Easygrants ID: 27926

National Fish and Wildlife Foundation NFWF/Legacy Grant Project ID: 1401.11.027926

LI Sound Futures Fund 2011 - Implementation - Habitat, Species, Invasives - Submit Final Programmatic Report (Activities)

Grantee Organization: National Audubon Society, Inc.

Project Title: Restoration of Forests at Audubon's First Bird Sanctuary (NY)

Project Period	06/01/2011 - 10/01/2014
Award Amount	$34,977.27
Matching Contributions	$13,210.00
Project Location Description (from Proposal)	This project will be conducted at Theodore Roosevelt Sanctuary and Audubon Center,located on 14 acres at 134 Cove Road,Oyster Bay, NY in Nassau County.Lat.- N 40 52' 11.6206" Long. - 73 30' 24.3896"
Project Summary (from Proposal)	Remove non-native plants and restore a rare 14 acre old growth coastal forest comprised of American Tulip Tree, Oak, Red Maple, Beech, and Hickory trees. Project will use native plantings to restore successional forest, forest edge/meadows, and shaded understory/woodland floor areas within the sanctuary for birds and other wildlife.
Summary of Accomplishments	The project, entitled "Restoration of Forests at Audubon's First Bird Sanctuary", spanned July 1, 2011 - October 1, 2014. Project goals as described on pg. 49 of the original application and include the removal of non-native plants and restoration of 3 acres in within a 14 acre coastal forest in Nassau County New York. The site, Theodore Roosevelt Sanctuary and Center (TRSAC) is dominated by an oak (Quercus sp.), tulip-poplar (Liriodendron tulipifera), red maple (Acer rubrum) and American beech (Fagus grandifolia) woodland habitat that has been degraded by unmanaged, exotic species infestations. To date, over 3 acres of forest and meadow habitats have undergone restoration activities, improving conditions in the forest and understory, woodland floor, and meadow habitats for songbirds and other wildlife. Site preparations included the removal of exotic plants that most severely diminished the habitat quality of the property, including English ivy (Hedera helix), sapphire-berry (Symplocos paniculata) and winged euonymus (Euonymus alatus). Following this preliminary work, replanting took place with over thirty native species selected by their value to songbirds, soil and sun conditions, and aesthetic appearance. Over 700 individual native trees, shrubs and forbs were installed over the course of the project.
Lessons Learned	The expected conservation outcomes for this project will demonstrate themselves over time, as plans for full restoration of the property is being implemented. Outcomes are measured by the number of acres restored, area cleared of invasive species, numbers of native plants installed, or man-hours devoted to the project. However, annual wildlife censusing should also be implemented to assess response of songbird populations and provide meaningful evidence of responses to habitat improvements. Furthermore, outreach to visitors of the site and to the neighboring community need to be more comprehensive to better articulate the goals of project, the damaging effects of introduced species, and the rationale behind the use of herbicides. Lastly, a key lesson learned is the value of developing a coordinated and adaptive project plan that guides completion of the work through several personnel changes and changing field conditions.

Conservation Activities	Treating invasive plants
Progress Measures	Acres of habitat restored or enhanced
Value at Grant Completion	3

Conservation Activities	Educational programming on native ecosystem restoration
Progress Measures	# schools involved in activity
Value at Grant Completion	25
Conservation Activities	Activity volunteer days
Progress Measures	# of communities engaged in activity
Value at Grant Completion	3
Conservation Activities	Activity volunteer days
Progress Measures	# of volunteers engaged in project
Value at Grant Completion	47
Conservation Activities	Workshops and mini-trainings; staff orientation
Progress Measures	# of workshops, webcasts, webinars, special events, meetings associated with activity
Value at Grant Completion	3
Conservation Activities	Integrated pest managemnet treatment of invasive species
Progress Measures	% or acres reduction in invasive species cover
Value at Grant Completion	25
Conservation Activities	Habitat restoration
Progress Measures	% increase and use of habitat by birds
Value at Grant Completion	25
Conservation Activities	Monitoring stations for restoration activites
Progress Measures	Other Activity Metric (# of monitoring stations)
Value at Grant Completion	14
Conservation Activities	Planting
Progress Measures	Other Activity Metric (Herbaceous and woody plants planted)
Value at Grant Completion	716
Conservation Activities	Planting
Progress Measures	Other Activity Metric (Acres of successional forest planted)
Value at Grant Completion	1
Conservation Activities	Planting
Progress Measures	Other Activity Metric (Acres of meadow/forest edge planted)
Value at Grant Completion	.5
Conservation Activities	Planting
Progress Measures	Other Activity Metric (Acres of shaded understory/woodland floor planted)
Value at Grant Completion	1.5

NFWF

Final Programmatic Report Narrative

Instructions: Save this document on your computer and complete the narrative in the format provided. The final narrative should not exceed ten (10) pages; do not delete the text provided below. Once complete, upload this document into the on-line final programmatic report task as instructed.

1. Summary of Accomplishments

In four to five sentences, provide a brief summary of the project's key accomplishments and outcomes that were observed or measured.

The project, entitled "Restoration of Forests at Audubon's First Bird Sanctuary", spanned July 1, 2011 - October 1, 2014. Project goals as described on pg. 49 of the original application and include the removal of non-native plants and restoration of 3 acres in within a 14 acre coastal forest in Nassau County New York. The site, Theodore Roosevelt Sanctuary and Center (TRSAC) is dominated by an oak *(Quercus sp.)*, tulip-poplar *(Liriodendron tulipifera)*, red maple *(Acer rubrum)* and American beech *(Fagus grandifolia)* woodland habitat that has been degraded by unmanaged, exotic species infestations.

To date, over 3 acres of forest and meadow habitats have undergone restoration activities, improving conditions in the forest and understory, woodland floor, and meadow habitats for songbirds and other wildlife. Site preparations included the removal of exotic plants that most severely diminished the habitat quality of the property, including English ivy *(Hedera helix)*, sapphire-berry *(Symplocos paniculata)* and winged euonymus (*Euonymus alatus)*. Following this preliminary work, replanting took place with over thirty native species selected by their value to songbirds, soil and sun conditions, and aesthetic appearance. Over 700 individual native trees, shrubs and forbs were installed over the course of the project.

2. Project Activities & Outcomes

Activities

- Describe and quantify (using the approved metrics referenced in your grant agreement) the primary activities conducted during this grant.

The original proposal called for 1.5 acres of successional forest habitat, 0.5 acre of meadow/forest edge habitat and 1.0 acre of the shaded understory/woodland floor habitat (3 acres total) to be restored throughout the 14 acre property. Treatment of non-native plant species were accomplished through chemical and mechanical methods, and implemented on a total of 3.17 acres. 2.45 acres of forest/understory and 0.72 acres of meadow habitats were restored with over 700 native plantings to improve habitat quality and conditions for wildlife. A work plan and framework has been developed to maintain these new restoration sites and establish goals to restore the remainder of the property.

Both Audubon staff and volunteers conducted the restoration work. Volunteers manually removed English ivy, and trained staff applied herbicides over larger areas severely infested with English ivy and Japanese knotweed, and restored these areas with native plants. More than 500 staff hours and 200 volunteer hours were invested in project success. Audubon staff hosted two volunteer invasive species removal programs at the site on April 22, 2012 and July 20, 2012, and held a public workshop about native plants and their benefits to wildlife in the community on May 10, 2014. Additionally, the impacts of invasive species were discussed in twenty-five school education programs with appropriately-aged students each year.

The majority of the restoration work was accomplished over two major field events, the first on October 24-26, 2012 with project completion occurring on September 3-5, 2014. Staff and volunteers planted 148 individual trees and shrubs in forest and understory areas, including spicebush *(Lindera benzoin),* winterberry holly *(Ilex verticallata),* witch-hazel *(Hamamelis virginiana),* and other species to provide cover, restore mid-story structure, and berry production for breeding

and migratory songbirds. The heavily shaded forest floor was re-planted with 75 white wood aster *(Eurybia divaricata)* and 150 native ferns, including Christmas *(Polystichum acrostichoides)*, hay-scented *(Dennstaedtia punctilobula),* and ostrich (*Matteuccia struthiopteris)* ferns.

Meadow and garden areas were replanted with multiple species comprised of 328 individual wildflowers, including butterfly milkweed *(Asclepias tuberosa),* black-eyed Susan, *(Rudbeckia fulgida)*, and purple coneflower *(Echinacea purpurea).* These areas were also supplemented with plantings of three species of native grasses, including little bluestem *(Schizachyrium scoparium)*, Indian grass *(Sorghastrum nutans)* and tufted hair grass *(Deschampsia cespitosa)*. Meadow and forest floor plantings were arranged in loose groupings to provide a naturalized appearance and to facilitate monitoring.

- Briefly explain discrepancies between the activities conducted during the grant and the activities agreed upon in your grant agreement.

The original project leads left their positions at TRSAC in 2012 and 2013, while this project was being planned and implemented. A grant extension request was proposed to NFWF on 7/30/2013 and approved, extending the project to 10/01/2014. The replacement project lead left in Spring, 2014, and other Audubon staff trained in invasive species management and habitat restoration were then recruited to oversee the satisfactory completion of the work.

During this reassessment, the new project coordinators visited the site to re-assess the status of the project. It was discovered that areas replanted during the October 24-26, 2012 work days differed in location from what was indicated on the original maps of the grant proposal. This deviation was likely due to communication lapses during project leadership changes at TRSAC, and opportunistic replanting by workers in other areas where English ivy had previously been removed. The severe impacts of Hurricane Sandy on 10/29/2012 included flooding, erosion and blowdowns throughout the property, and may have influenced the success of the original restoration plantings.

The new project coordinators utilized GPS to accurately re-map the property and developed new maps in arcGIS and work plans to effectively implement the final restoration and replanting efforts that took place during September 3-5, 2014. From these new observations, .30 acres of forest previously cleared of ivy was identified, and became the focus of the final restoration planting effort, along with supplemental plantings in the meadow, forest, and other relevant locations on the site.

Outcomes

- Describe and quantify progress towards achieving the project outcomes described in your grant agreement. (Quantify using the approved metrics referenced in your grant agreement or by using more relevant metrics not included in the application.)

3.17 acres of habitat were cleared of exotic species and restored with native vegetation. Overall, 716 new plants were placed in the ground in appropriate habitats, and will monitored over the next 3 years to ensure survivability.

- Briefly explain discrepancies between what actually happened compared to what was anticipated to happen.

Although the acreage goals were exceeded, modifications of specific locations of new plantings were necessary to match changing personnel and field conditions. Funding to achieve the comprehensive removal of English ivy on the property has been secured and a detailed estimate and work plan from a company experienced in environmental restoration has since been developed.

- Provide any further information (such as unexpected outcomes) important for understanding project activities and outcome results.

Native species have established themselves in the treated areas and are being monitoring to ensure success. The density of non-native plant species is high and regular monitoring will occur, as new plantings need to survive a minimum of three

growing seasons to be considered successful. Observations of failing plants during these monitoring events will trigger transplanting efforts to more suitable locations to ensure success.

Other exotic species mentioned in the original NFWF proposal need to be addressed. Japanese spurge *(Pachysandra terminalis)* and periwinkle *(Vinca minor)* will be removed through hand-pulling, or will be treated along with the English ivy during the upcoming larger scale herbicide treatment. Lesser celandine *(Ranunculus ficaria*) is present on the eastern edge of property, and two woody species mentioned in the grant, Norway Maple *(Acer platanoides)* and winged euonymus *(Euonymus alatus)* will be treated by cut-stump methods during the herbicide treatments, or they will be repeatedly pruned or defoliated until their root systems have been completely depleted of energy.

3. Lessons Learned
Describe the key lessons learned from this project, such as the least and most effective conservation practices or notable aspects of the project's methods, monitoring, or results. How could other conservation organizations adapt their projects to build upon some of these key lessons about what worked best and what did not?

The expected conservation outcomes for this project will demonstrate themselves over time, as plans for full restoration of the property is being implemented. Outcomes are measured by the number of acres restored, area cleared of invasive species, numbers of native plants installed, or man-hours devoted to the project. However, annual wildlife censusing should also be implemented to assess response of songbird populations and provide meaningful evidence of responses to habitat improvements. Furthermore, outreach to visitors of the site and to the neighboring community need to be more comprehensive to better articulate the goals of project, the damaging effects of introduced species, and the rationale behind the use of herbicides. Lastly, a key lesson learned is the value of developing a coordinated and adaptive project plan that guides completion of the work through several personnel changes and changing field conditions.

4. Dissemination
Briefly identify any dissemination of lessons learned or other project results to external audiences, such as the public or other conservation organizations.

The project was described and highlighted through Audubon New York's website and social media outlets and discussed through interpersonal communications with volunteers, other staff, and board members.

5. Project Documents
Include in your final programmatic report, via the Uploads section of this task, the following:

- 2-10 representative photos from the project. Photos need to have a minimum resolution of 300 dpi and must be accompanied with a legend or caption describing the file name and content of the photos;
- report publications, GIS data, brochures, videos, outreach tools, press releases, media coverage;
- any project deliverables per the terms of your grant agreement.

POSTING OF FINAL REPORT: *This report and attached project documents may be shared by the Foundation and any Funding Source for the Project via their respective websites. In the event that the Recipient intends to claim that its final report or project documents contains material that does not have to be posted on such websites because it is protected from disclosure by statutory or regulatory provisions, the Recipient shall clearly mark all such potentially protected materials as "PROTECTED" and provide an explanation and complete citation to the statutory or regulatory source for such protection.*

DRAFT

Theodore Roosevelt Audubon Sanctuary and Center (TRSAC)

Invasive Species Management Plan

The TRSAC property is currently dominated by a number of invasive and other non-native species. The goal of this plan is to provide a course of action for the property to be restored to a mostly native ecosystem by 2020. The major problem species in the sanctuary is *Hedera helix* (English ivy). This species dominates the ground cover layer and is preventing the normal regeneration of forest layers on the property. Other ground cover species that are of concern are *Vinca minor* (common periwinkle), *Euonymus fortunei* (winter creeper), *Ficaria verna* (lesser celandine) and *Pachysandra terminalis* (Japanese spurge).

Along with these non-native ground covers, there are several woody invasive species that degrade the habitat value of the site. They include *Euonymus alatus* (burning bush), multiple *Lonicera* species (honeysuckle) and *Aralia elata* (Japanese angelica tree), and a large population of *Symplocos paniculata* (sapphire-berry) dominates the understory. While not classified as invasive, *S. paniculata* is a non-native, ornamental species that has spread throughout the property.

Following the restoration of 3 acres completed in September 2014, the remainder ground cover species will be treated with herbicides starting in the spring of 2015, with two follow-up treatments in 2016 and 2017. The work is to be conducted by certified contractors through funding provided by the USFWS. The removal of the woody non-native species began in the fall of 2014 and will continue through 2018. In order to prioritize the areas to be worked on, the sanctuary has been spilt into 12 management units. All of these units will receive herbicide treatment for ground cover species concurrently. We recommend the mechanical removal of woody non-native species to be done unit by unit over the 4-year time period.

After each round of mechanical removal of woody species, follow-up treatments of cutting back regrowth, will need to be done at least twice that year, to ensure that the plants will not be able to reestablish themselves. Following the initial herbicide treatment of *H. helix*, monitoring and treatment should begin on another invasive species, *Microstegium vimineum* (Japanese stiltgrass) in summer 2015. There are small patches of stiltgrass growing along the trail system, which will likely spread once the *H. helix* is removed, due to the increased bare ground. These patches should be hand pulled twice throughout the summer, and be completed by late-August. If there are insufficient resources to accomplish this, the stiltgrass must be weed-whacked to the ground in late-August before the plants go to seed.

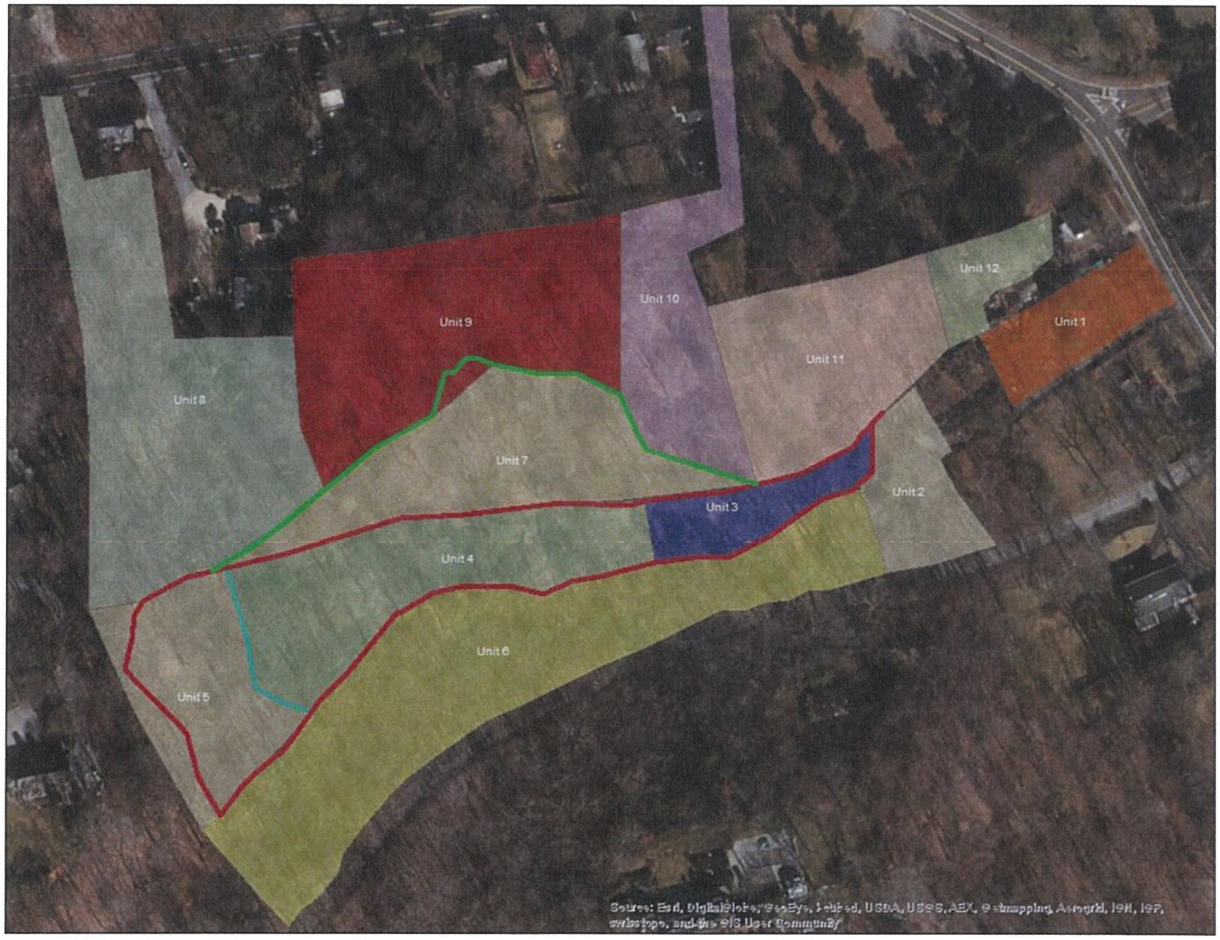
After the completion of all herbicide treatments in 2017, *H. helix* may still be present on the boundaries of the sanctuary, and may reappear from reseeding from infestations on the

surrounding properties. The new plants should be hand-pulled as soon as they are detected, so they cannot reestablish.

Woody non-native species treated in each management unit has will also need monitoring and retreatment until at least 2020, to ensure effectiveness of mechanical treatment. Furthermore, monitoring will need to continue over the entire sanctuary, to ensure that no new invasive species arrive, or no new individuals of a previously treated species begin to reestablish. These retreatments and monitoring activities will take very little time once the larger scale initial treatments are complete, and can be coordinated with volunteer groups.

Another round of native plantings will most likely occur in the fall of 2015 and 2016. These plantings will be done in areas that have shown the most effective removal of both the woody non-native species and *H. helix*, and other ground covers.

Management Units



Unit 1: This unit consists of the garden areas at the entrance to TRSAC. This area had its initial treatment of woody invasive species and was also planted with several native species in the fall of 2014. There is a patch of *V. minor* in the northeast corner that will be treated with herbicide in the spring of 2015. There is also a patch of *F. verna* in the southern part of the unit.

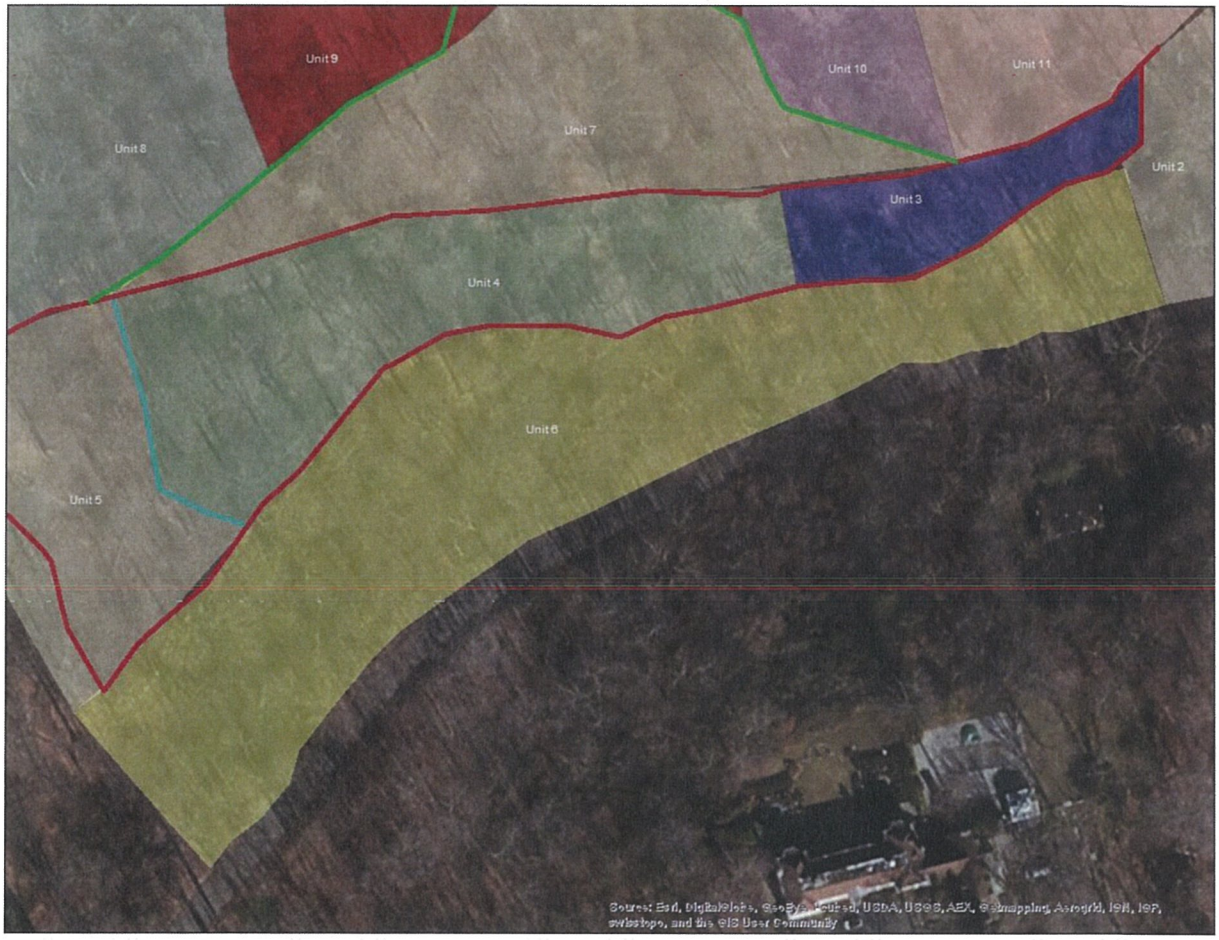
Unit 2: Unit 2 is the area directly to the west of the nature center. Its western border is a trail and unit 6, its northern border is the main trailhead, and its southern border is Highwood Circle. This area also includes the large man-made pond. There are several invasive woody species located in this area.

Unit 3: This unit is bordered on its north, south, and east sides by trails. It is bordered on the west side by the amphitheater. The east end of this unit contains several ornamental herbaceous plants that should be removed. The rest of the unit contains *S. paniculata*, and some *A. elata*. This unit had an initial treatment for the removal of non-native woody vegetation in the fall of 2014, accompanied by native understory and woodland floor plantings. The remaining non-native woody vegetation should be removed in the spring of 2015.

Unit 4: This unit is bordered on the north and south by trail #2, the east by the amphitheater and the west by trail #3. The main problem in this area is non-native woody vegetation, with planned removal to be completed in the spring of 2015.

Unit 5: This unit is bordered on the north by the trail and unit 8, the south by the trail and unit 6, the east by a connector trail and the west by the property boundary. This unit also contains non-native woody vegetation that will be removed in the spring of 2015. This unit will most likely need the regular monitoring and hand removal of remaining *H. helix* after 2017, due to its proximity to an infestation on a neighboring property.

Unit 6: This unit is bordered on the north by the lower trail, the south by Highwood Circle, the east by unit 2 and the west by the property boundary. The shape and the area of this unit may be altered by the sale of the brick house property. The unit contains several woody non-native species, including the largest population of *E. alatus.* The initial treatment of this unit will be done in the spring of 2016.



Unit 7: This unit is bordered on the north, east, and west by the meadow trial and the south by the main trail. Portions of this area have steep slopes, and the majority of the unit contains woody non-native species. This area will be treated in 2016. This area does not quite reach to the meadow trail in a small section in the north, as a small portion of the meadow area (unit 9) crosses over the trail.

Unit 8: Unit 8 is mostly defined by the property boundaries, with unit 9 on its east border. The removal of non-native woody vegetation in this unit should occur in 2017. This unit will most likely need the regular monitoring and had removal of remaining *H. helix* after 2017, due to its proximity to an infestation on a neighboring property.

Unit 9: This unit contains the meadow area of the preserve. This area was partially mowed and planted in the fall of 2014. This is the only unit in the preserve that contained *F. japonica*, and also contains a large population of *M. vimineum*. The management of this unit is different from due to its unique characteristics. It should be mowed annually, optimally in the late winter or early spring. *M. vimineum* should be weed-whacked each year in late-August to prevent seeding and spread of this invasive grass. This area surrounding the meadow needs initial treatment of woody non- native vegetation in the spring of 2015. A small water view of Oyster Bay Cove may be possible with the select removal of trees along the northern edge of the meadow.

Unit 10: Unit 10 is bordered on the north by the property boundary, the south side by unit 7, the east by the property boundary and unit 11, and the west side mostly by unit 9. This unit will have its initial removal of non-native woody species in 2017.

Unit 11: This unit contains the trail that begins across from the entrance to the nature center. This unit and the beginning of the trail is steep, and there is visible runoff towards the nature center down the trail. This may cause erosion problems in the future and this trail may need to be removed or modified. The unit is bordered on the north by the property boundary, the east by unit 10, the south by the nature center and trail, and the west by unit 12. The removal of woody non-native plants will begin in 2018.

Unit 12: This unit contains the aviaries and equipment storage areas for TRS. It is bordered by the property boundary on the north, the white house and aviaries on the east and south, and unit 11 on the west. This area will have the initial round of non-native woody species removed in 2018.

Timeline

Unit	Initial Treatment for Woody Species	Initial herbaceous Treatment
1	2014	2015
2	TBD	2012
3	2014	2012
4	2015	2015
5	2015	2015
6	2016	2012
7	2016	2015
8	2017	2015
9	2015	2015
10	2017	2015
11	2018	2015
12	2018	2015

Meadow restoration plantings on 9/5/14

PHOTOGRAPHS:

Audubon New York staff unloading and planting final restoration plantings on 9/4/14

Re: Appendix to Final Reporting to the National Audubon Society, Inc. for:

- Restoration of Forests at Audubon's First Bird Sanctuary (NY) #27926

Thank you for this interesting and excellent final programmatic report for the referenced project. We have additional questions related to activities delivered by the project. Please provide written responses to the questions that follow and this information will be added as an appendix to the reports.

1. In the project's proposal you listed renovating soil where invasive species had reduced soil quality and affected the pH as a primary goal. Please provide more information about how this goal was achieved.

The original proposal does list soil renovations where invasive species may have reduced soil quality and have adversely affected pH. No baseline soil testing results were provided by the original project coordinator at their departure. Rudimentary evaluations of soils were conducted by new project coordinators, and through the examination of adjacent healthy native vegetation, soils were deemed acceptable for the final round of restoration plantings. Soil amendments were limited to mulching new plantings with readily available surrounding organic material, and the full restoration of the forest and understory will contribute essential nutrients back to damaged soils over time.

2. Reduced stormwater and non-point source pollution run-off was also listed as a primary goal associated with the project in the original proposal. Please describe in more detail how this goal was achieved.

The site is relatively level with some moderate slopes, and does receive direct runoff from an adjacent road. No wetlands or watercourses are present. Increased vegetation density and quality from restoration plantings and the natural recovery of the forest and understory (following removal of exotic species) will slow runoff velocity, prevent soil erosion, increase soil absorption, and filter contaminants, and thus improve surface and ground water quality draining from the site.

3. I could not find any mention of the photo-documentation stations described in your project proposal in the final report. Please provide information about how you educated the public on the benefits of native restoration through photo-documentation stations.

No photo-documentation locations were provided by the original project coordinator at their departure, and it is likely that some physical locations provided by posts or signs were destroyed by tree falls during Hurricane Sandy. Public education about the benefits of forest habitat restoration continues to be a major goal of the full restoration of the property and staff of the managing organization.

4. The number of native plantings was reduced from 6020 herbaceous plants and 625 woody plants listed in the proposal to 716 total plants. Please provide an explanation for this change.

New project coordinators evaluated areas proposed for replanting in the original proposal and the existing property use, and found them incompatible for small 2' plugs of herbaceous vegetation. A decision was made to invest remaining funds in one gallon or larger sizes to introduce less vulnerable and more robust

native stock to the site. This decision reduced the overall number of plants purchased, but ensures a more viable end result.