2007 Wetland Mitigation Monitoring Report
Scarborough High School
Scarborough, Maine

March 2008

Prepared For:
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FIGURES

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Cover Photo: View east of wetland mitigation area M-1. Stantec Consulting. September 20, 2007.

PN 195600181 (103141.05)

PROJECT SUMMARY

Project Name	Scarborough High School Wetland Mitigation Project
Project Location/Town	Scarborough High School, Scarborough
County/State	Cumberland County, Maine
Monitoring Report	Year 4 of 5
Monitoring Date	September 20, 2007
Invasive Species Treatment Date	July and August 2007
Prepared By	Stantec Consulting; Georgia Hall, Project Scientist & Karol Worden, Project Manager[1]
Project Number	195600181 (103141.05)
Corps Permit Number	200300057
MDEP Permit Number	L-16166-TG-K-N

1.0 BACKGROUND

In 2003, the Scarborough School District began construction of the Scarborough High School expansion project in Scarborough, Maine (Figure 1). The expansion project included new access roads, parking areas, and buildings that resulted in approximately 1.45 acres of impacts to forested, scrub-shrub, and emergent wetlands. The approved *Scarborough High School, Scarborough, Maine - Wetland Mitigation Plan* (Woodlot, 2003) called for on-site wetland restoration and creation measures totaling 1.54 acres at 6 on-site wetland mitigation areas. Construction of the mitigation areas took place in the fall of 2003. Engineering and overall project management services were provided by Harriman Associates (Harriman). Dearborn Construction was the earthwork contractor, and Pierson Nurseries supplied and delivered the trees and shrubs. Salmon Falls Nursery (Salmon Falls) planted the trees and shrubs in November 2003 and mulched them during the winter of 2003/2004. In the fall of 2005, Salmon Falls replaced 121 trees and shrubs to compensate for stock mortality. Woodlot Alternatives, Inc. (Woodlot, now Stantec Consulting [Stantec])[2] provided oversight services for the mitigation construction, which was detailed in the *Scarborough High School Wetland Mitigation Project Construction and As-Built Report* (Woodlot, 2004). In 2007, Woodlot conducted the fourth year of post-construction mitigation monitoring, and the results are presented in this report.

During construction of a parking lot, an area east of wetland mitigation area M-4 was inadvertently cleared of small trees and shrubs. The area was graded smooth, seeded, and mulched after being cleared. The clearing and grading did not appear to have altered wetland hydrology, and the area was subsequently replanted with wetland trees and shrubs as recommended by Woodlot. Linda Kokemuller of the Maine Department of Environmental Protection (MDEP) was notified of the wetland clearing (hereafter referred to as the "remediation area") through the *As-Built Report* (Woodlot, 2004), and later met on-site with representatives from Harriman and Woodlot to determine why the area was cleared and what had been done to remediate the area. Upon review, Ms. Kokemuller indicated that the appropriate corrective actions had been taken, and no further measures were warranted. The remediation area and the six planted wetland mitigation areas will continue to be monitored to evaluate the success of the wetland restoration for the duration of the post-construction monitoring period.

[1] The Project Manager is available to answer questions concerning this report and can be reached at (207) 729-1199.
[2] On October 1, 2007, Woodlot Alternatives, Inc., merged with Stantec Consulting Services Inc. Throughout this report, references to work performed by Woodlot represent work performed before October 1, 2007, and references to work performed by Stantec represent work performed after October 1, 2007.

2.0 WETLAND MITIGATION MONITORING AND PERFORMANCE STANDARDS

The primary goal of wetland mitigation monitoring at the Scarborough High School wetland mitigation site is to determine whether wetland restoration and creation efforts at the six wetland mitigation areas and the remediation area are successfully meeting the wetland mitigation objectives as set forth in the wetland mitigation plan (Woodlot, 2003) and the standards and guidelines of the U.S. Army Corps of Engineers (Corps) and the MDEP. In accordance with the wetland mitigation plan for this site (Woodlot, 2003), wetland restoration and creation efforts at the mitigation areas and the remediation area will be considered successful if at the end of five years following construction, the following four performance standards are met.

1. **Density of Woody Plants:** (1) Those wetland mitigation areas that have been planted shall have at least 500 trees and shrubs per acre, of which at least 350 trees per acre are species that are healthy and vigorous, including planted and volunteer stock. (2) The area shall have at least three non-exotic species present, including planted and volunteer stock. To be counted, a species must be well-represented in the area. Volunteer species must support the functions consistent with the design goals. It is understood that restoring forested conditions will take at least 15–20 years, which is the time it typically takes for plantings to attain sufficient heights to be considered trees. However, if at the end of the monitoring period the planted wetland mitigation areas meet the standard for success for tree stocking density, it will be assumed that the wetland mitigation objective has been met regarding the establishment of forested wetland habitat.
2. **Percent Areal Cover:** With the exception of planned open water areas, the wetland portions of each wetland mitigation area and remediation area shall have at least 80 percent cover by non-invasive hydrophytes. For this project, invasive hydrophytes species are common reed (*Phragmites australis*)[3] and purple loosestrife (*Lythrum salicaria***)**. Other seeded areas (i.e., upland buffers) will be deemed successful if at the end of the third growing season, these wetland mitigation areas contain at least 80 percent areal cover of herbaceous plant species.
3. **Invasive Species Control:** Morrow's honeysuckle (*Lonicera morrowii*), oriental bittersweet (*Celastrus orbiculata*), multiflora rose (*Rosa multiflora*), Japanese knotweed (*Fallopia japonica*), common reed, purple loosestrife, and European alder (*Alnus glutinosa*) plants at the wetland mitigation areas are being controlled.
4. **Erosion Control:** Slopes within and adjacent to the wetland mitigation areas are stabilized.

3.0 MONITORING METHODS

The fourth year of wetland mitigation monitoring at Scarborough High School was conducted on September 20, 2007, and assessed:

- planted stock survivorship for the remediation area;
- general health and condition of the planted trees and shrubs in mitigation areas M-1 through M-4 and M-6;
- composition and percent areal cover of herbaceous vegetation in all mitigation areas and the remediation area;
- presence of invasive species; and
- soil stabilization.

During previous years of monitoring, quantitative assessment of woody stems was completed in mitigation areas M-1 through M-4, M-6, and within the remediation area. By 2006, the mitigation areas had met the performance standard for the density of woody stems; and in 2007, the quantitative assessment was replaced with a general health assessment of the woody stock. The general health assessment (i.e., apparent growth, vigor) was completed by a meander survey during which notes were

[3] Taxonomy follows *Flora of Maine a Manual for Identification of Native and Naturalized Vascular Plants of Maine.* (Haines and Vining, 1998) and National indicator status follows proposed revisions to Reed, P.B., Jr. (1988). *National List of Vascular Plant Species that Occur in Wetlands: National Summary.*

taken on the condition of woody vegetation. The quantitative assessment of the remediation area was completed by counting the planted stock within the 5,500 square-foot planted area.

Dense herbaceous vegetation was established by the first year of monitoring (i.e., 2004) within each of the wetland mitigation areas[4] and within the remediation area. To assess herbaceous cover and species composition in each of these areas, meander surveys were conducted in 2004 and 2005. In 2006 and 2007, to provide a better assessment of cat-tail (*Typha* spp.) density and plant diversity, vegetation also was surveyed along a transect through mitigation areas M-1 through M-4. Vegetation was sampled in 1-meter square plots placed at 10-meter intervals along the transect. Data recorded for each plot included the plant species present, estimated percent areal cover for each species, and hydrologic conditions. Meander surveys were then conducted to assess bank stabilization in mitigation areas M-1 through M-4 and, as in previous years, to assess vegetative cover and composition in mitigation areas M-5 and M-6 and the remediation area.

Photographs were taken to document vegetation composition and density and the health and growth of planted trees. Incidental wildlife observations were also recorded. Representative photographs are presented in Appendix A, and photograph locations are provided on Figure 2.

4.0 MONITORING RESULTS

4.1 SPECIES COMPOSITION AND PERCENT AREAL COVER

Mitigation Areas M-1, M-2, M-3, and M-4: Thirty-five native species and 2 introduced invasive species were identified in the 35 vegetation sample plots. Seven species occurred in at least 20 percent of the plots. In decreasing order of abundance, these species were wool-grass (*Scirpus cyperinus*, FACW+),[5] soft rush *(Juncus effusus*, FACW+), sallow sedge (*Carex lurida*, OBL), orange touch-me-not (*Impatiens capensis*, OBL), purple loosestrife (FACW+), blue vervain (*Verbena hastata*, FACW+), and cat-tail species (OBL). Cat-tails occurred in 20 percent of the vegetation sample plots but accounted for only 5 percent of the total estimated areal cover. This estimate for cat-tails is similar to the results of the 2006 assessment where cat-tails accounted for 8 percent of the total areal cover in the sample plots. The cat-tails occur along with a diverse assemblage of native plant species and only occasionally form a monotypic stand in the wettest areas. Note that no attempt was made to identify the cat-tails to species. The plants observed appeared to be common cat-tail (*Typha latifolia*), but the hybrid, *T*. x *glauca*, may also be present. Narrow-leaved cat-tail (*T*. *angustifolia*),[6] however, was not observed. The estimated areal cover for live vegetation in the 35 sample vegetation plots averaged 76 percent. Plots with low areal cover contained numerous dead purple loosestrife stems and/or contained standing water or evidence of ponding earlier in the growing season. In general, the mitigation areas are densely vegetated.

The purple loosestrife was treated with herbicide in July and August 2007 prior to monitoring. Live stems of purple loosestrife occurred in 26 percent of the vegetation sample plots but represented only 1.5 percent of the total areal cover. The percent areal cover of dead purple loosestrife stems in the plots also was estimated for comparison. Dead purple loosestrife stems occurred in 34 percent of the sample plots and accounted for 13 percent of the total areal cover. This is comparable to the results of the 2006 monitoring where purple loosestrife occurred in 52 percent of the vegetation sample plots and accounted for 10 percent of the total areal cover.

During the 2007 monitoring, European alder (FACW-), an introduced and invasive species, was identified within the mitigation areas. Much of the original woody stock that was planted in 2003 was labeled as

[4] As outlined in the *Scarborough High School Wetland Mitigation Project Construction and As-built Survey Report* (Woodlot, 2004), mitigation areas M-1 through M-4 were merged into a single mitigation area during the course of construction and are treated as one unit in the mitigation monitoring reports.

[5] National indicator status follows proposed revisions to Reed, P.B., Jr. 1988. *National List of Vascular Plant Species that Occur in Wetlands: National Summary*. U.S. Fish and Wildlife Service. Biol. Rep. 88 (24). 244 pp.

[6] *T. angustifolia* and *T. latifolia* are the putative parents of *T.* x *glauca*.

speckled alder but has been determined to be European alder. Based upon the 2007 monitoring, European alder occurred in only one sample plot but is well represented in the mitigation areas. Speckled alder also is well established; occurring primarily in the long, narrow portion of mitigation area M-1.

Mitigation Area M-5: Areal cover on the upland berm was greater than 100 percent and was dominated by Canada goldenrod (*Solidago canadensis*, FACU), deer tongue grass (*Panicum clandestinum*, FAC+), calico aster (*Symphyotrichum lateriflorum*, FAC), eastern lined aster (*S. lanceolatum*, NI), and American mannagrass (*Glyceria grandis*, NI). The wetland area north of the M-5 berm is dominated by cat-tails. Speckled alders are colonizing the surrounding area, and soft rush, orange touch-me-not, purple loosestrife, and bur-reed (*Sparganium* sp, OBL) also were observed.

Mitigation Area M-6: Areal cover exceeded 100 percent, and the area was dominated by native wetland species such as wool-grass, soft rush, sallow sedge, pointed broom-sedge (*Carex scoparia*), and speckled alders. Planted green ash (*Fraxinus pennsylvanica*), speckled alder, and balsam fir (*Abies balsamea*) appeared healthy, and volunteer gray birch (*Betula populifolia*), quaking aspen (*Populus tremuloides*), and speckled alder were present. Approximately a dozen European alders also were present.

4.2 WOODY STEM DENSITY

Remediation Area: Woodlot conducted a thorough meander survey of the remediation area and counted trees and shrubs. Twenty-nine stems were found, which represents a stem count of approximately 230 stems per acre. This is a decrease of seven stems (i.e., four green ashes, two arrowwood [*Viburnum dentatum*] and one silky dogwood [*Cornus amomum*]) since the 2006 monitoring. In addition, this count included seven stems of European alder. Eliminating the European alder brings the stem count to twenty-two, which represents 174 stems per acre. This is below the performance standard of 420 stems per acre for this area.

Volunteer gray birches were observed on the berm west of the remediation area, but colonization continues to be slower than in the mitigation areas. Adequate seed sources, including red maple (*Acer rubrum*), speckled alder, and native willow species, occur adjacent to the remediation area. It is anticipated that these species will eventually colonize the area, but supplemental planting will likely be needed to meet the performance standard.

Mitigation Areas M-1 through M-4 and M-6: In 2006, both the M-1 through M-4 mitigation area and the M-6 mitigation area had exceeded the success standard of 500 woody stems per acre (Woodlot, 2007). Areas M-1 through M-4 had attained an average estimated stem density of 739 stems per acre, and mitigation area M-6 had attained an estimated stem density of 992 stems per acre. European alder was confirmed at both mitigation areas in 2007. Utilizing the 2006 stem counts, M-6 still exceeds the success standard if the alder stems, including both speckled alders and European alders, are eliminated from the calculations. Also, mitigation areas M-1 through M-4 are very close (i.e., 465 stems/acre) to meeting the standard if two-thirds of the 2006 alder stem count is attributed to European alder and removed from the calculations. Based on 2007 site observations, European alder does not appear to account for more than two-thirds of the alders in areas M-1 through M-4.

Table 1. Results of September 2007 Meander Survey Stem Density Count

Species	Wetland Indicator Status	Number of Stems[a]
European alder (*Alnus glutinosa*)	FACW	7
Arrowwood (*Viburnum dentatum*)	FACW	2
Silky dogwood (*Cornus sericea*)	FACW	4
Green ash (*Fraxinus pennsylvanica*)	FACW	8
Red maple (*Acer rubrum*)	FAC	8
Stem Total:		29
Stems/Acre		230

[a] Sweetfern (*Comptonia peregrina*) and meadowsweet (*Spiraea alba* var. *latifolia*) volunteers are not included in the stem counts.

4.3 WOODY VOLUNTEERS

Native, woody volunteer species continue to colonize the mitigation areas. Commonly observed volunteers included speckled alder, pussy willow (*Salix discolor*), long-beaked willow (*Salix bebbiana*), slender willow (*Salix petiolaris*), meadowsweet (*Spiraea alba* v. *latifolia*), Virginia rose (*Rosa virginiana*), bayberry (*Myrica pensylvanica*), red maple, and gray birch. Green ash volunteers were also observed in areas M-1 through M-4, and eastern white pine (*Pinus strobus*) and northern red oak (*Quercus rubra*) were noted along the upland forested edge of these mitigation areas. Sweetfern (*Comptonia peregrina*) continues to colonize the adjacent road bank bordering the M-1 through M-4 mitigation areas, and volunteers of arrowwood and numerous stems of quaking aspens were observed in mitigation area M-6. Of these woody volunteers, speckled alder, the willows, meadowsweet, Virginia rose, bayberry, red maple, green ash, and arrowwood are considered either facultative (FAC) or facultative wetland (FACW) species.

4.4 HYDROLOGY AND SOILS

In 2007, soils within the pits of the constructed pit and mound micro-topography were either inundated or saturated. Abundant groundwater and surface flows contribute to the wetland hydrology.

4.5 INVASIVE PLANTS

Purple loosestrife: A licensed applicator conducted herbicide treatment of the purple loosestrife in August 2007. The treatment involved two separate rounds of herbicide application, which were completed approximately four weeks apart. The purple loosestrife was treated with a two percent solution of Rodeo® and water that was applied as a foliar spray using either a backpack sprayer or a hand sprayer. During the second application, the seed/flower heads on the purple loosestrife were cut from the plant, bagged, and removed from the site prior to spraying the plants. The application reduced the estimated areal cover of purple loosestrife by approximately 90 percent in the sample vegetation plots.

Japanese knotweed: The Scarborough Recreation Department substantially reduced the seed source for Japanese knotweed by removing the majority of the plants from the border of the retention pond on their property in 2006. They also have continued to mow the border of the retention pond, as close to the pond as practical, to limit the presence and potential seed source of this species. In addition, the licensed applicator applied a 50 percent solution of Rodeo® and water to the few plants along the berm north of the remediation area and along the edge of the parking lot east of the remediation area. The herbicide was applied by cutting the stems and filling the hollow of the stem with the herbicide solution.

Russian olive (*Elaeagnus angustifolia*): Russian olive plants were removed from the berm north of the remediation area as recommended in the 2006 monitoring report (Woodlot, 2007). In addition, the licensed applicator treated the few remaining plants along this berm using the "cut-and-paint" method. Under this method, the main stem of each plant was cut near ground level, and a 50 percent solution of Rodeo® and water was then painted on the remaining stump. This occurred as a single application during the 2007 growing season.

Common reed: Several stems of common reed were identified in 2006 in the M-2/M-3 area and were successfully treated. In 2007, a few stems of this species located in the M-2 mitigation area were treated with a foliar application of a two percent solution of Rodeo® and water. Six additional stems were found in the remediation area and one stem in the M-4 mitigation area. These stems were marked and will be treated with herbicide in 2008.

Morrow's honeysuckle: A hedgerow located between the M-1 mitigation area and Herbert Drive was densely populated with invasive species, including Morrow's honeysuckle. In 2007, the licensed herbicide applicator treated the invasive species within this hedgerow using the "cut-and-paint" method described above. Note that the herbicide application was restricted to the portion of the hedgerow owned by the school. During mitigation monitoring, one honeysuckle shrub also was removed from mitigation site M-6. Several additional shrubs in the M-1 through M-4 mitigation areas have been marked and will be treated with herbicide in 2008.

Multiflora rose: Multiflora rose shrubs were present in the hedgerow located between the M-1 mitigation area and Herbert Drive. As described above, these plants were treated with herbicide in 2007. No additional stems of this species were observed within the mitigation areas.

4.6 EROSION CONTROL

Banks and drainage channels in the mitigation areas have been successfully stabilized, and no detrimental erosion was observed in 2007.

4.7 WILDLIFE OBSERVATIONS

Incidental wildlife observations included American goldfinches (*Carduelis tristis*), gray catbird (*Dumetella carolinensis*), blue jay (*Cyanocitta cristata*), spring peeper (*Pseudacris crucifer*), green frog (*Rana clamitans*), meadowhawk dragonflies (*Sympetrum* spp.), monarch butterfly (*Danaus plexippus*), red admiral butterfly (*Vanessa atalanta*), bumblebees (*Bombus* sp.), and honey bees (*Apies mellifera*).

5.0 CONCLUSIONS

5.1 SUMMARY

European alder that was labeled as speckled alder at the time of the planting was identified within the mitigation areas and the remediation area. The Scarborough Schools Maintenance Department has contracted Stantec to design and implement a plan for the control of this invasive species. Based on the 2006 stem counts, mitigation area M-6 will continue to exceed the success standard for woody stem density after the European alder is removed. Mitigation areas M-1 through M-4 will continue to exceed or meet this standard. As volunteer native trees and shrubs continue to colonize these areas, it is not anticipated that additional plantings will be needed.

Speckled alder is the most common woody volunteer in the mitigation areas. Other wetland woody volunteers include pussy willow, meadowsweet, bayberry, red maple, and arrowwood. Volunteer species in upland areas include eastern white pine, red oak, sweetfern, and quaking aspen.

The density of herbaceous vegetation, expressed in percent areal cover, exceeds the 80 percent standard of success in each wetland mitigation area. Cat-tails occur in the area interspersed with a

diverse assemblage of native plant species and only occasionally form a monotypic stand in the wettest areas. Purple loosestrife, as well as other invasive species, is being successfully controlled.

The hydrology in the wetland mitigation areas and the remediation area was seasonally inundated and/or saturated. Abundant groundwater and surface flows in each wetland mitigation area appear to have contributed to the rapid development of wetland vegetation.

Drainage channels and banks in the mitigation areas are successfully stabilized, and no detrimental erosion was observed in 2007. It is expected that natural changes to drainage channel size and locations may continue over time.

5.2 RECOMMENDATIONS

To assure that the Scarborough High School wetland mitigation site is successfully meeting the stated goals, objectives, and performance standards, Stantec recommends the following.

1. Install 31 slender willows (*Salix petiolaris*) in the remediation area so that the number of woody stems matches the original number of 53 woody stems that were planted in this area.
2. Conduct quantitative assessment of woody stem density in the remediation area.
3. Continue to monitor invasive species.
4. Continue to contract a licensed herbicide applicator to control invasive species.
5. Conduct meander surveys of the mitigation areas for a qualitative assessment of woody stem density and vigor.
6. Conduct meander surveys for qualitative assessment of vegetation composition and density in areas M-5 and M-6.
7. Continue to assess common cat-tail density and plant diversity in areas M-1 through M-4 by monitoring percent areal cover along an east to west transect through these areas.

6.0 LITERATURE CITED

Haines, A. and T. F. Vining. 1998. *Flora of Maine: A Manual for Identification of Native and Naturalized Vascular Plants of Maine*. V. F. Thomas Co., Bar Harbor, Maine.

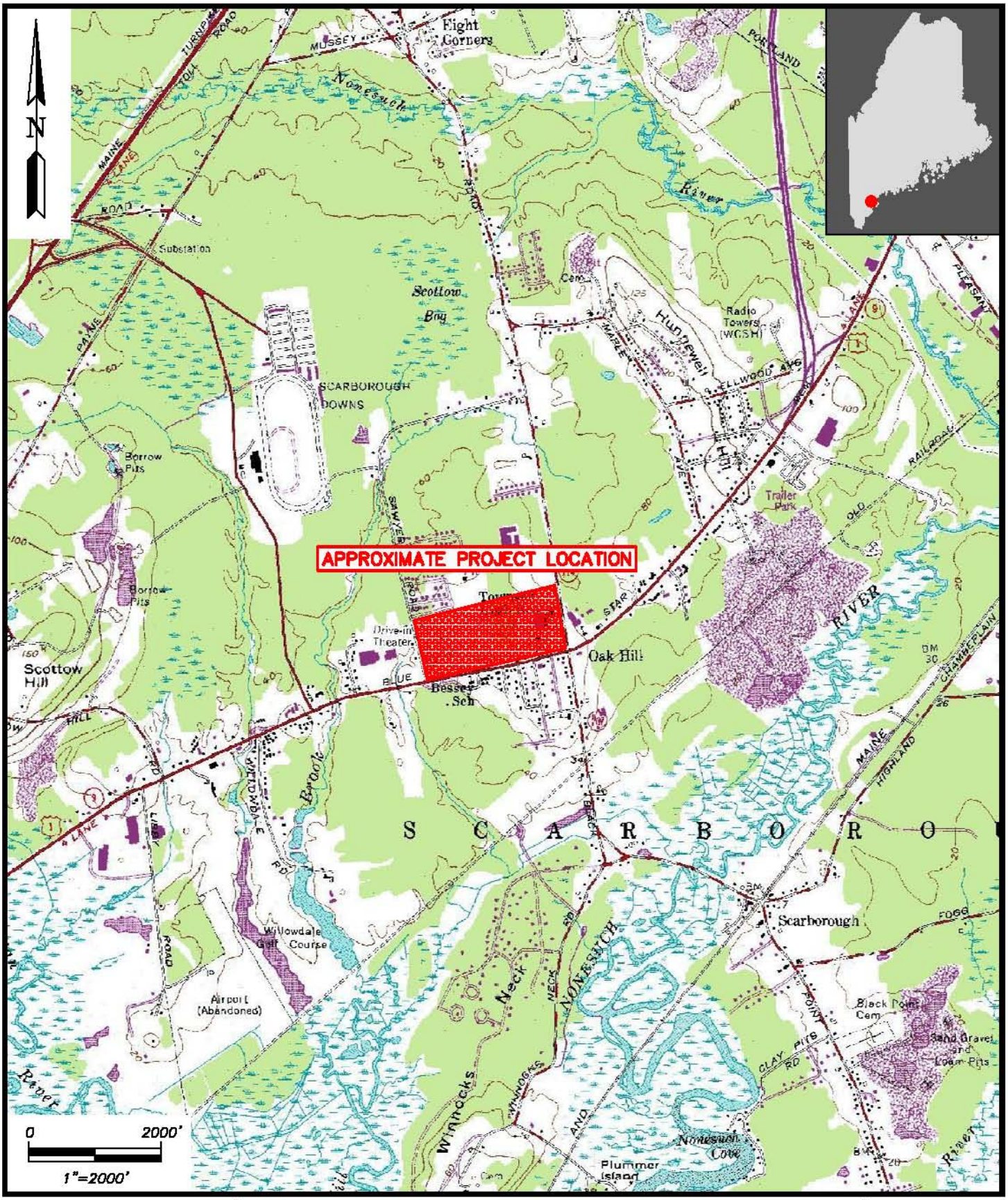
Reed, P. B., Jr. 1988. Proposed revision of the *National List of Vascular Plant Species that Occur in Wetlands: National Summary*. U. S. Fish & Wildlife Service Biological Report. 88(24).

Woodlot Alternatives, Inc. 2003. *Scarborough High School, Scarborough, Maine - Wetland Mitigation Plan*. Topsham, Maine.

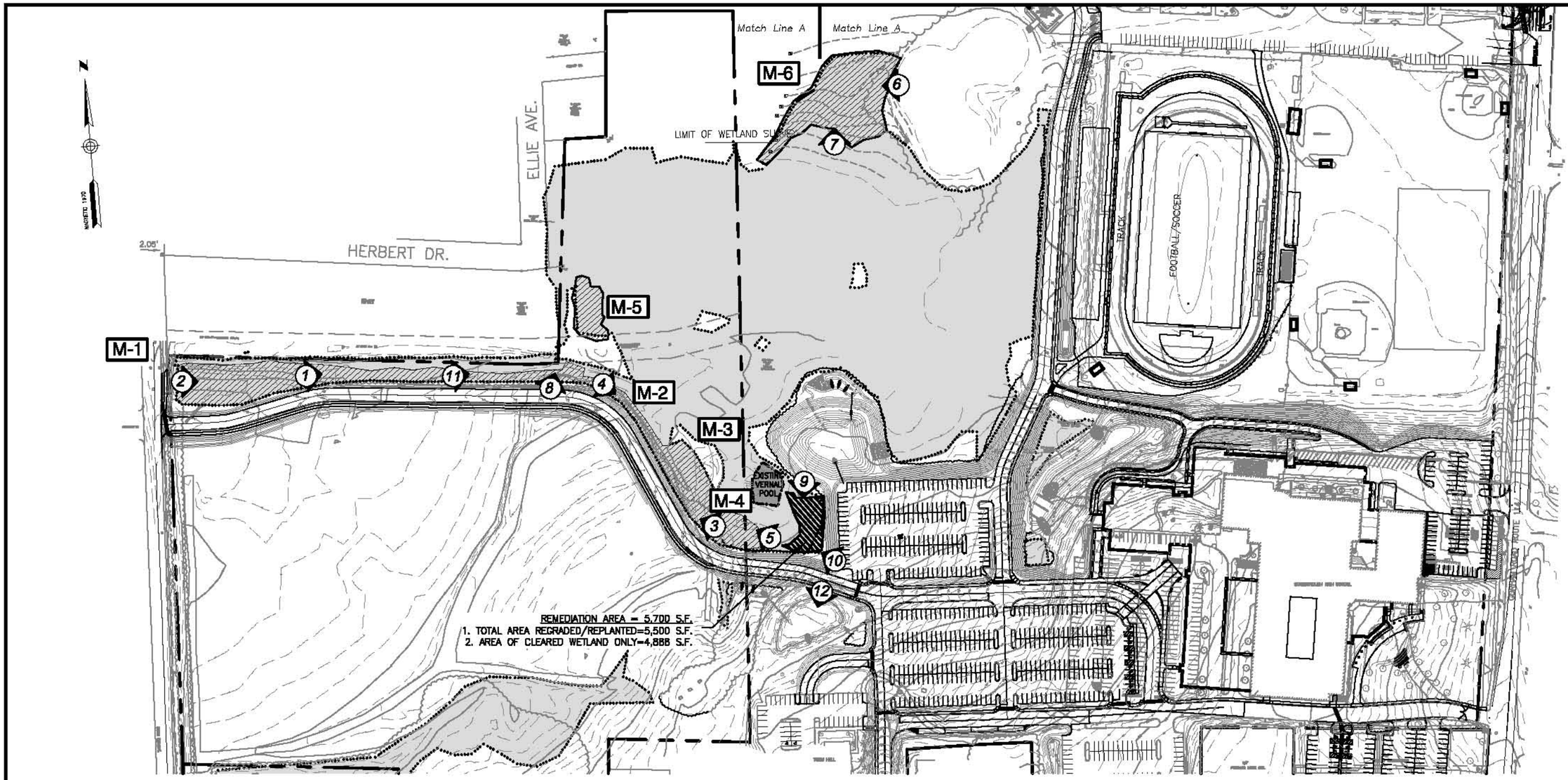
Woodlot Alternatives, Inc. 2004. Wetland Mitigation Monitoring Report Scarborough Schools.

Woodlot Alternatives, Inc. 2007. Wetland Mitigation Monitoring Report Scarborough Schools.

FIGURES



PREPARED BY: Stantec / WOODLOT 103141-F001-Location.dwg	SHEET TITLE: Wetland Mitigation Monitoring Report PROJECT: Scarborough High School Expansion Project Scarborough, Maine	DATE: March 2008 SCALE: 1"=2000' PROJ. NO: 103141.04 FIGURE: 1



NOTE(S):

1) Mitigation areas M-1 through M-4 were combined into one wetland restoration area during construction. Refer to the As-Built Survey Report for individual mitigation area descriptions and results.

2) As-Built mitigation area boundaries represent full extent of what was regraded during construction. This includes both upland slopes and wetland restoration/creation areas.

3) Base map information including road locations, topography, building locations, and property lines provided by Harriman Associates December 2002 and Owen Haskell, Inc., June 2002 and December 2002.

AS-BUILT MITIGATION SUMMARY

M-1	49,094 S.F.	WETLAND RESTORATION
M-2		WETLAND RESTORATION
M-3		WETLAND RESTORATION
M-4		WETLAND RESTORATION
M-5	4,074 S.F.	WETLAND RESTORATION
M-6	23,837 S.F.	WETLAND CREATION
TOTAL	77,005 S.F. (1.77 ACRES)	

1"=200'

200' 0 200' 400'

LEGEND

- WETLAND 2003
- MITIGATION AREAS (SEE NOTE 2)
- M-1 MITIGATION AREA LABEL (SEE NOTE 1)
- 1 PHOTO LOCATION AND DIRECTION

FIGURE 2

NO.	REVISIONS	DATE
1	REMEDIATION AREA DELINEATION	08/30/04

SHEET TITLE: 2007 Wetland Mitigation Monitoring Map
SCALE: 1"=200'
DATE: March 2008

PROJECT: Scarborough High School Expansion Project
2007 Mitigation Monitoring Report
ADDRESS: Scarborough Maine

PREPARED BY: WOODLOT Stantec

PROJ. NO. 103141

FIGURE NO. 2

APPENDIX A

REPRESENTATIVE SITE PHOTOGRAPHS

Photo 1. Wetland mitigation areas M-1 and M-2. View east along local access road. Woodlot Alternatives, Inc. September 20, 2007.

Photo 2. Wetland mitigation areas M-1 and M-2. View east along local access road. Woodlot Alternatives, Inc. September 20, 2007.

Photo 3. Wetland mitigation areas M-3 and M-4. View west along local access road. Woodlot Alternatives, Inc. September 20, 2007.

Photo 4 Wetland mitigation areas M-1 and M-2. View northeast of channelized drainage. No detrimental erosion was observed. Woodlot Alternatives, Inc. September 20, 2007.

Photo 5. Transect through wetland mitigation area M-4. View looking west along transect at Plot 2. Dominant plant species are sallow sedge (*Carex lurida*), cyperus-like sedge (*Carex pseudocyperus*) and blue vervain (*Verbena hastata*). Woodlot Alternatives, Inc. September 20, 2007.

Photo 6. Wetland mitigation area M-6. View northwest. Vigorous planted woody stock and dense herbaceous layer of naturally occurring grasses, sedges and rushes. Woodlot Alternatives, Inc. September 20, 2007.

Photo 7. Wetland mitigation area M-6. View southwest of mitigation site. Herbaceous vegetation consists of dense native sedges, rushes, and wool-grass (*Scirpus cyperinus*). Woodlot Alternatives, Inc. September 20, 2007.

Photo 8. Wetland mitigation area M-5. View north across mitigation area M-2 to mitigation area M-5. Woodlot Alternatives, Inc. September 20, 2007.

Photo 9. Remediation Area. View south across remediation area. Planted European alder (*Alnus glutinosa*) on left. Woodlot Alternatives, Inc. September 20, 2007.

Photo 10. Remediation Area. View northeast across remediation area. Woodlot Alternatives, Inc. September 20, 2007.

Photo 11. Wetland mitigation areas M-1 and M-2. Results of herbicide application to control purple loosestrife (*Lythrum salicaria*). Woodlot Alternative, Inc. September 20, 2007.

Photo 12: Department of Recreation retention pond showing continued control of Japanese knotweed (*Fallopia japonica*). Woodlot Alternatives, Inc. September 20, 2007.