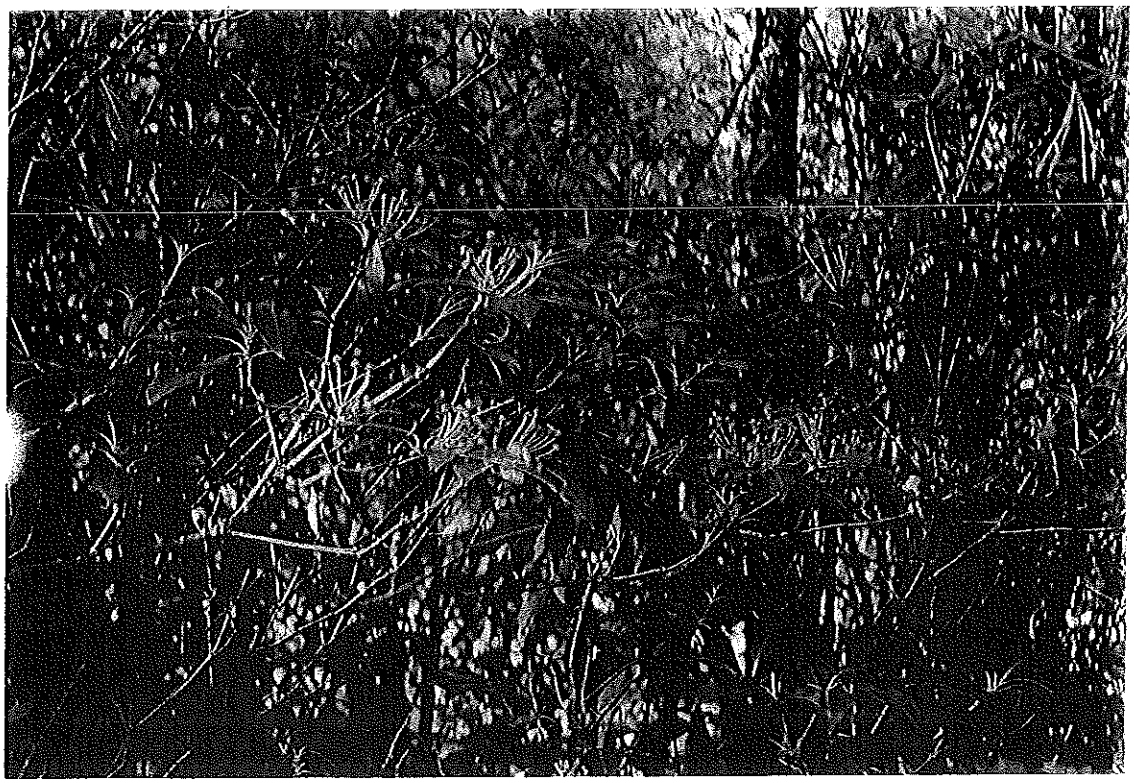
Urban upland/proximity y n
Rapid development upland y n see photographs
Critical habitat/threatened or endangered species y n plants
Archaeological sites y n ?
Stonewalls present y n
Historic sites y n ?
Ecological health/vigor y n
Value H M L

4-30-00
23660-39-41

WETLAND 32

Figure 109: This photograph shows a large stand of mature Alantic white cedars with Laurels in the understory of wetland 32. This area also has several Black gum trees. Atlantic white cedar and Black gum are an uncommon species in New Hampshire.

Figure 110: This photograph shows a Laurel bush in wetland 32. There were several of these under the cedars and in many parts of this wetland. Laurel is an indicator species for an acidic soil environment.



high
cedars
blackgum
laurel

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 32 Size: 3 AC Date: 11/02 WEI Project # 01-066NH
Classification: PFO4E PFO1E PFO1/4E
Film Roll #: 11 Photograph #: Aerial Photograph #: 39-41

may not meet 50% but is exemplary cedar stand

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function	
Restrictive layer present	y n	Groundwater relationship present	y n		
Subsoil type		Variable water levels observed	y n		
Other geologic features		Springs or seeps observed	y n		
Function Present	y n	Contains only inlet or outlet	y n	Yes	No

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area?		Topography of watershed	sloping		
Watershed position	H M L	Topography of wetland	gently sloping		
Other catchment storage	y n	Constricted outlet	y n		
Watercourse associated	y n	High degree of impervious surfaces in wetland watershed	y n		
Contains hydric soils	y n	Land uses downstream protected by this wetland	y n	Yes	No
Function Present	y n				

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	y n	Upstream sources of pollution	y n		
Broad boundary transition	y n	Erosion/sedimentation observed	y n		
Vegetation		Difuse flow/slow moving water	y n		
Herbaceous vegetation	y n	Does wetland flood	y n portions		
Dense vegetation	y n	Long water retention	y n	Yes	No
Function Present	y n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	y n	Organic soils	y n		
Slow moving water	y n	Aquatic vegetation	y n		
Nutrients upslope	y n	Abundant vegetation	y n		
Function Present	y n			Yes	No

Production Export

Vegetation		Export			
Density	H M L	Detritus	y n		
Interspersion	H M L	Aquatic plants	y n		
Diversity	H M L	Berry producing shrubs	y n		
Food source	y n	Nectar sources	y n		
Function Present	y n	Seed/mast sources	y n	Yes	No

* Laurel
* ~~Alnus~~.
* blackgum
* cedar
hemlock
red oak.
white oak.

winterberry
beech
HBBB
W. Pine

cinfern
sphagnum
RM
partridge berry

snags
trails
moose scat

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

Buffer		Degradation	
Type	RO	Present	y n
Width	>100'	Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value		Restoration Stabilization Potential
Parking available	y n	y n
Watercraft access	y n	Restoration area size:
Fishing available	y n	
Hunting permitted	y n	hiking
Walking/biking trails	y n	
Value	H M L	

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	
Diverse wildlife habitat	y n	cedar
Parking/access	y n	blackgum
Value	H M L	rhodo

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n see photograph
Critical habitat/threatened or endangered species	y n cedar,
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

WETLAND 33

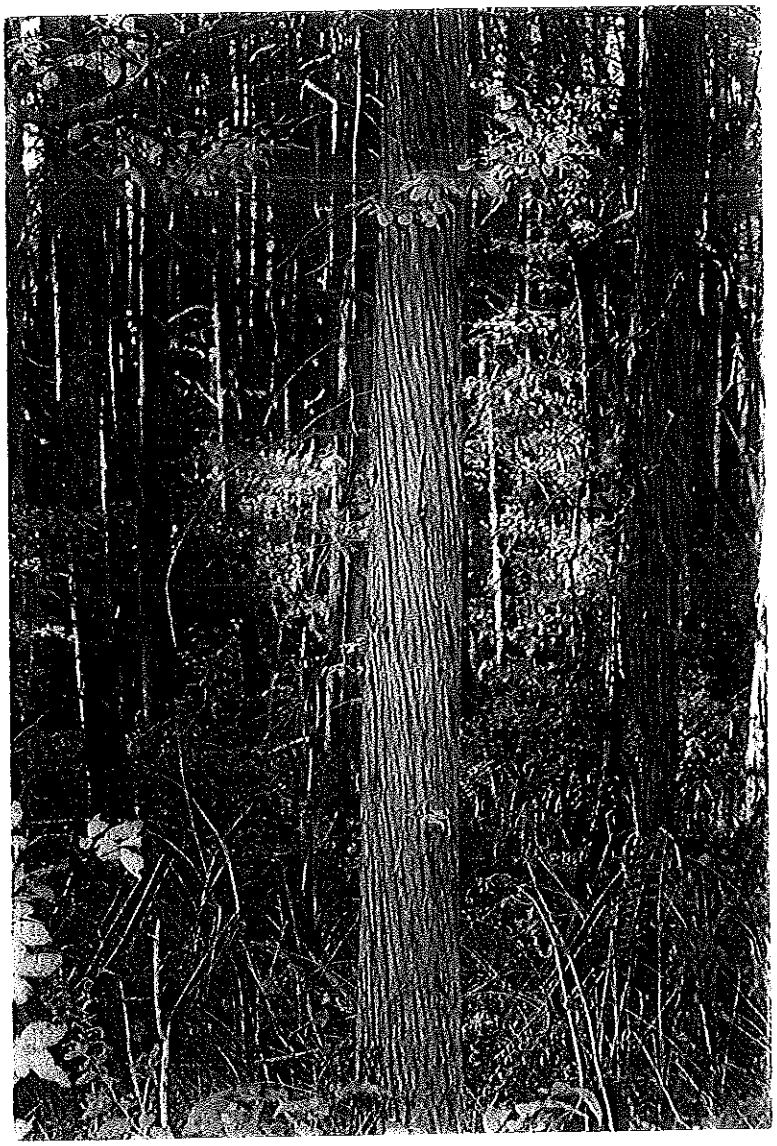


Figure 111: This photograph of wetland 33 shows a dense stand of Atlantic White Cedars with a thick vegetated understory. This is considered a rare plant community for this area of New Hampshire.

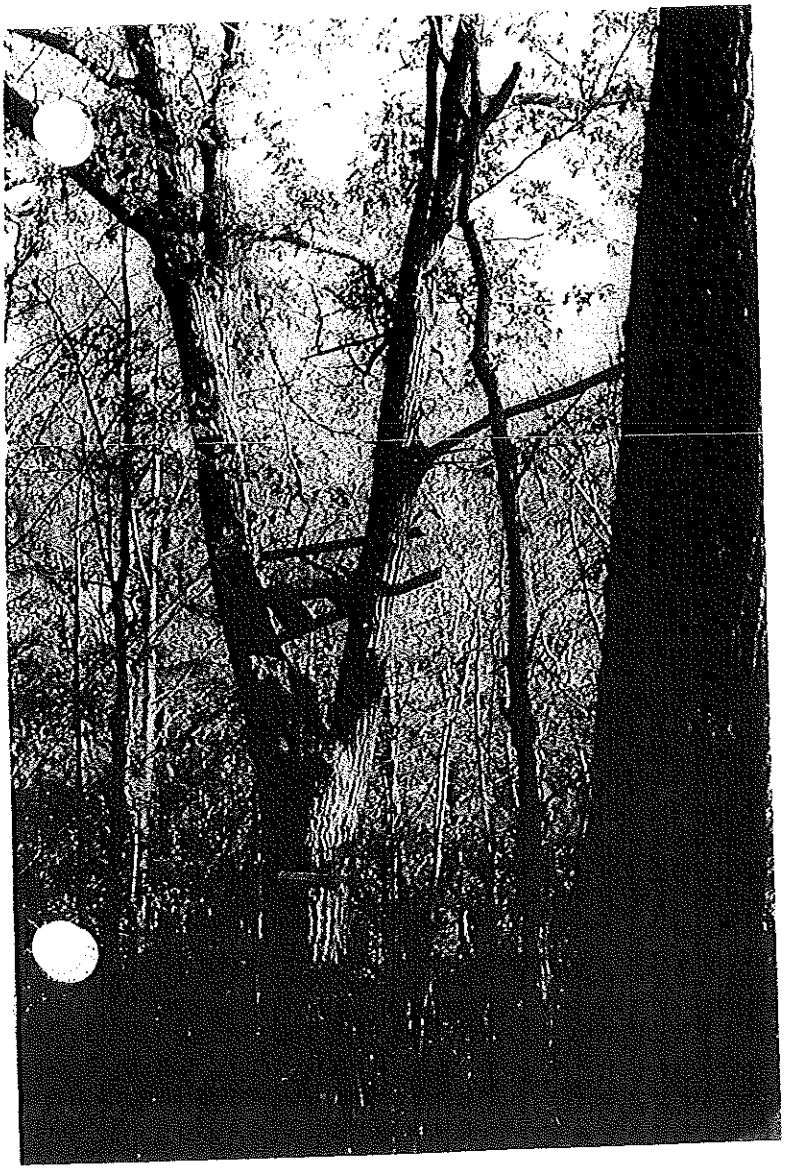


Figure 112: This photograph shows a deer stand in a white oak tree. This area has many mast producing white oaks which provide food for deer and other mammals.

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 33 Size: 3 AC Date: 11/02 WEI Project # 01-066NH
Classification: PFO4B PFO1E ~~PEM1/SS1B~~ Aerial Photograph #: 39-41
Film Roll #: 11 Photograph #: 18 - 24

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	(y) n	mod perm.
Subsoil type	mucky peat	Variable water levels observed	(y) n	↑ avail H_2O cap.
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed	sloping	
Watershed position	(H) M L	Topography of wetland	~~gent~~ mostly level	
Other catchment storage	(y) n	Constricted outlet	y (n)	
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	y (n)	Yes (No)
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention potential

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	construction (see photos wetland 31)
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n underground	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n in places	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y (n)	Organic soils	(y) n	tree uptake
Slow moving water	(y) n underground	Aquatic vegetation	y (n)	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	y (n)	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

33 connected to 32 + 34 under power line
Blackgum (old/big)
dense cedar community / large rhododendron
white oak
Hemlock
WP
red oak
HBBB
Cin fern
part. berry
RM
gold thread

Pictures
Seat
tree stand
Oak
cedar
cedar bark

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n see wetland 34 under powerline		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

Buffer		Degradation	
Type FO		Present	y n
Width >100'		Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

hunting
birding
walking

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

nice cedar / blackgum commu.

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n see photos from 31
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n ?
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

WETLAND 34

Figure 113: This photograph shows the forested wetland 34 with many mast producing trees and a thick vegetated understory. The understory has many berry producing shrubs.

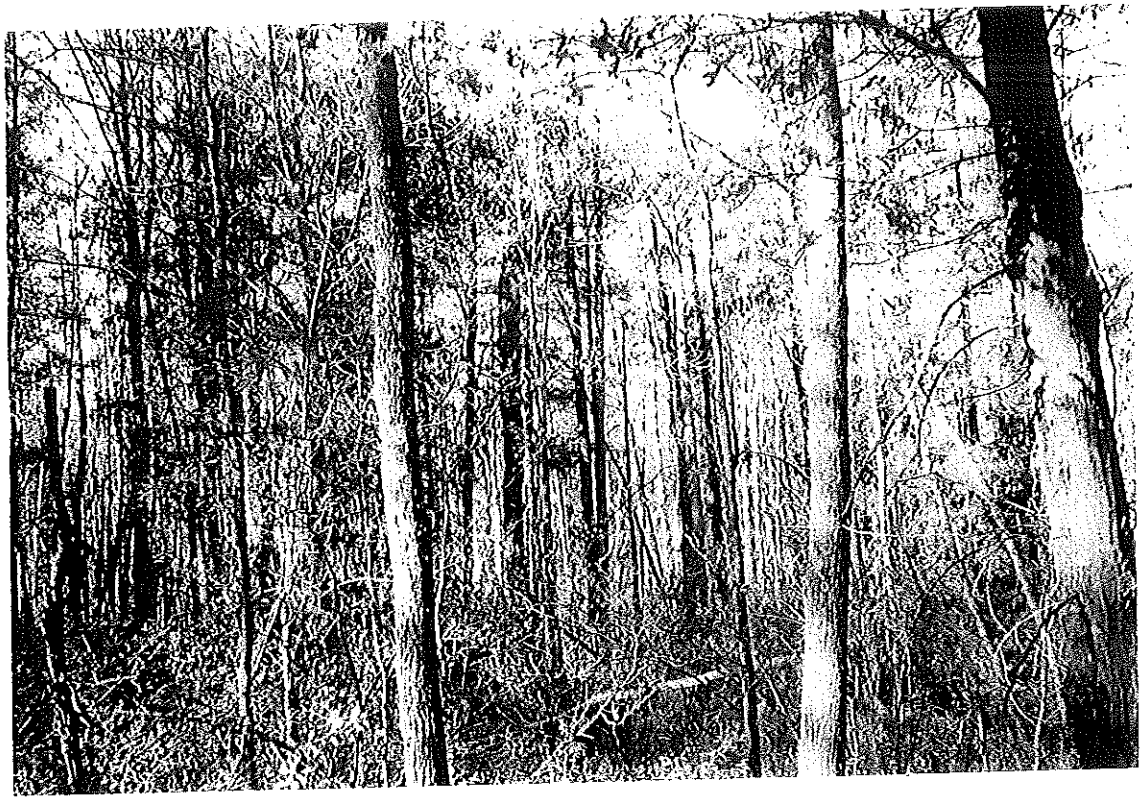
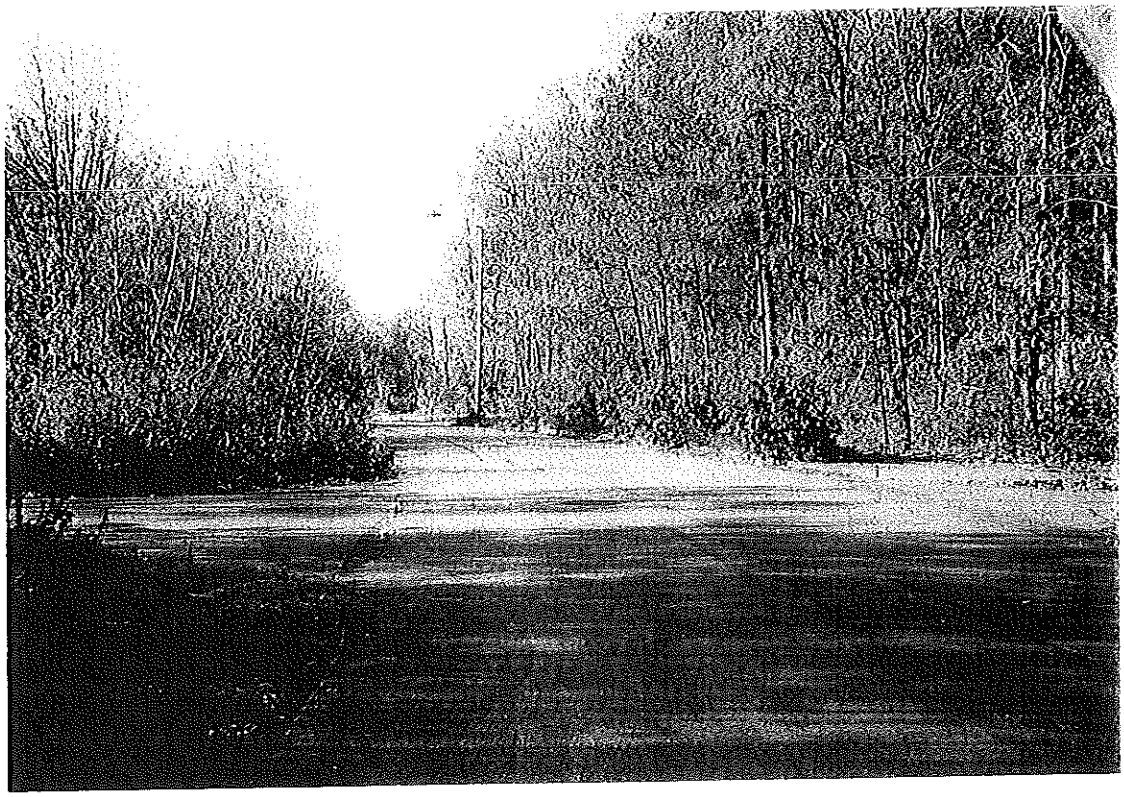


Figure 114: This photograph is of the surrounding upland area of wetland 34. The upland area adjacent to this wetland has road and electric infrastructure present. This infrastructure puts this adjacent area at risk for development. Most of this upland area drains into the wetland.



rhodo. wetland

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 39 Size: .5 AC Date: 10/02 WEI Project # 01-066NH
Classification: PFO4B P401/4B PEM1/SS1B
Film Roll #: 14 Photograph #: -25 Aerial Photograph #: 38-39
also see photos for wetland 33 (vernal pool area)

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	(y) (n)	could be recharge
Subsoil type Sandy loam		Variable water levels observed	(y) (n)	
Other geologic features rock outcrops		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	(y) n	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information	
Land cover in catchment area? FO		Topography of watershed Sloping	
Watershed position	(H) M L	Topography of wetland sloping	
Other catchment storage	(y) n	Constricted outlet	(y) n
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	y (n)
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	y (n) Yes (No)
Function Present	(y) n		

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology	
Organic Soils	y (n)	Upstream sources of pollution	y (n)
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)
Vegetation		Difuse flow/slow moving water	y (n)
Herbaceous vegetation	(y) n	Does wetland flood	(y) n in a few places
Dense vegetation	(y) n	Long water retention	y (n) Yes (No)
Function Present	(y) n		

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y (n)	Organic soils	(y) n	tree nutrient uptake
Slow moving water	(y) n ground	Aquatic vegetation	y (n)	
Nutrients upslope	y (n)	Abundant vegetation	(y) n	
Function Present	(y) n			Yes (No)

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	y (n)	
Diversity	H (M) L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

Potential vernal pool under power line near 53

rhodo.
red oak
white oak
RM
cin berr.
Poison

hemlock
partridge berry

Parking lots & road access infrastructure

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool Potential	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		Yes No

Potential vernal pool under power-line by wetland 33 boundary

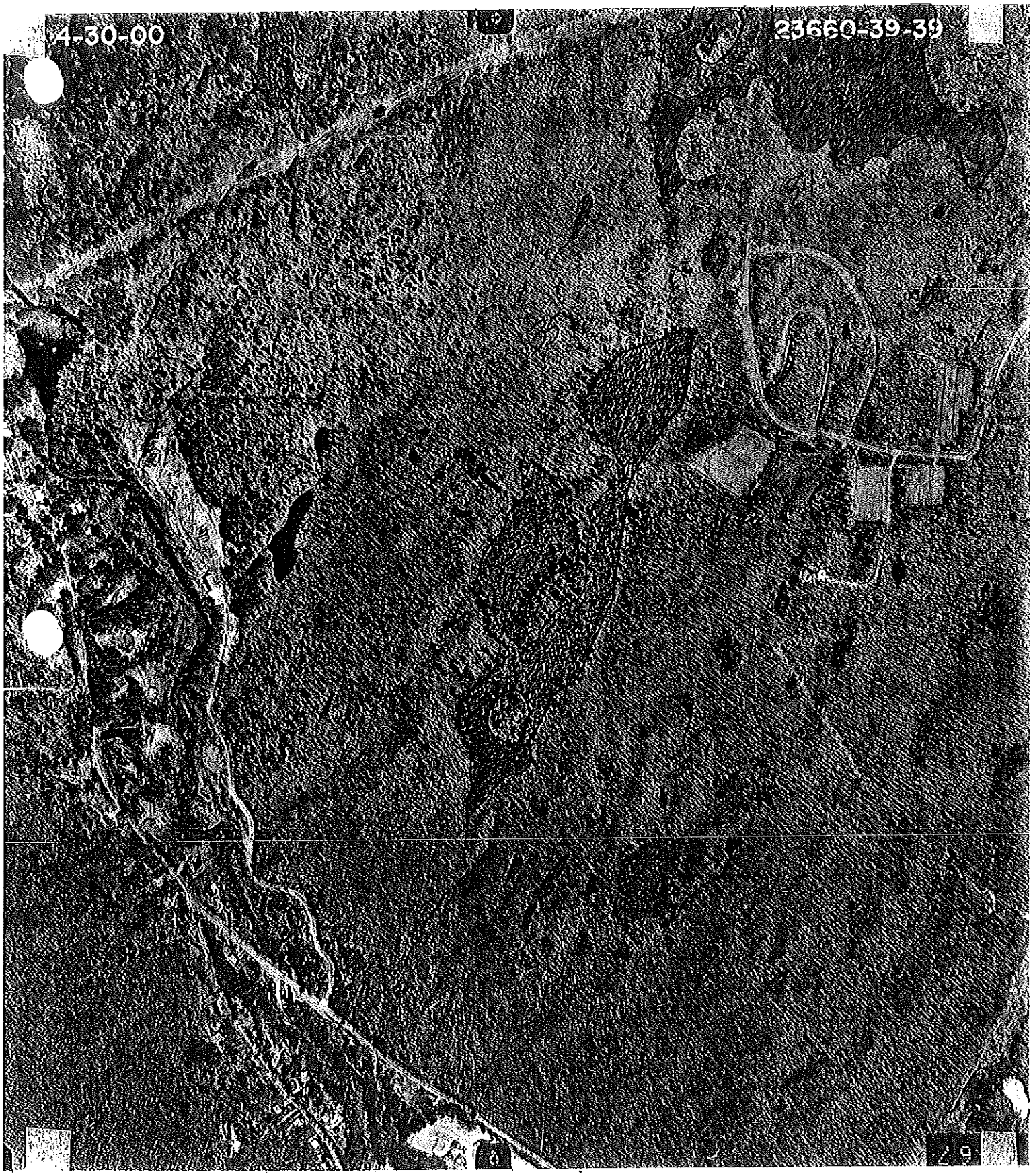
Buffer		Degradation	
Type F-D		Present	y n
Width >100'		Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value		Restoration Stabilization Potential
Parking available UNH	y n	y n
Watercraft access	y n	Restoration area size:
Fishing available	y n	
Hunting permitted	y n	
Walking/biking trails	y n	
Value	H M L	

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n Rhodo	
Diverse wildlife habitat	y n	
Parking/access	y n	
Value	H M L	

Uniqueness/Heritage		
Urban upland/proximity	y n	
Rapid development upland	y n	
Critical habitat/threatened or endangered species	y n	Plant Spps
Archaeological sites	y n ?	Plant Comm.
Stonewalls present	y n	
Historic sites	y n ?	
Ecological health/vigor	y n	
Value	H M L	


4-30-00
23660-39-39

WETLAND 35

Figure 115: This photograph shows a seep at the edge of wetland 35. Seeps are very important water sources for mammals and birds in the winter when all other water drinking sources are frozen.

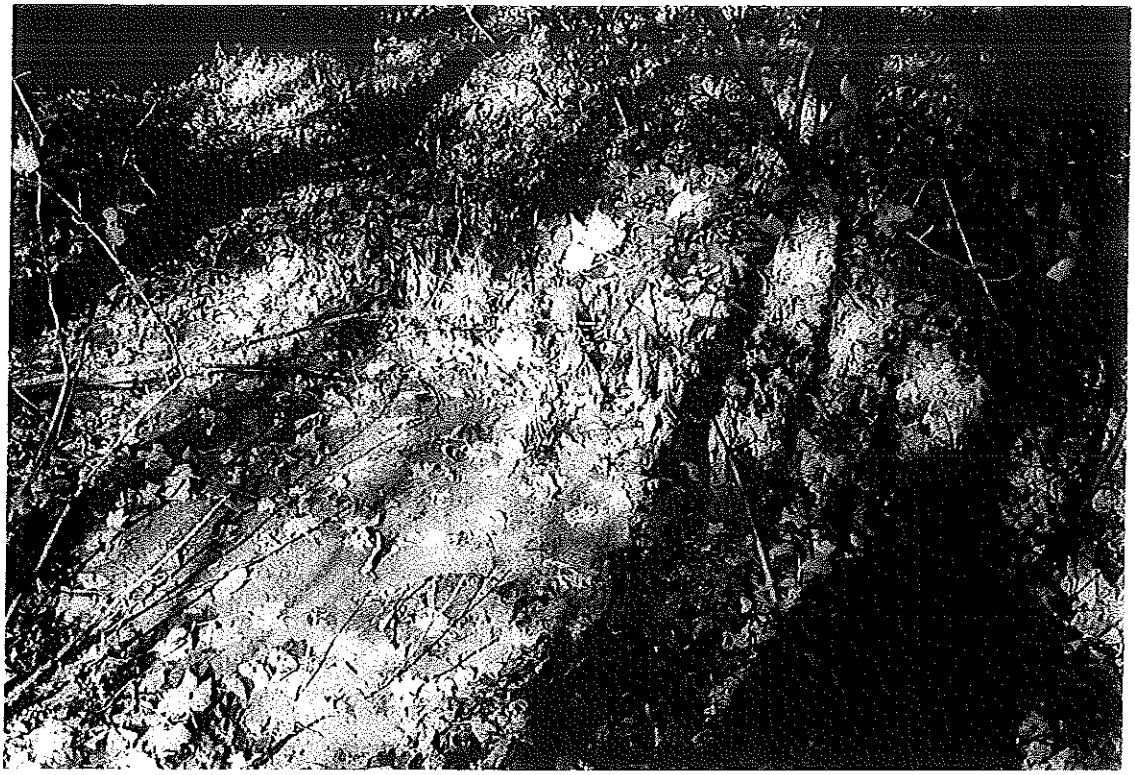


Figure 116: This photograph shows a Hemlock forested wetland with a thick vegetated understory. There were several wet pockets in wetland 35 that had standing water.

High

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 35 Size: 6 AC Date: 10/02 WEI Project # 01-066NH
Classification: PFO4B
Film Roll #: 14 Photograph #: 1-5 Aerial Photograph #: 37-39

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	(y) n	seep (see photo)
Subsoil type	Muck/Peat mucky Peat	Variable water levels observed	y (n)	
Other geologic features	exposed ~~[illegible]~~ muck	Springs or seeps observed	(y) n	
Function Present	(y) n	Contains only inlet or outlet	y (n)	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information	
Land cover in catchment area?	FO	Topography of watershed	sloping
Watershed position	(H) M L	Topography of wetland	sloping
Other catchment storage	(y) n	Constricted outlet	(y) n
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	y (n)
Contains hydric soils	(y) n		
Function Present	(y) n	Land uses downstream protected by this wetland	y (n) Yes (No)

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology	
Organic Soils	(y) n	Upstream sources of pollution	y (n)
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)
Vegetation		Difuse flow/slow moving water	(y) n ground
Herbaceous vegetation	(y) n	Does wetland flood	(y) n
Dense vegetation	(y) n	Long water retention	(y) n Yes (No)
Function Present	(y) n		

Nutrient Removal/Retention Transformation

Hydrology		Transformers	
Open water present	y (n)	Organic soils	(y) n
Slow moving water	(y) n ground	Aquatic vegetation	y (n)
Nutrients upslope	y (n)	Abundant vegetation	(y) n
Function Present	y (n)		(Yes) No

tree nutrient uptake

Production Export

Vegetation		Export	
Density	(H) M L	Detritus	(y) n
Interspersion	(H) M L	Aquatic plants	y (n)
Diversity	(H) M L	Berry producing shrubs	(y) n
Food source	(y) n	Nectar sources	y (n)
Function Present	(y) n	Seed/mast sources	(y) n Yes No

red oak
white oak
R.M.
cedar * dense

Hemlock
cin fern.
royal fern
sphagnum moss
HB BB

witch hazel
gold thread
rush
sedges

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present	y n
High seasonal flows	y n
Channelized flow	y n
Open water fetch	y n
Function Present	y n

Description of Bank

Bank present	y n
Bank vegetated	y n
Bank eroded	y n
Steep bank	y n
Stabilized Bank	y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat	y n in pockets
Amphibian habitat	y n
Fisheries habitat	y n
Cavity trees	y n
Vernal pool	y n
Defined stream channel	y n
Food sources	y n
Cover/nesting sources	y n
Function Present	y n

Connections

Corridor	y n
Wetland connections	y n
Upland connections	y n
Islands	y n

Yes No

Buffer

Type FO

Width >100'

Buffer stream or wetland y n

Does buffer provide shade y n

Degradation

Present none y n

Type

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n some
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

Plant spps. cedar rhodo

Plant Community

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n ?
Stonewalls present	y n ?
Historic sites	y n ?
Ecological health/vigor	y n
Value	H M L

34
35
36
Sorrell
water
ck 35

WETLAND 36

Figure 117: This photograph shows the open water and scrub shrub components of wetland 36 with the forested component along the fringes. There is recent beaver activity in this wetland. Notice the beaver dam in the background.

Figure 118: This photograph shows the open water, scrub shrub and emergent components of wetland 36 as well as the presence of snag trees. Snag trees are important for nesting and feeding for many species of birds, particularly the woodpeckers.

Same as wetland 35 (connected same wetland)

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 36 Size: 11 Date: 10/02 WEI Project # 01-066NH
Classification:
Film Roll #: 14 Photograph #: Aerial Photograph #: 39-39
39-41

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	(y) n	
Subsoil type		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?	~~Y~~	Topography of watershed		
Watershed position	H (M) L	Topography of wetland		
Other catchment storage	(y) n	Constricted outlet	(y) n — topo	
Watercourse associated	y n	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	y (n)	Yes (No)
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	y (n)	
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	potential
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	Yes No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	y (n)	Abundant vegetation	(y) n	
Function Present	(y) n			Yes (No) potential

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

Cedars fern
hemlock HBBB
RM alder
yellow birch
black
maple

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n

Yes No

Buffer

Type large
Width intact
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

walking
birding
remote quiet area

Restoration Stabilization Potential

y n
Restoration area size: none needed

Educational/Scientific Value

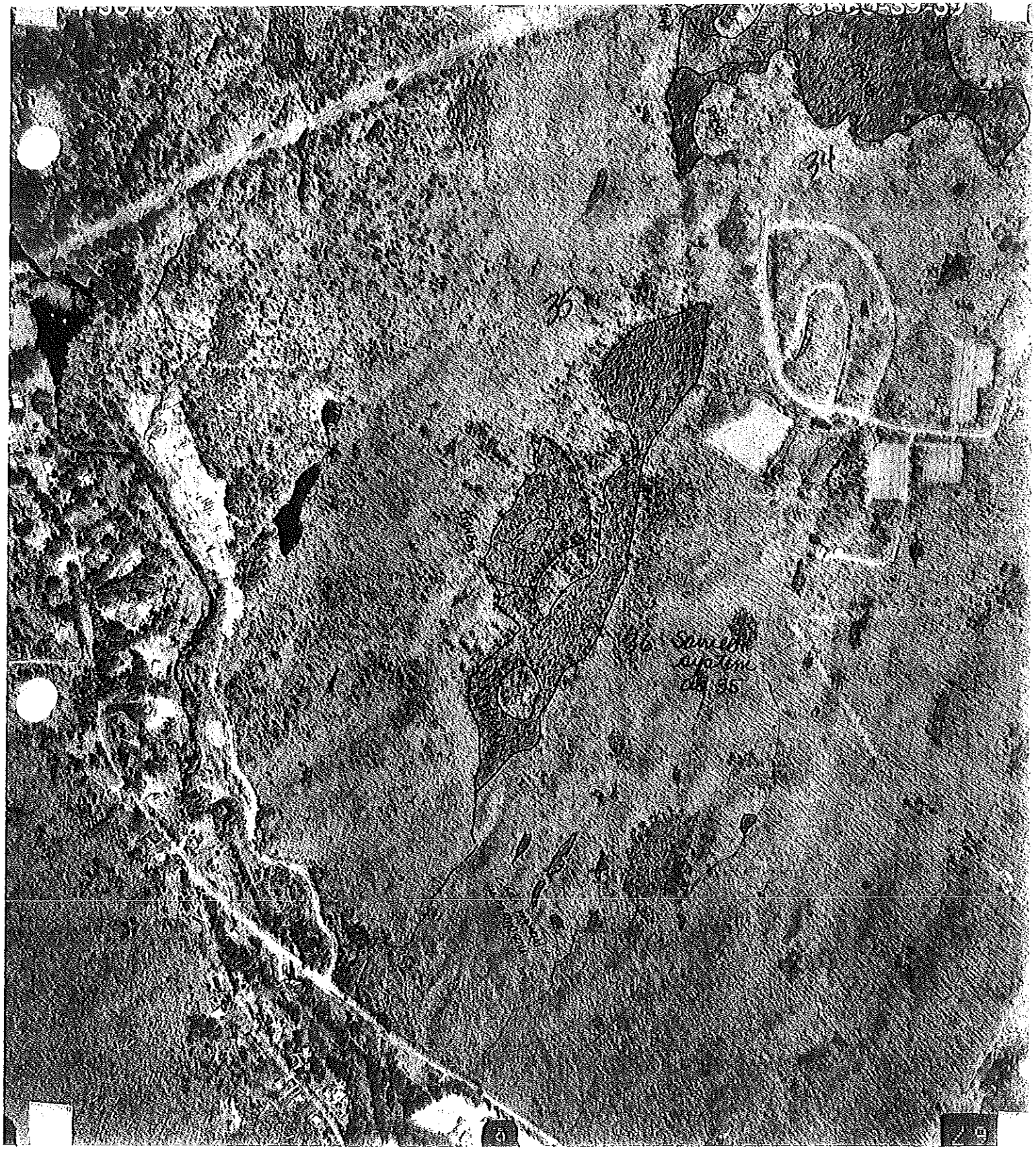
Unique habitats/plant species y n
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

plant Comm

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n plant
Archaeological sites y n
Stonewalls present y n
Historic sites y n
Ecological health/vigor y n
Value H M L


34
35
36 Senecio
aquatic
dk 36

WETLAND 37

Figure 119: This photograph shows the upland land use as a landfill that is in the process of being capped. This landfill is approximately 1,000 feet from wetland 37.

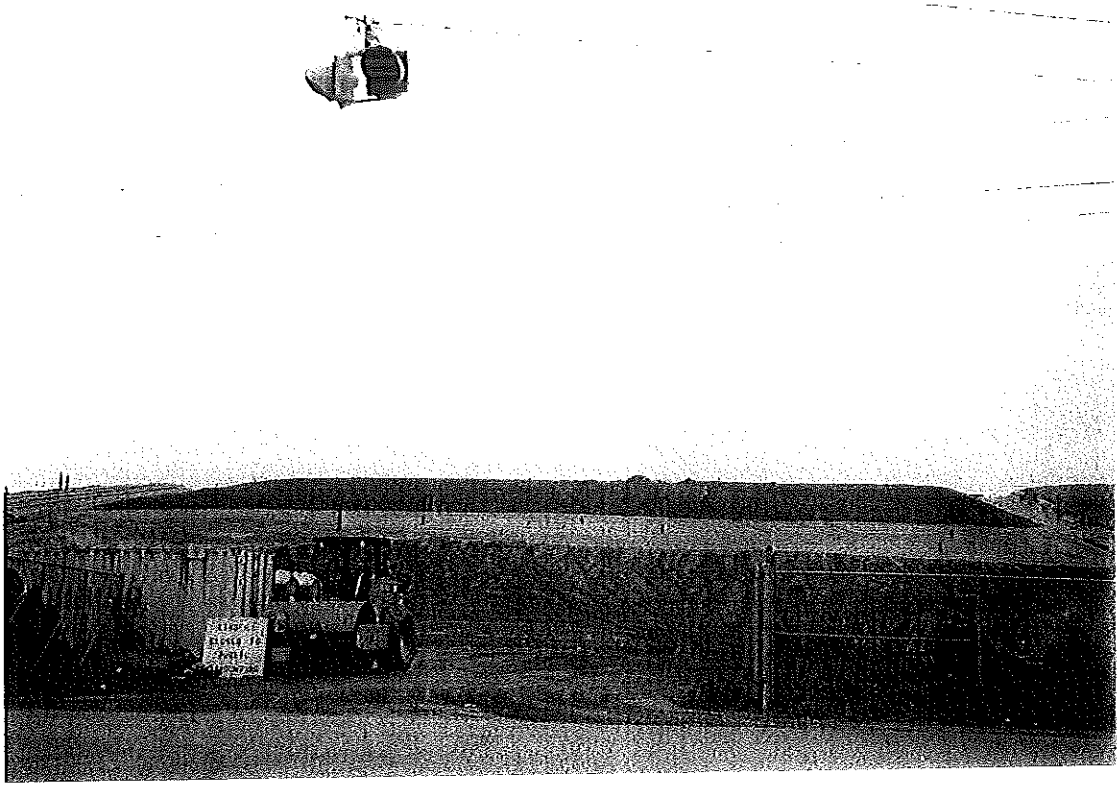
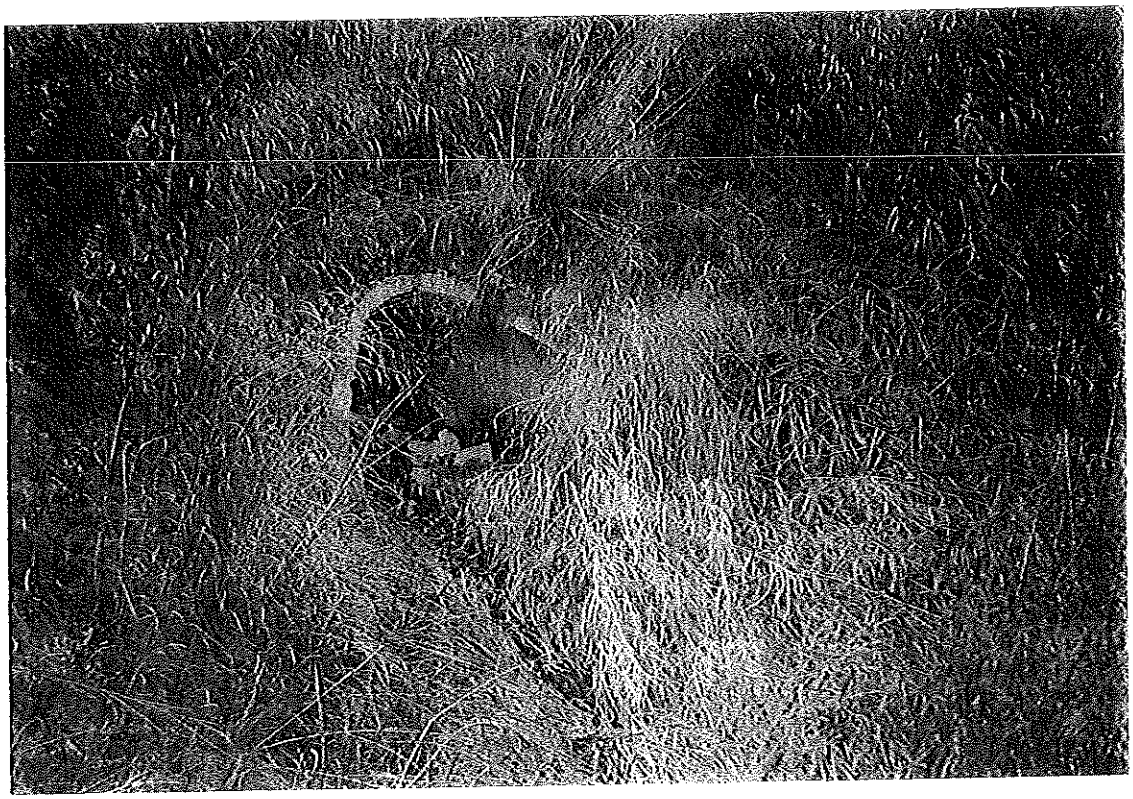


Figure 120: This photograph shows the outlet culvert for the closed landfill. The drainage from this culvert runs directly into wetland 37. This would be an excellent area for a water quality treatment basin with phytoremediation (plants that uptake metals and other contaminants).



high ~~outlets~~ drains into Black Br. joins 38 via Black Br.

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 37 Size: 20 AC Date: 10/00 WEI Project # 01-066NH
Classification: PSS1Fh, PUBGh, ~~PS~~ PEM1Fh, PFO1E
Film Roll #: 13 Photograph #: 1 – 11 Aerial Photograph #: 39-37

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function	
Restrictive layer present	y (n)	Groundwater relationship present	y (n)		
Subsoil type sand		Variable water levels observed	(y) n		
Other geologic features		Springs or seeps observed	y (n)		
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes	(No)

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area? FO, RES		Topography of watershed sloping			
Watershed position	H (M) L	Topography of wetland gently sloping			
Other catchment storage	(y) n	Constricted outlet	(y) n Bl. Br		
Watercourse associated	(y) n Bl. Br	High degree of impervious surfaces in wetland watershed	y (n)		
Contains hydric soils	(y) n				
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes)	No

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	(y) n	Upstream sources of pollution	(y) n capped landfill (see photo)		
Broad boundary transition	(y) n in areas	Erosion/sedimentation observed	(y) n		
Vegetation		Difuse flow/slow moving water	(y) n		
Herbaceous vegetation	(y) n	Does wetland flood	(y) n		
Dense vegetation	(y) n	Long water retention	(y) n	(Yes)	No
Function Present	(y) n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	(y) n	Organic soils	(y) n		
Slow moving water	(y) n	Aquatic vegetation	(y) n		
Nutrients upslope	(y) n landfill	Abundant vegetation	(y) n		
Function Present	(y) n			(Yes)	No

Production Export

Vegetation		Export			
Density	(H) M L	Detritus	(y) n		
Interspersion	(H) M L	Aquatic plants	(y) n		
Diversity	(H) M L	Berry producing shrubs	(y) n		
Food source	(y) n	Nectar sources	(y) n		
Function Present	(y) n	Seed/mast sources	(y) n	(Yes)	No

Photos
4B
FO
culvert from landfill
stream (outlet) Bl. Br.
beaver dam
powerline/PUB SS EM

purple loosestrife
snags
transition
upland use

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop) Perennial or intermittent Bl. Br

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated most areas y n
Bank eroded mostly condos y n
Steep bank y n
Stabilized Bank y n mostly

pretty stable bank

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees y n
Vernal pool y n
Defined stream channel y n Bl Br
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n connects to 38 via Black Br. 38 → River
Upland connections y n
Islands y n

Yes No

Buffer

Type FO, SS
Width 10' → > 100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type drainage from landfill & dumping station

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size:

- treatment basins (see photo) on other side of road from land fill
- plantings at dumping station dead end road area

Educational/Scientific Value

Unique habitats/plant species y n
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

plants, birds

dump → good nutrient hazardous waste study site, H_2O quality

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n plants, birds
Archaeological sites y n ?
Stonewalls present y n
Historic sites y n ?
Ecological health/vigor y n → diverse system, unsure of H_2O quality due to landfill
Value H M L

due to plant / birds species

4 30-00
23660-39-57

WETLAND 38

Figure 121: This photograph shows the open water, emergent and scrub shrub components of wetland 38. This wetland is referred to as Maxwell Pond and is hydologically connected to Black Brook.

Figure 122: This photograph shows a trail that runs along wetland 38 and appears to be used by people and wildlife. This wetland contributes to the urban quality of life due to its proximity to a nearby housing complex.

Maxwell Pond
Black Brook (inlet)

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 38 Size: 5 AC Date: 10/02 WEI Project # 01-066NH
Classification: PUBGh, PUBFh, PEM1Eh, PSS1Eh
Film Roll #: 12 Photograph #: 23 – 25 Aerial Photograph #: 40-41
UB, SS, FO, trail
draination

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	rapid permeability
Subsoil type loamy sand		Variable water levels observed	(y) n	low avail H_2O cap
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? FO, resi		Topography of watershed sloping		3-15% slopes
Watershed position	H M (L)	Topography of wetland sloping		
Other catchment storage	(y) n	Constricted outlet	(y) n	goes under rd
Watercourse associated	(y) n Black Br	High degree of impervious surfaces in wetland watershed	(y) n	pavement, Residential
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n on West side	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	H (M) L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	H (M) L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

RM
whitepine
red oak
cattail (dominant)
willow

Jewelweed
sedges
alder
grey birch

no arrowwood

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent Inlet Bl. Brook

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees y n
Vernal pool y n
Defined stream channel y n inlet
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n

Yes No

Buffer

Type FO, SS
Width 25' → >100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type floodplain in areas

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n see photos
Value H M L

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

Unique habitats/plant species y n
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

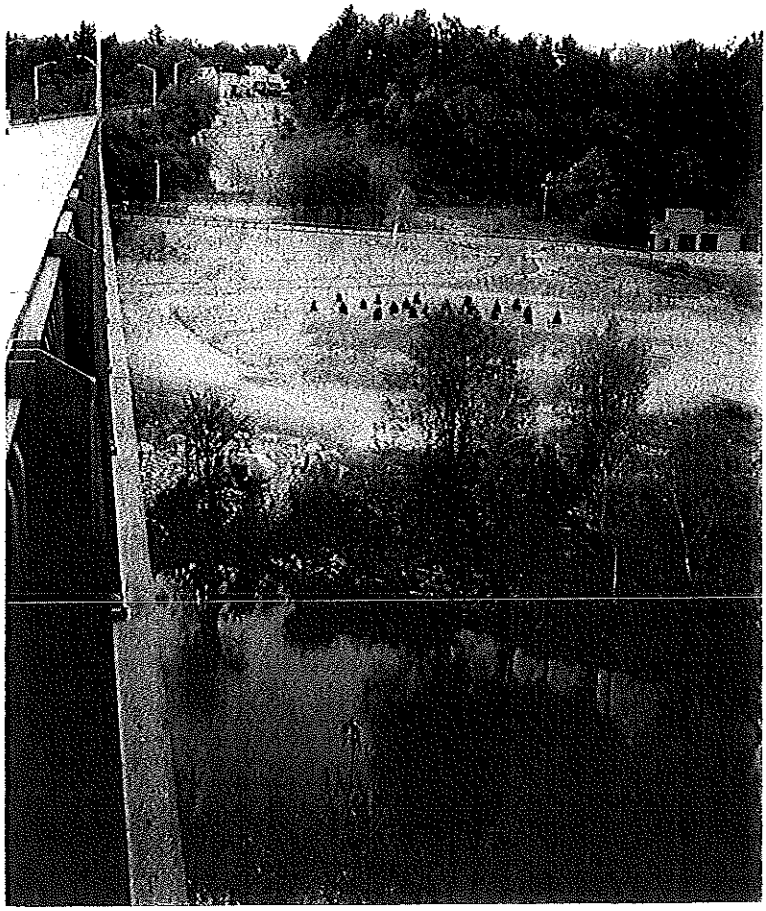
Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n
Archaeological sites y n ?
Stonewalls present y n
Historic sites y n ?
Ecological health/vigor y n
Value H M L

due to urban proximity

WETLAND 39

4-30-00
23660-40-41

Figure 123: This photograph shows a drainage pipe that empties directly into the Piscataquog River (wetland 39) without water quality treatment. It is recommended that the banking be further vegetated to prevent erosion and to allow for nutrient uptake. This water system would also benefit from a swale with check dams to slow water velocity.



Riverine
Protected by SPA.

do see potential restoration ideas

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 39 Size: River Date: 10/02 WEI Project # 01-066NH
Classification: L1UBHh
Film Roll #: 12 Photograph #: 20, 21, 22 Aerial Photograph #: 39-35, 39-33

River
inlet/culvert
mitigation area/swale left

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	(y) n	Groundwater relationship present	y n	
Subsoil type		Variable water levels observed	y n	
Other geologic features		Springs or seeps observed	y n	
Function Present	y n	Contains only inlet or outlet	y n	Yes No

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?		Topography of watershed		
Watershed position	H M (L)	Topography of wetland		
Other catchment storage	(y) n	Constricted outlet	y n	
Watercourse associated	(y) n River	High degree of impervious surfaces in wetland watershed	y n	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	y n	Yes No
Function Present	y n			

receives some protection from NH Shoreland Protection Act

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y n	Upstream sources of pollution	y n	
Broad boundary transition	y n	Erosion/sedimentation observed	y n	
Vegetation		Difuse flow/slow moving water	y n	
Herbaceous vegetation	y n	Does wetland flood	y n	
Dense vegetation	y n	Long water retention	y n	Yes No
Function Present	y n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y n	Organic soils	y n	
Slow moving water	y n	Aquatic vegetation	y n	
Nutrients upslope	y n	Abundant vegetation	y n	
Function Present	y n			Yes No

Production Export

Vegetation		Export		
Density	H M L	Detritus	y n	
Interspersion	H M L	Aquatic plants	y n	
Diversity	H M L	Berry producing shrubs	y n	
Food source	y n	Nectar sources	y n	
Function Present	y n	Seed/mast sources	y n	Yes No

☆ Riverine System is area for mitigation at bridge crossing on Pinard St.

could use bubbler plantings or even grass / currently sandy gravel w/ stone swale (see photos)

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		

Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		

Yes No

Buffer		Degradation	
Type		Present	y n
Width		Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size: swale, checkdams, install vegetation on banks

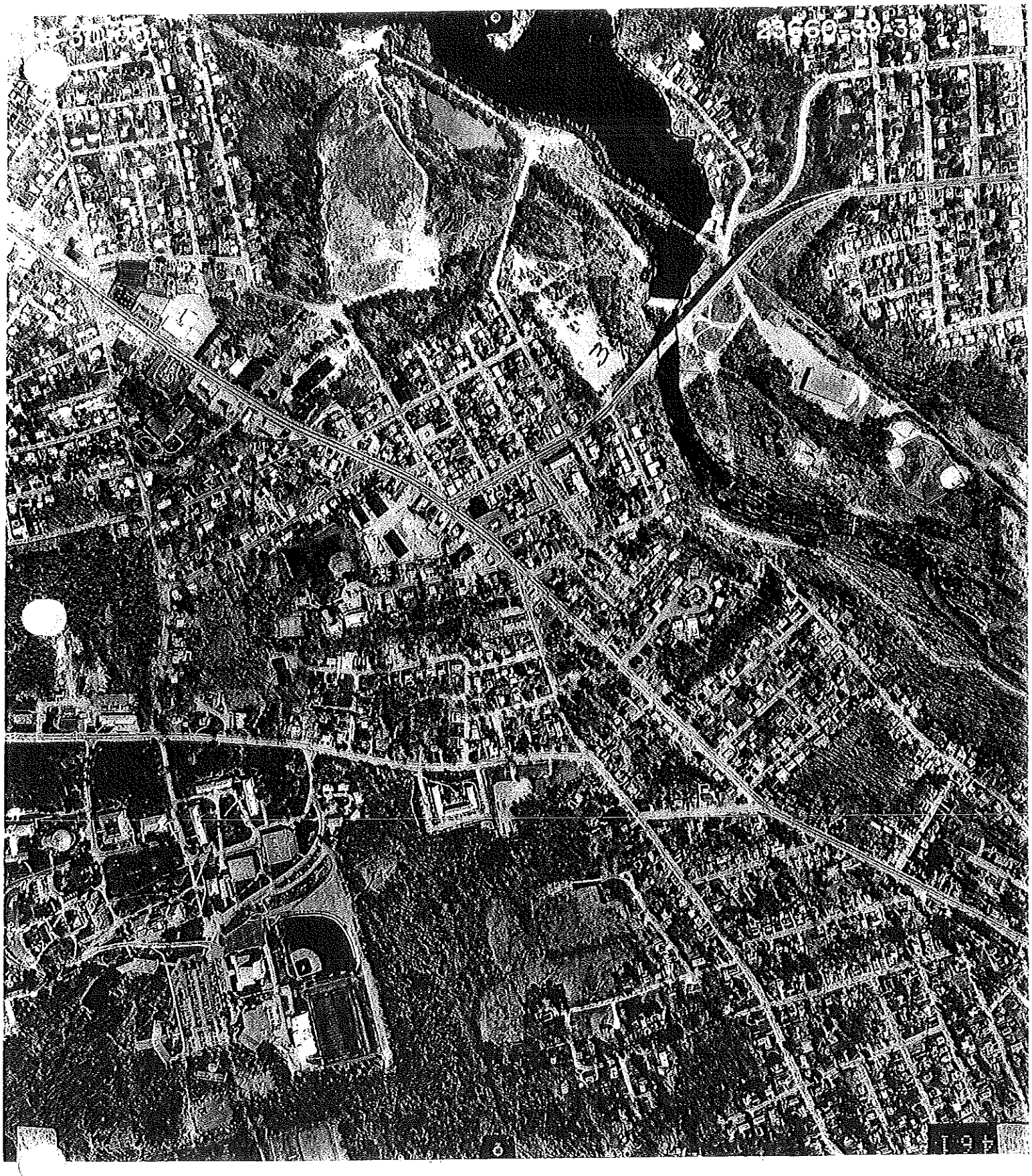
Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n
Stonewalls present	y n
Historic sites	y n
Ecological health/vigor	y n
Value	H M L


25660-59-38

WETLAND 40

was PFO1E

Formerly wetland 40

now developed

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 40 Size: gone (was 3ac) Date: 10/02 WEI Project # 01-066NH
Classification:
Film Roll #: 12 Photograph #: 18, 19 Aerial Photograph #: 40-37

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function	
Restrictive layer present	y n	Groundwater relationship present	y n		
Subsoil type		Variable water levels observed	y n		
Other geologic features		Springs or seeps observed	y n		
Function Present	y n	Contains only inlet or outlet	y n	Yes	No

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area?		Topography of watershed			
Watershed position	H M L	Topography of wetland			
Other catchment storage	y n	Constricted outlet	y n		
Watercourse associated	y n	High degree of impervious surfaces in wetland watershed	y n		
Contains hydric soils	y n	Land uses downstream protected by this wetland	y n	Yes	No
Function Present	y n				

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	y n	Upstream sources of pollution	y n		
Broad boundary transition	y n	Erosion/sedimentation observed	y n		
Vegetation		Difuse flow/slow moving water	y n		
Herbaceous vegetation	y n	Does wetland flood	y n		
Dense vegetation	y n	Long water retention	y n	Yes	No
Function Present	y n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	y n	Organic soils	y n		
Slow moving water	y n	Aquatic vegetation	y n		
Nutrients upslope	y n	Abundant vegetation	y n		
Function Present	y n			Yes	No

Production Export

Vegetation		Export			
Density	H M L	Detritus	y n		
Interspersion	H M L	Aquatic plants	y n		
Diversity	H M L	Berry producing shrubs	y n		
Food source	y n	Nectar sources	y n		
Function Present	y n	Seed/mast sources	y n	Yes	No

This wetland has been developed into condos. It was formerly a 3ac PD PFO1E wetland.

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		

Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		

Yes No

Buffer		Degradation	
Type		Present	y n
Width		Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		

Yes No

Wetland Values

Recreational Value		Restoration Stabilization Potential
Parking available	y n	y n
Watercraft access	y n	Restoration area size:
Fishing available	y n	
Hunting permitted	y n	
Walking/biking trails	y n	
Value	H M L	

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	
Diverse wildlife habitat	y n	
Parking/access	y n	
Value	H M L	

Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n
Stonewalls present	y n
Historic sites	y n
Ecological health/vigor	y n
Value	H M L

WETLAND 41

Figure 124: This photograph shows the open water component of wetland 41. Notice the pair of mallard ducks.

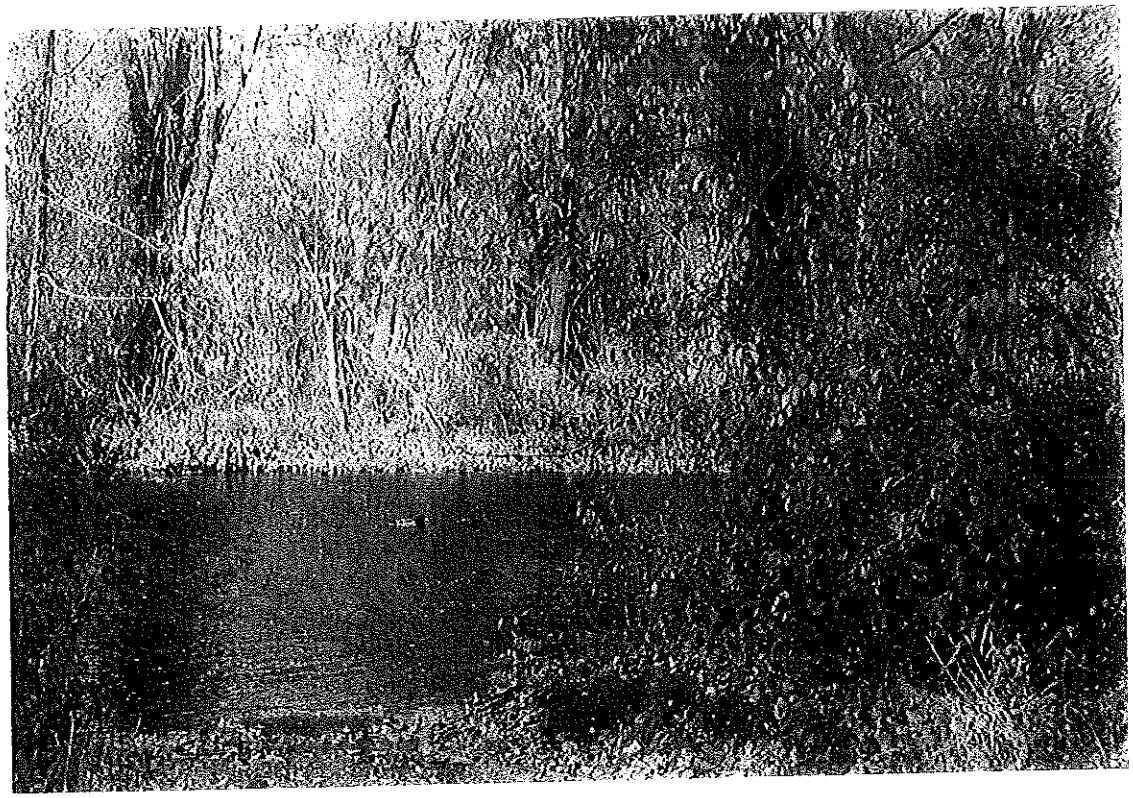
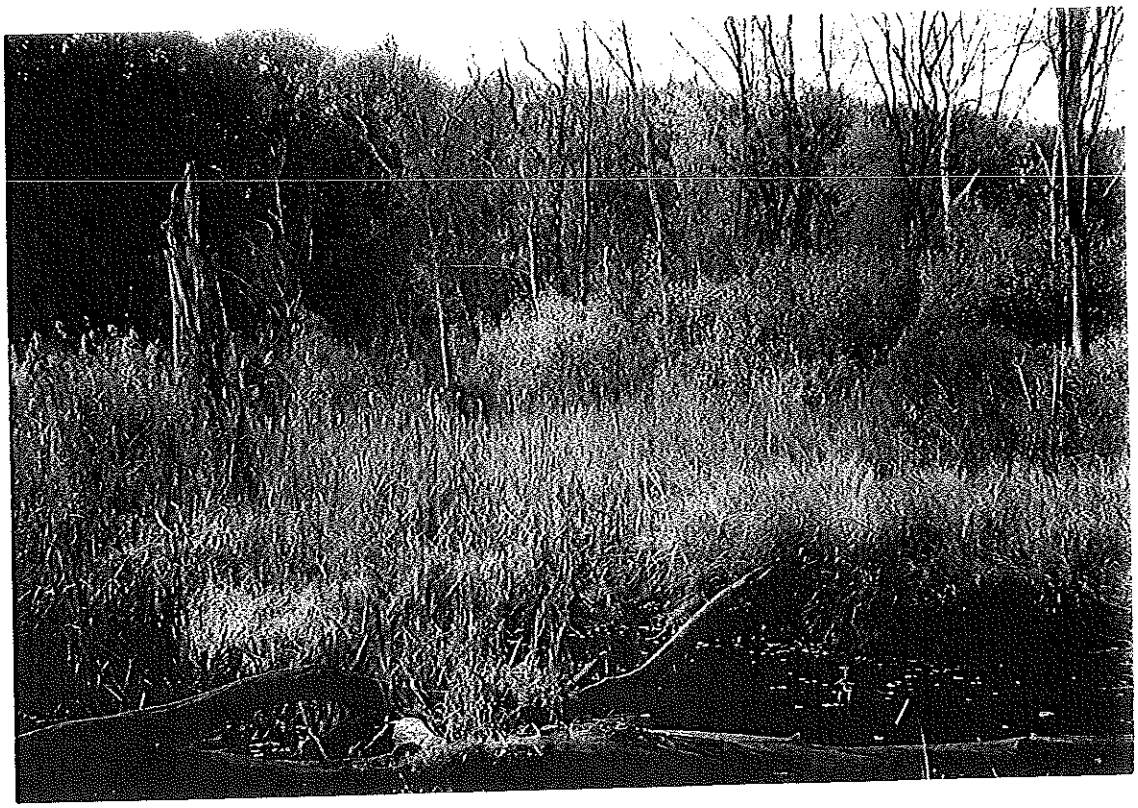


Figure 125: This photograph shows the emergent and scrub shrub component of wetland 41. There are several snag trees scattered throughout this wetland. There are some invasive phragmities and loosestrife plants in this wetland.



- Connects to Piscataquog High
- Surrounds Piscataquog River Park

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 41 Size: 3A Date: 10/02 WEI Project # 01-066NH
Classification: PFO1Ed PEM1/SS1Ed R3UB1H
Film Roll #: 12 Photograph #: 9-17 Aerial Photograph #: 40-37

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	
Subsoil type		Variable water levels observed	(y) n	
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area?	FO, Resid.	Topography of watershed		
Watershed position	H M (L)	Topography of wetland		
Other catchment storage	(y) n	Constricted outlet	(y) n	culvert
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n	roads, houses
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n in areas	Erosion/sedimentation observed	(y) n	see photo
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n River	Organic soils	(y) n	
Slow moving water	(y) n wetland	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

Photos
PUB – Ducks
FO
SS
EM
hydro connection
trees

phragmites/loosestrife
Parking

Hist
ASD

Wd D
So
Pi

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent River

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n near parking lot
Steep bank y n
Stabilized Bank y n in most areas

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n River
Cavity trees y n
Vernal pool y n
Defined stream channel y n
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n
Upland connections y n
Islands y n see aerial photograph 40-37

Saw 2 mallards (see photo)

Yes No

Buffer

Type FO, SS
Width 0' – > 100'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type dumping (tires) see photo
Some erosion
parking lot

Yes No

Wetland Values

* **Recreational Value**

Parking available River Park y n
Watercraft access in park y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size: 1000 sq Ft
(500 ea) by launch area
2) remove tires + by culvert under road
by park entrance (erosion)

* **Educational/Scientific Value**

Unique habitats/plant species y n
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

Plants, mussels, insects

* **Uniqueness/Heritage**

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n
Archaeological sites y n ?
Stonewalls present y n ?
Historic sites y n ?
Ecological health/vigor y n
Value H M L due to unique spp. + location + connection to river

4-50.00
23660

WETLAND 42

Figure 126: This photograph shows the open water component of wetland 42 with emergent vegetation along its fringes.

Figure 127: This photograph shows the emergent and scrub shrub component of this system (wetland 42). This area is densely vegetated.

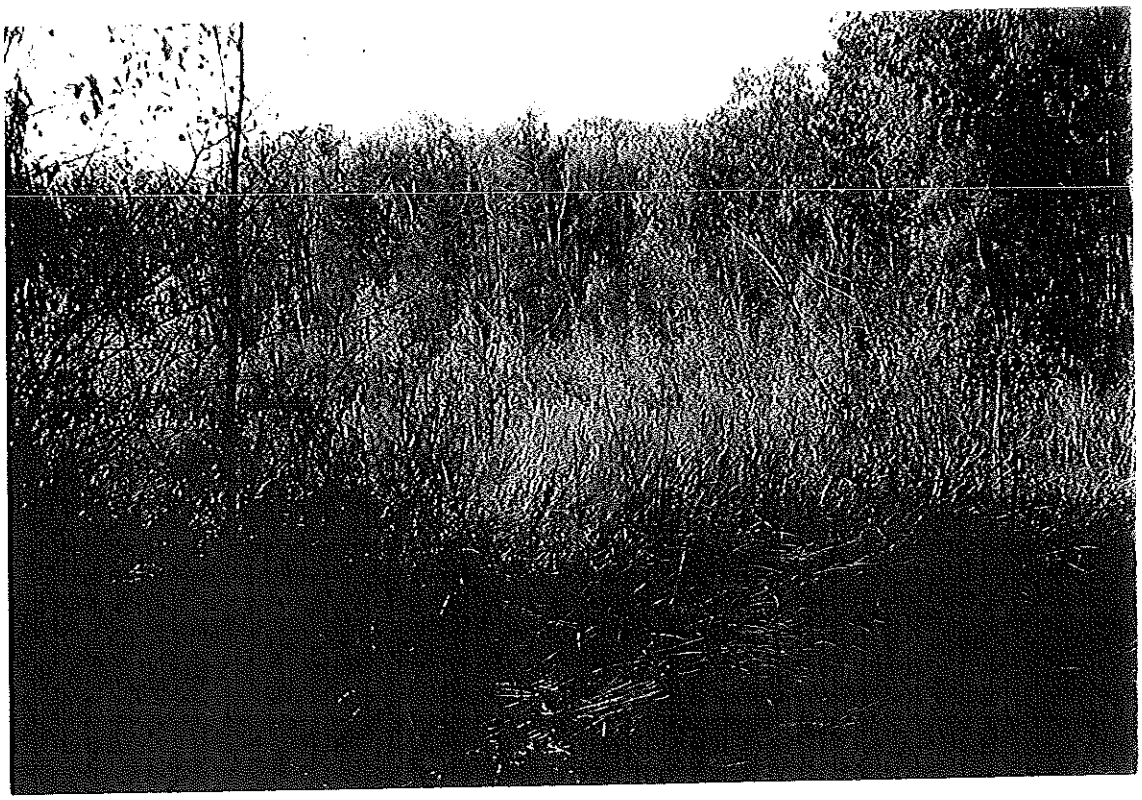
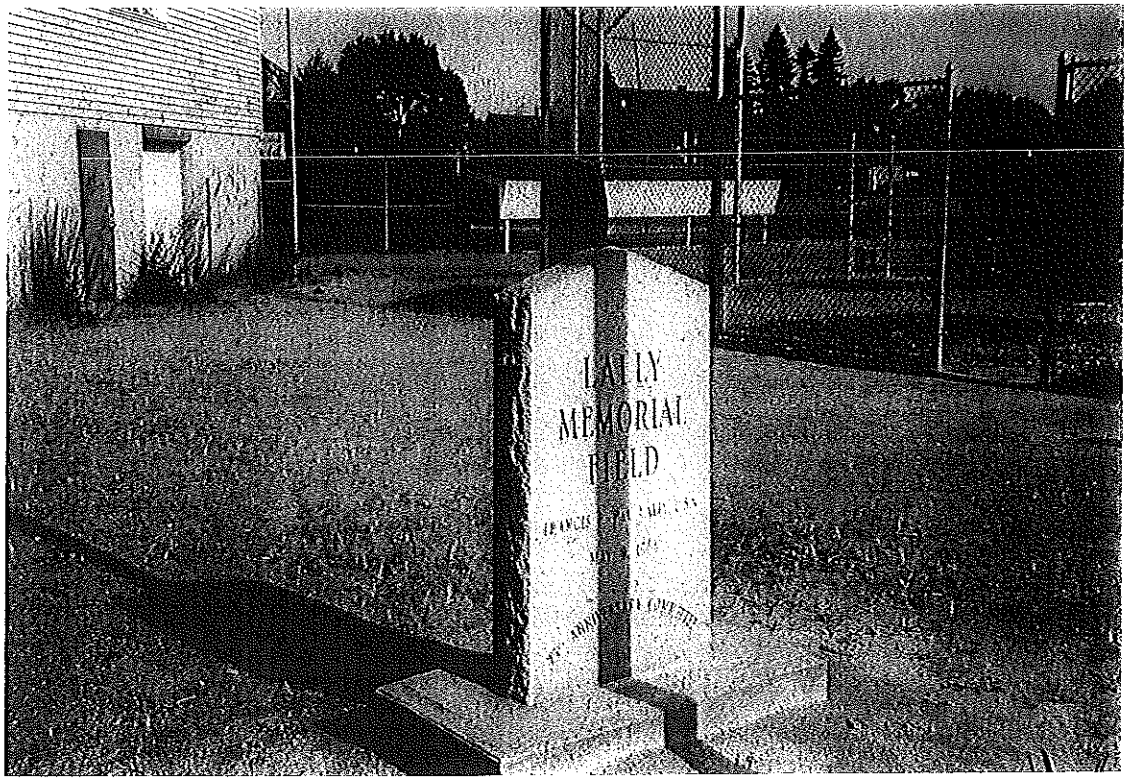


Figure 128: This photograph shows some of the degradation that is present. There were several large items dumped in wetland 42.

Figure 129: This photograph shows some of the upland land use that may be impacting the water quality of wetland 42. Runoff from these athletic fields goes directly into this wetland. It is assumed that herbicide, fertilizer and pesticide are used on the ballfields. Conservative use of these chemicals would benefit the water quality of this system.



Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections		
Aquatic insect habitat	y n	Corridor	y n	is most likely connected underground to Merrimack River (culvert)
Amphibian habitat	y n	Wetland connections	y n	
Fisheries habitat	y n warm	Upland connections	y n	
Cavity trees	y n H_2O spps	Islands	y n	
Vernal pool	y n			
Defined stream channel	y n			
Food sources	y n			
Cover/nesting sources	y n			
Function Present	y n			Yes No

Buffer

Type Shrub

Width 0'– 75'

Buffer stream or wetland y n

Does buffer provide shade y n

Degradation

Present y n

Type litter
dumped tank
(see photos)

Yes No

Wetland Values

Recreational Value

Parking available ball field y n

Watercraft access y n

Fishing available y n

Hunting permitted y n

Walking/biking trails y n

Value H M L

Restoration Stabilization Potential

y n

Restoration area size: – clean up litter
– removal phragmities
– pull silt fence by ball field
– treat H_2O runoff before it drains into wetland
– pick up litter
– BMP for ball field fertilizer/chemical use.

Educational/Scientific Value

Unique habitats/plant species y n

Diverse wildlife habitat y n

Parking/access y n

Value H M L

Comments/Wildlife Notes

isolated degraded system due to location – education/restoration + water quality improvement

Uniqueness/Heritage

Urban upland/proximity y n

Rapid development upland y n

Critical habitat/threatened or endangered species y n bird

Archaeological sites y n ?

Stonewalls present y n

Historic sites y n ?

Ecological health/vigor y n – receives a lot of run off due to bird (NHD)

Value H M L

High (water qual. tmt) connected to Merrimack

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 42 Size: 4.9AC Date: 11/02 WEI Project # 01-066NH
Classification:
Film Roll #: 12 Photograph #: 1-8 Aerial Photograph #: 40-33

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	Perm mod rapid
Subsoil type fine sandy loam		Variable water levels observed	(y) n	mod avail H_2O cap
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information	
Land cover in catchment area?		Topography of watershed nearly level	
near river Watershed position	H M (L)	Topography of wetland nearly level	
Other catchment storage	(y) n	Constricted outlet	(y) n
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n
Contains hydric soils	(y) n		
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n (Yes) No

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology	
Organic Soils	y n	Upstream sources of pollution	(y) n runoff/parking lots
most likely Connects under ground w/River Broad boundary transition	(y) n on west + no. side	Erosion/sedimentation observed	(y) n
Vegetation		Difuse flow/slow moving water	(y) n
Herbaceous vegetation	(y) n	Does wetland flood	(y) n
Dense vegetation	(y) n	Long water retention	(y) n (Yes) No * primary function
Function Present	(y) n		

Nutrient Removal/Retention Transformation

Hydrology		Transformers	
Open water present	(y) n	Organic soils	(y) n
Slow moving water	(y) n	Aquatic vegetation	(y) n
Nutrients upslope	(y) n	Abundant vegetation	(y) n
Function Present	(y) n		(Yes) No *

Production Export

Vegetation		Export	
Density	(H) M L	Detritus	(y) n
Interspersion	(H) M L	Aquatic plants	(y) n
Diversity	(H) M L	Berry producing shrubs	(y) n
Food source	(y) n	Nectar sources	(y) n
Function Present	(y) n	Seed/mast sources	(y) n (Yes) No

~~Constructed~~
tank cart) inlet
SS → FO
PUB.
driveway drainage

willow red maple
RM golden rod
grey birch crab apple
alder rose
cattail
phragmites

This wetland
[illegible]
Currently condo/apartments

WETLAND 43

Figure 130: This photograph shows the scrub shrub component of wetland 43. The vegetation is very thick and provides a good buffer to Nutt Pond.

Figure 131: This photograph shows drainage into Nutt Pond (wetland 43). Notice the accumulated sediment in the streambed. This area would make a good restoration site that would improve water quality for Nutt Pond.

Multi Force
High / Med

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 43 Size: 8 AC Date: 6/02 WEI Project # 01-066NH
Classification: L1UBH, PSS1E PFO1E, PEM1/SS1E
Film Roll #: 2 Photograph #: 23, 24, 25 Aerial Photograph #: 42-35

Wetland Functions

Groundwater Recharge/Discharge Potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	Perm. moderate
Subsoil type sandy loam		Variable water levels observed	(y) n	avail H_2O cap. mod
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? Paved		Topography of watershed nearly level		
Watershed position	H (M) L	Topography of wetland nearly level		
Other catchment storage	(y) n small	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y (n)	Upstream sources of pollution	(y) n	
Broad boundary transition	y (n)	Erosion/sedimentation observed	(y) n	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No *
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	y (n)	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			Yes No *

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	H (M) L	Aquatic plants	(y) n	
Diversity	H (M) L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

reed canary grass (invasive)
speckled alder
poplar
No. arrowwood
red maple
willow
red oak
buckthorn
skunk cabbage
silky dogwood
sassafrass
jewelweed

discharge from storm drains enters directly into this system.

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present (y) n opposite
High seasonal flows (y) n
Channelized flow (y) n
Open water fetch y (n)

Function Present (y) n

Description of Bank

Bank present (y) n
Bank vegetated (y) n mostly areas
Bank eroded y (n)
Steep bank y (n)
Stabilized Bank (y) n

Yes (No)

Wildlife Habitat

Diversity

Aquatic insect habitat (y) n
Amphibian habitat (y) n
Fisheries habitat y (n)
Cavity trees y (n)
Vernal pool y (n)
Defined stream channel (y) n upstream
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor y (n)
Wetland connections y (n)
Upland connections (y) n
Islands y (n)

sunfish
small amphibians

Yes (No)

Buffer

Type none
Width none
Buffer stream or wetland y (n)
Does buffer provide shade y (n)

Degradation ☆

Present
Type litter, severe sedimentation from parking lot runoff. great potential for restoration/water treatment basin for H_2O quality improvement (y) n

Yes (No)

Wetland Values

Recreational Value

Parking available Commercial (y) n
Watercraft access y (n)
Fishing available y (n)
Hunting permitted y (n)
Walking/biking trails y (n)
Value H M (L)

Restoration Stabilization Potential

y n

Restoration area size:

see above ↑

Educational/Scientific Value

Unique habitats/plant species (y) n birds
Diverse wildlife habitat y (n)
Parking/access Commercial (y) n
Value H (M) L

Comments/Wildlife Notes

good restoration/degradation education example

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species (y) n birds
Archaeological sites y n ?
Stonewalls present y (n)
Historic sites y n ?
Ecological health/vigor y (n)
Value H (M) (L)

severely degraded system, needs restoration

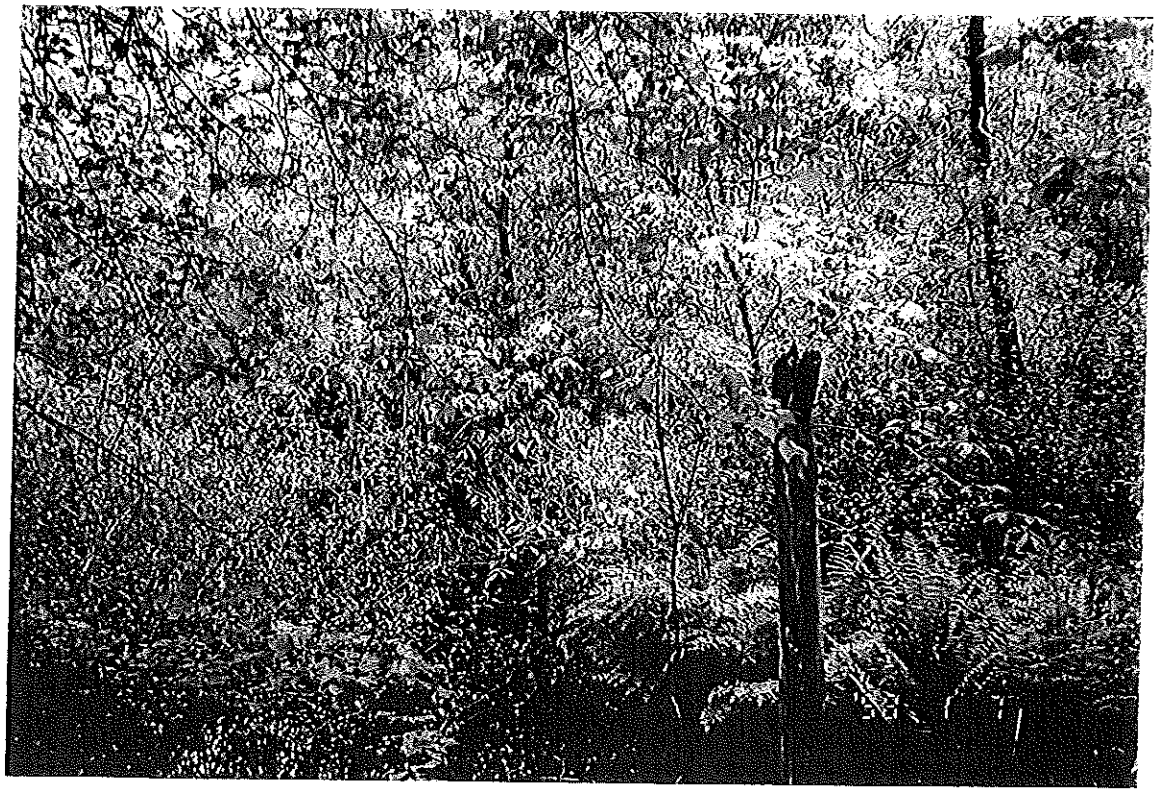
↳ urban quality of life

4-29-00
23660-42-35

WETLAND 44

Figure 132: This photograph shows the thick canopy and understory of this forested wetland (#44).

Figure 133: This photograph shows the dense understory of wetland 44.



West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 44 Size: 4.46 Date: 6/02 WEI Project # 01-066NH
Classification: PFO1E
Film Roll #: Photograph # Aerial Photograph #: 54-9

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	mod. perm.
Subsoil type sandy loam		Variable water levels observed	(y) n	mod avail H_2O cap.
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? Fo, Rec		Topography of watershed nearly level		
Watershed position	H (M) L	Topography of wetland nearly level		
Other catchment storage	(y) n	Constricted outlet	(y) n	
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n			
Function Present	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y (n)	Upstream sources of pollution	(y) n	
Broad boundary transition	y (n)	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	y (n)	
Herbaceous vegetation	(y) n	Does wetland flood	y (n)	
Dense vegetation	(y) n	Long water retention ground	(y) n	Yes (No)
Function Present	(y) n			

Low nat. meet 50% VPO soils

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y (n)	Organic soils	y (n)	
Slow moving water	y (n)	Aquatic vegetation	y (n)	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	y (n)			Yes (No)

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	H (M) (L)	Aquatic plants	y (n)	
Diversity	H (M) (L)	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

white ash
red maple
HBBB
Speckled Alder
Winterberry
Chokeberry

sensitive fern
Royal fern
Cinnamon fern
skunk cabbage
sedges
blue iris

poison ivy

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes (No)

Wildlife Habitat

Diversity

Aquatic insect habitat y (n)
Amphibian habitat (y) n
Fisheries habitat y (n)
Cavity trees y (n)
Vernal pool y (n)
Defined stream channel (y) n
Food sources (y) n
Cover/nesting sources (y) n
Function Present (y) n

Connections

Corridor (y) n → small mammals
Wetland connections y (n)
Upland connections (y) n
Islands y (n)

(Yes) No birds small mammals only

Buffer

Type lawn ~ SS
Width 0' ⇒ 25'
Buffer stream or wetland (y) n
Does buffer provide shade (y) n

Degradation

Present (y) n
Type clipping, lawn. fill (soil)

(Yes) No

Wetland Values

Recreational Value

Parking available y (n)
Watercraft access y (n)
Fishing available y (n)
Hunting permitted y (n)
Walking/biking trails y (n)
Value H M (L)

Restoration Stabilization Potential

y n
Restoration area size:

Educational/Scientific Value

Unique habitats/plant species (y) n reptiles
Diverse wildlife habitat y (n)
Parking/access y (n)
Value H M (L)

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity (y) n
Rapid development upland (y) n
Critical habitat/threatened or endangered species (y) n reptiles
Archaeological sites y n ?
Stonewalls present y (n)
Historic sites y n ?
Ecological health/vigor fair (y) n fragmented
Value H (M) L

29-bo
23660-54-9

WETLAND 45

Figure 134: This photograph of wetland 45 shows the scrub shrub component of the wetland which runs along an unnamed stream.

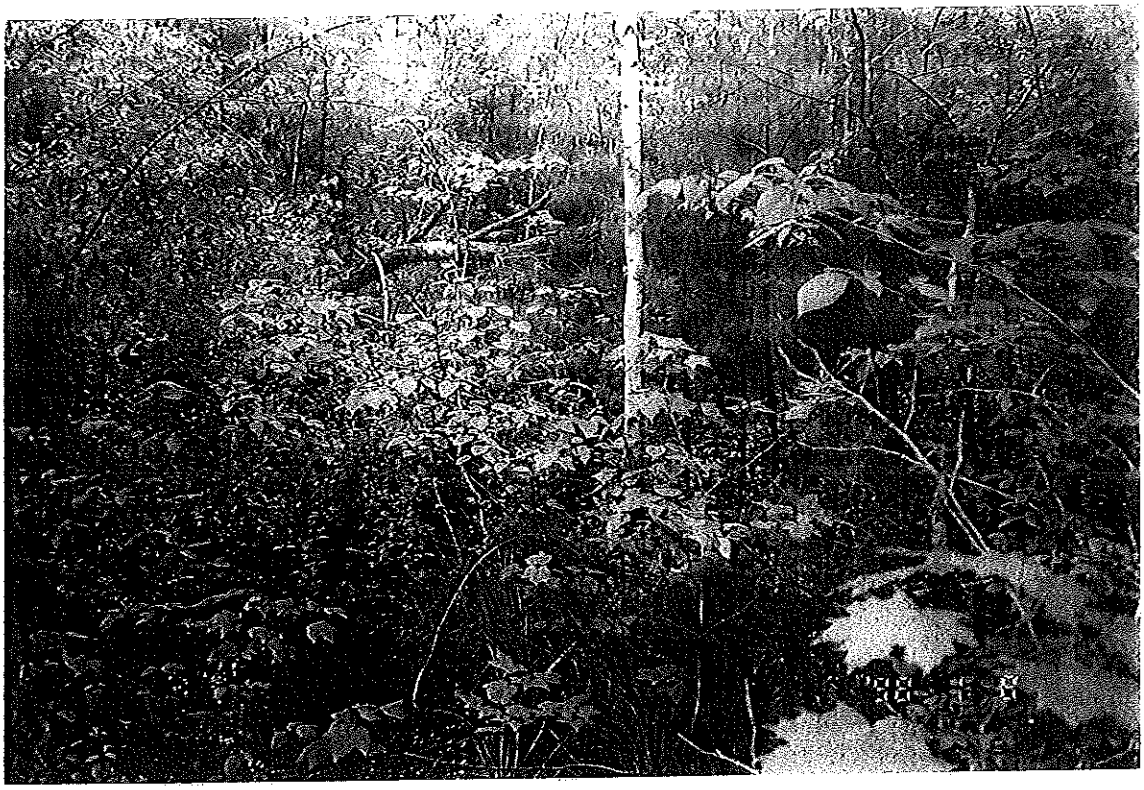


Figure 135: This photograph of wetland 45 shows the integration of upland islands within this wetland. The soils in this wetland are primarily hydric B and are poorly drained.

not evaluated
due to drought

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 45 Size: ~~1~~ 4 30c Date: WEI Project # 01-066NH
Classification:
Film Roll #: Photograph #: Aerial Photograph #:

Wetland Functions

Groundwater Recharge/Discharge

Geology		Hydrology		Principal Function	
Restrictive layer present	y n	Groundwater relationship present	y n		
Subsoil type		Variable water levels observed	y n		
Other geologic features		Springs or seeps observed	y n		
Function Present	y n	Contains only inlet or outlet	y n	Yes	No

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area?		Topography of watershed			
Watershed position	H M L	Topography of wetland			
Other catchment storage	y n	Constricted outlet	y n		
Watercourse associated	y n	High degree of impervious surfaces in wetland watershed	y n		
Contains hydric soils	y n	Land uses downstream protected by this wetland	y n	Yes	No
Function Present	y n				

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	y n	Upstream sources of pollution	y n		
Broad boundary transition	y n	Erosion/sedimentation observed	y n		
Vegetation		Difuse flow/slow moving water	y n		
Herbaceous vegetation	y n	Does wetland flood	y n		
Dense vegetation	y n	Long water retention	y n	Yes	No
Function Present	y n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	y n	Organic soils	y n		
Slow moving water	y n	Aquatic vegetation	y n		
Nutrients upslope	y n	Abundant vegetation	y n		
Function Present	y n			Yes	No

Production Export

Vegetation		Export			
Density	H M L	Detritus	y n		
Interspersion	H M L	Aquatic plants	y n		
Diversity	H M L	Berry producing shrubs	y n		
Food source	y n	Nectar sources	y n		
Function Present	y n	Seed/mast sources	y n	Yes	No

small pocket associated w/stream > 3 ac.

red maple
red oak
white birch
HBBB
elm

tussock sedge
royal + sensitive fern

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank:	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank: vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		

Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		

Yes No

Buffer		Degradation	
Type		Present	y n
Width		Type	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

Educational/Scientific Value

Unique habitats/plant species	y n
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n
Archaeological sites	y n
Stonewalls present	y n
Historic sites	y n
Ecological health/vigor	y n
Value	H M L

WETLAND 46

Figure 134: This photograph shows the thickly vegetated cattail marsh portion of wetland 46.

Figure 135: This photograph shows the forested component of wetland 46.

46A Red Rock Pond
46B Hose Pond

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 46 A&B Size: 5 AC Date: 6/02 WEI Project # 01-066NH
Classification: PFO1Ed, PEM1/SS1Eh
Film Roll #: Photograph #: Aerial Photograph #: 54-9

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	(y) n	rapid perm
Subsoil type Sand		Variable water levels observed	(y) n	avail H_2O cap low
Other geologic features		Springs or seeps observed	y (n)	
Function Present	(y) n	Contains only inlet or outlet	(y) n	(Yes) No

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? FO, Pave		Topography of watershed nearly level		
Watershed position	H (M) L	Topography of wetland nearly level		
Other catchment storage	y (n)	Constricted outlet	y n	
Watercourse associated	y (n)	High degree of impervious surfaces in wetland watershed	(y) n	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	(y) n	Upstream sources of pollution	(y) n	
Broad boundary transition	(y) n	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	(y) n	
Herbaceous vegetation	(y) n	Does wetland flood	(y) n	
Dense vegetation	(y) n	Long water retention	(y) n	(Yes) No
Function Present	(y) n			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	(y) n	Organic soils	(y) n	
Slow moving water	(y) n	Aquatic vegetation	(y) n	
Nutrients upslope	(y) n	Abundant vegetation	(y) n	
Function Present	(y) n			(Yes) No

Production Export

Vegetation		Export		
Density	(H) M L	Detritus	(y) n	
Interspersion	(H) M L	Aquatic plants	(y) n	
Diversity	(H) M L	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	(Yes) No

Cattail
red maple
arrowwood
HBB
Honey Suckle
Royal Fern

Tussock Sedge
Cinnamon Fern
fringed sedge
winter berry
maidenhair

tree cavities
4" standing H_2O

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y/n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		Yes No

Wildlife Habitat

Diversity		Connections		
Aquatic insect habitat	y n	Corridor	y n	
Amphibian habitat	y n	Wetland connections	y n	small mammals
Fisheries habitat	y n	Upland connections	y n	+ bird
Cavity trees	y n	Islands	y n	habitat
Vernal pool	y n			
Defined stream channel	y n Shrub/upstream			
Food sources	y n			
Cover/nesting sources	y n			
Function Present	y n			Yes No

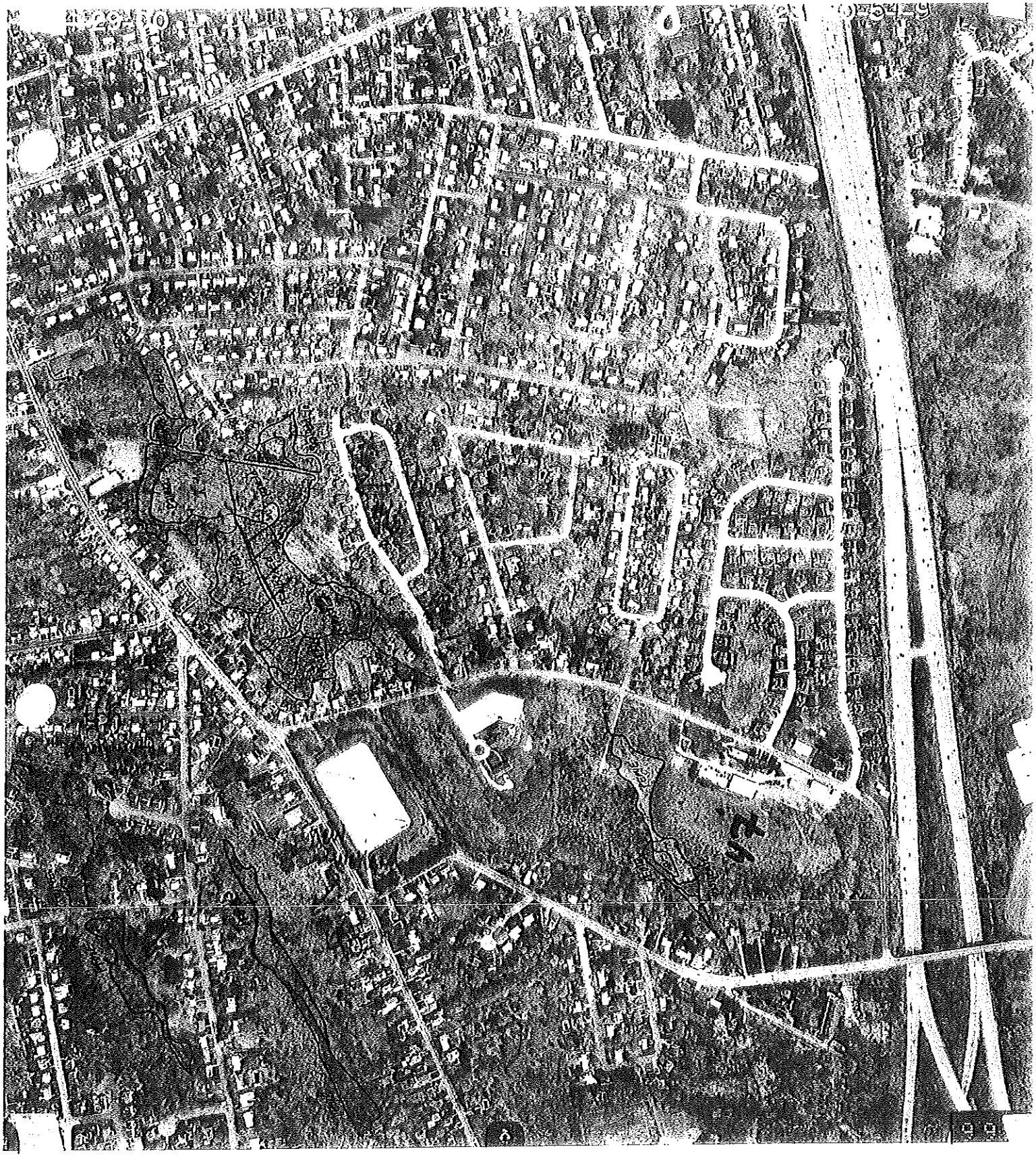
Buffer		Degradation	
Type	FO, SS, down	Present	y n
Width	15' > 50'	Type	ditched system
Buffer stream or wetland	y n		
Does buffer provide shade	y n		Yes No

Wetland Values

Recreational Value		Restoration Stabilization Potential	
Parking available	y n	y n	
Watercraft access	y n	Restoration area size:	
Fishing available	y n		
Hunting permitted	y n		birding
Walking/biking trails	y n, short trail		
Value	H M L		

Educational/Scientific Value		Comments/Wildlife Notes
Unique habitats/plant species	y n	reptiles
Diverse wildlife habitat	y n	
Parking/access	y n	
Value	H M L	due to reptile habitat

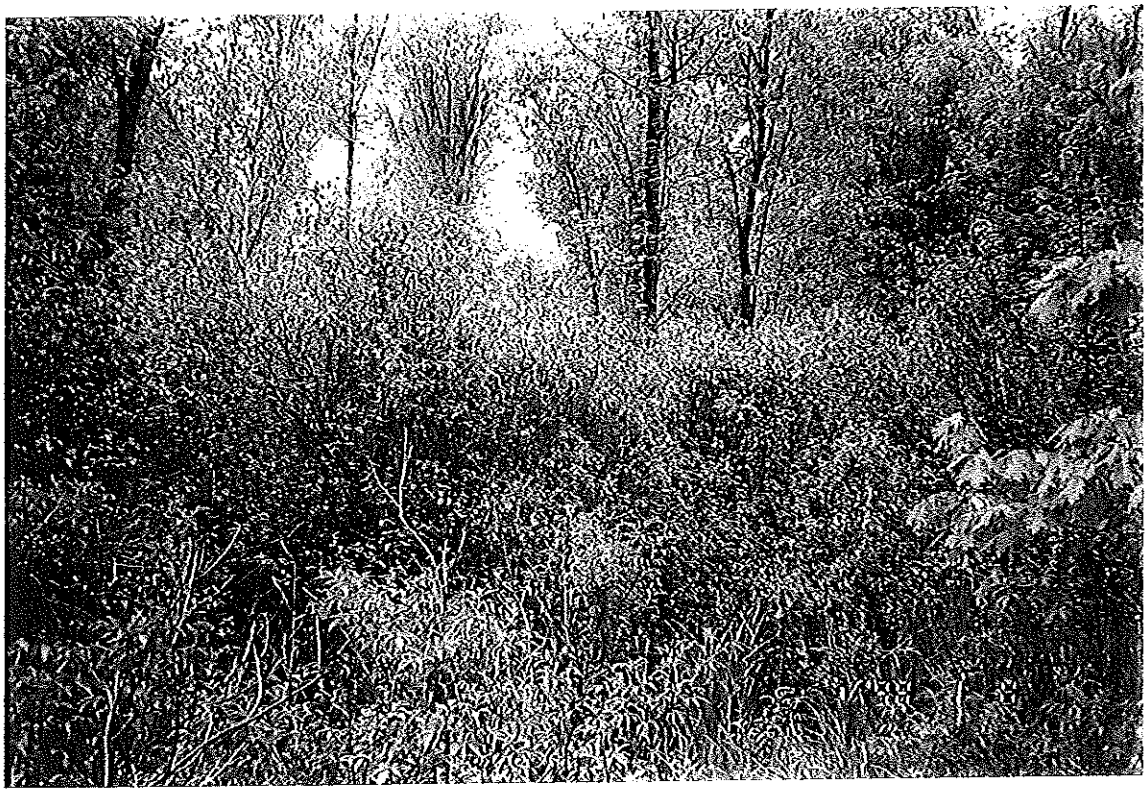
Uniqueness/Heritage	
Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n reptile
Archaeological sites	y n n,
Stonewalls present	y n n,
Historic sites	y n
Ecological health/vigor	y n moderate
Value	H M L cattail invasive



WETLAND 47

Figure 136: This photograph shows the emergent and scrub shrub component of this wet meadow (#47). The main portion of this system is dominated by cattails.

Figure 137: This photograph shows the scrub shrub component of wetland 47. The berry producing shrubs provide good food and nesting habitat for song birds.



low
monoculture
cattail
wet
meadow

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 47 Size: 4AC Date: 10/02 WEI Project # 01-066NH
Classification: PEM1E, PFO1E, PSS1/EM1E
Film Roll #: Photograph #: Aerial Photograph #: 5 6 4-9

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function
Restrictive layer present	y (n)	Groundwater relationship present	y (n)	mod perm.
Subsoil type Sandy loam		Variable water levels observed	y (n)	mod. H_2O avail cap.
Other geologic features		Springs or seeps observed	y (n)	
Function Present	y (n)	Contains only inlet or outlet	y (n)	Yes (No)

Floodflow Alteration

Watershed Information		Topographic Information		
Land cover in catchment area? FO		Topography of watershed nearly level		
Watershed position	H (M) L	Topography of wetland nearly level		
Other catchment storage	y (n)	Constricted outlet	(y) n	
Watercourse associated	(y) n	High degree of impervious surfaces in wetland watershed	y (n)	
Contains hydric soils	(y) n	Land uses downstream protected by this wetland	(y) n	(Yes) No
Function Present	(y) n			

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology		
Organic Soils	y (n)	Upstream sources of pollution	(y) n	
Broad boundary transition	y (n)	Erosion/sedimentation observed	y (n)	
Vegetation		Difuse flow/slow moving water	y (n)	
Herbaceous vegetation	y (n)	Does wetland flood	(y) n	
Dense vegetation	y (n)	Long water retention	y (n)	Yes (No)
Function Present	y (n)			

Nutrient Removal/Retention Transformation

Hydrology		Transformers		
Open water present	y (n)	Organic soils	y (n)	
Slow moving water	y (n)	Aquatic vegetation	y (n)	
Nutrients upslope	(y) n	Abundant vegetation	y (n)	
Function Present	y (n)			Yes (No)

Production Export

Vegetation		Export		
Density	H M (L)	Detritus	y (n)	
Interspersion	H M (L)	Aquatic plants	y (n)	
Diversity	H M (L)	Berry producing shrubs	(y) n	
Food source	(y) n	Nectar sources	(y) n	
Function Present	(y) n	Seed/mast sources	(y) n	Yes (No)

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream

Elevation change present y n
High seasonal flows y n
Channelized flow y n
Open water fetch y n

Function Present y n

Description of Bank

Bank present y n
Bank vegetated y n
Bank eroded y n
Steep bank y n
Stabilized Bank y n

Yes No

Wildlife Habitat

Diversity

Aquatic insect habitat y n
Amphibian habitat y n
Fisheries habitat y n
Cavity trees y n
Vernal pool y n
Defined stream channel y n short length
Food sources y n
Cover/nesting sources y n
Function Present y n

Connections

Corridor y n
Wetland connections y n birds
Upland connections y n reptiles
Islands y n

Yes No

Buffer

Type SS
Width ~50'
Buffer stream or wetland y n
Does buffer provide shade y n

Degradation

Present y n
Type cattail invaded swamp

Yes No

Wetland Values

Recreational Value

Parking available y n
Watercraft access y n
Fishing available y n
Hunting permitted y n
Walking/biking trails y n
Value H M L

Restoration Stabilization Potential

y n
Restoration area size: potential restoration of cattail portion for more diverse habitat + H_2O treatment restore hydrology plantings

Educational/Scientific Value

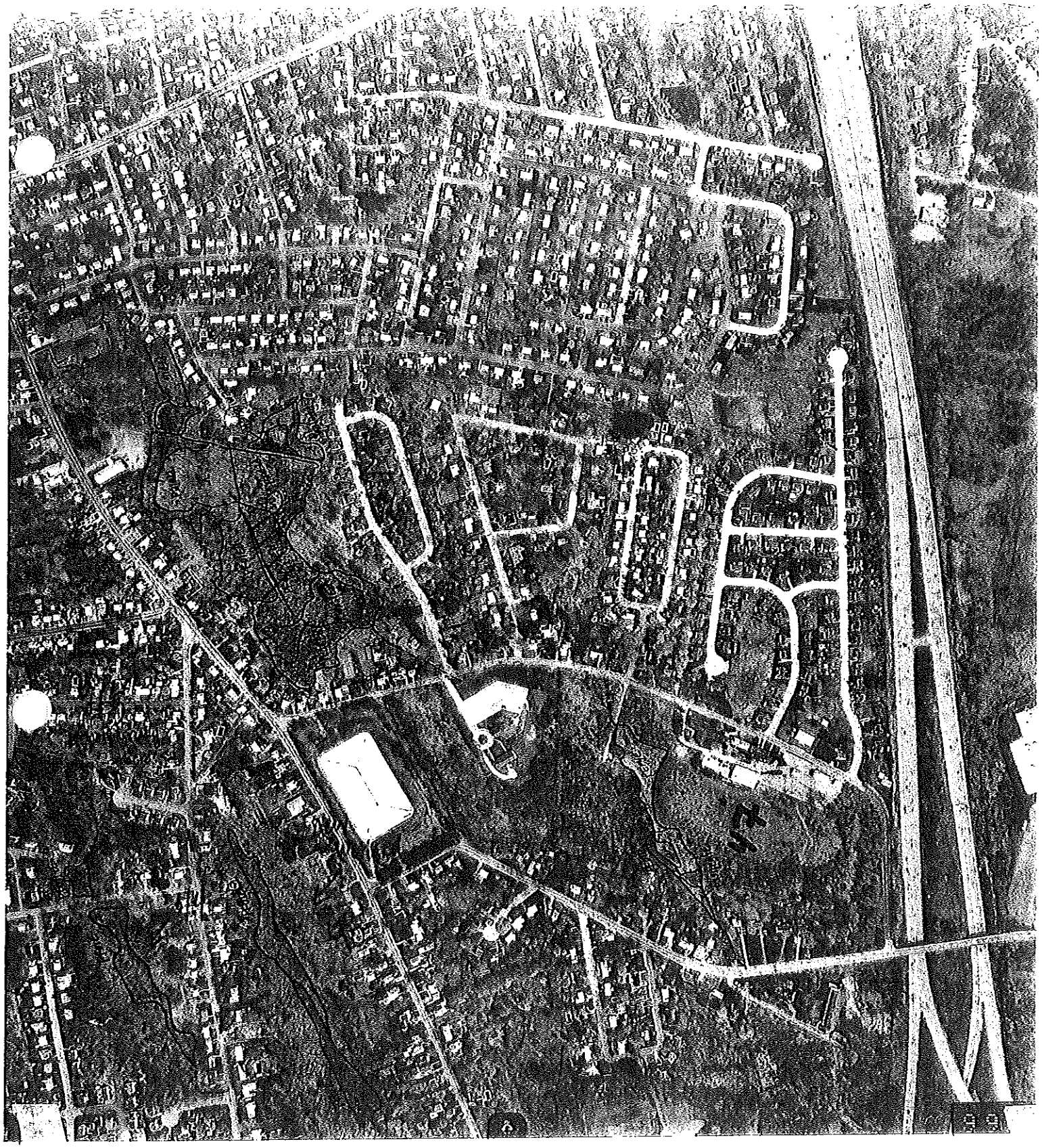
Unique habitats/plant species y n reptiles
Diverse wildlife habitat y n
Parking/access y n
Value H M L

Comments/Wildlife Notes

Uniqueness/Heritage

Urban upland/proximity y n
Rapid development upland y n
Critical habitat/threatened or endangered species y n reptiles
Archaeological sites y n ?
Stonewalls present y n
Historic sites y n ?
Ecological health/vigor fair y n
Value H M L

wet meadow/ cattail swamp



WETLAND 48

Figure 140: This photograph shows the emergent component of wetland 48. The open water may serve as potential vernal pool habitat.

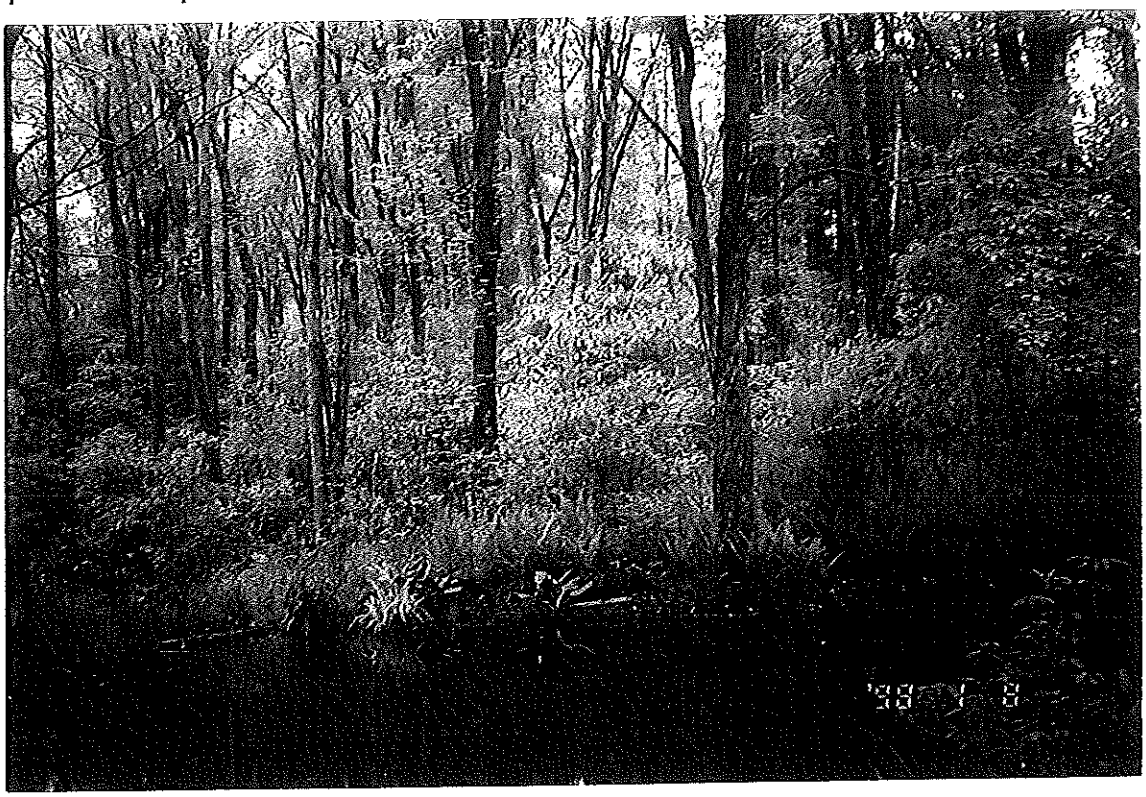


Figure 141: This photograph shows the forested wetland with the drainage that exits the ponded water area. This area serves as small mammal and song bird habitat. This wetland (#48) contributes to urban quality of life because of the development that surrounds this system.

med/high

West Environmental, Inc.
Manchester Wetland Inventory Functional/Value Assessment Data Form

Wetland ID: 48 Size: 3 AC Date: 6/02 WEI Project # 01-066NH
Classification: PFO1E PFO1B
Film Roll #: Photograph #: Aerial Photograph #: 54-9

Wetland Functions

Groundwater Recharge/Discharge potential

Geology		Hydrology		Principal Function	
Restrictive layer present	y n	Groundwater relationship present	y n		
Subsoil type mucky peat		Variable water levels observed	y n		
Other geologic features		Springs or seeps observed	y n		
Function Present	y n	Contains only inlet or outlet	y n	Yes	No

Floodflow Alteration

Watershed Information		Topographic Information			
Land cover in catchment area?	FO, RES	Topography of watershed	gently sloping		
Watershed position	H M L	Topography of wetland	nearly level		
Other catchment storage	y n	Constricted outlet	y n no outlet		
Watercourse associated	y n	High degree of impervious surfaces in wetland watershed	y n		
Contains hydric soils	y n	Land uses downstream protected by this wetland	y n	Yes	No
Function Present	y n				

Sediment/Toxicant/Pathogen Retention

Soils		Setting & Hydrology			
Organic Soils	y n	Upstream sources of pollution	y n		
Broad boundary transition	y n	Erosion/sedimentation observed	y n		
Vegetation		Difuse flow/slow moving water	y n		
Herbaceous vegetation	y n	Does wetland flood	y n		
Dense vegetation	y n	Long water retention	y n	Yes	No
Function Present	y n				

Nutrient Removal/Retention Transformation

Hydrology		Transformers			
Open water present	y n	Organic soils	y n		
Slow moving water	y n	Aquatic vegetation	y n		
Nutrients upslope	y n	Abundant vegetation	y n		
Function Present	y n			Yes	No

Production Export

Vegetation		Export			
Density	H M L	Detritus	y n		
Interspersion	H M L	Aquatic plants	y n		
Diversity	H M L	Berry producing shrubs	y n		
Food source	y n	Nectar sources	y n		
Function Present	y n	Seed/mast sources	y n	Yes	No

moderate

red maple
white pine
yellow birch
arrowwood
HBBB
winterberry

cin fern
sens. fern
white ash
skunk cabbage

cavity trees
3-6" standing H_2O

Sediment/Shoreline Stabilization

Is wetland associated with surface water? (if no, stop), Perennial or intermittent

Characteristics of Stream		Description of Bank	
Elevation change present	y n	Bank present	y n
High seasonal flows	y n	Bank vegetated	y n
Channelized flow	y n	Bank eroded	y n
Open water fetch	y n	Steep bank	y n
		Stabilized Bank	y n
Function Present	y n		

Yes No

Wildlife Habitat

Diversity		Connections	
Aquatic insect habitat	y n	Corridor	y n
Amphibian habitat	y n	Wetland connections	y n
Fisheries habitat	y n	Upland connections	y n
Cavity trees	y n	Islands	y n
Vernal pool	y n potential		
Defined stream channel	y n		
Food sources	y n		
Cover/nesting sources	y n		
Function Present	y n		

Yes No

Buffer		Degradation	
Type SS, FO		Present	y n
Width 15' → >100'		Type litter/tires in H2O	
Buffer stream or wetland	y n		
Does buffer provide shade	y n		

Yes No

Wetland Values

Recreational Value

Parking available	y n
Watercraft access	y n
Fishing available	y n
Hunting permitted	y n
Walking/biking trails	y n
Value	H M L

Restoration Stabilization Potential

y n

Restoration area size:

restore ponded area w/ OBL shrubs for diversity

remove tires/litter

Educational/Scientific Value

Unique habitats/plant species	y n reptiles
Diverse wildlife habitat	y n
Parking/access	y n
Value	H M L

Comments/Wildlife Notes

restoration

Uniqueness/Heritage

Urban upland/proximity	y n
Rapid development upland	y n
Critical habitat/threatened or endangered species	y n reptiles
Archaeological sites	y n ?
Stonewalls present	y n
Historic sites	y n ?
Ecological health/vigor	y n moderate
Value	H M L

due to reptiles + urban setting

44-29-00
23660-54-9

Appendix D

Technical References

Prepared by:

WEST ENVIRONMENTAL

Technical References

Cowardin, L.M., V. Carter, F.C.Golet, E.T. LaRoe. Classification of Wetlands And Deepwater Habitats of the United States, 1979.

James W. Sewall Company, Aerial Photography, April 29, 2000.

New Hampshire Fish & Game Department Nongame Program, New Hampshire Natural Heritage Inventory Map for Manchester, February 27, 2002.

New Hampshire Wetlands Bureau Code of Administrataive Rules, Part Wt 701, Criteria and Evaluation.

United States Department of Agriculture Soil Conservation Service, Soil Survey of Hillsborough County New Hampshire, October 1981.

U.S. Department of the Interior Fish and Wildlife Service, National Wetlands Inventory Map, 1990.

Appendix E

Natural Resources Conservation Service
Wildlife Enhancement Program
Grant Sheet

Prepared by:

WEST ENVIRONMENTAL

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Farm Service Agency

UNIVERSITY of NEW HAMPSHIRE
COOPERATIVE EXTENSION

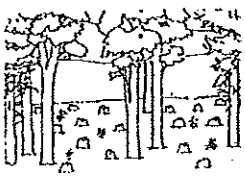
Help for Forest Landowners

The 2002 Farm Bill offers a mix of financial incentives, technical assistance, and education to help landowners voluntarily care for their forests. The NH Division of Forests and Lands, UNH Cooperative Extension, NH Farm Service Agency, and the Natural Resources Conservation Service (NRCS) all help bring these programs to you.

Contacting your UNH Cooperative Extension Forester, your local NRCS Conservationist, or your Farm Service Agency is the best way to decide which programs are right for you. What follows is a brief description of the available programs.

FLEP (Forest Land Enhancement Program): Landowners who own at least 10 acres of undeveloped land and have a forest stewardship plan written by a NH licensed forester are eligible for up to 50% reimbursement for reforestation, wildlife and forest stand improvement, and other practices. Financial assistance is available to cover up to 75% of the cost to develop a plan for those lacking one. For more information about FLEP guidelines and priorities, contact your UNH Cooperative Extension Forester or 800-444-8978.

EQIP (Environmental Quality Incentives Program): EQIP is for installing structural and management practices on eligible agricultural and forest land. EQIP activities are carried out according to a plan that includes practices that meet NRCS technical standards. The cost sharing rate is 50% for most conservation practices, and contracts are from 1-10 years. For more information, contact your local NRCS Conservationist.



WHIP (Wildlife Habitat Incentives Program): WHIP is for habitat improvement on private land. WHIP provides up to 75 percent cost share to establish and improve fish and wildlife habitat. Contracts generally last from 5 to 10 years. For more information, contact your local NRCS Conservationist.

NH Fish and Game Department Small Grants Program: This is a state program designed for restoring, sustaining, or enhancing wildlife habitat on privately owned land. Owners of private, municipal, corporate or other non-governmental lands can apply for funds to implement habitat-improving practices. These grants can be used as a match for WHIP and other programs. Property must be open for public use, including hunting. For more information, contact your regional New Hampshire Fish and Game Department office or Charlie Bridges at (603) 271-2461.

UNH Cooperative Extension programs and policies are consistent with pertinent federal and state laws and regulations, and prohibits discrimination in its programs, activities and employment on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sex, sexual orientation or veteran's, marital or family status. College of Life Sciences and Agriculture, County Governments, NH Dept. of Resources and Economic Development, Division of Forests and Lands, NH Fish and Game, U.S. Dept. of Agriculture and U.S. Fish and Wildlife Service cooperating.

Management Practice	FLEP	EQIP	WHIP	Small Grant
Forest Stewardship Plan Development	**X**			
Weeding and Thinning (stand improvement)	**X**	X		
Water Quality Improvement/Watershed Protection				
Riparian Forest Buffer	X	X	X	X
Access Road Construction	X	X		
Critical Area Planting	X	X	X	X
Forest trails and landings	X	X		
Grade stabilization	X	X		
Water control structures (crossings)	X	X		
Streambank and shoreline protection	X	X	X	X
Wildlife Habitat Improvement				
Fish Habitat Improvement	X	X		
Apple tree/fruiting shrub release	X		X	X
Brush clearing/mowing	X		X	X
Old field restoration	X		X	X
Woodland openings	X		X	X
Other habitat improvements	X		X	X
Reforestation				
Site preparation for natural regeneration	**X**	X		
Tree planting	**X**	X	X	
Invasive Species Control		X	X	
Catastrophic Event Rehabilitation	X			
Firebreaks			X	
Prescribed Burning	X		X	
Windbreaks		X		

Note: Bolded X's indicates a high priority practice for FLEP.

Help Is a Phone Call Away

County	UNH Cooperative Extension	Natural Resources Conservation Service (NRCS)	NH Farm Service Agency
Belknap	527-5475	527-5880	223-6003
Carroll	539-3331	447-2771	788-4602
Cheshire	352-4550	756-2988	756-2970
Coos	788-4961	788-4651	788-4602
Grafton	787-6944	747-2001	747-3751
Hillsborough	673-2510	673-2409	673-1222
Merrimack	225-5505	223-6023	223-6003
Rockingham	679-5616	679-1587	679-4656
Strafford	749-4445	679-1587	679-4656
Sullivan	863-9200	863-4297	756-2970

Appendix F

Manchester Rare or Endangered Species List
Natural Heritage Map

Prepared by:

WEST ENVIRONMENTAL

Town Flag	Species or Community Name	Listed? Federal	Listed? State	# reported last 20 yrs Town	# reported last 20 yrs State
MANCHESTER					
	Natural Communities - Terrestrial				
*	SNE Acidic Rocky Summit/Rock Outcrop Community	-	-	1	20
**	SNE Dry Central Hardwood Forest on Acidic Bedrock or Till	-	-	1	15
**	SNE Floodplain Forest	-	-	3	48
*	SNE High-Energy Riverbank Community	-	-	1	7
***	SNE Riverside Outcrop Community	-	-	1	2
	Natural Communities - Palustrine				
****	Atlantic White Cedar Basin Swamp	-	-	2	28
**	Blackgum/Red Maple Basin Swamp	-	-	1	17
**	Inland New England Acidic Pond Shore/Lake Shore Community	-	-	1	13
**	SNE Basin Swamp	-	-	1	11
*	SNE Level Bog	-	-	1	19
	Plants				
***	Atlantic White Cedar (Chamaecyparis thyoides)	-	-	1	44
**	Bird's-Foot Violet (Viola pedata var lineariloba)	-	T	2	12
	Black Maple (Acer nigrum)	-	T	Historical	10
	Blunt-Leaved Milkweed (Asclepias amplexicaulis)	-	T	Historical	12
	Budding Pondweed (Potamogeton pusillus var gemmiparus)	-	T	Historical	6
	Burgrass (Cenchrus longispinus)	-	T	Historical	10
	Cinna-Like Reed Bent-Grass (Calamagrostis cinnoides)	-	-	Historical	5
	Climbing Fern (Lygodium palmatum)	-	-	Historical	3
	Erect Knotweed (Polygonum erectum)	-	E	Historical	3
*	False Pimpernel (Lindernia anagallidea)	-	E	1	4
	Frank's Love-Grass (Eragrostis frankii)	-	-	Historical	2
	Fringed Gentian (Gentiana crinita)	-	T	Historical	28
	Gall-of-the-Earth (Prenanthes serpentaria)	-	-	Historical	3
***	Giant Rhododendron (Rhododendron maximum)	-	-	1	14
*	Goat's-Rue (Tephrosia virginiana)	-	E	1	6
*	Golden-Heather (Hudsonia ericoides)	-	T	1	12
**	Hairy Stargrass (Hypoxis hirsuta)	-	T	1	14
	Lined Bulrush (Scirpus pendulus)	-	T	Historical	5
	Long-Fruited Anemone (Anemone cylindrica)	-	-	Historical	11
	Low Bindweed (Convolvulus spithamaeus)	-	T	Historical	7
	Many Forms Sedge (Carex polymorpha)	-	T	Historical	2
	Marsh Horsetail (Equisetum palustre)	-	T	Historical	12
*	Maryland Tick-Trefoil (Desmodium marilandicum)	-	E	1	4
	Northern Blazing Star (Liatris borealis)	-	E	Historical	14
	One-Sided Rush (Juncus secundus)	-	E	Historical	6
	Piled-Up Sedge (Carex cumulata)	-	T	Historical	9
	Reflexed Sedge (Carex retroflexa)	-	T	Historical	5
*	River Birch (Betula nigra)	-	T	4	12
	Sharp Flowered Manna-Grass (Glyceria acutiflora)	-	E	Historical	9
	Skydrop Aster (Aster patens var patens)	-	T	Historical	10

Listed? E = Endangered T = Threatened

Flags **** = Highest importance
*** = Extremely high importance
** = Very high importance
* = High importance

These flags are based on a combination of (1) how rare the species or community is and (2) how large or healthy its examples are in that town. Please contact Natural Heritage Inventory at (603) 271-3623 to learn more about this or other ways of setting priorities.

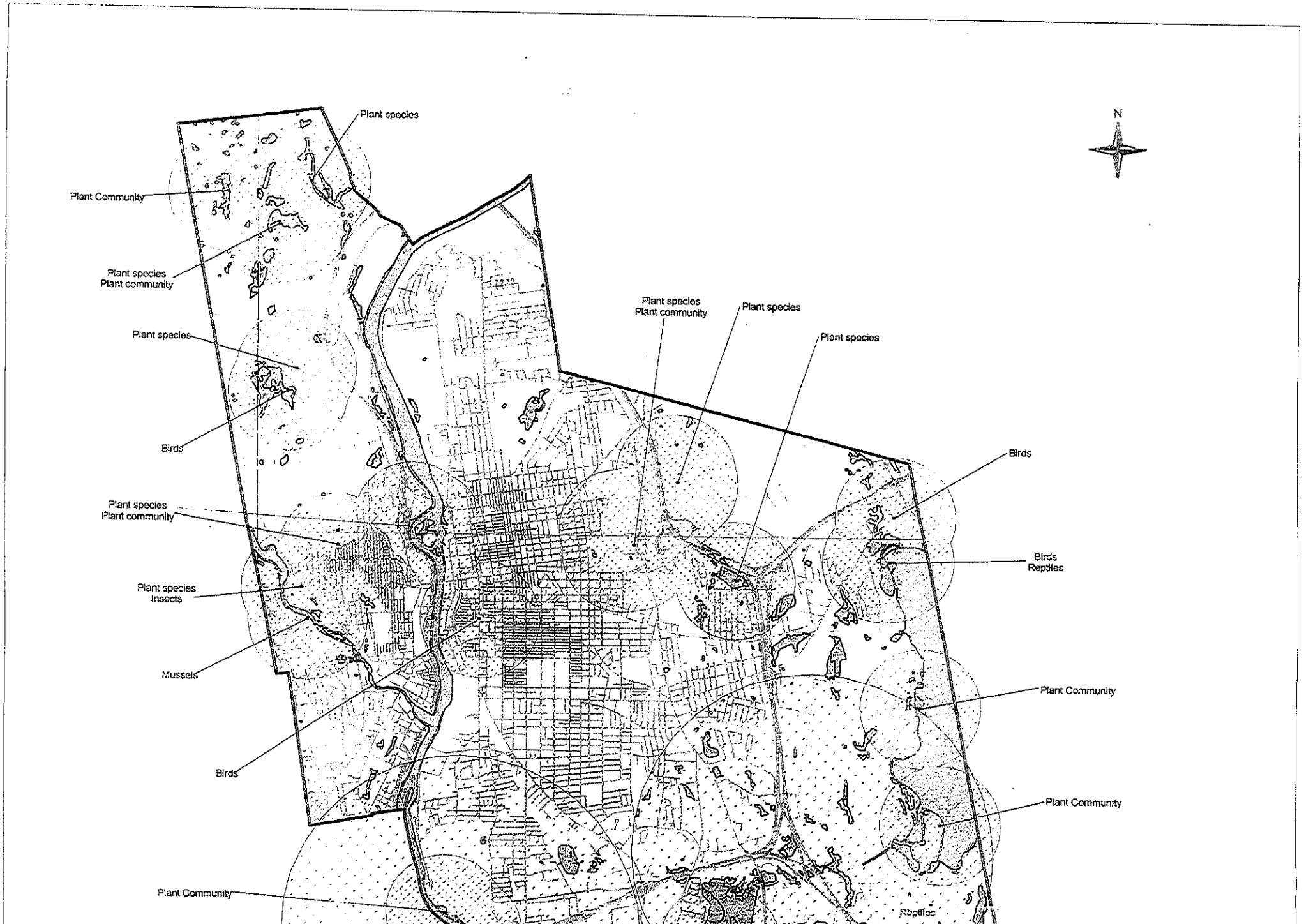
Town Flag	Species or Community Name	Listed? Federal	Listed? State	# reported last 20 yrs Town	# reported last 20 yrs State
	Slender Crab-Grass (Digitaria filiformis)	-	-	Historical	4
**	Small Bidens (Bidens discoidea)	-	E	1	9
*	Spiked Needlegrass (Aristida longespica var geniculata)	-	E	1	4
**	Swamp Azalea (Rhododendron viscosum)	-	T	1	42
**	Sweet Goldenrod (Solidago odora)	-	T	4	12
	Toothed Tick-Trefoil (Desmodium cuspidatum)	-	-	Historical	3
*	White-Topped Aster (Sericocarpus linifolius)	-	T	1	6
**	Wild Lupine (Lupinus perennis)	-	T	1	38
	Woodland Hound's-Tongue (Hackelia virginiana)	-	T	Historical	20
	Vertebrates - Birds				
**	American Bittern (Botaurus lentiginosus)	-	-	1	2
**	Bald Eagle (Haliaeetus leucocephalus)	T	E	1	14
**	Common Loon (Gavia immer)	-	T	1	5
**	Fish Crow (Corvus ossifragus)	-	-	1	3
**	Peregrine Falcon (Falco peregrinus anatum)	M	E	1	24
**	Pied-Billed Grebe (Podilymbus podiceps)	-	E	1	21
	Purple Martin (Progne subis)	-	E	Historical	11
**	Upland Sandpiper (Bartramia longicauda)	-	E	1	5
	Vertebrates - Reptiles				
	Blanding's Turtle (Emydoidea blandingii)	-	-	Historical	61
	Eastern Hognose Snake (Heterodon platirhinos)	-	T	Historical	15
**	Spotted Turtle (Clemmys guttata)	-	-	1	39
	Vertebrates - Fish				
	Banded Sunfish (Enneacanthus obesus)	-	-	Historical	8
	Invertebrates - Insects				
	A Noctuid Moth (Eucoptocnemis fimbriaris)	-	-	Historical	2
	A Noctuid Moth (Trichosilia manifesta)	-	-	Historical	2
	Karner Blue Butterfly (Lycaeides melissa samuelis)	E	E	Historical	7
**	Persius Dusky Wing (Erynnis persius persius)	-	E	1	6
**	Pine Barrens Zanclognatha Moth (Zanclognatha martha)	-	T	1	5
	Invertebrates - Mollusks				
**	Brook Floater (Alasmidonta varicosa)	-	E	1	29
MARLBOROUGH					
	Natural Communities - Palustrine				
**	NNE Level Bog	-	-	1	18
	Plants				
	Fringed Gentian (Gentiana crinita)	-	T	Historical	28

Listed? E = Endangered T = Threatened

Flags
**** = Highest importance
*** = Extremely high importance
** = Very high importance
* = High importance

These flags are based on a combination of (1) how rare the species or community is and (2) how large or healthy its examples are in that town. Please contact Natural Heritage Inventory at (603) 271-3623 to learn more about this or other ways of setting priorities.

Town of Manchester



Appendix G

Aerial Photograph Interpretation Reports

Prepared by:

WEST ENVIRONMENTAL

May 7, 2002

West Environmental Inc.
122 Mast Road, Suite 6
Lee, NH 03824

Re: Manchester wetlands interpretation

Dear Mark and Bobbie

Enclosed is the first set of aerial photographs with interpretation of the wetlands you marked. They are the first two flight lines on the west side of town, and west of the river. I labeled the wetlands on the overlays in red with the numbers shown on your topo copy. A few of the wetlands that appear separate on the topo/NWI map are actually connected. I occasionally delineated a little more wetland in the area if it seemed to be connected to the targeted wetland.

The following photos have selected wetlands delineated on them:

Line 39	wetland #
39-33	39
39-35	39
39-37	37
39-39	36,35,34
39-41	34,33,32,31

Line 40	wetland #
40-33	40
40-37	41,40(no wetland)
40-41	38
40-43	29(less than shown on map)
40-45	30
40-47	30?

Please let me know if you have any questions. I will be continuing eastward on the interpretation, and will have more ready for you next week.

Sincerely,

May 20, 2002

West Environmental Inc.
122 Mast Road, Suite 6
Lee, NH 03824

Re: Manchester wetlands interpretation

Dear Mark and Bobbie

Enclosed is the second set of aerial photographs with interpretation of the wetlands you marked. They are in flight lines 42, 53, 54, and 55, covering the southern part of town. I labeled the wetlands on the overlays in red with the numbers shown on your topo copy. A few of the wetlands that appear separate on the topo/NWI map are actually connected. I occasionally delineated a little more wetland in the area if it seemed to be connected to the targeted wetland, or might be large enough to be considered in your project. There was some over the bank flooding on 54-7 and 55-7, which made delineations and classification difficult (esp. 54-7). On 54-5 it was hard to tell if the flooded vegetation next to the river was shrub or emergents because of the high water- it looks like it could be buttonbush, and maybe some non-persistent emergent (like wild rice?) Cohas Brook looks like a really nice river system-I imagine you will need a canoe and some time to evaluate those wetlands.

The following photos have selected wetlands delineated on them:

Line 42	wetland #
42-25	maybe part of 1?
42-27	1
42-29	new wetland?
42-31	2 & 3

Line 53	wetland #
53-7	3 & 4

Line 54	wetland #
54-3	4
54-5	4 & 5
54-7	4, 15 & new wetlands
54-9	43, 44, 45, 46 & new wetland

Line 55	wetland #
55-5	5, 6, 12
55-7	12, 13, 14, 16

Besides these photos I enclose the stereo pairs for them (unless still needed for the next photos). The full list of returned photos in this package is:
Line 38- photos 33-40 (not needed)
Line 41- photos 30-37 (not needed)
Line 42- photos 25-37
Line 53- photos 5-15

June 11, 2002

West Environmental Inc.
122 Mast Road, Suite 6
Lee, NH 03824

Re: Manchester wetlands interpretation

Dear Mark and Bobbie

Enclosed is the third and last set of aerial photographs with interpretation of the wetlands you marked. They are in flight lines 54, 55, 56 and 57, covering the eastern part of town. I labeled the wetlands on the overlays in red with the numbers shown on your topo copy. A few of the wetlands that appear separate on the topo/NWI map are actually connected. I occasionally delineated a little more wetland in the area if it seemed to be connected to the targeted wetland, or might be large enough to be considered in your project. In wetland 21 I was not sure if the tall darker signature was *Phragmites* or shrubs, but classified it as *Phragmites*. In wetland 22 there are a lot of dead tree remnants that could not be included in the already mixed classification (PSS1/EM1E), but might be important for habitat information. Several wetlands have changed from forested to open since the NWI maps were done, due to beaver activity. The large wetland off the northwestern shore of Massabesic Lake (#25, photo 56-11) appears to be a floating bog but I am not sure. I am also not sure if the vegetation in the water surrounding the mat is flooded shrubs or emergents. There is another smaller bog mat south of this on the western shore of the same lake (part of wetland 17?, photo 56-9) that I think is also probably leatherleaf, with some small trees that I think are larch, but may be dead or broad-leaved deciduous (maples). I would like to know what you folks find at these two sites when you visit them.

The following photos have wetlands delineated on them:

Line 54	wetland # dead snags
54-11	24, 22, and part of 21 bog? phragmites
54-13	23

Line 55	wetland #
55-9	18 (larger than on NWI map)
55-11	19, 20, 22, and part of 21
55-13	part of 25, and a possible new one (not sure if large enough) Bog?
55-15	26 and 27 (extends into anther town)

Line 56	wetland #
56-3	9, 10, 11, part of 8, and part of a possible new one
56-5	part of 8 and part of 17 (not sure if 17 included Massabesic Lake, but included it just in case)
56-7	part of 17 Bog mat? leatherleaf & larch?
56-9	part of 17
56-11	part of 17 and 25

Line 57	wetland #

#25 bog mat
#17 - leatherleaf bog
larch

57-2 part of new wetland continued from 56-3.

Besides these photos I enclose the stereo pairs and unneeded photos. The full list of returned photos in this package is:
Line 54- photos 10-15
Line 55- photos 4, 8-16
Line 56- photos 2-13
Line 57- photos 2-8

I also enclose the photo index and the coded NWI map. They were both very helpful. The only wetland I did not delineate was number 28, Dorrs Pond, because there was not photo coverage. It does not appear from the NWI map that there is much there.

Please let me know if you have any questions. Thanks for your patience, and I hope I have not held you up with your work. I will write up a bill this week and send it to you separately. Good luck with your project, and hope you find some really neat areas.

Sincerely,

Jamie