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Memorandum

To: Jay Clement (USACE), Bob Green (MDEP)

Cc: Angela Blanchette (Town of Scarborough), Larry Grondin (Grondin), Jim Boyle (Boyle Associates), Ruth Ann Brien (USACE)

From: Heather Storlazzi Ward (Boyle Associates) on behalf of Grondin Aggregates/Larrabee Farms Wetland Mitigation Site

Date: March 2, 2016

Re: **Gateway at Scarborough Retail Development (anchored by Cabela's) Wetland Mitigation Project at Larrabee Farms – Year 8 (2015) Remediation and Project Update**

Corps Permit No.: NAE-2006-3128
Maine DEP NRPA Project Number: L-23242-26-A-N

2015 marks the eighth year since construction of wetlands created as compensation for functions and values impacted by the construction of the Gateway at Scarborough project (anchored by Cabela's) was completed. According to the approved mitigation plan for this project, complete monitoring procedures are not required in the eighth year, however the site is not currently meeting all of the performance standards set forth in the mitigation plan and remedial activities to address these deficiencies were completed in 2015.

In September of 2015, along with representatives from Grondin and Boyle Associates, the Corps of Engineers performed a site inspection. Overall comments were positive and observations made by the Corps are similar to those outlined by this memorandum. Areas of concern or interest identified by the Corps include: the expansive and dense nature of the switchgrass (*Panicum virgatum)*, deficient woody plant densities in the northern creation cell, and invasive species. Their memorandum of findings is attached at the end of this report.

This memorandum provides an update of the current state of this wetland creation project, describes remedial actions that occurred in 2015, and outlines site assessments planned for the remaining two year monitoring period.

Annual Monitoring

Construction of the Gateway at Scarborough project impacted approximately 4.47 acres of freshwater wetland (2.49 acres PEM, 1.29 acres PFO and 0.69 acres of mixed PFO/PSS/open water wetlands). Wetland compensation took place at Larrabee Farms Wetland Mitigation Site, a multi-user mitigation project owned by Grondin Aggregates. Wetland compensation at Larrabee Farms totals 31.55 acres and consists of 4.55 acres of wetland creation (2.10 acres PEM, 0.35 acres PSS and 2.10 acres PFO), preservation of 14.93 acres of existing upland, and preservation of 12.07 acres of existing wetland, including a stretch of the Nonesuch River.

The mitigation plan for the project outlines that wetland creation and buffer areas will be assessed annually during the summer growing season (May-October) for 10 years. Monitoring has taken place

twice per season during the first through fifth years following planting; one visit in the spring to assess general site health and identify any corrective needs and a second visit later in the growing season to assess plant mortality/vitality and to gather data for the annual monitoring reports. After year five, data gathering and reporting procedures occur during the 7th and 10th years, if the site is not meeting the performance standards. As outlined in the mitigation plan, if the site is meeting all of the success criteria, the fifth year will be the final year of monitoring. Unfortunately, at the end of year five, the site was not meeting all of the performance standards, thus sixth and seventh year monitoring took place in 2013 and 2014, respectively. At the end of the seventh monitoring year, the success of the mitigation site was evaluated and reported on in the seventh year monitoring report for the site. The report was submitted at the end of 2014. As outlined in the mitigation plan, at that point if the site is meeting all of the success criteria, the seventh year will then be the final year of monitoring during which full reports are provided. Unfortunately, the site was not meeting all of the performance standards and additional monitoring and reporting will be provided in the 9th and 10th years to ensure that site is meeting all of the performance standards in the mitigation plan. The 9th year will consist of an annual memorandum of findings update, while the 10th year will be full monitoring and reporting of findings. The following section provides an overview of the successes at the site to date, which performance standards are being met and what remedial activities are occurring.

Site Successes and Deficiencies

In general, and as can be noted in the attached photographs, the wetland creation areas are responding well after nine growing seasons. In the wetland creation area, hydrology is adequate and wetland conditions are being achieved. As planned, the site is progressing toward a diverse mix of common wetland covertypes and successfully replacing functions and values of the impacted wetlands. Herbaceous plants are growing well, aerial cover is high and established woody species are doing well. Of note at the site is the exceptional performance of the southern creation cell. This area of the site has experienced a high level of recruitment over the past several years. A natural alder swamp, located south of the site in the floodplain of the Nonesuch River has been seeding the southern creation cell, creating a high level of recruitment. The southern cell is performing better than expected and contains a diverse array of woody and herbaceous species with speckled alder (*Alnus incana*) dominating throughout. In addition to the proliferation of alders, the PFO/PSS portion of the wetland in the southern cell has an average of 450 trees/acre. Trees have not yet reached heights above the alders, but it is anticipated that they will do so and the area will flourish into a forested wetland.

Despite the site's successes, the density goal of trees in the northern cell is low and reduces the overall average density for the combined northern and southern cells to numbers lower than the required performance standard of 350 trees per acre. The tree density in the southern cell is greater than the required performance standards, totaling 450 trees per acre, while the tree density in the northern cell is 303 trees per acre, much less than the requirement.

The majority of tree loss has occurred in the northern creation cell of the site. As noted in past monitoring reports, hydrology in a portion of the north creation cell was insufficient post construction. The second year after construction, the separator berm was removed to increase hydrology across the north creation cell. Due to insufficient hydrology during woody plant establishment, plants struggled and loss was observed. Monitors surmised that woody volunteers would begin to colonize the site and make up for these initial losses, but recruitment of tree species, has been insufficient to meet the performance standards. The site monitor's recommended remedial action in the 2012 monitoring report to install an additional 100 supplemental trees (50 gray birch and 50 green ash) in 2013 across the northern creation cell, with the intention of increasing the woody plant density from 329 to an anticipated 350 trees per acre. As reported in the 2014 monitoring report however, only 303 trees per acre were counted the following season.

Remedial Actions Completed in 2015

The tree species recommended for the 2013 installation were chosen due to their hearty nature, fast growth and quick establishment. Despite these advantages, sufficient tree densities were not

documented during the 2014 monitoring effort. Monitors surmised that the new saplings in the northern cell had been obscured by the thick herbaceous layer. To rule out this possibility, monitors recommended in the 2014 mitigation monitoring report that woody stem counts in the northern creation cell be timed to occur at the start of the growing season, prior to the emergence of the thick herbaceous cover. Monitors also recommended that a full stem count ensue, rather than the typical transect methodology. Performing a full count prior to the emergence of the thick switchgrass enabled the monitors to better detect the saplings while accounting for the entire creation area.

During the 2015 field assessment, monitors found and counted 313 trees within the 1.56 acre northern creation cell. This is the equivalent of 200 trees per acre. Combined with the latest data for the southern cell a weighted average formula was used to calculate the average number of trees per acre within the combined cell areas. We have determined that the number of trees per acre is 253 trees per acre, which does not meet the performance standards of 350 trees per acre.

In addition to the methodology changes, monitors also recommended that control and assessment of invasive plant species continue. Site walk overs to identify colonies of invasive plants around the site were conducted in mid-September. Invasive species locations were marked on a plan and provided to an approved licensed herbicide applicator. Limited infestations of invasive plants were found within and directly adjacent to the creation basin. Monitors observed a few individuals of purple loosestrife (*Lythrum salicaria*) on the west end and east ends of the northern creation cell. A few multiflora rose (*Rosa multiflora*) shrubs were observed in the northwest and northeast portions of the northern creation cell, a few black locust (*Robinia psuedoacacia*) were observed in the southern portion of the northern creation cell, two glossy buckthorn (*Rhamnus frangula*) were identified in the northeastern portion of the northern creation cell, Oriental bittersweet (*Celastrus orbiculatus*) located in the northern creation cell and three very small (2-3 individual, young stalks) separate areas of common reed (*Phragmites austrailis*) was identified in the northeast portion of the northern creation cell. Each of these invasive sites is small and manageable. The multiflora rose, black locust, glossy buckthorn, bittersweet and common reed were cut down, removed from the site and treated with undiluted triclopyr, which literature cites as more effective than glyphosate. These areas will be monitored next year for further spread. At that time, monitors will determine if additional control is warranted. Chemical control of the purple loosestrife is scheduled in early August of 2016.

Future Monitoring

Complete monitoring procedures for the site will take place in 2017 (Year 10) to assess the on-going health of the site and assure that it is successfully replacing the functions and values impacted by the construction of the Gateway at Scarborough project. Year 9 will be a quick site assessment and update of remedial actions and outcomes. Monitors will pay particular attention to the status of the tree survivorship in the northern creation area and provide a discussion detailing their expected survivability in next year's (Year 9) memo.

If you have any questions or would like to conduct a site visit, please contact Larry Grondin (207-854-1147) or myself (207-317-6630).

Thank you,

Heather Storlazzi Ward, Senior Wetland Scientist/Project Manger
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PHOTOLOG – all by Boyle Associates

Photo 1 – Facing west across northern creation cell. Established plants are surviving, but providing sparse cover, April 28th, 2015.

Photo 2 – Facing south across northern creation cell, planned PEM in foreground and PSS/PFO in background. Diverse herbaceous cover dominated by switchgrass (*Panicum virgatum*), April 28th, 2015.

Photo 3 – Facing northeast across northern creation cell, planned PSS/PFO in foreground and robust PEM in background, April 28th, 2015. Blue flags denote those plants counted in tallies.

Photo 4 – Monitors noted heavy girdling of trees and shrubs within the northern cell, April 28th, 2015. This could be a factor in tree survivorship.

Photo 5 – Facing northwest from the eastern corner, across northern creation cell, April 28rd, 2015.

Photo 6 – Facing northeast from the western portion of the northern cell, April 28th, 2015. Counting the tree cover prior to herbaceous growth allowed monitors to see all woody stems.

Attachment 1: Army Corps of Engineers Memorandum

CENAE-R-PT 24 September 2015

MEMORANDUM FOR File

SUBJECT: Site visit to Larrabee Farms mitigation site for Gateway at Scarborough (Cabelas); Scarborough, Maine; File No. NAE-2006-3128

Inspection Date: 21 September 2015
Time arrived: 1300 Time departed: 1400
Weather conditions: sunny, 65 degrees

Construction of this site was completed in the fall of 2007, with a 0.5 acre portion redone in spring 2009. It is the second constructed mitigation project at this pooled mitigation site.

The site continues to have very good herbaceous cover. However, the portion of the site nearest the active mining pit also continues to be dominated by grasses, primarily switchgrass (*Panicum virgatum*), which appears to be expanding. Also, some members of the aster family (Asteraceae) are common throughout the site.

As noted last year, woody plant survival is still lower than planned. While some plantings survive throughout the site, the south cell – with dense cover of alder (*Alnus incana*) – is the only area where woody plants are truly thriving. They need an additional 422 woody plantings/volunteers to meet performance standards. A plan for additional plantings is currently being formulated. The extensive switchgrass cover may be making woody plant establishment difficult. Adequate mulching around the plantings may help them successfully compete with the switchgrass.

Woody plant survival and volunteer recruitment should be examined next summer to determine if any additional actions are necessary then. While switchgrass is an acceptable plant, if it is causing low woody plant survivorship, there may be a need for control immediately surrounding the woody plantings.

There are small amounts of multiflora rose (*Rosa multiflora*) and purple loosestrife (*Lythrum salicaria*) at the site and black locust (*Robinia pseudo-acacia*) and crown vetch (*Securigera varia*) on the slopes above the site. Monitoring and control of invasive species should continue. For the first time, they are considering hiring commercial herbicide applicators. This is an off year for monitoring.

PAUL MINKIN
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Environmental Resource Section
Policy and Technical Support Branch