

## Appendix 2: Hartman Park Lyme, CT New England Cottontail Vegetation Report

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### Introduction/Background

The New England cottontail (*Sylvilagus transitionalis*) or NEC is a species of rabbit native to New England and southern New York east of the Hudson River, it is the only species of rabbit native to New England. NEC has been determined to be globally vulnerable by both the International Union for the Conservation of Nature and Nature Serve. In the 1960's the range of NEC included large areas of Vermont, New Hampshire, southern Maine, southeastern New York, and all of Massachusetts, Connecticut, and Rhode Island (Fig 1). Currently the range of the species is much more restricted. The species appears to be extirpated or locally extinct in Vermont, and only has 2 known occurrences in Rhode Island. Its historic range has decreased by 85%, mainly due to habitat loss. In 2006, the rabbit was considered for listing under the federal Endangered Species Act but was not placed on the list. To track the range of NEC and to distinguish it from the nearly identical Eastern Cottontail, rabbit fecal pellets are collected and genetical tested. Occasionally a NEC location is documented using skull morphology or direct genetic testing of an animal. Using these methods, it has been determined that the NEC range in Connecticut has shrunk from statewide to just pockets in the western part of the state, and New London County and southern Windham and Tolland Co. in the southeast (Fig. 2). The powerline right of way (ROW) from Gungy Rd. in Lyme, CT to rte 85 in Montville, CT has one of the highest numbers of documented NEC occurrences in the eastern part of Connecticut. Hartman Park is the western end of this high-density NEC area.

The New England Cottontail species is dependent on heavy shrub cover. NEC's habitat has been in decline because much of New England's young forest and shrub lands have gone through succession and have matured into older forests with little understory. A target density 20,000 woody stems per acre, which is equal to about 46 stems in a 10 x 10 foot square area (only counting plants over 20 inches tall with a diameter of 3 inches or less) is ideal NEC habitat. Woody species shorter than 3 feet does not afford enough overhead cover, and trees taller than 15 feet tend to have larger crowns that shade out the vegetation at or near ground level. The ideal habitat patch is a tangle of sapling trees, vines, briars, shrubs, and broadleaved plants, interspersed with small sunny openings where rabbits can feed on grasses and other herbaceous plants during summer. As a rule, if vegetation is dense enough that it is nearly impossible for a person to walk through, it constitutes good NEC cover

Additionally, extensive areas of habitat with shrub thickets at present time is very uncommon in New England, and habitat size is key for NEC population survival. New England cottontail's death rate is 2-fold on patches below 6 acres than it is on areas over 12 acres. On limited patches, the area may provide inadequate food to sustain the cottontails throughout the winter. In these situations, New England cottontails either starve or risk predation to find food out in the open. Habitat areas 25 acres in size, or ideally much larger, and adjacent to additional blocks of habitat are necessary for long term NEC survival.

Electrical utility rights of ways (ROWs) are obviously primarily managed for the purposes of electrical transmission, but due to the mature successional state of many of Connecticut forests these corridors has become key habitat for many early successional vertebrates, invertebrates, and plants. For decades ROWs had a moderate level of management where early to mid-succession communities occurred and was key to NEC persistence in this area. Anecdotally, ROWs appear to be more highly

managed currently and lack woody species in many areas and have a high prevalence of grass and goldenrod species, this habitat type is too open to be good NEC cover.

Unfortunately, in the winter of 2022-2023 Eversource did major vegetation removal along the Hartman Park ROW and denuded some locations entirely of the woody plant cover key to NEC habitat Fig 4. Additionally, gravel roads and crane pads were put in place around 2019 to install new powerline poles. Because of this vegetation removal, I conducted a vegetation study to determine the impact of the vegetation clearing, as well as the impacts of the gravel road and crane pads which were put in place a few years before the clearing.

## Methods

The study area was in the town of Lyme at Hartman park. The parcel investigated was a utility ROW bordered by Gungy road on the west and the town of Lyme border on the east. The site is approximately 18 acres including wetlands. A vegetation survey was conducted at the study area. This area has had documented NEC fecal pellets documented in the past. To understand the amount of potential habitat left on the right of way after vegetation clearing occurred, data from 53 vegetation plots ea. 10' x 10' was recorded. For each plot the number of stems per woody species above 20" was recorded, as well as presence/absence of any woody species above 20" and all herbaceous species seen. The number of invasive plant species and NEC food plants species as listed in Arbuthnot 2008 per plot was also recorded, presence/absence. Data was collected from July 2024 to December 2024 (see Figures 6&7).

The site was divided into 4 management types:

- 1) **general**, meaning this area has not had recent heavy clearing or herbicide
- 2) **heavy management**, areas that had been denuded during the winter of 2022-2023
- 3) **crane pads**, sections of the study area that were bulldozed and gravel added to allow placement of new metal powerline poles and reseeded in 2019 with native grasses
- 4) **road**, maintained gravel roads that were installed to update the poles and lines, 18, 12, 18, and 5 plots were done in each area respectively, see Figures 8-11 for example photos of plot types . Additional survey plots will be added to equal the sample sizes at 20 each, for a total of 80 plots. The supplemental work will be done later in the Jan-Mar of 2025.

See Figure 5 for plot locations. See attached Excel files with raw data (sheet 1) and summary statics (sheet 2)

## Results

Of the four management types the crane pad supported 0 woody plant species above 20", 0 woody stems above 20", had the fewest food plants at an average of 0.2 species per plot, and also contained the lowest number of invasive species with an average of .167 species per plot, no crane pad areas had enough woody stems to be considered NEC habitat. Road plots also had 0 woody plant species above 20", 0 woody stems above 20", few food plants at an average of 1.0 species per plot, no road plots had enough woody stems to be considered NEC habitat. Even though the road plots had 1.0 species per plot, 60% of the plots had invasive species which was the highest. Heavy management plots had an average

3.83 woody species over 20" per plot, 23.5 woody stems over 20", and an average 2.67 food plant species, four out of twelve or 33% of the heavy management plots had over 46 stems and could be considered NEC habitat. Heavy management plots had an average of 0.25 invasive species per plot. Lastly the general management plots, which have not had any major management done to them within the last few years had the most woody species over 20" 6.67 on average, the highest average number of stems per plot at 64.6, and the most food plant species 3.67, 72.2% of the general management plots can be considered NEC habitat. See Table 1.

Table 1. Four management types on the utility ROW at Hartman Park Lyme, CT and the average woody plant species, average number of woody stems above 20", average of NEC food plants, and average number of invasive species per plot.

Management Type	Number of Plots	Average Number of Woody Plant Species	Average Number of Stems over 20"	Average Number of NEC Food Plants Species	% of plots w/ invasives	Average number of invasives per plot	% NEC Habitat
Crane Pad	18	0	0	0.22	16.7%	.167	0%
Road	5	0	0	1.2	60%	1	0%
General	18	6.7	64.61	3.67	55.6%	1.18	72.2%
Heavy Management	12	3.83	23.5	2.67	16.7%	.25	33%

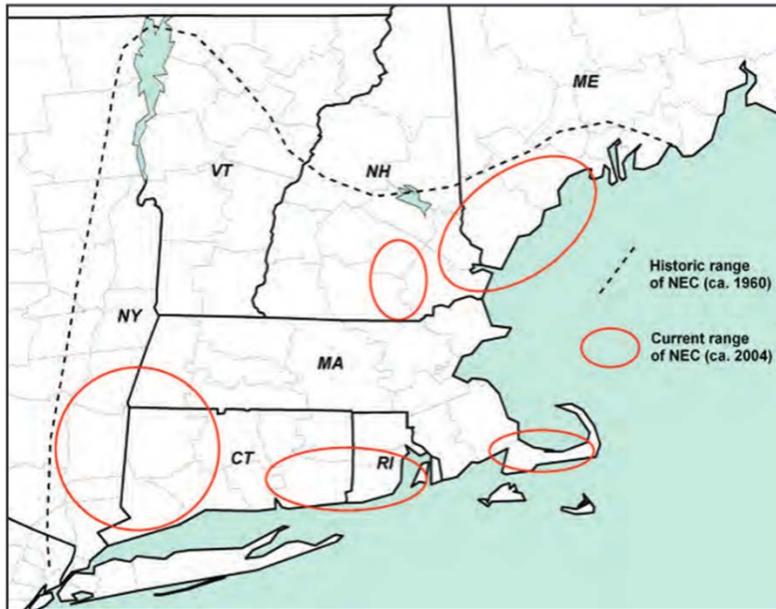
### Discussion/Conclusions

From the data in Table 1 it is obvious that the crane pads and roads are not good habitat for NEC and these types of land modification should be avoided. These areas are extensive and may form barriers to NEC dispersal and fragment the habitat with crane pads covering 1.25 acres, and the gravel road occupying slightly less than .8 of an acre, meaning these land use types with little value to NEC make up approximately 11.4% of the site (see Figure 12). The heavily managed areas appear to be recovering though two-thirds of these plots still do not qualify as NEC habitat after two growing seasons. The 28% of the general management plots that are not habitat are on very rocky or sandy soils though they may grow into habitat at some point. The road areas will not be easily reclaimable as habitat, but the crane pad could be planted with low growing shrub species e.g. sweet fern. Without some sort of planting effort these areas are unlikely to become NEC habitat for decades. The crane pad and heavily managed areas have few invasives but that may be because the invasives have been targeted by the ROW vegetation crews and additionally by All Habitat a company that was hired by the Town of Lyme to control mugwort. The roads have low invasive species diversity but many (60%) had spotted knotweed in them.

## Future efforts

More plots will be done to even the sample size of the 4 categories to 20 each for a total of 80 plots. These additional plots will allow for better spatial distribution of the plots. Plots will be added to the areas indicated by the orange arrows in Figure 5. Efforts should be made to increase woody plant cover on the crane pads, the areas denuded in the recently heavily managed area should be left to grow for 5-10 years, and the areas that are already good habitat should be eventually managed so that the vegetation does not get too high to be useful for NEC habitat, but likely will remain habitat for 5-10 years without management. Invasive plant species should be monitored and managed as much as possible throughout the ROW and in all management types.

*Funds for this project were provided by the Eightmile River Wild & Scenic Coordinating Committee and the National Park Service under CFDA: 15:962-Eightmile Wild and Scenic River Assistance. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of traded names or commercial products does not constitute their endorsement by the U.S. Government.*



Historic range of the New England cottontail is indicated by the broken black line. Red circles show approximate range as of 2004. Credit: Pete Bowman

Figure 1.

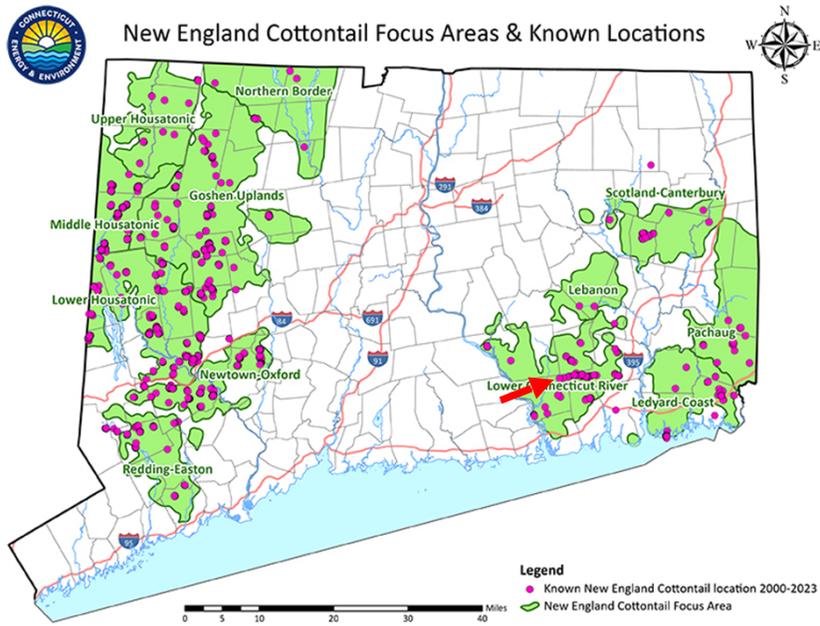


Fig. 2. Focus area and documented occurrences of New England Cottontail | Connecticut <https://portal.ct.gov/DEEP/Wildlife/Habitat/New-England-Cottontail-Restoration>, red arrow indicates the Hartman Park section of the ROW. Notice high density of NEC along this ROW

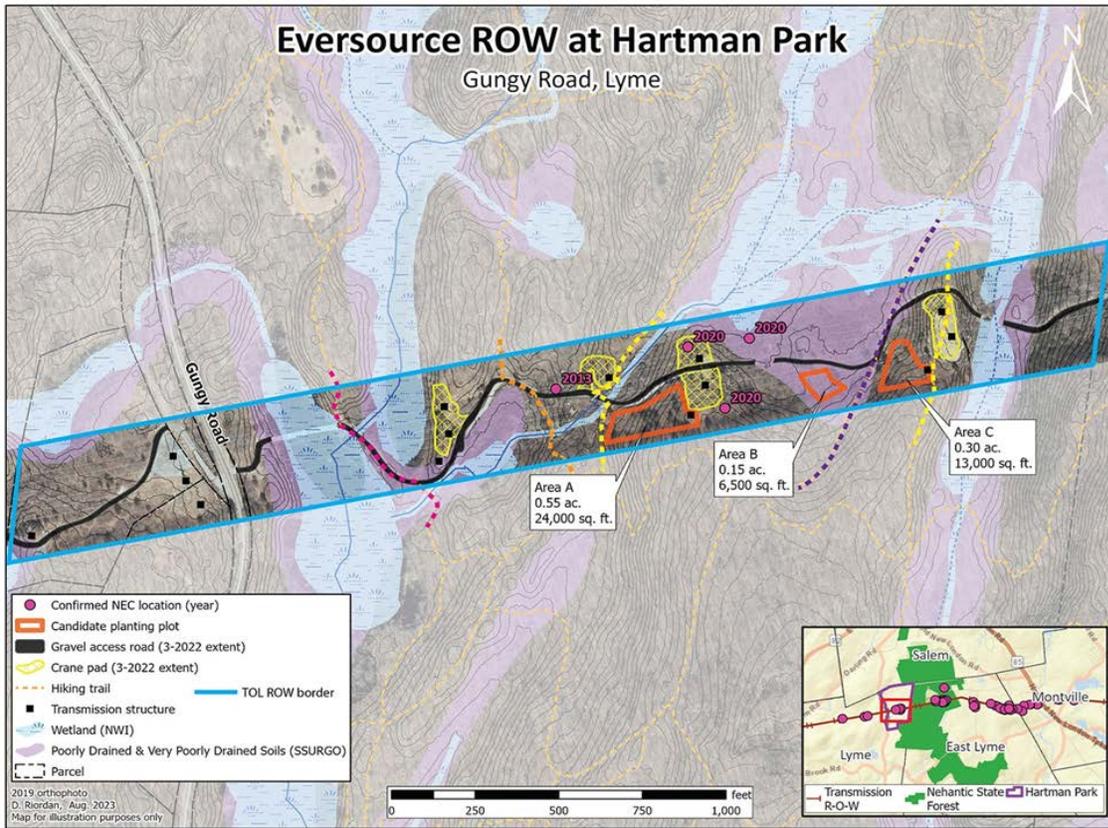


Figure 3. Utility right of way Hartman Park showing crane pads, denuded heavily managed areas and NEC pellet locations.



**Feb 1 2023—Hartman Park ROW west of Pole 5515 showing extensive habitat loss.**

Figure 4. Recently cleared area on Hartman Park ROW

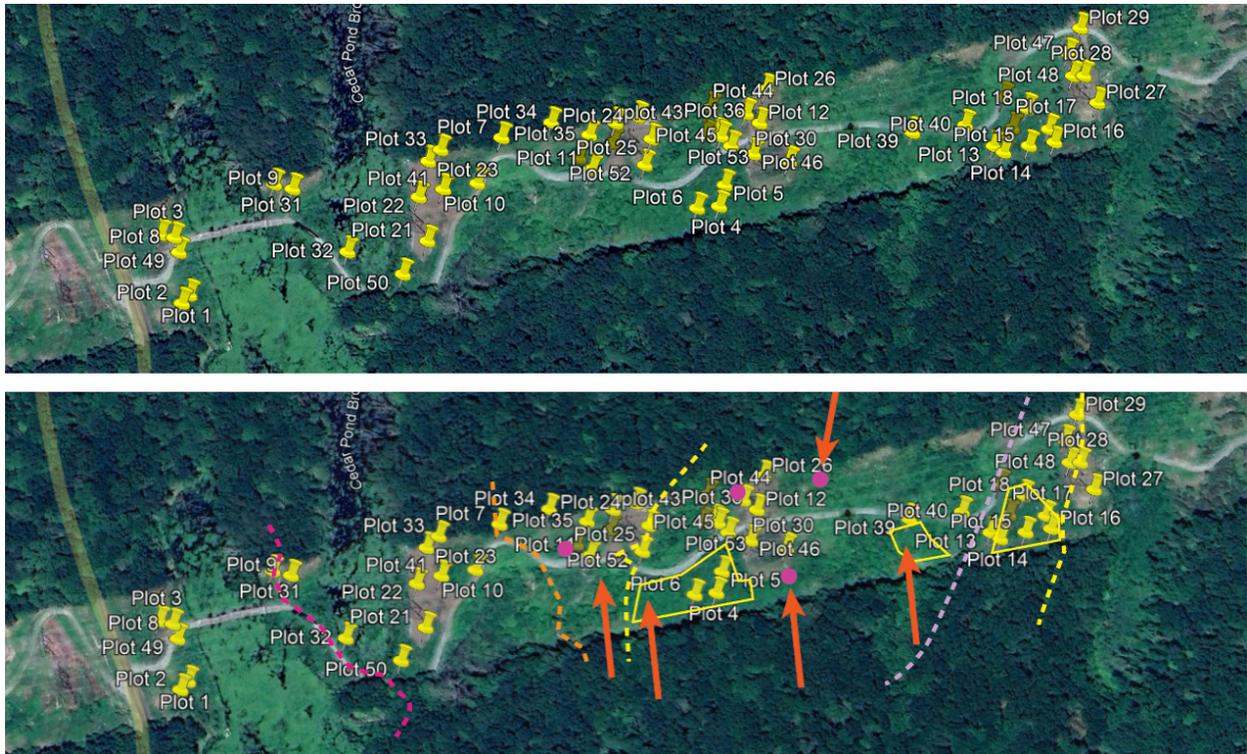


Figure 5. Location of 53 vegetation plots done on the Hartman Park utility right of way on Lyme CT.  
Bottom panel: Orange arrows indicate areas where future plots will be located. Pink dots indicate where NEC were present in 2020. See attached Excel files with raw data (sheet 1) and summary statics (sheet 2)



Figure 6. Collecting vegetation data



Figure 7. Collecting vegetation data.



Figure 8. General management plot with dense woody stems.



Figure 9. Heavy management plot with few woody stems.



Figure 10. Crane pad plot with no woody stems.



Figure 11. Road plot with no woody stems

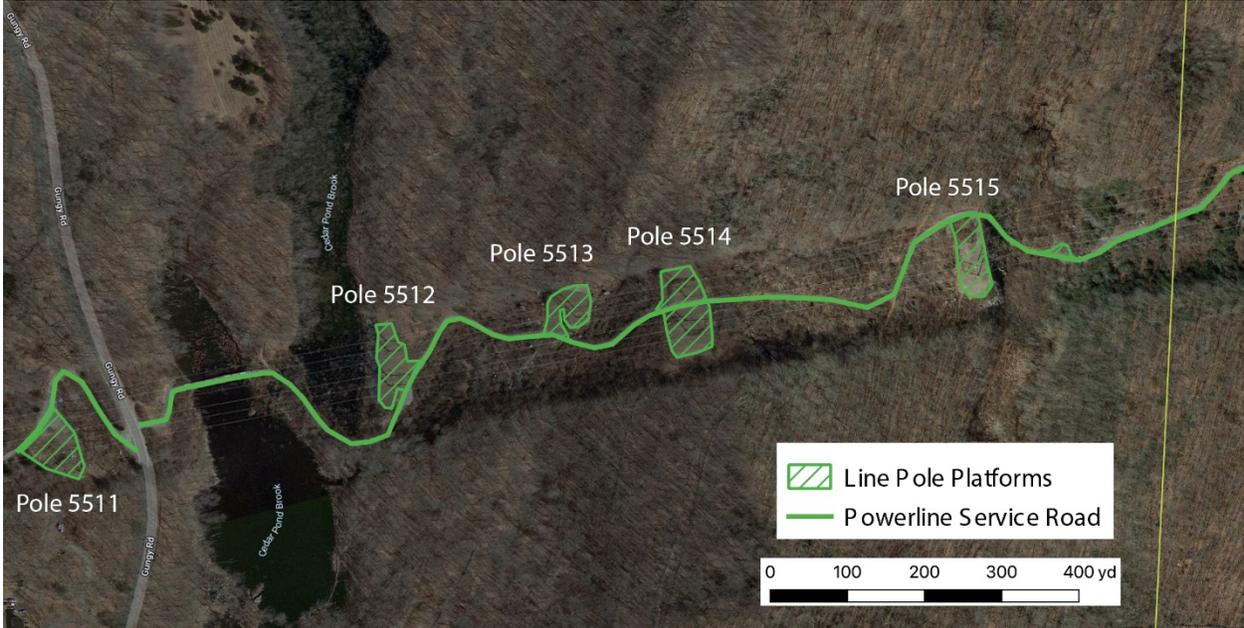


Figure 12. Map of crane pads and gravel road on the Hartman Park utility right of way covering 2.05 acres or 11.4% of the site.

## References

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[https://www.edf.org/sites/default/files/8828\\_New-England-Cottontail-Guide\\_0.pdf](https://www.edf.org/sites/default/files/8828_New-England-Cottontail-Guide_0.pdf)