



Preliminary Project Proposal

North Atlantic Shrublands

(Rachel Carson NWR, Parker River/Great Bay NWR, Eastern Massachusetts NWR Complex, Rhode Island NWR Complex, Silvio O. Conte F&WR, and Wallkill River NWR Complex)



New England cottontail in thicket – *Lindsey Fenderson*

Northeast Region
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Introduction

Shrubland habitats in the northeast have declined dramatically over the past century. These habitats are an intermediate seral stage between old field and mature forest that are typically created when fields or grasslands are allowed to cede into shrubland, or when openings are created in the forest canopy thus temporarily reverting the patch to an earlier seral stage. Either way, these habitats are ephemeral and may only persist for ~10-25 years. Still, in a well-functioning ecosystem, additional early-successional habitat is frequently created to offset losses due to succession. However in recent decades, shrubland habitat has generally not been replenished due to the removal of the factors that would typically create early-successional habitat, through such practices as fire suppression, flood control and beaver management. In addition, human development directly removes habitat from the landscape and further degrades existing habitat via fragmentation. Combined with extensive reforestation throughout the northeast, the availability of early-successional habitat on the landscape has diminished significantly. In many areas, young forest is as rare as old growth forest.

Due to the reduced availability and connectivity of shrublands, a large number of plant and animal species associated with these habitats have become increasingly rare – especially the New England cottontail (*Sylvilagus transitionalis*; NEC). Research indicates that the New England cottontail requires extremely dense vegetation for escape cover, especially in the winter. This stem density is only achievable in shrubland habitats. Based upon information obtained in a regional inventory to determine the distribution of the NEC, its range has declined by 86% since 1960, and the New England cottontail now only persists in highly disjunct populations that are both geographically and genetically isolated (Figure 1). Thus, as a direct result of habitat loss, New England cottontail populations have declined to the point where they will rapidly become extinct without intervention.

The New England cottontail has been identified as a Species of Greatest Conservation Need by all states throughout its historic range. It is listed as state-endangered in Maine and New Hampshire, although it remains a game animal in Vermont, Massachusetts, Rhode Island, Connecticut and New York. In 2006, the Fish and Wildlife Service (USFWS/Service) announced that listing of the NEC under the federal Endangered Species Act was warranted but precluded and the species was placed on the Candidate Species list with a Listing Priority Number of 2.

Although the New England cottontail has the greatest dependency on these dwindling shrublands, numerous other species rely on these important early-successional habitats. Several shrub-nesting birds, such as the brown thrasher (*Toxostoma rufum*) and eastern towhee (*Pipilo erythrophthalmus*) have shown recent population declines and are threatened by early-successional habitat loss. Other shrub-dependent species, such as the American woodcock (*Scolopax minor*) and golden-winged warbler (*Vermivora chrysoptera*) have declined significantly in the Northeast from lack of habitat availability. Thus, landscape-level conservation for the New England cottontail, the most dispersal-limited species, will provide significant habitat creation and improved connectivity for an entire suite of species – many of which are current North Atlantic Landscape Conservation Cooperative (NALCC) representative species for shrubland habitats in the region, including the blue-winged warbler (*Vermivora pinus*), chestnut-sided warbler (*Setophaga pensylvanica*), field sparrow (*Spizella pusilla*), prairie warbler (*Dendroica discolor*) and eastern hognose snake (*Heterodon platyhinus*). However the New England cottontail is the only early-successional species to date where remaining populations are no longer self-sustaining and the species is in critical need of conservation attention. Given the conservation urgency of this species, a range-wide New England cottontail initiative has been established.

The Range-wide New England Cottontail Initiative

This is a highly unique Refuge land acquisition proposal, which stems from a regional conservation effort for the New England cottontail. Embracing concepts of landscape-level conservation, this proposal represents the current priorities of not only multiple refuges in the northeast, but the broader efforts of a regional conservation group composed of a multitude of agencies and stakeholders. The New England cottontail range-wide initiative is an ideal model for future Service conservation actions, where we are truly functioning as one Service, fully integrating the conservation capacities of Ecological Services, Coastal Programs, Partners, and Refuges. We are further demonstrating close interagency collaboration with a strong scientific foundation for directed conservation of a suite of wildlife, where the New England cottontail is the representative species.

This collaborative effort combines resources from federal and state agencies, as well as local land trusts, universities and other non-governmental organizations such as the Wildlife Management Institute and The Nature Conservancy. There is a strong organizational structure, with management and recovery being directed by the NEC Executive Committee, composed of the New England and New York state wildlife directors, a representative from NRCS, and chaired by Steve Weber (New Hampshire Fish and Game) and USFWS Regional Director Wendi Weber.

Partners in the New England cottontail Initiative are working on all aspects of NEC recovery. The Fish and Wildlife Service, the Natural Resources Conservation Service (NRCS), and all the state wildlife agencies, in coordination with the Wildlife Management Institute (WMI), recently formalized an agreement to develop a range-wide Conservation Strategy intended to ensure the development and implementation of a well-coordinated conservation effort to address the population status of the NEC. The NEC Executive Committee has also initiated a regional NEC Land Protection subcommittee to plan an acquisition strategy for the NEC. The Southern New England/ New York Bight Coastal Ecosystem Program is coordinating this effort with a diverse group of land protection specialists representing many agencies and organizations. The role of the Service in land acquisition for the protection of its trust species is the basis for this proposal. Without the protection and management of early-successional habitat into perpetuity, not only the New England cottontail, but several other shrubland-dependent species will need to be listed.

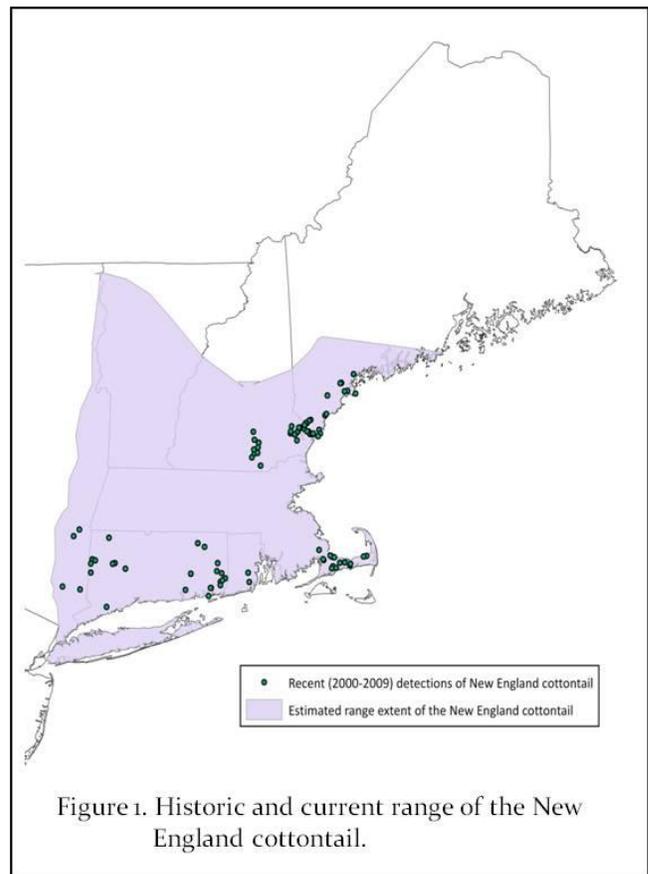


Figure 1. Historic and current range of the New England cottontail.



USEFWS – The bog turtle is one of several Federal trust species that will benefit from early-successional habitat creation.

Since the New England cottontail is an obligate shrubland specialist, it is an ideal indicator species for monitoring the abundance, quality, and connectivity of early-successional habitats in the landscape. Due to the cottontail's limited dispersal ability relative to many other shrubland-dependent species, by establishing a network of early-successional habitat on the landscape suitable for NEC population viability, we will inevitably improve habitat quantity and quality for other less-demanding shrubland species, some of which are already showing population declines.

By supporting regional connectivity for rare and ephemeral shrubland habitat and associated species, in collaboration with other landowners, this proposal exemplifies recent Service initiatives which prioritize landscape-scale conservation and management. The recently-formed North Atlantic Landscape Conservation Cooperative (NALCC) is a Service-led partnership in this region for strategic conservation efforts and using sound science to inform biological planning and conservation design at landscape and regional scales. Early-successional habitat is one of the highest priorities of the NALCC. This regional habitat protection proposal is a timely application of science-led land protection and an exemplary model of interagency cooperation and collaboration.

Additionally, The Service's new *Conserving the Future* vision is of a Fish and Wildlife Service that "embrace[s] a scientific, adaptive, landscape-level approach to conserving, managing, and restoring refuge lands and waters, and work[s] to project conservation benefits beyond our boundaries." This proposal aptly demonstrates those very principles. Regarding conservation on our National Wildlife Refuges, it recommends: "Ensuring future land acquisitions are based on explicit priorities, rigorous biological planning and conservation design that support achieving quantifiable conservation and population objectives that are developed in cooperation with state fish and wildlife agencies." That recommendation is a concise description for the NEC Conservation Strategy and this land acquisition proposal. We have formed a partnership among agencies and land-protection organizations to develop a landscape of early-successional habitat, of which the Service will play a definitive part with approval of this proposal.

■ The Role of Refuges

There is clearly an urgent need to protect lands with the express purpose of managing for early-successional habitat. This seral stage is not stable and requires ongoing maintenance and management. The Fish and Wildlife Service is ideally suited to provide continuous habitat management capability through the National Wildlife Refuge System. Refuges can fill an important gap in habitat capacity, without which the Service will lack essential authority and management capability to help conserve our early-successional trust species. Thus, if approved, this combined proposal would permit further analysis with our partners to identify locations where Refuge land acquisition can best contribute to the regional matrix of public and private lands being managed for shrubland. Refuges will work with multiple stakeholders to make specific land acquisition recommendations using a science-driven strategy for explicit biological outcomes. We will apply decision support tools and models to strategically select land in 6 states for Service protection to guarantee the persistence of shrubland habitat and the species that depend on it.

Location and Size

The six refuges involved – Rhode Island NWR Complex, Parker River/Great Bay NWR, Eastern Massachusetts NWR Complex, Silvio O. Conte F&WR, Wallkill River NWR Complex and Rachel Carson NWR – propose to develop a Refuge acquisition plan that specifically identifies the role that Service land acquisition can play in the conservation of the NEC and early-successional habitat. Refuges will work closely with the NEC technical committee and land protection subcommittee to ensure that our efforts are well coordinated and supported by the broader NEC conservation group.

■ **Focus Area Selection**

Forty-nine focus areas in 6 states have been identified as locations for initiating management and habitat restoration efforts for the New England cottontail. These focus areas are located in 5 geographic regions: southern Maine and Seacoast New Hampshire; along the Merrimack Valley in New Hampshire and Massachusetts; Cape Cod, Massachusetts; eastern Connecticut and Rhode Island; and in western Connecticut, southeastern New York and southwestern Massachusetts (Figure 2; see also figures 4-8). Significant habitat science and biological expertise were utilized to define the focus areas and direct conservation efforts to locations where they will be most successful.

The focus areas were developed using habitat models, proximity to recent New England cottontail occurrences, and expert opinion of regional biologists. For each focus area, early-successional habitat acreage and NEC population goals have been established. These goals were developed by regional biologists and based on the best available knowledge concerning cottontail population requirements and density, as well as dispersal capability. Each focus area will also have a business plan that outlines a strategic plan for achieving those habitat and population goals, by employing the resources of our many partners. Refuge land protection and management will play an important role in early-successional habitat conservation since maintaining shrublands requires an ongoing management presence. We can offer that capability into perpetuity on protected lands where wildlife is the first priority.

We therefore request authorization to initially use the 49 focus areas as study areas for detailed land acquisition planning by the 6 Refuges. Not all of those focus areas will be considered for Refuge acquisition, due to their distance from current Refuge lands which would limit the feasibility of Refuge management. The Refuges in this proposal will further undertake highly specific planning, utilizing decision support tools in collaboration with the NEC land protection committee to identify the best utilization of Refuge resources in this regional conservation effort and establish a specific, well-founded Land Protection Proposal. Moreover, we emphasize that it is not the intent of the Refuges to be the primary means of land conservation within these focus areas, but rather, in combination with other partners and landowners, to ensure sufficient habitat protection to establish self-sustaining populations of New England cottontail and other shrubland-dependent species.



Steve Maslowski/USFWS – The prairie warbler has exhibited recent population declines due to a lack of early-successional habitat.

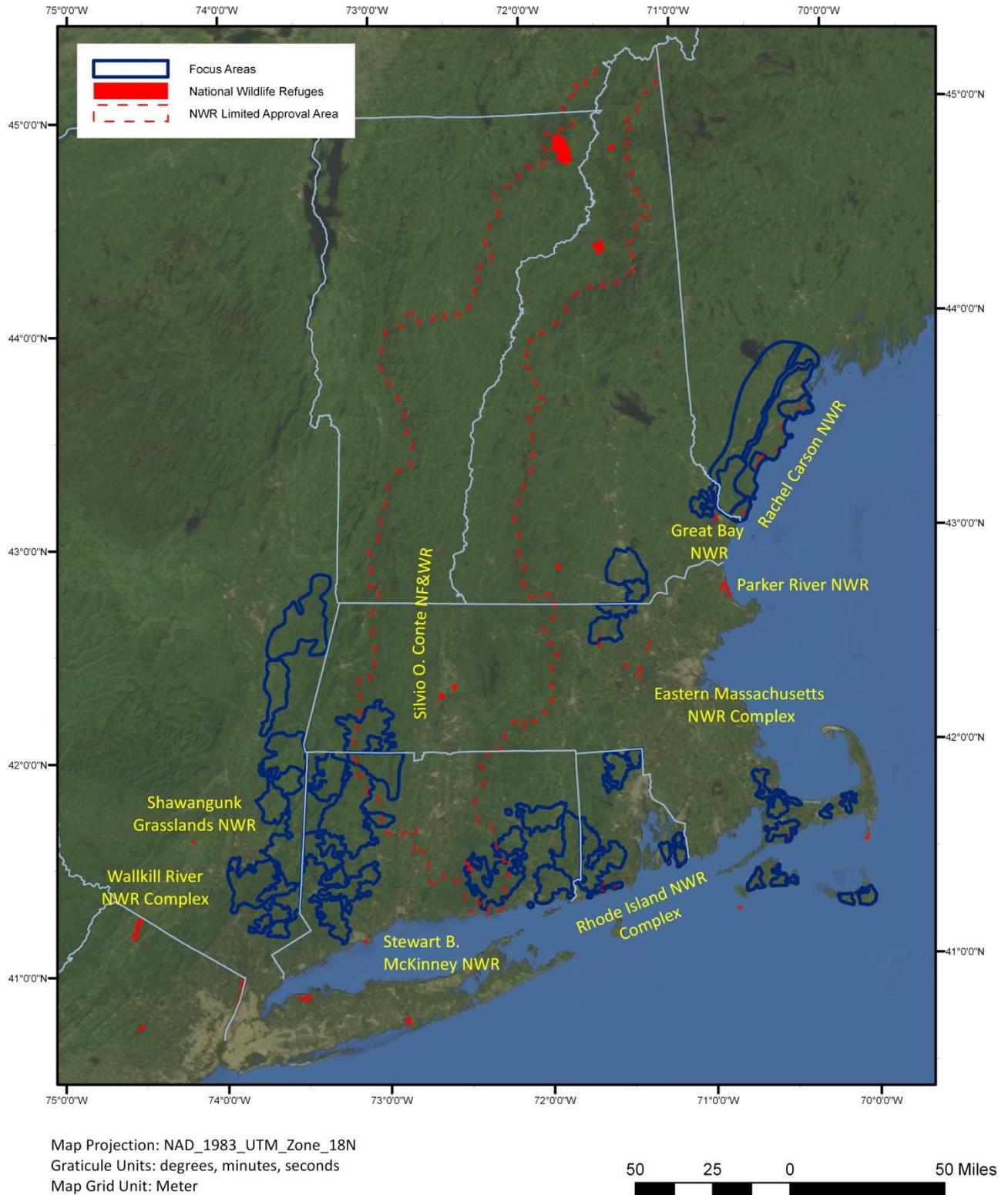


Figure 2. Range-wide New England cottontail focus areas.

■ **Parcel Prioritization within Focus Areas**

If approved to plan land acquisition in greater detail, Refuges will commence evaluation of potential parcels in their respective proximate focus areas, in collaboration with our conservation partners. Currently, ranking criteria are being developed by the NEC land protection committee to help prioritize parcels with the greatest conservation value. Land acquisition within the focus areas will be based upon the best available science concerning NEC habitat requirements, landscape design, and the site capacity and management capability to create and maintain early-successional habitat.

➤ **Science-driven land acquisition**

The science driving this proposal is based on known habitat needs of the New England cottontail, a shrubland obligate species. The amount of suitable shrubland habitats has declined by 86% during the past 50 years and is the primary cause of declining populations of this rabbit. Along with the structural nature of the vegetation within a patch of habitat, the size of the patch must be considered when assessing its value for supporting New England cottontail. The NEC is known to be area-sensitive, experiencing lower rates of predation on patches of at least 12 acres in size. The distance among suitable patches is also an important factor if we are to ensure functional connectivity on the landscape, and efforts will be made to establish suitable habitat patches within the average dispersal distance of NEC. Furthermore, landscape planning efforts will take into account the landscape matrix, since areas with numerous anthropogenic features or substantial natural barriers are likely to be highly fragmented and form barriers to dispersal or otherwise encumber conservation efforts.

The basis for developing a successful NEC Conservation Strategy is founded by resource managers recognizing the need to develop decision support tools to aid in focusing limited resources to areas where conservation of shrubland habitat and the NEC is expected to provide the greatest benefits. As a result, resource managers have developed habitat models to help guide the allocation of resources to specific areas throughout the range of the New England cottontail. Numerous factors will be considered when evaluating parcels for acquisition. We are utilizing the principles of Strategic Habitat Conservation, having already determined population goals in all of these focal areas, and are currently working to establish how to best achieve these goals at a landscape-level.

Early-successional habitat restoration for landscape-scale connectivity of the New England cottontail will benefit numerous other shrubland-dependent species, described below, including birds, bats and other pollinators. We request flexibility at this time in determining the amount of land to be secured by the Service, and emphasize our partnership with state and local governments, NGOs and private landowners. We will work closely with our partners to identify specific locations where Refuge protection and management will be most beneficial.



USFWS – New England cottontail at Crescent Beach State Park, Maine

Description of Habitat

Mature forests dominate the land cover of the northeastern U.S., while shrublands are exceptionally rare (Figure 3). Although early-successional habitats were normally never very common on the landscape, their current levels are not sufficient to sustain the high-priority wildlife species that depend on them. Many landscape plans call for a goal of 10% - 20% of the landscape be in early-successional habitat; they currently occupy only 2%. Historically, these habitats were created by natural disturbances, such as those created by fire, wind or insect outbreaks. However, reduced natural disturbances (e.g., fire suppression), along with severe habitat losses resulting from development and forest maturation, have reduced the majority of early-successional habitat to coastal scrub or to managed areas such as utility corridors and recent timber harvests.

Although efforts will be made to protect and maintain properties that are currently in shrubland habitat, given the current landscape composition, appropriate management will be needed for most of the acquired lands to create and assemble sufficient high-quality early-successional habitat on the landscape. The major drawback is that altering the seral stage of a site takes years to develop into suitable shrubland habitat. Additional management activities are being explored as means of increasing stem density more rapidly, including dormant season prescribed burns, reducing herbaceous competition, direct seeding and planting of native shrub species. Since early-successional habitat is by nature ephemeral, maintenance activities will also be needed to retain a suitable amount of shrubland habitat on the landscape. Refuges can fill an important gap in resource management capability, and also supply future adaptive management evaluation to determine the best management practices and most efficient means of maintaining early-successional habitat under a variety of conditions.



J. and K. Hollingsworth/USFWS - Karner blue butterflies are one of many threatened species that will benefit from shrubland habitat creation.

Land cover in the focal areas is fairly representative of the region as a whole, however, they encompass a greater relative percentage of deciduous forest, which is readily converted to shrubland habitat, and more pasture/hay, which may be important summer habitat. Also, the focal areas have less relative open water and medium or high intensity development than the region as a whole, which may act as dispersal barriers for some species. Thus, the focal areas identified for the proposed Refuge expansions are some of the best opportunities in the region to manage for this suite of wildlife, with New England cottontail as the representative species.

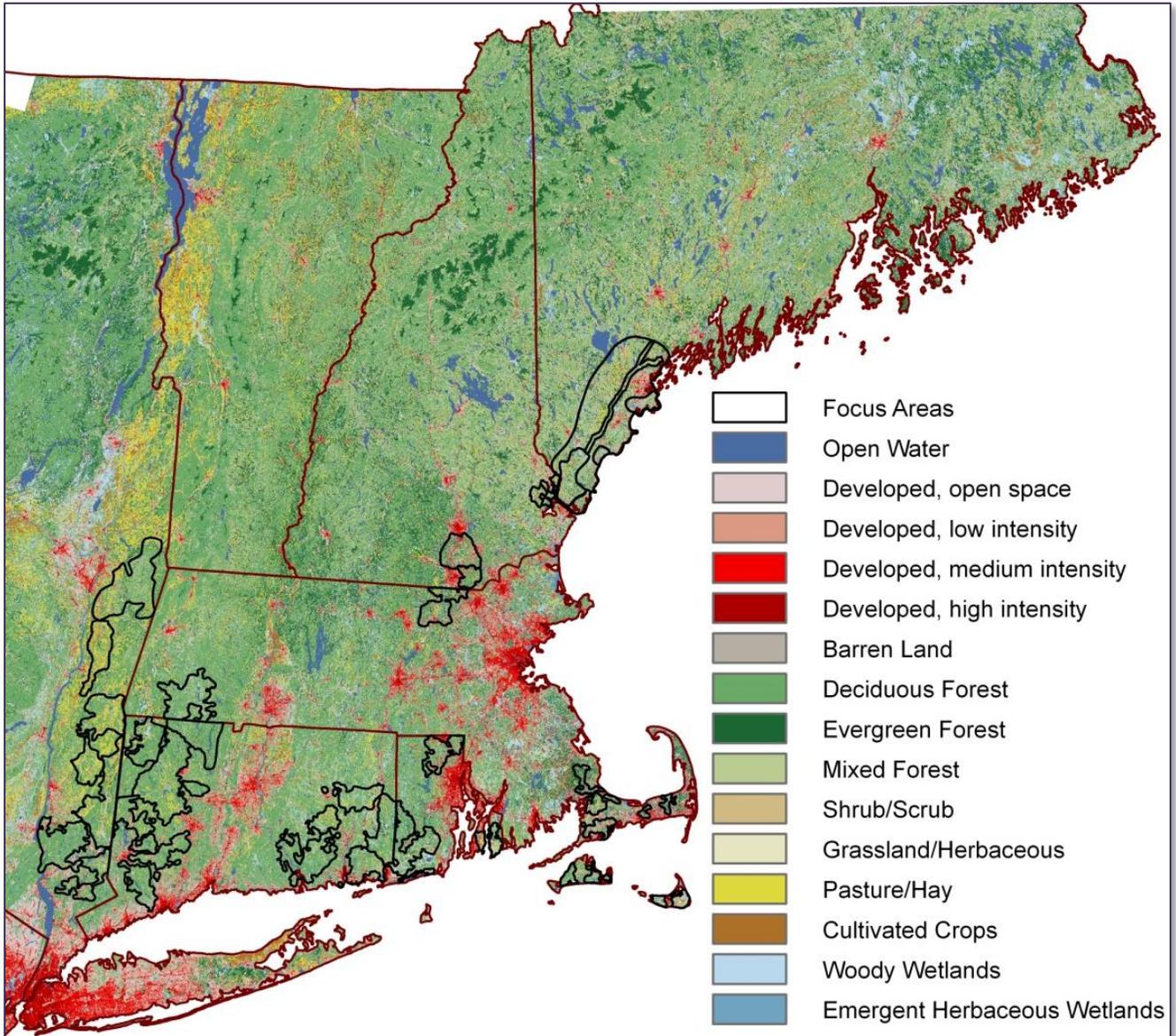


Figure 3. Regional land cover (2006 National Land Cover Database) and focus areas for project proposal.

Major Wildlife Values



Ed McCrea/USFWS – The state-endangered eastern hognose snake is known to utilize forest edges and other shrubland habitat.

Early-successional habitats are of special concern to the Service. Shrubland habitat and NEC population goals have been established throughout the region for the focus areas, to help guide our Strategic Habitat Conservation with measurable objectives and explicit conservation outcomes. The New England cottontail has been described as a barometer for the health of other shrubland dependent wildlife species that occur throughout the northeast because the NEC is: (1) an extreme habitat specialist; (2) is highly sensitive to habitat area size; (3) is dispersal limited; and (4) lives in these habitats through all seasons. As a result, conserving and creating habitat for the NEC benefits other species of national conservation priority and several Species of Greatest Conservation Need including Federally-listed species such as the bog turtle (*Clemmys muhlenbergii*: Table 1).

Shrublands and thickets provide vital breeding and foraging habitat for numerous avian species which are considered priorities by bird conservation initiatives, including several species identified as Region 5 LAPS important bird species: American woodcock (*Scolopax minor*), blue-winged warbler (*Vermivora pinus*), golden-winged warbler (*Vermivora chrysoptera*), chestnut-sided warbler (*Dendroica pensylvanica*), prairie warbler (*Dendroica discolor*), field sparrow (*Spizella pusilla*), olive-sided flycatcher (*Contopus cooperi*), loggerhead shrike (*Lanius ludovicianus*) and red-headed woodpecker (*Melanerpes erythrocephalus*). Additionally, research has indicated the importance of early-successional habitat to many other species, including hoary (*Lasiurus cinereus*), red (*L. borealis*) and big brown bats (*Eptesicus fuscus*), and several state-endangered reptile species such as the Northern black racer (*Coluber constrictor*) and Blanding's turtles (*Emydoidea blandingii*). Finally, early-successional habitats provide important landbird migration habitat as well as habitat for insect pollinators.

Preservation of viable populations of this multitude of early-successional wildlife will necessitate significant planning and a strong scientific foundation to direct conservation efforts to sites where management will have the greatest chance of success. Four of the six refuges in this proposal are currently using an adaptive management framework to test various strategies of developing native shrublands for birds and New England cottontail. This process entails habitat monitoring and analysis of the effects of various treatments over time to permit evaluation and adjustment of management techniques. This science will help us better manage any acquired lands for early-successional habitat, as well as provide invaluable information and technical expertise for our conservation partners.

Table 1. Regional conservation plans and priority species benefitting from early-successional habitat creation in the northeast.

Species common name (Federal T&E status)	Scientific name	Associated Step-down plans	Comments
American Burying Beetle (E)	<i>Nicrophorus americanus</i>	NALCC*	State-endangered in MA & RI, species of special concern in CT
American Woodcock	<i>Scolopax minor</i>	NALCC*, BCR14‡, BCR28‡, BCR30‡, BCR13†, PIF27§, PIF09§, American Woodcock Conservation Plan	
Blue-winged Warbler	<i>Vermivora pinus</i>	NALCC*, BCR30‡, BCR13†, BCR14†, BCR28†, PIF09§	
Bog Turtle (T)	<i>Clemmys muhlenbergii</i>	NALCC*	State-endangered in MA, CT & NY
Indiana Bat (E)	<i>Myotis sodalis</i>	NALCC*	State-endangered in MA, CT & NY
Karner Blue Butterfly (E)	<i>Lycaeides melissa samuelis</i>	NALCC*	State-endangered in NH & NY
New England Cottontail (C)	<i>Sylvilagus transitionalis</i>	NALCC*	State-endangered in ME & NH, species of special concern in NY
Northeastern Bulrush (E)	<i>Scirpus ancistrochaetus</i>	NALCC*	
Northern Redbelly Cooter (E)	<i>Pseudemys rubriventris</i>	NALCC*	State-endangered in MA
Prairie Warbler	<i>Dendroica discolor</i>	NALCC*, BCR30‡, BCR28†, PIF09§	
Brown Thrasher	<i>Toxostoma rufum</i>	BCR13†, BCR28†, BCR30†	Species of special concern in CT
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	BCR28‡, BCR30†	
Field Sparrow	<i>Spizella pusilla</i>	BCR28‡, BCR13†, BCR30†	
Northern Bobwhite	<i>Colinus virginianus</i>	BCR30†	
Whip-poor-will	<i>Caprimulgus vociferus</i>	BCR30†	Species of special concern in CT & NY
Willow Flycatcher	<i>Empidonax traillii</i>	BCR28†, BCR30†	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	BCR14†, PIF27§	
Olive-sided Flycatcher	<i>Contopus cooperi</i>	BCR14†	
Rusty Blackbird	<i>Euphagus carolinus</i>	BCR14†	
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	BCR13‡, BCR28‡, PIF09§	State-endangered in MA & CT, species of special concern in NY
Canada Warbler	<i>Cardellina canadensis</i>	BCR14‡	
Black Racer	<i>Coluber constrictor</i>		State-endangered in ME, state-threatened in NH
Eastern Hognose Snake	<i>Heterodon platyhinos</i>		State-endangered in NH, species of special concern in CT & NY

*NALCC – Highest priority species for North Atlantic Landscape Conservation Cooperative Development and Operations Plan

† High and ‡highest priority species for Bird Conservation Region Plans (BCR30 = New England/Mid-Atlantic Coast Bird Conservation Region; BCR14 = Atlantic Northern Forest; BCR13 = Lower Great Lakes/St. Lawrence; BCR28 = Appalachian Mountains)

§Priority species for Partners in Flight Landbird Conservation Plans (PIF27 = Northern New England; PIF09 = Southern New England)

Relationship of Project to Ecosystem's Management Goals and Objectives

The proposed refuge expansions are part of the regional effort to create and conserve early-successional habitat with suitable landscape connectivity for the species that depend on this resource, using the New England cottontail as a representative species due to its more specific habitat requirements and limited dispersal. This project is compatible with a number of regional partnerships, such as the Atlantic Coast Joint Venture and Northern Young Forest Initiative. Refuge land acquisition and management for early-successional habitat would directly support a number of ecosystem-level management goals and objectives in this region, including:

■ **North Atlantic Landscape Conservation Cooperative**

The NALCC has identified early-successional habitats as one of the highest priorities for conservation. This project complements NALCC methods by promoting landscape-level conservation and cooperation. Refuge land acquisition will be strategic, based on scientific planning, and will incorporate the input and expertise of our conservation partners.

■ **State Wildlife Action Plans**

All of the New England states and New York have recognized early-successional habitat protection as a priority in their State Wildlife Action Plans. Land conservation at the Federal level will provide increased management capacity and protection for this ephemeral habitat type. Further, the Service will utilize the participation of the States in identifying the most appropriate parcels for Refuge protection to meet our mutual wildlife conservation goals.

■ **New England cottontail Conservation Strategy and Service goals**

A multi-agency, range-wide task force has been established to promote NEC recovery and avoid federal endangered species listing. The goals stated in the New England cottontail recovery plan are to:

...implement conservation actions, throughout the range, to establish:

- 1 NEC landscape capable of supporting 2,500 or more individuals;
- 5 NEC landscapes each capable of supporting 1,000 or more individuals;
- 12 NEC landscapes each capable of supporting 500 or more individuals;

where the Service has defined a NEC landscape as an area consisting of a network of 15 or more habitat patches, several of which should be 25 acres or greater in size, and situated within dispersal distance to other patches of suitable habitat.

This objective will require habitat conservation and management by numerous parties, including federal, state, and local agencies, non-governmental organizations and private landowners. Federal land protection will be necessary to support management for early-successional habitat into perpetuity. This proposal supports the NEC recovery goals by permitting refuge land acquisition for parcels to be managed as early-successional habitat and designated as National Wildlife Refuge.

■ **Bird Conservation Region Plans**

The New England/Mid Atlantic Coast BCR 30 plan identifies scrub-shrub and early successional communities as priorities for conservation. The plan calls for several conservation actions, including acquiring, protecting, creating and maintaining early successional habitats; and management activities such as invasive species control and recreating natural disturbance processes that maintain early-successional habitats. Additionally, many of the landbird focus areas coincide with the focus areas identified in this proposal. Thus, this proposal will directly contribute to the BCR plans by meeting the above conservation actions in areas considered important for landbirds.

■ **Partners in Flight Bird Conservation Plans**

The Southern New England PIF Bird Conservation Plan identifies early successional scrub and pitch pine barrens as priority habitats and sets forth several population goals for declining shrubland bird species. The plan further discusses the need for rotational management to continuously maintain sufficient amounts of early-successional habitat on the landscape. This project proposal would be able to not only provide protection for early-successional habitat, but Refuges can offer the management capability necessary for continued shrubland maintenance.

■ **American Woodcock Conservation Plan**

The American woodcock requires early-successional habitats for feeding and nesting and has experienced steady population declines in recent decades. Within BCR 30, the plan calls for an additional 2.2 million acres of young forest and shrubland habitat creation. This proposal would contribute to this plan by establishing, protecting and maintaining woodcock habitat throughout the region.

■ **Pollinator Partnership**

This proposal will provide considerable habitat creation and improvement for pollinators throughout the region, by providing necessary habitat management to help control invasive species, while encouraging native, pollinator-friendly shrubs.

Related Resources

This project demonstrates strong partner coordination and collaboration for landscape-scale conservation and successfully implements the principles of the NALCC. The Refuges are working closely with many partners, including State wildlife agencies, NRCS, the Wildlife Management Institute, and local land trusts, to create a network of protected shrublands. Currently, those partners have a total of approximately 3500 acres of public lands within the focus areas being managed for early-successional habitat (Figures 4 – 8). Furthermore, Partners for Fish and Wildlife and several other entities are working with numerous private landowners to manage for early-successional habitat on some of their lands, thus increasing the availability and proximity of shrubland habitat on the landscape. Securing additional Refuge lands for early-successional habitat will help improve connectivity and management capability.



USFWS – American woodcock is an important game species that depends on shrubland habitat for feeding and nesting.

Parcel selection for Refuge protection and management will be strategic and focused. Priority will be given to areas in greatest need of protection, while promoting habitat linkages for the New England cottontail and other shrubland species. The proposed refuge expansions will ensure coordination and connectivity with other conserved lands being managed for early-successional habitat, while emphasizing landscape-scale conservation and design among numerous stakeholders.

Threats

Several threats to early-successional habitat have been identified. Refuge land acquisition can help address these threats by providing management capability and resources that may not be available to other parties.

■ **Land Use Change and Habitat Fragmentation**

Early-successional habitat in New England has declined in the past century as a direct consequence of land-use change. The once agrarian and pastoral landscape of New England has over time largely yielded to woodlands. Understory vegetation thinned during the process of forest maturation, causing thicket habitat to decline. These losses are exacerbated by the fact that additional new early-successional habitat is not being created through natural processes and public opposition to clearcutting has limited the creation of new stands of young forest in many areas. The early-successional habitat that does remain is typically fragmented in small, isolated patches. Consequently, current early-successional habitat availability is not similar to levels that would have existed on the landscape prior to European settlement.

- The proposed refuge expansions will conserve habitat that is threatened by rampant development and restore shrublands by active management such as prescribed fire, forest harvesting and mechanical means to create native shrublands that were once much more common in New England. Furthermore, protection will be prioritized toward protecting and assembling larger contiguous habitats and promoting connectivity in an effort to reduce the negative impacts of fragmentation.

■ **Climate Change and Sea-Level Rise**

Future climate change will significantly impact our natural resources. Changes in temperature and precipitation will alter the vegetative matrix and necessitate changes in associated wildlife assemblages. Furthermore, much of the existing early-successional habitat in this region is located on the coast where abiotic factors convene to promote a fairly persistent shrubland state. Current sea-level rise predictions for the next century would result in inundated low-lying coastal areas, increased erosion of the shoreline, and flooding of important coastal shrublands and marshes. Thus, without the protection of adequate upland habitat that can be managed for this seral stage, we may further limit the abundance of this community in the face of sea-level rise and climate change.

- This project proposal seeks to help mitigate the impacts of future climatic changes on our Federal trust resources by working to assemble a variety of large blocks of land to help buffer against these effects and provide greater flexibility for adaptive management as new information becomes available. Along with collaborative partner actions, these Refuge expansions will help provide wild shrubland species with greater time and opportunity to emigrate and adapt to ensuing climate change.



Bill Thompson/USFWS – The Eastern towhee is a high priority shrubland species

Invasive Species

Not only are early-successional habitats rare and in decline, but they are further threatened by numerous invasive shrub species. These exotic species choke out and exclude native plants, alter the structural characteristics of our native shrublands, and often provide lower quality food for wildlife than native species. Additionally, the negative effects of invasive plants on many native pollinators are well-documented. Invasive plants can be highly detrimental to shrubland habitat quality and associated species.

- Currently, invasive shrubs are providing some of the only shrubland habitat on the landscape. It would be imprudent and potentially detrimental to attempt total elimination of exotic shrubs before further native shrublands have been created. However, once native shrublands are established, expansion of these Refuges will help prevent and mitigate the negative effects of invasive species by increasing our capacity for early detection, eradication and control, while facilitating resistance to new invasions.

Proposal Objectives and Funding

Acquisition of important habitats for shrubland species is the primary objective of this proposal. Establishment and conservation of rare and ephemeral shrublands and promoting native plants will benefit the numerous species that utilize them. Permanent protection and management of early-successional habitat will contribute to the recovery and persistence of currently declining shrubland species, especially the New England cottontail. There will also be occasional important opportunities to help preserve large core blocks of unfragmented habitat, and to promote strategic habitat connectivity in partnership with other conserved lands. The proposed refuge expansions will furthermore provide opportunities to safeguard against land use and climate change through habitat resiliency and redundancy.

Several sources of funding exist for the necessary land acquisition and habitat manipulation. It is anticipated that the majority of these lands would be acquired with Migratory Bird Conservation Funds and Land and Water Conservation Funds. Additional potential sources of funding include NFWF and other grants as well as private donations.

Ownerships and Type of Acquisition

A diverse assortment of parcels will be considered by each refuge for acquisition. Parcels that meet our criteria for shrubland habitat creation and management will define the opportunities where we will work. Properties will be evaluated using available habitat models, the best existing science, and expert input to prioritize parcels with the greatest potential for high-quality shrubland habitat, while accounting for appropriate connectivity and landscape design. Some of the proposed parcels will currently contain thickets, however most will require management to grow into early-successional habitat or to revert back to secondary succession.

Acquisition efforts will be prioritized by funding availability and shrubland habitat ranking criteria (e.g. size of parcel that can be managed in early-successional habitat, proximity to other conserved shrublands, etc.). Unfortunately, the landscape in the northeast is highly fragmented and the highest and best uses for the majority of land in the region is for industrial, commercial or residential development. This has made land acquisition in this region expensive and a multitude of funding sources will be necessary to achieve our conservation goals. Several means will be employed to develop and conserve early-successional habitat on the landscape:

- **Full fee acquisition** – the Service will acquire property to be managed as a National Wildlife Refuge. Acquisition by donation or partial donation will be attempted.
- **Conservation easement** – the Service would be authorized to acquire a less than fee interest in property that would prevent the property from being converted to development use and that a significant portion of the property be managed by the Service as early-successional wildlife habitat.
- **Low or no-cost lease** – the Service would be permitted to conduct early-successional wildlife management activities at reduced cost or even no cost on leased lands.
- **Partners for Fish and Wildlife** – the Service would target private landowners in the proposed Refuge units to enter into habitat management agreements to create shrubland wildlife habitat.
- **Promote partner conservation** – the Service will promote partner conservation efforts that would include land trust and other agency conservation efforts.

Initial and Annual Costs

- **Land Acquisition:** Land values inevitably vary across the region. Estimated cost to acquire land in this region ranges from approximately \$1000/acre to \$10,000/acre. However, not all acquisitions will be in full-fee title ownership. Conservation easement acquisition is estimated at about 50% - 80% of the above costs.
- **Other Initial Costs:** Additional initial costs include boundary posting, interpretive signs and other outreach materials. These costs are estimated at approximately \$10,000 per refuge.
- **Habitat Management:** Due to the current scarcity of shrubland habitat in the northeast, most land acquisitions will require significant management to establish high-quality early-successional habitat. Depending on the initial habitat composition and the treatments necessary for shrubland creation, initial habitat management will cost up to \$1500/acre.
- **Habitat Maintenance:** Early-successional habitat, once established, will require periodic maintenance to remain in that seral stage; this may be conducted on a rotational basis. It is estimated that maintenance activities will cost roughly \$25 - \$250/acre.
- **Annual Operating Costs:** There may be a long-term need for 1-2 additional staff positions at some of the refuges, depending on lands acquired and current refuge management capability. Some additional workforce requirements may only need to be seasonal and/or temporary. These needs will be evaluated on an individual-refuge basis.

Non-Service funding would supplement Service acquisition and operational funds and would be obtained from sources such as grants and private donations. Additionally, some of these costs may be partially offset by revenue derived from timber harvesting. These cost estimates will be refined with additional planning and development of the Land Protection Plan (LPP).

Water Rights

The Service would acquire all water rights when fee interest was acquired.

Contaminants and Hazardous Wastes

The EPA currently lists several Superfund sites and Resource Conservation and Recovery Act (RCRA) Corrective Action sites in many of the focal areas identified, especially in eastern New York, Rhode Island, eastern Massachusetts and coastal New Hampshire. These properties will not be considered for acquisition and standard Level 1 contaminant surveys will be conducted prior to all acquisitions.

Public Attitude and Involvement

Young forest habitat and New England cottontail management has generally received very positive public response. All state fish and wildlife agencies support proposed federal land acquisition benefiting early-successional habitat. Many local groups, land trusts, schools, and conservation commissions have voiced their support for preserving shrubland habitat for birds and cottontails. Volunteer days for planting native shrubs and removing invasive species have been well-attended. Furthermore, an Outreach subcommittee has been formed under the NEC Executive Committee which is involved in increasing public awareness about the importance of shrubland habitat and educating the public about controversial management methods such as clearcutting. They are developing audience-tailored messages (e.g. for hunters, farmers, foresters, etc.) to educate and promote early-successional habitat management. As with any land acquisition project, there will be individuals opposed to purchasing land, opposed to removing land from tax roles, and opposed to federal actions. However, no localized opposition has been noted. Additionally, congressional staffs have been briefed on the proposal and it is anticipated we will have the support of our State elected officials, especially given strong local support.

Special Considerations

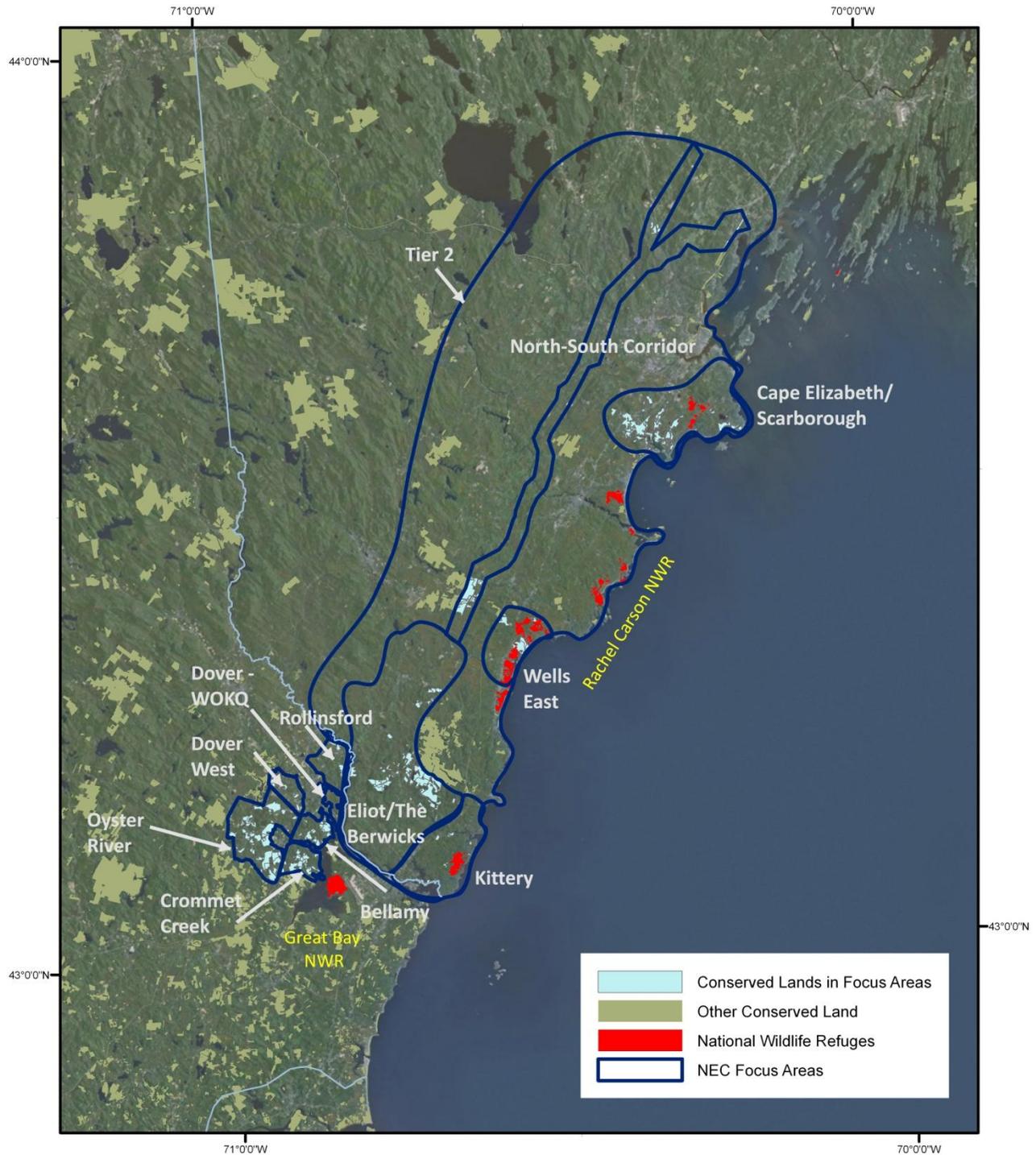
The periodic management required to maintain early-successional habitat would preclude wilderness designation. There are some military installations in some of the focus areas. Although disturbance of wildlife may occur as a result of military activities, the military, most notably, the Massachusetts Military Reservation, is an active conservation partner.

Findings and Recommendations

Early-successional habitat is one of the rarest habitats in this region. Yet, it remains a crucially important resource for numerous wildlife species, as well as for preserving our native shrubs. Although we are working with several public and private stakeholders, conservation by these partners alone will not be sufficient. Lack of available resources and management capability, as well as economic and public use pressures will greatly limit the protection and maintenance of shrublands on private and state lands into the future. National Wildlife Refuge protection offers some resiliency for managing for these important habitats into perpetuity. Although some properties on each of the six refuges in this proposal are already being managed for early-successional habitat, additional expansion is necessary if we are to plan enough redundancy to ensure future connectivity regardless of climate change impacts, as well as to accommodate necessary rotational management activities to maintain early-successional habitat on the landscape. The Service has a significant opportunity to better manage for this dwindling habitat type which should not be ignored.



John Greene – New England cottontail



Map Projection: NAD_1983_UTM_Zone_18N
 Graticule Units: degrees, minutes, seconds
 Map Grid Unit: Meter



Figure 4. Map of focus areas and conserved lands in the Maine/Seacoast New Hampshire region.

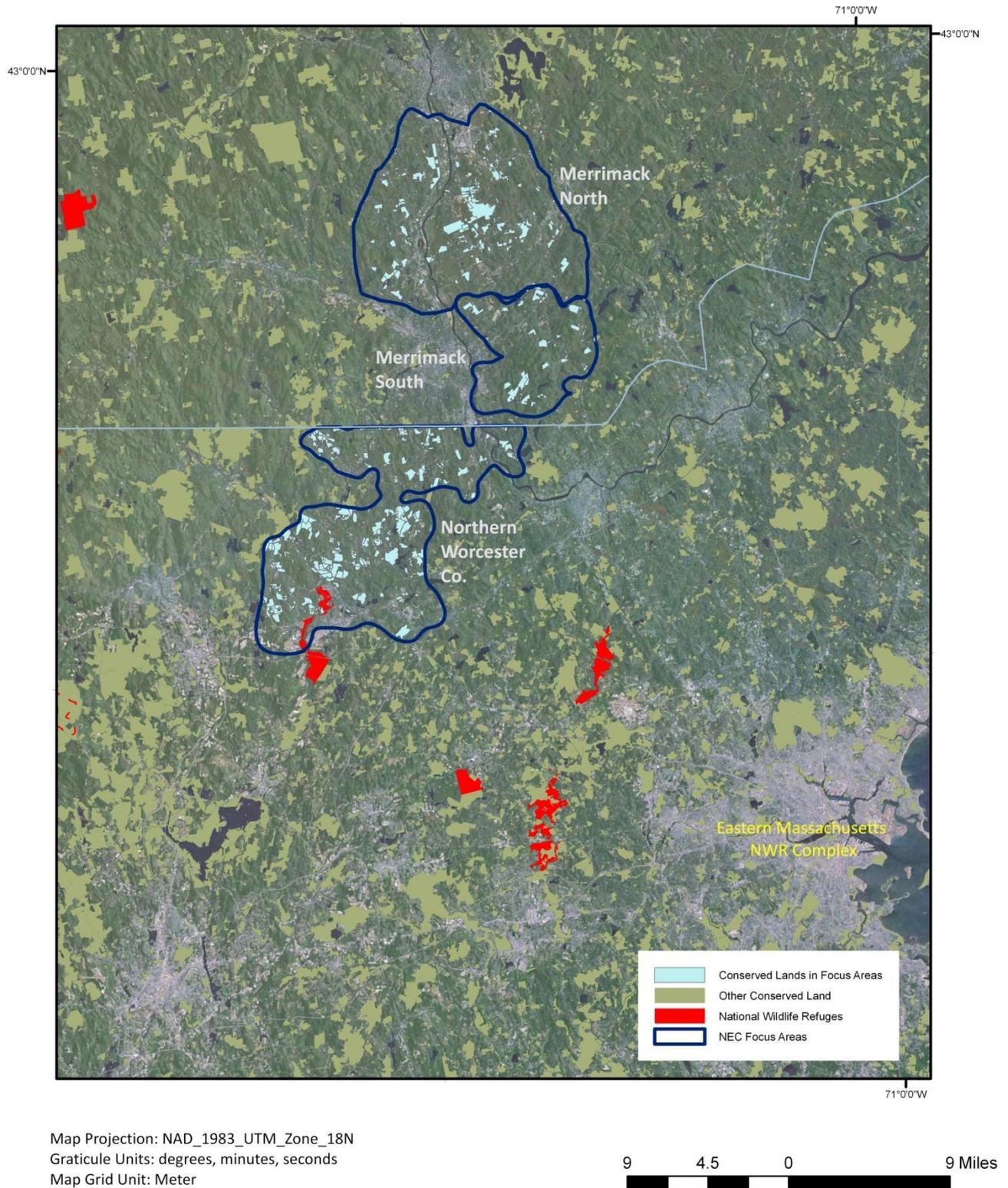


Figure 5. Map of focus areas and conserved lands in the Merrimack Valley (NH & MA) region.

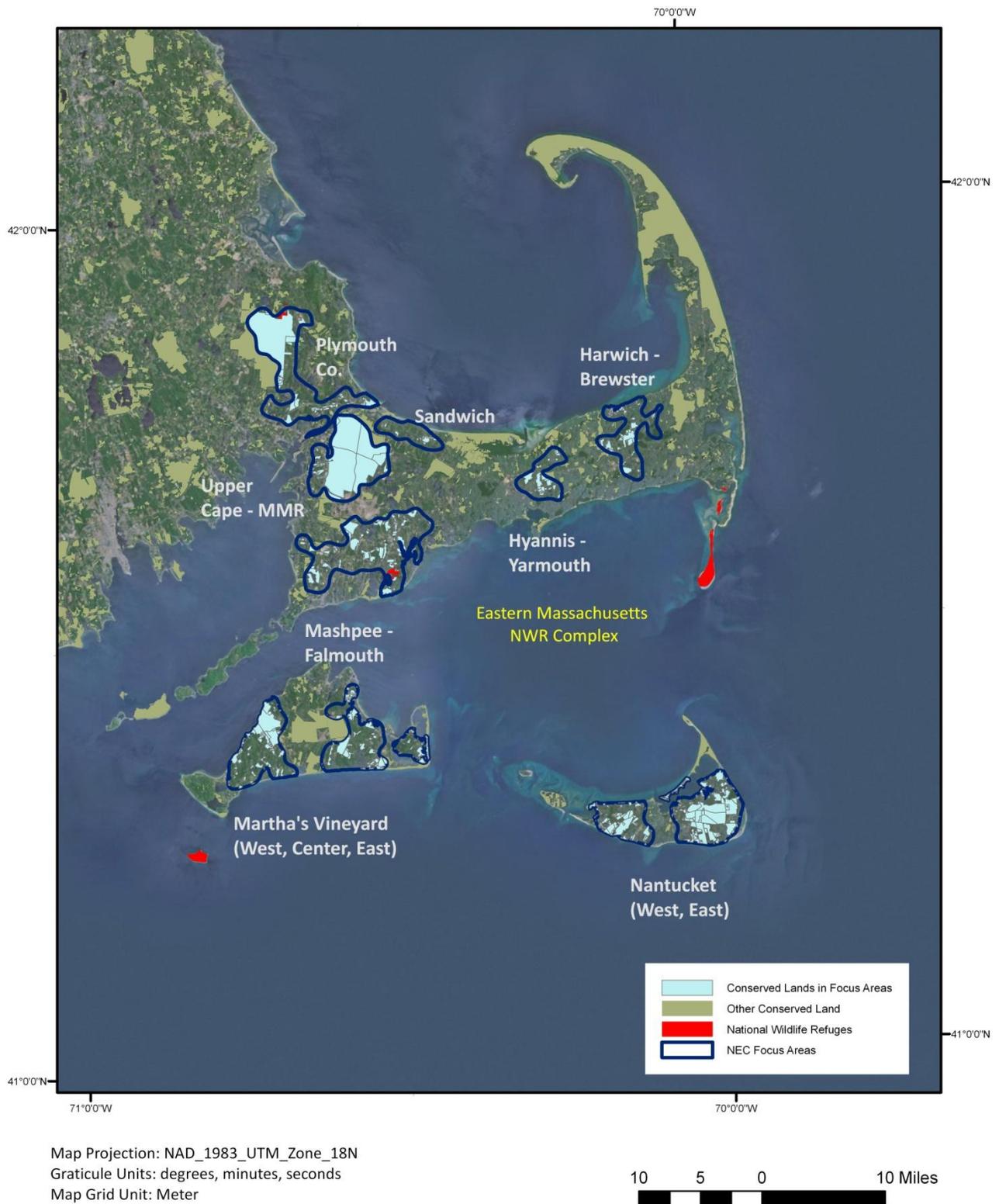
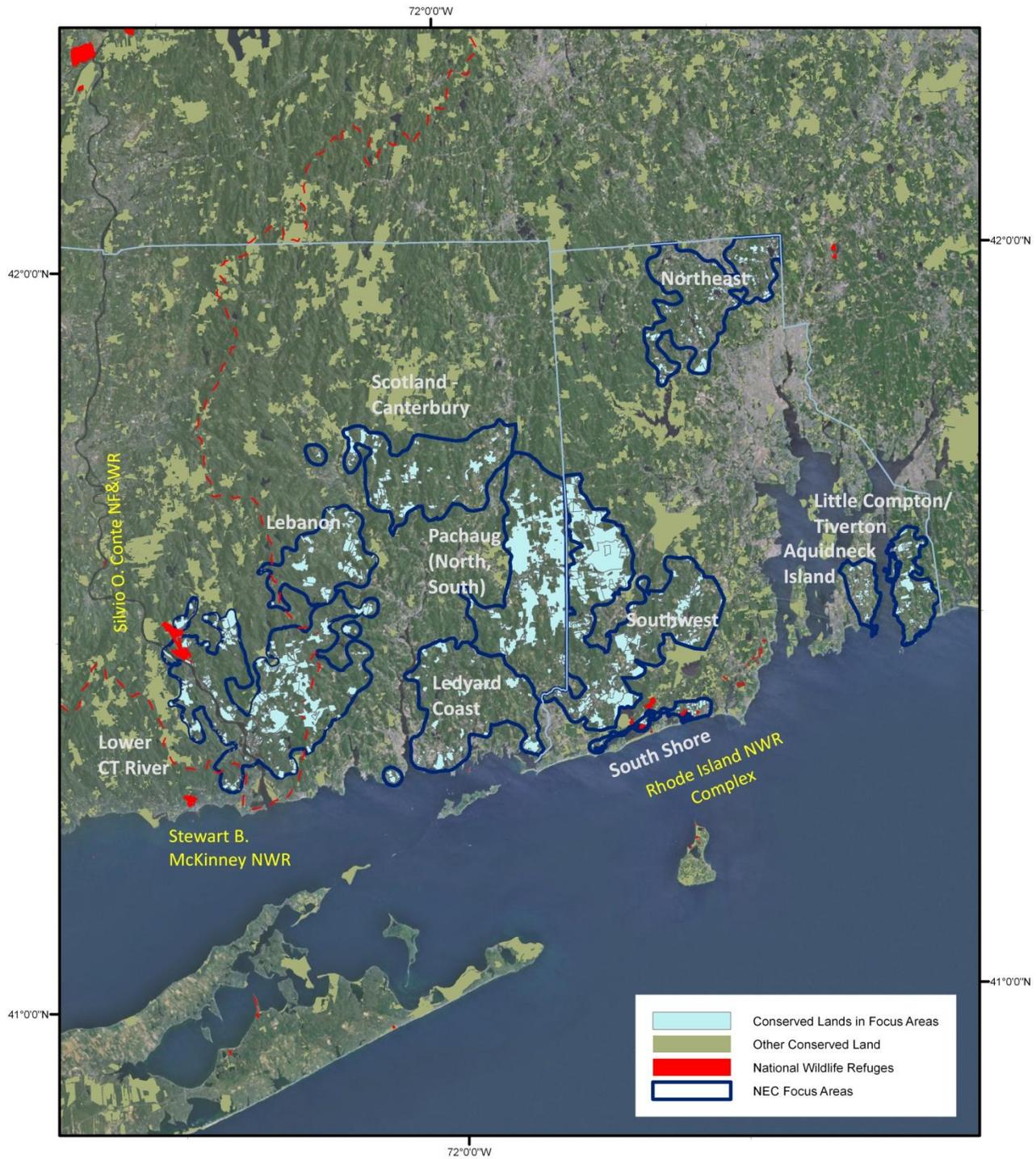


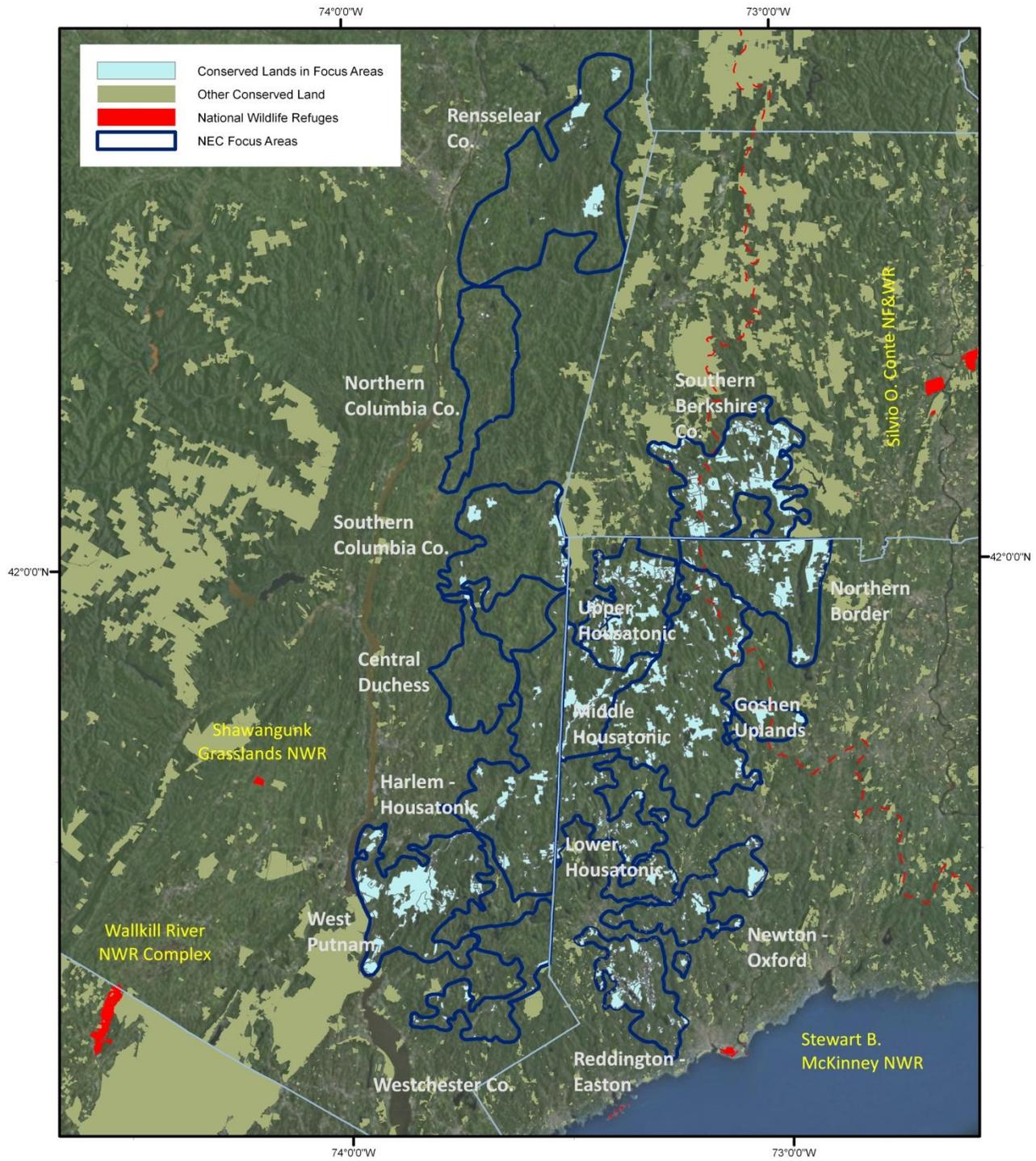
Figure 6. Map of focus areas and conserved lands in the Cape Cod, MA region.



Map Projection: NAD_1983_UTM_Zone_18N
 Graticule Units: degrees, minutes, seconds
 Map Grid Unit: Meter



Figure 7. Map of focus areas and conserved lands in the eastern CT and RI region.



Map Projection: NAD_1983_UTM_Zone_18N
 Graticule Units: degrees, minutes, seconds
 Map Grid Unit: Meter

10 5 0 10 Miles

Figure 8. Map of focus areas and conserved lands in the western CT and NY region.