

ATTACHMENT 1

GRANTHAM CONSERVATION COMMISSION WETLAND INVENTORY REPORT & RECOMMENDATIONS

I. PROJECT TASK

The Master Plan adopted by the Town in 2005 mandated that the Grantham Conservation Commission (“GCC”) “prepare a local wetlands inventory and evaluation, and consider the designation of prime wetlands.” As a first step towards completing this task, a number of bids were received and after due consideration of each of those bids, in January 2011 the GCC chose to engage the services of New Hampshire (NH) certified wetland scientist, Rick Van de Poll, Ph.D., of Ecosystems Management Consultants, to complete a comprehensive wetland inventory and assessment of Grantham’s wetlands (“Wetland Inventory”).

The primary goals of the Wetland Inventory were to:

- 1) identify and evaluate all Town wetlands greater than 2 acres;
- 2) identify those wetlands with the highest value to the Town in terms of public benefits, health, and safety goals and objectives set forth in the Master Plan; and
- 3) recommend designation of prime wetlands according to state standards defined in RSA 482-A:15 and EnvWt Rules Chapter 700.

II. METHODOLOGY AND TIMELINE

At the outset of the Wetland Inventory project, the GCC decided to conduct this project in a completely open fashion, and involvement of Grantham residents was strongly encouraged throughout the project. One aspect of this is reflected in the decision to use trained volunteers from the community to perform wetland evaluations, subject to review and supervision by Dr. Van de Poll. A Wetland Inventory subpage was created on the Town’s website, and periodic status updates, FAQ’s, training materials and other useful resources were posted on the webpage. In addition, periodic articles or other information were distributed to the public through mechanisms such as the Grantham e-News and *Eastman Living*, and educational posters were displayed at Dunbar Free Library and Town Hall.

The GCC introduced the Wetland Inventory project to the Town at a well-advertised public forum held on February 21, 2011. While it was not possible at this time to know which landowners would have a wetland evaluation unit (“WEU”) on or adjacent to the their property, GCC felt it was important to inform landowners whose properties are adjacent to certain high priority wetland areas identified in Grantham’s 2009 Critical Conservation Lands Index (“CCLI”) about the project, as one or more of these would likely be considered as a WEU. Thus in early February, a letter was sent to 147 landowners advising them that the Wetland Inventory project was starting and inviting them to attend the first informational public forum. Forty (40) members of the public attended, and the minutes of the public forum can be found on the Town’s website.

The first phase of the Wetland Inventory began in March 2011, which involved Dr. Van de Poll reviewing a multitude of resources, including all applicable digital geographic information system (GIS) data, all pertinent map and literature data associated with wetlands in the region, and hydric soils data from the USDA Natural Resources Conservation Service. Thereafter, Dr. Van de Poll used 2010, high-resolution (1-foot pixel) aerial photographs to accurately identify and map WEU's for further evaluation, and conducted roadside surveys to field-test his aerial photo interpretation work and check hydrologic connectivity.

In May 2011, Dr. Van de Poll conducted classroom and field-based training sessions for approximately thirty-seven (37) volunteers from the community and GCC members in order to educate them on how to assess a WEU and complete an evaluation using the 2011 Revised *Comparative Method for Evaluating Non-Tidal Wetlands in New Hampshire* (otherwise known as the "Revised NH Method").

By the end of October 2011, Dr. Van de Poll completed his initial work, which resulted in the identification of fifty-four (54) WEU's and generation of two (2) maps for each WEU that the trained volunteers needed to perform evaluations of their assigned WEU(s). One map is a topographic map with the boundaries of the wetland delineated by a light blue/aqua line, a 500-foot buffer zone around the wetland shown with a pink line, and codes that indicate the types of wetland habitats in the unit depicted using the Cowardin system^{1/} of wetland habitat classification ("WEU NWI Map"). The other map is an aerial photograph that uses the same wetland & buffer delineations as the first map, but instead of habitat types it shows the soil types in the WEU ("WEU Soils Map").

At this time, Dr. Van de Poll also provided the GCC with a list of properties adjacent to each WEU, and access permission request letters were sent to the landowners of these properties on a rolling basis beginning in late October 2011 and ending in March 2012. In addition, reminders and status update letters were sent to landowners in December 2011 and September 2012. The list provided by Dr. Van de Poll included a total of two hundred seventy (270) parcels with one hundred sixty eight (168) distinct owners. Responses to the request letters and reminders sent out to these landowners were as follows: eighty-four (84) approved access (160 parcels, 59%); nine (9) denied access (14 parcels, 5%); and seventy-five (75) did not respond (96 parcels, 36%).

To minimize the risk of potential bias, the GCC assigned teams of two (2) or more trained volunteers (which included sixteen (16) community volunteers and six (6) GCC members) to each WEU and tasked them with completing a Revised NH Method assessment and evaluation report for their assigned WEU(s). This evaluation report comprises a total of eighty-eight (88) questions grouped into twelve (12) Functions, which are: #1-Ecological Integrity; #2-Wetland-Dependent Wildlife Habitat; #3-Fish & Aquatic Habitat; #4-Scenic Quality; #5-Educational Potential; #6-Wetland-Based Recreation; #7-Floodwater Storage; #8-Groundwater; #9-Sediment Trapping; #10-Nutrient Transformation; #11-Shoreline Anchoring; and #12-Noteworthiness.

^{1/} See Cowardin et al., *Classification of Wetlands and Deepwater Habitats of the United States*, U.S. Fish & Wildlife Service, FWS/OBS-79/31 (1979, Washington DC: Government Printing Office). Revised NH Method manual Appendix F provides a key to Cowardin codes, and can be found on GCC's Wetland Inventory/Wetland Resources page on the Town's website.

The volunteers performed the evaluations by visiting the WEU, where possible, being careful to only access properties where landowners had granted permission or viewing the WEU from publicly accessible land or roadways. In several instances, on-site access to a WEU was completely prevented as a result of landowner access denial or failure to respond, and in those cases, the evaluations were completed using high-resolution aerial photographs, topographic maps, and other resources, such as UNH's online tools GRANITView & Wetlands Data Mapper, and GoogleEarth.

All fifty-four (54) WEU evaluations were completed and submitted to Dr. Van de Poll for his review by mid-August 2012. Dr. Van de Poll performed a detailed review of each WEU's evaluation, made corrections where necessary, and followed up with the volunteers for further information as needed. Thereafter, he analyzed the evaluation results and data in detail, and as directed by the GCC, made a primary focus of his analysis the comparison of each WEU's results across four (4) characteristics mandated in Grantham's Master Plan as being of high importance to public benefit, health, and safety, specifically: 1) flood storage capability; 2) contribution to water supply; 3) contribution to water quality; and 4) wildlife habitat (collectively, "Master Plan Mandates").

On September 25, 2012, the GCC held another well-advertised public forum in which the interim Wetland Inventory results and next steps were discussed. The GCC sent invitations for this forum to a total of two hundred fifty three (253) landowners, which included everyone that GCC had contacted previously about the project. The minutes for this public forum can be found on the Town's website. Since Dr. Van de Poll's final report for the Wetlands Inventory was not available at the time of the forum, the GCC offered forum attendees the opportunity to sign-up to receive a copy once this final report became available, and this offer was also extended to other people through the GCC's page on the Town website. At their request, a total of thirty-four (34) people were sent the final report when it became available.

At the end of October 2012, Dr. Van de Poll completed his Grantham Wetland Inventory & Assessment Project Final Report (the "Final Report")^{2/} in which he recommended that twelve (12) very high and high value wetlands be designated prime wetlands in accordance with RSA 482-A:15 and DES Env Wt Rules Chapter 700. On November 4th, the Final Report was posted on the Town's website and sent via email to twenty-four (24) of the people requesting a copy, and hard copies were printed for the ten (10) remaining requestors that did not provide an email address. They were mailed a memorandum on November 5th advising them that their copy of the Final Report was available for pick up at Town Hall. In addition, two (2) hard copies of the Final Report for public review were placed at Town Hall.

Another public forum to present an overview of the Final Report and the GCC's recommendations for prime wetland designations that are discussed herein, is scheduled for November 13, 2012, starting at 7:00 PM in the Town Hall's lower level meeting room. In addition to the usual advertising, the details for this public forum were also included in the transmittal email/memorandum sending copies of the Final Report to those who requested a copy.

^{2/} For more detailed information on the Wetlands Inventory project, Revised NH Method, maps, analysis of functions, results for each WEU, and the like, see the Final Report.

III. CONCLUSIONS AND RECOMMENDATIONS

As part of its consideration of whether to recommend designation of any of the WEU's as prime wetlands, GCC members carefully reviewed the evaluation results for each WEU, the analysis and recommendations reflected in Dr. Van de Poll's Final Report, relevant NH RSAs and local zoning ordinances, DES rules, and other applicable references such as guidelines for municipal water supplies, and flood zone information and history. A primary focus of the GCC's review was how a particular WEU scored in relation to each of the Master Plan Mandates, and on how many of the Master Plan Mandates did the WEU score well. In reaching its final recommendations, the GCC strongly focused on applying the least restrictions that would provide the most protection of these valuable resources while respecting and balancing the needs and rights of the property owner with the demands of public interest, health, and safety in resource protection. In addition, where possible, the GCC sought to avoid duplicating state and local protections that are currently in place.

Using this balanced approach, the GCC decided that, at this time, it is recommended that the following eight (8) highest scoring wetlands be designated prime wetlands:

- 1) WEU#32-Bog Brook
- 2) WEU#1-Chase Pond
- 3) WEU#26-Grass Pond West
- 4) WEU#8-Lily Pond
- 5) WEU#37- Lower Eastman Brook
- 6) WEU#50-Stocker Pond
- 7) WEU#20-Upper Dunbar Hill Beaver Pond
- 8) WEU#30-Upper Stroing Brook

Supporting details for each of the eight (8) WEU's recommended for designation as prime wetlands are set forth in **Section III.A** below.

The GCC would like to stress that its decision not to recommend the remaining four (4) WEU's recommended by Dr. Van de Poll, or any other WEU, for prime wetland designation at this time should not be interpreted as indicating that these WEU's do not provide valuable functions for the Town. The current recommendations are focused on those WEU's that are highly ranked across multiple Master Plan Mandates that have little or no current protection for the entire wetland unit, and thus are in the GCC's opinion the most critical and urgent to protect against future degradation of their functions and values in order to protect the general health and well-being of the Town.

Among those WEU's that are not being recommended presently, there are a number that particularly deserve mention in this report. These WEU's and their characteristics are briefly discussed in **Section III.B** below.

A. WETLAND UNITS RECOMMENDED FOR PRIME WETLAND DESIGNATION

1. Bog Brook (WEU# 32)

The Bog Brook WEU is a very large unit at 509.71 acres, with portions of the unit lying in Springfield. This WEU is located along the eastern border of Grantham, starting on the north side of Route 114 and it includes the junction of Bog Brook and Eastman Brook. The boundaries of this WEU are clearly delineated in the two (2) WEU Soils Maps attached as **Exhibit A-1a** and **Exhibit A-1b**.^{3/}

The Bog Brook WEU received the second highest overall ranking score in the Final Report (along with one other WEU). While a large portion of this WEU is pristine, areas in the lower portion have seen some historical degradation, e.g., from the old town landfill. While these impacts in the southern section of the WEU did lower what otherwise would have been some of the highest evaluation scores across almost all functions if only the condition of the northern portion was considered (in particular, Function #1-Ecological Integrity), many function scores for the WEU still ended up being relatively high compared to other WEU's, and this WEU scored higher than the mean score for eleven of the twelve functions.

The Bog Brook WEU has high value in terms of flood storage capability, providing moderate to high flood storage value for both Grantham and its neighboring towns, and the WEU received the 4th highest evaluation score for Function #7-Flood Storage.

This WEU also is a key area in terms of contributions to water supply. A large portion of this 509+-acre WEU overlies low- or unknown-yield aquifer that constitutes the vast majority of such aquifer acres in Grantham, and this WEU received the 3rd highest evaluation score for Function #8-Groundwater (along with two other WEU'S). In 2010, the Society for the Protection of NH Forests ("SPNHF") issued an updated "Guide to Identifying Potentially Favorable Areas to Protect Future Municipal Wells on Stratified-Drift Aquifers" (the "FGWA Report"), and in that report there were several areas in this WEU indicated as being potential but "undefined" favorable gravel well areas ("FGWA") that may have the potential for future well-head sites.^{4/} The undefined label indicates that an area is an FWGA where there is sufficient land in a natural state to satisfy the DES's required suite of protective buffer distances for hydrological features, transportation features, known/potential contamination sites, and urban features to form a sufficiently large sanitary protective radius ("SPR") around a potential municipal well-head site; however, there was insufficient data available at the time of the analysis to determine the area's potential pumping rate or water yield. Thus, there are several areas in this WEU that might have the potential to provide a municipal well-head site, but at present, the utility of those sites is not known.

^{3/} The WEU is so large that the north and south parts are broken into separate maps so that the maps are easier to read.

^{4/} See SPNHF's "Guide to Identifying Potentially Favorable Areas to Protect Future Municipal Wells on Stratified-Drift Aquifers", Updated Methodology and Data June 2010, and in particular, the associated May 2010 map entitled "Potentially Favorable Areas for Future Municipal Wells in N.H. Stratified Drift Aquifers", copies of which can be found on GCC's Wetlands Inventory/Wetland Resources page on the Town's website.

Bog Brook WEU also contributes significantly to water quality in Town, ranking among the top ten WEU's for each of the three evaluation functions that relate to water quality. Specifically, it received the 2nd highest score for Function #10-Shoreline Anchoring and the 7th highest scores for each of Function #9-Sediment Trapping and Function #10-Nutrient Transformation.

The 2010 NH Wildlife Action Plan Highest Ranked Wildlife Habitat by Ecological Condition map ("2010 NHWAP Ranked Map") shows that a large portion of the Bog Brook WEU is the highest ranked habitat in the region.

From both the state and local zoning perspective, the Shoreland Water Quality Protection Act ("SWQPA") only applies to a small portion of the southeast section of this WEU, after the junction of Bog Brook and Eastman Brook.

The GCC concludes that this WEU is a major contributor across three Master Plan Mandates (flood storage capability, water supply and water quality), and also provides some value in connection with the fourth, wildlife habitat. It is a critical component in a series of connected WEU's that play an important role in water quantity and quality, and may provide potential municipal water supply sites in the future should such be necessary, but at the moment, very little of this wetland has existing protection for these important functions. Thus, the GCC feels it is crucial to the mandates of the Master Plan and public benefit, health, and safety, to begin protecting the functions and values of this WEU from further degradation, and it should be designated as a prime wetland.

While not relevant to the consideration of prime wetland designation, the GCC also believes it is important for Grantham to continue its cooperation with Springfield (the abutter to the north and east of the Grantham portions of the Bog Brook WEU) in providing protection for this valuable WEU.

2. Chase Pond (WEU# 1)

Chase Pond WEU is 36.14 acres and is located along the Croydon Turnpike astride the northwest border between Grantham and Plainfield, with about two-thirds of the wetland lying in Plainfield. The portion of the WEU in Grantham is entirely within Grantham's Town Forest, and thus the Town currently owns all of the adjacent land in Grantham. The boundaries of Chase Pond WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-2**.

Chase Pond WEU received the highest overall ranking score in the Final Report, scoring above the mean score for all of the twelve (12) evaluation functions in the Revised NH Method.

In terms of flood storage capabilities, Chase Pond WEU provides moderate to high flood value and received the 5th highest score for Function #7-Flood Storage (along with one other WEU). Should the flood storage capacity of this WEU be degraded, the risk of flooding along Miller Pond Road and down Skinner Brook would increase greatly.

In terms of contribution to water supply, Chase Pond WEU was one of only thirteen (13) WEU's that scored above the mean for Function #8-Groundwater, receiving the 8th highest score for this function. It also contributes to water quality, receiving the 3rd highest score for Function #9-Sediment Trapping, and it plays a significant role in keeping sediment from traveling down into "Miller Pond West", Mill Pond, and Skinner Brook. It also received the 4th highest score for Function #10-Shoreline Anchoring although for this function it was not among the top ten highest WEU's as eleven WEU's tied for the next highest score.

The Chase Pond WEU also provides some of the best wildlife habitat in Grantham. It received high scores for two of the three wildlife habitat related functions, getting the 2nd highest score (tied with two other WEU's) for Function #2-Wetland-Dependent Wildlife Habitat and the 3rd highest score for Function #3-Fish & Aquatic Habitat. The 2010 NHWAP Ranked Map shows Chase Pond WEU as including both highest ranked habitat in NH and in the region, and it is largely surrounding by highest ranked habitat in NH.

Chase Pond WEU in Grantham is not subject to the SWQPA on either the state or local zoning level. It is within Grantham's Forest Lands Conservation District, but the regulations relating to this district do not afford adequate protection of the wetland functions of this WEU, particularly should this area be removed from the Town Forest at some point in the future. Further, designation of this WEU as a prime wetland will have a negligible impact on timber, firewood and other natural resource management in the Town Forest.

The GCC concludes that Chase Pond WEU is our Town's highest ranked WEU across all functions of the Revised NH Method, and it also provides significant benefits to the Town across all four of the Master Plan Mandates. At present, it is only protected in the sense that it is currently part of the Town Forest. It is the GCC's opinion that the interests of public benefit, health, and safety, are best served by protecting this WEU from the possibility of changes in the future that may result in degradation of its functions and values, and it should be designated as a prime wetland.

3. Grass Pond West (WEU# 26)

The Grass Pond West WEU is 12.68 acres and most of the unit is located on the Leavitt Hill Road property that was recently purchased by Upper Valley Land Trust ("UVLT") in connection with the wetlands mitigation needed in order to build the Town's new athletic fields. The boundaries of Grass Pond West WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-3**.

Grass Pond West WEU (along with three other WEU's) received the 4th highest overall ranking score in the Final Report. This WEU is pristine with little to no man-made impacts, as evidence by its receipt of the highest score possible for Function #1-Ecological Integrity (along with four other WEU's).

While this WEU did not score in the top ten for Function #7-Flood Storage, it did score above the mean for this function with a score that indicates it has moderate flood storage capability.

Grass Pond West WEU also contributes to water quality, receiving the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

With regard to wildlife habitat, Grass Pond West WEU scored high in two of the three wildlife related functions, scoring the previously noted “perfect” score for Function #1-Ecological Integrity, and the 6th highest score for Function #3-Fish & Aquatic Habitat (along with two other WEU’s). In addition, several unique and distinctive species of plants were observed in the WEU, including the carnivorous sundew. A portion of the WEU contains marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan, and this area is also identified as highest ranked habitat in the region on the 2010 NHWAP Ranked Map.

This WEU does not receive any protection under the SWQPA. While it is afforded some level of protection from degradation for the portions owned by UVLT, it is potentially vulnerable to degradation by activities on other properties.

The GCC concludes that this WEU is particularly valuable with regard to wildlife habitat, and also provides significant contributions to water quality and flood storage capabilities. It is currently afforded very little regulatory protection, although there is some incidental protection provided where the WEU is on conserved land. The GCC is of the opinion that it is important to take steps now to help ensure that this WEU remains in its current pristine state, and in the interests of public benefit, health, and safety, this WEU should be designated as a prime wetland.

4. Lily Pond (WEU# 8)

Lily Pond WEU is 8.96 acres and is located at the top of Miller Pond Road along the Plainfield border. A small portion of the WEU is in Plainfield. The Grantham portion of the WEU is on Town Forest property that is currently owned by the Town, though to the south it abuts one property owned by a private landowner. The boundaries of Lily Pond WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-4**.

The Lily Pond WEU received the 3rd highest overall ranking score in the Final Report, scoring above the mean score for all of the twelve evaluation functions, with one function’s score being just slightly above the mean.

With regard to flood storage capability, while Lily Pond WEU did not score in the top ten for Function #7-Flood Storage, it did score higher than mean and has moderate flood storage capability.

The Lily Pond WEU does provide some contribution to water quality, receiving the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

In terms of wildlife habitat, Lily Pond WEU is another high quality wildlife unit and its scores were in the top ten scores for all three evaluation functions relating to wildlife, receiving the 5th highest score for each of Function #1-Ecological Integrity, Function #2-Wetland-Dependent Wildlife Habitat, and Function #3-Fish & Aquatic Habitat. Almost the entire WEU is marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan, and portions of the WEU are also identified as highest ranked habitat in NH and highest ranked habitat in the region on the 2010 NHWAP Ranked Map, as well as being surrounded by large areas of highest ranked habitat in NH to the north and west.

Lily Pond is listed as a locally protected water body under the SWQPA by virtue of its addition to the list in Grantham's zoning ordinance. The amount and edge of water in this WEU fluctuates a great deal based on natural conditions, such as building and breaking of beaver dams, and at times there is not a great deal of open water in the wetland. Since the buffer protection afforded by the SWQPA is measured from the water's edge and not the wetland edge, there are significant portions of the WEU that are afforded little or no protection under the SWQPA.

The GCC concludes that Lily Pond WEU provides significant contributions in the area of wildlife habitat, as well as contributions to two other Master Plan Mandates, flood storage capability and water quality. The entire WEU is not currently afforded adequate protection, and it is the GCC's opinion that it is in the best interests of public benefit, health, and safety for this WEU to be designated as a prime wetland.

5. Lower Eastman Brook (WEU# 37)

Lower Eastman Brook WEU is 44.22 acres, with about four (4) of those acres in Springfield. It is located north of Route 114 and at its southern edge abuts the Bog Brook WEU at the junction of Eastman Brook and Bog Brook. The boundaries of Lower Eastman Brook WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-5**.

Lower Eastman Brook WEU (along with three other WEU's) received the 4th highest overall ranking score in the Final Report, and scored above the mean score for nine of the twelve evaluation functions.

With regard to water supply, the southern portion of this WEU that abuts the Bog Brook WEU overlies a low- or unknown-yield aquifer,^{5/} and Lower Eastman Brook WEU received the 6th highest score for Function #8-Groundwater. The FGWA Report map indicates that a fairly large section of the southwestern side is a potential, but "undefined" FGWA that may have the potential for future municipal well-head sites subject to a determination of the area's potential pumping rate or water yield.

^{5/} See the water supply discussion for the Bog Brook WEU in Subsection III.A.1 above.

Lower Eastman Brook WEU also provides some contribution to water quality, receiving the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

While the evaluation scores for the wildlife evaluation functions were right around the mean, this WEU includes two types of Critical Habitat identified in the NH Wildlife Action Plan, marsh and shrub wetland habitat and floodplain forest. In addition, almost the entire WEU is identified as highest ranked habitat in the region on the 2010 NHWAP Ranked Map.

Lower Eastman Brook WEU ends at the confluence of Eastman Brook and Bog Brook, and thus a small portion along the southern edge of the WEU is afforded protection under the SWQPA. The rest of the WEU is not protected.

The GCC concludes that Lower Eastman Brook WEU is a high value wetland that provides very significant contributions in terms of the water supply characteristic of the Master Plan Mandates, and important contributions in two other Master Plan Mandates. It is part of a series of connected WEU's that are very important to the water supply and water quality Master Plan Mandates, and it may provide one or more potential municipal water supply sites in the future should such be necessary. At the moment, only a very small portion of this WEU has any existing protection. Thus, the GCC feels it is crucial to the mandates of the Master Plan and public benefit, health, and safety, to begin protecting the functions and values of this WEU from future degradation, and it should be designated as a prime wetland.

6. Stocker Pond (WEU# 50)

Stocker Pond WEU is 104.41 acres and is located in the southeastern corner of Grantham, just south of Route 114. While a large part of this WEU is the open water of Stocker Pond itself, the WEU also includes a fair amount of other wetland habitats, especially marsh and shrub habitat and peatland habitat at the northern and southern tips and along the western edge. The boundaries of Stocker Pond WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-6**.

The Stocker Pond WEU (along with three other WEU's) received the 4th highest overall ranking score in the Final Report, and scored above the mean score for nine of the twelve evaluation functions

In terms of flood storage capabilities, Stocker Pond WEU provides moderate to high flood value (with a score very close to the highest range), and received the 2nd highest score value for Function #7-Flood Storage.

Stocker Pond WEU is the most important WEU in Grantham with regard to contributions to water supply. It received the highest score for Function #8-Groundwater, which was the highest score possible for this function. The western portion and around the southern tip of the WEU overlie a significant percentage of the only high-yield aquifer in Grantham, while the north and eastern portions of the WEU overlie a low-yield aquifer. (As noted below, these portions currently have little to no protections.) In addition, the FGWA Report and Map

identifies approximately 2 acres in and along the western edge of Stocker Pond WEU as FGWA300 with a suitable SPR. This means that this area is a FGWA with the potential for high yield municipal wells pumping >75 gallons per minute after removing areas that are unfavorable due to quality (requisite buffers) and yield (transmissivity) considerations. This is the only acceptable high yield FWGA currently identified in Grantham.

With regard to wildlife, a portion of the WEU in the northeastern corner is indicated as highest ranked habitat in the region on the 2010 NHWAP Ranked Map, and it is forest floodplain habitat, which is a Critical Habitat in the NH Wildlife Action Plan. In addition, there is a fairly sizable area of marsh and shrub wetland habitat along the WEU's western side and some in the southern tip as well, and an area of peatland habitat in the southwestern corner, and both of these are also Critical Habitats.

While Stocker Pond itself is subject to both state and local applications of the SWQPA, this protection is measured from the water's edge, and as mentioned above, much of the most important features of this WEU lie in areas of the wetland that are beyond the water's edge, and these areas are afforded little to no protection under the SWQPA. Should the water supply functions in these areas of the WEU be degraded or lost, Grantham may have serious problems trying to establish a municipal water supply should such ever be needed, and even if it was possible to reclaim this area, the economic burden on the Town to do so would be extraordinarily high.

The GCC concludes that Stocker Pond WEU is a high value WEU across three of the Master Plan Mandates. It is the most important WEU in Grantham with regard to contributions to water supply, it provides very significant flood storage capabilities, and it also has wildlife habitat value. Degradation or loss of the functions and values of the Stocker Pond WEU could pose very serious risks to public benefit, health, and safety, and would also potentially cause very serious economic harm to the Town should a municipal water supply be necessary in the future. Thus, it is GCC's opinion that providing more adequate protection to the functions and values of this WEU is vital to the interests of the public, and this WEU should be designated as a prime wetland.

7. Upper Dunbar Hill Beaver Pond (WEU# 20)

Upper Dunbar Hill Beaver Pond WEU ("Upper Dunbar WEU") is 32.29 acres and is located off of Old Dunbar Hill Road, just northwest of the junction of Olde Farms Road and Dunbar Hill Road. The boundaries of Upper Dunbar WEU are clearly delineated on the WEU Soils Map attached as **Exhibit A-7**.

The Upper Dunbar WEU received the 2nd highest overall ranking score in the Final Report (along with Bog Brook WEU), scoring above the mean score for eleven out of twelve functions.

Upper Dunbar WEU's flood storage capabilities are significant. The WEU has moderate to high flood value and it received the 5th highest score value for Function #7-Flood Storage (along

with one other WEU). Should the flood storage capacity of this WEU be degraded or lost, the flood risk in portions of the Dunbar Hill area would increase greatly.

This WEU also provides some contribution to water quality, scoring above the mean for two of the three evaluation functions related to water quality, and receiving the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

In terms of wildlife habitat, Upper Dunbar WEU is one the highest quality wildlife areas, scoring very high for all three evaluation functions relating to wildlife. This WEU received the 2nd highest score for Function #1-Ecological Integrity (along with 2 other WEU's), the 4th highest score for Function #2-Wetland-Dependent Wildlife Habitat (along with 2 other WEU's), and the 2nd highest score for Function #3-Fish & Aquatic Habitat. Almost the entire WEU is marsh and shrub wetland habitat, with much of the rest peatland habitat, both of which are Critical Habitats identified in the NH Wildlife Action Plan.

The SWQPA does not apply to this WEU. Under Grantham's current zoning ordinances, this WEU is in the Rural Residential 3 district that requires a 5-acre minimum lot size. This area of Town has experienced a great deal of growth in the last 10 years, and thus this WEU is potentially subject to more development pressure than many other WEU's. Should such development occur without adequate measures to protect against degradation of the functions and values in place, there could be severe negative impacts on the existing residents of this area of Town.

The GCC concludes that the Upper Dunbar WEU is a very high ranking WEU that provides significant contributions in two of the four Master Plan Mandates, and moderate contribution to a third. Degradation or loss of the current functions and values of this WEU will likely result in increased risks to public welfare, health, and safety, and thus this WEU should be designated as a prime wetland.

8. Upper Stroing Brook (WEU# 30)

Upper Stroing Brook WEU is 29.97 acres (with approximately 0.7 acres in Enfield) and is located in the northeast corner of Grantham. The boundaries of Upper Stroing Brook WEU are clearly delineated in the WEU Soils Map attached as **Exhibit A-8**.

Upper Stroing Brook WEU (along with three other WEU's) received the 4th highest overall ranking score in the Final Report, and it scored above the mean score for ten out of twelve functions.

In terms of flood storage capabilities, Upper Stroing Brook WEU provides moderate to high flood value and received the 6th highest score for Function #7-Flood Storage. Should the flood storage capacity of this WEU be degraded, the risk of flooding in at least some areas of Eastman would increase.

Upper Stroing Brook WEU contributes significantly to water quality, scoring among the top ten WEU's in each of the three evaluation functions relating to water quality. Specifically, this WEU received the 6th highest score for Function #9-Sediment Trapping, the 3rd highest score for Function #10-Nutrient Transformation (along with one other wetland), and the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

Upper Stroing Brook WEU is a very high quality wildlife area, scoring in the top five for all three evaluation functions relating to wildlife. This WEU received the highest score for Function #1-Ecological Integrity (along with 4 other WEU's) and this score is the highest score possible for the function, the 4th highest score for Function #2-Wetland-Dependent Wildlife Habitat (along with one other WEU), and the 4th highest score for Function #3-Fish & Aquatic Habitat (along with one other WEU). A portion of the WEU is marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan.

The SWQPA does not afford any protection to this WEU on either the state or local level. All but about two percent (2%) of the Upper Stroing Brook WEU lies within a property owned by the Eastman Community Association and is protected as a Wildlife Management Area under an easement granted to NH Fish and Game Department; however, there are no specific protections in place for the wetland functions and values of this WEU.

The GCC concludes that Upper Stroing Brook WEU provides very important contributions in three of the four Master Plan Mandates. It is the GCC's opinion that it is in the best interests of public welfare, health, and safety for this WEU to be designated as a prime wetland.

B. OTHER IMPORTANT WETLAND UNITS OF NOTE

Set forth below are brief descriptions of other WEU's that, while they are not being recommended for prime wetland designation at this time, they are very important to the Town in one or more aspects. Several of these WEUs are also currently protected by state and/or local SWQPA provisions. The GCC believes that these WEU's should be marked as being of particular note, and future consideration should be given to some form of protection to avoid degradation or loss of the WEU's functions and values.^{6/}

1. Madore Spruce Fen (WEU# 47)

Madore Spruce Fen WEU is adjacent to and portions of it overlie the limited area of high-yield aquifer in Grantham. It received the 2nd highest score for Function #8 – Groundwater, and that score was more than three times the mean score for this function. It also scored high for one of the three water quality related functions, receiving the 5th highest score for Function #9-Sediment Trapping. So, this WEU provides significant value in terms of water supply and water quality.

^{6/} See the Final Report, Appendix A Page A-5, to see the location of each of the WEU's discussed in this section.

It should also be noted that the Madore Spruce Fen WEU is a unique habitat in Grantham. Spruce fens are relatively rare throughout the NH landscape, and this type of habitat is very sensitive to changes in the uplands that surround it. While access to the property was not granted, several rare insect species that are dependent on the unique habitat of fens were seen during the roadside evaluation of this WEU, and it is very likely that there are unique and rare plant species dependent on this type of habitat in the WEU as well.

2. Eastman Lake (WEU# 24)

Eastman Lake WEU is a very large 338+-acre wetland unit, which is almost entirely open water. It is a high ranked WEU that (along with three other WEU's) received the 6th highest overall ranking score in the Final Report, and it scored above the mean score for seven out of twelve functions.

It is the highest ranking WEU in terms of flood storage capability. With a water storage depth of about 5 feet, it is capable of holding back nearly 4 inches of rain run-off from its 5120-acre watershed, mitigating the risk of flooding of Stocker Brook and Sugar River. The Eastman Lake WEU is afforded protection under both state and local application of SWQPA. In the event that SWQPA does not afford adequate protection to the flood storage capabilities of the WEU, other protections should be put in place as degradation of Eastman Lake WEU's flood storage capability would pose serious risks of increased flooding in not only areas of Grantham, but several surrounding towns as well.

3. Miller Pond (WEU# 14)

Miller Pond WEU is a high ranked WEU that received the 5th highest overall ranking score in the Final Report, and it scored above the mean score for eight out of twelve functions.

This WEU is the 3rd highest ranking WEU in terms of flood storage capability, with a moderate to high flood value. Miller Pond WEU is afforded protection under both state and local application of SWQPA. If the protections provided by SWQPA do not afford adequate protection to the flood storage capabilities of this WEU, other protections should be put in place as degradation of Miller Pond WEU's flood storage capability would pose serious risks of increased flooding at least along Skinner Brook and potentially beyond.

Miller Pond WEU also scored high in one of the three functions relating to wildlife. Specifically, this WEU received the 2nd highest score (tied with two other WEU's) for Function #2-Wetland-Dependent Wildlife Habitat.

4. Northwest Corner (WEU# 17)

Northwest Corner WEU is 11.1 acres. It is a high quality wildlife area, scoring in the top five for two of the three evaluation functions relating to wildlife. This WEU received the highest score for Function #1-Ecological Integrity (along with 4 other WEU's) and this score is the highest score possible for the function, and the 4th highest score for Function #3-Fish & Aquatic Habitat

(along with one other WEU). Large portions of the WEU are marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan, and the entire WEU is highest ranked habitat in NH on the 2010 NHWAP Ranked Map.

5. Butternut Pond (WEU# 22)

Butternut Pond WEU is 67.46 acres (about 6.5 acres of which are in Enfield). It is a high ranked WEU that (along with three other WEU's) received the 6th highest overall ranking score in the Final Report, and it scored above the mean score for nine out of twelve functions.

This WEU is the 8th highest ranking WEU in terms of flood storage capability, with a moderate to high flood value.

Wildlife habitat is the Master Plan Mandate where Butternut Pond WEU is of particular importance. It scored in the top 5 for all three evaluation functions relating to wildlife, and received the highest score for two of the three functions. Specifically, Butternut WEU received the highest score for Function #2-Wetland-Dependent Wildlife Habitat (along with 1 other WEU), the highest score for Function #3-Fish & Aquatic Habitat, and the 4th highest score for Function #1-Ecological Integrity (along with 1 other WEU). In addition, a number of portions of the WEU are marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan.

Butternut Pond WEU is afforded protection under both state and local application of SWQPA. In addition, Butternut Pond and the land surrounding it is part of the NH Fish & Game Department's Henry Laramie Wildlife Management Area.

6. Little Brook Gravel Pit (WEU# 35)

Little Brook Gravel Pit WEU is 6.05 acres and located in the corner of Grantham east of Eastman Lake and adjacent to the boundaries of both Enfield and Springfield. Portions of this WEU are currently impacted by an active gravel operation.

This WEU was one of the higher scoring WEU's with regard to contribution to water supply. It received the 4th highest score for Function #8-Groundwater, with a score almost three times the mean score for this function

Located upstream of the Village District of Eastman's wells, Little Brook Gravel Pit WEU provides contributions to water quality, scoring high in two of the three evaluation functions relating to water quality. Specifically, this WEU received the 2nd highest score for Function #9-Sediment Trapping, and the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands).

7. Leavitt Pond (WEU#5)

Leavitt Pond WEU is 24.59 acres located up Leavitt Hill Road close to the Plainfield border. It is a high ranked WEU that (along with three other WEU's) received the 6th highest overall ranking score in the Final Report, and it scored above the mean score for eight out of twelve functions.

Leavitt Pond WEU contributes to water quality, receiving the 3rd highest score for Function #11-Shoreline Anchoring (along with ten other wetlands). Leavitt Pond (which is 14.8 acres) itself is afforded protection under both state and local applications of the SWQPA, but the remaining 9+acres of the Leavitt Pond WEU, beyond the SWQPA buffer zone measured from the edge of open water, is not protected.

This WEU provides high quality wildlife habitat, scoring in the top five for two of the three evaluation functions relating to wildlife. Leavitt Pond WEU received the 3rd highest score for Function #1-Ecological Integrity, and the 2nd highest score for Function #2-Wetland-Dependent Wildlife Habitat (along with two other WEU's). The northern and southeastern tips of this WEU contain marsh and shrub wetland habitat, a Critical Habitat identified in the NH Wildlife Action Plan, and the lower half of the WEU is highest ranked habitat in NH on the 2010 NHWAP Ranked Map and abuts a large tract of highest ranked habitat in NH in this area.

8. Ash Swamp East (WEU# 42)

The Ash Swamp East WEU is 24.47 acres and is another unique habitat in Grantham, and likely provides habitat for a number of unique species. With regard to wildlife habitat, this WEU received the highest score for Function #1-Ecological Integrity (along with 4 other WEU's), and this score is the highest score possible for the function.

Although located in a remote section of unfragmented forest, Ash Swamp East WEU significantly contributes to water quality, receiving high scores in two of the three evaluation functions relating to water quality. Specifically, it received the highest score for Function #9-Sediment Trapping, and the 6th highest score for Function #10-Nutrient Transformation (along with 1 other WEU). This WEU is not afforded protection under state or local SWQPA applications.