

Species Status Assessment

Class: Mammalia
Family: Leporidae
Scientific Name: *Sylvilagus transitionalis*
Common Name: New England cottontail

Species synopsis:

The New England cottontail (*Sylvilagus transitionalis*), abbreviated as NEC, is the only rabbit native to the northeastern United States from the Hudson River Valley of New York eastward. Although it is very similar in appearance to the Eastern cottontail (*Sylvilagus floridanus*), NEC are a separate species, which taxonomists recognized in 1992 when it was split off from the Appalachian cottontail (*Sylvilagus obscurus*) on the basis of chromosomal differences, morphology, and geographic separation (Fuller and Tur 2012). The NEC usually can be distinguished from the Eastern cottontail by its shorter ears, the presence of a black spot between the ears, the absence of a white spot on the forehead, and a black line on the anterior edge of the ears (Litvaitis *et al.* 1991). However, external characteristics alone are not completely diagnostic and cranial differences provide a more reliable means of distinguishing the two species (Johnston 1972, Chapman and Ceballos 1990).

The NEC was previously widely distributed in New England, but the range has been reduced and fragmented (Chapman *et al.* 1992) and it currently has a disjunct distributional pattern, surviving in refugia in portions of the original range. It occurs generally in much of New England northward to southern Maine, westward to the Hudson River in eastern New York, and southward to eastern Long Island (Whitaker and Hamilton 1998). Remnant populations are now restricted to five regions: 1) seacoast region of southern Maine and New Hampshire, 2) Merrimack River Valley of New Hampshire, 3) a portion of Cape Cod, Massachusetts, 4) eastern Connecticut and Rhode Island, and 5) portions of western Connecticut, eastern New York, and southwestern Massachusetts (Litvaitis *et al.* 2006).

I. Status

a. Current and Legal Protected Status

- i. **Federal** Not listed **Candidate?** No
- ii. **New York** Special Concern: SGCN

b. Natural Heritage Program Rank

- i. **Global** G3
- ii. **New York** S1S2 **Tracked by NYNHP?** Yes

Other Rank:

IUCN Red List— (VU) Vulnerable
Species of Northeast Regional Conservation Concern (Therres 1999)

In response to a petition requesting that the USFWS list NEC as federally endangered or threatened, the USFWS conducted a review of NEC status and threats and in 2006, determined that listing the NEC was warranted but that this action was precluded by higher-priority listing actions. Therefore, the NEC was designated a “candidate” for listing (71 FR 53756 Sept. 12, 2006) (Fuller and Tur 2012). A 12-month finding published in September 2015 determined that listing was not warranted, and NEC were removed from the candidate species list.

Status Discussion:

The New England cottontail range has shrunk by an estimated 86% since 1960. In 2004, the NEC was listed as a priority species in every Wildlife Action Plan (WAP) for the states in which it occurs. In 2007, the Northeast Fish and Wildlife Diversity Technical Committee named NEC as the top-priority Species of Greatest Conservation Need (SGCN) for regional landscape-scale habitat conservation. The Committee then began a cooperative effort to secure funding for a sustained multi-state conservation effort, with the goal of averting the need for the USFWS to list the NEC as threatened or endangered (Fuller and Tur 2012).

II. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: 1960s to present

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Severe decline in the Northeast

Time Frame Considered: 1960s to present

c. Adjacent States and Provinces

CONNECTICUT Not Present No data

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: _____

Listing Status: Not listed (S2) SGCN? Yes

MASSACHUSETTS Not Present _____ No data _____

i. Abundance

 X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

 X declining ___ increasing ___ stable ___ unknown

Time frame considered: _____

Listing Status: _____ Not listed (S2) _____ SGCN? Yes

NEW JERSEY Not Present _____ No data X

i. Abundance

___ declining ___ increasing ___ stable ___ unknown

ii. Distribution:

___ declining ___ increasing ___ stable ___ unknown

Time frame considered: _____

Listing Status: _____ Not listed (SNR/SU) _____ SGCN? Yes

ONTARIO Not Present X No data _____

PENNSYLVANIA Not Present X No data _____

QUEBEC Not Present X No data _____

VERMONT Not Present X No data _____

i. Abundance

___ declining ___ increasing ___ stable ___ unknown

ii. Distribution:

___ declining ___ increasing ___ stable ___ unknown

Time frame considered: _____

Listing Status: _____ Not listed (SH) - Extirpated _____ SGCN? Yes

d. NEW YORK

No data _____

i. Abundance

X declining ___ increasing ___ stable ___ unknown

ii. Distribution:

X declining ___ increasing ___ stable ___ unknown

Time frame considered: Moderate decline from 1960s to present

Monitoring in New York.

The NYSDEC has conducted survey efforts (skull collection, live-trapping, fecal analysis) in potential counties of occurrence and has discovered extant populations in Columbia, Dutchess, Putnam, and Westchester counties (Litvaitis *et al.* 2006).

Trends Discussion:

NECs have disappeared from many historical locations in New York including Warren County, the Catskills, and Long Island. The species was last documented in Rensselaer County in the 1960s (Benton and Atkinsin 1964). Recent surveys suggest that the species continues to decline throughout its range due to forest maturation, habitat loss, habitat fragmentation, and competition with Eastern cottontails (Litvaitis *et al.* 2006). In New York, it is now limited to a few fragmented populations in Columbia, Dutchess, Putnam, and Westchester counties. If current trends continue, the NEC will likely become extirpated in the state.

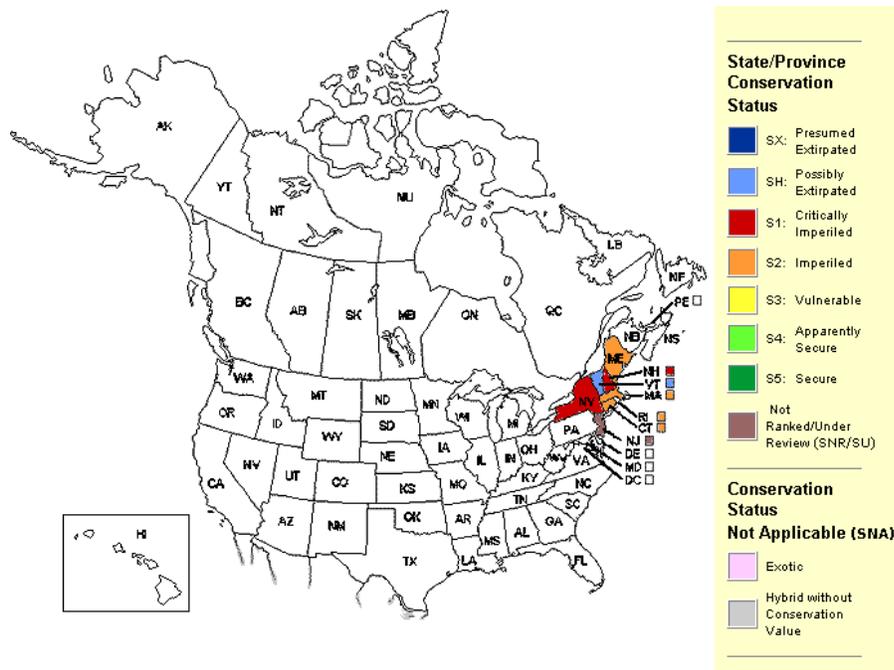


Figure 1: Conservation status of the New England cottontail in North America (NatureServe 2012).

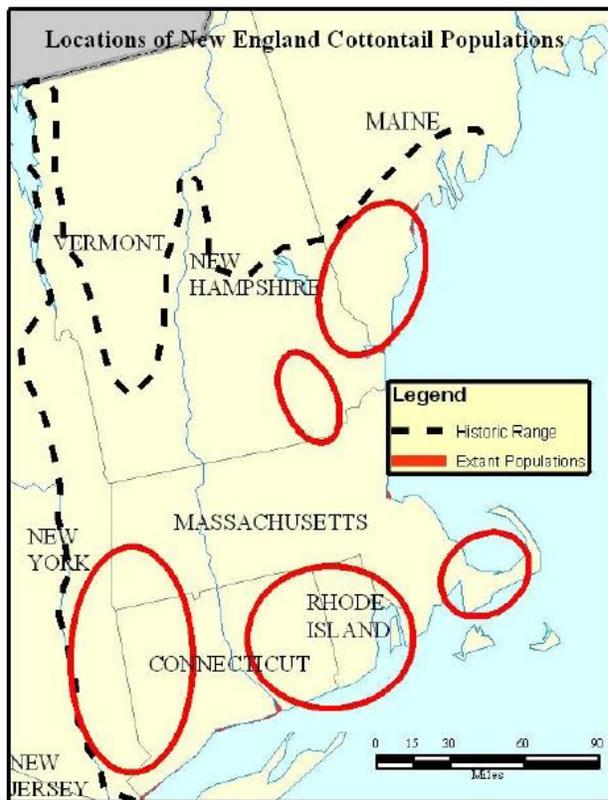


Figure 2: Distribution of five extant NEC populations within the species' historical range (Fuller and Tur 2012).

III. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	<u>10-17 Element Occurrences</u>	_____

Details of historic occurrence:

Accounts from the late nineteenth century describe native cottontails as “common” and robust populations apparently persisted into the mid-twentieth century (Litvaitis 1984).

Historical records exist for NEC in Warren, Rensselaer, and Dutchess counties. Eighteen extant locations (20 records) are known in Columbia, Dutchess, Putnam, and Westchester counties. When appropriate separation distances are taken into consideration, this represents between 10 and 17 element occurrences (NYNHP 2013).

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	_____	<u>6-20 Element Occurrences</u>	_____

Details of current occurrence:

NEC are known to occur at 45 locations in New York, but with the current data the population size can only be estimated at most of these locations. Eastern cottontails also occur at 30 of these 45 locations. The metapopulation dynamics and viability of these occurrences are currently unknown.

New York’s Contribution to Species North American Range:

% of NA Range in New York	Classification of New York Range
___ 100 (endemic)	<u> X </u> Core
___ 76-99	___ Peripheral
___ 51-75	___ Disjunct
<u> X </u> 26-50	Distance to core population:
___ 1-25	_____

V. New York Species Demographics and Life History

- Breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Anadromous**
- Non-breeder in New York**
 - Summer Resident**
 - Winter Resident**
 - Catadromous**
- Migratory only**
- Unknown**

Species Demographics and Life History Discussion:

The nests of NECs are similar to those of Eastern cottontails, simple depressions in the ground lined with fur and grass, capped by twigs and leaves (Dalke 1942). Nests have been found in a variety of habitats including brush (43%), woods (25%), hayfields (16%) and other grasslands (16%). Several litters are born, from late winter to late summer. Litters consist of 3 to 8 young (mean 5.2) and lactation persists for about 6 days (Whitaker and Hamilton 1998).

NEC home range has been estimated to be about 0.2 to 0.7 ha (0.5-0.2 acres) in the fall, with the configuration of the home range more linear in those individuals that live along borders (Dalke 1937). In January and February, major movements of rabbits have been noted, likely due to the onset of reproduction, in which both sexes were found to move up to 530 meters (1740 feet).

Brown and Litvaitis (1995) found that mammalian predators accounted for the loss of 17 of 40 NECs in their study. Barbour and Litvaitis (1995) determined that the coyote (*Canis latrans*) and red fox (*Vulpes vulpes*) are the primary predators of NEC in New Hampshire. Litvaitis *et al.* (1984) noted that cottontails were a major prey item of bobcats (*Felis rufus*) in New Hampshire during the 1950s and more recently when species could be determined from genetics, researchers identified all as NEC. In recent decades, bobcat populations have declined in some northeastern states (Litvaitis 1993), but at the same time, a new predator became established: the coyote. Other mammalian predators include the gray fox (*Urocyon cinereoargenteus*), weasels (*Mustela* sp.), and fisher (*Martes pennanti*). Avian predation is also considered a significant cause of mortality for NEC (Smith and Litvaitis 1999). Both barred owls (*Strix varia*) and great horned owls (*Bubo virginianus*) take cottontails. The abundance of above-ground hunting perches is believed to reduce the quality of cottontail habitat along powerlines, because the perches make it easier for red-tailed hawks (*Buteo jamaicensis*) and other raptors (Litvaitis *et al.* 2007) to locate and catch prey. NEC are also killed by domestic dogs (*Canis familiaris*) and cats (*Felis catus*).

Threats:

Permanent destruction of habitat caused by human population growth and land development has reduced or wiped out some NEC populations, and it remains a threat to those still existing. Overall trends in the pattern of humans' land-use and land-management practices have limited the distribution and amount of early successional habitat (Litvaitis 1993). The many factors contributing to the modification of early successional habitats, if they continue unabated, will prevent the creation, regeneration, and expansion of habitat, making it hard to conserve the NEC. In a final analysis by the New England Cottontail Technical Committee, the primary threat facing this species was modification of its habitat, including:

- 1) Natural forest maturation associated with land-use change, such as the progressive abandonment of farming and a decrease in logging (Litvaitis 1993).
- 2) Loss of shrubland habitat capable of supporting NEC has occurred as a result of interrupted or abated natural processes that once maintained a shifting mix of shrub communities and understory structure on the natural landscape. Factors include a present-day dearth of fire in pine barrens (Litvaitis 2003); flood-control structures that limit natural flooding, and fewer beaver impoundments (Earby 1968, Litvaitis 2003), deer browsing that limits understory growth (Martin *et al.* 1961, Latham *et al.* 2005), and a lack of fire in oak forests to promote oak and enhance mountain laurel thickets (Earby 1968).
- 3) In some areas, Eastern cottontails seem to be gradually displacing NEC in otherwise suitable habitat. Johnston (1972) reported that the occupation of new areas by Eastern cottontails may be at the expense of NEC. Minor physical adaptations, such as a larger exposed surface area of the eye, allow Eastern cottontails to use a wider range of habitats, including relatively open areas such as meadows and residential back yards, compared to NEC (Probert and Litvaitis 1996, Smith and Litvaitis 1999). There is some question as to whether the diet of the NEC and Eastern cottontail is essentially the same, or if the Eastern cottontail is better able to utilize a variety of foods. However, in areas where the species are sympatric, there is a superabundance of food, so competition is mostly for dens (wood-chuck holes), thickets, general space, or other resources (Whitaker and Hamilton 1998). Eastern cottontails may exploit newly created habitats sooner than NEC (Litvaitis *et al.* 2007) and once established in a given area, the highly fecund Eastern cottontails are not readily displaced (Probert and Litvaitis 1996, Litvaitis *et al.* 2007).
- 4) NEC habitat has seen significant modification, fragmentation, and destruction as a result of human population growth and accompanying development.

Overutilization for commercial, recreational, scientific, or educational purposes poses another threat to the species. The NEC is difficult to distinguish from the Eastern cottontail with which it sometimes shares brushy habitats (Litvaitis *et al.* 1999). Cottontail rabbits are considered small game animals and are legally hunted in four of the six states that NEC inhabits. The states have the jurisdictional authority to regulate Eastern cottontail and NEC harvest and the ability to adopt regulations to maintain healthy populations according to local circumstances. Because hunting pressure is low relative to the overall abundance of cottontails and not considered significant compared to other mortality factors, its impact on the NEC population is believed to be minimal. On the basis of the best available information, the USFWS (2011) concluded that hunting by humans does not appear to significantly threaten NEC. However, if the species' population continues to fall, hunting may be reconsidered as a potential threat.

Cottontail rabbits are known to contract a number of different diseases, but there is little evidence to suggest disease is a limiting factor for NEC. However, Eastern cottontails introduced onto the Massachusetts islands of Nantucket and Martha's Vineyard probably competed with the native NEC and that the eastern cottontails introduced tularemia to the islands. It is not known whether tularemia played a role in the disappearance of NEC from the islands (Eabry 1983).

Predation is a natural source of mortality for rabbits, and where habitat is ample it would not threaten species' survival. However, most thicket habitats supporting NEC today are not large enough to provide enough cover and food to sustain rabbit populations amid high predation rates by what is now a more diverse set of mid-sized carnivores (Barbour and Litvaitis 1993, Brown and Litvaitis 1995, Villafuerte *et al.* 1997). Available evidence suggests that land use influences predation rates and NEC survival in several ways. The extent of developed lands, presence or absence of coniferous cover, and lack of surface-water features correlate with an increase in predation rates (Brown and Litvaitis 1995). Oehler and Litvaitis (1996) examined the effects of contemporary land uses on coyote and fox numbers and concluded that the abundance of these generalist predators doubled as forest cover decreased and agricultural land use increased. Thus, the populations of NEC predators have increased substantially in recent decades.

The significance of the domestic cat as a predator on numerous species is well known (Loss *et al.* 2013). It has been identified as a major predator of the endangered Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*) and is thought to be the single greatest threat to that species' recovery. Although there is no direct evidence regarding the role of domestic cats in influencing NEC populations, given the high human population and housing densities throughout most of the NEC range, domestic cats may be important predators of NEC (USFWS 2011).

The NEC was classified as "moderately vulnerable" (MV) to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program. Available evidence suggests that abundance and/or range extent within the geographical area assessed is likely to decrease by 2050 (Schlesinger *et al.* 2011).

Overall, disease does not appear to be an important factor affecting NEC populations. Numerous studies suggest that mortality from predation is very important and is linked to habitat destruction and degradation. Predation is a routine aspect of the life history of most species, and under natural conditions, predation probably was not a threat to the persistence of NEC. Today, however, the diversity of types of predators has increased, the amount of suitable cottontail habitat has decreased, the remaining habitat is highly fragmented, and many habitat patches are small. The available evidence strongly suggests that predation is the reason why most small-thicket habitat patches are unoccupied by NEC. Since predation is strongly influenced by habitat quantity and quality, the NEC Technical Committee concluded that the primary risk factor is the present destruction, modification, and curtailment of NEC habitat and range, and that predation has become an important risk factor due to current habitat conditions.

Are there regulatory mechanisms that protect the species or its habitat in New York?

No Unknown

Yes

Environmental Conservation Law, §§ 11-0905, provides hunting regulations for cottontails, which includes both Eastern and NEC.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Conservation actions following IUCN taxonomy are categorized in the table.

Conservation Actions	
Action Category	Action
Land/Water Management	Habitat and Natural Process Restoration

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for game species of concern, which includes the New England cottontail.

Habitat research:

- ___ Compare the habitat within extant and extirpated sites to see if there are significant differences between the two .

Habitat restoration:

- ___ If significant habitat characteristics are found, identify suitable areas within the historical range and modify the habitat to the advantage of the species. Reintroduce the species to that area if necessary.

Other action:

- ___ Conduct an investigation into the taxonomic separation of *S. transitionalis* and *S. obscurus* and determine if in fact they deserve separate status.

Population monitoring:

- ___ Conduct high intensity surveys in and around the areas where the species is discovered during low intensity surveys to better understand their local distribution.
- ___ Continue low intensity surveys of the distribution of NEC through fecal collections. Conduct follow- up live trapping where animals are detected for confirmation. These surveys will be conducted throughout the region where the species had been detected since the early 1960s (Washington to Westchester county).

The NEC is in need of continuous population monitoring throughout the range, at least until status and population trends are better understood. As this is a game species, monitoring in many areas might best be accomplished by analyzing cottontail skulls collected from hunters and roadkills (NatureServe 2012).

Additional research is needed to determine significant habitat characteristics. With those characteristics, it may be possible to identify potential habitat within the historic range of the NEC, modify this habitat to increase its suitability, and reintroduce NECs to these locations (Litvaitis and Villafuerte 1996, Tash and Litvaitis 2007). Absence of the Eastern cottontail would probably also favor success (NatureServe 2012).

Restoring large-scale natural processes is made difficult by land parcelization (fragmented ownership patterns and reduced parcel size) that would require extensive landowner cooperation and coordination. However, using maps and local knowledge of habitat, the NEC Technical Committee identified over 30,000 acres of protected habitat where ecological processes could be restored, and over 20,000 acres of conserved land that may be available to actively manage for NEC. On public lands, a combination of silvicultural manipulations and restoration practices may minimize the cost of sustaining habitat by taking advantage of ecological processes and large-scale forest economics, thereby collectively and substantially lessening the threat of NEC habitat modification and fragmentation (USFWS 2011).

To sustain the species in Vermont, Litvaitis (1993) recommended that restoration sites (early successional habitats in forest-dominated landscapes) be at least 5 ha and clustered to facilitate exchange between patches. It is important to limit fragmentation of mature forests, as maintaining large blocks of essentially unbroken forest might provide a competitive advantage to NEC over Eastern cottontails. Although both species prefer early successional habitat, the NEC is apparently better adapted to forest and unbroken dense cover than is the Eastern cottontail (NatureServe 2012).

The USFWS New England Cottontail Conservation Strategy (Fuller and Tur 2012) was released in 2012 and sets forth actions to address threats to NEC and show how conservation partners are implementing those actions to ensure the presence of NEC into the future as well as precluding the need to place the species on the Endangered Species List. Resolving the uncertainty about the best approaches to managing Eastern cottontails is a top-priority research need. It is unknown which species in sympatric populations will benefit more from habitat-management activities, but successful management of sympatric Eastern cottontail populations could let NEC expand into formerly occupied habitats (USFWS 2011).

VI. References

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