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Wetlands Assessment, Inventory, and Prime Wetlands Designation Project in the Taylor River Watershed, Town of Hampton

Hampton Conservation Commission

Rockingham County Conservation District

WETLANDS ASSESSMENT, INVENTORY, AND PRIME WETLANDS DESIGNATION PROJECT IN THE TAYLOR RIVER WATERSHED

A Final Report to
The New Hampshire Estuaries Project
Submitted by the

Hampton Conservation Commission in conjunction with the
Rockingham County Conservation District
110 North Road
Brentwood, NH 03833

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Executive Summary and Introduction

The purpose of this project was to provide significant educational efforts on wetlands functions and values, prime wetlands designation, on-the-ground inventory findings, wildlife habitat, and New Hampshire's Prime Wetlands laws and rules for the two communities located within the project focus area. The focus area for this project was the Taylor River Watershed, which comprises the Taylor River as it flows through both Hampton and Hampton Falls, a bit of Ash Brook and Old River as it flows through Hampton, and Grapevine Run as it flows through Hampton Falls. This project assessed over 152 wetland areas containing approximately 620 acres. This project included a comprehensive wetland resource assessment of an area that was originally roughly defined as shown on Map 1 (Appendix A). A NH Certified Wetland Scientist was hired by the Town of Hampton to complete an inventory of wetlands along the Taylor River corridor, and to identify individual wetland areas as well as wetland complexes that were potentially suitable for prime wetlands designation. Once that assessment was completed, four distinct areas were chosen as potential candidates for prime wetlands designation, and a functions and values assessment was conducted on each candidate. The *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project offered substantial education and outreach to both conservation commissions, residents, and municipal officials, and was successful in helping to advance the continuation of evaluating additional wetland complexes within each community.

No warrant articles were prepared for town meeting for either community, and there were no prime wetlands application submissions to the NH Department of Environmental Services (DES) completed during the length of this project. However, conservation commission members became educated on prime wetlands designation, and both communities have jointly proceeded to complete the wetlands assessment for the remainder of each community. In fact, with the assistance of this project and as a follow up to a formerly funded project by the New Hampshire Estuaries Project (NHEP) on shoreland protection, there are landowners along the Taylor River in both communities that are interested in participating in permanent protection efforts. The educational efforts on wetland functions and values, the importance of protecting prime habitat, and on NH RSA 482 and Chapter Wt 700 of the NH DES Administrative Rules regarding the law and rules has brought much interest on this topic in both communities. Both communities are jointly moving forward with prime wetland inventories for the remainder of wetlands in each community, with additional support from the NHEP in 2005. Due to this advancement, it was decided by both communities that another year of educational initiatives was important, and as there is the possibility of redelineating existing prime candidate boundaries, no warrant articles were prepared for 2005. Completing full wetland assessments and determining additional prime wetlands candidates were recognized as being critical for each community, with the provision that it include substantial educational opportunities. All of the outcomes from the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project have given both communities a renewed sense of the importance of

stewardship, understanding and documenting, and protecting these critical natural resources.

Project Goals and Objectives

The project involved two main phases:

1) Public informational meetings and educational initiatives to promote awareness of the NHEP Management Plan, functions and values of wetlands, habitat assessment, and the law at the local and state level for prime wetlands designation, and what it means to landowners took place through out the project. This phase included several informal and formal public workshops held in both Hampton Falls and Hampton on all of the above-mentioned topics.

2) Hiring a NH Certified Wetland Scientist to complete the wetlands inventory and assessment, to identify wetlands potentially suitable for prime wetlands designation, and to complete a functions and values assessment of each of the prime wetland candidates by using the *Method for Comparative Evaluation of Nontidal Wetlands in New Hampshire (NH Method) (1991).* This phase did not include the drafting of local warrant articles due to the decision by both communities to jointly inventory and assess the remaining wetlands in 2005. This phase included the coordination, review, and comment of draft information/reports, and the decision to jointly complete the wetlands assessment and prime wetlands designation in full in 2005, with funding support from NHEP.

Methods

It is important to note that the success of this project involved the collaboration of a variety of natural resource groups and agencies. The UNH Cooperative Extension assisted with outreach efforts, and the Rockingham County Conservation District (RCCD) was involved with the coordination and public outreach of the entire project. Although the result (i.e., draft warrant articles for the local designation of prime wetland candidates) was not reached during the timeframe of this project, significant advances on educating residents and municipal officials on wetlands functions and values, and on the law regarding prime wetlands occurred. Moreover, the successful application and resultant funding opportunity to complete the prime wetlands assessment in both communities represents a considerable achievement of this project. For both communities the accomplishments of this project in addition to the educational outreach has been very successful. The most significant accomplishments for both communities are bulleted for informational purposes. It should be recognized that all parties involved in each of the documented tasks have expended a substantial amount of time, effort, energy, and resources.

- RCCD coordinated with the Towns of Hampton and Hampton Falls on organizing and completing the landowner/abutter data needed for sending letters and information on the prime wetlands assessment. Town staff and Conservation

Commission members spent a great deal of time completing this task so that the data would be available repeatedly. Initially, only 50 abutters were estimated. However, both towns included approximately 160 abutters, who were notified throughout this project. RCCD also coordinated with both towns and the Rockingham Planning Commission on existing GIS mapping tools available for this project. There were 1998 digital color infrared orthophotographs available for both communities that advanced this evaluation (see Appendix C).

- RCCD coordinated with the Towns of Hampton and Hampton Falls on drafting and receiving comments/edits on a Request for Proposal (RFP) from qualified individuals or companies for the inventory, assessment, delineation, mapping and designation of possible prime wetland candidates within the Taylor River Watershed as roughly shown on Map 1 (provided in previous reports) (Appendix A). Applicants responded and the RFP was then redrafted and resubmitted again in June of 2004 to several local papers and local wetland scientists. The RCCD coordinated reviews and interviews with possible candidates. During the interview process the project focus area was refined to include the Grapevine Run area in Hampton Falls and an area to the east of Route 95 in Hampton. Gove Environmental Services, Inc. was selected by the Town of Hampton, and work on the project began in August of 2004.

- RCCD organized and provided public relations on an introductory workshop on the NHEP Management Plan, the overall project, and on information on Prime Wetlands Designation at the local and state level in June of 2004. The program brochure was distributed throughout both communities, presented on local access cable, and provided to local newspapers for distribution (provided in previous reports).

- Once field-work was initiated, additional meetings and informal gatherings took place with the wetland consultant to determine the progression of this project. RCCD provided a draft letter to both Conservation Commissions to mail to all abutters regarding this project, which offered the wetland consultant as the main contact for any additional questions regarding field-work, and RCCD and the Hampton Conservation Commission for information on any future workshops (provided in previous reports). Both Conservation Commissions mailed the letter to all abutters.

- RCCD met with both Conservation Commissions and wetland consultant to discuss status of project. Wetland consultant completed the aerial photographic interpretation and then Geographic Information Systems (GIS) Analysis (see Appendix C).

- RCCD organized and coordinated a second public meeting to discuss the initial findings of the wetland assessment and what data had been collected, and habitat assessment and management/conservation options with regard to the Taylor River Watershed. The program brochure was distributed throughout both

communities, presented on local access cable, and provided to local newspapers for distribution. Abutters were also notified. UNH Cooperative Extension staff and the wetland consultant prepared a presentation that was very well attended in Hampton Falls. There were several good questions put forth by the audience, indicating that residents in fact needed additional education on this topic.

- ❖ Wetland complexes were reviewed by the wetland consultant that met the criteria for prime wetland designation which includes: 1) that wetlands must meet the standard regulatory definition of wetlands, i.e. they must have the presence of hydric soils, hydrophytic vegetation, and wetlands hydrology, and 2) that at least 50% of the candidate wetland must have Type A Hydric Soils, and the remaining soils must be Type B Hydric Soils.

- ❖ Using these criteria the wetland consultant initially put forth seven wetland complexes selected for evaluation and consideration for potential prime wetland designation. After a couple of public meetings and additional review of the available data, those wetland complexes were effectively condensed to four candidate wetland complexes that would then be evaluated using the NH Method (*Method for Comparative Evaluation of Nontidal Wetlands in New Hampshire (1991).*

- ❖ For this study, all fourteen wetland functions and values outlined in the NH Method were evaluated for the four candidate wetland complexes chosen. More detailed information on each of the wetland functions and values for each wetland complex chosen can be found in Appendix C, and include:

- Ecological Integrity – Evaluates the overall health and function of the wetland ecosystem;
- Wetland Wildlife Habitat – Evaluates the suitability of the wetland as habitat for those animals typically associated with wetlands and wetland edges;
- Finfish Habitat – Evaluates the suitability of watercourses, ponds, or lakes associated with the wetland for either warm water or cold water fish;
- Education Potential – Evaluates the suitability of the wetland as a site for an "outdoor classroom";
- Visual/Aesthetic Quality – Evaluates the visual and aesthetic quality of the wetland;
- Water-Based Recreation – Evaluates the suitability of the wetland and associated watercourses for non-powered boating, fishing, and other similar recreational activities;
- Flood Control Potential – Evaluates the effectiveness of the wetland in storing floodwaters and reducing downstream flood peaks;
- Groundwater Use Potential – Evaluates the potential use of the underlying aquifer as a drinking water supply;

- Sediment Trapping – Evaluates the potential of the wetland to trap sediment in runoff water from surrounding upland;
- Nutrient Attenuation – Evaluates the potential of the wetland to reduce the impacts of excess nutrients in runoff water on downstream lakes and streams;
- Shoreline Anchoring and Dissipation of Erosive Forces – Evaluates the effectiveness of the wetland in preventing shoreline erosion;
- Urban Quality of Life – Evaluates the potential for the wetland to enhance the quality of urban life by providing wildlife habitat and other natural values in an urban setting;
- Historical Site Potential – Evaluates for indications of use by early settlers;
- Noteworthiness – Evaluates the wetland for certain special values such as critical habitat for endangered species, or exemplary natural communities, etc.

❖ RCCD completed an NHEP funding application for continued prime wetlands inventory and assessment and possible designation at the request of the Hampton Falls Conservation Commission. This application was submitted as a joint application with the Hampton Conservation Commission to evaluate the remainder of wetland complexes in each community. The NHEP approved the funding request, and additional wetlands inventory and assessment and possible prime wetlands designation for both communities will be completed in 2005.

❖ Throughout the entire project the RCCD staff met with representatives from both the Towns of Hampton and Hampton Falls. RCCD was in constant contact with the wetland consultant during the entire project to ensure project timeframes and expected outcomes were delivered. RCCD provided information to several members of the public on the overall project, and on the educational initiatives that were being arranged. This aspect of the project involved several personal contacts with RCCD, as well as numerous email and phone conversations, and additional meetings.

❖ Once the NH Method was completed for each of the four candidate wetland complexes chosen, RCCD organized and coordinated the final public workshop to present the results of the findings, and to discuss prime wetlands designation laws and regulations (at the local and state level). The program brochure was distributed throughout both communities, presented on local access cable, and provided to local newspapers for distribution. Abutters were also notified by direct mailings from both Conservation Commissions (see Appendix B).

❖ Several additional meetings took place near the end of the project. After reviewing the data presented as well as several discussions with NH DES and town officials, and having received notification that additional funding would be available to complete the wetland inventory and assessment for the remainder of both communities, it was jointly decided to postpone the drafting of local warrant articles until 2006. Therefore, no warrant articles were drafted and mapping

requirements per NH DES for submittal for prime wetlands designation were not prepared within the timeframe of this project.

- An additional draft final presentation was presented by the wetland scientist and incorporated the final data and findings, prior to the final public presentation. This meeting in particular was extremely informative to all of the Commission members in attendance, and was hopefully helpful to the wetlands consultant as well. Questions on data, appearance of data on GIS maps, and the town responses to questions regarding prime wetlands designation were all reviewed.

- The final presentation was well received by all that attended, and there were several excellent questions presented by those in attendance. Town staff and officials attended, as well as several interested residents (see Appendix B). With the knowledge that the inventory and assessment would continue, several residents were pleased that additional information would be provided to them. In addition, through the educational efforts, at least two residents are now interested in permanent protection efforts within the Taylor River Watershed.

- These accomplishments are due in large part to the success of the educational efforts and technical assistance provided under the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project.

Results and Discussion

The two main objectives at the onset of the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project have been achieved. The variety of formal and informal workshops offered were well attended with valuable information provided, and excellent questions asked by the various participants. Considerable educational efforts on the importance of these significant wetland resources, and municipal options for documenting and potentially protecting these natural resources were provided to municipal officials and residents alike. The outcome from these educational efforts led both communities to have tremendous support to continue assessing their critical wetland resources, and to understand what prime wetlands designation means at the local and state level. Additionally many residents became more aware of wildlife habitat, the importance of riverine protection, and of the special values and functions that these noteworthy natural resources possess. Increasing the awareness of natural resources and of options to protect those resources among both municipal officials and community members proved to be an outstanding success in both communities.

A strong similarity between each communities' success from this project was in the recognition of the importance and uniqueness of the disappearing shoreland/riverine resources within this watershed. Moreover, the coverage of the chosen four prime wetland candidate boundaries clearly extends beyond town borders (and beyond the towns involved in this project). This is a wonderful opportunity for each of the

communities to collaborate with adjacent communities in these areas to expand the educational initiatives, and to assist in protecting these resources, which would benefit the entire health of the watershed.

It should also be noted that the study area for this project was restricted to the Taylor River corridor which included a portion of the Ash Brook and Old River (as originally designated by the Conservation Commissions, and shown on Map 1, as well as Grapevine Run and a large wetland complex to the east of Route 95 in Hampton (see Appendix A & Appendix C). With this in mind, there are several items to note including that while the four prime wetland candidates that were analyzed all ranked very high in all function and value categories, the small study area created interesting situations that should be taken in to consideration while reviewing the data:

1) The study area truncated large wetland complexes at arbitrary points. The majority of the wetlands analyzed in this assessment extend well beyond the limit of the study area; and
2) The restricted area of the study limits the size of the prime candidate set and makes the comparison of relative value difficult.

With these factors in mind, the GIS data layers associated with this project, as well as the NH Method assessments, were assembled in such a manner as to prepare for a relatively easy integration of this phase and the proposed Phase II assessment of the town-wide wetlands inventory. Additionally, it is possible to draw some conclusions about high-value wetland complexes within each of the four candidate areas, which can be found in greater detail in Appendix C.

Moreover, there were several recommendations provided that relate to the significant upland and wetland habitat, conservation opportunities, and restoration potential within the project focus area. Both communities are pleased to be getting additional information and data relating to the health and uniqueness of these four potential candidates for prime wetlands designation. This will assist both communities to move forward with funding requests for restoration opportunities or new management initiatives to enhance and protect the natural resources within these designated areas. This information also will provide additional support to coordinate and cooperate on joint natural resource ventures or conservation projects between these two communities and adjacent communities. In fact, the educational programs provided for during the length of this project has brought forth at least two land owners interested in permanent protection options along the Taylor River corridor. With the technical assistance provided for under this project, and the knowledge gained on the critical natural resources located within the focus areas of these two communities, both communities have prevailed with educating themselves, as well as many of the residents, which is a success in itself. Another success of the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project is that the information provided for in this inventory and assessment will allow each community to make more informed land-use decisions, as well as to continue to educate and inform residents about these unique natural resources.

It is interesting to note that this project has motivated both Conservation Commissions to continue to study and assess their wetland resources, which will continue into at least the next year. This was a very new avenue for both communities to undertake, and both are now jointly enthusiastic to continue with successful assessments and educational initiatives on wetland resources and protection options. Both communities unanimously approved moving forward with an additional request to complete the wetlands assessment and inventory in each community. This component of the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project would never have occurred if the significant educational and outreach efforts during the past year had not been completed.

The Hampton and Hampton Falls Conservation Commissions are now motivated to continue with large-scale resource assessment and conservation efforts within each community, with assistance from those agencies and groups that have been working with them throughout this project. The overall project has allowed both communities to advocate for critical resource identification, protection options and techniques, and has clearly strengthened the local capacity of both Conservation Commissions. Both communities also appreciate the ability to assist landowners in town with information on resources in each community, and also on how they may assist with protecting these exceptional resources. This accomplishment is the direct consequence of the data collected and provided, as well as on the education, outreach, and technical assistance provided under the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project.

The Towns of Hampton and Hampton Falls have significantly expanded their conservation capacity through the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project. Most of all, both Conservation Commissions are now ready to continue with additional wetland resource inventory and assessment opportunities, and to coordinate on these efforts both amongst themselves, with adjoining communities, and with residents. All of these positive outcomes are the direct result of the *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project. It is very likely that this effort will be a catalyst for additional enhancement and perhaps protection efforts in both communities, and hopefully will extend to adjacent communities within the Hampton Harbor and NH Coastal Watersheds.

Conclusions

The *Wetlands Assessment, Inventory, and Prime Wetland Designation Project in the Taylor River Watershed* project has ended successfully. The conservation commission members that have been involved with this project have strengthened their capacity to educate residents on critical wetland resources, conservation and management options, and the laws and rules regarding prime wetlands designation at the local and state level. Obviously, the results achieved from a drafted and perhaps passed local warrant article designating prime wetlands within each community would have highlighted the ultimate success of the *Wetlands Assessment, Inventory, and Prime Wetland*

Designation Project in the Taylor River Watershed project. However, it is well known that resource evaluations and the resultant accomplishment of management practices can often take a long time. So both communities are pleased to be moving forward with the continued wetlands inventory and assessment of these unique and valuable resources, and are encouraged that they will be continuing to educate residents, municipal officials, and visitors alike on prime wetlands designation and options to protect these resources. That in itself is a significant accomplishment for the health of the entire NH Coastal Watershed. Moreover, due to the increases in requests for technical assistance for these types of services from communities throughout Rockingham County, RCCD can confirm that the type of assistance offered to the Towns of Hampton and Hampton Falls has significantly expanded their conservation capacity through this project, which is desired, and therefore should be considered another accomplishment of this project.

Recommendations

Coastal communities in Rockingham County are now feeling immense development pressures, and there are development plans hitting every corner of town, targeting every resource including previously assumed undevelopable lands. The conservation commissions now recognize the importance of having accurate natural resource data. The higher the quality of data available to them, the more informed they can be with both land-use decisions and with their recommendations or requests to others. Moreover, the ability to offer stronger protection measures provides these communities a greater chance at potentially protecting these significant natural resources. With more accurate data and new resource recommendations, communities may be able to obtain support for protective overlay zones, prime wetlands designation, and possibly additional funds. Moreover, other related resource projects may be more readily completed if additional funds were requested or provided to the conservation commissions. The information provided on the resources within the project focus area, combined with the educational initiatives, has been a great success for this project.

All of the components of this project led to significant educational opportunities for all involved, and that is a most impressive outcome. The considerable outreach and educational efforts that resulted from this project achieved significant conservation enthusiasm within both communities. Moreover, any further conservation or natural resource projects that are implemented because of this project will emphasize the importance of this work, and the importance of the stewardship of the natural resources within each community, and within the Taylor River and NH Coastal Watersheds. This result not only benefits the communities involved, but also benefits all that live and enjoy in the NH Coastal Watershed.

GOVE ENVIRONMENTAL SERVICES, INC.
Wetlands and Soil Mapping

TAYLOR RIVER WATERSHED WETLAND INVENTORY

Hampton and Hampton Falls, New Hampshire

December 27, 2004

GES Project # 2004156

118 Portsmouth Ave Ste B201, Stratham, NH 03885-2487
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz

TAYLOR RIVER WATERSHED WETLAND INVENTORY
HAMPTON AND HAMPTON FALLS, NH

INTRODUCTION

In early 2004, the Hampton and Hampton Falls Conservation Commissions requested proposals from qualified consultants to complete an inventory of wetland boundaries within approximately 400' of either side of the Taylor River and its primary tributaries. The purpose of the inventory was to identify individual wetland areas as well as wetland complexes that were potentially suitable for prime wetland designation. A functions and values assessment of each prime wetland candidate was conducted to determine the relative importance of each wetland complex both in the communities and when appropriate, regionally. Using geographic information system (GIS) data and digital orthophotos as base maps the wetland boundaries were mapped and provided to each of the participating municipalities as a layer for their geographic data system.

Gove Environmental Services, Inc. (GES) was selected to complete the wetland inventory and analyses, which culminated in the preparation of this summary report. Most of the fieldwork was completed in the summer and fall of 2004.

The information presented in this report is intended to be used as an inventory and planning tool for the communities of Hampton and Hampton Falls, and not as a site-specific impact evaluation tool, nor as a detailed wetland delineation. For Federal and most State jurisdictional purposes, a formal delineation must be completed utilizing the standards of the U.S. Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, (January 1987).

The municipalities will be able to use the information presented in this report for many planning purposes and can also pursue special designation of those wetlands determined to be of the highest ecological value. In New Hampshire, wetlands can be designated as "prime wetlands" by a municipality in accordance with the requirements of RSA 482-A: 15 and Chapter Wt 700 of the New Hampshire Department of Environmental Services (DES) administrative rules. The municipality chooses to evaluate the wetlands within its boundaries. As was the case in this instance, the evaluation method typically used is the *Method for Comparative Evaluation of Nontidal Wetlands in New Hampshire* "(NH Method)" *(1991)* or the *Method for the Evaluation and Inventory of Vegetated Tidal Marshes in New Hampshire* "(Coastal Method)" (1993). Field and available mapping and/or aerial photos are used for the evaluation process.

After the initial evaluations were completed, GES and the Conservation Commissions from the municipalities evaluated the functions and values exhibited by those wetlands determined to be likely candidates for prime wetland designation. Criteria such as size, location and a preponderance of "Type A Hydric Soils" were used to develop a list of candidate wetlands.

This report covers Phase I of the town-wide wetlands inventory for Hampton and Hampton Falls. Grant money utilized to fund this study was limited to the study of the Taylor River watershed. It is currently anticipated that the remainder of each community will be mapped as Phase II in 2005. Following the completion of Phase II, the most valuable wetlands in the communities will

be evident and the municipalities will hold a public hearing before the residents of the community to vote on the designation. Once the municipalities approve the wetlands for designation as prime, the municipalities will provide the DES Wetlands Bureau with a copy of the study and tax maps with the designated prime wetlands identified. DES will then review the submission from the municipality to ensure that it is complete and in accordance with Wt 702.03. Once the submission is considered complete, DES will apply the rules and law that are applicable to any future projects that are in or adjacent to a prime wetland. All projects that are in or adjacent to a prime wetland are classified as "Major" projects and will require a field inspection by DES and a public hearing conducted by DES.

As of December 2004, there are 22 communities in New Hampshire that have designated prime wetlands. They are:

Andover	Meredith
Barrington	Northwood
Bow	Nashua
Brookline	New London
Derry	Pelham
Enfield	Salem
Exeter	Sanbornton
Fremont	Sandwich
Gilford	Tamworth
Holderness	Weare
Hooksett	Wolfeboro

Several additional communities have completed inventories towards designating prime wetlands and are in various stages of completion with the remainder of the process. Additional information regarding prime wetlands in New Hampshire may be found by contacting the NH Department of Environmental Services Wetlands Bureau by phone at (603) 271-2147 or online at http://www.des.state.nh.us/wetlands/guidebook/primewet.htm.

WETLAND INVENTORY

GES mapped all wetlands on the basis of hydrophytic vegetation, hydric soils, and wetlands hydrology in accordance with the techniques outlined in the Corps of Engineers Wetlands Delineation Manual, Technical report Y-87-1, (January, 1987). However, the complete and accurate jurisdictional wetland limits were not delineated or marked in the field using survey flagging. Wetland boundaries were determined by using a combination of tools, primarily infrared orthophotos and NRCS soils maps, and were verified by a cursory field check. These boundaries are generally not adequate for NHDES or US Army Corps regulatory permitting requirements. Wetland data plots and transects were not completed for this study. This study provides an inventory and evaluation of the wetland systems within the primary watershed of the

Taylor River (as determined by the Conservation Commissions) and serves to assist the municipalities with their ongoing planning efforts.

Each wetland was given a unique ID and the wetland boundary location was sketched onto the plots of infrared digital aerial orthophotos provided by the Rockingham Planning Commission. The wetland boundaries were then digitized into Geographic Information Systems format by GES.

GES also determined the classifications of the wetlands in accordance with the US Fish & Wildlife Service Manual FWS/OBS-70/31, Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, et al, 1979). Each wetland with a unique ID was classified. In some cases where an individual wetland is made up of different wetland classes an estimate of each cover type was made based on the percent of each wetland type. These wetland classifications have also been entered into the GIS data layer.

During the course of the study, 152 wetland areas were identified representing a total of approximately 618 acres within Hampton and Hampton Falls.

During the field studies, GES gathered information relative to the ecological condition of the wetlands and wetland complexes. A brief description of each wetland was prepared and used in developing the NH Method Wetland Evaluations found in the appendices to this document.

Sensitive Wildlife Species and Plant Species and Communities

GIS point data was provided by the NH Department of Resources and Economic Development's (DRED) NH Natural Heritage Inventory (NH NHI). This data identified general locations of two sensitive plant species and one known rare fish location within the study area. Additionally, four sensitive plant species were identified immediately adjacent the study area. These species ranged in State Conservation Rankings from "Critically Imperiled" to "Rare or Uncommon." To protect the well-being of these plants, the exact species type was not readily available. This data was overlaid on the 2004 mapped wetlands to help identify wetlands that may include or be located within close proximity to sensitive resources. Please contact the NH NHI [(603) 271-3623] for additional information related to this data.

Wetland Numbering System

An numeric label was used to identify the wetland complex that each individual wetland is associated with.

Wetland Mapping Process

Below is an itemized list of the methodology employed during both the field and GIS portions of the Taylor River Wetland Inventory. Mapping began in the Summer of 2004 and continued as necessary to verify initial results. GIS analysis began during the Fall of 2004 and was continually modified until the conclusion of the finished product.

Field Work Analysis

1. The Rockingham Planning Commission provided digital color infrared orthophotographs. The maps were printed at 1:200 scale with tic marks printed on the maps for further reference.
2. Wetlands were identified visually by vegetation and infrared signature. Wetland lines were drawn on the maps using plane table mapping techniques and photo interpretation. A generalized Cowardin Classification was noted on the maps.
3. Wetland information from the National Wetlands Inventory and soil information from the Natural Resources Conservation Service was used to supplement photo interpretation in areas that were not visually distinctive.
4. Delineated wetland boundaries and TIC marks were transferred to sheets of transparent mylar using a light table hand tracing.

Geographic Information Systems (GIS) Analysis

1. The mylars were electronically scanned into digital format (.tif). The resulting image files were converted to GIS format using a batch digitizing program and the individual tiles were merged into one layer covering the entire study area..
2. Additional field observations were made to determine wetland boundaries still in question.
3. The Taylor River Wetland Inventory GIS file was edited to reflect the additional information collected.
4. The resulting GIS file was used in conjunction with additional GIS data provided by the University of New Hampshire's Complex System Research Center (GRANIT) to complete the New Hampshire Method Comparative Analysis. Following summation of NH Method data sheets, a relative ranking system was produced.

PRIME WETLAND CANDIDATE EVALUATION

Methodology

Several evaluations and/or rankings must be completed in order to nominate wetlands of substantial value for additional regulatory protection, including designation as prime wetlands in New Hampshire. The necessary steps to classify wetlands as prime wetlands are identified as; 1) wetlands must be greater than 2.0 acres in size, and 2) the municipality may set threshold conditions. The remaining wetlands are then ranked for each of the adopted functional values.

Candidates for prime wetland designation were selected based on meeting the following criteria:

- The wetlands must meet the standard regulatory definition of wetlands, i.e. they must have the presence of hydric soils, hydrophytic vegetation, and wetlands hydrology.

- At least 50% of the candidate wetland must have Type A Hydric Soils, and the remaining soils must be Type B Hydric Soils.

Using these criteria, 4 candidate wetlands were selected for evaluation and future consideration for potential prime wetland designation. The four wetland complexes are designated as Prime Wetland Candidates 1-4.

These wetland complexes were evaluated using the *Method for Comparative Evaluation of Nontidal Wetlands in New Hampshire* (1991), (NH Method). For this study, all fourteen wetland functions and values outlined in the NH Method were evaluated for the 4 candidate wetland complexes. They are:

1. Ecological Integrity – Evaluates the overall health and function of the wetland ecosystem.
2. Wetland Wildlife Habitat – Evaluates the suitability of the wetland as habitat for those animals typically associated with wetlands and wetland edges.
5. Finfish Habitat – Evaluates the suitability of watercourses, ponds, or lakes associated with the wetland for either warm water or cold water fish.
6. Education Potential – Evaluates the suitability of the wetland as a site for an "outdoor classroom".
7. Visual/Aesthetic Quality – Evaluates the visual and aesthetic quality of the wetland.
8. Water-Based Recreation – Evaluates the suitability of the wetland and associated watercourses for non-powered boating, fishing, and other similar recreational activities.
9. Flood Control Potential – Evaluates the effectiveness of the wetland in storing floodwaters and reducing downstream flood peaks.
10. Groundwater Use Potential – Evaluates the potential use of the underlying aquifer as a drinking water supply.
11. Sediment Trapping – Evaluates the potential of the wetland to trap sediment in runoff water from surrounding upland.
12. Nutrient Attenuation – Evaluates the potential of the wetland to reduce the impacts of excess nutrients in runoff water on downstream lakes and streams.
13. Shoreline Anchoring and Dissipation of Erosive Forces – Evaluates the effectiveness of the wetland in preventing shoreline erosion.
14. Urban Quality of Life – Evaluates the potential for the wetland to enhance the quality of urban life by providing wildlife habitat and other natural values in an urban setting.
15. Historical Site Potential – Evaluates for indications of use by early settlers.
16. Noteworthiness – Evaluates the wetland for certain special values such as critical habitat for endangered species, or exemplary natural communities, etc.

Findings

As the study area was restricted to the primary watershed of the Taylor River (as designated by the Conservation Commissions), it is important to note that while the four Prime Wetland Candidates analyzed all ranked very high in all function and value categories, the small study area creates several situations that should be taken in to consideration:

1. The study area truncates large wetland complexes at arbitrary points. The majority of the wetlands analyzed in this assessment extend well beyond the limit of the study area.
2. The restricted area of the study limits the size of the Prime Candidate set and makes comparison of relative value difficult.

With these factors in mind, the GIS data layer associated with this study, as well as the NH Method assessments, were assembled in such a manner as to allow for the seamless integration of Phase I and the proposed Phase II of the town wide assessments. However, it is possible to draw some conclusions about high-value wetland complexes within the study area. Maps and descriptions of the overall study area and each prime candidate wetland complex as well as details of the findings are provided in the following sections.

STUDY AREA AERIAL OVERVIEW

Taylor River Wetland Inventory

Study Area Aerial Overview
Hampton and Hampton Falls, NH

Exeter
North Hampton
Hampton
Hampton Falls
BRIDE HILL DR
SANBORN RD
TAYLOR RIVER RD
KING ST
CURTIS ST
BROWN RD
NASON RD
TIMBER SWAMP RD
DRAKESIDE RD
101
27
88
95

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Taylor River Wetlands
- NHDOT Roads

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

1998 Digital Orthophoto- UNH Complex Systems Research Center

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

STUDY AREA TOPO OVERVIEW

Taylor River Wetland Inventory

Study Area Topo Overview
Hampton and Hampton Falls, NH

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Taylor River Wetlands
- NHDOT Roads

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

1998 Digital Orthophoto- UNH Complex Systems Research Center

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

STUDY AREA HYDRIC SOILS OVERVIEW

Taylor River Wetland Inventory

Study Area Soils Overview
Hampton and Hampton Falls, NH

Exeter
North Hampton
Hampton
Hampton Falls
BRIDE HILL DR
SANBORN RD
TAYLOR RIVER RD
KING ST
CURTIS ST
BROWN RD
DRAKESIDE RD
TIMBER SWAMP RD
101
27
88
95

Hydric A Soils have developed in these areas since SCS mapping was completed.

Legend

- Town Boundary
- Study Area
- Hydric A Soils
- Hydric B Soils

To qualify as a prime wetland candidate, a wetland must have a minimum of 50% Hydric A soils. The remainder must be Hydric B Soils. The data on this map is from NRCS coarse soil mapping. Field investigations revealed a greater percentage of Hydric A soils than shown.

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

1998 Digital Orthophoto- UNH Complex Systems Research Center

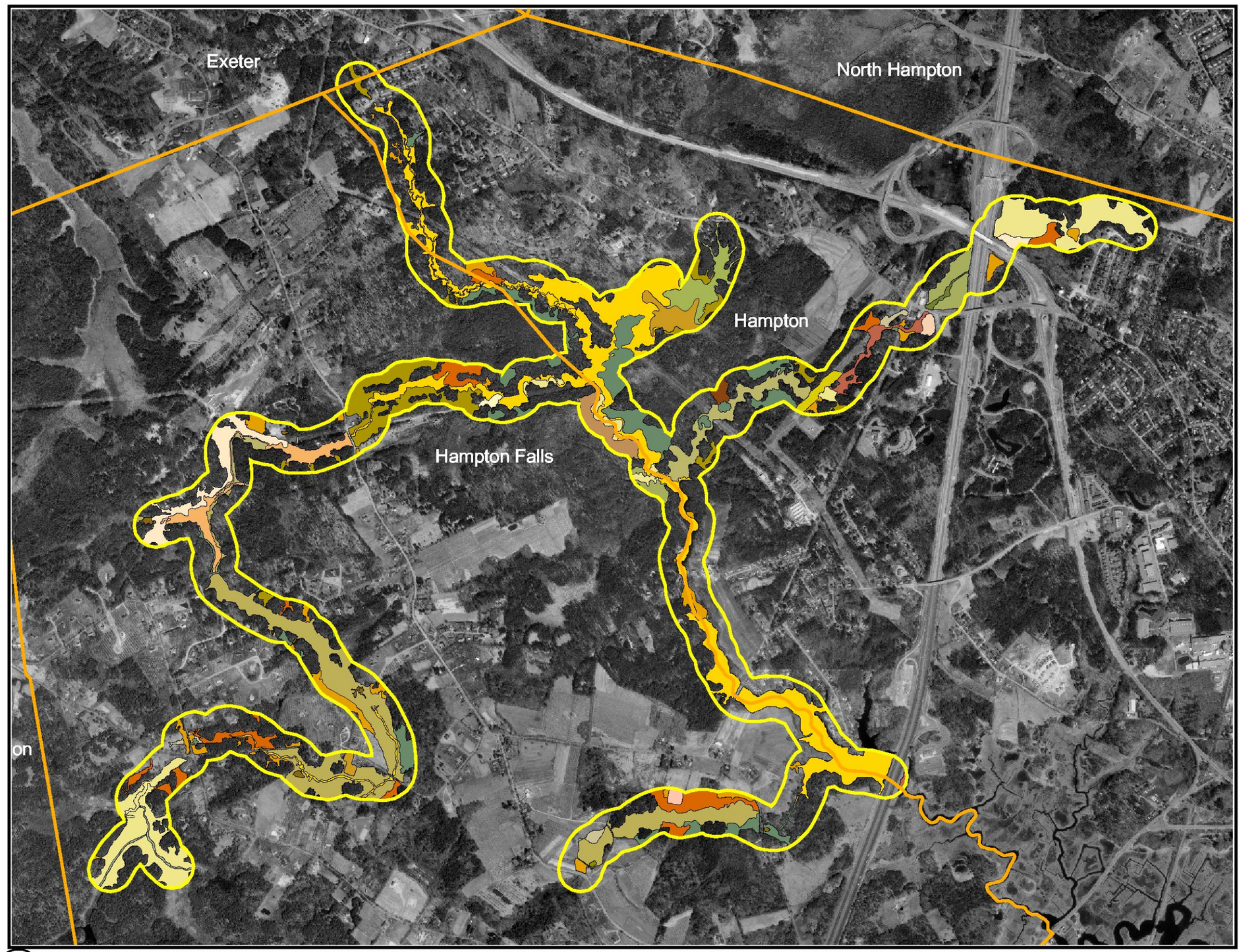
New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

STUDY AREA ECOLOGICAL CLASSIFICATION

Taylor River Wetland Inventory

Study Area Aerial Overview
Hampton and Hampton Falls, NH



Legend

Taylor River Wetlands
Ecological Classification

- E1UB
- L1UBHh
- PEM1/SS1E
- PEM1/SS1F/R3UB
- PEM1E
- PEM1Ed
- PEM1F
- PFO/SS1E
- PFO1E
- PFO4/1E
- PFO4/SS1E
- PFO4E
- POW
- POWx
- PSS/EM1E
- PSS1/EM1E
- PSS1/EM1Em
- PSS1/EM1F
- PSS1/EM1d
- PSS1/FO1E
- PSS1/FO4E
- PSS1E
- PSS1Eh
- PUBHh
- R2UB3
- R2UBH
- R3UB
- R3UB3/EM1F

Please refer to the classification key on the following pages.

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

1998 Digital Orthophoto- UNH Complex Systems Research Center

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

PRIME WETLAND CANDIDATE AERIAL OVERVIEW

Taylor River Wetland Inventory

Prime Candidate Aerial Overview
Hampton and Hampton Falls, NH

Exeter
North Hampton
Hampton
Hampton Falls
BRIDE HILL DR
101
27
88
95
SANBORN RD
TAYLOR RIVER RD
KING ST
CURTIS ST
BROWN RD
NASON RD
TIMBER SWAMP RD
DRAKESIDE RD
on

Legend

- Town Boundary
- Study Area
- NHDOT Roads
- Candidate One
- Candidate Two
- Candidate Three
- Candidate Four

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

1998 Digital Orthophoto- UNH Complex Systems Research Center

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

Prime Candidate One Description

Prime Candidate is the largest wetland complex in the study area that is recommended for prime wetland designation. This complex comprises 378 acres and extends across town boundaries. Much of this complex is associated with the main branch of the Taylor River that forms much of the boundary between Hampton and Hampton Falls. Approximately 206 acres of the complex are located in Hampton Falls, while the remaining 172 acres are located to the east in Hampton.

This complex is notable for several reasons, foremost being its size. Prime Candidate One consists of 19 distinct classes of wetland under the USFWS Wetland Classification System ("the Cowardin system") spread along nearly 6.5 miles of river and stream channel. Additional forested wetlands adjacent to the riparian habitat adds to the value of this system.

While no rare, threatened or endangered species or communities have been documented by the NH Natural Heritage Inventory within the limits of this complex, that may reflect an absence of surveys within this area. The area is certainly significant wetland wildlife habitat. Additionally, the value of the area is enhanced by a nearly 1200-acre block of relatively unfragmented forest and wetland habitat that forms the core of the wetland complex. This area is very roughly bounded by Route 88 to the west, Route 27 to the north and east, and Timber Swamp Road to the south.

Prime Candidate One comprises much of the study area and is crossed by several roads and utility corridors. Despite this, the complex remains connected from a hydrologic perspective as well as from a Type A hydric soil perspective. Indeed it is the very poorly drained soils that suggest that this area should be treated as one complex. This is evident on the maps shown on the following pages.

PRIME CANDIDATE ONE
2003 AERIAL PHOTO

Taylor River Wetland Inventory

Prime Candidate One
Hampton and Hampton Falls, NH

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Prime Candidate One
- Existing Conservation Land
- NHDOT Roads

North Hampton
Hampton
Hampton Falls
Large Unfragmented Habitat Block
BRIDE HILL DR
SANBORN RD
KING ST
CURTIS ST
TAYLOR RIVER RD
BROWN RD
MASON RD
DRAKESIDE RD
TIMBER SWAMP RD
101
27
88
95

1000 0 1000 2000 3000 4000 5000 Feet
Approximate Scale

2003 Infrared Orthophoto- Rockingham Planning Commission

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

PRIME CANDIDATE ONE PHOTOLOG

PRIME WETLAND CANDIDATE ONE PHOTOLOG

November 2004

1. Candidate One from Curtis Street. A diverse mix of emergent, open water and scrub-shrub habitat.

2. Candidate One from Sanborn Road. This area provides significant flood water storage.

PRIME WETLAND CANDIDATE ONE PHOTOLOG

November 2004

3. Candidate One from Route 88. Some purple loosestrife is present amongst the scrub-shrub habitat.

4. Snag trees and emergent vegetation create valuable wildlife habitat east of Bride Hill.

PRIME WETLAND CANDIDATE ONE PHOTOLOG

November 2004

5. Native grasses and red maples comprise an area of floodplain forest along Ash Brook.

6. Several vegetated strata (herbaceous, shrub, sapling and canopy) create layers of habitat throughout this wetland.

PRIME WETLAND CANDIDATE ONE PHOTOLOG

November 2004

7. A beaver pond area to the northeast of Timber Swamp Road is representative of the high quality wildlife habitat within a core block of unfragmented land that surrounds portions of Prime Candidate One.

Prime Candidate Two Description

Prime Wetland Candidate Two is a 36-acre, primarily emergent complex located entirely in Hampton. The complex is situated immediately to the southeast of the Interstate 95 Hampton Toll Plaza and is associated with the Old River.

Prime Candidate Two consists of four distinct ecological classes of wetland. The dominant natural features of this complex include large areas of dense emergent vegetation with inclusions of scrub-shrub and forested areas. No known occurrences of rare, threatened or endangered species or communities have been documented within this wetland complex, however, that may indicate that no survey has been conducted in this area by NH NHI. In areas, this complex is within 200' of the North Hampton town line. It should be noted that this wetland complex forms the southern edge of an approximately 165-acre island of relatively unfragmented land, albeit much of it in North Hampton. This area is bounded by Interstate 95 to the west as well as South Road to the north and areas of residential development to the south and east.

The boundaries of Prime Wetland Candidate Two are driven by three factors: significant man-made barriers, the North Hampton townline and hydric A soil areas. As noted above, Interstate 95 is located immediately west of this complex. This forms a formidable barrier between Prime Wetland Candidate Two and Prime Wetland Candidate One to the southeast. Additionally, Candidate Two consists of approximately 75% very poorly drained soils with an interior inclusion of poorly drained Hydric B soils. As the Old River flows beneath Interstate 95, soils become primarily poorly drained. As noted in the introduction to this report, a prime wetland must consist of at least 50% hydric A soil with the remainder being hydric B. Given the location of Interstate 95 as well as the absence of hydric A soils to the immediate west of Interstate 95, Candidate Two was separated from Candidate One. Finally, despite extending significantly north into North Hampton, Candidate Two is limited by the townline.

PRIME CANDIDATE TWO
2003 AERIAL PHOTO

Taylor River Wetland Inventory

Prime Candidate Two
Hampton, NH

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Prime Candidate Two
- Existing Conservation Lands
- NHDOT Roads

500 0 500 1000 1500 Feet

Approximate Scale

2003 Infrared Orthophoto- Rockingham Planning Commission

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

PRIME CANDIDATE TWO PHOTOLOG

PRIME WETLAND CANDIDATE TWO PHOTOLOG

November 2004

1. Dense scrub-shrub cover and broad swaths of emergent vegetation are typical of Candidate Two.

2. High quality upland adjacent Candidate Two elevates its wildlife habitat value.

Prime Candidate Three Description

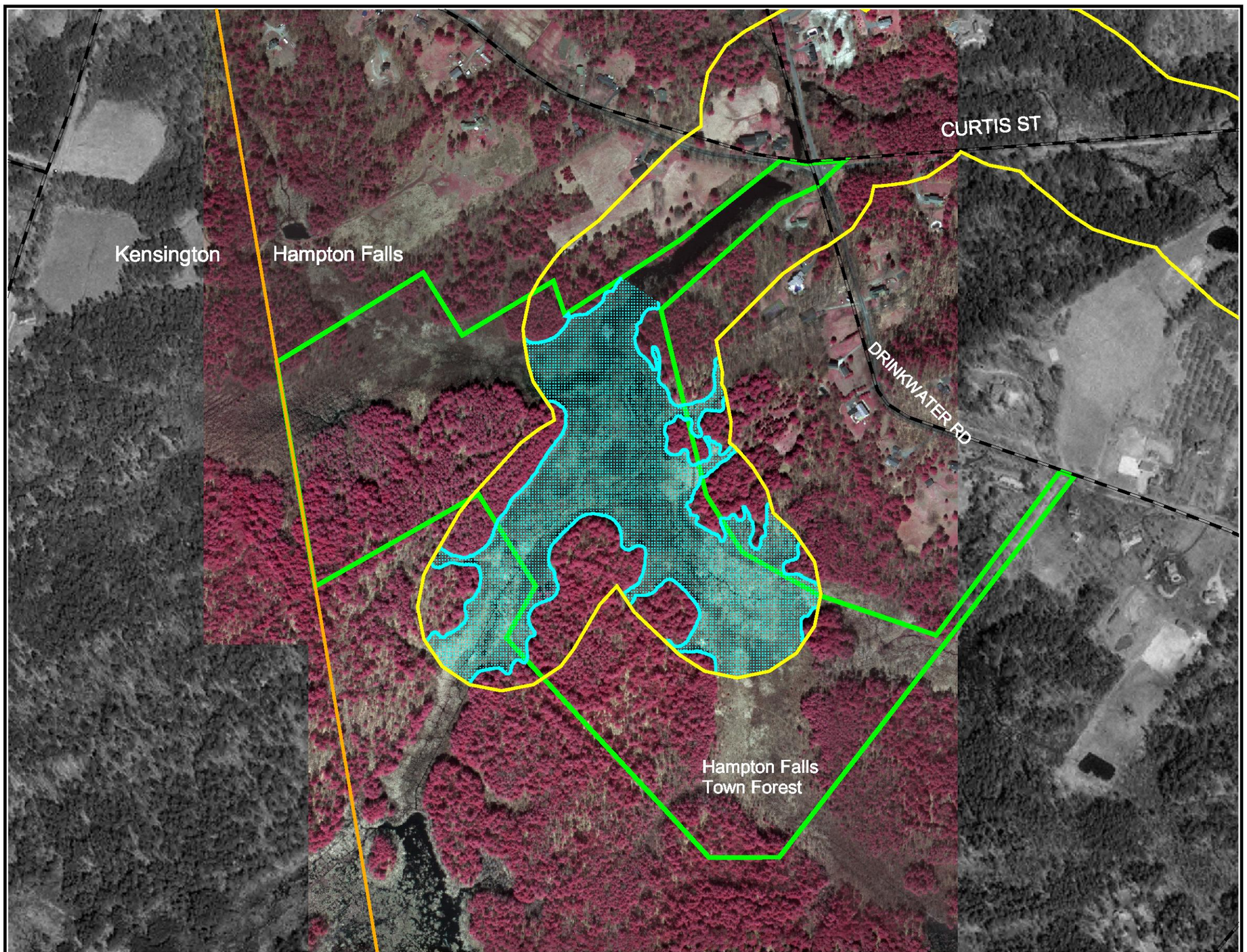
Prime Candidate Three is a 32-acre complex located near the western edge of Hampton Falls. Much of the area that comprises this complex is contained within the boundaries of the Hampton Falls Town Forest, a 111-acre area that is designated as permanent conservation land.

The wetland area is comprised nearly entirely of dense emergent vegetation surrounded by thick scrub-shrub vegetation. Small areas of pit-and-mound forested wetlands are present at the margins of the complex. Five distinct wetland classes are present including the main branch of the Taylor River and its confluence with two unnamed tributaries. No known occurrences of rare, threatened or endangered species or communities have been documented within this wetland complex, however, that may indicate that no survey has been conducted in this area by NH NHI.

Prime Candidate Three is situated in the north-central portion of a nearly 640-acre (one square mile) area of relatively unfragmented habitat that extends well beyond the Hampton Falls townline into neighboring Kensington. This area is of sufficient size to provide valuable habitat to wildlife species that require undisturbed interior forest habitat. Additionally, the Taylor River and two unnamed streams likely function as riparian (streamside) travel corridors for a variety of wildlife species.

Prime Candidate Three is located approximately 3000 feet upstream from Candidate One. In this instance, the decision to separate the two complexes was based on the remnants on the historic grist mill dam that creates much of the impoundment within Candidate Three. Additionally, the two Prime Candidate areas are also separated by the intersection of Drinkwater Road and Curtis and King Streets.

PRIME CANDIDATE THREE
2003 AERIAL PHOTO



2003 Infrared Orthophoto- Rockingham Planning Commission

Taylor River Wetland Inventory

Prime Candidate Three
Hampton Falls, NH

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Prime Candidate Three
- Existing Conservation Lands
- NHDOT Roads

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

PRIME CANDIDATE THREE PHOTOLOG

PRIME WETLAND CANDIDATE THREE PHOTOLOG

November 2004

1. Candidate Three from Drinkwater Road. This outflow area was the former location of a historic grist mill.

2. A large impounded open water area with emergent vegetation and snag trees.

PRIME WETLAND CANDIDATE THREE PHOTOLOG

November 2004

3. Broad expanses of dense emergent vegetation are present within the Hampton Falls Town Forest portion of Prime Candidate Three.

4. Emergent, scrub-shrub and sapling vegetation provide several strata of wildlife habitat.

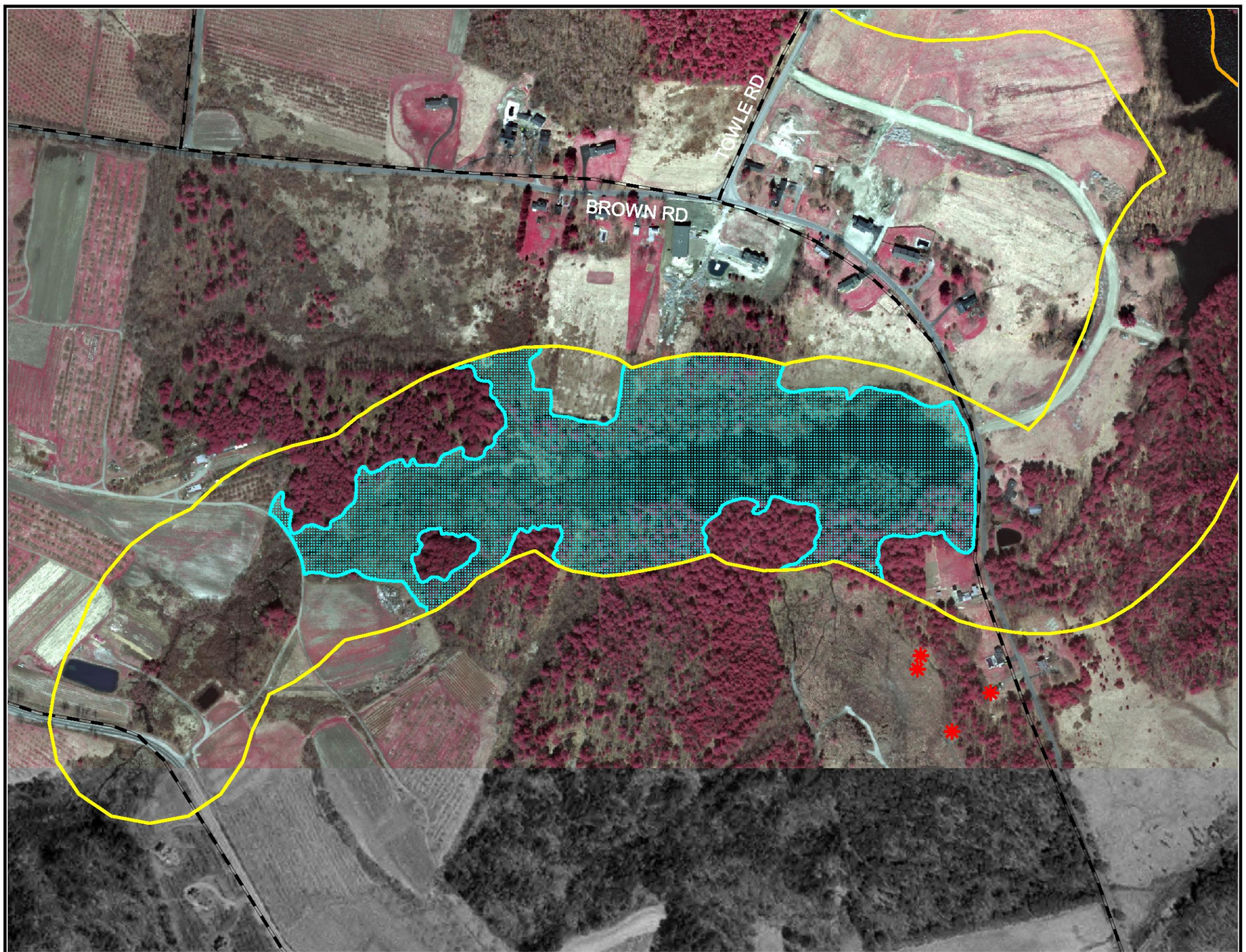
Prime Candidate Four Description

Prime Candidate Four is a 35-acre wetland complex associated with an area in the east-central portion of Hampton Falls known locally as the Grapevine Run. The area is influenced by the remains of a grist mill dam which contributes to the large impoundment of open water within this wetland complex. The complex is bounded to the east by Brown Road and to the west by a private road associated with Applecrest Orchards. An area of active agricultural land and an associated woodlot totaling nearly 200 acres lies adjacent the wetland complex to the south.

Three distinct wetland classes are present within this complex. The dominant natural features include large areas of dense emergent vegetation with inclusions of scrub-shrub and forested areas. Purple loosestrife (*Lythrum salicaria*), an aggressive invasive species that out-competes native wetland flora, is well established within the shallow portions of this wetland complex.

Four occurrences of rare, threatened or endangered plant species are documented to the immediate south of this Prime Candidate Four. It should be noted that NH NHI applies a random shift of up to 500 feet to all mapped occurrence locations in order to protect the resource from unscrupulous collectors. As a result, it is possible that these generically identified plant species may actually occur within the boundaries of Prime Candidate Four. More information regarding this issue may be available to town officials upon coordination with NHI staff.

PRIME CANDIDATE FOUR
2003 AERIAL PHOTO



Taylor River Wetland Inventory

Prime Candidate Four
Hampton Falls, NH

Legend

- Town Boundary
- Study Area
- RTE Species/Communities
- Prime Candidate Four
- Existing Conservation Lands
- NHDOT Roads

500 0 500 1000 1500 Feet

Approximate Scale

2003 Infrared Orthophoto- Rockingham Planning Commission

New Hampshire Estuaries Project

Gove Environmental Services, Inc.
Wetlands and Soils Analysis

PRIME CANDIDATE FOUR PHOTOLOG

PRIME WETLAND CANDIDATE FOUR PHOTOLOG

November 2004

1. Candidate Four from Brown Road. This area of deep open water is influenced by the remains of a historic grist mill dam.

2. Dense growths of purple loosestrife, an invasive species, are prevalent throughout the complex.

FUNCTIONS AND VALUES SUMMARY

This section of the report provides a summary of functions and values for each of the four prime wetland candidates as assessed using the "NH Method". A brief explanation of each function or value is provided as well as the results for each complex. Please note that some functions and values only occur in portions of each complex (i.e. finfish habitat occurs only in streams and ponds). As a result, area evaluated for each function or value is less than the total acreage of the complex in some instances. Finally, "Wetland Value Units" may be interpreted as the product of wetland acreage multiplied by the "Functional Value Index" (the raw score of each wetlands' ability to provide a specific function or value).

Function/Value 1: Ecological Integrity

This wetland function is a measure of the high degree of productivity that is typical of many wetland systems. Runoff entering wetlands from the surrounding uplands generally contains dissolved nutrients, which are then slowly released and assimilated by the lush vegetation characteristic of most of these wetlands. Wetland vegetation, along with interspersion of upland edges and in some cases, surface waters, also contribute to a diverse animal community. All of these factors contribute to the ecological integrity of the wetland.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	283.8
2	36.1	24.5
3	32.1	28.9
4	35.1	26.3

Function/Value 2: Wetland Wildlife Habitat

It should be noted that the methodology used for this particular wetland identification and evaluation study (the New Hampshire Method) does not evaluate the wetlands as habitat for any particular wildlife species, but does attempt to assess the suitability of a particular wetland for wildlife species that are typically associated with wetlands. This functional value concentrates on those wildlife species that are most dependent on emergent (marsh) wetlands for habitat. This outcome of this functional assessment is heavily dependent on the outcome of the Ecological Integrity assessment.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	351.9
2	36.1	27.8
3	32.1	26.9
4	35.1	29.1

Function/Value 3: Finfish Habitat of Watercourses and/or Lakes Associated with the Wetland

This Functional Value is a measure of the ability of streams and brooks, or lakes and ponds to provide finfish habitat. Although this study focuses on the primary watershed of the Taylor River, it is important to note that the vast majority of wetlands surveyed are forested, scrub-shrub, shallow marsh or some variant that is not suitable for fish habitat. As a result, despite the large size of the study area, a relatively small percentage of wetlands surveyed actually provide finfish habitat. The value of the Taylor River and its tributaries to anadromous (sea-run) species such as alewife, herring, salmon and shad is also limited by the presence of obstructions such as dams (both natural and manmade) that prevent access to potential spawning areas.

The wetland value units for Finfish Habitat Rivers and Streams are highly dependent on the size of the wetland complex and its areas of free-flowing water and ponds. Results for stream habitat are shown below:

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	112.0	71.7
2	0.33	0.2
3	2.0	1.3
4	3.5	2.3

The wetland value units for Ponds and Lake Finfish Habitat (shown below) are also closely linked to the amount of open water habitat within the complex. When interpreting these results, it is important to remember that shallow marsh habitat is not always appropriate finfish habitat.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	0.0	0.0
2	0.25	0.1
3	1.2	0.6
4	14.0	15.6

Function/Value 4: Educational Potential

A potential for use of wetlands as an educational tool is directly related to its proximity to a school and accessibility of the wetland. The potential area of a wetland that could provide educational opportunities may include all or some of the wetland. The diversity of the wetland and the variety of wetland types within the wetland system area also key factors. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	20.0	11.8
2	14.0	7.6
3	8.0	6.0
4	16.0	10.1

Function/Value 5: Visual/Aesthetic Quality

Although visual and aesthetic qualities can be subject to some interpretation, the New Hampshire Method attempts to quantify this element by considering a variety of factors. These include scenic diversity (several different plant communities), general appearance of the wetland and surrounding area, landform contrasts, flowering trees and shrubs, or trees and shrubs that turn vibrant colors in the fall, and wetland wildlife habitat. This Functional Value also considers intrusions such as noise from highways and unnatural odors. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	60.1	50.5
2	20.1	14.2
3	10.0	9.3
4	17.0	15.0

Function/Value 6: Water-Based Recreation

Recreational activities involving wetlands can include active uses such as hunting and fishing, but also more passive activities like bird watching, hiking or identifying the varied plant life. Boating activities, including canoeing and kayaking, can also be considered under this functional value, and the New Hampshire Method stresses non-powered boating since it is less disruptive to the wetland environment. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	295.2
2	36.1	22.4
3	32.1	21.2
4	35.1	27.0

Function/Value 7: Flood Control Potential

Freshwater wetlands act as natural storage areas reducing downstream flood peaks. They can also act as natural flood regulators by temporarily storing floodwaters and then slowly releasing the floodwaters over time. During a heavy rain event, the wetland vegetation and soils slow the water entering the wetland from rainfall, surface runoff and streamflow. This reduces the amount of waters entering the main stream or river at the peak of the flood and ensures that floodwaters from the tributaries do not reach the main river at the same time.

The two main factors that influence the effectiveness of a wetland in reducing downstream flood peaks are the storage potential of the wetland and a measure of how slowly the wetland will release the stored water. Storage potential is assessed by comparing the size of the wetland with the watershed area that could contribute water from snowmelt or heavy rainfall, or both. In general, a large wetland with a small contributing watershed will be more effective for flood control than a small wetland with a large watershed. The rate of release of the stored water is related to the size and shape of the wetland outlet.

The New Hampshire Method uses a table that provides an index value drawn from calculations of areas and measurements of flow restrictions to determine a value for wetland flood control potential. In this evaluation, the flood control potential is a function of the relationship between the wetland area-to-watershed ratio, and the size of the restrictive feature at the outlet. A wetland with a small contributing watershed but a wide outlet with little restriction will score lower than the same wetland with a narrow restricted outlet. Because of the large size of the four candidate wetland complexes and their close association with riverine systems, the highest possible flood control FVI (1.0) was assigned to each wetland. Results for each wetland when size is considered are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	378.4
2	36.1	36.1
3	32.1	32.1
4	35.1	35.1

Function/Value 8: Ground Water Use Potential

Although wetlands are most frequently groundwater discharge areas they can also play an important role in recharging ground water aquifers in some cases. This function is evaluated only if a wetland is upstream of a stratified drift aquifer or if the wetland is overlying all or part of a stratified drift aquifer. Stratified drift aquifers are generally assumed to have a high potential to yield water. Stratified drift aquifer locations were assessed using maps provided by the UNH GRANIT GIS Clearinghouse. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	283.8
2	36.1	27.1
3	32.1	12.8
4	35.1	9.8

Function/Value 9: Sediment Trapping

Runoff from a heavy rainfall may cause erosion and sedimentation, which can cause damage to aquatic ecosystems. Accumulated sediment in the stream bottom can smother gravel spawning areas and kill aquatic insect larvae, an important food source for fish. Sediment can also reduce the capacity of downstream water supplies. Wetland vegetation can slow the water flow and remove some of the sediment loads before the water moves downstream.

The New Hampshire Method evaluates the opportunity for a wetland to trap sediment based on the current land use in the watershed above it. The evaluation also considers the overall potential for sediment trapping by measuring the potential trap efficiency of the wetland. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	340.6
2	36.1	26.0
3	32.1	27.6
4	35.1	33.3

Function/Value 10: Nutrient Attenuation

Excessive amounts of nutrients from fertilizers used in agricultural fields and on lawns, or from other urban activities, can contribute to algal blooms and oxygen deficiencies in lakes and slow moving streams resulting in fish kills and reduced water quality. Within reason, a wetland can reduce the impact of nutrient levels in a downstream waterbody and thereby reduce the effects of eutrophication. Because wetlands serve as buffers between upland areas and waterbodies they can intercept and absorb excess nutrients transported in runoff waters. Some nitrogen can be released to the atmosphere as a harmless gas, although much of the excess nitrogen, as well as phosphorus, can be stored in sediments or taken up by wetland vegetation.

The New Hampshire Method considers the opportunity for a wetland to attenuate nutrient impacts on downstream waterbodies by evaluating the current land use in the watershed above the wetland, as well as the potential for the wetland to retain or otherwise attenuate nutrients (typically a function of vegetation density and water flow). Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	321.64
2	36.1	24.5
3	32.1	24.7
4	35.1	33.7

Function/Value 11: Shoreline Anchoring and Dissipation of Erosive Forces

When water levels in streams and rivers are high, significant erosive forces can act upon streambanks and lakeshores. One of the best countermeasures to these forces is dense natural vegetation. Thick root mats greatly strengthen and reinforce the soil that make up streambanks. As a result, slumping from undercut banks and general erosion is significantly reduced. Because of this, the potential for sediment to choke fish spawning areas is minimized and streams are also able to maintain there natural channel character to a greater extent. This function is measured by assessing vegetation density.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	8.0	8.0
2	0.66	0.66
3	0.83	0.83
4	0.61	0.51

Function/Value 12: Urban Quality of Life

Because urban wetlands may not perform certain wetland functions as well as those in less developed areas, they tend to rank lower in several values including ecological integrity, wetland wildlife habitat and visual/aesthetic quality. However, these urban wetlands may actually have considerable value when considered in the context of the surrounding urban land. For example, some wetlands may be among the last refuges for wildlife or may also provide some of the few remaining viewscapes. In that context urban wetlands can enhance the quality of human life in an urban setting. The New Hampshire Method attempts to recognize these factors by measuring this Functional Value. While neither Hampton Falls nor Hampton can be considered urban, both communities are experiencing rapid growth. As a result, this portion of the assessment may become more important as time passes. This portion of the analysis typically re-assesses earlier portions of the report with an eye to the landscape and cultural context of the study area.

A. Wetland Wildlife Habitat

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	378.4
2	36.1	32.5
3	32.1	28.9
4	35.1	31.6

B. Educational Opportunity

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	20.1	12.6
2	36.1	18.1
3	8.0	5.0
4	16.0	10.1

C. Visual/Aesthetic Quality

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	60.0	54.0
2	20.0	18.1
3	10.0	10.0
4	17.0	17.0

D. Water-Based Recreation

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	253.5
2	36.1	22.7
3	32.1	20.2
4	35.1	22.1

-

Function/Value 13: Historical Site Potential

Although most other factors consider present uses and values of the wetlands, the wetlands also may have provided value to those who lived there in the past. Early settlers made extensive use of wetlands, streams and lakes, particularly for water power. The New Hampshire Method evaluates the wetlands for the functional value by noting remnants of historic uses, including remains of structures, foundations, walls, dams, sluiceways, or even dumps. This value is particularly appropriate in both of the subject communities were the study area was closely associated with several gristmills and sawmills. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	100	100
2	36.1	10.1
3	20.0	20.0
4	35.1	35.1

Function/Value 14: Noteworthiness

This Functional Value considers certain features a wetland may possess which gives it a high value regardless of any other attribute. These features include:

- Critical habitat for a State or Federally listed threatened or endangered species;
- The wetland is a known study site for scientific research;
- National Natural Landmark status, or recognized as a exemplary natural community in New Hampshire by the New Hampshire Natural Heritage Inventory;
- Locally significant because the wetland ranks among the highest number of Wetland Value Units within the study area for one or more Functional Values;
- Locally significant because the wetland has biological, geological, or other features which are locally rare or unique;
- Contains an important archaeological site; and
- Wetland is hydrologically connected to a State or Federally designated river.

Note that a FVI of 1.0 is assumed if the wetland meets any of the above criteria. Results for the four prime wetlands candidates are shown below.

Prime Candidate	Acreage Evaluated	Wetland Value Units
1	378.4	378.4
2	36.1	36.1
3	32.1	32.1
4	35.1	35.1

RECOMMENDATIONS

In addition to recommending four wetland complexes as candidates for prime wetland designation (with the caveat that the boundaries of these candidates are likely to change following Phase II of the study), this report also seeks to provide recommendations related to significant upland and wetland habitat, conservation opportunities and restoration opportunities within the Taylor River watershed.

Significant Wetland Habitat

As documented in this report, the entire Taylor River study area rates as high value significant wildlife habitat. Perhaps the most common examples of wetland wildlife habitat that most people think of are vernal pools. Vernal pools are areas of temporarily ponded water that flood in the spring and dry in mid to late summer. These pools typically occur in the same locations from year to year. Because these pools dry each year, they cannot support fish populations. As a result, these areas become very attractive to pond breeding amphibians such as spotted salamanders (*Ambystoma maculatum*) and wood frogs (*Rana sylvatica*) among others. These species, spend the majority of each year in upland habitat but return to vernal pools in the spring to mate and deposit egg masses that gradually mature as the pool dries. The absence of fish in the pools minimizes the potential for predation on eggs and juvenile amphibians (metamorphs). In recent times, the term vernal pool has been used in a loose sense to encompass any small ponded area that supports breeding amphibians regardless of its hydroperiod.

Aerial photo analysis and field reconnaissance did not identify any classic vernal pools within the study area, however this may be a function of the autumn survey period. Despite this, it is important to note that pond-breeding amphibians frequently and successfully use small ponded areas such as deep puddles associated with tree tip-ups as breeding habitat. Additionally, small portions of larger ponds are often employed. As a result, it is likely that there are hundreds of small amphibian breeding areas within the forested and scrub-shrub wetland matrix that surrounds much of the study area. With this in mind, designation of an appropriate buffer adjacent wetlands within the study area is an important step towards protecting the upland and wetland habitat that is critical to the longevity of these species.

Significant Upland Habitat

A nearly 1200-acre block of relatively unfragmented forest and wetland habitat forms the core of Prime Candidate One. This area is very roughly bounded by Route 88 to the west, Route 27 to the north and east, and Timber Swamp Road to the south. While a small portion of this two square mile area is contained within the Candidate One, much is outside of the boundaries of the study area. Additionally, a moderate percentage of this area is wetland of some type or another, however, significant portions of upland are

present. This area is a tremendous resource to both Hampton and Hampton Falls as it is a large block of land of which a significant portion functions as interior forest habitat suitable for species such as black bear, fisher, bobcat, moose and scarlet tanagers. These species are rare in southern New Hampshire due to the absence of large blocks of unbroken habitat. Additionally, this area is linked to other smaller habitat blocks both within and adjacent the study area by natural travel corridors associated with the stream and rivers of the Taylor River system.

Conservation Opportunities

While it is outside the scope of this study to identify conservation opportunities in the subject communities, it is recommended that the conservation committees coordinate with the open space committees regarding the large blocks of habitat associated with Prime Candidate One and Prime Candidate Three described in other portions of this report.

Restoration Opportunities

Despite ranking highly as a candidate for prime wetland designation, Prime Candidate Four is severely infested with purple loosestrife, an aggressive invasive species that choke out native wetland vegetation thereby significantly reducing the biodiversity of the wetland system. Prime Candidate Four would make an optimum location for attempts to biologically control this species. Typically, biological control is attempted, but not always attained, using a species of beetle (*Galerucella* spp.) that feeds upon the plant, limiting its vigor and ultimately killing it. This method has met with limited success in New Hampshire but may be the best hope for the future of Prime Candidate Four. More information of this method is available by contacting the New Hampshire Field Office of The Nature Conservancy at (603) 224-5853.

Additionally, a recent report funded by the New Hampshire Estuaries Program and conducted for the New Hampshire Office of State Planning entitled “Freshwater Wetland Mitigation Inventory for Nineteen Coastal Communities” provides detailed descriptions of wetland restoration opportunities that go beyond the scope of this report. The mitigation inventory covers both Hampton and Hampton Falls and will be available to the public shortly.