South Mountain Reservation 10-Year Stewardship Plan

December 2024

Executive Summary, General Information and Implementation Plan

Prepared for

South Mountain Conservancy
Stewardship, Advocacy & Public Engagement

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Red Chanterelle (*Cantharellus cinnabarinus*)

This species is part of an immense underground mycorrhizal network characteristic of healthy soils.

FoHVOS New Jersey Invasive Species Strike Team

Executive Summary

This stewardship plan applies to the South Mountain Reservation located in Essex County, New Jersey. This 10-year stewardship plan includes results of field investigations that informed recommendations to improve ecological health. There are three main purposes of this plan. The first is to clearly state the vision and goals including protection of biodiversity. The second is to carefully define conservation values, threats to their health, and strategies/actions to mitigate identified threats. The third purpose is to provide baseline conditions and ample sources of reference material to effectively navigate the many aspects of the Reservation and guide its adaptive stewardship over time.

The plan vision is to provide model stewardship of biodiversity for a large, but ecologically isolated forest located in a highly developed area. The primary objective is the enhancement and recovery of native flora and fauna. The primary habitat conservation target is mature forest, but there are also important small-scale habitats including vernal pools, meadows, and glades that support our flora and fauna. A total of four rare species have been documented within the Reservation (See page ii), including the globally rare Torrey's Mountain-mint, and there are multiple documented and potential vernal pool habitats. Importantly, the Reservation provides important core forest habitat but connections to nearby open space are non-functional for most biota. All habitats and species are under immediate threat from overabundant deer and invasive species.

Deer management has occurred on the Reservation for nearly 20 years. While there have been dramatic reductions in the deer population, it remains too high to allow for the development of healthy forests (e.g., tree regeneration, forest shrubs and wildflowers). This is particularly evident in long-standing deer exclosures that demonstrate healthy forests. Virtually all forests fall into two impaired categories – "Empty Forest Syndrome" (few understory plants) or "Infested Forest Syndrome" (dense patches of unpalatable invasive understory plants). Reduction of deer density to a minimum of 20-30 per square mile is critical to allow native species, freed from excessive browse, to exert ecological control over invasive species and produce healthy native plant communities.

The extent of invasive species infestation is severe. A total of 69 unique invasive species were detected with 35% of the Reservation having severe infestations of one or more species. Approximately 27% of the Reservation is considered "clean" (i.e., virtually free of invasive species), the remaining 29% has moderate or mixed infestation status. The most abundant species are Japanese Barberry, Wine Raspberry, Japanese Aralia, Japanese Knotweed, and Winged Burning Bush. There are 35 emerging invasive species that should be considered for eradication to avoid future degradation.

The Reservation is entering a period where severe degradation will accelerate without significant active stewardship. American Beech is a significant component of the tree canopy that will disappear over the next 5 years due to infection by the invasive Beech Leaf Disease. Once trees are dead, there will be growing invasive species infestations, and overabundant deer will prevent the establishment of native oaks and hickories to replace the dying beech.

A "brute force" approach that seeks direct control of all invasive species is not practical. This plan recommends a strategic approach by focusing efforts within a Stewardship Priority Area (932 acres). The ultimate goal is significantly reducing invasive species through directed active control and reliance on ecological control through deer herd reduction to both reverse current infestations and resist future infestations. The plan provides four primary recommendations with six associated goals (see next page). Over the next 10 years, full plan implementation is estimated to cost $200,475 (See Table 17 for additional details). This includes contracted services and supplies. It will also require 3,800 volunteer hours provided by the South Mountain Conservancy (estimated value of $91,200).

Primary Plan Recommendations

This 10-year plan has four primary recommendations and six associated stewardship goals. Goals are further divided into specific tasks with associated level-of-effort and cost estimates (Table 17).

Recommendation #1: Improve Existing White-tailed Deer Management Program

Goal #1-1: Reduce deer density to meet ecological health goals

- Deer density should be maintained at 20-30 per square mile. Considerable progress toward this goal has already occurred, but the population remains too high to allow for healthy forests. Goals include 70% native shrub cover a robust population of reproducing forest wildflowers.

Recommendation #2: Perform Strategic Invasive Species Control

Goal #2-1: Eradicate 35 emerging invasive species (Action Code 1 species)

- Reduce future damage by eliminating species that have not yet established extensive populations. This goal fulfills 'ecological responsibility' by preventing spread beyond the Reservation.

Recommendation #3: Protect and Restore Highest Quality Habitat Areas

Goal #3-1: Protect and restore Stewardship Priority Area

- Maintain quality of Clean patches (See Table 16)
- Focused intensive efforts to reduce populations of the most highly threatening widespread invasive species including Sapphire berry, Oriental Photinia, Linden Viburnum, Weeping Higan Cherry, and Japanese Aralia
- Maintain and steward existing deer exclosures to serve as seed sources to restore the Reservation
    - The highest priority is the Wildflower and Forest Preserve, which receives regular, intensive stewardship that has already led to significant improvement in ecological health. Continuing work will make this area the model of healthy forest at the Reservation.
    - Focus additional exclosure work on those located within the Stewardship Priority Area
- In the future, consider prescribed fire to reduce dense infestations and promote development of oak / hickory forests to replace dying beech trees and maintain glade habitat.

Goal #3-2: Protect unique habitats

- The globally rare Torrey's Mountain-mint is documented at the Reservation, but its current presence / condition is unknown. This species occupies glade communities growing on thin, rocky soils with few trees. These communities also support a unique plant species assemblage. Perform selective invasive species control in highest quality glades.
- The Reservation contains five occurrences of vernal pools that are critical to a variety of frog and salamander species. Ongoing surveys suggest small populations of Wood Frog, Spring Peeper, and New Jersey Chorus Frog along with potential for Spotted Salamander that might be bolstered via introduction of egg masses from elsewhere in the state (see Section IV). Perform selective invasive species control at all vernal pool areas.

<u>Recommendation #4: Conduct Forest Health and Unique Habitat Monitoring</u>

Goal #4-1: Perform ecological health monitoring to guide adaptive stewardship over time

- Ongoing implementation of forest health monitoring protocols (every 5 years) and evaluation of existing deer exclosures (every 7 years)

Goal #4-2: Perform surveys focusing on unique habitat types

- Botanical survey with focus on Torrey's Mountain-mint (globally rare species) and glades

Annual vernal pool surveys to track amphibian breeding activity (FrogWatch, Lori LaBorde).

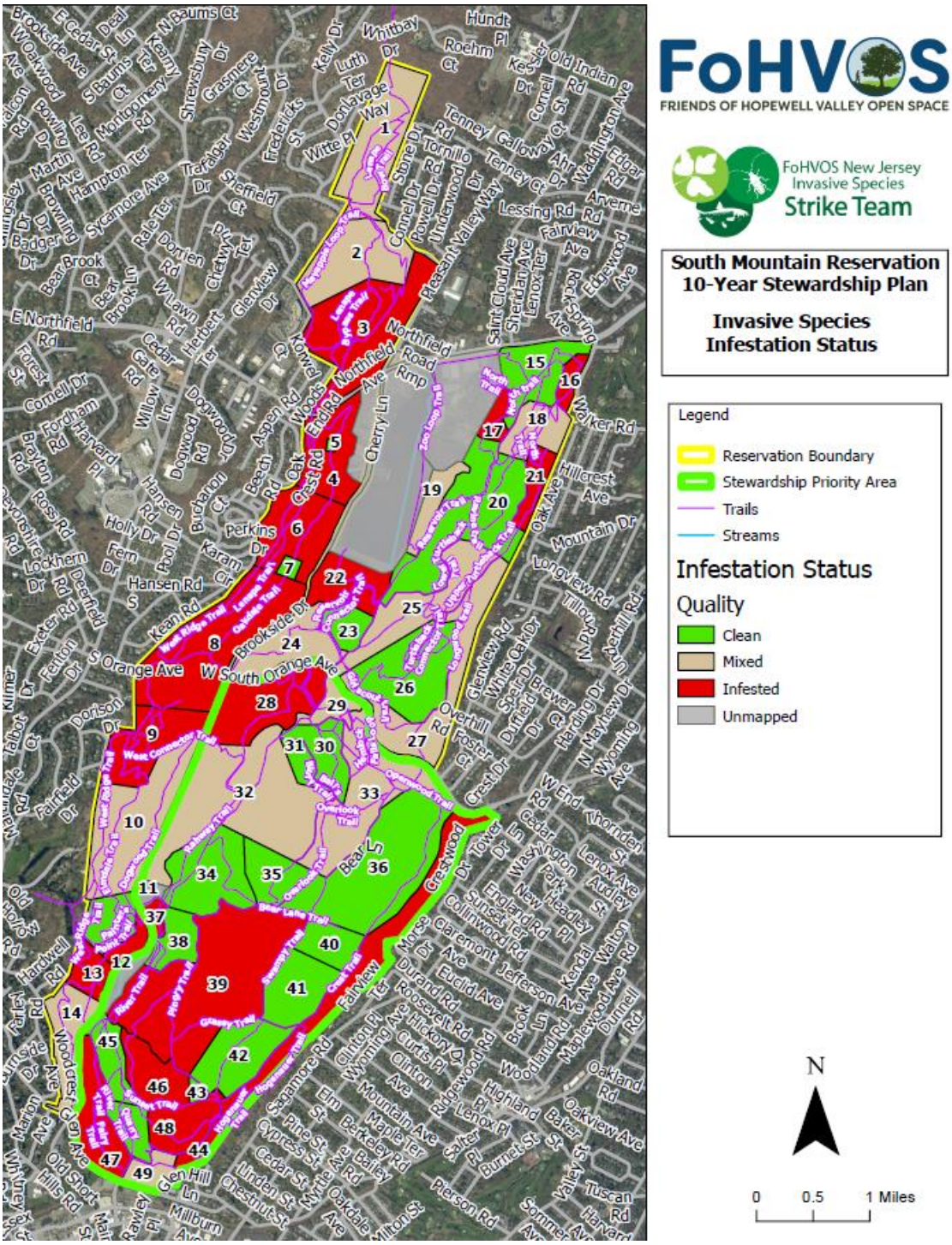
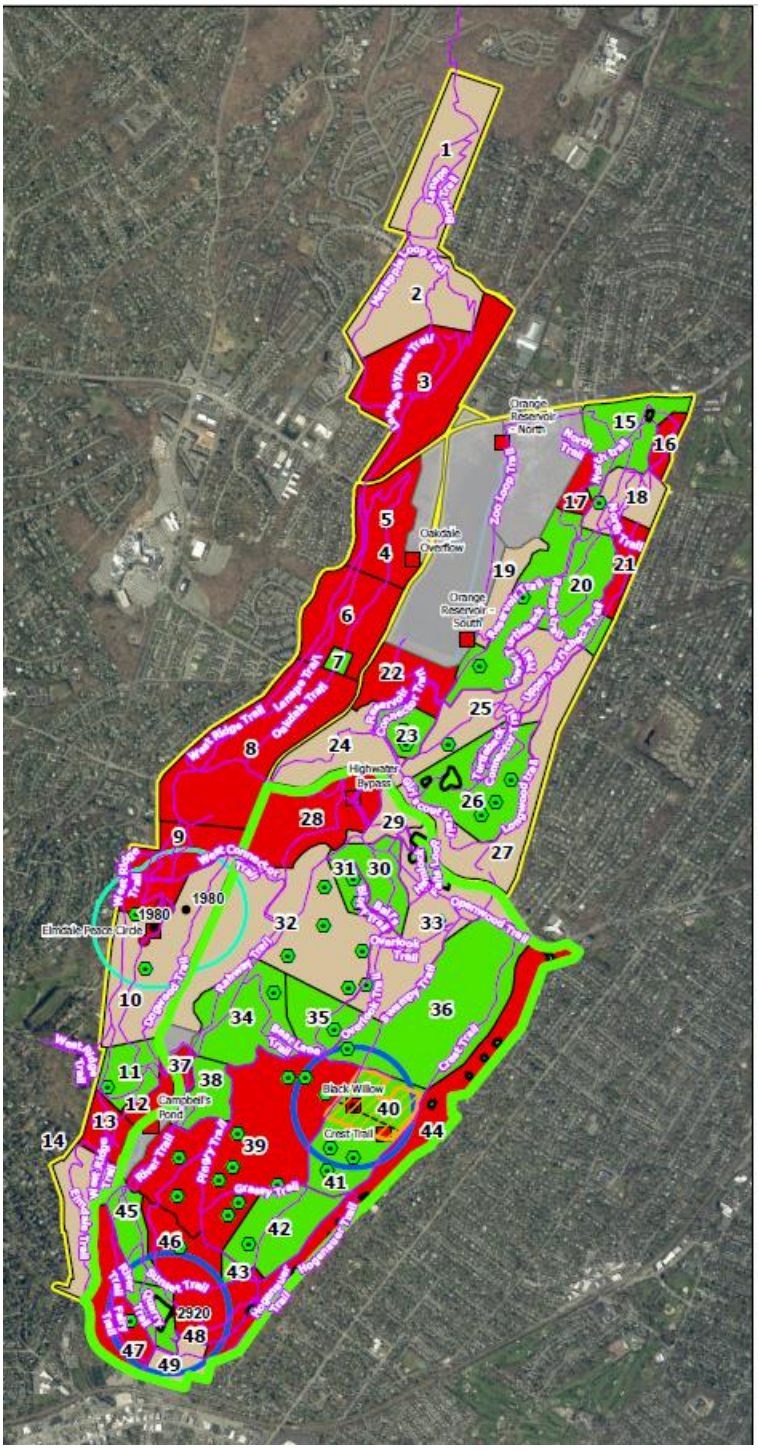


Table 16. Stewardship Priority Area Patch Summary

Patch ID	Patch Acres	Patch Infestation Category	Patch Treatment Priority	Patch Beech Canopy Cover	Number of Exclsoures	Stewardship Notes
30	23	Clean	High	51-75	0	Treat all occurrences of woody invasive species
31	9	Clean	High	11-25	2	Treat all occurrences of woody invasive species
34	50	Clean	High	51-75	1	Treat all occurrences of woody invasive species
35	23	Clean	High	11-25	2	Treat all occurrences of woody invasive species
36	100	Clean	High	51-75	0	Treat all occurrences of woody invasive species
38	18	Clean	High	26-50	0	Treat all occurrences of woody invasive species
40	20	Clean	High	11-25	1	Contains portion of Wildflower and Forest Preserve that should receive priority stewardship activity. Treat all occurrences of woody invasive species.
41	35	Clean	High	11-25	4	Contains portion of Wildflower and Forest Preserve that should receive priority stewardship activity. Treat all occurrences of woody invasive species.
42	38	Clean	High	51-75	1	Treat all occurrences of woody invasive species
43	3	Clean	High	1-10	0	Treat all occurrences of woody invasive species
45	20	Clean	High	51-75	0	Treat all occurrences of woody invasive species
48	15	Clean	High	1-10	0	Treat all occurrences of woody invasive species. Contains quarry area potential vernal pool and Glade ID#2
29	13	Mixed	Moderate	51-75	0	Focus treatments on priority species along with areas adjacent to Clean patches.
32	115	Mixed	Moderate	11-25	6	Contains populations of Sapphire berry that should be eliminated quickly. Focus treatments on priority species along with areas adjacent to Clean patches.
33	69	Mixed	Moderate	51-75	1	Contains highest quality glade habitat, Glade ID#1. Its stewardship is contained under Goal 3-2.
49	13	Mixed	Moderate	1-10	0	Focus treatments on priority species along with areas adjacent to Clean patches.
28	52	Infested	Low	26-50	0	Contains populations of Sapphire berry that should be eliminated quickly. Focus treatments on priority species, especially in areas adjacent to Clean patches.
37	5	Infested	Low	26-50	0	Focus treatments on priority species along with areas adjacent to Clean patches.
39	138	Infested	Low	26-50	11	Focus treatments on priority species along with areas adjacent to Clean patches.
44	73	Infested	Low	< 1	0	Focus treatments on priority species along with areas adjacent to Clean patches. Contains 12 infested glade habitat areas.
46	52	Infested	Low	1-10	1	Focus treatments on priority species along with areas adjacent to Clean patches.
47	36	Infested	Low	1-10	1	Focus treatments on priority species along with areas adjacent to Clean patches.
						Priority Widespread Species
						Sapphire berry: Patches 28, 32 along with Patches 22 and 23 located north of the Stewardship Priority Area with the goal of limiting its distribution to the west of Cherry Lane / Brookside Drive. Rapidly becoming widespread and abundant.
						Oriental Photinia: Patches 28, 29, 30, 32, 33, 34, 36, 39, 40, 41. Rapidly becoming widespread and abundant.
						Linden Viburnum: Patches 28, 40, 49. Populations threaten rapid increase in abundance.
						Weeping Higan Cherry: Patches 40. Populations threaten rapid increase in abundance.
						Japanese Aralia: Widespread and abundant
						Winged Burning Bush: Widespread and abundant



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South Mountain Reservation
10-Year Stewardship Plan

Stewardship Priority Area

Legend

- Reservation Boundary
- Stewardship Priority Area
- Trails
- Streams

Infestation Status

Quality

- Clean
- Mixed
- Infested
- Unmapped
- Exclosure
- Wildflower and Forest Preserve

ENSP Listed Vernal Habitat Areas

- Potential
- Confirmed
- Vernal Habitat - 2024 Observation
- SMC Amphibian Survey Location
- Glade Candidate Areas

N

0 0.5 1 Miles

Introductory Information

Property: South Mountain Reservation

Owners: Essex County Department Parks, Recreation, and Cultural Resources

Property Acreage: 2,059 acres (inclusive of Essex properties adjacent to SMR)

County, Municipality: Essex County, Maplewood Township / Millburn Township / West Orange Township

Wildlife Action Plan Piedmont Plains (03)

Conservation Zone:

NJDEP Watershed Arthur Kill (WMA 07); > 99% of Reservation

Management Area: Upper Passaic, Whippany, Rockaway (WMA 06); <1% of Reservation

Waterbodies:

Waterbody Name	Acres
Campbells Pond	6
Diamond Mill Pond	3
Orange Reservoir	63
Rahway River	10
Unnamed Pond	0.1
Totals	**82**

Streams:

Stream Name	Length (miles)
Bear Brook tributaries	0.4
Beech Brook	0.3
Maple Brook	0.3
Rahway River	3.6
Rahway River tributaries	1.3
Unnamed tributaries	0.1
Totals	**6.0**

Wetlands: 101 acres

Numbers of Rare Species Conservation Targets[1]:

Total Number of Animal Species: 3

Total Number of Plant Species: 1

Total Number of Ecological Communities: 0

Globally Rare Species: 1

Federally Endangered Species: 0

Federally Threatened Species: 0

State Endangered Species: 1

State Threatened Species: 0

State Special Concern Species: 3

State Game Species of Concern: 0

Globally or State Rare Ecological Communities: 0

Habitat Conservation Targets: 1) Mature Forest, 2) Meadow Habitat, 3) Vernal Pools

Landscape-Scale Conservation Areas:

ENSP Landscape Project Importance Summary -

Largest Habitat Patch - Forest, 670 contiguous acres

Vernal Pool Habitat - Two confirmed areas and three additional locations

New Jersey Natural Heritage Program Priority Sites -

There are no sites that overlap with the Reservation.

New Jersey Audubon Society Important Bird and Birding Areas -

There are no sites that overlap with the Reservation.

Species Conservation Target List[1]:

Birds (3)

Glossy Ibis (S3B, S4N), Great Blue Heron (S3B, S4N), Snowy Egret (S3B, S4N). All occurrences at the Reservation are for non-breeding / foraging (S4N), which are not considered rare in New Jersey. None of these species have breeding populations at the Reservation.

Mammals (0) None

Amphibians (0) None

Retiles (0) None

Insects (0) None

Habitats (2)

Vernal Pool Habitat Area (ID 2920)

Vernal Pool Habitat Area (ID 2923)

Plants (1)

Torrey's Mountain-mint (S1, Endangered). Global Rank = G2

Plant Communities (0) None

[1] Species include those confirmed to be present within the Reservation based upon New Jersey Natural Heritage Program data request (See Appendix B). Rank Key: S1=Critically Imperiled/Endangered (< 5 known populations); S2=Imperiled/Threatened (6-20 known populations), S3=Rare/Special Concern (21-100 populations). Plant species ranked S2 or S3 are equivalent to Threatened and Special Concern, but do not have official state status. Global ranks have similar rarity ranks to the state (e.g., G2 for Torrey's Mountain-mint suggests 6-20 known populations worldwide).

Invasive Plant Species List:

Each invasive plant species was assigned an 'Action Code' based upon observations of current extent of infestations on the Reservation and within New Jersey. Code Key: "1" = immediate implementation of an eradication program across the entire Reservation, "2" = selective control measures to minimize negative impacts, especially in particular habitats, and "3" = no direct control measures due to low probability of causing significant harm or species is very abundant and control measures are impractical. See report for additional information on distribution, infestation severity, and control recommendations.

Total Number of Mapped Invasive Species: 69

Action Code = 1 (35 species)

Amur Corktree, Amur Maple, Autumn Olive, Black Jetbead, Boston Ivy, Butterflybush, Callery Pear, Chinese Bushclover, Chinese Silvergrass, Chinese Wisteria, Cornelian Cherry, Cow Parsley, English Ivy, Five-fingered Aralia, Fuzzy Pride-of-Rochester, Glossy Buckthorn, Goutweed, Guelder-rose, Japanese Hop, Japanese Maple, Japanese Snowball, Japanese Zelkova, Kousa Dogwood, Leatherleaf Mahonia, Malus spp., Mimosa, Porcelainberry, Princesstree, Purple Loosestrife, Rugosa Rose, Siebold's Crabapple, Siebold's Viburnum, Tea Viburnum, Water Chickweed, Wintercreeper, Yellow Iris

Action Code = 2 (24 species)

Amur Honeysuckle, Border Privet, Common Reed (Phragmites), Garlic Mustard, Japanese Aralia, Japanese Barberry, Japanese Holly, Japanese Honeysuckle, Japanese Knotweed, Linden Viburnum, Mile-a-minute, Mugwort, Multiflora Rose, Narrow-leaf Bittercress, Norway Maple, Oriental Bittersweet, Oriental Photinia, Sapphireberry, Tree-of-Heaven, Water Chestnut, Watercress, Weeping Higan Cherry, Wine Raspberry, Winged Burning Bush

Action Code = 3 (10 species)

Asiatic Dayflower, Common Star-of-Bethlehem, Japanese Andromeda, Japanese Pachysandra, Japanese Stiltgrass, Lesser Celandine, Lesser Periwinkle, Norway Spruce, White Mulberry

Overabundant Native Animal Species:
This plan will address management of invasive species in the context of an overabundant deer population, which has a profound negative impact on conservation values. The Reservation is located within the NJ Fish & Wildlife Deer Management Zone #8 and Deer Management Unit 149 (small areas are also located within Units 131 and 167). Hunting dates and harvest regulations may vary by season, but unlimited antlerless deer harvests are allowed throughout most seasons ranging from early September to mid-February. The Reservation participates in a Community-based Deer Management Program with special arrangements defined within ongoing annual permits obtained from NJ Fish & Wildlife.

Table 17. Goals and Estimated Costs for 10-Year Plan Implementation Period

Recommendation Group	Goal #	Goal Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Estimated Material Cost	Estimated Contractor Cost	Total Plan Cost	Average Cost per Year	Total SMC Volunteer Hours	Volunteer Value @ $24/hour
Reduce deer density to meet ecological health goals	1-1	Administer Deer Management Program	Essex	Essex	Essex	Essex	Essex	Essex	Essex	Essex	Essex	Essex	N/A	N/A	**N/A**	N/A	N/A	N/A
Strategic Invasive Species Control	2-1	Eradicate Amur Corktree (3 populations; all small)	Contractor	Contractor									$0	$200	**$200**	$20	0	$0
Strategic Invasive Species Control	2-1	Eradicate Amur Maple (4 populations, all small)	Contractor	Contractor									$0	$200	**$200**	$20	0	$0
Strategic Invasive Species Control	2-1	Eradicate Autumn Olive (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Black Jetbead (34 populations, 10 are large)			Contractor	Contractor	Contractor						$0	$8,500	**$8,500**	$850	0	$0
Strategic Invasive Species Control	2-1	Eradicate Boston Ivy (1 population, small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Butterflybush (3 populations, unknown sizes)	Contractor	Contractor									$0	$200	**$200**	$20	0	$0
Strategic Invasive Species Control	2-1	Eradicate Callery Pear (1 population, small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Chinese Bushclover (1 population, small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Chinese Silvergrass (2 populations, All small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Chinese Wisteria (5 populations, 3 moderate-large)			Contractor	Contractor	Contractor	Contractor	Contractor				$0	$3,375	**$3,375**	$338	0	$0
Strategic Invasive Species Control	2-1	Eradicate Cornelian Cherry (2 populations, unknown sizes)	Contractor	Contractor									$0	$250	**$250**	$25	0	$0
Strategic Invasive Species Control	2-1	Eradicate Cow Parsley (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate English Ivy (41 populations, 10 moderate-large). There are possibly >100 indivudual plants scattered throughout the Reservation, requiring constant searching and eradication.			Contractor	Contractor	Contractor	Contractor	Contractor				$0	$10,000	**$10,000**	$1,000	0	$0
Strategic Invasive Species Control	2-1	Eradicate Five-fingered Aralia (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Fuzzy Pride-of-Rochester (2 populations, 1 small and 1 unknown)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0

Table 17. Goals and Estimated Costs for 10-Year Plan Implementation Period (continued)

Recommendation Group	Goal #	Goal Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Estimated Material Cost	Estimated Contractor Cost	Total Plan Cost	Average Cost per Year	Total SMC Volunteer Hours	Volunteer Value @ $24/hour
Strategic Invasive Species Control	2-1	Eradicate Glossy Buckthorn (61 populations, 14 moderate-large, 32 unknown)		Contractor	Contractor	Contractor	Contractor	Contractor					$0	$10,000	**$10,000**	$1,000	0	$0
Strategic Invasive Species Control	2-1	Eradicate Goutweed (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Guelder-rose (7 populations, unknown sizes)	Contractor	Contractor									$0	$750	**$750**	$75	0	$0
Strategic Invasive Species Control	2-1	Eradicate Japanese Hop (6 populations, 1 moderate-large, 3 unknown)	Contractor	Contractor	Contractor	Contractor							$0	$1,875	**$1,875**	$188	0	$0
Strategic Invasive Species Control	2-1	Eradicate Japanese Maple (1 poulation, small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Japanese Snowball (3 populations, unknown sizes)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Japanese Zelkova (2 populations, all small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Kousa Dogwood (1 population, small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Leatherleaf Mahonia (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Mimosa (2 populations, all small)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Porcelainberry (34 populations, 19 moderate-large, 8 unknown)	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor					$0	$10,250	**$10,250**	$1,025	0	$0
Strategic Invasive Species Control	2-1	Eradicate Princess Tree (4 populations, 3 small and one unknown)	Contractor	Contractor									$0	$300	**$300**	$30	0	$0
Strategic Invasive Species Control	2-1	Eradicate Purple Loosestrife (5 populations, unknown sizes)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Rugosa Rose (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Siebold's Crabapple (3 populations, 1 small and 2 unknown)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Strategic Invasive Species Control	2-1	Eradicate Siebold's Viburnum (13 populations, 5 small and 8 unknown)	Contractor	Contractor	Contractor	Contractor							$0	$1,375	**$1,375**	$138	0	$0

Table 17. Goals and Estimated Costs for 10-Year Plan Implementation Period (continued)

Recommendation Group	Goal #	Goal Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Estimated Material Cost	Estimated Contractor Cost	Total Plan Cost	Average Cost per Year	Total SMC Volunteer Hours	Volunteer Value @ $24/hour
Strategic Invasive Species Control	2-1	Eradicate Tea Viburnum (23 populations, 11 small and 12 unknown)	Contractor	Contractor	Contractor	Contractor							$0	$3,500	**$3,500**	$350	0	$0
Strategic Invasive Species Control	2-1	Eradicate Water Chickweed (1 population, unknown size)	Contractor	Contractor									$0	$375	**$375**	$38	0	$0
Strategic Invasive Species Control	2-1	Eradicate Wintercreeper (20 populations, 6 moderate-large and 9 unknown). There are possibly >100 indivudual plants scattered throughout the Reservation, requiring constant searching and eradication.			Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	$0	$5,125	**$5,125**	$513	0	$0
Strategic Invasive Species Control	2-1	Eradicate Yellow Iris (1 population, unknown size)	Contractor	Contractor									$0	$150	**$150**	$15	0	$0
Protect and Restore Highest Quality Habitat Areas	3-1	Protect 354 acres of Clean / high priority patches within the designated Stewardship Priority Area (See Table 16). This work includes maintaining clean areas through spot treatments.	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	$0	$25,000	**$25,000**	$2,500	0	$0
Protect and Restore Highest Quality Habitat Areas	3-1	Reduce abundance of high priority widespread invasive species across entire Stewardship Priority Area (See Table 16). Goal reduce spread into clean areas and begin to reverse severe infestations of the most threatening species.	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	$0	$85,000	**$85,000**	$8,500	0	$0
Protect and Restore Highest Quality Habitat Areas	3-1	Protect existing deer exclosures - Wildflower and Forest Preserve. Eliminate all detected invasive species.	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	$1,500	$0	**$1,500**	$150	1500	$36,000
Protect and Restore Highest Quality Habitat Areas	3-1	Protect existing deer exclosures with initial focus on 11 exclosures within Clean / high priority patches and secondary priority for remaining 20 exclosures located within the Stewardship Priority Area.	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	$750	$0	**$750**	$75	750	$18,000
Protect Unique Habitats	3-2	Glades: Glade ID #1. Detect and eliminate any invasive species every three years.	SMC Vols			SMC Vols			SMC Vols			SMC Vols	$200	$0	**$200**	$20	100	$2,400
Protect Unique Habitats	3-2	Glades: Glade ID #2. Detect and eliminate any invasive species every three years.		SMC Vols			SMC Vols			SMC Vols			$150	$0	**$150**	$15	75	$1,800
Protect Unique Habitats	3-2	Glades: Glade ID #3. Detect and eliminate any invasive species every three years.			SMC Vols			SMC Vols			SMC Vols		$150	$0	**$150**	$15	75	$1,800

Table 17. Goals and Estimated Costs for 10-Year Plan Implementation Period (continued)

Recommendation Group	Goal #	Goal Description	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Estimated Material Cost	Estimated Contractor Cost	Total Plan Cost	Average Cost per Year	Total SMC Volunteer Hours	Volunteer Value @ $24/hour
Protect Unique Habitats	3-2	Vernal Habitat: Black Willow Pond. Eliminate Phragmites via contractor. Detect and eliminate any invasive species every two years.	Contractor	Contractor		SMC Vols		SMC Vols		SMC Vols		SMC Vols	$200	$5,500	**$5,700**	$570	100	$2,400
Protect Unique Habitats	3-2	Vernal Habitat: Crest Trail; Detect and eliminate any invasive species every two years.			SMC Vols		SMC Vols		SMC Vols		SMC Vols		$200	$0	**$200**	$20	100	$2,400
Protect Unique Habitats	3-2	Vernal Habitat: Elmdale Peace Circle; Detect and eliminate any invasive species every two years.			SMC Vols		SMC Vols		SMC Vols		SMC Vols		$200	$0	**$200**	$20	100	$2,400
Conduct Forest Health and Unique Habitat Monitoring	4-1	Perform existing standardized forest health monitoring protocols every 5 years.				Contractor					Contractor		$0	$6,000	**$6,000**	$600	0	$0
Conduct Forest Health and Unique Habitat Monitoring	4-1	Perform existing standardized deer exclosure monitoring protocols every 7 years.			Contractor							Contractor	$0	$10,000	**$10,000**	$1,000	0	$0
Conduct Forest Health and Unique Habitat Monitoring	4-2	Perform botanical surveys focusing on globally rare Torrey's Mountain-mint and their glade habitats.					Contractor						$0	$3,000	**$3,000**	$300	0	$0
Conduct Forest Health and Unique Habitat Monitoring	4-2	Perform existing standardized protocol for amphibian breeding activity at vernal pools.	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	SMC Vols	$500	$0	**$500**	$50	1000	$24,000
Conduct Forest Health and Unique Habitat Monitoring	4-2	Peform botanical surveys focusing on all vernal pool areas and assess threats.		Contractor									$0	$3,000	**$3,000**	$300	0	$0
Totals													**$3,850**	**$196,625**	**$200,475**	**$20,048**	**3,800**	**$91,200**

Table 18. Summary of Plan Implementation Costs by Year

Costs	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	Total
Essex County Parks Staff & Expenses	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
Materials Utilized by SMC Volunteers	$325	$325	$425	$375	$425	$375	$425	$375	$425	$375	**$3,850**
ıtractor Services	$24,750	$22,125	$32,125	$19,375	$14,750	$14,375	$15,375	$15,250	$18,250	$20,250	**$196,625**
Totals	**$25,075**	**$22,450**	**$32,550**	**$19,750**	**$15,175**	**$14,750**	**$15,800**	**$15,625**	**$18,675**	**$20,625**	**$200,475**
SMC Volunteer Hours	350	350	400	375	400	375	400	375	400	375	**3,800**
SMC Volunteer Value @ $24/hour	$5,250	$5,250	$6,000	$5,625	$6,000	$5,625	$6,000	$5,625	$6,000	$5,625	**$57,000**