Mitigation for the I-93 Improvements
Salem to Manchester

Mitigation Overview

Throughout the planning stages for the I-93 Improvements, the impacts to wetlands were carefully evaluated. The term ***wetland mitigation*** refers to the method of minimizing the unavoidable impacts on wetlands during the planning and construction phases of the project. The New Hampshire Department of Transportation (NHDOT) utilized the following approach to minimize impacts on wetlands: 1) avoidance; 2) minimization; and 3) compensation. While evaluating the highway improvement alternatives, avoidance of wetland impacts was a primary concern. Due to the large scale of the project, however, all options considered involved impacts to wetlands. Where it was not possible to avoid wetlands, impacts were minimized by using steeper side slopes or by constructing retaining walls. A compensatory mitigation package was then developed to offset any remaining impacts to existing wetlands. This resulted in equal or greater amounts of wetlands being created and/or preserved within the five communities directly impacted to replicate and preserve the functions and values lost from these impacts to the ecological systems.

In the early 1990s, NHDOT, in cooperation with State and Federal natural resource agencies, began the evaluation of the wetland impacts. At that time it was generally understood that any highway improvement scenario would require compensatory wetland mitigation, meaning that new wetland areas would need to be created elsewhere to compensate for the impacted wetlands. With that understanding in mind, in 1995 the NHDOT began searching for potential compensatory wetland sites. By 1999, two advanced sites were identified: the South Road site in Londonderry and Pelham Road site in Salem. Creation of the Pelham Road site was completed in 2001 and the South Road site has been designed and will be under construction in coordination with the Exit 4 construction contract.

In August 2000, the first of several interagency Environmental Streamlining meetings was held. This “partnering”, in advance of preparing the Environmental Impact Statement (EIS), made the complex environmental process more efficient. The I-93 Improvements project was the first in the State to formally adopt agency partnering protocols. These protocols will potentially serve as a model for future projects. As part of the “streamlining” process, Federal and State agencies met a number of times in various forums to identify wetland mitigation “package” components with the goal of obtaining early acceptance of mitigation components that would adequately compensate for wetland impacts.

During the development of the EIS many highway improvement scenarios were evaluated and considered. The result of this process was the ***Selected Alternative***, which basically can be described as expanding the existing highway from two to four lanes in both directions. Additionally, the Selected Alternative improvements will include improving the capacity of interchanges (exits), resulting in safer driving conditions, and the construction of new Park-and-Ride (PNR) facilities at Exits 2, 3 & 5 and of a bus terminal building at the existing Exit 4 facility. The Selected Alternative impacts approximately seventy-seven acres of wetlands along approximately twenty miles of improvements to the I-93 Corridor. For the most part, these proposed highway improvements will follow the existing corridor so the bulk of the direct wetland impacts are along the edges of existing wetland systems located adjacent to I-93. In many cases, these "edge impacts" represent a small percentage of the total acreage within larger wetland systems and therefore are not expected to diminish the functions and values of these wetlands.

Wetland Mitigation Site Selection

Selection of both the advanced and subsequent mitigation sites was done through a collaborative effort. Each of the five communities along the I-93 corridor was contacted in an effort to locate potential mitigation sites. Discussions and meetings were conducted with the conservation commissions, natural resource agencies, municipal officials, other interested individuals, and the general public to obtain recommendations and information about specific mitigation sites. Each potential site was subsequently field investigated by wetland mitigation specialists. The goal was to evaluate the likelihood of creating or restoring wetlands of sufficient size that would replace lost functions and values and to evaluate these natural areas for their suitability as preservation areas.

In general, the following criteria were utilized in the initial selection of potential compensatory wetland sites:

- Contain wetlands that provide similar functions and values as those impacted by the proposed construction activities.
- Be large enough to provide a relatively unfragmented wildlife habitat or preservation of unique communities or buffers thereto.
- Lie adjacent to functioning wetlands, streams or rivers, or undeveloped areas, thereby providing or enhancing continuity with established wildlife corridors or greenways.
- Have a mix of relatively undisturbed uplands and wetlands that provides important wildlife habitat or contains rare/threatened plant or animal communities.
- Constitute areas threatened by imminent development within communities impacted by the I-93 Improvements.
- Constitute areas in reasonable proximity to the wetlands impacted by the I-93 Improvements.
- Involve wetland creation and/or enhancement, as opposed to preservation only.
- Provide potential use by the public as recreational or educational areas with accessibility, i.e., areas adjacent to existing established conservation tracts with public access.

As NHDOT received input and feedback from communities and agencies, numerous sites were compiled and investigated between early 2001 and the spring of 2002. In all, more than 60 sites comprising 7,000 acres of land were researched, visited, and assessed by NHDOT. A number of field visits were jointly undertaken with Federal and State resource agencies and/or local officials. Based on NHDOT's study, the initial mitigation package proposal included 11 sites and approximately 650 acres. The proposed package was developed under assumptions that the mitigation should:

- Primarily address direct impacts to wetlands, flood storage, and water quality.
- Be located within close proximity to project impacts, and to the extent practicable, within the five corridor communities which would absorb the majority of impacts associated with the highway widening.
- Be generally distributed within the corridor communities in accordance with the quality of the impacted resources within each community, and the overall magnitude of impact the project brings to bear on each community.
- Reflect the priorities of each community relative to mitigation with recognition of the direction provided by the natural resource agencies.
- Involve a reasonable expenditure of public funds.

At the same time that NHDOT was evaluating wetlands impact mitigation, the United States Environmental Protection Agency (USEPA), with assistance from the New Hampshire Department of Environmental Services (NHDES), the United States Fish and Wildlife Service (USFWS), Audubon Society and the University of New Hampshire (UNH) Complex Systems Research Center, undertook a study to suggest locations in the impacted area (the south central region of New Hampshire) that were of high environmental value and worthy of preservation. The study utilized Geographic Information Systems (GIS) mapping of natural resource data, existing conservation lands, and large unfragmented land areas, as well as input from local conservation commissions, environmental professionals from State and Federal agencies, and environmental interest groups. In general, emphasis was placed on areas with important natural resources, large (500- to 1,000-acre) conservation lands, and land areas providing continuity among wildlife corridors.

This study resulted in USEPA recommendations that go beyond offsetting the impacts from highway improvements by addressing the general issue of secondary impacts in the region served by the southern I-93 corridor. USEPA's proposed mitigation would have included not only the NHDOT's proposed wetland compensation sites, but also another eight sites totaling 2,900+ acres. Moreover, their mitigation package proposed funding of an unspecified amount for the purchase of additional sites over time and funding for the Community Technical Assistance Program (CTAP) to address the growth and development associated with the southern I-93 corridor.

In response to this proposal and comments by the USEPA and others, NHDOT expanded the draft mitigation package to include:

1) Purchase of additional lands in the Southeast Lands region of Windham, bringing the total area to be preserved by NHDOT in this area to 290 acres;

2) Placing easements on ecologically important lands in Londonderry adjacent to the Musquash Swamp that will add permanent protection to approximately 110 acres of land and create a reserve of approximately 820 acres including already preserved Musquash Conservation Area lands;

3) Protection of approximately 70 acres in Londonderry, which will help preserve the integrity of adjacent Scobie Pond;

4) Conservation and recreation easements in Salem on a 27-acre parcel owned by NHDOT, known as Cluff Crossing, which will protect the confluence of Porcupine and Policy Brooks including their adjacent prime wetlands;

5) Preservation of an additional 37-acre parcel adjacent to Beaver Brook and the 75-acre South Road advanced mitigation site in Londonderry;

6) A commitment to provide up to $3 million in funding to the NHDES Drinking Water Supply Land Grant Program for protection of lands adjacent to Massabesic Lake (the drinking water supply for Manchester and parts of Derry and Londonderry); and

7) A commitment to study the feasibility of providing wildlife crossings of I-93 at Policy, Porcupine, Beaver, and Cohas Brooks during final design.

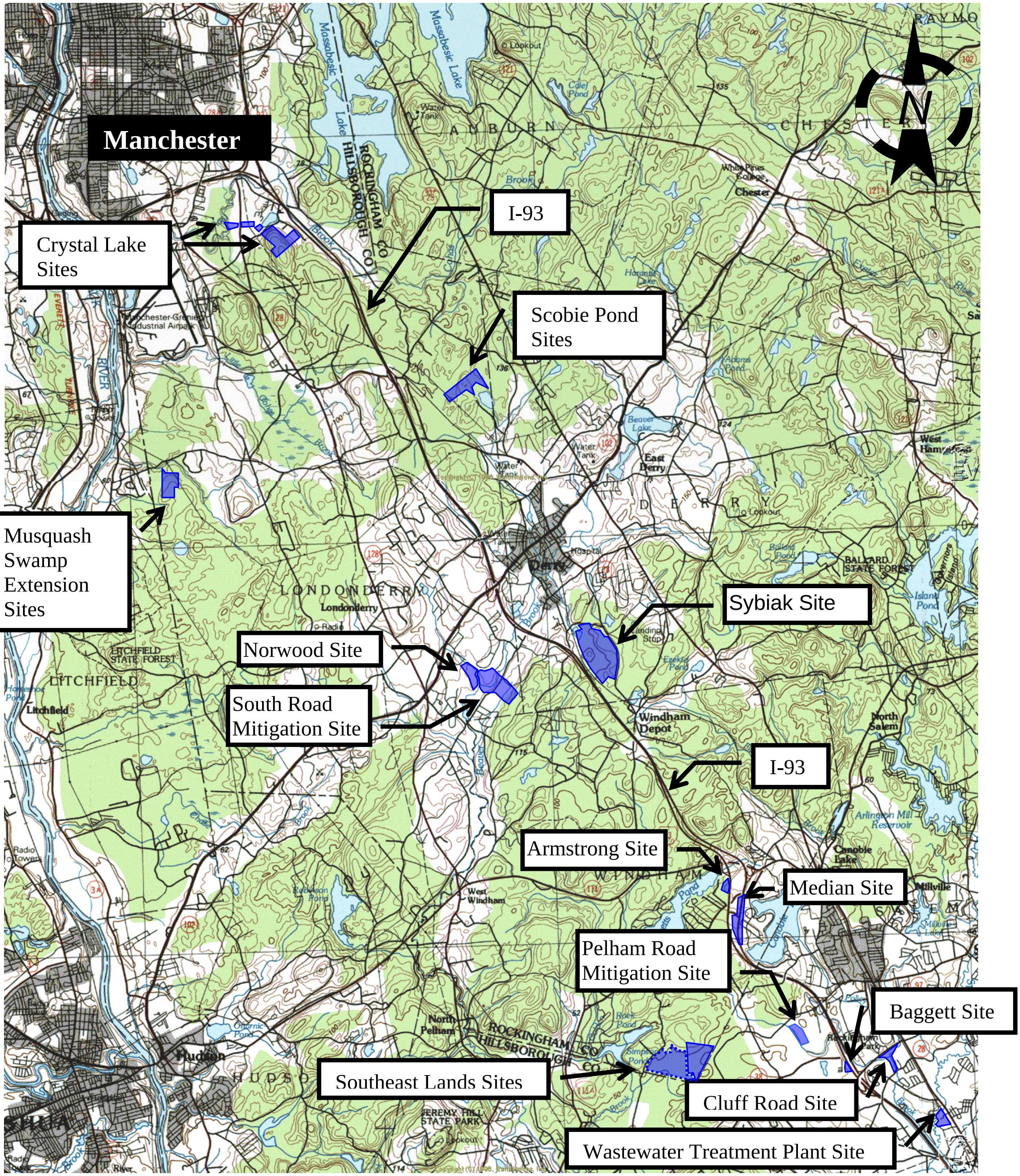
The total mitigation package includes 17 sites, protecting over 1,000 acres of land. At five sites within these lands, approximately 27 acres of new wetlands will be created. These totals do not include the land that will be protected through the $3 million in funding to the NHDES Drinking Water Supply Land Grant Program.

Location of the chosen mitigation sites is provided in the graphic and table that follow. Specific descriptions for each of the chosen mitigation sites are provided following the summary table.

I-93 Improvements ~ Salem - Manchester

Wetland Mitigation Sites

Listing of Chosen Wetland Mitigation Sites



Summary of Wetland Mitigation Sites

*Site ID #	Site Name	Town	Mitigation (acres)	Creation (acres)	Preser-vation (acres)	Notable Site Features
3	Filip Farm Site	Manchester	16		16	Site comprised of open field and wetlands that abut Mosquito Brook and other Crystal Lake area parcels. Also a portion of Filip's Glen development deeded to Crystal Lake Preservation Association.
44	Giovagnoli Farm Property	Manchester	20		20	Agricultural fields that lie adjacent to Cohas Brook and connect to Great Cohas Swamp located to west.
46	Podsadowski Property - The Hill	Manchester	34		34	Forested, hillside parcel providing important connection to other undeveloped and protected land areas. Source of groundwater recharge for Crystal Lake.
47	Greek Picnic Grounds	Manchester	40		40	Hilltop parcel that connects Crystal Lake area parcels to existing conservation lands.
53	Demers Property Easement	Manchester	10		10	Conservation easement on existing undeveloped land to widen ecological corridor along Mosquito Brook.
Manchester Summary:		*Subtotal:*	*120*	*(5 acres of wetlands impacted by the Selected Alternative)*		
14, 15	South Road Mitigation Site	Londonderry	75	11	64	Advanced mitigation site. Abuts Beaver Brook. The site will provide created wetlands and wildlife habitat restoration.
58	Scobie Pond Area	Londonderry	70		70	Identified by Town of Londonderry as opportunity for preservation. Buffer to Scobie Pond.
61	Musquash Expansion Parcels	Londonderry	110		110	Upland/wetland complex adjacent to conservation lands. Identified by Town of Londonderry as opportunity for preservation.
63	Norwood Parcel	Londonderry	37		37	Diverse wetlands, adjacent to a perennial tributary to Beaver Brook, make up 80% of the site. Adjacent to conservation lands.
Londonderry Summary:		*Subtotal:*	*292*	*(26 acres of wetlands impacted by the Selected Alternative)*		
16	Sybiak Farm Property	Derry	200		200	Wide variety of wildlife habitat including upland forest, abandoned farm field/orchards and prime wetlands.

*Site ID #	Site Name	Town	Mitigation (acres)	Creation (acres)	Preser-vation (acres)	Notable Site Features
Derry Summary:		***Subtotal:***	***200***	***(5 acres of wetlands impacted by the Selected Alternative)***		
24	Highway Median	Windham	17	3	14	Relocation of existing northbound lanes will provide for wetland creation and restoration. Located adjacent to existing NHDOT creation site and within a wellhead Watershed Protection District.
49	Armstrong Property (Cobbetts Pond Site)	Windham	11		11	Adjacent to existing NHDOT creation site. Located within a wellhead Watershed Protection District.
45	Windham Southeast Lands	Windham	290		290	Large, undisturbed, contiguous forested areas adjacent to Porcupine Brook and Golden Brook containing diversity of species and habitat. Some areas under development threat. Contains identified Heritage Site (NE Basin Swamp).
Windham Summary:		***Subtotal:***	***318***	***(18 acres of wetlands impacted by the Selected Alternative)***		
30	Cluff Crossing	Salem	27		27	Flat open fields and prime wetlands.
31	Pelham Road Mitigation Site	Salem	25	4	21	Advanced mitigation site that abuts Porcupine Brook. Creation of wetlands is complete.
32	Salem Wastewater Treatment Plant	Salem	32	7	25	Abandoned buildings and treatment plant components; second-growth and floodplain areas. Flood storage compensation and hazardous waste remediation.
38	Baggett Property	Salem	6	2	4	Forested area adjacent to prime wetland. Flood storage and/or preservation (wildlife habitat).
Salem Summary:		***Subtotal:***	***90***	***(23 acres of wetlands impacted by the Selected Alternative)***		
Complete Mitigation Package Summary		***Total:***	***1020***	***(77 acres of wetlands impacted by the Selected Alternative)***		

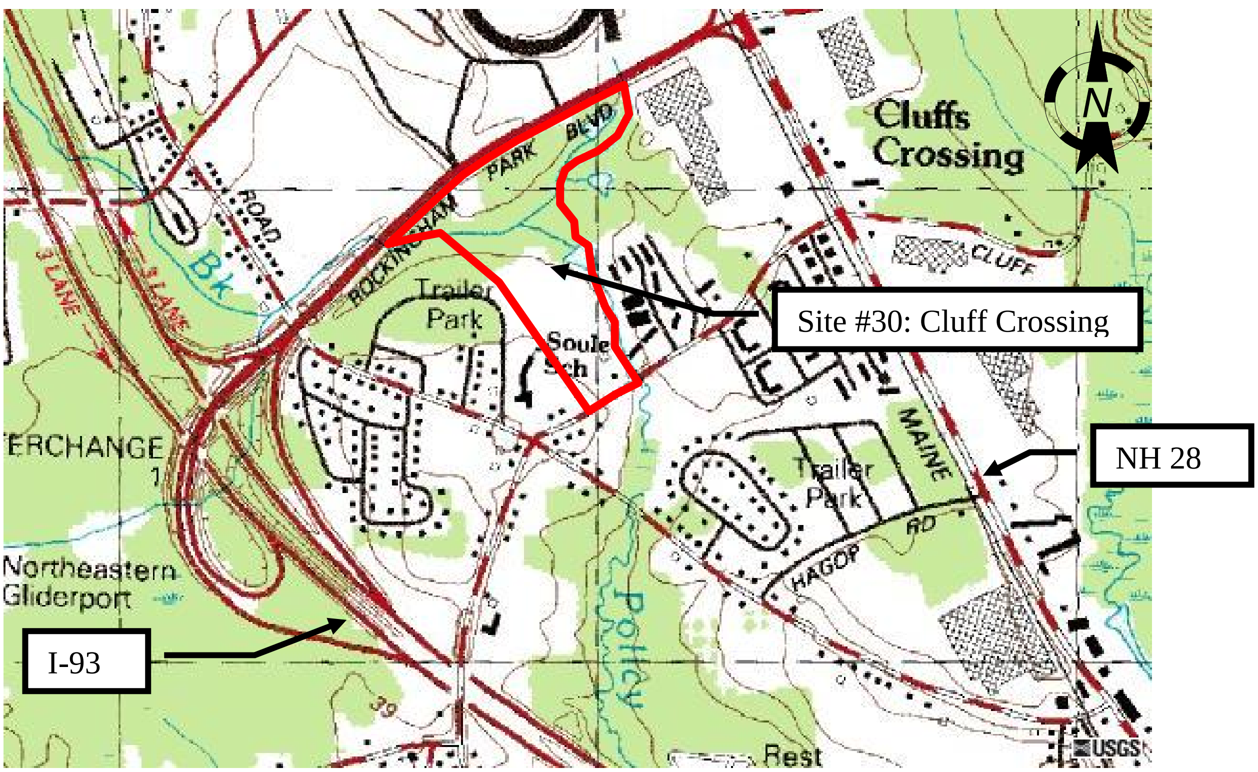
* Note that each site was assigned an ID number during the evaluation process. This ID number provides a link to reference information contained in the DEIS and FEIS documents. Out of the 60 sites originally evaluated the 17 sites selected for the mitigation package are listed above.

Specific descriptive site summaries are provided here for each component of the mitigation package. Sites are located within each of the five corridor communities: Salem, Windham, Derry, Londonderry, and Manchester.

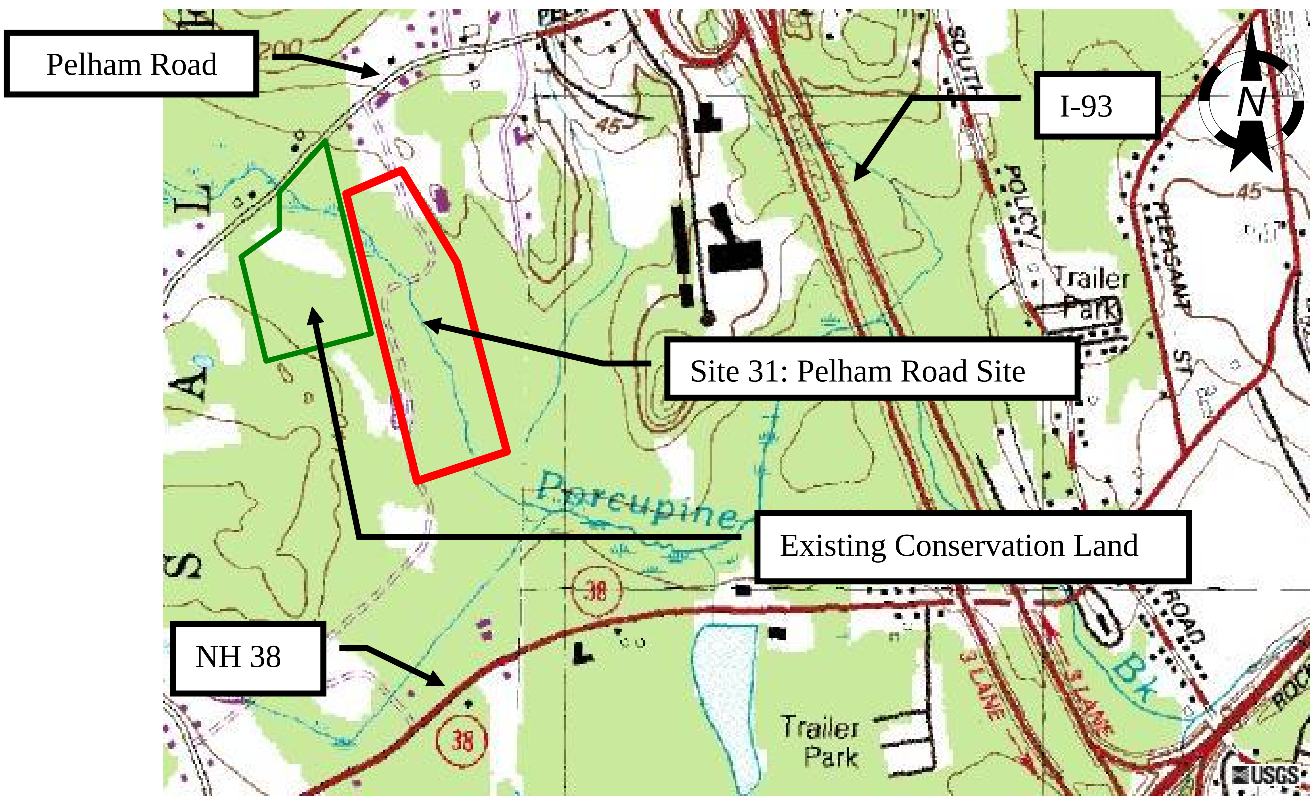
Salem

The sites proposed in Salem all contain a flood storage component to assist with the persistent flooding problems and to mitigate for lost flood storage due to proposed highway construction. In providing for flood storage, wetland creation/enhancement will also provide benefits in terms of wildlife habitat and water quality. For the Selected Alternative, the total amount of wetland impacts (including the Exit 2 Park-and-Ride and sound walls) within Salem is approximately 23 acres. Total mitigation provided by the proposed sites amounts to approximately 90 acres (including creation, preservation, and flood storage replacement elements). Each of the sites is described below.

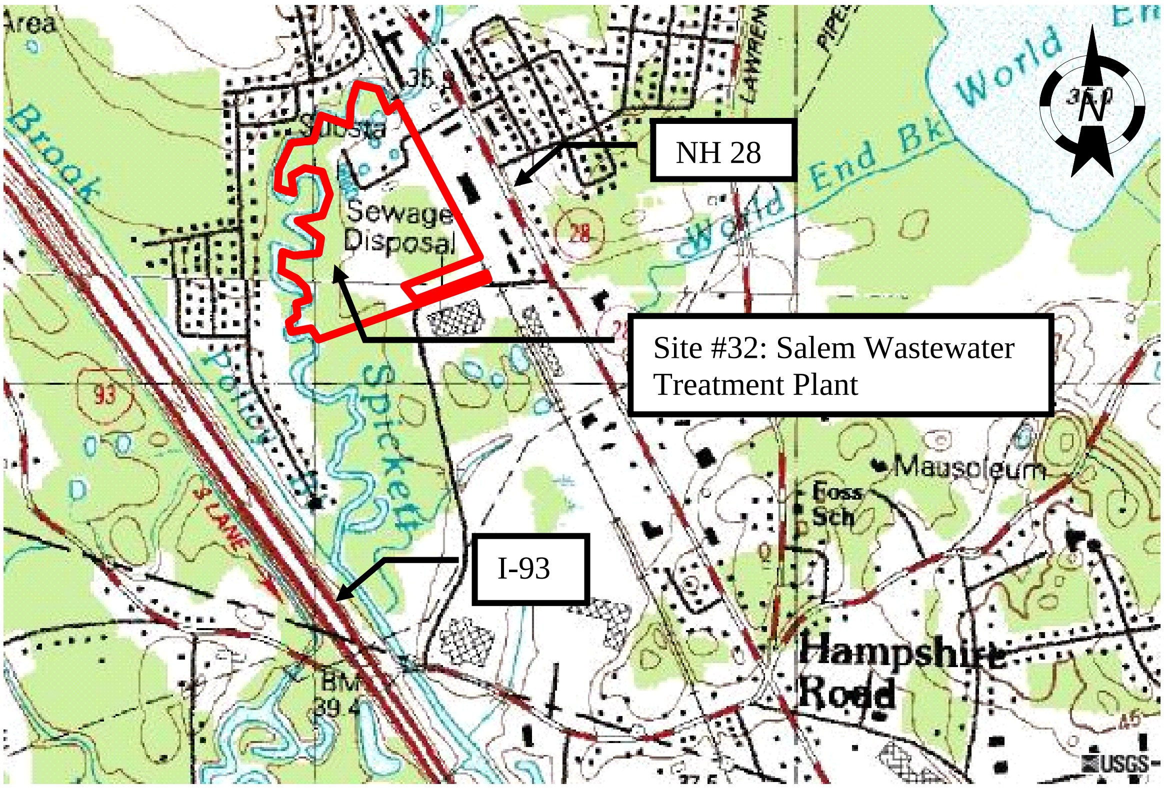
Cluff Crossing Road (Site #30) is a 27-acre parcel located adjacent to the confluence of Policy Brook and Porcupine Brook. The site provides floodplain protection and contains a prime wetland designated by the town of Salem. In discussions with the Salem Conservation Commission, protection of the Cluff Crossing parcel was identified as a high priority.



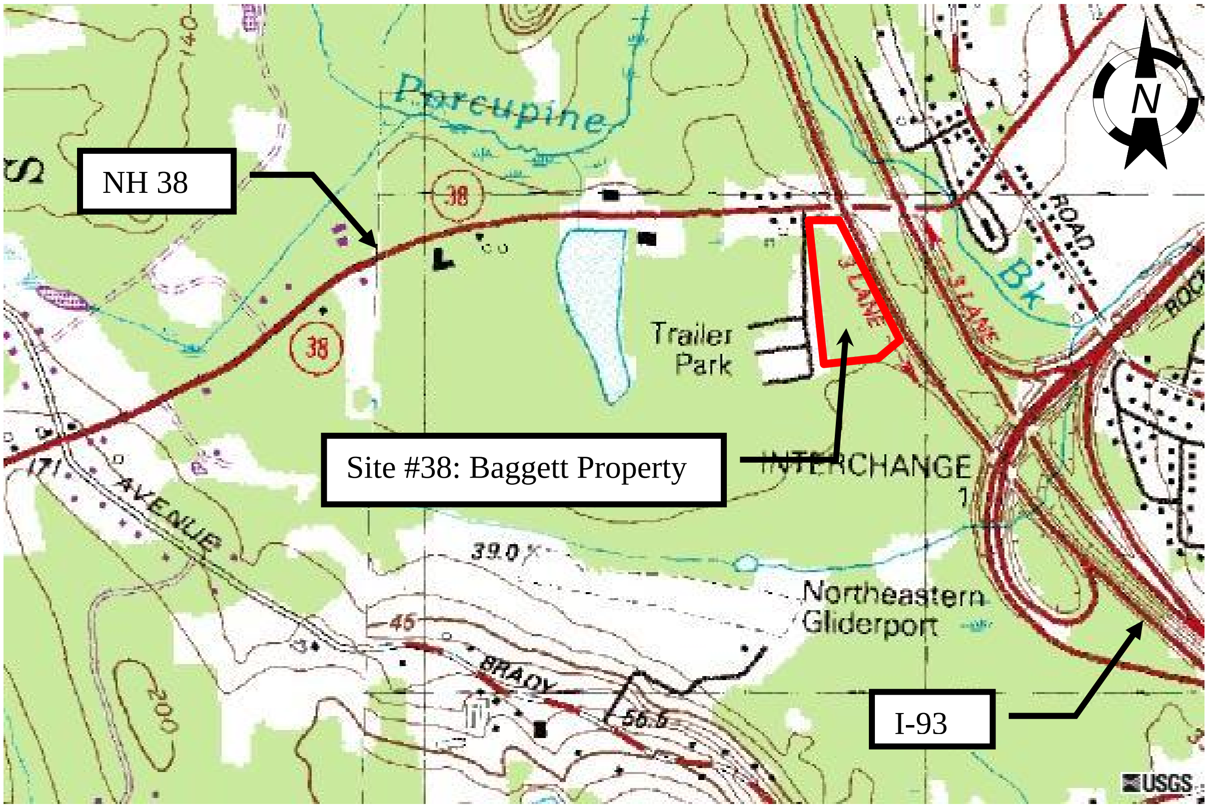
Pelham Road Mitigation Site (Site #31) is an advanced mitigation site located west of Exit 2, south of Pelham Road, that consists of three former lots of varying dimensions totaling 25 acres in size. Porcupine Brook, a designated Salem prime wetland, passes through the site. A portion of the northern-most lot was subdivided and is occupied by a commercial skating rink. The portion of the lot used for mitigation was degraded, having served as an area for excavation and for disposal of fill materials and refuse. These portions were developed into wetlands and combined with the existing Porcupine Brook wetland system (providing additional flood storage) with site grading and excavation over approximately five acres of the site. Principal wetland functions and values provided by the site include flood flow alteration, sediment retention, nutrient removal, sediment/shoreline stabilization, and wildlife habitat. The site provides about four acres of wetland creation/enhancement and about 21 acres of preservation. Construction was completed in 2001.



<u>Salem Wastewater Treatment Plant Site (Site #32)</u> is adjacent to the Spicket River. A portion of the site lies within the existing floodplain. Although cleanup of the site (hazardous materials, including removal of buildings and old wastewater treatment plant components) will be necessary, the site is ideal for its flood storage potential and additional wetland creation area. The Town of Salem is in favor of this site. The site is approximately 32 acres in size and will provide seven acres of wetland creation and an increase of approximately 22 acre-feet of flood storage.



Baggett Property (Site #38) is located on NH 38 adjacent to the existing highway. Although only six acres in size, the site will provide critical flood storage and additional created wetlands (2 acres) to tie into existing prime wetlands located south of the site.

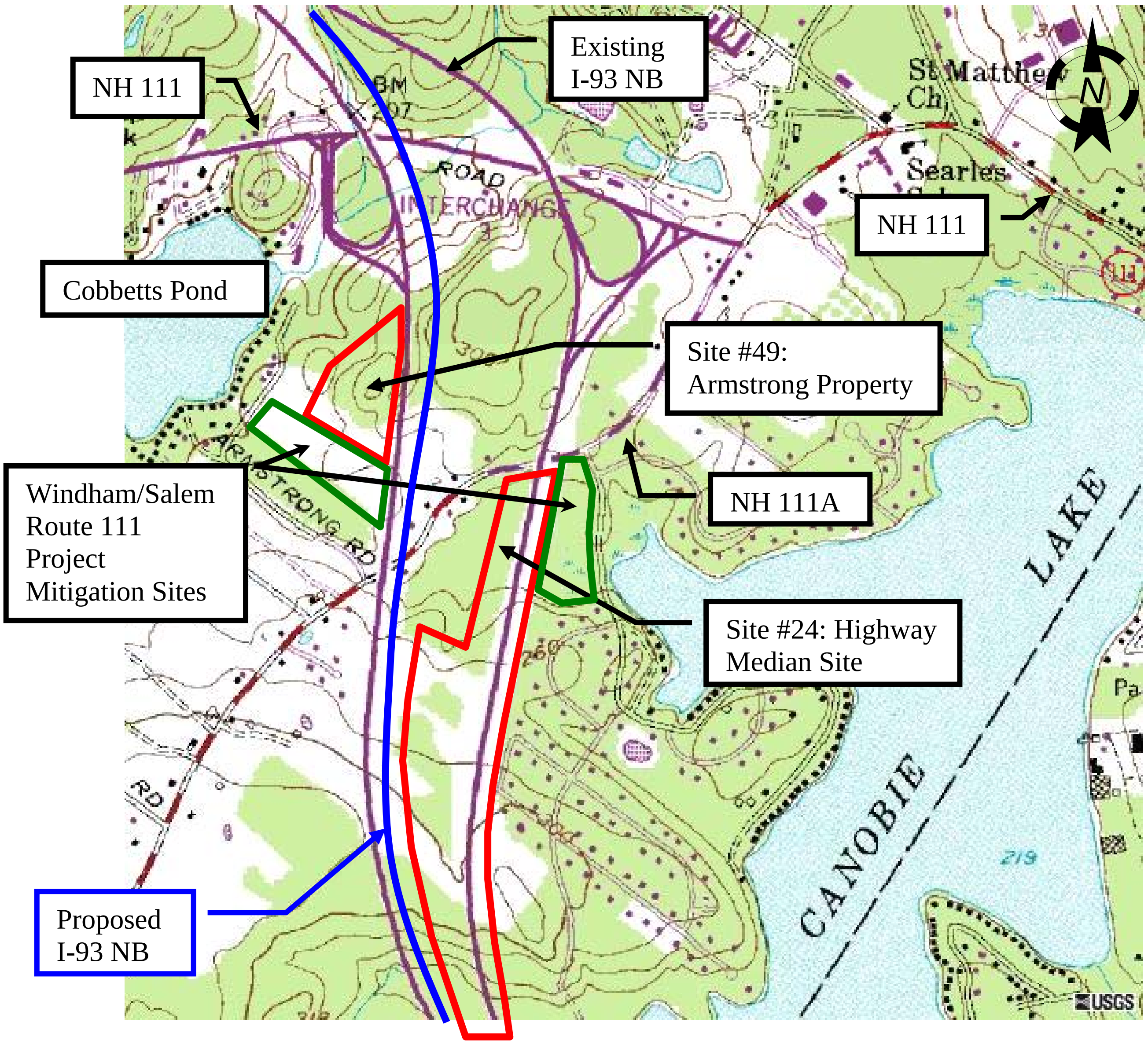


Windham

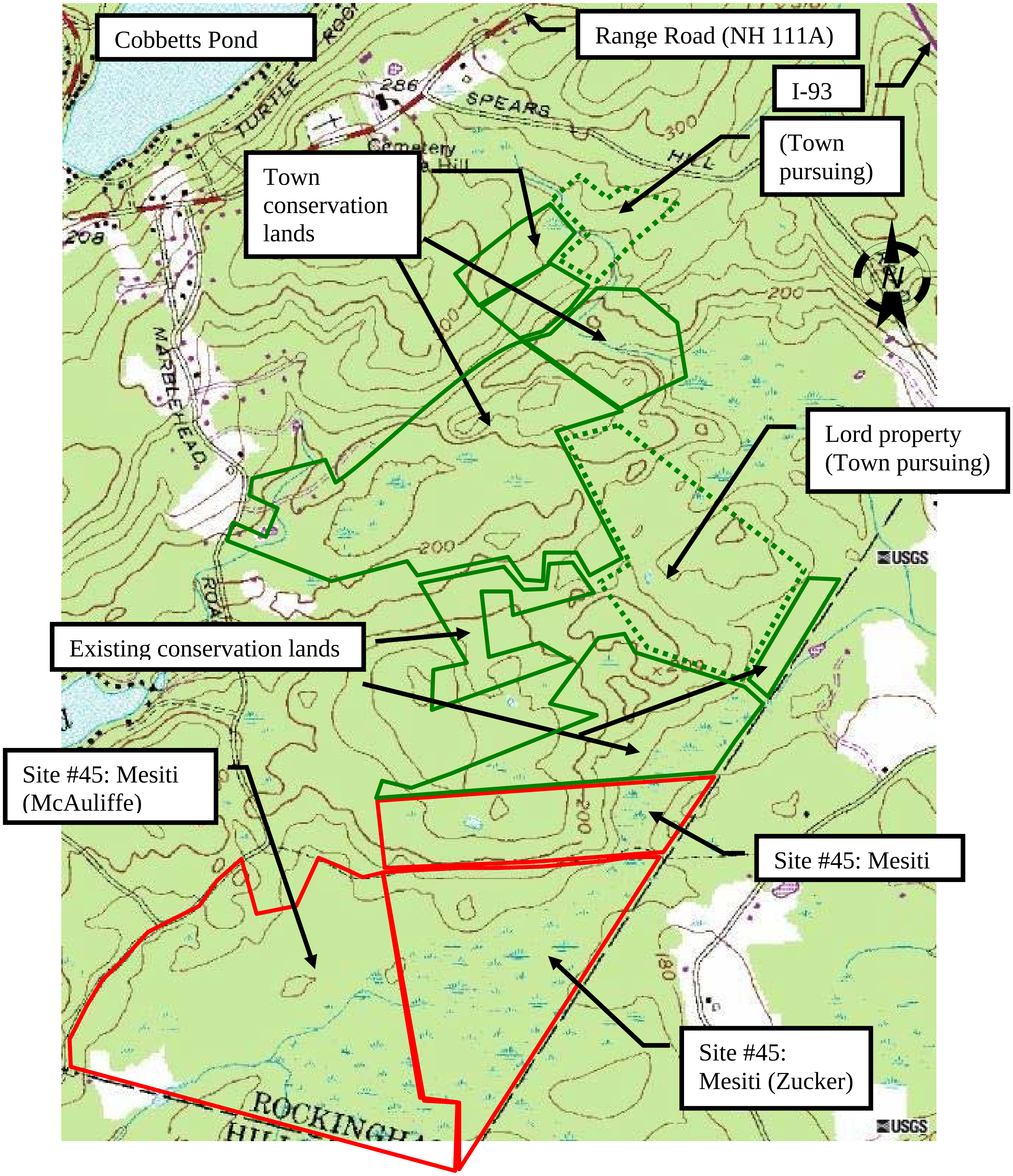
The two sites proposed in Windham in the vicinity of Exit 3 (Highway Median and Armstrong Property) provide respectively wetland restoration and preservation in close proximity to Canobie Lake and Cobbetts Pond, locations which have little remaining buffer areas to development. The remaining mitigation site (Southeast Lands) provides preservation over a large undeveloped area with diverse habitat. For the Selected Alternative, the total amount of wetland impacts (including the Exit 3 Park-and-Ride and sound walls) in Windham is approximately 18 acres. Total mitigation provided by the sites in Windham would amount to nearly 318 acres (creation, preservation, and flood storage replacement). Each of the sites is described below.

Highway Median Site (Site #24) is located between the existing northbound and southbound lanes, south of NH 111A in the vicinity of Canobie Lake and Cobbetts Pond. This site is 17 acres in size and will become available with the Selected Alternative as a result of shifting the northbound lanes to the east. The removal of fill will allow for the restoration of 3 acres of wetlands adjacent to a large area of emergent marsh. This area is also adjacent to an existing wetland mitigation creation site and is within the wellhead protection zone of a Pennichuck Water Supply well.

Armstrong Property (Site #49) is located adjacent to an existing Windham-Salem Route 111 Project mitigation Site. As it lies in close proximity to Cobbetts Pond, the 11-acre property (under threat of development) will provide an important preservation buffer to the pond.



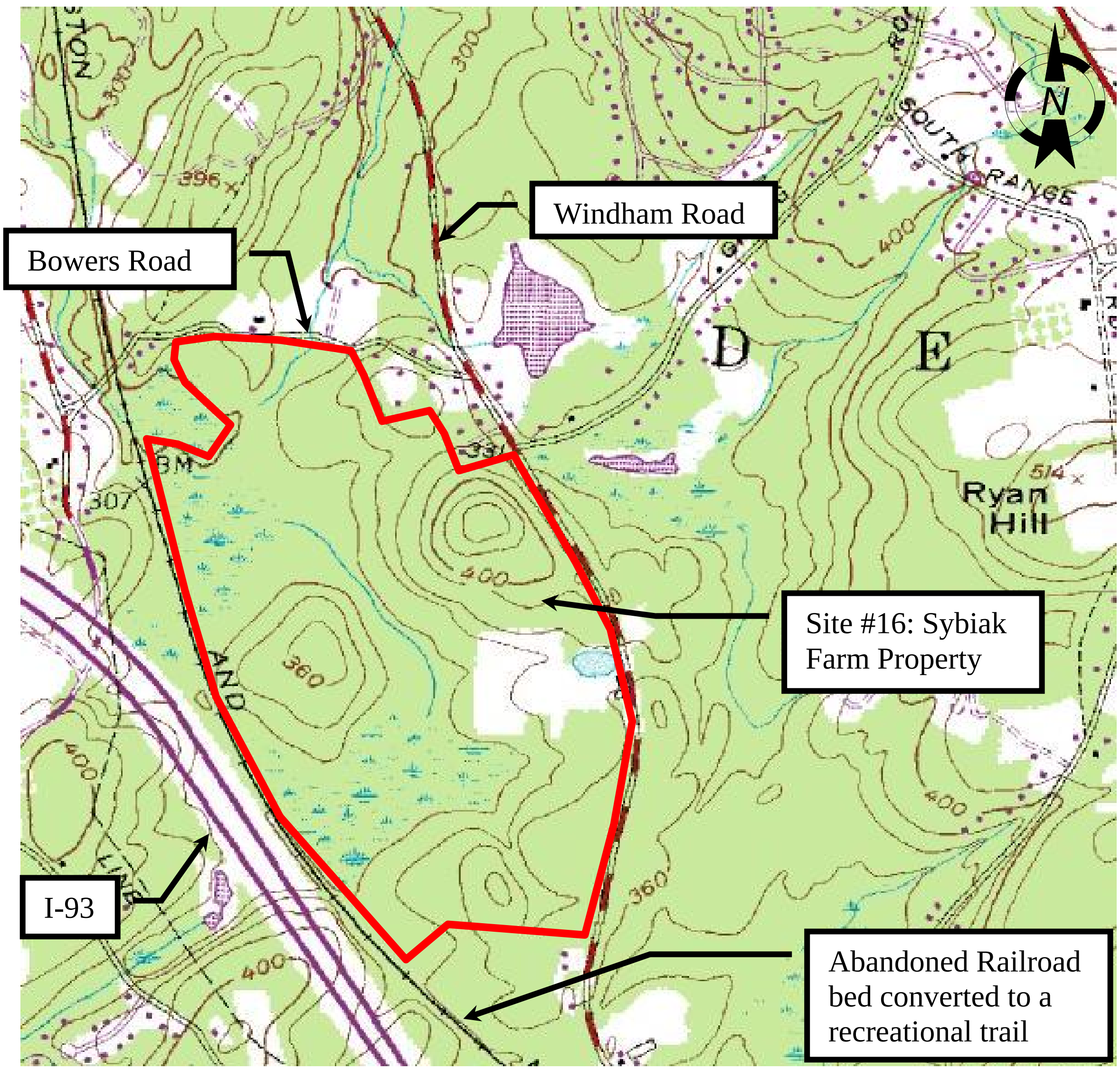
Southeast Lands Area (Site #45) is located in the southeast corner of Windham. The approximately 290 acres proposed for preservation represent a core section of a larger area totaling about 1,100 acres that is currently undeveloped but under the immediate threat of development. Consisting of large areas of wetland habitat interconnected with upland buffers, the area provides largely unspoiled wildlife habitat, vernal pools, diverse plant communities, and buffer protection to forested, scrub/shrub and emergent marsh wetlands. NHDOT has worked closely with the Windham Conservation Commission to coordinate the proposed mitigation with the Town's preservation efforts.



Derry

The Sybiak site in Derry is a large preservation site of importance to the Town and is under immediate threat of development. For the Selected Alternative, the total amount of wetland impacts (including sound walls) in Derry is approximately five acres. Total mitigation provided by the site in Derry would amount to nearly 200 acres (preservation). The proposed mitigation site is described below.

Sybiak Farm Property (Site #16) is located east of I-93, and north of the Windham/Derry municipal boundary. The nearly 200-acre site consists of abandoned pastures and orchard, with a mix of varied upland habitat (forested & open fields) and prime wetlands (emergent marsh & forested), providing an extensive area for use by wildlife. Continued public use of the site (via the abandoned rail bed adjacent to the property that serves as a recreational trail) was indicated as an important factor to the town.

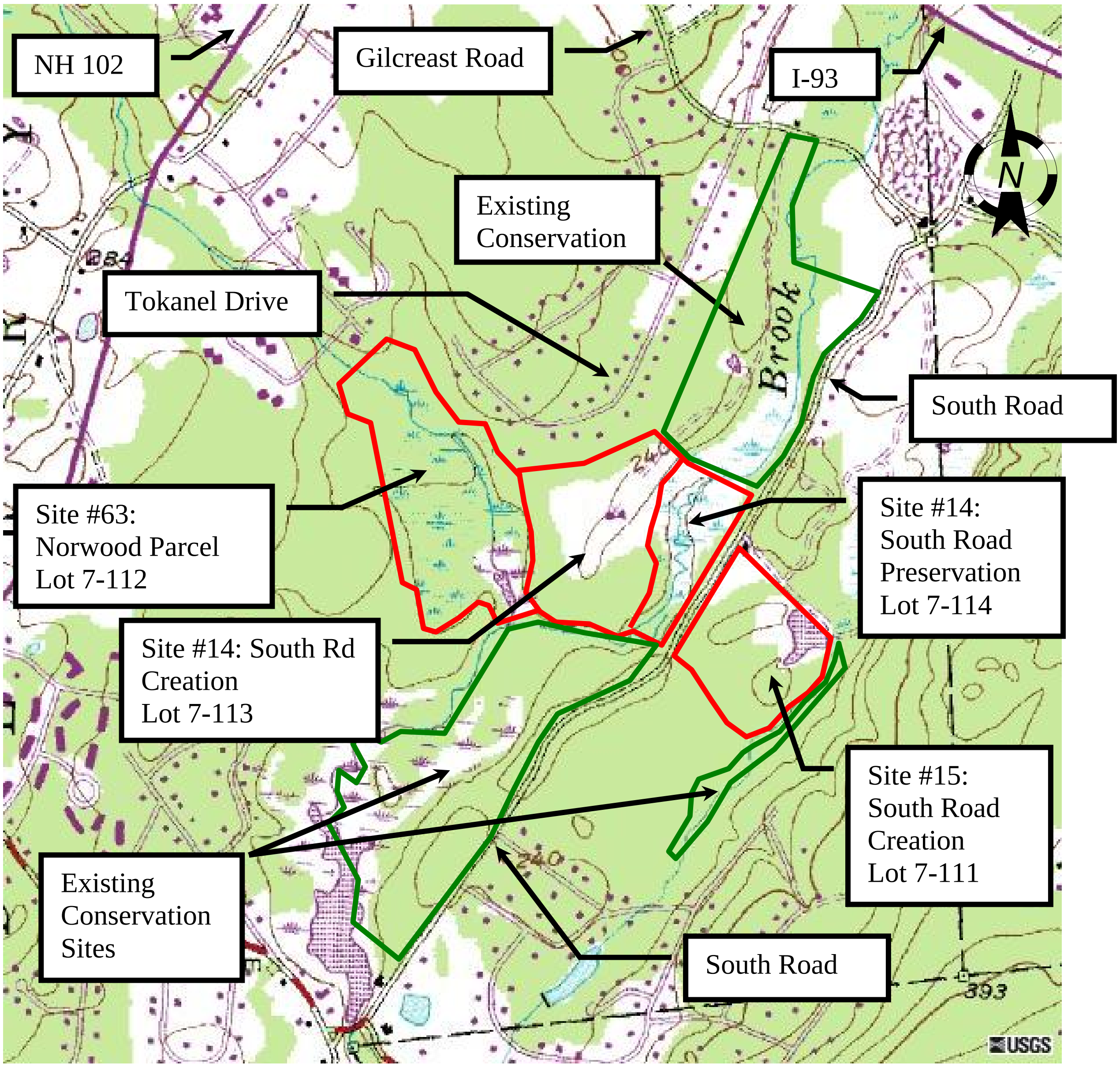


Londonderry

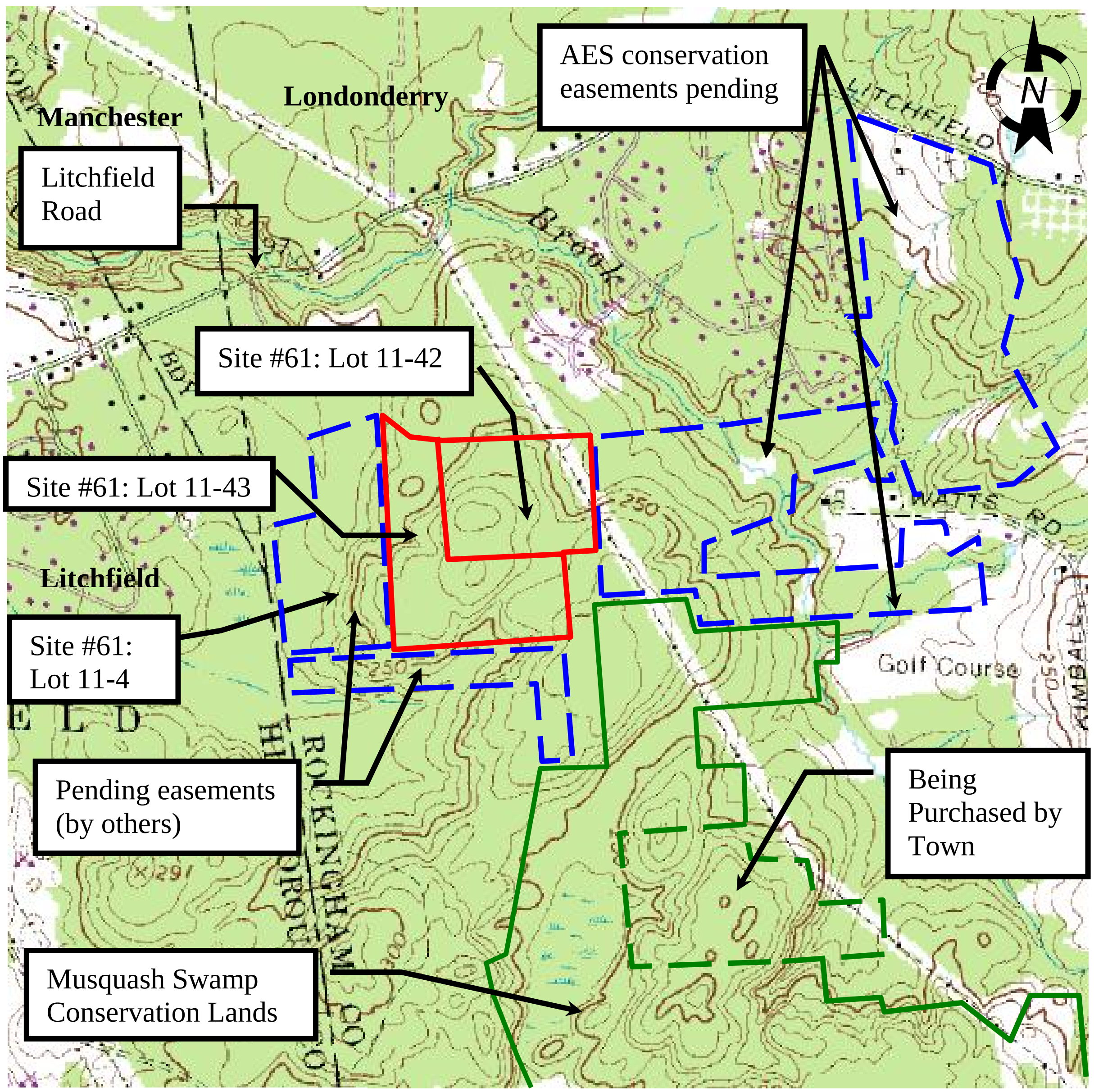
The sites proposed in Londonderry provide wetland creation adjacent to Beaver Brook and preservation of wetland and upland habitat adjacent to other conservation lands. The sites were selected with input from the Town and in recognition of the direct impacts in Londonderry. For the Selected Alternative, the total amount of wetland impacts (including the Exit 5 Park-and-Ride and sound walls) in Londonderry is approximately 26 acres. The total mitigation provided by the sites would amount to nearly 290 acres. The sites have also been identified as potential locations for passive recreational use.

South Road Mitigation Site (Sites #14 and #15) is an advanced mitigation site comprised of an approximately 75-acre collection of three lots located west of the Londonderry/Derry border near the intersection of South Road and Gilcreast Road in Londonderry. The site borders Beaver Brook, which is a designated Conservation District pursuant to local ordinances in Londonderry. Large portions of two of the lots were privately-owned gravel pits which had the potential to become residential development until they were purchased by NHDOT. The third lot is mainly wetlands and flood plains associated with Beaver Brook. Principal wetland functions and values expected to be provided by the site include groundwater recharge/discharge, fish and shellfish habitat, sediment retention, and wildlife habitat. An estimated 11 acres of wetland creation and/or enhancement and approximately 64 acres of preservation will be provided on the site. Design of wetland areas has been completed for this site and construction of the mitigation area(s) is scheduled to begin in coordination with Exit 4 construction contracts.

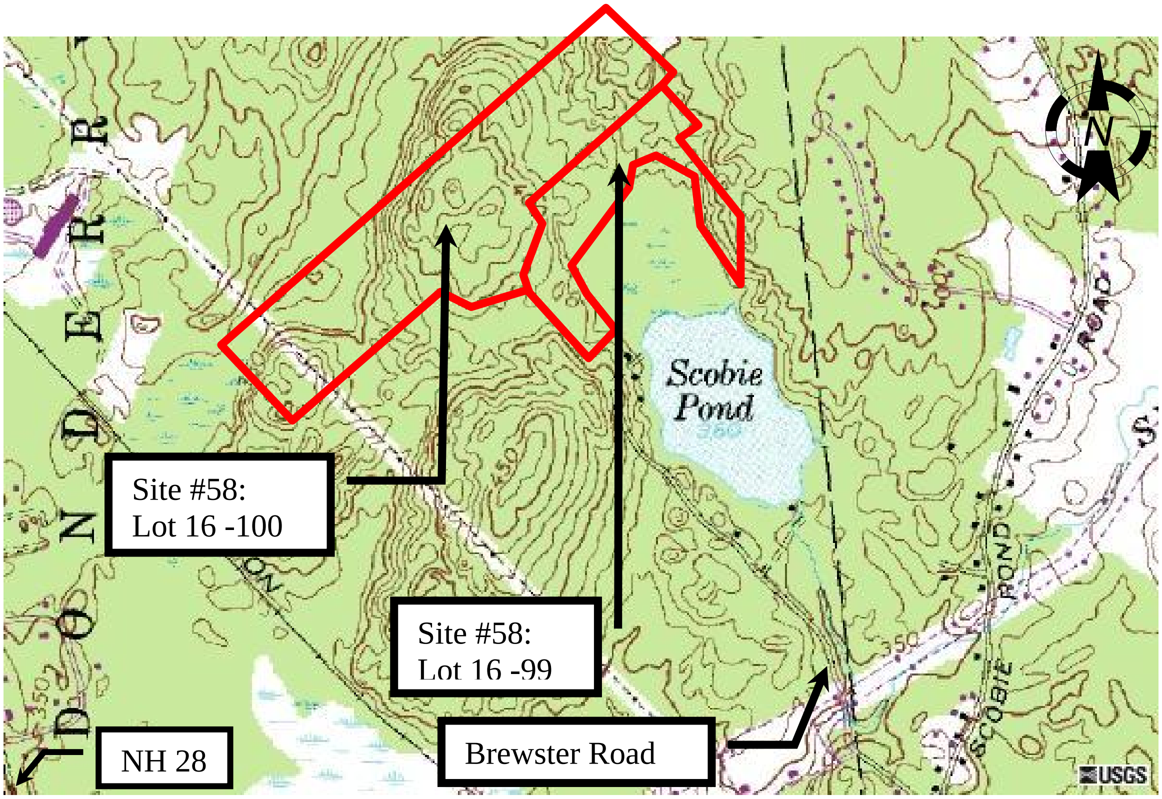
Norwood Site (Site #63) is a 37-acre parcel that lies adjacent to the South Road Mitigation Site and provides additional protection to the Beaver Brook wetland system. The site is a diverse mix of wetlands (forested, scrub-shrub and emergent) adjacent to a perennial tributary to Beaver Brook. Wetlands comprise 80 percent of the site, which lies adjacent to Town conservation land.


NH 102
Gilcreast Road
I-93
N
Existing Conservation
Tokanel Drive
Brook
South Road
Site #63: Norwood Parcel Lot 7-112
Site #14: South Road Preservation Lot 7-114
Site #14: South Rd Creation Lot 7-113
Site #15: South Road Creation Lot 7-111
Existing Conservation Sites
South Road
USGS

Musquash Expansion Parcels (Site #61) consist of large blocks of land in the vicinity of the Musquash Swamp Conservation Area, and are part of a relatively large, unfragmented forest. Of this available land, the NHDOT proposes to acquire approximately 110 acres for land preservation. Overall, the parcels are highly diverse, with stands of mature mixed hardwoods, pine/oak forests, hemlock forests and red maple swamp, as well as emergent marsh habitat. They are largely uplands on moderately to excessively well-drained outwash soils. Given the relative intactness, the diversity of landforms and vegetation, and the large size of the undeveloped land associated with the Musquash Swamp, this area is very valuable as a wildlife habitat. The additional preservation will add to the already preserved Musquash Swamp Conservation area lands, providing a reserve of approximately 820 acres in the area.



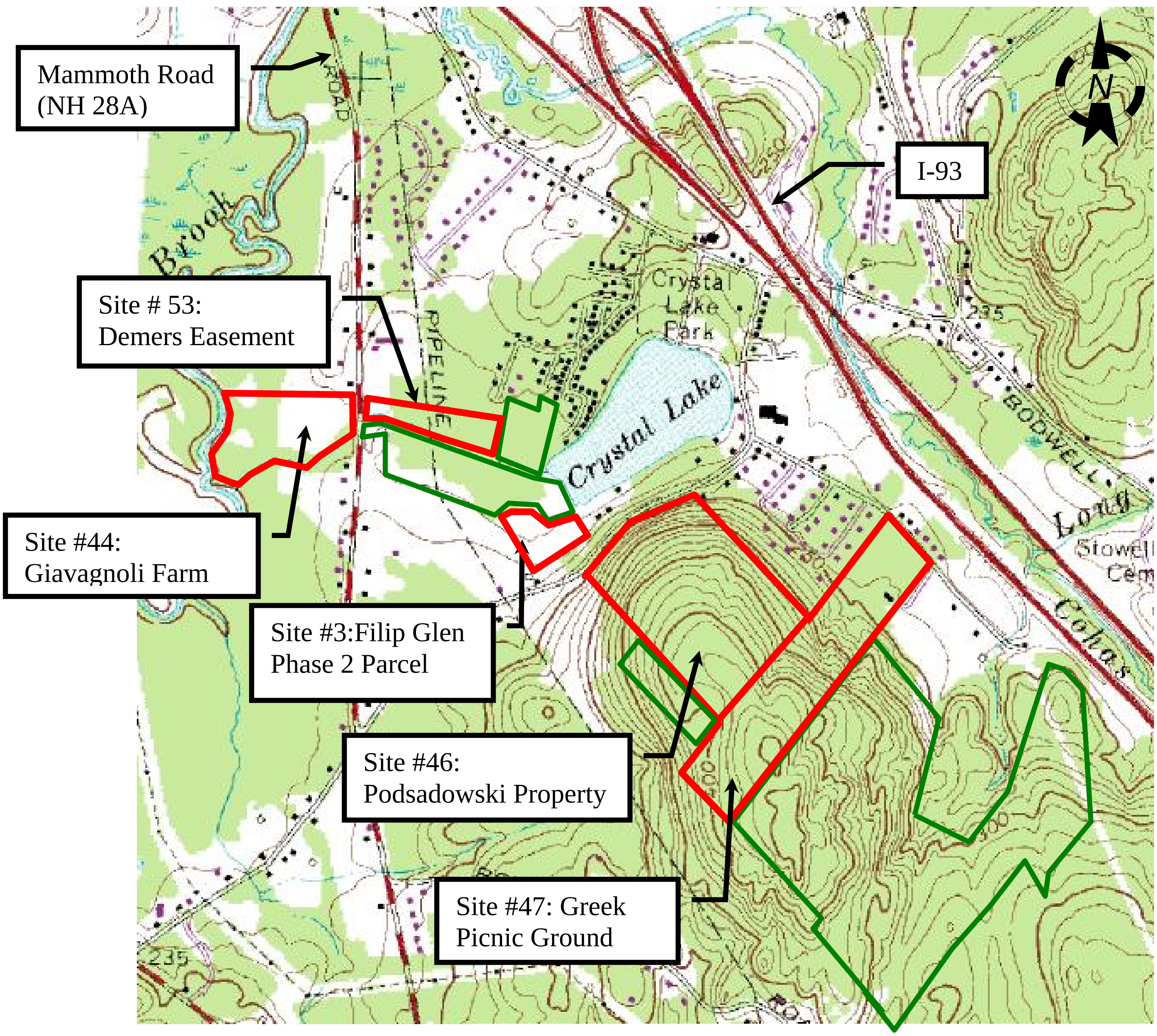
<u>Scobie Pond Area Properties (Site #58)</u> are approximately 70 acres of mature, intact oak/pine forest on shallow soils with bedrock outcroppings, stands of mixed deciduous hardwoods and a red maple swamp that occupy central portions of the site. The site is largely intact, and is well utilized for passive recreation. The conservation of these parcels will add substantially to the protection of the adjacent Scobie Pond.



<u>Manchester</u>

The sites in Manchester provide wetland and habitat protection on lands adjacent to Crystal Lake. City officials and the local Crystal Lake Preservation Association have voiced strong support for preservation of undeveloped properties in the area of Crystal Lake. Preservation of such properties would benefit the lake in terms of water quality and provide some open space for wildlife utilizing the Cohas Brook area as a wildlife corridor. Under the Selected Alternative, the total amount of wetland impacts (including sound walls) in Manchester is approximately five acres. Total mitigation provided by the sites in Manchester would amount to about 120 acres of preservation. The proposed mitigation sites are described below.

<u>Crystal Lake Area Properties (Sites #3, 44, 46, 47, and 53)</u> are located to the north, west, and south of the lake. Preservation of the properties will provide an important buffering function to the lake. The properties are contiguous with one another and provide a wildlife corridor extending from Crystal Lake to Great Cohas Swamp. With a variety of wetland and upland habitats, preservation of these areas would protect many of the functions and values impacted in other wetlands due to highway construction. The approximately 120 acres (all parcels combined) are more suitable as preservation properties than wetland creation. Preservation of these remaining Crystal Lake parcels is a top priority of the Crystal Lake Preservation Association and has been endorsed by the Manchester Board of Aldermen.



Additional Mitigation/Enhancement Measures

In addition to the sites described above, other proposed measures to provide project mitigation and enhancement include:

- The NHDOT will provide funding not to exceed $3 million to the NHDES Drinking Water Supply Land Grant Program to be used to purchase property rights to aid in the protection and long-term viability of Massabesic Lake, the water supply for Manchester and portions of Derry and Londonderry.

- A commitment to study the feasibility of reconstructing existing culverts at Policy Brook and Porcupine Brook in Salem, Beaver Brook in Derry and Cohas Brook in Manchester to address wildlife crossing issues. These measures will be fully evaluated as part of the final design of the Selected Alternative. To the degree that these measures are practical, they will be constructed.

- Development and funding of the Community Technical Assistance Program (CTAP) to assist communities and address the growth and development associated with the southern I-93 corridor.

Summary of Wetland Mitigation

From the onset of project planning, the effects on wetlands have been carefully studied. Throughout the planning stages for the I-93 Improvements, mitigation of wetland impacts followed a sequential approach of:

1) Avoidance - selection of the alternative that provides maximum roadway improvements while minimizing impacts to wetlands.

2) Minimization - use of design standards such as steeper side slopes or construction of retaining walls to minimize wetland impacts.

3) Compensation - creating new wetland areas and/or preserving existing wetlands/ conservation land.

Even though the practices of avoidance and minimization were employed, direct wetland impacts resulting from the selected improvement alternative (i.e., four lanes in both directions) total approximately 77 acres. Taking into account the length of the twenty-mile corridor, these impacts are relatively minor.

NHDOT, working in cooperation with other State and Federal natural resource agencies, reached out to the local communities along the I-93 corridor to obtain recommendations and information in developing a list of potential mitigation sites. In all, more than 60 sites, comprised of more than 7,000 acres of land, were researched, visited, and assessed by NHDOT and other Agencies/Departments. The culmination of these efforts is a mitigation package of 17 sites protecting over 1,000 acres of land. Within five of these sites, approximately 27 acres of new wetlands will be created. Furthermore, these totals do not include the amount of land that will be protected through $3 million in funding to be provided to the NHDES Drinking Water Supply Land Grant Program.

This significant land protection effort, in combination with the commitment to provide funding for planning technical assistance (CTAP) to help communities address future growth pressures, compensates for the overall project impacts to an acceptable level. On May 2, 2006, the NH Department of Environmental Services (DES) issued the Wetlands Permit and the 401 Water Quality Certificate. NHDOT continues to move forward and is currently in the process of obtaining the required permits from the US Army Corps of Engineers.