

Northwood Wetland Inventory And Prime Wetland Designation Project Northwood, NH



A Final Report to
The New Hampshire Estuaries Project

Submitted by

Rick Van de Poll, Ph.D.
Ecosystem Management Consultants
PO Box 331
Gilsum, NH 03448

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EXECUTIVE SUMMARY

In the fall of 1998, fieldwork was completed on a multi-year project to assess the prime wetlands in the Town of Northwood, New Hampshire. The work was begun in December 1992 by the Northwood Conservation Commission, and continued with the help of volunteers until the fall of 1998. At that time, after the Town had authorized the Board of Selectmen to apply for, accept, and expend money from state governmental sources, a grant from the New Hampshire Estuaries Program was secured in order to expedite the completion of the study. Contracted work was begun by this investigator in early November and was completed by the end of April 1999. Field work on the remaining 32 wetlands to be assessed was completed between November 10 and December 7, 1998. Preliminary analysis was accomplished by early January 1999, at which time a presentation was made to the Town of Northwood as a part of a proposal to revise the existing wetlands ordinance in Town. Draft revisions were submitted to the Planning Board, and subsequent hearings were attended in order to secure the eventual passage of a revised ordinance that recognized Prime Wetlands. The Town of Northwood passed these revisions along with a number of other Planning Board supported zoning amendments by ballot vote on March 9, 1999.

Further analysis of the data collected on potential Prime Wetlands in the Town of Northwood was completed between February and April 1999. A total of 63 wetlands were assessed using the "Comparative Evaluation of Non-tidal Wetlands In New Hampshire" (1991).¹ Both Functional Value Indices and Wetland Value Units were compiled and compared in order to derive threshold values for nomination as Prime Wetlands in the Town. In addition, a functional value point ranking system was devised in order to aid in the selection of nominees.

The 63 wetlands comprise a total of 1336.1 acres, or 6.3% of the total land and water area of Northwood (19,355 acres).² The amount of wetland area assessed represents 87.9% of the wetland area in the Town according to the 1992 National Wetland Inventory map. The remaining wetland acreage, which was excluded from the inventory, was largely comprised of small, isolated wetlands. The size of the 63 wetlands that were assessed ranged between 2.4 and 106 acres, with a mean size of 21.21 acres. Wetland Value Units (WVU's) ranged between .05 and 360.33, with a mean of 10.24, whereas Functional Value Indices (FVI's) ranged between .10 and 1.0, with a mean of .57.³ Sixteen wetlands held the top three WVU rankings among all of the functions that were assessed. An additional nine wetlands held the highest three ranks for individual Functional Value Indices. Three others contained rare or endangered species even though their WVU or FVI ranks were not among the highest scores.

Whereas the initial wetland selection was grouped according to apparent size and significance, primarily the top two groupings (color-coded red and blue) showed consistently high WVU or FVI rankings. Of the other three groups (color-coded green, orange, and yellow) only the orange group contained wetlands with several top ranks in either WVU or FVI categories. The devised point scale indicated a high consistency between average WVU values and ranked points; however, there were several discrepancies between average FVI values and ranked points. Since the WVU scale is skewed by wetland size, the devised ranking scale provided an additional and reliable method to crosscheck significance among the 63 candidate prime wetlands. As a result, a total of 17 wetlands are being proposed as prime wetlands based on high cumulative point ranks, and an additional two are being proposed based on rare or endangered species.

The following report contains a description of the methods used in the assessment and analysis process, as well as a detailed account of the wetland ordinance revision process. Charts, graphs, and maps of candidate prime wetlands can be found in the Appendix.

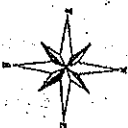
¹ Amman, A., and A. L. Stone, 1991. A Method for the Comparative Evaluation of Non-tidal Wetlands In New Hampshire. Concord, NH: NH Department of Environmental Services.

² Source of total land and water area in Northwood: 1998 Master Plan Update, Northwood, NH, p. 3. Percentage is based on actual wetland acreage in Northwood, or 1216.1 acres. The remainder (167 acres) fell outside the Town boundaries.

³ This percentage is 45.3% when based on poorly and very poorly drained soils. Source: GRANIT GIS database, Complex Systems Research Center, UNH, Durham, 1992.

⁴ WVU's are calculated by multiplying the wetland's size (or size of the evaluation area) by the FVI for each function. FVI's are those indices, between a value of 0.0 and 1.0, that are derived from the mean value of all of the attributes for a particular function.

Locus Map



SCALE 1-24000



பெரிய செய்தி

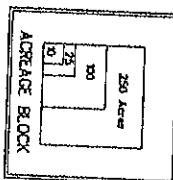
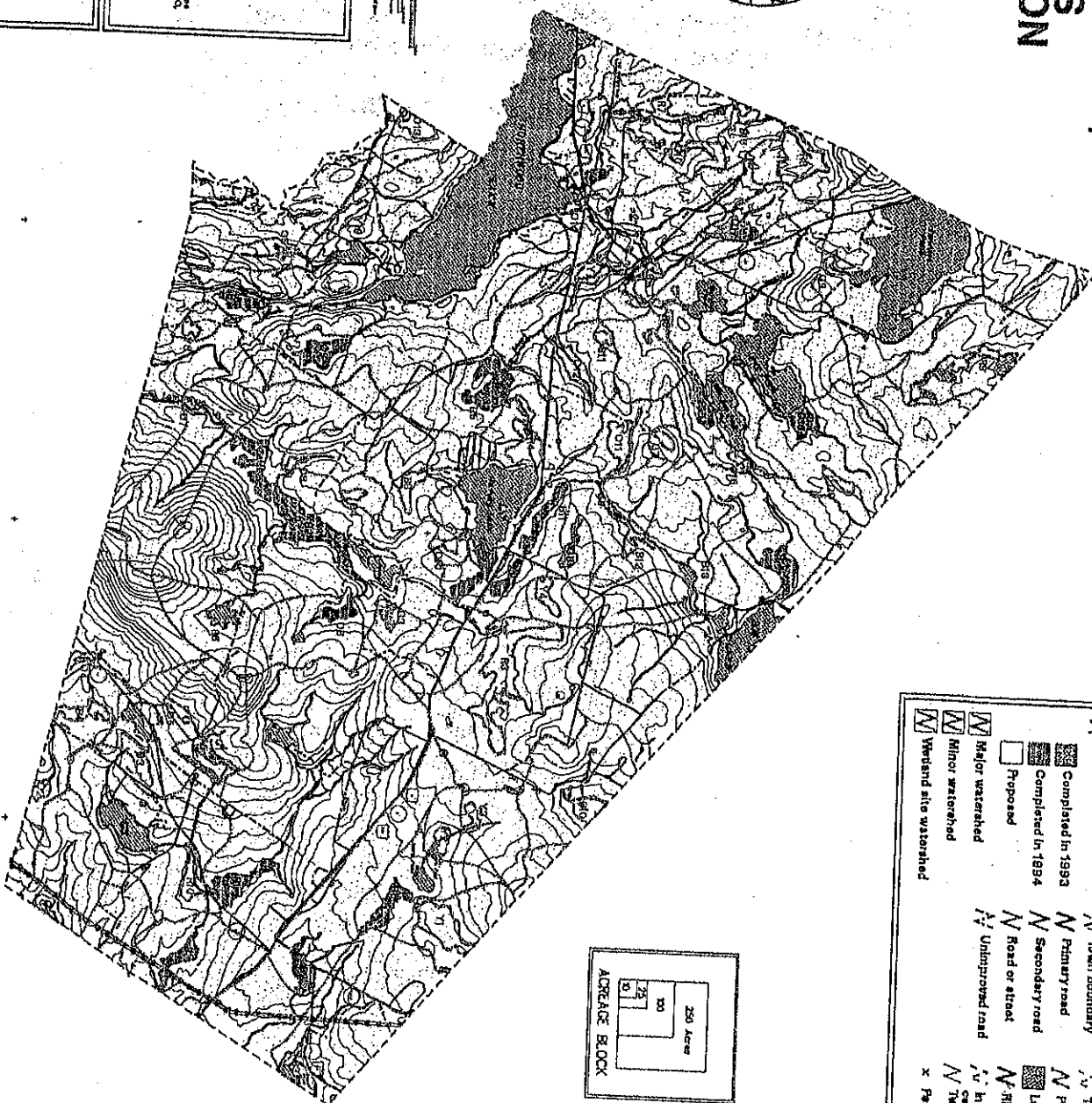
10111111 1975-1976, a large, covered by Northwood
 for services, 124,000, 1982, 1983, 1984, 1985,
 based on NYW, with a fee - US Fish & Wildlife
 Service, National Wildlife Conservation Service,
 and the state of - US Fish & Wildlife Service,
 County 501 Survey, 124,000.

Major workshop and demonstrations from the Department of Environmental Services, Water Resource Division, 124,000, last revised February 1991. Additional watershed delineations prepared by Northwest Conservation Commission, 124,000, 1993-94.

For: **End-user requirements and transmission** for the US 6000 Series Digital Line Graph, 624,000, as well as the 6000 Series. Additional requirements for the 6000 Series. Additional requirements for the 6000 Series. Additional requirements for the 6000 Series.

**Complex Systems Research Center
Institutes for the Study of Earth,
Oceans and Space
University of New Hampshire**

Northwestern Connecticut Community College
New Britain, CT 06053




















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|---|------------------------|---|-----------------------------------|
|  | Evaporation site |  | Town boundary |
|  | Completed in 1993 |  | Primary road |
|  | Completed in 1994 |  | Secondary road |
|  | Proposed |  | Road or street |
|  | Major watershed |  | Unimproved road |
|  | Minor watershed | | |
|  | Wetland site watershed |  | Lake or pond |
| | |  | Shore or stream |
| | |  | Interspersed wetland
scrubline |
| | |  | Twenty-foot contour |
| | |  | Park |

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**Northwood Wetland Inventory
And
Prime Wetland Designation Project**

Northwood, NH

INTRODUCTION

The Town of Northwood, New Hampshire contains a number of unique water resource attributes that warrant special attention. Sitting at the headwaters of three rivers, the Lamprey, the Isinglass, and the Merrimack, Northwood holds the distinction of being one of the few towns in the state that is not subject to downstream flow from neighboring municipalities. It also boasts a large number of lakes and ponds, most of which support an active recreation and tourism industry. However, these attributes give rise to a special cause for concern: all waters that flow over or percolate through Northwood soil end up somewhere else. This is especially true for water that flows into the Lamprey River, which in 1987, was designated a National Wild and Scenic River from the Epping / Lee Town Line to the Atlantic Ocean.¹

Since 1899, Federal legislation has aided state and municipal efforts to protect water resources in and along major waterways. Passage of the Clean Water Act in 1972 (and its subsequent revision in 1977), as well as the Safe Drinking Water Act of 1976, the Food and Security Act of 1985, and the Water Resource Protection Act in 1990, all helped ensure a measure of water resource protection of both waterways and isolated wetlands. In 1979, passage of the Prime Wetlands legislation in the state of New Hampshire furthered the assistance offered to municipalities who wished to protect those areas, that "because of their size, unspoiled character, fragile condition or other relevant factors, make them of substantial significance."² RSA-A:15 provided towns with a "Local Option" for wetlands protection, in order to strengthen efforts to recognize and preserve special wetland areas.

In December of 1992, the Town of Northwood Conservation Commission began its effort to document and protect the wetland resources in town. The "Method for the Comparative Evaluation of Non-tidal Wetlands in New Hampshire," or simply, the 'NH Method,' had recently been published, and offered a succinct guide for the evaluation of fourteen different wetland functions. Developed for New Hampshire communities, it was intended to aid and assist Conservation Commissions, Planning Boards, and other municipal officials in their recognition and understanding of wetland functional values. Within three years after it was developed, over 36 towns had employed the NH Method in assessing wetlands for Prime Wetland designation. This process was facilitated in 1992, when the NH Wetlands Bureau adopted the NH method as the recommended procedure for assessing candidate Prime Wetlands under Chapter Wt700 of the NH Code of Administrative Rules.

By the summer of 1998, a great deal of work had been completed on the Northwood wetland inventory project. Spear-headed by former Northwood Conservation Commission Chair, Nancy Voorhis, GIS maps had been completed of the entire town, National Wetlands Inventory overlays had been procured, all of the major wetlands had been identified and numbered, and folders had been prepared for each wetland. The latter contained overlay topo sheets, a blank set of NH Method data sheets, and acreage and watershed sizes for each wetland. Approximately twenty-seven wetlands had been assessed, or roughly half of the anticipated 64 wetlands to be evaluated in town.

With the advent of the grants program of the New Hampshire Estuaries Project, as sponsored by the US EPA and the NH Office of State Planning, a funding mechanism existed for the completion of the work with the help of outside assistance. The initial proposal was submitted in July 1998, accepted by the NH Office of State Planning and the Northwood Board of Selectmen on September 14th, and approved by the Attorney General's office on October 26th. On October 29th, the first meeting between the Northwood Conservation Commission and this author was held in order to agree upon and initiate a course of action.

¹ 1998 Master Plan Update, Northwood, N.H., p. 2.

² RSA 482-A:15 Local Option; Prime Wetlands. www.state.nh.us/des/482.htm.

This report contains a three-parted synopsis of the above described work: 1) the results of the functional value assessment of 64 wetlands in the Town of Northwood; 2) a review of the wetlands ordinance revision effort as required by the NH Estuaries Project grant; and 3) a description of the candidate Prime Wetlands for the Town. Project objectives are identified in the subsequent section, followed by the methods utilized to evaluate the Town's wetlands and the pass the revisions to the Town's wetlands ordinance. The conclusory section contains both a rationale for nominating candidate Prime Wetlands, as well as suggestions for follow-up steps to ensure their passage and acceptance as Prime.

PROJECT GOALS AND OBJECTIVES

This wetland assessment project had the following goals and objectives, as identified in the New Hampshire Estuaries Project Grant documentation:

- 1) Complete the evaluation of town wetlands;
- 2) Modify the Town's ordinances to improve wetlands protection; and
- 3) Propose the designation of the highest value wetlands as Prime Wetlands

Objective #1 was completed by January 5th, Objective #2 was effectively finished by January 4th (although the wetland ordinance revisions were not voted on until March 9th), and Objective #3 was finished by March 31st. Because of the short amount of time between the beginning of the wetland evaluation and the Planning Board deadline for revising the wetlands ordinance, the Northwood Conservation Commission decided to focus on strengthening the existing ordinance without proposing Prime wetland designation this year. Therefore, the official proposal to write Prime Wetlands into the wetlands ordinance and designate them at Town Meeting was postponed until the next fiscal year.

³ From the New Hampshire Estuaries Project Grant Agreement, Exhibit A: Work Program.

METHODS

This section is separated into three distinct sub-sections as reflected by the above objectives. Each sub-section contains a description of the procedural steps followed while achieving the assigned tasks. Specific detail on the wetland evaluation procedure sub-section is provided in Appendix D.

A. Wetland Evaluation

The procedures outlined in the NH Method detail a two-step process in the evaluation of selected wetlands. First, an office portion requires that the user obtain base maps and other remotely derived in order to prepare for field work and answer "office-based" questions associated with the 14 functions recognized by the method. The second step is the actual field evaluation of each attribute that is recognized within the 14 functions themselves. Questions are asked based on specific characteristics that are associated with a particular function. A value between 0 and 1.0 is assigned for each question, and tallied at the end of each set of functional attribute questions. The summary value, called a Functional Value Index (or FVI), is an average of the value assigned for each question, and therefore ranges between 0 (lowest) and 1.0 (highest). A second value is then computed, called the Wetland Value Unit (or WVU), that is equal to the FVI times the size in acres of the area associated with the particular function. In most case, the functional area is equal to the entire wetland acreage; however, for selected functions such as Educational Potential or Visual/Aesthetic Quality, functional areas tend to be much less than the entire wetland acreage.

Both the office and field steps require a working knowledge of wetlands on the landscape, as well as an understanding of where to find certain informational resources. Some guidance is given in the method about whom to contact for information and how to develop base maps; however, a certain level of expertise is required in order to use the NH Method efficiently.

Having an extensive knowledge of wetlands, as well as having assisted in the development of the NH Method in 1990 and 1991, allowed this researcher to expedite the process of completing the office and field assessment. This would not have been possible without the preparatory work of the Northwood Conservation Commission, whose efforts in map generation, wetland identification, and preliminary evaluation of 27 wetlands allowed for the rapid completion of Objective #1.

Thirteen of the fourteen functions that are recognized by the NH Method were assessed:

Ecological Integrity	Ground Water Use Potential
Wetland Wildlife Habitat	Sediment Trapping
Finfish Habitat	Nutrient Attenuation
Educational Potential	Shoreline Anchoring & Dissipation of Erosive Forces
Visual/Aesthetic Quality	[Urban Quality of Life]
Waster-based Recreation	Historical Site Potential
Flood Control Potential	Noteworthiness

Only the 12th function, Urban Quality of Life, was not assessed owing to the rural nature of the Town of Northwood. In addition, the 3rd function, finfish habitat, was maintained in the data analysis as two separate sub-functions, finfish habitat – streams & rivers, and finfish habitat – lakes & ponds.

Initial selection of which Northwood wetlands to assess followed a stratified, representative approach as defined by the Northwood Conservation Commission. Utilizing the GIS soils and NWI maps for the Town, wetlands were grouped into five color-coded categories. The largest and perhaps the most significant wetlands were assigned a red color; virtually all of these wetlands were selected for assessment. The next most important wetlands were assigned a blue color; these wetlands were not as large as the red-coded wetlands, but were predicted to be significant in one or more of their attributes. The remaining three categories, green, orange, and yellow, were spatially selected to represent both different areas of Town as well as diverse wetland classes. Green-coded wetlands were fairly small, yet likely contained attributes that made them noteworthy. Yellow-coded wetlands were also small, but lacked an apparent noteworthy

characteristic. Orange-coded wetlands were medium-sized wetlands that fell somewhere in-between in terms of noteworthiness.

A second important step in completing the wetland evaluation was the integration of the existing 27 assessments into a standardized set of 63 functional evaluations. Reviewing the 27 files that had been completed required the alteration of flood control calculations, ground water use assignments, and the recognition of historical sites. Once the remaining 36 assessments were completed, question number 4 of the Noteworthiness function was also answered. Additional checks were completed on wetland and watershed sizes, special features such as municipal water supply areas, rare & endangered species, and federally designated rivers.

Initial mapping work was completed by Nancy Voorhis at Complex Systems Research Center at UNH Durham. Laminated 1:24,000 scale maps were prepared for the following:

Base Map	Special Features
Wetlands Site Evaluation	Water Resources
Wetlands Composite (soils)	

Overlays were prepared from the National Wetlands Inventory data of the US Fish & Wildlife Service in St. Petersburg, Florida. Wetland classes and sizes were registered on a 1:24,000 vellum sheet, which provided essential back-up information for conducting field checks of wetland types and locations. A second vellum overlay with water resource protection features also aided in the completion of selected office-based questions. The laminated Special features map was essential in identifying the location of wildlife management areas, tree farms, and other protected land areas identified in the Educational Potential functional assessment.

Wetland identification and location was completed with the assistance of the above maps. However, connectivity to other wetlands was ascribed according to the guidance of the NH Method – i.e. wetlands were considered hydrologically separated if they narrowed to less than fifty feet in width (unless they were mostly long and narrow). Additionally, wetlands traversed by a two-lane road were considered two wetlands if there was insufficient passage of water through a culvert. In all cases (N = 6), wetlands that crossed town lines were assessed in their entirety.

Occasionally, wetlands were significantly different in size than what was mapped. In all cases where field delineations proved a change of greater than 5 – 10%, revisions were made to the official wetland acreage. This only occurred for those wetlands that were personally field checked. Those 27 wetlands that were previously completed were not altered in this way. However, acreages of some of the latter were checked with a dot grid calculator for those wetlands that had listed sizes that did not obviously fit mapped information. Changes in the size of wetlands based on field examination are summarized in Appendix B-1.

Other field features that precipitated a change from the remote information that was provided included: wetland class interspersions, the presence of islands, the percent of hydric A soils, the number of occupied buildings within 500 feet of the wetland edge, areas of permanent shallow water, sources of excess sediments or nutrients, and the presence of significant biological, geological, or other features.

Because specific functional attribute inquiries required standardized responses prior to field evaluation, and because these standards were essential components of the overall assessment, I have included a detailed list of them in the Appendix.

B. Revision of the Northwood Wetland Ordinance

In the background description of the NH Estuaries Grant Work Program, a rationale statement was given for the revision of the Northwood Zoning Ordinances. The result of several years of scientific evaluation of the wetland resources in Town was intended to support revisions to the Wetlands Preservation District

Ordinance, specifically, to “make recommendations for the inclusion of a wetlands setback... and to propose the designation of the highest ranking wetlands as Prime Wetlands.”⁴

In taking a look at the existing wetland ordinance, dated March 15, 1980, it was clear that several revisions were needed. Jurisdictional criteria for wetlands were not identified, source documents for delineating wetlands during cases of dispute were not cited, and no mitigation procedures were outlined for unavoidable loss. These deficiencies stood out beyond the absence of a development setback or the recognition of Prime Wetlands. In preparing suggested revisions for the Conservation Commission, several sources were utilized: the regional planning agencies, the NH Wetlands Bureau, and the NH Association of Conservation Commissions.

A first step was to enhance an existing file of municipal zoning ordinances with recent ones that contained wetland zoning districts. Sixteen additional zoning ordinances were procured from diverse towns in the state. Both the Southwest Regional Planning Commission and the Rockingham Regional Planning Commission provided assistance in this step. Secondly, updated wetlands rules were obtained from the NH Wetlands Bureau, as well as information from the NH DES web site at www.state.nh.us/des/482.htm. Marjorie Swope, Executive Director of the NH Association of Conservation Commissions, also contributed sample wetlands ordinances, and provided an exact count of the number of New Hampshire communities which have passed prime wetland designation in their towns. She also provided a database on wetland setbacks in the state for the various uses that are recognized in local ordinances.

All of this information was extremely useful when preparing a draft revision of the Northwood Zoning Ordinance, section 5.01. The latter was initially reviewed by the Northwood Conservation Commission in early December, presented to the Planning Board at their hearing on December 10, 1998, and further discussed at a Planning Board work session on January 4th. Matthew Nazar, from the Rockingham Regional Planning Commission, was also contacted in regards to the Northwood Conservation Commission’s proposed revisions; language that he subsequently incorporated into his draft zoning ordinance revisions reflected this effort. Additional support was provided by Herb Bergquist of the Northwood Conservation Commission, who presented succinct data at the latter meeting regarding lot specific impacts of a 50-foot buffer zone around all wetlands in Town.

C. Proposing Prime Wetlands Designation

As mentioned above, proposing Prime Wetlands in the Town of Northwood took longer than anticipated. In revising the wetlands ordinance, emphasis was placed on establishing building setbacks and upgrading the Wetlands Conservation Overlay District language. Whereas a public presentation was given on January 5th to members of the Planning Board, Zoning Board, and Board of Selectmen, this presentation was more of an informational “preview” than an actual proposal. During subsequent discussions with the Northwood Conservation Commission, it was decided to take more time to develop a solid Prime Wetlands designation proposal and to build collateral support within the Town prior to revising the wetlands ordinance again. Since the Northwood CC felt it wanted to continue to plan on a 100-foot setback for Prime Wetlands, and since there was such difficulty in establishing *any* setback from wetlands, more time and education was felt essential for eventual passage.

To date, the Prime Wetlands designation process has involved two principal steps: data analysis and wetland selection. Data analysis of the fieldwork took place during the months of December, January and February. Utilizing a Microsoft Excel spreadsheet provided by Nancy Voorhis of the Northwood Conservation Commission, the remaining 32 wetland data was entered and checked. Standards for each functional attribute were applied to the other 31 wetlands at this time.⁵ Summary tables were produced for both FVI’s and WVU’s in order to devise a point ranking system. The latter simply assigned ranks for the top three average values in each category. The highest ranking wetlands for both FVI’s and WVU’s values

⁴ From the New Hampshire Estuaries Project Grant Agreement, Exhibit A: Work Program.

⁵ Members of the Northwood CC completed 4 additional wetland evaluations prior to submittal of the spreadsheet summary, bringing the total to 63 wetlands in all.

received 3 points, the second highest received 2 points, and the third highest received 1 point. These points were summed, ranked, and compared to overall FVI or WVU mean values. As a final step, a cumulative point rank score was derived from the additive products of the WVU mean rank, the FVI mean rank, and the point value ranks for both WVU's and FVI's. Charts that compare this point ranking system with FVI and WVU means can be found in Appendix B-6.

Summary charts for both FVI's and WVU's were also prepared to graphically compare mean values with wetland size. These values were then broken down by color group, in order to determine if there were any significant differences among them. Finally, line graph summaries for each functional value were prepared for each color group in order to show individual value variances among wetlands within each group. All of these graphs and charts are presented in the above order in Appendix C.

The selection of wetlands for candidate Prime Wetlands relied on the above data analyses as well as knowledge of the individual wetlands themselves. Initially, WVU ranks were assessed as suggested in the NH Method. However, these tend to reflect wetland size, and often overshadow the significance of individual functional values. Therefore, greater attention was paid to the individual Functional Value Indices in both the point rank summary charts and the color group charts. Where overlap did occur between high WVU's and high FVI's,⁶ all of these wetlands (N = 8) became immediate candidates for Prime. Among the 14 remaining high value WVU and FVI wetlands, selections were made based on the cumulative point ranks. All high point ranked wetlands that had mean FVI values within the top 15 scores were also nominated for candidate Prime Wetlands (N = 5). Finally, any additional wetlands that had either high cumulative point rank scores, or had other unique or rare attributes were added to the nomination list (N = 6).

This initial selection of 19 candidate Prime wetlands was reviewed with members of the Northwood Conservation Commission. Input was solicited on the selection process as well as the candidate wetlands themselves. Considerable discussion about wetlands that were not nominated, as well as those attributes or threshold values that were deemed most important helped shape the final list of candidates. Often, an individual's familiarity with specific wetlands was crucial in identifying noteworthy characteristics that were not reflected in WVU, FVI, or point rank scores. Since there was considerable sentiment about limiting the selection of Prime Wetlands to a specific number, it was decided to be liberal in preparing the final candidate list for proposing to the Town's Planning Board and subsequently to the Town itself.

⁶ The top 15 ranked wetlands were considered "high" in this first round of assessment.

RESULTS AND DISCUSSION

A. Wetland Evaluation

A total of 63 wetlands were assessed between 1993 and the end of 1998. Approximately 1336 acres of wetlands were analyzed, 1216.7 acres of which lay in Northwood, or roughly 6% of the land and water area of the Town (19355 acres). The total wetland acreage of this study was estimated to represent roughly 90% of the wetland in Town, and primarily excluded small (i.e. less than 3 acres), isolated wetland areas.⁷ Twenty-seven wetlands were previously assessed by the Northwood Conservation Commission; six additional wetlands were assessed by the Commission during the fall of 1998 and the remaining 30 wetlands were assessed by this researcher between November 10 and December 7, 1998.

Thirteen of the 14 functional values of wetlands recognized by the NH Method were assessed. Only Function 12, Urban Quality of Life, was not assessed owing to the rural nature of Northwood. The NH Method was adhered to in its discrimination of individual wetlands within wetland complexes, and therefore the overall number of wetlands counted were well below the number represented on the National Wetlands Inventory maps. However, the field assessment of Hydric A (very poorly drained) and Hydric B (poorly drained) soils suggested that the Town-wide soils maps were quite liberal in their discernment of where wetlands exist. Where significant differences existed between the soils estimate and the field estimate of wetland size, the smaller of the two values were used in the analysis. These differences are summarized in Appendix B-1.

Among the 63 wetlands, sizes ranged from 2.4 acres (G11, Northwood Narrows East) to 106 acres (R3, Betty Meadows), with a mean size of 21.2 acres. Watershed sizes ranged from 11.8 acres (G11, Northwood Narrows East) to 4401 acres (O14, Northwood Lake Inlet), with a mean size of 674.3 acres. Functional Value Indices (FVI's) ranged from 0.0 for those functions that were not present and .10 for those that were, to 1.0. Those functions that received 1.0 FVI's included FV1 Ecological Integrity (N=18), FV7 Flood Control Potential (N=23), FV8 Ground Water Use Potential (N=1), FV11 Shoreline Anchoring and Dissipation of Erosive Forces (N=22), and FV14 Noteworthiness (N=27). Wetland Value Units (WVU's) ranged from .05 (FV3A for O8 Betty Meadows West) to 360.33 (FV3B for B13 Sherburne Brook), with a mean of 10.26.

Mean Functional Value Indices for all 14 functions ranged from .36 (G8 Northeast Long Pond and G11 Northwood Narrows East) to .79 (R2 Betty Meadows), with a mean of .57 (SD = .12). Thirteen mean FVI's exceeded .70 in value. Mean Wetland Value Units for 14 functions ranged from .97 (G8 Northeast Long Pond) to 47.41 (R2 Betty Meadows), with a mean of 10.26 (SD = 9.51). Eleven mean WVU's exceeded 15.0 in value. Both summary tables for these values and summary charts representing all 63 wetlands can be found in the Appendix.

All but six of the 63 wetlands contained FVI scores that ranked first, second, or third in at least one function. Using the point rank system as described above, wetland point totals ranged between 1 (Y5 Town Hall Pond) and 20 (R8 Old Pittsfield Rd) per wetland, with a mean of 6.88. Red color-coded wetlands had the highest mean point score of 10.7 per wetland, followed by Blue (8.0), Orange (7.125), Yellow (4.2), and Green (3.9). Of the top seventeen point ranked wetlands, 7 were Red, 5 were Blue, 5 were Orange, and none were Yellow or Green. Thirteen of these seventeen were also among the top 15 ranking wetlands based on overall average FVI scores.

Sixteen wetlands received points for being first, second, or third highest in at least one WVU score. Point totals ranged between 1 (B14 N side of L Bow Pd, O4 Woodman Marsh West, O11 Narrows/Sherburne, and R5 Kelsey Mill) and 24 (R2 Betty Meadows), with a mean of 1.38. Red-coded wetlands had the highest mean score of 4.9, followed by Blue (1.31), Orange (1.06), and Yellow and Green (0.0 each). Of the sixteen wetlands that received points, 6 were Red, 5 were Blue, 5 were Orange, and none were Yellow or

⁷ The actual wetland percentage represented by the wetland sample was likely somewhat smaller, since the NWI maps were somewhat conservative in their overall inclusion of poorly drained soils.

Green. Ten of the sixteen point ranked wetlands were among the 15 top ranking wetlands based on overall average WVU scores.

Whereas the consistency between point ranked wetlands and top FVI scores was fairly high, there were some discrepancies. These primarily involved wetlands such as O9 Blakes Hill Bog where open water was not present to any significant degree. However, noteworthy attributes such as rare species, excellent flood control potential, and ground water use potential could be found. This was similar to some of the discrepancies among the top ranked WVU scores as well. Overall mean WVU's for B6 (Mtn Rd Beaver Pd) and O16 (N Side of Long Pd) were fairly low based on a wetland size that was not much higher than the mean. However, both sites had significant attributes, (i.e. B6 contained a historical site and O16 had excellent finfish habitat for streams), and therefore received points and ranked among the top 16 wetlands.

A fairly strong consistency among point ranks and FVI and WVU scores could be found among the color-coded groups (See Appendix C-10). As described above, the Red-coded wetlands received consistently high scores in both rating systems. Their mean WVU's were the highest (21.73), as well as their mean FVI's (.69). Second to this group was the Blue-coded wetlands, which had the second highest mean WVU (11.86) as well as the second highest mean FVI (.62). The Orange group followed with a mean WVU score of 9.44, and a mean FVI score of .59. While this was fairly close to the Blue scores, the mean wetland size of the Orange-coded wetlands was actually larger (20.41 acres versus 19.74 acres). Yellow and Green-coded wetlands had significantly lower scores than the first three: WVU's of 6.18 and 2.44, respectively; and FVI's of .52 and .44, respectively.

Line graph depictions of each color group illustrate the wide variation among functional value scores of the wetlands in each group (see Appendix C). Red, Blue and Orange wetlands appeared to have the greatest consistency among FVI's, particularly for Ecological Integrity, Wetland Wildlife, Flood Control Potential, and Noteworthiness. Both Yellow and Green-coded wetlands showed a higher number of low scores or zeroes for these functions. While each wetland cannot be solely compared to other wetlands based on its color-coded group, it was interesting to observe the apparent consistency among overall scores in the evaluation of each group.

In 27 wetlands, noteworthy attributes suggested taking a closer look at their overall value. Most of these attributes related to factors that were not size-dependent. For example, the occurrence of black gum swamps as exemplary natural communities forced the re-valuation of Green and Yellow-coded wetlands, which typically had low WVU scores and lacked ranking points. Three of the six Green-coded wetlands and three of the Yellow-coded wetlands contained black gum communities. A second example involved great blue heron nests. At least 4 wetlands contained what appeared to be active nests, and in one case, five nests were found in an Orange-coded wetland. A third example entailed the presence of rare animal or plant species. Blakes Hill Bog (O9) was recorded as having at least one rare plant species and one rare animal species, yet it received no top rank points and ranked 21st in terms of mean FVI value. Spotted turtles (*Clemmys guttata*) were observed between two Yellow-coded wetlands that were otherwise quite low in WVU points.

B. Revision of the Northwood Wetland Ordinance

The methods section above described the process by which the changes to the Northwood Wetlands Conservation Overlay District were made, proposed, and accepted. At the first Planning Board hearing on December 10,th it was clear that the Town officials, as well as the several citizens who were present, were not prepared to accept any major modifications to the existing ordinance. Instead of tacking on a Prime Wetlands designation sub-section, the Northwood Conservation Commission wisely chose to emphasize establishing a building setback in Town for all wetlands, as well as update the language of the ordinance as it was written. In this regard, several significant steps were made and greater protection is now afforded the wetland resource in the Town of Northwood.

As is exhibited in the Appendix, several major revisions were drafted, discussed, and accepted. The definitional criteria of wetlands was recognized, and tied to the Army Corps of Engineers definition and

delineation guidance; greater emphasis was placed on the prevention of the destruction of wetlands, as well as ways in which to mitigate their losses; licensed wetland scientists were recognized in addition to licensed soil scientists; references were made to the Best Management Practices guidebooks published by the Department of Environmental Services; Special Exceptions were clarified as to the intent and standards that an applicant must comply with; and, most importantly, a setback distance was agreed upon and voted in by all parties. While the latter did not entail as large a setback distance as was originally hoped for, (nor which was recommended in the 1998 Master Plan Update for the Town of Northwood – i.e. 50 feet vs. 20 feet),⁸ it did represent a first step in strengthening the wetlands protection in Town. The second major step, designating Prime Wetlands and providing for a development setback distance for them, remains as the single most important implementation step of the Northwood Conservation Commission.

B. Proposing Prime Wetlands Designation

As a result of the above analysis, nineteen wetlands of the sixty-three that were assessed are being proposed as Prime Wetlands. The list of these wetlands is as follows:

B3 North River Pond Inflow	B5 Acorn Ponds
B6 Mtn Rd Beaver Pd	B10 Bennett Hill Marsh N
B13 Sherburne Brook	B14 N Side of L.Bow Pond
O1 Demeritt Pond	O4 Woodman Marsh West
O9 Blakes Hill Bog	O13 Pleasant Lake North
R1 Rt. 43	R2 Betty Meadows
R3 Tucker Brook	R4 Harvey Lake West
R5 Kelsey Mill	R6 Upper Northwood Narrows N
R7 Lower Flat Meadow Brook	R8 Old Pittsfield Rd
R9 Jenness Pond North	

The nineteen candidate Prime Wetlands comprise 733.6 acres, or roughly 27% of the wetland acreage in Town.⁹ This total equals 54.9 % of the total acreage of wetlands assessed during this evaluation.

While each wetland has its own set of unique attributes, several salient features are common to the above list:

- 1) They all contained open water bodies
- 2) They all ranked 1st, 2nd, or 3rd for at least one WVU score, or had high overall mean WVU's
- 3) They all ranked highest among the cumulative point ranking system, or contained an invaluable Noteworthiness attribute

The last feature highlighted seventeen of the nineteen candidates. Only O9 Blakes Hill Bog and B5 Acorn Ponds were outside of the top 17 cumulatively ranked wetlands. As mentioned above, the presence of documented rare species in O9 has suggested that this wetland be nominated for Prime Wetland status. The presence of the only other great blue heron rookery observed in Town supported the nomination of Acorn Ponds.¹⁰ With the exception of the black gum swamps, all of the other observed exemplary natural communities or rare species fall within the list of nominees.

Since the official proposal for designating Prime Wetlands has not yet occurred, I can only speculate as to the success of this process. With adequate information about the selection process, wherein strict criteria are decided upon by the Conservation Commission, a greater likelihood for acceptance by the Town will result. While the initial presentation on January 5, 1999 to members of the Conservation Commission, Planning Board, Selectmen, and Board of Adjustment was quite informative and generally well received, more promotion to the general citizens of the Town will be required in order to "sell" the idea of Prime Wetlands. This will have to include an assessment of landowner sentiment in affected areas, as well as a review of the overall impacts of an even more stringent setback than what was passed by the March Town vote.

⁸ 1998 Master Plan Update, Town of Northwood, p. 38.

⁹ Based on total estimated hydric soils in Northwood, or 2686.6 acres.

¹⁰ Great blue heron rookeries were found in B5, R3, R7, and O4.

CONCLUSIONS

The process of evaluating 63 wetlands in the Town of Northwood and revising the Wetlands Conservation Overlay District produced significant results. Whereas the 63 wetlands were definitively representative of the wetland resources in Town, the larger, more complex wetlands that were sampled proved to contain the highest valued attributes. Open water bodies and unique characteristics helped elevate functional values, and gave rise to both high Wetland Value Units and Functional Values Indices. Cumulative point ranks that were based on the first, second, and third highest WVU and FVI scores confirmed these findings, and aided in setting the criteria for designating candidate Prime Wetlands.

Revisions to the outdated wetlands ordinance of March 1980 proved to be no less challenging to effect, especially in a short period of time. Whereas the Town of Northwood Master Plan Update of 1998 clearly spelled out the need to enhance wetland resource protection in Town, considerable difficulty was encountered in establishing the suggested setback distances. Because of the caution that the Planning Board and citizens voiced at public hearings and work sessions, further revisions to designate Prime Wetlands in Northwood were tabled until FY 2000. Nonetheless, a number of significant revisions were made, and a development setback distance of 20 feet was established.

Prime Wetland designation will require a concerted effort on the part of the Northwood Conservation Commission in terms of gaining Town-wide support for an even more stringent buffer zone. Substantial documentation has been provided by this report, including specific language to use in the upcoming revisions that are being sought to accomplish Objective #3 above (see Appendix A-7). However, a careful review of areas affected by a 100-foot setback needs to be accomplished in order to help this process along. While the 100-foot buffer in the Conservation Overlay District was fairly easy to agree upon due to the remoteness of the area, at least two of the candidate Prime Wetlands entail fairly populated lakeshore sites with small lots. In these cases, a clear explanation of the Special Exceptions section of the existing ordinance will need to be communicated.

On the whole, the Town of Northwood Conservation Commission should be commended for their commitment to protect wetlands in their Town. Through a concerted effort that involved hundreds of volunteer hours, as well as a successful grant program that allowed for the completion of the wetland assessment, the Commission has achieved a significant step in the protection of Town-wide water resources. Only through such commitment will the amelioration and maintenance of safe drinking water, natural habitat, and a pleasing living environment be effected for generations to come.

SOURCE DOCUMENTS

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APPENDICES

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5.01 WETLANDS CONSERVATION OVERLAY DISTRICT

(A) Purpose. In the interest of public health, convenience, safety and general welfare, the regulations of this District are intended to guide the use of areas of land THAT HAVE SOILS THAT ARE SATURATED OR INUNDATED FOR EXTENDED PERIODS OF TIME DURING THE GROWING SEASON; and

(1) To PREVENT THE DESTRUCTION OF wetlands which provide flood protection, recharge of ground water supplies, RETENTION OF SEDIMENTS, ATTENUATION OF NUTRIENTS, augmentation of stream flow during dry periods and continuing existence of important wildlife habitat.

(2) To protect potential water supplies and existing aquifers and aquifer recharge areas.

(3) To protect naturally occurring wetlands from pollution of surface and ground water by sewage and other contaminants.

(4) To ALLOW FOR those uses which can be located appropriately and safely in wetland areas AND ENSURE THEIR PROPER DESIGN.

(5) To protect the town from unnecessary or excessive expenses in providing or maintaining essential services and/or utilities which might be required as a result of misuse or abuse of wetlands.

(B) Overlay district boundaries. The Wetlands Conservation Overlay District shall include all areas of poorly drained and very poorly drained soils as defined by the National Cooperative Soil Survey conducted by the US Department of Agriculture in their Soil Survey of Rockingham County, New Hampshire, dated October 1994. FURTHER, THE WETLANDS CONSERVATION OVERLAY DISTRICT RECOGNIZES A BUFFER OF FIFTY FEET FROM ALL POORLY DRAINED AND VERY POORLY DRAINED SOILS, AS DESCRIBED IN SECTION (E) BELOW.

(1) The location of a wetland boundary in any particular case must be determined by on-site inspection of ALL THREE CHARACTERISTICS OF WETLANDS, NAMELY, hydrology, hydric soils, and hydrophytic plants, as recognized BY THE US ARMY CORPS OF ENGINEERS IN TECHNICAL REPORT Y-87-1, THE CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, AND AS CITED IN THE NEW HAMPSHIRE WETLANDS RULES WT 101.82. This shall be undertaken by a qualified soil OR WETLAND SCIENTIST using THE ABOVE ARMY CORPS DELINEATION METHOD, the Site Specific Soil Mapping Standards for New Hampshire, or other appropriate standards. When such information is submitted, it shall supersede more generalized information, such as that obtained from the county soil survey.

(2) If there is question or dispute as to the boundary of this overlay district, the owner of the property or any abutter may petition the Town to hire a qualified soil OR WETLAND scientist to examine the area and report all findings to the Town. The cost of such action shall be paid by the petitioner.

(C) Permitted Uses. Permitted uses are those that will not require the erection or construction of any permanent structure or building, will not alter the natural surface configuration by the addition of fill or by dredging, OR WILL NOT COMPROMISE PUBLIC HEALTH, SAFETY, OR WELFARE AS DESCRIBED BY SECTION 5.01.(A) ABOVE. OR THOSE THAT ARE otherwise permitted by the Zoning Ordinance OF THE TOWN OF NORTHWOOD. Such uses may include the following or similar uses:

(1) Forestry ACTIVITIES CONDUCTED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES FOR EROSION CONTROL ON TIMBER HARVESTING OPERATIONS IN NEW HAMPSHIRE, AS PUBLISHED BY THE NH DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT, AND WITH SUITABLE NOTIFICATION TO THE NEW HAMPSHIRE WETLANDS BUREAU, WHERE REQUIRED;

(2) Agriculture conducted in accordance with the MANUAL OF BEST MANAGEMENT PRACTICES FOR AGRICULTURE IN NEW HAMPSHIRE, PUBLISHED BY THE NH DEPARTMENT OF AGRICULTURE;

(3) Ponds and well recharge sources CONDUCTED IN ACCORDANCE WITH ANY DREDGE AND FILL PERMITTING REQUIREMENTS BY THE STATE OF NEW HAMPSHIRE;

(4) [Recommend revising/rewriting. Probably best done by Matt Nazar. Is this aimed at allowing drainways for agricultural and storm runoff?

(5) Wildlife refuges;

(6) Parks and such recreational uses as are consistent with the purpose and intent of THIS ordinance;

(7) Conservation areas, nature trails, AND OTHER EDUCATIONAL OR SCIENTIFIC PURPOSES;

(8) Open spaces as permitted or required by the Subdivision Regulations, the Zoning Ordinance, or in conjunction with a use which may be permitted in an adjacent district where an adequate open space area is not available within the adjacent district.

(D) Special Exceptions. Special Exceptions may be granted by the Board of Adjustment upon notice and hearing as prescribed in RSA Chapter 676, for the following uses within the Wetlands Conservation Overlay District:

(1) Those uses essential to the productive use of land not involved in the Wetlands Conservation Overlay District, if located and constructed to minimize any detrimental impact upon the wetlands OR THEIR BUFFERS. Those uses include, but are not limited to: the construction of roads, other access ways, utility rights-of-way and easements, including power lines and pipelines, with adequate provisions where called for, for the continued, uninterrupted flow of surface run-off water FREE FROM SEDIMENT OR OTHER POLLUTANTS PROVIDED THAT NO ALTERNATIVE ROUTE WHICH DOES NOT CROSS THE WETLANDS DISTRICT IS AVAILABLE AND THAT ECONOMIC ADVANTAGE ALONE IS NOT THE REASON FOR THE CROSSING. PROPOSAL FOR SUCH AN EXCEPTION TO BE BROUGHT BEFORE THE ZBA MUST BE ACCOMPANIED BY THE FINDINGS OF A REVIEW BY The Northwood Conservation Commission AND BY A LEGAL DREDGE AND FILL PERMIT FROM THE STATE OF NH, WHERE REQUIRED.

(2) The undertaking of a use not otherwise permitted in the Wetlands Conservation Overlay District which may include the erection of a temporary structure; or dredging, filling, draining or otherwise altering the surface configuration of the land, if it can be shown that such proposed use will not conflict with the purpose and intention of the Wetlands Conservation Overlay District and if such proposed use is otherwise permitted by the Zoning Ordinance. Proper evidence to this effect shall be submitted in writing to the Board of Adjustment and shall be accompanied by the findings of a review by the NORTHWOOD CONSERVATION COMMISSION of the environmental effects of such proposed use upon the wetland in question, and by a legal dredge and fill permit from the State of New Hampshire, where required.

(3) Special Provisions. No septic tank or leach field may be located closer than permitted by the State of New Hampshire Water Supply and Pollution Control COMMISSION standards, nor on any land of a soils type or so located adjacent to any wetland that is otherwise deemed inadequate for the purpose.

(E) BUFFER PROVISIONS. THE WETLANDS CONSERVATION OVERLAY DISTRICT RECOGNIZES THE IMPORTANCE OF SUITABLE SETBACKS FROM WETLAND AREAS IN ORDER TO PROTECT THE FUNCTIONS THAT WETLANDS PROVIDE AS IDENTIFIED UNDER SECTION 5.01(A) ABOVE AND IDENTIFIED BY THE NH METHOD FOR COMPARATIVE EVALUATION OF WETLANDS. THE FOLLOWING GUIDELINES SHALL BE ADHERED TO:

(1) SEPTIC SYSTEMS. SEPTIC TANKS AND LEACH FIELDS SHALL BE SET BACK IN ACCORDANCE WITH THE NEW HAMPSHIRE WATER SUPPLY AND POLLUTION CONTROL COMMISSION STANDARDS AS OUTLINED IN SECTION (D) (3) ABOVE.

(2) BUILDINGS. NO NEWLY CONSTRUCTED BUILDINGS SHALL BE PLACED WITHIN FIFTY FEET OF ANY WETLAND, UNLESS APPROVED UNDER SPECIAL EXCEPTION AS STIPULATED IN SECTION 5.01(D)(2) ABOVE.

(3) OTHER ACTIVITIES. ALL OTHER CONSTRUCTION, FORESTRY, AND AGRICULTURAL ACTIVITIES SHALL BE UNDERTAKEN WITH SPECIAL CARE TO AVOID EROSION, SILTATION, AND OTHER SURFACE OR GROUND WATER POLLUTION OF THE ADJACENT WETLAND.

(4) GRANDFATHERING. ANY BUILDINGS, CONSTRUCTION, FORESTRY, OR AGRICULTURAL ACTIVITIES EXISTING PRIOR TO THE PASSAGE OF THIS AMENDMENT TO THE NORTHWOOD ZONING ORDINANCE SHALL BE ALLOWED, PROVIDING THAT ANY NEEDED REPAIR OR MAINTENANCE OF THIS ACTIVITY NOT EXTEND FURTHER INTO THE WETLAND OR BUFFER ZONE DISTRICT, ADHERE TO THE EROSION AND POLLUTION CONTROL GUIDELINES IDENTIFIED ABOVE, AND BE SUBJECT TO PERMIT REVIEW BY THE NEW HAMPSHIRE WETLANDS BUREAU WHERE REQUIRED.

(5) SPECIAL EXCEPTIONS. SPECIAL EXCEPTIONS MAY BE GRANTED BY THE BOARD OF ADJUSTMENT IN ACCORDANCE WITH SECTION (D) ABOVE.

5.01 WETLANDS CONSERVATION OVERLAY DISTRICT

- (A) Purpose. In the interest of public health, convenience, safety and general welfare, the regulations of this District are intended to guide the use of areas of land that have soils that are saturated or inundated for extended periods of time during the growing season; and
- (1) To prevent the destruction of wetlands which provide flood protection, recharge of ground water supplies, retention of sediments, attenuation of nutrients, augmentation of stream flow during dry periods and continuing existence of important wildlife areas.
 - (2) To protect naturally occurring wetlands from pollution of surface and ground water by sewage and other contaminants.
 - (3) To protect potential water supplies and existing aquifers and aquifer recharge areas.
 - (4) To allow those uses which can be located appropriately and safely in wetland areas and ensure their proper design.
 - (5) To protect the Town from unnecessary or excessive expenses in providing or maintaining essential services and/or utilities which might be required as a result of misuse or abuse of wetlands.
- (B) Overlay District Boundaries. The Wetlands Conservation Overlay District shall include all areas of poorly drained and very poorly drained soils as defined by the National Cooperative Soil Survey conducted by the US Department of Agriculture in their Soil Survey of Rockingham County, New Hampshire, dated October 1994.
- (1) The location of a wetland boundary in any particular case must be determined by on-site inspection of all three characteristics of wetlands, namely, hydrology, hydric soils, and hydrophytic plants, as recognized by the US Army Corps of Engineers in Technical Report Y-87-1, the Corps of Engineers Wetlands Delineation Manual, and as cited in the New Hampshire Wetlands Rules Wt 101.82. This shall be undertaken by a licensed soil or wetland scientist using the above Army Corps delineation method, the Site Specific Soil Mapping standards for New Hampshire, or other appropriate standards. When such information is submitted, it shall supersede more generalized information, such as that obtained from the county soil survey.
 - (2) If there is question or dispute as to the boundary of this overlay district, the owner of the property or any abutter may petition the Town to hire a licensed soil or wetland scientist to examine the area and report all findings to the Town. The cost of such action shall be paid by the petitioner.
- (C) Permitted Uses. Permitted uses are those that will not require the erection or construction of any permanent structure or building, will not alter the natural surface configuration by the addition of fill or by dredging, or will not compromise the purpose of this overlay district, and that are otherwise permitted by the Zoning Ordinance. Such uses may include the following or similar uses:

- (1) Forestry. It is recommended that activities be conducted in accordance with Best Management Practices For Erosion Control on Timber Harvesting Operations in New Hampshire, as published by The NH Department of Resources and Economic Development as amended, and with suitable notification to the New Hampshire Wetlands Bureau, where required;
 - (2) Agriculture. It is recommended that these activities be conducted in accordance with the Manual of Best Management Practices for Agriculture in New Hampshire, published by the NH Department of Agriculture, as amended;
 - (3) Ponds and well recharge sources conducted in accordance with any dredge and fill permitting requirements by the State of New Hampshire;
 - (4) Wildlife refuges;
 - (5) Parks and such recreational uses as are consistent with the purpose and intent of the Ordinance;
 - (6) Conservation areas, nature trails, and other educational or scientific purposes; and
 - (7) Open spaces as permitted or required by the Subdivision Regulations, the Zoning Ordinance, or in conjunction with a use which may be permitted in an adjacent district where an adequate open space area is not available within the adjacent district.
- (D) Uses allowed by Special Exceptions. Special exceptions may be granted by the Board of Adjustment upon notice and hearing as prescribed in RSA Chapter 676, for the following uses within the Wetlands Conservation Overlay District and its buffers:
- (1) Those uses essential to the productive use of land not within the Wetlands Conservation Overlay District. Those uses include, but are not limited to: the construction of roads, other access ways, utility rights-of-way and easements, including power lines and pipelines, with adequate provisions where called for, for the continued, uninterrupted flow of surface run-off water. The ZBA shall grant a Special Exception, provided the following are met:
 - (a) findings by the Northwood Conservation Commission regarding the proposal are submitted with the Special Exception application, are reviewed by the ZBA, and are made part of the record of the case.
 - (b) dredging, filling, or other alteration shall be designed to minimize adverse impact on the wetland, even if this requires adjustments in design outside of this overlay district.
 - (c) such activity is required for the legitimate use of land areas outside of this overlay district, and there is no reasonable way to eliminate the impact and still accommodate the use.
 - (d) there shall be provisions made to restore the site as nearly as possible to its original grade and condition.
 - (e) a state wetlands permit shall be obtained when required.

- (2) The undertaking of a use permitted by this Ordinance but not otherwise permitted in the Wetlands Conservation Overlay District shall be allowed provided the following conditions are met:
- (a) findings by the Northwood Conservation Commission regarding the proposal are submitted with the Special Exception application, are reviewed by the ZBA, and are made part of the record of the case.
 - (b) dredging, filling, or other alteration shall be designed to minimize adverse impact on the wetland, even if this requires adjustments in design outside of this overlay district.
 - (c) there is no reasonable way to eliminate the impact and still accommodate the use.
 - (d) there shall be provisions made to restore the site as nearly as possible to its original grade and condition.
 - (e) a state wetlands permit shall be obtained when required.

(E) Buffers:

- (1) Where the Wetland Conservation Overlay District and the Conservation Area Overlay District overlap, a 100 foot buffer area shall be maintained. No structures shall be constructed within this buffer. Vegetation within this buffer area shall remain in its natural state.
- (2) Structures shall not be placed within 20 feet of the edge of a wetland unless a Special Exception for the structure and use has been obtained in accordance with S 5.01(D)(2).

Proposed Revision to the Northwood Zoning Ordinance to Designate Prime Wetlands in FY 2000

The following language (IN CAPS) is suggested for revisions to the 1999 Northwood Zoning Ordinance Section 5.01 in order to designate Prime Wetlands and a suitable buffer zone according to the Northwood Master Plan Update of 1998.

Amendment 1: Add to "Overlay District Boundaries" Section (B): The Wetlands Conservation Overlay District shall include all areas of poorly drained and very poorly drained soils as defined by the National Cooperative Soil Survey conducted by the US Department of Agriculture in their Soil Survey of Rockingham County, New Hampshire, dated October 1994. SEVERAL WETLAND AREAS ARE DESIGNATED PRIME WETLANDS WITHIN THE SCOPE OF RSA 482-A:15 AND THE NH CODE OF ADMINISTRATIVE RULES WT700. THESE PRIME WETLANDS ARE DESCRIBED IN "NORTHWOOD WETLAND INVENTORY AND PRIME WETLAND DESIGNATION PROJECT, NORTHWOOD, NH," DATED APRIL 1999. THE NINETEEN LARGEST AND/OR MOST SIGNIFICANT WETLANDS ARE IDENTIFIED FOR INCLUSION AS PRIME WETLANDS:

BETTY MEADOWS	TUCKER BROOK
PLEASANT LAKE NORTH	NORTH RIVER POND INFLOW
WOODMAN MARSH WEST	SHERBURNE BROOK
JENNESS POND NORTH	UPPER NORTHWOOD NARROWS NORTH
RT. 43	OLD PITTSFIELD ROAD
BENNETT HILL MARSH NORTH	MTN RD BEAVER POND
KELSEY MILL	HARVEY LAKE WEST
NORTH SIDE OF LITTLE BOW POND	DEMERITT POND
LOWER FLAT MEADOW BROOK	ACORN PONDS BLAKES HILL BOG

Amendment 2: Add to "(E) Buffers" number (3): A BUFFER ZONE OF 100 FEET FROM THE EDGE OF ANY PRIME WETLAND SHALL BE MAINTAINED. NO STRUCTURES, ROADS OF OTHER DEVELOPMENTS SHALL BE PLACED UNLESS A SPECIAL EXCEPTION FOR THE STRUCTURE AND USE HAS BEEN OBTAINED IN ACCORDANCE WITH S 5.01(D)(2). VEGETATION WITHIN THIS BUFFER AREA SHALL REMAIN IN ITS NATURAL STATE.

Northwood Wetland Acreages Summary Sheet (N=30) Soils Map vs Actual

SITE NAME	Area(Soils)	Area (Field)	Abs. Diff.
B 3-North River Pd Inflow	20.00	20.00	0.00
B 4-Woodman Marsh East	20.00	20.00	0.00
B10-Bennett Hill Marsh N.	16.00	30.70	14.70
B16-Upper Flat Meadow Bk	10.00	14.10	4.10
G 4-Blake Hill East	6.00	6.00	0.00
G 5-NW Gulf Hill	7.00	5.90	1.10
G 8-Northeast Long Pond	8.00	3.00	5.00
G 9-Jenness Pd outflow	6.00	2.40	3.60
G10-Lower Flat Meadow Bk E.	7.00	7.00	0.00
G11-Northwood Narrows E.	5.00	4.20	0.80
O 1-Demeritt Pond	18.00	25.00	7.00
O 2-Town Line SE	8.00	13.00	5.00
O 4-Woodman Marsh West	8.00	32.00	24.00
O 5-Diller/Houston Mtn Rd	8.00	8.00	0.00
O 7-Lower Lamprey River	5.00	6.40	1.40
O 8-Betty Meadows W	5.00	5.00	0.00
O12-Kelsey Brook North	27.00	27.00	0.00
O13-Pleasant Lake North	15.00	79.00	64.00
R 3-Tucker Brook	94.00	75.30	18.70
R 6-Upper Nwood Narrows N.	26.00	26.00	0.00
R 7-Lower Flat Meadow Brook	52.00	36.00	16.00
R 8-Old Pittsfield Road	48.00	34.60	13.40
R 9-Jenness Pond North	46.00	46.00	0.00
R10-Rt 43 Voorhis Wetland	27.00	23.00	4.00
Y 1-Hall Brook/Town Line	45.00	22.00	23.00
Y 4-Bow Lake Road East	13.00	19.60	6.60
Y 6-Coffeetown Road	6.00	9.00	3.00
Y 7-Northwood Narrows S.	21.00	28.70	7.70
Y 8-Northwood Narrows N.	22.00	22.00	0.00
Y10-Pleasant Lake Rd. NE	13.00	13.00	0.00
TOTAL	612.00	663.90	223.10
MEAN	20.40	22.13	7.44
STANDARD DEV.	19.60	18.78	12.87

SITE ID & NAME	Summary Table: Wetland Value Units (WVU) Acres	WVU1	WVU2	WVU3A	WVU3B	WVU4	WVU5	WVU6	WVU7	WVU8	WVU9	WVU10	WVU11	WVU12	WVU13	WVU14	Ave WVU	
B-1-Rt 152 Power Lines	B-1-Rt 152 Power Lines	21.00	15.93	14.61	0.88	0.00	7.90	9.44	10.49	18.90	8.99	11.55	12.89	1.00	N/A	0.00	0.00	8.55
B-2-Route 202	B-2-Route 202	20.00	14.33	13.83	0.29	4.51	12.01	10.35	10.96	6.00	11.00	11.50	15.40	0.46	N/A	0.00	0.00	8.49
B-3-North River Rd Inflow	B-3-North River Rd Inflow	20.00	15.42	13.00	0.05	43.20	16.42	43.50	71.89	20.00	18.75	16.00	14.75	0.32	N/A	0.00	20.00	21.99
B-3-Woodman Marsh East	B-3-Woodman Marsh East	20.00	18.40	15.60	0.00	10.25	16.62	4.02	11.59	20.00	11.00	10.00	14.00	1.45	N/A	0.00	20.00	10.92
B-6-Acorn Ponds	B-6-Acorn Ponds	23.00	21.08	18.44	0.00	0.39	16.04	17.02	12.48	11.50	12.65	13.34	16.70	0.31	N/A	0.00	23.00	11.64
B-6-Alden Rd Beaver Pond	B-6-Alden Rd Beaver Pond	15.00	13.75	14.88	0.46	9.97	11.65	12.73	12.94	7.50	8.25	10.05	12.36	1.53	N/A	0.00	15.00	9.44
B-7-Bibles Hill Road	B-7-Bibles Hill Road	13.00	10.63	10.18	0.00	5.33	7.42	12.07	7.33	10.40	7.15	9.49	10.50	1.61	N/A	0.00	13.00	7.45
B-8-Harvey Lake South	B-8-Harvey Lake South	26.00	17.77	18.94	0.13	0.00	2.47	3.07	12.97	28.00	11.05	13.52	16.38	1.51	N/A	0.00	26.00	10.71
B-8-Harvey Lake East	B-8-Harvey Lake East	28.00	18.42	20.04	2.41	0.00	7.95	6.97	5.83	18.42	16.90	19.76	21.35	0.86	N/A	0.00	28.00	11.27
B-10-Bennett Hill Marsh N.	B-10-Bennett Hill Marsh N.	30.70	30.70	36.40	0.00	11.36	22.41	20.38	18.44	18.42	16.90	22.10	24.71	1.10	N/A	0.00	30.70	17.42
B-11-Cove Brown	B-11-Cove Brown	23.00	13.80	13.57	0.00	0.00	13.69	6.92	0.00	23.00	12.65	14.28	11.82	1.38	N/A	0.30	23.00	9.35
B-12-Sherburne Brook #2	B-12-Sherburne Brook #2	5.00	5.00	3.40	0.35	0.00	0.67	1.20	0.00	1.50	2.75	3.10	2.90	1.52	N/A	0.00	0.00	1.72
B-13-Sherburne Brook	B-13-Sherburne Brook	16.00	10.80	10.36	7.01	390.33	3.28	3.75	6.22	6.40	8.90	9.79	9.74	1.21	N/A	3.75	16.00	32.67
B-14-N Side of Lebow Pond	B-14-N Side of Lebow Pond	28.00	23.63	12.78	3.50	0.00	13.72	14.49	17.28	23.40	14.30	17.16	19.50	1.52	N/A	0.00	28.00	13.39
B-15-SIV of Lebow Pond	B-15-SIV of Lebow Pond	17.00	16.29	14.55	0.76	0.00	12.46	13.28	10.20	13.60	9.35	13.09	11.03	0.46	N/A	0.00	17.00	8.44
B-16-Upper Flat Meadow Bk	B-16-Upper Flat Meadow Bk	14.10	14.10	11.42	0.09	0.00	9.51	3.50	0.00	11.28	7.76	9.07	6.34	0.25	N/A	0.00	0.00	3.85
G-1-Alden Rd West #1	G-1-Alden Rd West #1	11.00	8.71	7.53	0.83	0.51	3.63	2.97	4.30	6.60	8.63	4.65	6.26	0.47	N/A	0.00	0.00	4.23
G-2-Alden Rd West #2	G-2-Alden Rd West #2	8.00	7.00	5.18	0.00	0.00	4.20	4.04	0.00	0.00	6.20	1.36	3.89	0.00	N/A	0.00	0.00	2.46
G-3-Bedy Meadows N Bord	G-3-Bedy Meadows N Bord	6.00	7.67	5.65	0.00	0.13	2.11	3.80	4.16	2.40	4.40	4.72	4.03	0.22	N/A	0.30	0.00	3.05
G-4-Bedy Meadows N Bord	G-4-Bedy Meadows N Bord	6.00	6.00	3.24	0.00	0.00	2.97	0.54	0.00	6.00	3.30	1.68	2.22	0.00	N/A	0.00	6.00	2.28
G-5-NW Gulf Hill	G-5-NW Gulf Hill	3.90	4.92	2.77	0.00	0.00	3.34	3.06	0.00	3.90	5.16	1.88	2.39	0.00	N/A	0.00	0.00	2.26
G-6-Cove Brown Woodland	G-6-Cove Brown Woodland	13.00	8.78	6.99	0.00	0.00	6.86	1.57	0.00	13.00	5.53	5.72	5.98	0.00	N/A	0.00	0.00	4.19
G-7-Narrow Shrubland #2	G-7-Narrow Shrubland #2	6.00	6.00	3.78	0.83	0.00	2.33	0.55	1.65	2.40	3.90	2.78	2.87	0.32	N/A	0.00	6.00	2.34
G-8-Northeast Long Pond	G-8-Northeast Long Pond	3.00	3.00	1.62	0.00	0.00	1.19	1.09	0.00	2.10	1.65	0.90	1.13	0.00	N/A	0.00	0.00	0.97
G-9-Jemness Rd outflow	G-9-Jemness Rd outflow	2.40	1.92	1.87	0.07	0.10	4.12	2.36	0.11	0.72	1.56	1.06	1.04	0.29	N/A	0.00	0.00	1.17
G-10-Lower Flat Meadow Bk E.	G-10-Lower Flat Meadow Bk E.	7.00	7.00	3.78	0.00	0.00	3.35	1.01	0.00	7.00	3.87	2.34	2.84	0.00	N/A	0.00	7.00	2.71
G-11-Northwood Narrows E.	G-11-Northwood Narrows E.	4.30	3.94	2.23	0.09	0.00	2.30	0.90	0.00	0.00	2.31	0.50	0.55	0.00	N/A	0.00	4.30	1.21
O-1-Bennett Pond	O-1-Bennett Pond	25.00	21.88	20.50	0.00	6.17	18.07	20.86	9.03	25.00	13.75	19.00	18.50	0.64	N/A	0.00	0.00	13.54
O-2-Town Line SE	O-2-Town Line SE	13.00	13.00	12.35	0.31	3.53	10.05	9.83	2.96	7.80	7.15	7.34	7.41	0.39	N/A	0.00	0.00	6.33
O-3-Woodman Marsh West	O-3-Woodman Marsh West	32.00	24.93	27.52	0.11	10.82	8.57	25.95	10.92	32.00	17.60	24.33	23.68	1.10	N/A	0.00	32.00	17.12
O-4-Diller/Houston Min Rd	O-4-Diller/Houston Min Rd	8.00	8.78	7.15	0.00	6.28	6.05	3.91	1.75	5.60	4.40	6.00	5.15	0.29	N/A	0.00	0.00	3.87
O-5-Dutton Pond	O-5-Dutton Pond	10.20	6.40	4.95	0.28	0.00	3.35	2.79	0.23	6.40	4.16	4.03	3.09	0.17	N/A	0.00	6.40	3.01
O-6-Bedy Meadows W	O-6-Bedy Meadows W	5.00	3.00	4.50	0.05	0.31	3.31	3.04	0.31	1.50	2.75	2.83	2.84	0.30	N/A	0.00	5.00	2.27
O-8-Shakes Hill Bog	O-8-Shakes Hill Bog	28.00	28.00	16.24	0.00	0.00	3.18	2.30	0.00	25.20	28.00	15.89	13.02	0.46	N/A	0.00	28.00	11.43
O-10-Harvey Lake Southeast	O-10-Harvey Lake Southeast	10.00	7.59	7.36	0.00	0.00	2.71	1.19	0.00	6.00	8.50	5.00	4.50	0.69	N/A	0.00	0.00	3.19
O-11-Narrow Shrubland	O-11-Narrow Shrubland	30.00	28.75	25.68	0.00	0.00	18.72	18.30	0.00	18.00	16.50	14.10	20.98	0.43	N/A	0.00	0.00	12.42
O-12-Kelley Brook North	O-12-Kelley Brook North	22.80	23.06	18.09	0.00	0.00	2.44	1.63	0.00	27.00	13.16	9.72	13.23	0.00	N/A	0.00	0.00	8.33
O-13-Pleasant Lake North	O-13-Pleasant Lake North	79.00	72.42	74.36	3.15	0.00	5.36	17.93	3.21	55.30	69.13	35.30	47.40	1.10	N/A	0.00	79.00	34.54
O-14-Northwood Lake East	O-14-Northwood Lake East	6.00	3.40	3.16	0.49	136.93	1.12	2.16	3.17	6.00	2.65	4.82	4.12	0.38	N/A	0.00	6.00	12.42
O-15-Little Bow Pond East	O-15-Little Bow Pond East	6.00	6.00	5.16	0.83	0.88	3.75	0.67	2.41	4.80	3.30	3.54	3.82	0.46	N/A	0.00	6.00	2.94
O-16-N Side of Long Pond	O-16-N Side of Long Pond	20.00	18.17	13.52	4.55	0.00	6.49	3.49	5.22	6.00	11.00	10.80	9.20	0.45	N/A	0.00	20.00	7.85
O-17-Near Dugan Pond	O-17-Near Dugan Pond	21.00	18.49	12.25	0.00	0.00	6.03	3.22	0.00	21.00	8.93	7.55	10.25	0.00	N/A	0.00	0.00	6.52
R-1-Rte 43	R-1-Rte 43	34.00	30.46	23.28	1.12	0.79	12.84	19.76	13.78	34.00	18.70	25.50	24.44	1.29	N/A	0.00	34.00	16.78
R-2-Bedy Meadows	R-2-Bedy Meadows	106.00	92.75	99.39	1.49	1.57	11.61	14.91	85.21	74.20	58.30	90.10	84.14	2.30	N/A	0.40	106.00	51.60
R-3-Tucker Brook	R-3-Tucker Brook	75.30	75.30	61.75	0.00	22.98	7.63	31.75	24.38	75.30	38.36	55.72	55.72	0.92	N/A	0.00	75.30	39.06
R-4-Harvey Lake West	R-4-Harvey Lake West	38.00	26.03	26.42	0.21	0.00	1.80	2.05	3.10	39.00	16.38	22.62	24.18	2.30	N/A	0.00	38.00	14.54
R-5-Kelley Hill	R-5-Kelley Hill	42.00	35.00	25.34	0.53	0.00	14.11	13.65	19.97	37.80	17.95	31.08	25.62	0.90	N/A	0.53	42.00	18.99

R-6-Lipper Newood Narrows N.	R-6-Lipper Newood Narrows N.	26.00	26.00	25.66	0.15	2.10	19.04	17.13	2.08	18.20	20.15	15.60	14.95	0.56	N/A	0.50	26.00	13.38
R-7-Lower Flat Meadow Brook	R-7-Lower Flat Meadow Brook	36.00	33.75	30.60	0.74	0.00	6.55	14.16	0.00	36.00	23.40	24.48	17.82	0.55	N/A	0.00	0.00	14.46
R-8-Old Pittsfield Road	R-8-Old Pittsfield Road	34.60	32.87	32.87	0.00	10.66	16.54	18.14	12.67	31.14	19.03	29.06	26.30	0.70	N/A	0.00	34.60	19.02
R-8-Jennets Pond North	R-8-Jennets Pond North	46.00	46.00	39.56	0.49	1.91	10.31	16.05	1.18	46.00	25.50	33.12	26.68	2.20	N/A	0.00	46.00	21.06
R10-R-43 Voonis Wetland	R10-R-43 Voonis Wetland	23.00	19.17	17.35	0.32	0.00	12.35	7.41	0.16	18.40	12.66	13.57	10.87	0.46	N/A	0.00	0.00	8.65
Y-1-Hall Brook/Town Line	Y-1-Hall Brook/Town Line	22.00	22.00	14.96	0.00	0.00	9.38	13.83	0.00	19.80	12.10	6.60	8.80	0.00	N/A	0.00	22.00	9.25
Y-2-Northwood Ridge #2	Y-2-Northwood Ridge #2	13.00	12.46	9.96	0.00	4.01	8.82	6.97	9.20	13.00	10.06	9.88	9.82	0.31	N/A	0.63	0.00	7.31
Y-3-Northwood Ridge #1	Y-3-Northwood Ridge #1	8.00	7.33	6.41	0.00	0.00	2.47	3.70	0.00	4.00	6.20	2.40	4.00	0.24	N/A	0.00	0.00	2.83
Y-4-Lower Lake Road East	Y-4-Lower Lake Road East	19.60	17.72	13.33	0.00	0.00	7.88	3.18	0.00	11.76	12.74	6.27	9.90	0.00	N/A	0.00	0.00	6.37
Y-5-Town Hill Pond	Y-5-Town Hill Pond	14.00	9.86	8.27	0.09	0.39	1.73	0.47	0.54	8.00	10.86	8.54	8.40	0.61	N/A	0.00	0.00	4.35
Y-6-Coffertown Road	Y-6-Coffertown Road	9.00	7.69	5.13	0.00	0.00	4.72	1.34	0.00	9.00	4.95	2.52	1.31	0.00	N/A	0.00	9.00	3.26
Y-7-Northwood Narrows S.	Y-7-Northwood Narrows S.	28.70	19.01	17.22	0.39	0.00	12.86	11.13	10.46	25.83	18.66	20.09	21.17	0.70	N/A	0.00	0.00	12.12
Y-8-Northwood Narrows N.	Y-8-Northwood Narrows N.	22.00	16.23	18.04	0.14	1.54	1.29	6.50	0.65	22.00	17.05	17.60	14.30	0.51	N/A	0.00	0.00	8.91
Y9-Landworn Stone Wetland	Y9-Landworn Stone Wetland	8.00	4.07	5.37	0.81	0.55	5.00	2.88	0.86	0.80	0.00	4.72	5.43	0.82	N/A	0.00	0.00	2.24
Y10-Pleasant Lake Rd. NE	Y10-Pleasant Lake Rd. NE	13.00	9.21	6.76	0.00	0.00	8.43	2.61	0.00	13.00	9.26	4.16	5.92	0.00	N/A	0.00	13.00	3.17

SITE ID & NAME		Summary Table: Wetland Functional Values																	Ave FV	
		Site Name	Acres	FV1	FV2	FV3A	FV3B	FV4	FV5	FV6	FV7	FV8	FV9	FV10	FV11	FV12	FV13	FV14		
B-1-RT 162 Power Lines	B-1-RT 162 Power Lines		21.00	0.76	0.70	0.54	0.00	0.53	0.60	0.50	0.90	0.43	0.55	0.52	0.83	0.00	0.00	0.00	0.54	
B-2-Route 202	B-2-Route 202		20.00	0.72	0.69	0.64	0.56	0.75	0.74	0.89	0.30	0.53	0.56	0.77	1.00	0.00	0.00	0.00	0.51	
B-3-North River Pd Inflow	B-3-North River Pd Inflow		20.00	0.77	0.65	0.67	0.53	0.82	0.76	0.89	1.00	0.94	0.80	0.70	1.00	0.00	0.00	1.00	0.75	
B-4-Woodman Marsh East	B-4-Woodman Marsh East		20.00	0.92	0.78	0.00	0.68	0.83	0.80	0.77	1.00	0.55	0.50	0.72	1.00	0.00	0.00	1.00	0.68	
B-5-Scorn Ponds	B-5-Scorn Ponds		23.00	0.92	0.80	0.00	0.40	0.70	0.74	0.54	0.90	0.55	0.58	0.73	0.52	0.00	0.00	1.00	0.56	
B-6-4th Rd Beaver Pond	B-6-4th Rd Beaver Pond		15.00	0.92	0.99	0.25	0.77	0.78	0.91	0.86	0.50	0.55	0.67	0.82	0.83	0.00	0.55	1.00	0.74	
B-7-Blakes Hill Road	B-7-Blakes Hill Road		13.00	0.83	0.78	0.25	0.53	0.57	0.83	0.58	0.80	0.55	0.73	0.84	0.40	0.00	0.00	1.00	0.53	
B-8-Harvey Lake South	B-8-Harvey Lake South		26.00	0.68	0.73	0.54	0.00	0.62	0.68	0.58	1.00	0.43	0.52	0.46	1.00	0.00	0.00	1.00	0.59	
B-9-Harvey Lake East	B-9-Harvey Lake East		26.00	0.71	0.77	0.48	0.00	0.79	0.70	0.98	1.00	0.65	0.76	0.39	0.83	0.00	0.00	0.00	0.59	
B-10-Bennett Hill Marsh N.	B-10-Bennett Hill Marsh N.		30.70	1.00	0.86	0.00	0.53	0.73	0.89	0.78	0.60	0.55	0.72	0.31	0.92	0.00	0.00	1.00	0.95	
B-11-Coe Brown	B-11-Coe Brown		23.00	0.60	0.59	0.00	0.00	0.50	0.35	0.00	1.00	0.55	0.62	0.51	0.92	0.00	0.30	1.00	0.50	
B-12-Sherburne Brook #2	B-12-Sherburne Brook #2		5.00	1.00	0.68	0.70	0.00	0.34	0.60	0.00	0.30	0.55	0.62	0.13	0.83	0.00	0.00	0.00	0.44	
B-13-Sherburne Brook	B-13-Sherburne Brook		16.00	0.68	0.65	0.64	0.77	0.55	0.62	0.62	0.40	0.55	0.61	0.61	1.00	0.00	0.75	1.00	0.67	
B-14-N Side of Lbow Pond	B-14-N Side of Lbow Pond		26.00	0.92	0.49	0.70	0.00	0.62	0.62	0.68	0.90	0.55	0.68	0.75	1.00	0.00	0.00	1.00	0.63	
B-15-SW of Lbow Pond	B-15-SW of Lbow Pond		17.00	0.96	0.86	0.76	0.00	0.83	0.99	0.68	0.80	0.55	0.77	0.85	1.00	0.00	0.00	1.00	0.70	
B-16-Upper Flat Meadow Bk	B-16-Upper Flat Meadow Bk		14.10	1.00	0.81	0.71	0.00	0.70	0.61	0.00	0.80	0.55	0.64	0.49	1.00	0.00	0.00	0.00	0.55	
G-1-4th Rd West #1	G-1-4th Rd West #1		11.00	0.79	0.68	0.76	0.47	0.66	0.73	0.38	0.80	0.78	0.45	0.57	0.23	0.00	0.00	0.00	0.55	
G-2-4th Rd West #2	G-2-4th Rd West #2		8.00	0.88	0.65	0.00	0.00	0.52	0.50	0.00	0.00	0.78	0.17	0.50	0.70	0.00	0.00	0.00	0.36	
G-3-Betty Meadows N Bord	G-3-Betty Meadows N Bord		8.00	0.96	0.71	0.00	0.62	0.53	0.65	0.52	0.30	0.55	0.59	0.50	1.00	0.00	0.30	0.00	0.56	
G-4-Blake Hill East	G-4-Blake Hill East		6.00	1.00	0.54	0.00	0.00	0.50	0.54	0.00	1.00	0.55	0.28	0.41	0.00	0.00	0.00	1.00	0.42	
G-5-NW Gulf Hill	G-5-NW Gulf Hill		5.90	0.83	0.47	0.00	0.00	0.48	0.44	0.18	1.00	0.68	0.32	0.46	0.80	0.00	0.00	0.00	0.39	
G-6-Coe Brown Woodland	G-6-Coe Brown Woodland		13.00	0.68	0.54	0.00	0.00	0.59	0.52	0.00	1.00	0.43	0.44	0.46	0.46	0.00	0.00	0.00	0.37	
G-7-Narrows/Sherburne #2	G-7-Narrows/Sherburne #2		6.00	1.00	0.63	0.83	0.00	0.58	0.55	0.28	0.40	0.55	0.46	0.48	0.70	0.00	0.00	1.00	0.53	
G-8-Northeast Long Pond	G-8-Northeast Long Pond		3.00	1.00	0.54	0.00	0.00	0.40	0.54	0.00	0.70	0.55	0.30	0.44	0.00	0.00	0.00	0.00	0.34	
G-9-Jennies Pd outflow	G-9-Jennies Pd outflow		2.40	0.80	0.78	0.65	0.70	0.69	0.76	0.77	0.30	0.65	0.44	0.41	0.67	0.00	0.00	0.00	0.59	
G-10-Lower Flat Meadow Bk E.	G-10-Lower Flat Meadow Bk E.		7.00	1.00	0.54	0.00	0.00	0.46	0.50	0.00	1.00	0.55	0.32	0.13	0.00	0.00	0.00	1.00	0.39	
G-11-Northeast Narrows E.	G-11-Northeast Narrows E.		4.20	0.94	0.53	0.00	0.00	0.46	0.50	0.00	0.00	0.55	0.12	0.74	0.00	0.00	0.00	1.00	0.35	
O-1-Demetri Pond	O-1-Demetri Pond		25.00	0.88	0.82	0.00	0.62	0.72	0.91	0.90	1.00	0.56	0.76	0.57	0.92	0.00	0.00	0.00	0.68	
O-2-Town Lake SE	O-2-Town Lake SE		13.00	1.00	0.95	0.94	0.77	0.77	0.89	0.64	0.60	0.55	0.58	0.74	0.92	0.00	0.00	0.00	0.72	
O-4-Woodman Marsh West	O-4-Woodman Marsh West		32.00	0.78	0.86	0.88	0.83	0.86	0.81	0.83	1.00	0.55	0.76	0.64	1.00	0.00	0.00	1.00	0.77	
O-5-Diller/Houston Mtn Rd	O-5-Diller/Houston Mtn Rd		8.00	1.90	0.81	0.00	0.62	0.78	0.78	0.44	0.70	0.56	0.75	0.72	0.75	0.00	0.00	0.00	0.61	
O-6-Damon Pond	O-6-Damon Pond		10.20	0.98	0.70	0.00	0.62	0.74	0.77	0.71	0.70	0.55	0.57	0.72	0.57	0.00	0.00	0.00	0.57	
O-7-Lower Lamprey River	O-7-Lower Lamprey River		6.40	1.00	0.77	0.71	0.00	0.65	0.70	0.38	1.00	0.65	0.63	0.57	0.83	0.00	0.00	1.00	0.65	
O-8-Betty Meadows W	O-8-Betty Meadows W		5.00	1.00	0.90	0.88	0.62	0.66	0.76	0.56	0.30	0.55	0.57	0.47	1.00	0.00	0.00	1.00	0.56	
O-9-Blakes Hill Bog	O-9-Blakes Hill Bog		28.00	1.00	0.58	0.00	0.00	0.53	0.77	0.00	0.90	1.00	0.56	0.47	1.00	0.00	0.00	1.00	0.56	
O-10-Harvey Lake Southeast	O-10-Harvey Lake Southeast		10.00	0.76	0.74	0.00	0.00	0.68	0.69	0.00	0.80	0.65	0.50	0.62	0.50	0.00	0.00	0.00	0.43	
O-11-Narrows/Sherburne	O-11-Narrows/Sherburne		30.00	0.96	0.86	0.00	0.00	0.62	0.80	0.33	0.60	0.55	0.47	0.70	0.97	0.00	0.00	0.00	0.48	
O-12-Kelsey Brook North	O-12-Kelsey Brook North		27.00	0.85	0.67	0.00	0.00	0.61	0.41	0.00	1.00	0.48	0.36	0.60	0.00	0.00	0.00	0.00	0.38	
O-13-Pleasant Lake North	O-13-Pleasant Lake North		79.00	0.92	0.94	0.70	0.00	0.77	0.66	0.71	0.70	0.88	0.70	0.69	1.00	0.00	0.00	1.00	0.69	
O-14-Northeast Lake Inlet	O-14-Northeast Lake Inlet		8.00	0.57	0.53	0.66	0.49	0.56	0.43	0.52	1.00	0.43	0.77	0.69	0.83	0.00	0.00	1.00	0.60	
O-15-Little Bow Pond East	O-15-Little Bow Pond East		6.00	1.00	0.86	0.83	0.68	0.86	0.67	0.80	0.80	0.55	0.59	0.80	1.00	0.00	0.00	1.00	0.70	
O-16-Side of Long Pond	O-16-Side of Long Pond		20.00	0.96	0.68	0.65	0.00	0.65	0.70	0.52	0.30	0.55	0.54	0.46	0.63	0.00	0.00	1.00	0.56	
O-17-Near Durgin Pond	O-17-Near Durgin Pond		21.00	0.74	0.58	0.00	0.00	0.48	0.61	0.44	1.00	0.43	0.38	0.48	0.40	0.00	0.00	0.00	0.43	

Northwoods FVI Summary 1998

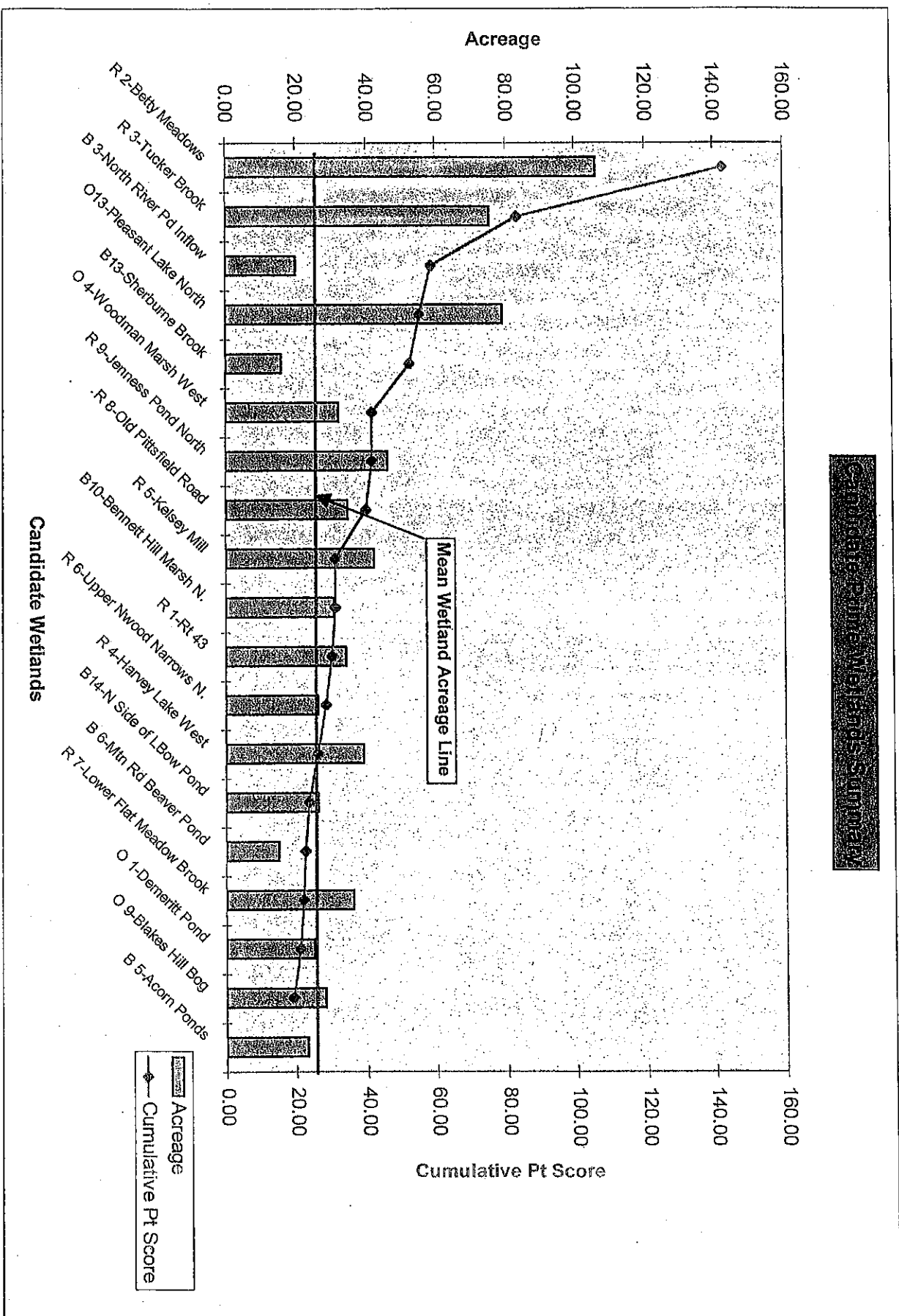
R-1-Rt 43	R-1-Rt 43	34.00	0.90	0.68	0.88	0.62	0.63	0.67	0.58	1.00	0.55	0.75	0.72	1.00	0.00	0.53	1.00	0.75
R-2-Betty Meadows	R-2-Betty Meadows	106.00	0.86	0.94	0.65	0.68	0.77	0.99	0.80	0.70	0.55	0.85	0.79	1.00	0.00	0.40	1.00	0.79
R-3-Tucker Brook	R-3-Tucker Brook	75.30	1.00	0.82	0.00	0.73	0.76	0.88	0.78	1.00	0.78	0.76	0.62	0.83	0.00	0.00	1.00	0.71
R-4-Harvey Lake West	R-4-Harvey Lake West	39.00	0.88	0.68	0.51	0.00	0.45	0.69	0.62	1.00	0.43	0.58	0.62	0.63	0.00	0.00	1.00	0.58
R-5-Kelsey Mill	R-5-Kelsey Mill	42.00	0.83	0.60	0.39	0.00	0.56	0.50	0.40	0.90	0.43	0.74	0.61	1.00	0.00	0.63	1.00	0.63
R-6-Lupper Meadow Narrows N.	R-6-Lupper Meadow Narrows N.	26.00	1.00	0.92	0.76	0.47	0.73	0.89	0.58	0.70	0.78	0.60	0.50	1.00	0.00	0.00	0.75	0.76
R-7-Lower Full Meadow Brook	R-7-Lower Full Meadow Brook	36.00	0.94	0.65	0.63	0.00	0.65	0.75	0.00	0.90	0.65	0.68	0.76	0.92	0.00	0.00	1.00	0.62
R-8-Old Pittfield Road	R-8-Old Pittfield Road	34.00	1.00	0.95	0.00	0.88	0.86	0.95	0.81	0.90	0.55	0.64	0.58	1.00	0.00	0.00	1.00	0.72
R-9-Jennens Pond North	R-9-Jennens Pond North	46.00	1.00	0.86	0.70	0.62	0.75	0.84	0.69	1.00	0.55	0.72	0.47	1.00	0.00	0.00	1.00	0.59
R-10-Rt 43 Vorthis Wetland	R-10-Rt 43 Vorthis Wetland	23.00	0.83	0.75	0.84	0.00	0.64	0.57	0.74	0.80	0.55	0.59	0.40	0.92	0.00	0.00	1.00	0.47
R-11-Hill Brook/Town Line	R-11-Hill Brook/Town Line	23.00	1.00	0.68	0.00	0.00	0.63	0.73	0.00	0.90	0.55	0.30	0.74	0.00	0.00	0.00	1.00	0.44
Y-1-Hill Brook/Town Line	Y-1-Hill Brook/Town Line	13.00	0.96	0.77	0.00	0.62	0.69	0.70	0.71	1.00	0.78	0.75	0.74	0.63	0.00	0.63	0.00	0.58
Y-2-Northwood Ridge #2	Y-2-Northwood Ridge #2	8.00	0.92	0.80	0.00	0.00	0.62	0.74	0.00	0.50	0.78	0.30	0.50	0.63	0.00	0.00	0.00	0.44
Y-3-Northwood Ridge #1	Y-3-Northwood Ridge #1	19.00	0.90	0.68	0.00	0.00	0.61	0.64	0.00	0.60	0.65	0.32	0.67	0.00	0.00	0.00	0.00	0.39
Y-4-Bow Lake Road East	Y-4-Bow Lake Road East	14.00	0.70	0.59	0.78	0.56	0.58	0.47	0.66	0.40	0.78	0.61	0.67	0.83	0.00	0.00	0.00	0.39
Y-5-Town Hill Pond	Y-5-Town Hill Pond	9.00	0.85	0.57	0.00	0.00	0.52	0.45	0.00	1.00	0.55	0.28	0.74	0.00	0.00	0.00	1.00	0.43
Y-6-Collection Road	Y-6-Collection Road	28.70	0.66	0.60	0.96	0.00	0.61	0.53	0.65	0.90	0.65	0.70	0.65	1.00	0.00	0.00	0.00	0.58
Y-7-Northwood Narrows S.	Y-7-Northwood Narrows S.	22.00	0.74	0.82	0.83	0.47	0.65	0.54	0.81	1.00	0.78	0.80	0.68	1.00	0.00	0.00	0.00	0.70
Y-8-Northwood Narrows N.	Y-8-Northwood Narrows N.	8.00	0.51	0.67	0.81	0.56	0.71	0.50	0.86	0.10	0.76	0.59	0.46	0.92	0.00	0.00	0.00	0.52
Y9-Hardware Store Wetland	Y9-Hardware Store Wetland		0.71	0.52	0.00	0.00	0.65	0.52	0.00	1.00	0.71	0.32	0.00	0.00	0.00	0.00	1.00	0.39
Y10-Pleasant Lake Rd. NE	Y10-Pleasant Lake Rd. NE	13.00																

Northwood Wetlands Assessment 1998
Cumulative Ranking

Site Name	Acreage	Ave WVU	WVU Rank	WVU Pt Rank	Ave FVI	FVI Rank	FVI Pt Rank	Cum WPts	Cum FPts	TOTAL CUM
R 2-Betty Meadows	106.00	51.60	1.00	1.00	0.79	1.00	4.00	3.00	6.00	7.00
R 3-Tucker Brook	75.30	39.06	2.00	2.00	0.77	2.00	6.00	6.00	10.00	12.00
B 3-North River Pd Inflow	20.00	21.09	5.00	5.00	0.75	4.00	3.00	14.00	12.00	17.00
O13-Pleasant Lake North	79.00	34.54	3.00	3.00	0.76	3.00	9.00	9.00	15.00	18.00
B13-Sherburne Brook	16.00	32.67	4.00	4.00	0.74	5.00	6.00	13.00	15.00	19.00
O 4-Woodman Marsh West	32.00	17.12	10.00	8.00	0.75	4.00	2.00	22.00	16.00	24.00
R 9-Jenness Pond North	46.00	21.06	6.00	7.00	0.73	6.00	5.00	19.00	17.00	24.00
R 8-Old Pittsfield Road	34.60	19.02	7.00	9.00	0.71	8.00	1.00	24.00	16.00	25.00
R 5-Kelsey Mill	42.00	18.89	8.00	8.00	0.70	9.00	7.00	25.00	24.00	32.00
B10-Bennett Hill Marsh N.	30.70	17.42	9.00	5.00	0.70	9.00	9.00	23.00	27.00	32.00
R 1-Rt 43	34.00	16.76	11.00	9.00	0.72	7.00	6.00	27.00	24.00	33.00
R 6-Upper Nwood Narrows N.	26.00	13.28	16.00	7.00	0.72	7.00	5.00	30.00	28.00	35.00
R 4-Harvey Lake West	39.00	14.54	12.00	6.00	0.69	10.00	10.00	28.00	32.00	38.00
B14-N Side of LBow Pond	26.00	13.39	14.00	8.00	0.68	11.00	9.00	33.00	34.00	42.00
B 6-Mtn Rd Beaver Pond	15.00	9.44	25.00	6.00	0.70	9.00	4.00	40.00	38.00	44.00
R 7-Lower Flat Meadow Brook	36.00	14.46	13.00	9.00	0.67	12.00	11.00	34.00	36.00	45.00
O 1-Demeritt Pond	25.00	13.34	15.00	9.00	0.68	11.00	12.00	35.00	38.00	47.00
O14-Northwood Lake Inlet	6.00	12.42	17.00	7.00	0.66	13.00	10.00	37.00	40.00	47.00
B 4-Woodman Marsh East	20.00	10.92	22.00	9.00	0.65	14.00	6.00	45.00	42.00	51.00
O 9-Blakes Hill Bog	28.00	11.43	20.00	9.00	0.59	19.00	4.00	48.00	43.00	52.00
B15-SW of LBow Pond	17.00	9.44	25.00	9.00	0.66	13.00	6.00	47.00	44.00	53.00
Y 7-Northwood Narrows S.	28.70	12.12	18.00	9.00	0.63	15.00	12.00	42.00	45.00	54.00
O11-Narrows/Sherburne	30.00	12.42	17.00	8.00	0.61	17.00	15.00	42.00	49.00	57.00
B 5-Acorn Ponds	23.00	11.64	19.00	9.00	0.61	17.00	14.00	45.00	50.00	59.00
B 9-Harvey Lake East	26.00	11.27	21.00	9.00	0.62	16.00	13.00	46.00	50.00	59.00
B 8-Harvey Lake South	26.00	10.71	23.00	9.00	0.59	19.00	8.00	51.00	50.00	59.00
Y 8-Northwood Narrows N.	22.00	8.91	27.00	9.00	0.65	14.00	10.00	50.00	51.00	60.00
B11-Coe Brown	23.00	9.58	24.00	9.00	0.58	20.00	9.00	53.00	53.00	62.00
O 2-Town Line SE	13.00	6.33	36.00	9.00	0.63	15.00	5.00	60.00	56.00	65.00
Y 1-Hall Brook/Town Line	22.00	9.25	26.00	9.00	0.56	22.00	9.00	57.00	57.00	66.00
Y 2-Northwood Ridge #2	13.00	7.31	33.00	9.00	0.63	15.00	10.00	57.00	58.00	67.00
O16-N Side of Long Pond	20.00	7.85	31.00	7.00	0.59	19.00	11.00	57.00	61.00	68.00
B 7-Blakes Hill Road	13.00	7.45	32.00	9.00	0.59	19.00	9.00	60.00	60.00	69.00
R10-Rt 43 Voorhis Wetland	23.00	8.65	28.00	9.00	0.58	20.00	13.00	57.00	61.00	70.00
B 2-Route 202	20.00	8.49	29.00	9.00	0.59	19.00	14.00	57.00	62.00	71.00
B 1-Rt 152 Power Lines	21.00	8.65	28.00	9.00	0.56	22.00	14.00	59.00	64.00	73.00
O12-Kelsey Brook North	27.00	8.33	30.00	9.00	0.50	27.00	14.00	66.00	71.00	80.00
B16-Upper Flat Meadow Bk	14.10	5.85	37.00	9.00	0.54	24.00	10.00	70.00	71.00	80.00
O15-Little Bow Pond East	6.00	2.94	47.00	9.00	0.60	18.00	7.00	74.00	72.00	81.00
O 7-Lower Lamprey River	6.40	3.01	46.00	9.00	0.57	21.00	7.00	76.00	74.00	83.00
O 6-Demon Pond	10.20	5.43	38.00	9.00	0.55	23.00	15.00	70.00	76.00	85.00
O17-Near Durgin Pond	21.00	6.52	34.00	9.00	0.48	28.00	14.00	71.00	76.00	85.00
Y 5-Town Hall Pond	14.00	4.33	40.00	9.00	0.56	22.00	16.00	71.00	78.00	87.00
O 5-Diller/Houston Mtn Rd	8.00	3.87	43.00	9.00	0.56	22.00	14.00	74.00	79.00	88.00
Y10-Pleasant Lake Rd. NE	13.00	5.17	39.00	9.00	0.44	30.00	11.00	78.00	80.00	89.00
O 8-Betty Meadows W	5.00	2.27	53.00	9.00	0.56	22.00	6.00	84.00	81.00	90.00
Y 4-Bow Lake Road East	19.60	6.37	35.00	9.00	0.44	30.00	17.00	74.00	82.00	91.00
G 1-Mtn Rd Wetl #1	11.00	4.23	41.00	9.00	0.53	25.00	17.00	75.00	83.00	92.00
G 3-Betty Meadows N Bord	8.00	3.05	45.00	9.00	0.52	26.00	12.00	80.00	83.00	92.00
Y 6-Coffectown Road	9.00	3.26	43.00	9.00	0.43	31.00	11.00	83.00	85.00	94.00
G 6-Coe Brown Woodland	13.00	4.19	42.00	9.00	0.39	33.00	14.00	84.00	89.00	98.00
G10-Lower Flat Meadow Bk E	7.00	2.71	49.00	9.00	0.39	33.00	8.00	91.00	90.00	99.00
O10-Harvey Lake Southeast	10.00	3.19	44.00	9.00	0.43	31.00	17.00	84.00	92.00	101.00
G 7-Narrows/Sherburne #2	6.00	2.34	51.00	9.00	0.43	31.00	11.00	91.00	93.00	102.00

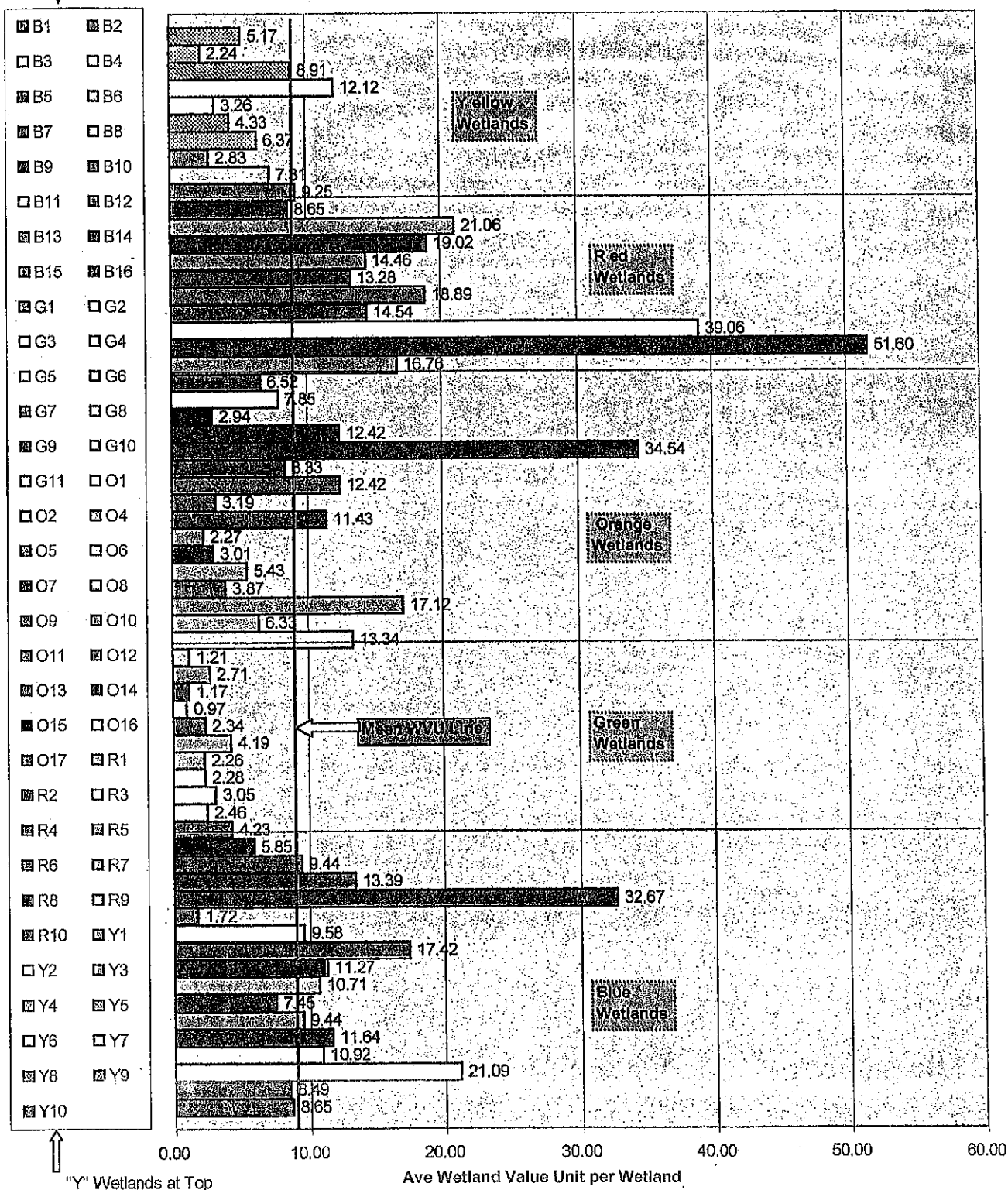
Northwood Wetlands Assessment 1998
Cumulative Ranking

G 4-Blake Hill East	6.00	2.28	52.00	9.00	0.38	34.00	8.00	95.00	94.00	103.00
Y 3-Northwood Ridge #1	8.00	2.83	48.00	9.00	0.39	33.00	17.00	90.00	98.00	107.00
G 2-Mtn Rd Wetl #2	8.00	2.46	50.00	9.00	0.37	35.00	17.00	94.00	102.00	111.00
Y 9-Hardware Store Wetland	8.00	2.24	55.00	9.00	0.42	32.00	15.00	96.00	102.00	111.00
B12-Sherburne Brook #2	5.00	1.72	56.00	9.00	0.38	34.00	13.00	99.00	103.00	112.00
G 5-NW Gulf Hill	5.90	2.26	54.00	9.00	0.36	36.00	13.00	99.00	103.00	112.00
G 9-Jenness Pd outflow	2.40	1.17	58.00	9.00	0.47	29.00	17.00	96.00	104.00	113.00
G11-Northwood Narrows E.	4.20	1.21	57.00	9.00	0.35	37.00	13.00	103.00	107.00	116.00
G 8-Northeast Long Pond	3.00	0.97	59.00	9.00	0.34	38.00	14.00	106.00	111.00	120.00
MEAN	21.21	10.27	29.89	8.17	0.57	19.54	10.30	57.60	59.73	67.90
MEDIAN	19.60	8.49	29.00	9.00	0.59	19.00	10.00	57.00	60.00	68.00
STANDARD DEVIATION	18.36	9.51	16.79	1.80	0.12	10.12	4.23	27.51	29.10	30.26

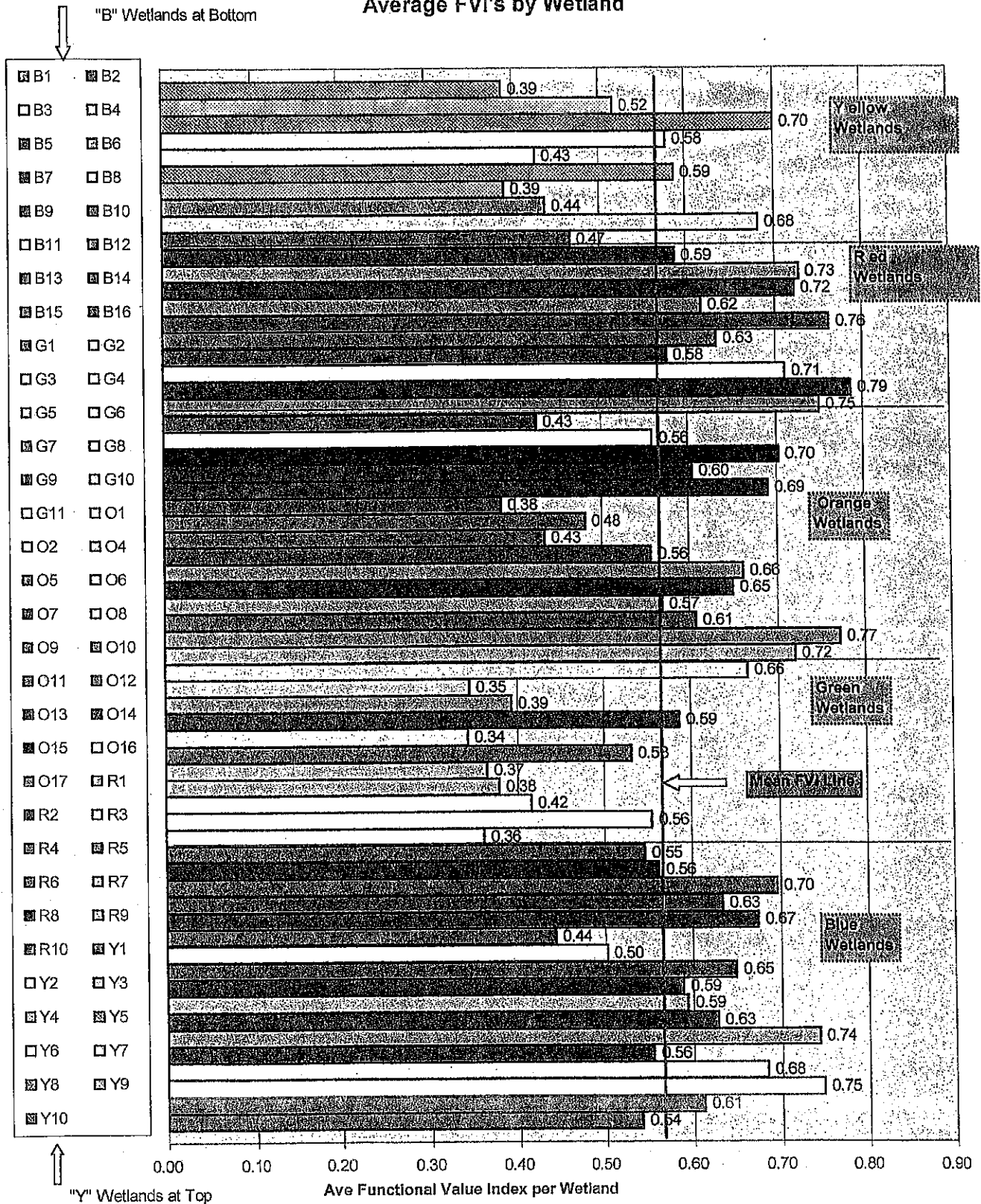


"B" Wetlands at Bottom

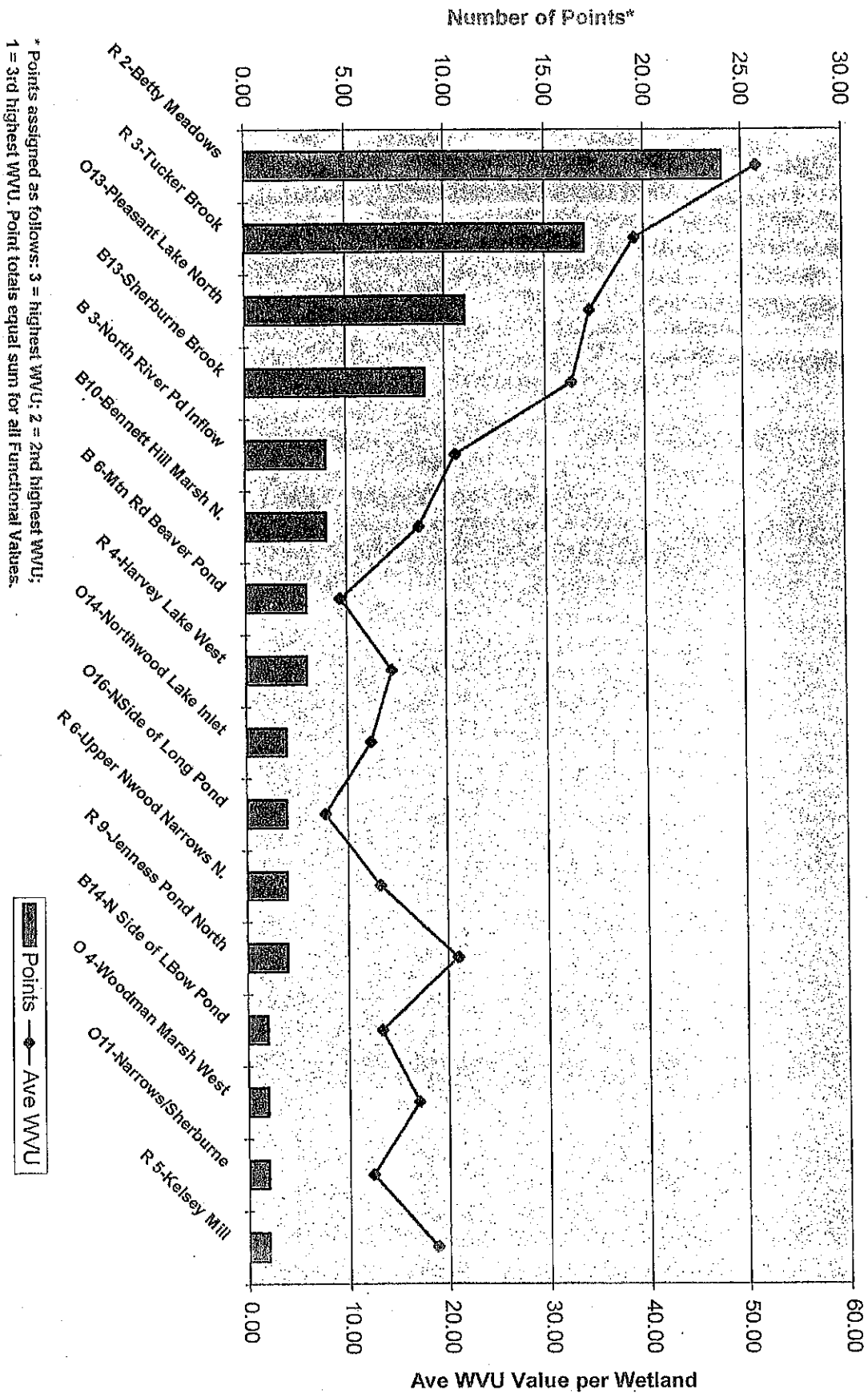
Average WVU's by Wetland

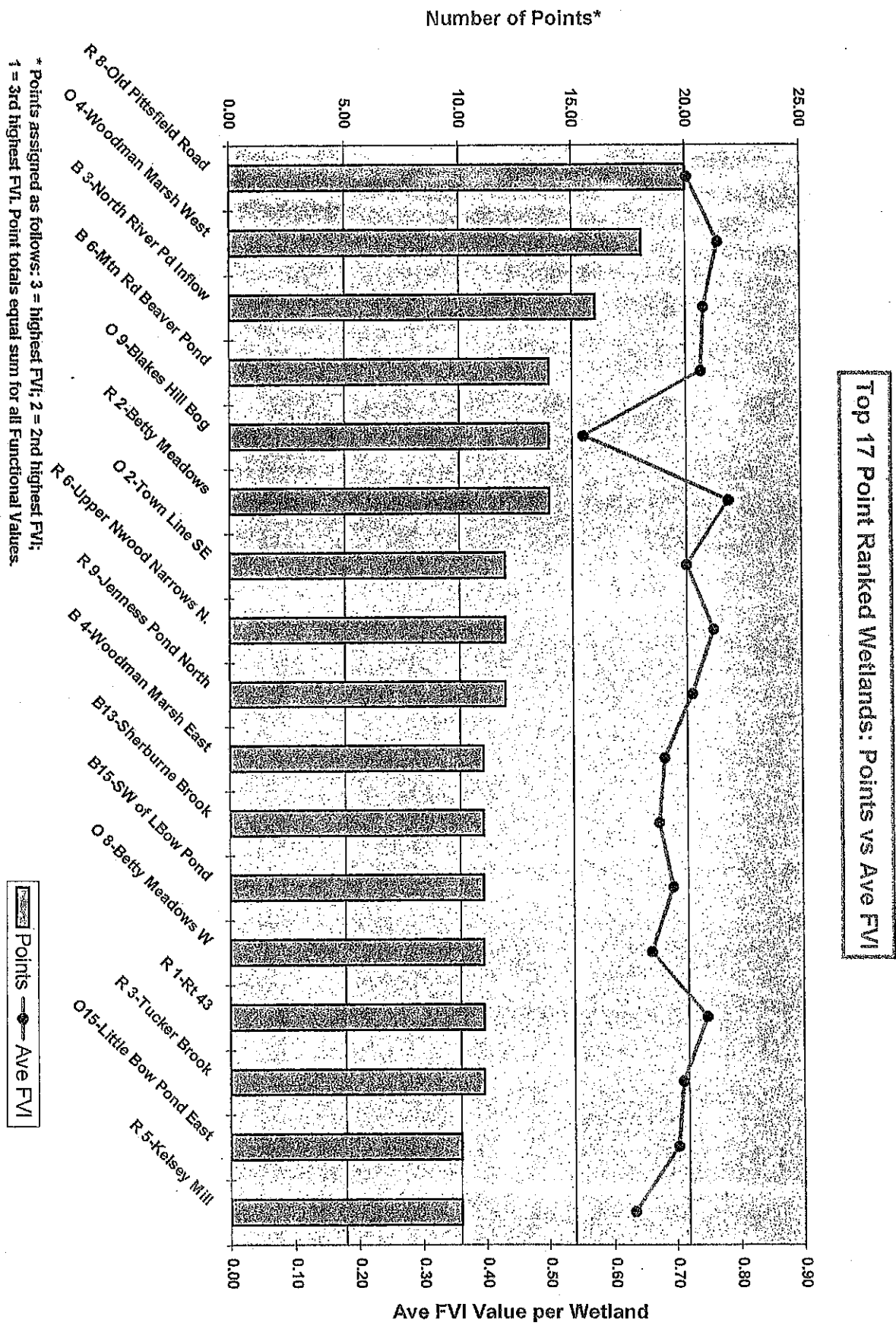


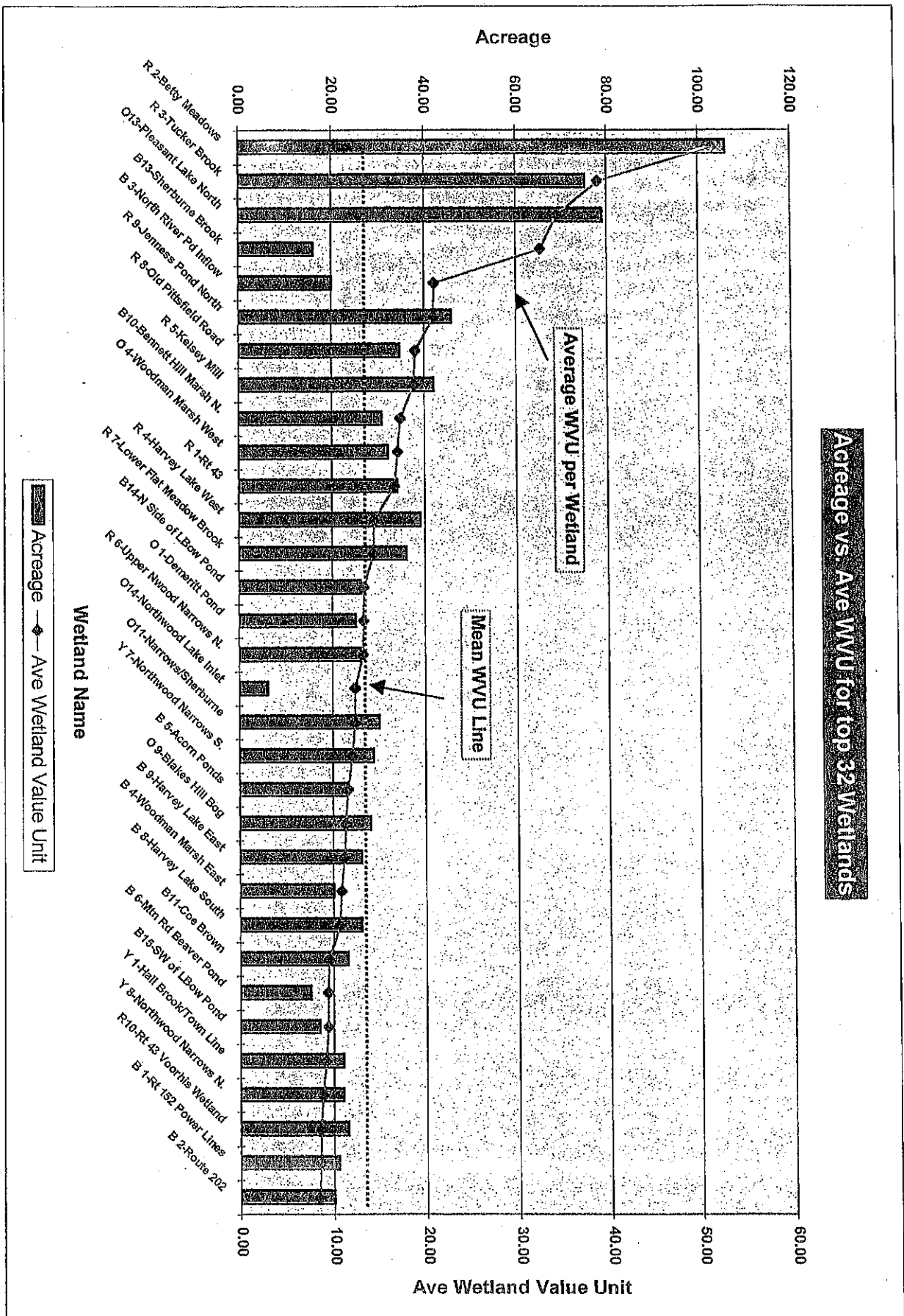
Average FVI's by Wetland

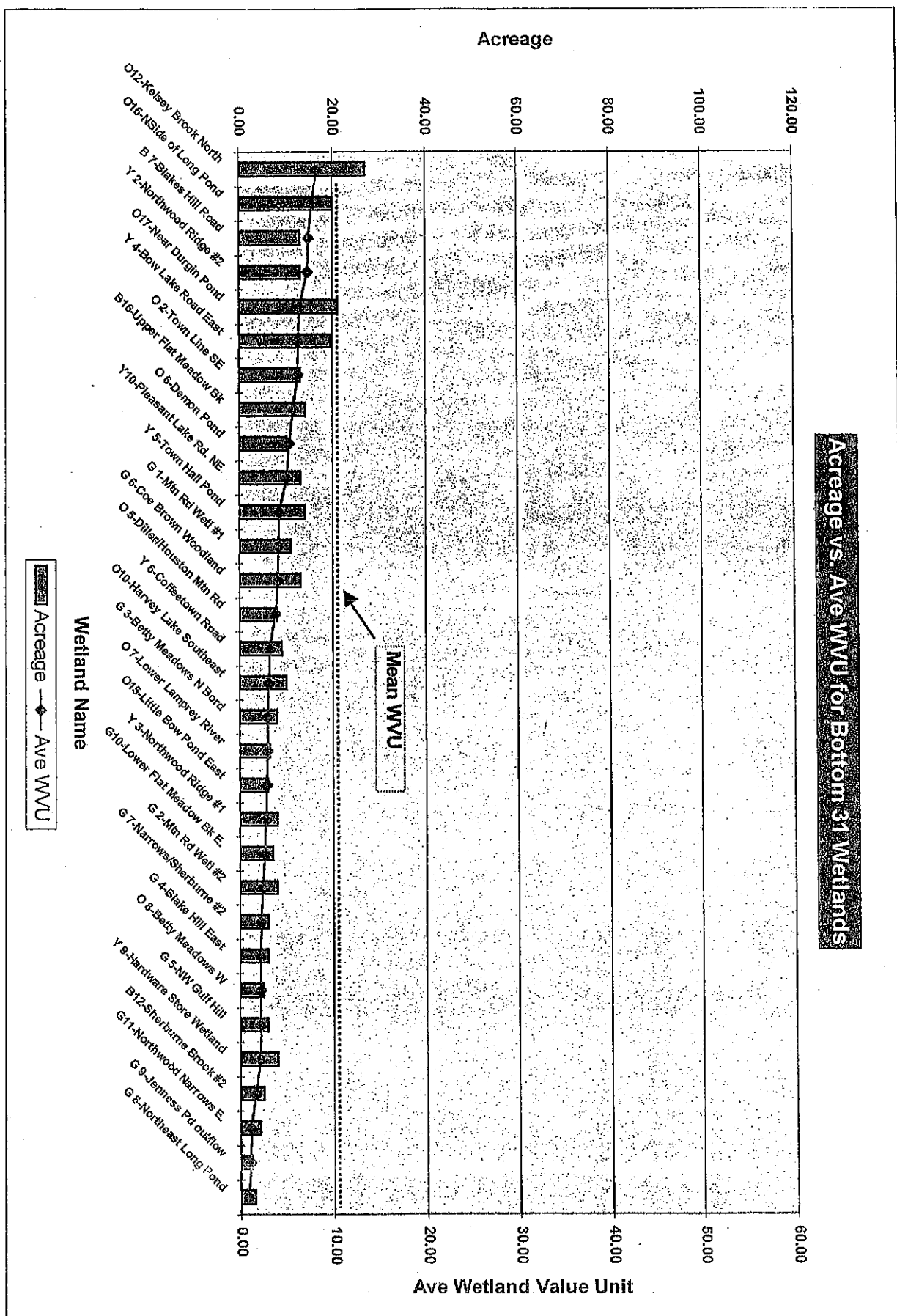


Top 16 Point Ranked Wetlands: Points vs Ave WVU

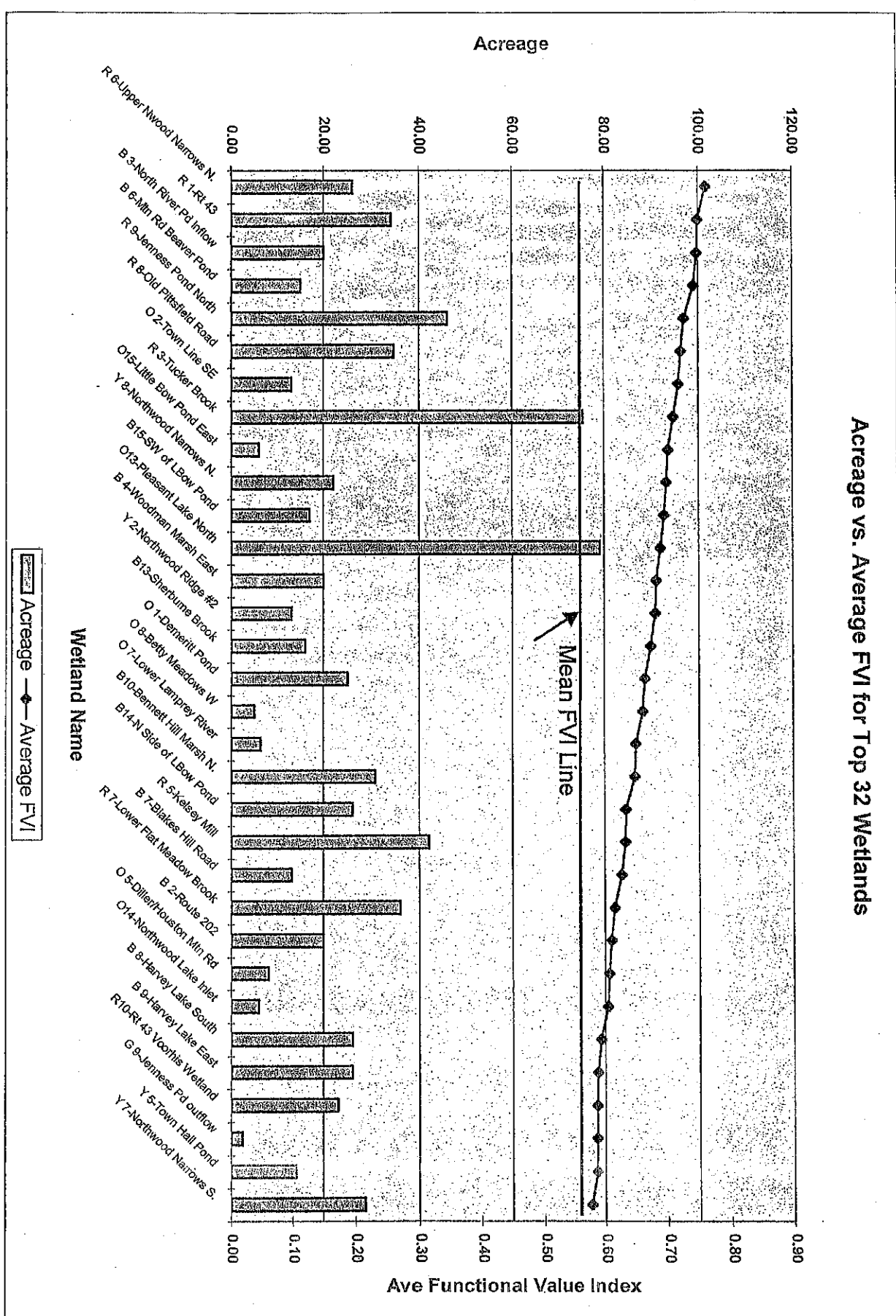




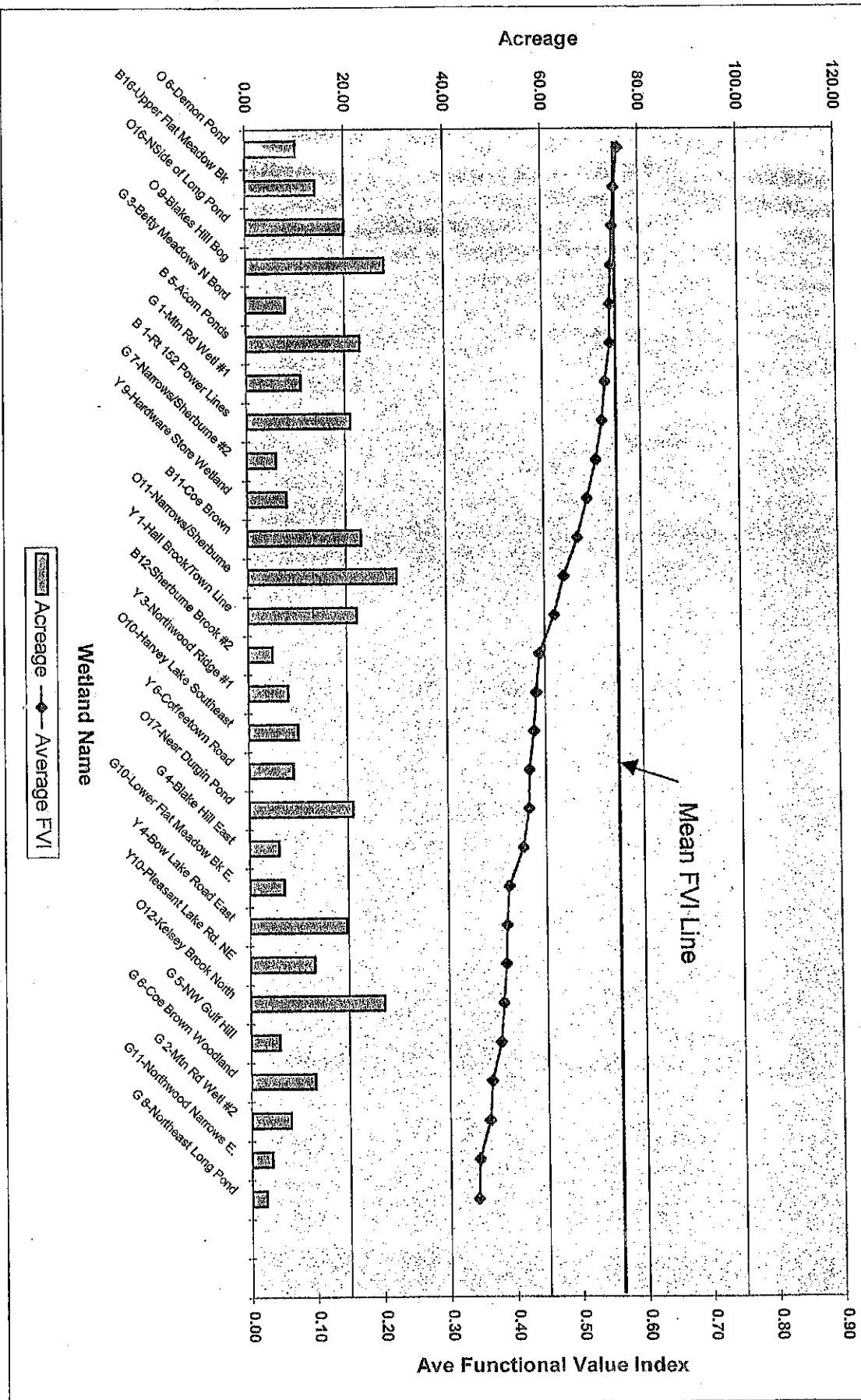


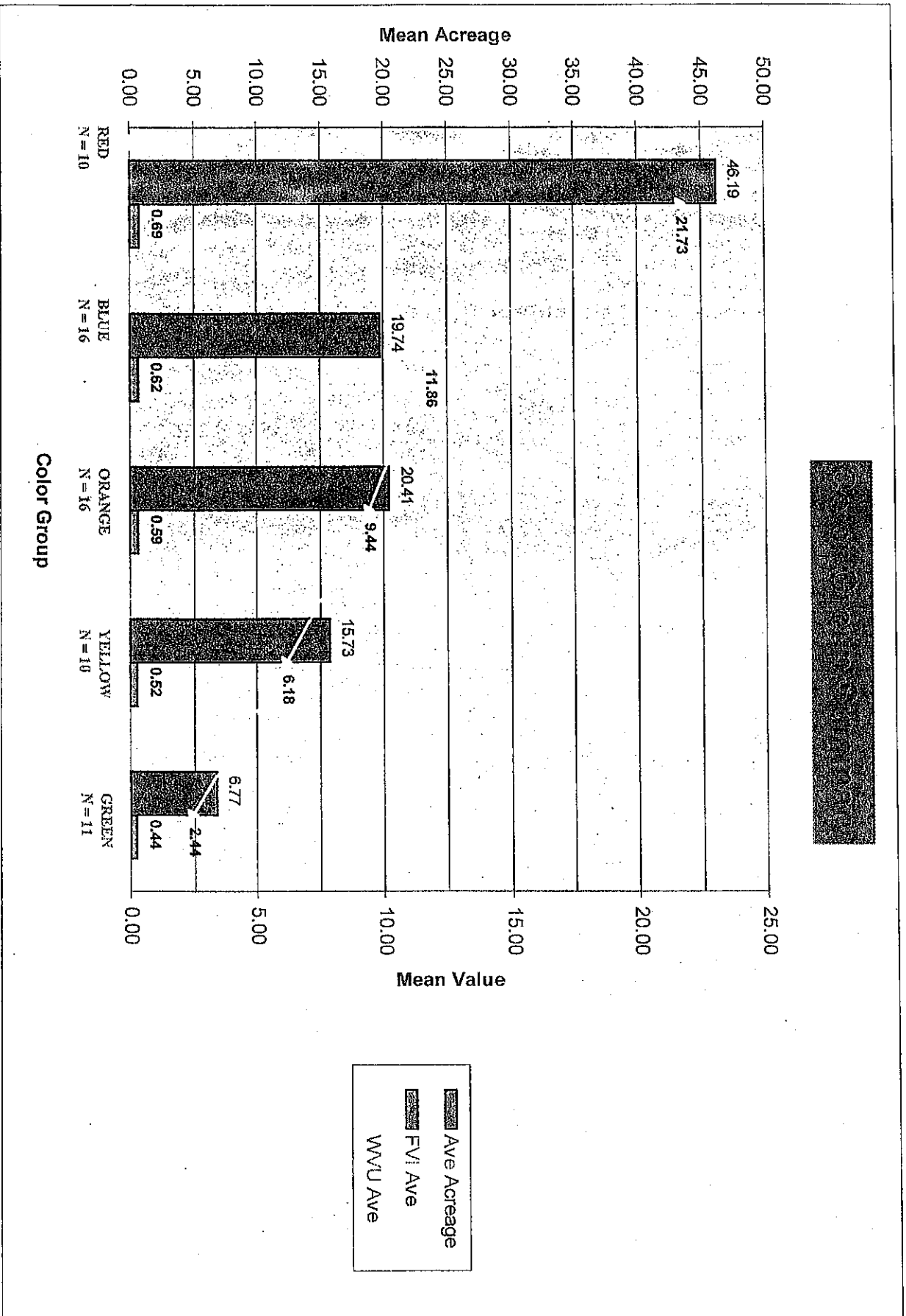


Acreage vs. Average FVI for Top 32 Wetlands

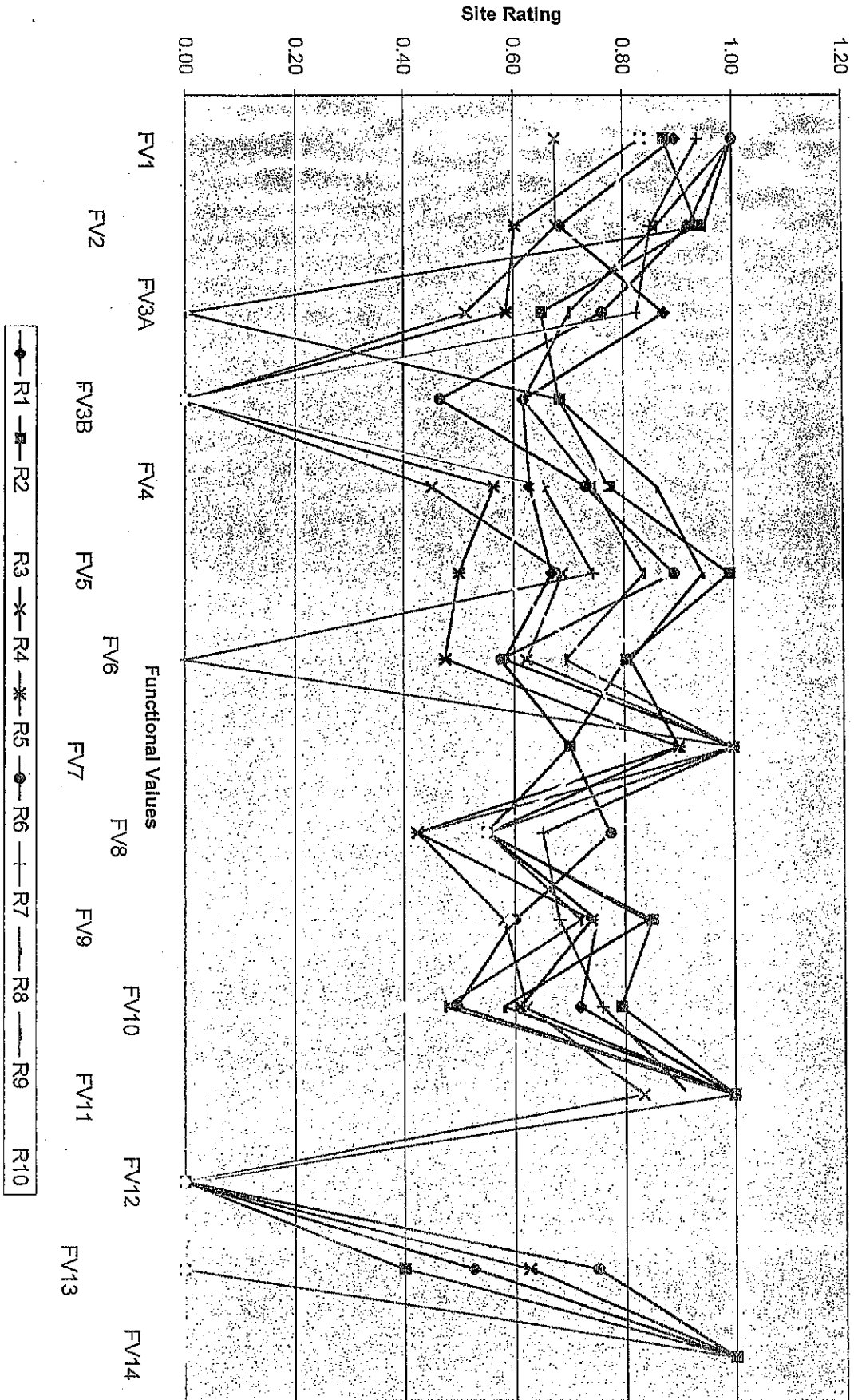


Acreage vs. Average FVI for Bottom 31 Wetlands

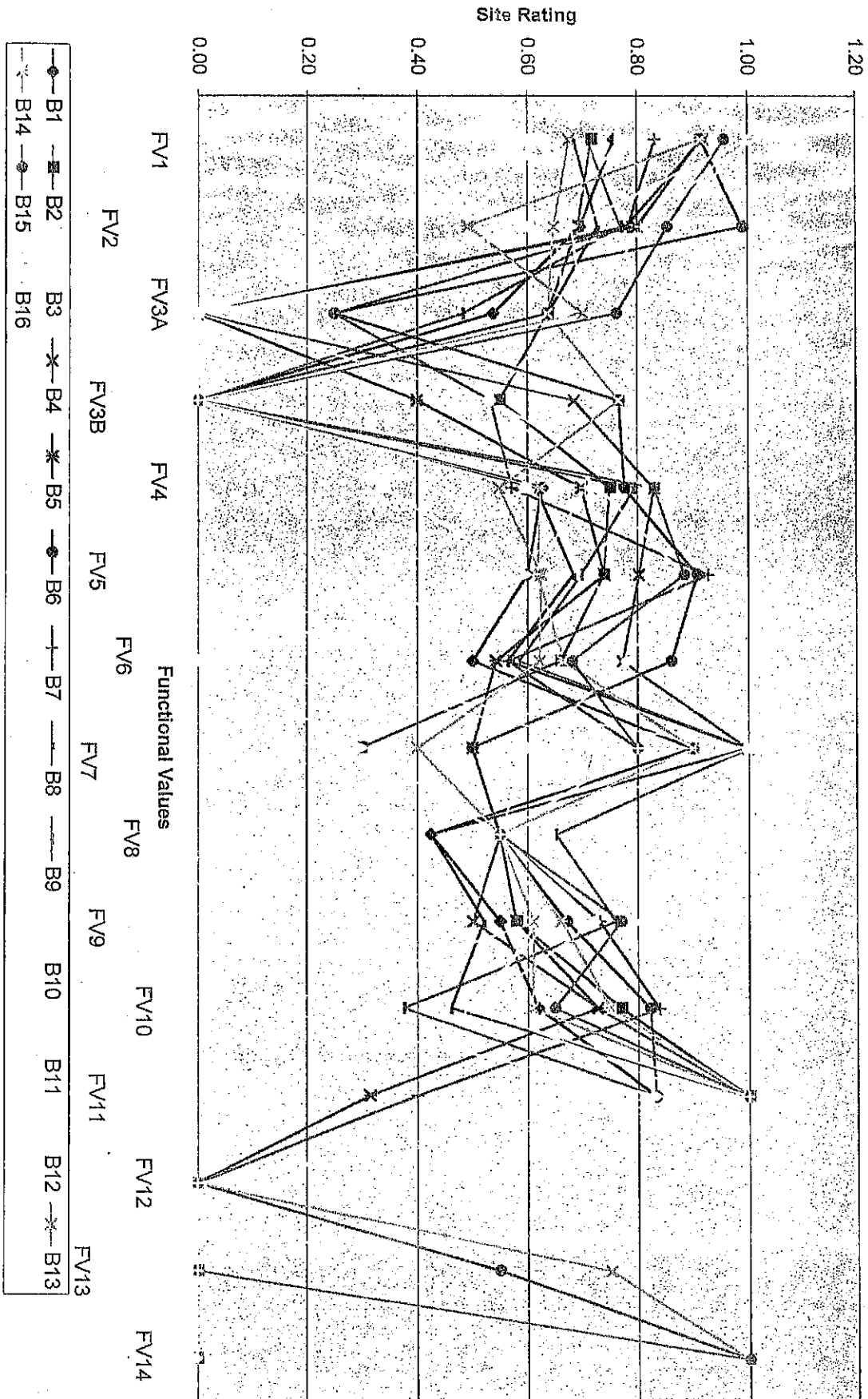




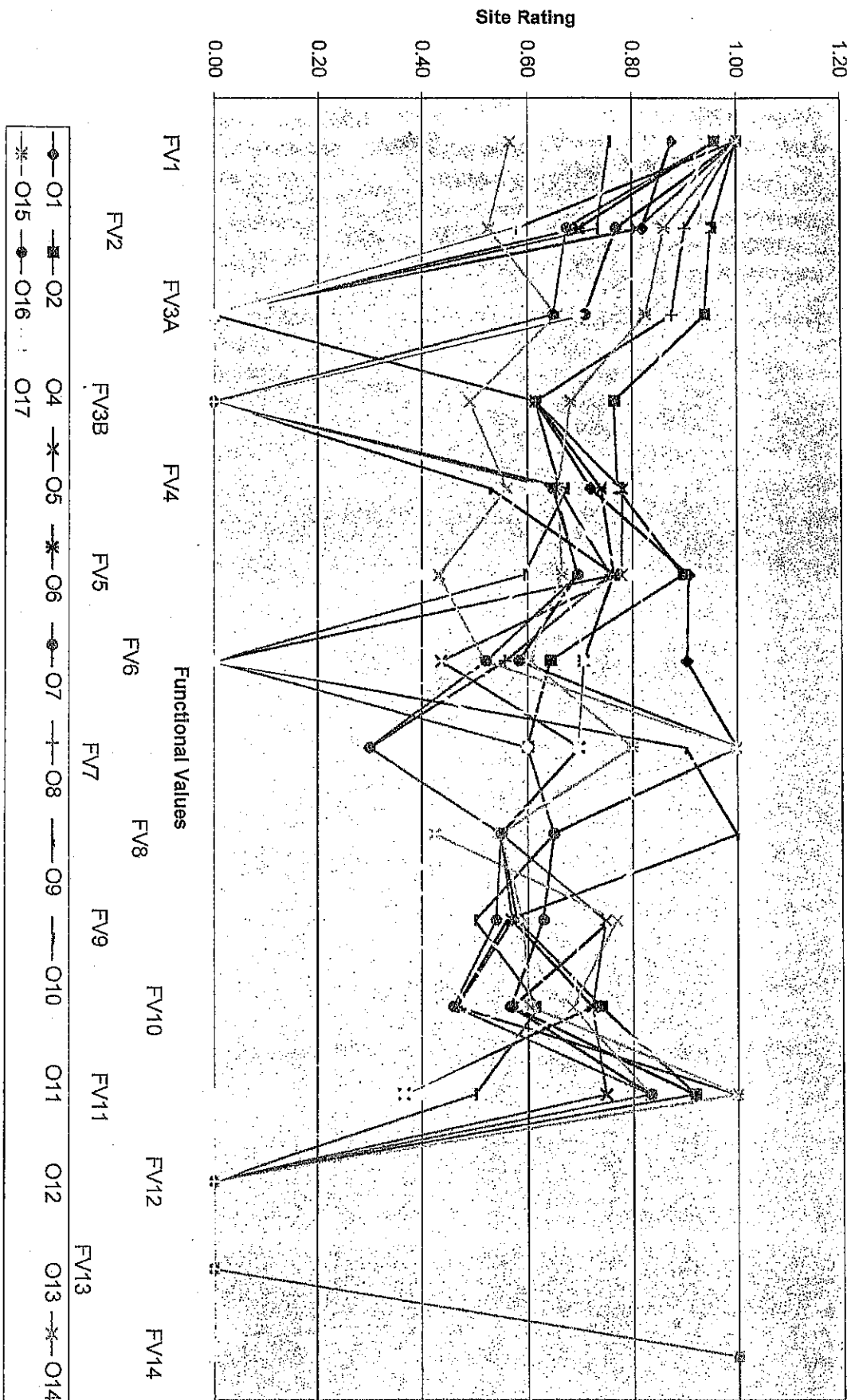
Functional Value Indices R1 - R10



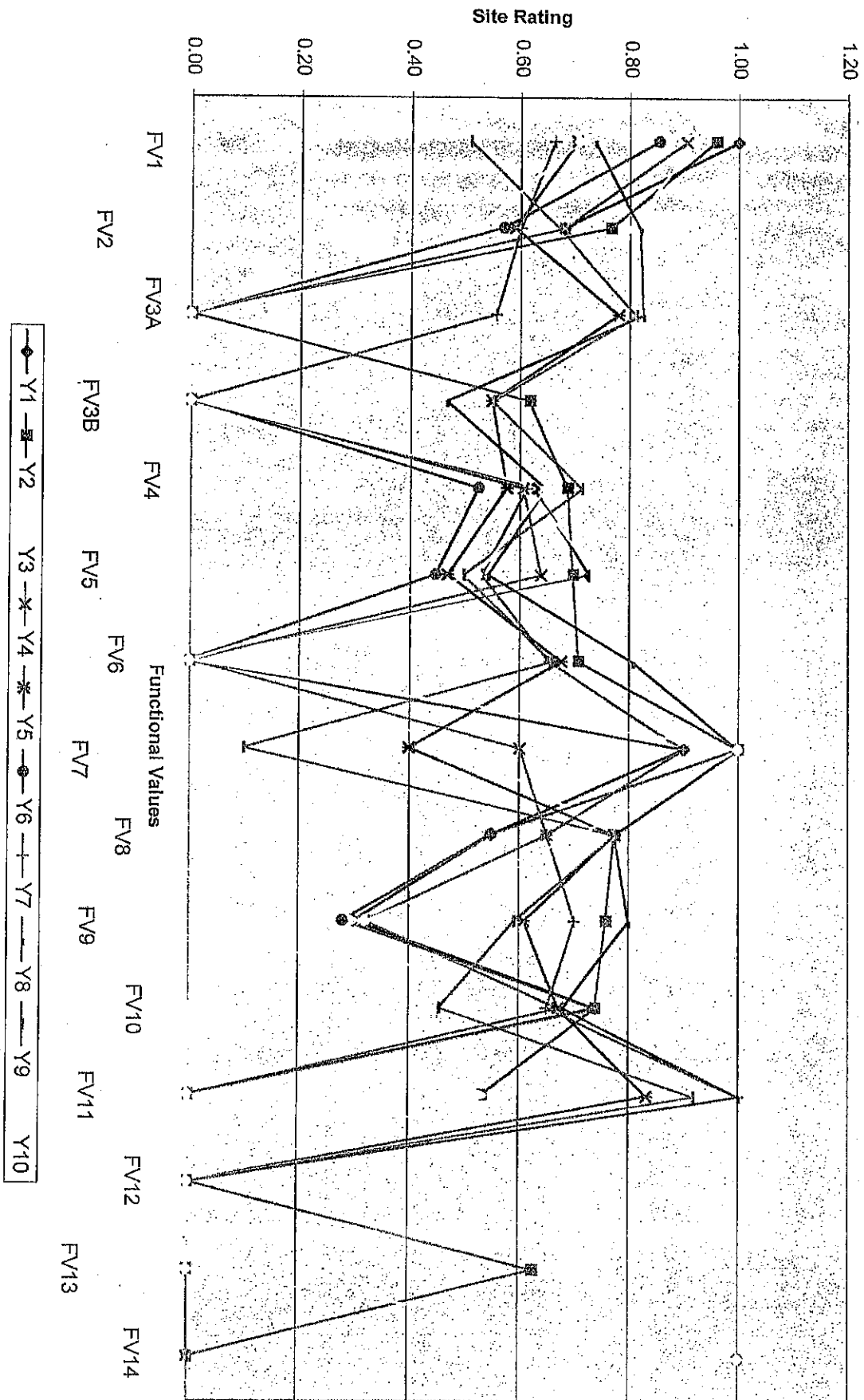
Functional Value Indices B1 - B16



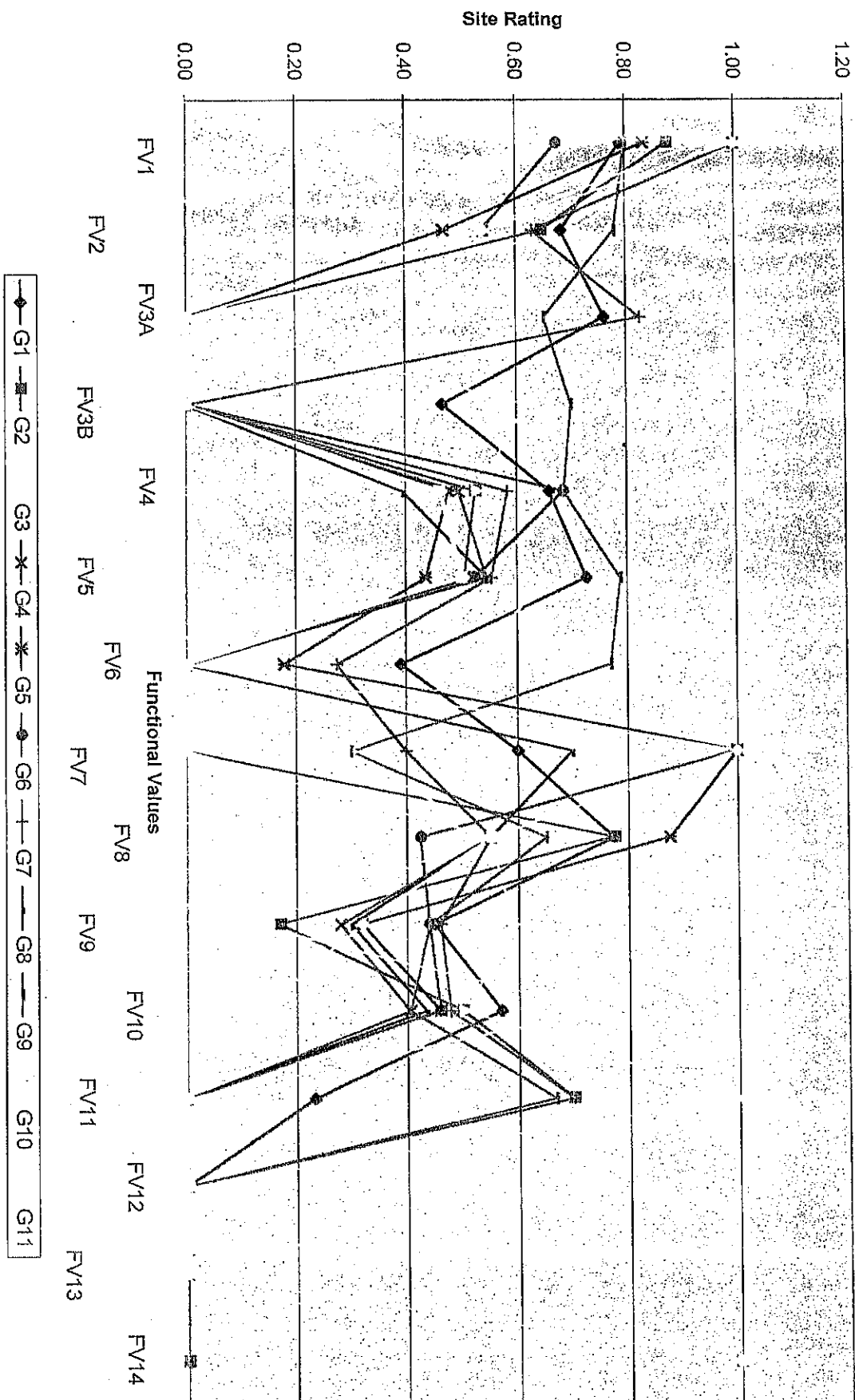
Functional Value Indices O1 - O17 (O3 Missing)



Functional Value Indices Y1 - Y10



Functional Value Indices G1 - G11



APPENDIX D: FUNCTIONAL VALUE SPECIFICATIONS

FVI 1 – Ecological Integrity

- 1) Estimation of the amount of hydric a soil was always field checked
- 2) Dominant land use zoning was identified as agriculture, forestry or similar open space zoning
- 3) Water quality was estimated based on surrounding land use; i.e. it was not field tested
- 4) The density of buildings within the 500 ft buffer was also field checked
- 5) The amount of fill was always estimated visually, and included only the amount of non-hydric fill
- 6) Woodland and idle land included all undeveloped, non-agricultural land
- 7) Level of human activity in the wetland was estimated after the entire wetland edge was walked
- 8) Level of human activity within the 500 ft buffer was visually estimated after the edge was walked
- 9) Plant community impacts included logging; invasive species effects were estimated on winter presence
- 10) Percent of wetland being drained was visually estimated during the high water table time period (N/A in this study)
- 11) Number of public road crossings included those that ran along the edge of the wetland; however these were only counted once even if they extended beyond 500 feet in length along the edge of the wetland
- 12) Artificial dams that altered the flow of water yet supported sufficient flow through a culvert were assigned a .5 value; beaver dams that were inactive or broken yielded a 1.0 value; beaver dams that were active but which did not significantly alter the wetland size were assigned a .75 value

FVI 2 – Wetland Wildlife Habitat

- 1) FVI1 index derived from above
- 2) Area of shallow permanent water was always estimated in field based on winter condition
- 3) Water quality was estimated based on surrounding land use; i.e. it was not field tested
- 4) Wetland classes were determined to be present only if in discernible amounts – i.e. >5% of the total wetland area or .25 acres, whichever was larger
- 5) Dominant wetland class was determined areally; intergrades (e.g. PEM/SS) were allowed based on height
- 6) Minimum interspersed size was approximately .25 acres; at least 3 patches each of at least 2 wetland classes had to have been present
- 7) Wetland juxtaposition was based on perennial stream or other open water connectivity as determined in field; adjacency to other unconnected wetlands was based on NWI map
- 8) Island minimum size: .1 acres; did not have to be separated by open water
- 9) Wildlife access was present if at least one strip >50 feet wide existed to another wetland; however, the other wetland could have been hydrologically connected
- 10) Percent of wetland edge bordered by upland wildlife habitat was applicable to all non-developed lands (incl. agricultural)

FVI 3 – Finfish Habitat – Streams & Rivers

(Zero entered for all fields unless perennial stream was visibly present at time of assessment)

PART A – stream name (if any) based on USGS map; size in acres based on average width times length

- 1) Dominant land use in watershed was based on USGS map AND field survey as necessary; intergrade land uses allowed – e.g. .75 or .25 values OK
- 2) Water quality was estimated based on surrounding land use; i.e. it was not field tested
- 3) Barriers to anadromous fish N/A – all streams in Northwood beyond range; therefore 1.0 value assigned
- 4) Stream bank width was estimated as average width from beginning of wetland boundary to end
- 5) Available shade was visually estimated in field as described in method
- 6) Stream modification applicable mostly to culverts and channels between hydrologically connected wetland units
- 7) Abundance of cover objects – included estimated presence of floating aquatic vegetation
- 8) Spawning areas were visually estimated based on all species of fish (i.e. not just stocked or anadromous)

PART B – size of pond or lake estimated in field, or if large, estimated using a dot grid and map (also checked against NWI map information)

- 1) Dominant land use as above
- 2) Water quality as above
- 3) Barriers to anadromous fish as above
- 4) Total area estimated as above
- 5) Abundance of cover objects was estimated visually as above
- 6) Percent of rooted vegetation was based on visual estimate of summer condition

FVI 4 – Educational Potential

(Site located at easiest access point(s) and comprised area accessible within a 15 minute walk)

- 1) Ecological Integrity FVI from above

- 2) Wetland Wildlife Habitat FVI from above
- 3) Proximity to schools based upon ability to walk to wetland, or of school bus to drive to wetland (i.e. not for 4WD drive vehicles)
- 4) Presence of nature preserve or other wildlife management areas based upon Special Features map of Northwood; included tree farms, conservation & deed restricted properties; 1.0 assigned only for publicly owned wildlife or nature preserve areas; .75 for tree farms; .50 for all other protected areas
- 5) Proximity to other plant communities always present; only condition otherwise would have been active farmland that immediately bordered the wetland on all sides
- 6) Off-road parking present (suitable for school buses) only if within 15 minutes walk of wetland; moderate expense assumed to develop parking area unless wetland difficult to get to and more than a fifteen minute walk from the nearest access point
- 7) Number of wetland classes was tallied for area within 15 minute walk of primary access point
- 8) Access to perennial stream present only if stream within 15 minute walking radius of primary access point
- 9) Access to pond or lake same as above
- 10) Student safety assessment based on attributes listed; bush-wacking not applicable; no .10 values assigned
- 11) Public access prohibited if most or all of wetland posted or fenced off; otherwise, some public access assumed; unlimited access applicable only to wetlands along busy roads
- 12) Visual/aesthetic detractors primarily road noise; intergrades allowed
- 13) Handicap accessibility present only if paved or gravel road surface present adjacent to wetland edge

FVI 5 – Visual/Aesthetic Quality

(Viewing sites located at principal access points, or if several available, from the locale(s) that presented the greatest opportunity to view the entire wetland)

- 1) Number of wetland classes based on minimum size of .25 acres per wetland class
- 2) Dominant wetland class based on attributes listed; intergrades acceptable if clearly a mixture of visible classes
- 3) Noise principally from roads, based on winter condition of surrounding vegetation
- 4) Odors present based on winter condition; unnatural odors primarily due to vehicle exhaust
- 5) Visible open water extent based on visual estimate at time of assessment, not summer condition
- 6) General appearance based on winter condition; minor detractors primarily skid trails, litter, etc.; severe detractors principally the developed landscape
- 7) Landform contrast subjectively determined; mostly moderate to low; intergrades often given
- 8) Dominant surrounding land use mostly 1.0, unless extensive residential and/or commercial areas present
- 9) Area of flowering trees & shrubs, or those that turn vibrant colors in fall based on observed presence and amount of deciduous vegetation
- 10) Wetland Wildlife Habitat as above

FVI 6 – Water-based Recreation in Watercourse Associated with Wetland

(Only evaluated for wetlands with permanent open water that would support non-powered boats)

- 1) Fishing – data on stocked streams came from local sources; when in doubt, occasional use was assumed, unless stream or pond was too shallow to support game fish
- 2) Hunting – posted signs seen in the field were the only reason to assume hunting prohibition
- 3) Wildlife as above
- 4) Water quality as above
- 5) Canoe and boat passage assumed as defined, even though some wetlands had very small areas for passage
- 6) Off-road parking value assumed 4WD access as well; 15 minute walking limit used as in FVI4 and FVI5
- 7) Access also assumed 4WD road usage; moderate expense typically assigned
- 8) Visual/aesthetic quality from above

FVI 7 – Flood Control Potential

(Wetland and watershed acreage derived from sources described above; Wetland Control Length (WCL) based on field observation; 0.0 assigned for two wetlands that were effective basins without an inflow or outlet)

- 1) Total wetland acreage as above
- 2) Total watershed size as above; some discrepancy with GIS data for watersheds that lay mostly outside of the Town boundaries (used dot grid and topo for these)
- 3) WCL measured in field at one foot flood stage at the outflow point; for stream outflows, WCL point chosen at narrowest width of stream channel immediately below the end of the palustrine wetland
- 4) Calculations completed in field, and checked using Microsoft Excel spreadsheet
- 5) FV index selected from table as given; whole tenths of an integer used; some intergrade points assigned where scale equivalencies warranted a clear selection – i.e. if Ratio A was 5 and Ratio B was 3, an FVI of .9 was assigned

(Sketches of the WCL was completed on field sheets for the 32 wetlands I was assigned)

FVI 8 – Ground Water Use Potential

(All wetlands were evaluated for this function, even if the wetland was greater than 1 mile from a stratified drift aquifer; presence of the latter was based upon NH GRANIT aquifer maps for Northwood and surrounding towns)

- 1) The presence of public wells was determined from the ground water hazard overlay map; private wells were assumed to be present at all occupied residences observed within 1 mile downstream of the wetland
- 2) Stratified drift aquifers were determined from the water resources map of the Northwood CC
- 3) Ground water quality was always assumed to meet NH DES drinking water quality standards
- 4) Water quality of watercourse as above

FVI 9 – Sediment Trapping

PART A - Opportunity

- 1) Average slope of the watershed was calculated as described in the NH method; at least 6 transverse lines both north-south and east-west were used for larger (e.g. > 25 acre) wetlands; 4 transverse lines were used for smaller wetlands
- 2) Potential sources of excess sediments were visually estimated based on observed and assumed land use in watershed

PART B – Overall Potential

- 1) Opportunity from Part A
- 2) Flood water storage from FVI 7
- 3) Average observed wetland border was used in this attribute
- 4) Dominant wetland class border was determined in the field as the class with the greatest amount of areal coverage; scrub shrub and dense cattails were assigned 1.0, forested wetland borders were assigned .5, all others were assigned 0.1 including those where no open water body was present; intergrade index points were acceptable
- 5) Areas of impounded water included all non-flowing open water bodies

FVI 10 – Nutrient Attenuation

PART A – Opportunity

- 1) Opportunity for sediment trapping from above
- 2) Potential sources of excess nutrients based on field and assumed conditions in the watershed; 1.0 assigned for areas with septic systems immediately adjacent to the wetland; intergrades occasionally assigned

PART B – Overall Potential

- 1) Opportunity for nutrient attenuation from above
- 2) Overall potential for sediment trapping from above
- 3) Dominant wetland class determined in field as described; only 2 “bogs” found
- 4) Area of water impoundment determined in the field as in FV 5 above

FVI 11 – Shoreline Anchoring and Dissipation of Erosive Forces

(Zeroes were assigned for this function for all wetlands without permanent open water)

- 1) Wetland morphology determined in the field, based on assumed growing season condition; all distinct shorelines assessed and computed for evaluation area
- 2) Width of wetland border estimated for growing season condition
- 3) Vegetation density estimated in field from assumed summer condition

FVI 12 – Urban Quality of Life

(Not assessed for the Town of Northwood)

FVI 13 – Historical Site Potential

(This function was only assessed for those wetlands where historical sites were observed, as determined in the field through direct observation of historic structures; stone walls did not count as ‘significant’; the area of the potential historical site was estimated based on the size and extent of the visible structures, and was never less than 1 acre; the average FVI was assigned a 1.0 if the site was well known locally for its historical significance)

- 1) Proximity of potential site to a perennial stream was visually estimated
- 2) Visible structures had to be quite evident in order to be recorded
- 3) Existence of mill pond had to be determined through local knowledge, unless the dam and outflow or mill race was still intact
- 4) Historical buildings had to be recognized as being locally significant and associated with the wetland and water course

FVI 14 – Noteworthiness

- 1) Determination of the presence of rare and endangered species was made through written communication with the NH Natural Heritage Program
- 2) Local knowledge (i.e. the Northwood CC) was utilized for determining whether the wetland was used for scientific research
- 3) The NH Natural Heritage Program also provided information on rare or exemplary natural communities; for example, the presence of several black gum swamps in Northwood suggested that others needed to be looked for
- 4) Local significance based upon high WVU scores was assessed upon completion of the data analysis; all wetlands with top (1st, 2nd, or 3rd) WVU scores were assigned a 1.0 for this question