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SCIENCE TO SOLUTIONS

WORKING LANDS FOR WILDLIFE

A New Tool for Evaluating Outcomes of New England Cottontail Conservation Efforts

In Brief:

The loss of early successional habitat in the Northeast poses a threat to wildlife species that depend on young forests. One of those species, the New England cottontail, is the focus of a targeted conservation strategy designed to re-establish early successional habitat across the rabbit's native range. A new assessment tool, highlighted in a recent study, can be used to evaluate the quality of this habitat on managed lands. The future application of this tool will enable conservation partners to quantify and track benefits to the species over time.

Land Management for Species Conservation

Many wildlife species rely on naturally occurring disturbances, such as fires and windstorms, to create patches of forest habitat necessary for their survival. Ecosystems that develop after disturbance, often called early successional habitats, are highly productive communities composed of dense shrubs and grasses and young forest trees. Certain land uses and forest management practices pose a threat to wildlife species because of the resulting loss of habitat from fewer and smaller disturbances.

The New England cottontail (*Sylvilagus transitionalis*) relies on the early successional habitats of the Northeast for survival. Observed declines in the rabbit's populations have been linked to several factors including predation, competition from the Eastern cottontail and loss of habitat. Since the 1960s, these threats to the species have decreased the range of the rabbit by more than 80 percent compared to historic estimates. Conservation efforts focus on modifying forests to increase the population and range of the rabbit, in part, by planting shrubs and removing invasive plants.

Conservation lands developing into shrubland habitat for the New England cottontail.

Developing a Tool to Evaluate Habitat Quality

Beginning in 2012, scientists from the University of New Hampshire (UNH) partnered with the USDA's Natural Resources Conservation Service (NRCS) and other partners to evaluate ongoing conservation efforts for the New England cottontail. UNH and NRCS staff, with support from USDA's Conservation Effects Assessment

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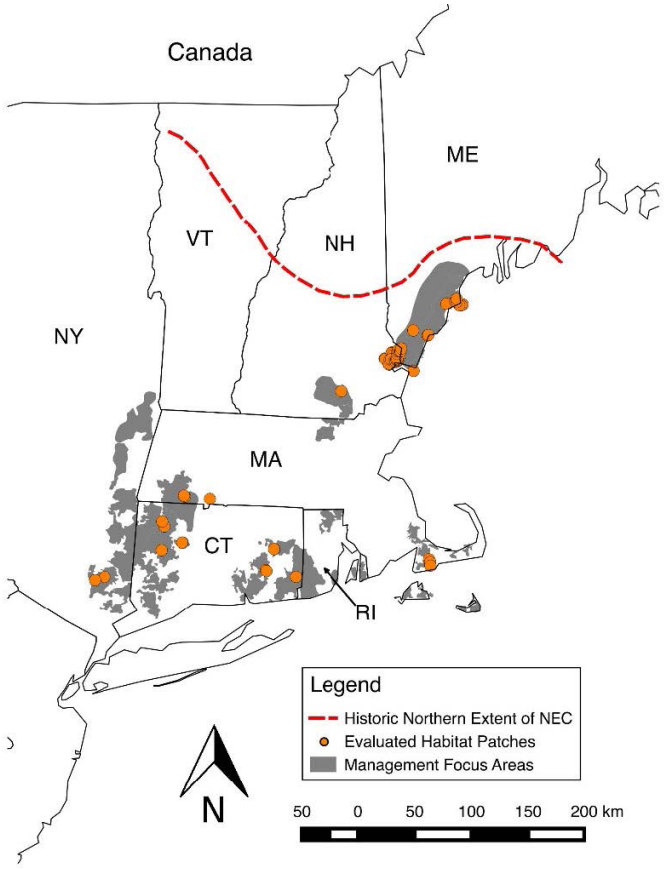


Location of conservation lands surveyed to create the habitat suitability index (Warren et al. 2015).

Project, worked to develop a science-based tool to measure the quality of the habitat created on managed lands.

To tackle this task, the research team reviewed published literature, gathered on-the-ground data and collaborated with a panel of species experts to evaluate created habitat features (Warren et al. 2015). This work led to the creation of the new Habitat Suitability Index (HSI), which was recently published in the Wildlife Society Bulletin. The new HSI focuses on five habitat components (see "Variable Descriptions" box) and weighs each factor based on its importance to the rabbit.

Habitat Suitability Index

$$= \frac{(3 \times V_1) + (2 \times V_2) + V_3 + V_4}{7} + V_5$$

Weights given to variables V_1 and V_2 reflect the rabbit's preference for dense vegetation.

Variable Descriptions

Security cover (V_1) is the abundance of very dense understory vegetation that provides protection from predators and weather extremes.

Other cover (V_2) is the abundance of moderately dense and low density understory vegetation that provides cover and forage during winter.

Vegetation height (V_3) is the average height of the understory vegetation that provides protection from predation.

Summer forage (V_4) is the abundance of grasses and forbs near protective cover that provide forage during the growing season.

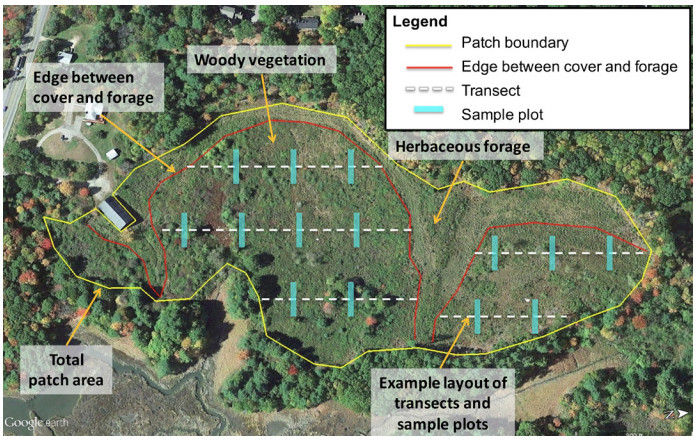
Additional refuges (V_5) is the presence of natural and artificial burrows and other structural cover that provide protection from predation.

Using the Habitat Suitability Index to Promote Conservation

The New England cottontail is one of the target species of NRCS' Working Lands for Wildlife (WLFW) partnership, which provides technical and financial assistance to private landowners to voluntarily restore and improve habitat on their land. While monitoring of WLFW efforts for the rabbit is still in its early stages, the HSI can help improve conservation outcomes by providing a consistent method for evaluating habitat quality over time.

The WLFW conservation model has six critical elements, including accountability. This tool will play an important role in enabling scientists to track species to evaluate and improve program effectiveness, said Don Keirstead, NRCS state resource conservationist for New Hampshire and co-author of the HSI paper. Keirstead said he plans to work with partners to use the new tool to guide management actions for the rabbit. "We know that many conservation lands require additional management down the road and the HSI can identify which habitat component needs attention and when," he said. Using data collected on-site and the information provided in the scientific publication, critical habitat components can be identified and, if necessary, targeted as part of conservation projects.

The HSI is also a valuable tool for evaluating habitat quality in support of other elements of the larger Conservation Strategy for the New England Cottontail (Fuller and Tur 2012). For example, since 2010, conservation partners have been working to increase the number of rabbits in the wild through a captive breeding and release program. John Litvaitis, UNH wildlife ecology professor, anticipates using the HSI to find new homes for these rabbits. "This work can be used to determine when managed habitats are 'rabbit ready' or suitable for releasing captive-bred cottontails, enabling us to more effectively expand populations of the rabbit," he said.



Assessing the variables used in the HSI is accomplished by establishing permanent transects and sample plots on conservation lands. Correct placement of transects and plots is a critical step in accurately quantifying habitat quality (Warren et al. 2015).

New England cottontail in grasses and forbs used as summer forage.

Conservation Outcomes for the New England Cottontail

The New England Cottontail Technical Group has created a targeted, science-based strategy to aid the species' recovery, relying on the support and participation of state and federal agencies, non-governmental organizations, private landowners, and others. This broad partnership has successfully established thousands of acres of early successional habitats throughout the Northeast, benefiting the New England cottontail and other wildlife species.

New England cottontail using woody groundcover as refuge.

Contacts

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Dr. Litvaitis and his research team work with partners to conduct projects on the effects of contemporary land uses on wildlife populations, especially species that are hampered by habitat fragmentation.

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Sources

Warren, A., J.A. Litvaitis, and D. Keirstead. 2015. Developing a Habitat Suitability Index to Guide Restoration of New England Cottontail Habitats. Wildlife Society Bulletin. DOI: 10.1002/wsb.616

Fuller, S. and A. Tur. 2012 Conservation Strategy for the New England Cottontail (*Sylvilagus transitionalis*). U.S. Fish and Wildlife Publications. Paper 320.

Additional Resources

To learn more about New England Cottontail conservation, visit the Working Together for the New England Cottontail website at **newenglandcottontail.org**.

To learn more about the Natural Resource Conservation Service's Working Lands for Wildlife partnership, visit **nrcs.usda.gov/wildlife**.

To learn more about the Natural Resource Conservation Service's Conservation Effects Assessment Project, visit **nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/**.

To find your local NRCS Service Center, visit the NRCS website at **nrcs.usda.gov/wps/portal/nrcs/main/ national/contact/local**.

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