JAMESBURG PARK CONSERVATION AREA: BUCKELEW BOGS & SHEKIRO POND-WETLAND ENHANCEMENT PROJECT

Block 9, Lots 1, 3, 4, 5, 6 (Helmetta Borough) (WMA 9)
Block 83, Lot 12.02 (Monroe Township) (WMA 9)
Middlesex County, New Jersey

Prepared by:
GreenTrust Alliance, Inc.
6755 Business Parkway, Suite 317
Elkridge, Maryland 21075
(443) 445-0068
kirk@greentrustalliance.org
Funding Request: $669,877.93
Total Project Cost: $669,877.93

February 03, 2020

TABLE OF CONTENTS

PROJECT BACKGROUND

Abstract: GreenTrust Alliance (GTA) and its partners Middlesex County, GreenVest LLC and Princeton Hydro are pleased to submit this proposal to the New Jersey Wetlands Mitigation Council as part of our commitment to assist the Council in fulfilling its mandated objective of deploying in-lieu fees (ILF). Our Buckelew Bogs-Shekiro Pond Wetland Enhancement Project is a viable and cost-effective opportunity to implement compensatory mitigation using ILF funds collected for permanent freshwater wetland impacts within the Raritan Region (WMA's 7, 8, 9 and 10). This project will promote State and regional objectives for restoration, water quality and wildlife habitat improvement, open space management, and greenway connections by improving ecosystem services at this unique site in Middlesex County. Our proposal seeks to apply available funding to enhance ecosystem services provided on this site, owned by Middlesex County. As proposed, the project will enhance 9.86 acres of wetlands, resulting in significant functional uplift yielding 3.29 mitigation units using accepted mitigation ratios. The GTA team seeks funding to design, implement, maintain, and monitor this project, at an average estimated cost of **$203,816.82** per mitigation unit, which is **$145,583.18** less than the current, minimum ILF contribution of $349,400 per acre of impact.

GTA and its partners respectfully ask that this Pre-Proposal be advanced to the final proposal round under the 2019 Request for Proposals. This project as proposed is a feasible, efficient and economical means of maximizing the application of collected ILF funds in this heavily developed region of New Jersey.

Introduction: The Buckelew Bogs-Shekiro Pond Wetland Enhancement project (The Project) is located in the Jamesburg Park Conservation Area, a 1,488-acre management unit of Middlesex County Parks. The property was acquired by the County for the primary purpose of protecting Spotswood Outlier (pinelands) upland and wetland habitat in an otherwise fully developed small town (Jamesburg and a portion of Helmetta). The property provides unique and extensive public access to local residents and visitors alike.

The project as proposed will enhance 9.86 acres of freshwater wetland habitats. Project elements are located within historically disturbed, modified agricultural impoundments and clear-cut areas and will include 9.86 acres of freshwater scrub-shrub/emergent wetland enhancement.

This project will be undertaken by GreenTrust Alliance (GTA), a regional conservation nonprofit organization and land trust, as part of our Coastal Resiliency Initiative which focuses on the protection and enhancement of lands in highly developed coastal plain watersheds from Northern New Jersey through North Carolina. Under this initiative, GTA has successfully completed five (5) projects (4 in the Raritan Region) with funds granted by the New Jersey Wetlands Mitigation Council In-Lieu Fee Grant Program, as well as large scale resiliency and restoration projects funded by the National Fish and Wildlife Foundation, Maryland Department of Natural Resources, Chesapeake Bay Trust, United States Air Force and others.

Why the project is needed: The Buckelew Bogs are primarily comprised of abandoned cranberry production bogs that have failed structurally as a result of catastrophic storms. The namesake of the bogs, James Buckelew, managed the site for cranberries until his death in the late 1800s. The bogs likely pre-dated his acquisition of the property in 1832, however, and were created from Spotswood Outlier upland and wetland habitats including peatlands. The bogs remained in production until the 1960s and the sale of the property to Middlesex County occurred throughout the 1970s. Remnants of acidic wetland conditions remain intact around the margins of the now-abandoned cranberry bogs, comprised of several *Vaccinium* species as well as *Itea*, *Matteuccia*, *Osmunda*, and *Clethra*, all of which have survived despite increased nutrient loading and a lack of natural fire suppression of hardwood overstory species. During 2008, the cranberry production dikes were damaged by heavy precipitation and were further damaged by Hurricane Irene in 2011 and Superstorm Sandy in 2012.

The failure of water control structures, cranberry production dikes, and the failure of subsequent structural repair projects (early 2000s) has fundamentally changed the hydrologic regime within the Buckelew Bogs. While the resulting flow regime is now similar to historic "flowing swamp" conditions than the artificially flooded and drained cranberry bogs, the rapid, permanent dewatering of these cells resulted in an open, unvegetated impoundment, which was promptly colonized by Phragmites, Asiatic Tearthumb, and other non-native invasive species. These species continue to spread into other areas that were and continue to be vegetated by native vegetation with higher value to wildlife. The site also contains a remnant of Shekiro Pond, a sawmill pond created for timbering the Atlantic White Cedar stand that historically dominated Jamesburg Park Conservation Area. This pond, too, has long since failed structurally and the vegetation is dominated by Phragmites. The current hydrology of the site, post-structural failure, is closer to typical pre-disturbance hydrology, which eliminates the need for hydrologic enhancement as part of this project.

The proposed project is necessary because the recolonization of this high quality plant community is still achievable, and as a Spotswood Northern Outlier, there is significant societal value to placing the Buckelew Bogs and Shekiro Pond on a more resilient and sustainable ecological trajectory that will result in enhanced ecosystem services provided by this permanently protected and publicly accessible site.

Current condition of wetlands

Wetland conditions outside of the former cranberry production bogs and former pond footprint exhibit nominal vegetation diversity and productivity, with sufficient groundwater and surface hydrology, and a predominance of stress tolerant native vegetation including Red Maple, High-bush Blueberry, Buttonbush and Sweetgum. Invasive species are prevalent in spots, and include Phragmites, Asiatic Tearthumb, and Oriental Bittersweet.

As stated above the project site is located within the former agricultural impoundments (cranberry bogs) where vegetative cover is approximately 80% Phragmites, with smaller colonies of Asiatic Tearthumb, Japanese Knotweed, and Multiflora Rose all present.

GOALS, OBJECTIVES, AND APPROACH

Goals of the project: The goals of this project are numerous but well-integrated. The eradication of invasive species out of this potentially highly diverse and globally rare ecotone is a significant goal in itself, however, achieving that goal will also fully integrate this large block of habitat back into the more nominally performing surrounding wetlands and uplands. Functional wetland improvements are in the areas of erosion prevention, fish and wildlife habitat enhancement, and outdoor recreation and aesthetic benefits.

Goal 1: Project Planning, Design, and Permitting

Objective A: Develop restoration plans and obtain regulatory approvals/permits.

Task 1: Complete Boundary and Topographic Survey

Task 2: Complete Cultural Resources Phase IA

Task 3: Complete Ground & Surface Water Monitoring

Task 4: Conduct Functional Wetland Assessment / Complete Wetland Delineation

Task 5: Conduct T&E Surveys and Habitat Evaluations

Task 6: Conduct Soil Investigation & Complete Eco-Risk-Assessment

Task 7: Hydrology Analysis &Biological Benchmarks

Task 8: Develop Engineering Plans

Task 9: Prepare Mitigation Proposal and Obtain Approvals

Task 10: Permit Application Preparation, Submittal, and Permit Acquisition

Goal 2: Construction – Wetland Enhancement

Objective A: Eradicate invasive vegetation, clear/grub, and restore native scrub-shrub and emergent wetlands.

Task 11: Wetland Enhancement Actions

- Herbicide treatments
- Mechanical removal of invasive species
- Site preparation
- Planting of native plant species
- Herbivory control

Goal 3: Post-Construction Maintenance and Monitoring.

Objective A: Conduct 5-year maintenance and monitoring in accordance with NJDEP mitigation guidelines.

Task 12: As-built plan, metes and bounds description, easement filing. Develop and submit the required construction completion report including as-built plans, photographs, and documentation on soils, vegetation, and hydrology; implement required maintenance activities as needed including but not limited to: Year 1 herbicide treatments, fence repairs, re-planting as required ensuring compliance with NJDEP guidelines including 85% aerial coverage and less than 10% noxious species in each mitigation area. Monitoring report submitted to the Department no later than December 31st.

Task 13A: Implement required maintenance activities as needed including but not limited to: Year 1-5 herbicide treatments, fence repairs, re-planting as required ensuring compliance with NJDEP guidelines including 85% aerial coverage and less than 10% noxious species in each mitigation area.

Task 13B: Develop and submit the required photographs, data, and relevant success criteria documentation in an annual monitoring report (Years 1-5) on soils, vegetation, and hydrology. Monitoring report submitted to the Department no later than December 31st of each monitoring year, including a final monitoring report in Year 5.

Objectives of the project are as follows:

- Eradication of invasive species cover
- Re-Establishment of diverse native plant cover
- Improvement of vegetative composition and diversity

PARTNERS

Green Trust Alliance is a Land Trust Alliance member organization and the applicant and administrator of this project. GTA will administer the funding and be responsible for project accounting, project deliverables and QA/QC. GTA will coordinate all actions contributed by the various team members and be responsible for reporting to the Council and NJDEP as required pursuant to the FWWPA Rules and Comp Fund Guidelines.

Middlesex County Office of Parks & Recreation is the project sponsor and will be providing the land upon which the restoration will be conducted and has agreed to permanently deed restrict this acreage. Middlesex County Office of Parks & Recreation will be responsible for collaborative project design, oversight of project implementation and long-term stewardship of the project site.

Princeton Hydro LLC will be responsible for collaborative design, baseline ecological work, , engineering design and plan production as engineer of record, hydrology analysis and herbicide application/invasive species control and collaborative monitoring and reporting.

GreenVest, LLC will act as program manager collaborating on the design development and permitting and serve as the chief contractor to complete the proposed construction. GV will be responsible for compliance with all permit conditions during and post construction. GV will be responsible for routine maintenance in collaboration with Union County. GV will collaborate with PH and Middlesex County to conduct frequent monitoring and produce/submit required annual monitoring reports.

WORK PLAN

Planning and Implementation

The project area is dominated by common reed (*Phragmites australis*) and broad-leaved cattail (*Typha latifolia*). Management and control measures begin with site design and native plant selection based on reference area composition and our team's long-standing experience in restoring freshwater systems in the Raritan Region. Implementation of an eradication and management program begins prior to planting and continues throughout the life of the project. This is followed by clearing and grubbing within the former agricultural impoundment area and then planting. Subsequent management throughout the maintenance and monitoring period will vary based on any recurrences of invasive species. Management measures may include but are not limited to: mechanical removal/cutting, hand pulling, and specific herbicide prescriptions suitable for aquatic environments, applied either mechanically or by hand. Secondary measures may include adding native plant material. Installing herbivory controls prior to, or concurrent with, planting will facilitate a robust establishment of native species and prevent reestablishment of invasive species during the Maintenance and Monitoring period. A diligent monitoring and maintenance program based on the principles of adaptive management will allow for early problem identification and implementation of required corrective measures. This strategy relies on the team's ability to quickly implement corrective measures.

Monitoring

A maintenance and monitoring plan will be implemented following the completion of construction for a five-year period or until all permitted performance standards have been met. Once construction is complete, the team will submit an as-built plan and construction completion report for Department approval. The Team will begin monitoring the sites immediately following the completion of construction and maintaining the site as needed through the end of the monitoring period. The first monitoring visits will examine initial vegetative response of the plants to their new environment. Subsequent semi-annual monitoring visits will provide a regular schedule for data gathering, maintenance, and repair as needed. A flexible adaptive management approach will be applied to address any problems or deficiencies as they arise. Annual monitoring reports to NJDEP will be prepared and submitted on or before December 31st in each of the five years of monitoring. At the end of the maintenance and monitoring period the Team will secure final regulatory release upon successful achievement of all permitted performance standards.

Monitoring will measure key biological and physical characteristics of the mitigation project and will include:

- As-built survey/monitoring plan after completion of construction and in year 5 to close out the monitoring period.
    - Plan view of entire project including topography at 1-foot contour intervals
    - Location of permanent photograph, monitoring and sampling stations
    - The mitigation boundary will be marked in the field with 3-inch white PVC pipe extending at least four feet above the ground elevation and appropriate signage.
- Photograph Documentation
    - Permanent photograph stations will be established, surveyed, and located on the as-built plan.
    - Evidence of hydrology will be documented.
    - Sedimentation patterns to indicate flow will be documented.
    - Success of planted vegetation, percent cover including native recruitment and composition and structure.
    - Wildlife habitat structure and utilization.
- Soils Documentation
    - Soil profile descriptions to a depth of 18 inches in representative locations throughout the site.
    - Document maintenance, development, or enhancement of hydric soils of evidence of reduction within monitoring plots through soil borings.
    - Location of all soil borings and profiles on the as-built survey / monitoring plan.

- Vegetation Documentation
    - Documentation that the site has achieved 85% survival and 85% aerial cover of target hydrophytes both planted and recruited.
    - Documentation of less than 10% cover of invasive/exotic species within all enhancement/restoration areas as identified in the NJDEP freshwater wetland mitigation monitoring checklist.
    - Documentation that all plant species are healthy and thriving. A quality assessment of plant health, vigor, growth, shoot production, vegetative stress, foraging effects and flowering will be documented.
    - Documentation that all plant communities containing trees demonstrate that the trees are a minimum of 5 feet in height in year 5 with a density of 436 stems per acre.
- Hydrology Documentation
    - Documentation demonstrating that the existing hydrologic regime has been created, maintained, or enhanced.
        - Observations and photos of surface flow, inundation, and saturation made during scheduled field visits and noted in the monitoring reports.
        - Groundwater data will continue to be collected from permanent wells installed from representative areas within the restoration sites.

- Documentation of redoximorphic features within 18" of ground surface will be noted.

CONCLUSION

GTA and its partners propose the Buckelew Bogs-Shekiro Pond Wetland Enhancement Project as a viable and cost-effective opportunity to implement compensatory mitigation using ILF funds collected for permanent freshwater wetland impacts within the Raritan Region (WMA's 7, 8, 9 and 10). This project will promote State and regional objectives for restoration, water quality and wildlife habitat improvement, open space management, and greenway connections by improving ecosystem services at this unique site in Middlesex County. As proposed, the project will enhance 9.86 acres of wetlands (3.29 mitigation units), resulting in significant functional uplift to a previously heavily impacted palustrine scrub-shrub/emergent wetland in a landscape context of adjacent, nominally performing wetlands.