



## Environmental Stewardship

PHOTO: Pennsylvania Agricultural Experiment Station

# Protecting biodiversity for healthy ecosystems and communities

*Biodiversity supports healthy ecosystems and recreation around the world. A diverse range of species ensures stability and resilience in the face of environmental changes. Protecting biodiversity also preserves the opportunity for new discoveries, such as species that can be used as biological pest control agents or medicines. Land-grant university researchers and Extension professionals are working to protect the biodiversity that humans rely on and enjoy.*

### Here are a few examples of that work:

- Long-term studies and adaptive strategies have led to successful restoration of oyster reefs in **New Hampshire**. Restoring oyster reefs supports the health of the Great Bay/Piscataqua River estuarine system by increasing biodiversity and improving water quality. It has also fostered growth of commercial oyster farming in Great Bay, which grew over the last 20 years from just two licensed farms to 32 commercial operations, contributing significantly to the local economy. *New Hampshire Agricultural Experiment Station; Other USDA Competitive*. See [full statement](#).
- As part of a collaborative effort, scientists in **Washington** developed camera-based methods to monitor lynx, providing new insights into lynx population status and habitat requirements. Findings contributed to the development of a 20-year collaborative monitoring plan for lynx and other threatened carnivores in the Cascades. Washington Agricultural Experiment Station. See [full statement](#).
- In **New Hampshire**, scientists developed a noninvasive, cost-effective acoustic sensor to monitor moose behavior and habitat use, providing crucial data for conservation and forest management. This pioneering work is the first step toward creating an acoustic sensor network to monitor moose populations accurately. New Hampshire Agricultural Experiment Station, Hatch. See [full statement](#).

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## landgrantimpacts.org

The National Land-grant Impacts Database (NIDB) documents the individual and collective impacts of the national Land-grant University System of joint research, education and Extension. Much of this work is supported by capacity and competitive funds through the USDA's National Institute of Food and Agriculture.

This document was prepared by the NIDB communications team. The Association of Public and Land-grant Universities' Board on Agriculture Assembly manages the NIDB.

- Sea Grant Extension in **Oregon** helped West Coast fishermen reduce seabird bycatch, including endangered albatrosses, by providing free streamer lines and promoting sustainable fishing practices. *Oregon State University Extension Service* See [full statement](#).
- Scientists in **Washington** assessed the ability of polar bears to survive on land during ice-free summers. *Washington Agricultural Experiment Station*. See [full statement](#).
- In **Guam**, scientists found a more accurate, less invasive way to estimate populations of a native tree snail. Having a reliable count will help agencies and ecologists as they work to conserve the declining species. In addition, thousands of snail images from this study are being used to train an artificial intelligence-based program that will be used around the world to detect tree snails. *University of Guam Western Pacific Tropical Research Center; McIntire-Stennis*. See [full statement](#).
- Analyzing historical city maps and bird census data over time across three cities, researchers in **Maryland** showed that the total area of greenspace was the most important factor influencing the number of bird species in cities, and even small parcels of disconnected greenspace can have significant impacts on bird diversity. This is important information for city planners and conservation organizations. *Maryland Agricultural Experiment Station*. See [full statement](#).
- Researchers in **Washington** are working on a long-term study to determine which aspects sensory pollution have the most impact on birds. *Washington Agricultural Experiment Station*. See [full statement](#).
- In **New Hampshire**, researchers conducted pivotal research on the saltmarsh sparrow, revealing the intricate genetic landscape that underpins its survival and highlighting the urgent need for targeted conservation efforts. By informing policy and conservation efforts, this study helps safeguard the future of the saltmarsh sparrow and the ecological health of northeastern coastal marshes. *New Hampshire Agricultural Experiment Station; McIntire-Stennis*. See [full statement](#).
- Despite decades of decline, genetic research in **Pennsylvania** showed the maintaining ruffed grouse numbers is possible and informed conservation strategies for Pennsylvania's iconic state bird. *Pennsylvania Agricultural Experiment Station; Hatch*. See [full statement](#).
- A collaborative study by researchers in **New Hampshire** and North Carolina produced the first national abundance map of coyotes and revealed that hunting may increase coyote populations by fostering higher reproduction and immigration rates. These are critical insights for wildlife management. *New Hampshire Agricultural Experiment Station, North Carolina State University; McIntire-Stennis*. See [full statement](#).
- Researchers in **New Mexico** evaluated the prevalence of shell rot disease among turtles. Results help state and federal agencies manage threatened species, including identification of disease-susceptible populations and guiding captive-breeding planning. Turtle health can also be used as an indicator of water quality, helping target remediation efforts in watersheds throughout the southwestern United States. *New Mexico Agricultural Experiment Station*. See [full statement](#).
- In **New Hampshire**, efforts to restore habitat for the endangered New England cottontail rabbit have also enhanced the survival and diversity of several shrubland birds. This study

adds to the evidence that targeted habitat protection often has unintended positive impacts on other species. *New Hampshire Agricultural Experiment Station; McIntire-Stennis*. See [full statement](#).

- Extension efforts in **Vermont** empowered Vermont landowners, public lands managers, municipal officials, and concerned citizens to take the necessary steps to protect black ash trees from emerald ash borers. *University of Vermont Extension; State Appropriations, Smith-Lever (3b&c)*. See [full statement](#).
- As part of a collaborative effort, researchers in **New Mexico** tracked when and where lesser long-nosed bats moved across their migratory range. These data help target management of the bat's food resources and guide safe placement of offshore wind energy. *New Mexico Agricultural Experiment Station*. See [full statement](#).
- Researchers in **Pennsylvania** found that early-nesting ducks that nest on cropland in the Prairie Pothole Region are at increased risk, and earlier spring warmups may worsen their situation. This information could help guide agricultural practices to avoid harming duck habitat and nesting sites. *Pennsylvania Agricultural Experiment Station; Other, Hatch*. See [full statement](#).
- Scientists in **New York** developed and demonstrated “slash walls,” which are now used widely by private woodland owners, timber companies, state and federal agencies, and others to efficiently and effectively exclude deer from forests to allow regeneration and preserve native wildlife habitat. *Cornell Cooperative Extension, Cornell Agricultural Experiment Station (Ithaca)*. See [full statement](#).
- **Tennessee** landowners participating in an Extension program on deer management have increased and enhanced habitat not only for white-tailed deer, but also for wild turkey, northern bobwhite, several grassland/shrubland songbird species, and pollinators. *University of Tennessee Extension; Other USDA Capacity – Extension*. See [full statement](#).
- Researchers showed that ungulate (hoofed mammal) removal is allowing forests in **Guam** to recover. Fewer non-native species and more native species are growing in the understory. This study provides evidence that forest restoration managers should prioritize the removal of ungulates to allow native plant species and forests to recover. *University of Guam Western Pacific Tropical Research Center* See [full statement](#).

### Microbial diversity essential for ecosystems

Microorganisms are an important part of biodiversity. In soils, microbial diversity plays a vital role in maintaining healthy ecosystems by facilitating key processes. For example, “biocrusts” made up of microorganisms frequently form on the surface of drylands, stabilizing the soil and preventing it from breaking down into dust. Researchers in **Pennsylvania** developed innovative technologies that allowed new insights into the diverse microbial makeup of biocrusts and will help identify ways to help preserve them, especially as droughts and global dust emissions become more common issues.

*Pennsylvania Agricultural Experiment Station; Hatch*. See [full statement](#).