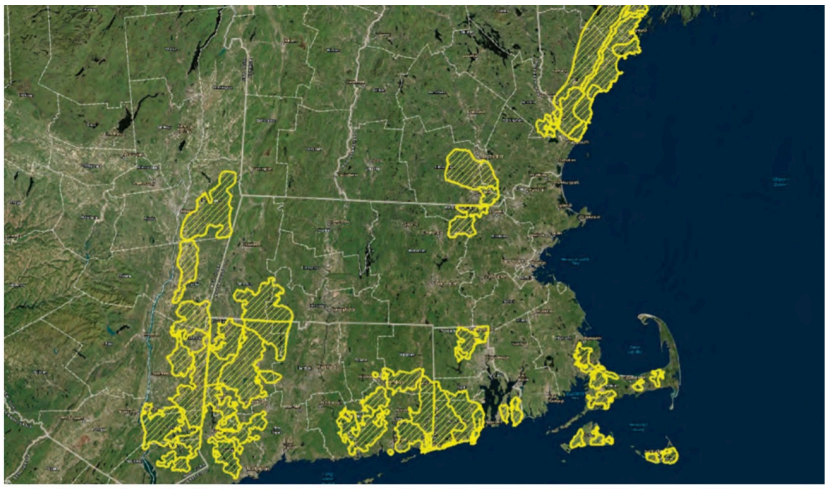
USA: New England Cottontail Project



Conservationists are concentrating efforts to help New England cottontails by creating and refreshing young forest habitat in the Regional Focus Areas shown in yellow. NEC may also occur in other parts of the region. Credit: Lisa Wahle

Overview

The New England Cottontail Project is a restoration effort with the objective to restore the New England Cottontail (*Sylvilagus transitionalis*) to their native habitats through the creation of young forest and captive breeding programs. A young forest is an early successional forest that is created through managing and maintaining techniques such as clear cutting and prescribed burn. Contributing factors to the decline of the New England Cottontail populations are habitat loss due to fragmentation and competition with the Eastern Cottontail. The Eastern Cottontail (*Sylvilagus floridanus*) were introduced into the region in the last century from states such as Missouri, Kansas, Oklahoma, and Texas and later became invasive through their rapid expansion. The restoration efforts for the New England Cottontail (NEC) commenced in 2009 when state/federal biologists convened to organize efforts and will be continued until 2030. The restoration efforts were put into effect after the U.S Fish and Wildlife Service petitioned to list the New England Cottontail under the ESA (Endangered Species Act) in 2000. In 2006, the U.S Fish and Wildlife Service designated NEC as a "candidate" under the ESA and in September of 2015 the listing of the NEC was no longer warranted due to demonstrated success of conservation efforts.

Project Details

Lead Entity:

U.S Fish and Wildlife

Lead entity types:

- Governmental Body

Partner Organizations:

U.S. Geological Survey, USDA Natural Resources Conservation Service, U.S. Fish and Wildlife Service, Mashpee Wampanoag Tribe, American Forest Foundation, Woodcock Limited, WCS Queens Zoo, Wells National Estuarine Research Reserve, Roger Williams Park Zoo, Audubon Connecticut, Connecticut Audubon Society, Open Space Institute, Audubon New York, Quail Forever, Pheasants Forever, Wildlife Conservation Society, American Bird Conservancy, Quality Deer Management Association, Sustainable Forestry Initiative, White Memorial Foundation, National Fish and Wildlife Foundation, Ruffed Grouse Society/American Woodcock Society, National Wild Turkey Federation, Wildlife Management Institute, New England Cottontail Conservation Initiative, Doris Duke Charitable Foundation, Northeast Forest and Fire Management, Lyme Timber Company, University of New Hampshire, University of New Hampshire Cooperative Extension, URI College of Environment and Life Sciences, Massachusetts National Guard, New York Division of Fish, Wildlife and Marine Resources, Northeast Association of Fish and Wildlife Agencies, Rhode Island Division of Fish and Wildlife, Connecticut Department of Energy & Environmental Protection, Massachusetts Division of Fisheries and Wildlife, New Hampshire Fish and Game Department, Maine Department of Inland Fisheries & Wildlife, Monterey Preservation Land Trust, Narrow River Land Trust, Nantucket Conservation Foundation, Scarborough Land Trust, Avalonia Land Conservancy, Orenda Wildlife Land Trust, The Trustees of Reservations, Berkshire Natural Resources Council, York Land Trust, Becket Land Trust, Trust for Public Land

Adaptive management

Describe adaptive management processes and mid-course corrections taken to address unforeseen challenges and improve outcomes in each of the following categories:

Other:

Initiating in 2014, annual performance reports have been created for the implementation progress of the efforts on a yearly basis. A detailed list of all the recent information on continued uncertainties and suggestions in strategy adaptations that are broken down into each individual work group can be found in the New England Cottontail Regional Initiative 2016 Performance Report (Link attached in External Resources Section). As of the 2016 Performance report, a few of the key outstanding uncertainties are: Funding to keep management and research effort moving forward. Long-Term success with the captive breeding and restoration programs. Resolving management uncertainties is ongoing, and is the subject of multiple research efforts; specifically, site-level population and vegetation responses need to be confirmed. To date, the developing regional occupancy monitoring protocol has not adequately demonstrated power to detect long-term regional trends. The approach to confirm a range-wide response is still being tested. Statistical consultation is underway to validate the occupancy monitoring protocol. Captive survival of offspring and survival of released individuals remains low. Actions to increase the rate of survival will be discussed and implemented.   A few of the priority implementation directions for 2017 are (New England Cottontail Regional Initiative 2016 Performance Report): Request State Land Management Teams conduct an annual review of the Focus Area Status Screening Templates (FASST forms) to document any changes in population estimates, habitat estimates, or ranking of each focus area in their state. Continue to seek funding. Continue to work closely with the Executive and Technical Committees and the various Work Groups to maintain focus. Release rabbits into the large pens at Great Bay, NH to increase breeding program output. Target key focus areas identified through status assessment for increased efforts to recruit landowners and inform the public about NEC conservation. Seek assistance from the NEC Technical Committee's Outreach Work Group and individual States to make NEC BMPs available to the public via Internet outlets and through education and outreach materials and efforts. Allow State Land Management Teams to develop and implement state specific charges for their objectives.

State of Progress:

- Implementation

Project Start:

2009-01-01

Project End:

2030-01-01

Global Regions:

- Americas
- Northern America
- World

Countries:

- United States of America

Ecosystem Functional Groups / Biomes:

- Temperate-boreal forests and woodlands biome

Extent of project:

- Other

Extent of restoration:

- Other

Degradations:

- Fragmentation
- Invasive species
- Urbanization, Transportation & Industry

Description:

Competition with the invasive Eastern Cottontail is one of the leading causes of the decline in the New England Cottontail (NEC) populations. The Eastern Cottontail was introduced from its native range elsewhere in North America in the 1800s and 1900s for hunting purposes but it wasn't until the 1960s that this species started to become the predominant rabbit throughout New England. The Eastern Cottontail was able to dominate because of their better success rates at inhabiting fragmented areas. This is due to the species not needing a large area to live and reproduce unlike the NEC. Through causes of degradation such as rapid urbanization and the maturing of forests, they were able to expand and use smaller areas such as backyards to inhabit. This caused the NEC's habitat to be reduced by 86% percent resulting in five isolated populations in the region (New England Cottontail Regional Technical Committee. 2017. Best Management Practices for the New England Cottontail). The lack of young forest magnifies the competition for resources and habitat between the two rabbit species. Young forest (NEC habitat) is less available due to the increasing rate of urban development throughout the New England states, natural forest succession, and the lack of natural disturbances in the region. Urban development has fragmented the natural habitat of the NEC by decreasing the amount of incidences of natural

flooding or burning that once took place historically in these areas.These are important factors in the natural process of forest succession and the main reason many of the forests today throughout New England are old-growth.

Planning and Review

Goals and Objectives

Was a baseline assessment conducted:

unsure

Was a reference model used:

OTHER

Other reference models used::

The reference ecosystem is based on <u>diverse sources of information</u> (e.g. multiple extant reference sites, field indicators, historical records, predictive data).

were_goals_identified:

YES

Goals and objectives:

- Other

Goals Description::

The restoration effort for the New England Cottontail Project was initiated in 2009 after the species was petitioned in 2000 by the U.S Fish and Wildlife to be listed under the ESA. In 2011 the regional New England Cottontail Conservation initiative was formally established and in 2012 the regional conservation plan was approved. The conservation strategy for the New England Cottontail was developed by Dr. Steven Fuller, Anthony Tur, and with input from the New England Cottontail Technical Committee. The petition was later rejected due to the success of the conservation efforts. The goal now is to continue these efforts in creating, maintaining, and managing the NEC habitats through parts of New York, Connecticut, Massachusetts, Rhode Island, Maine, and New Hampshire. This is done with the objective of increasing NEC population numbers in each of the sub focus areas selected. This is important because the NEC is the only native rabbit to New England. Initial predicated goals for rabbits re-established in focus areas was calculated by biologists using Focus Area Status Screening Templates (FASST) estimates based on local knowledge, partial surveys, observations in the field, and professional judgments on current populations. The most feasible goal total for all sub focus areas are 17,500 rabbits, the highest potential goal is 34,500, and the FASST population estimate is 16,687(Fuller, S. and A. Tur. 2015. New England Cottontail Conservation Progress).

Stakeholder Engagement

Were Stakeholders engaged?:

unsure

Description of Stakeholder Involvement:

There are numerous stakeholders within the region that are in cooperation for the NEC Project. These include state agencies within Connecticut, Massachusetts, Rhode Island, Maine, New Hampshire, and New York. In addition to state agencies, federal agencies such as the U.S Fish and Wildlife Services (USFW), USDA Natural Resources Conservation Service (NRCS), U.S Geological Survey (USGS) and nonprofits such as Wildlife Management Institute (WMI) and National Fish and Wildlife Foundation (NFWF). Additionally, much of the land that is used to create these habitats is owned by private landowners. To keep all stakeholders informed on the progress of the project, a report is created annually by The Technical Committee. It is a performance report reviewing the 83 objectives outlined in the original conservation strategy. This report is used as a way to update the New England Cottontail Executive Committee, to identify uncertainties underlying performance and to develop recommendations to improve the conservation strategy. Additionally, websites were created for both the New England Cottontail Project and the Young Forest Project that contain any information that is needed for the general public or private landowners who want to be or are already involved. On these websites the public has access to the Annual Performance Reports, Young Forest Guide for Landowners, the Conservation Strategy, and Best Management Practices.

Ecosystem Activities and Approaches

General Activities: To determine areas that are suitable to create habitat for the NEC, biologist use field surveys and computer models to identify focus areas. Forty-one focus areas have delineated in the region with the capacity to support 80 metapopulations (New England Cottontail Regional Technical Committee. 2017. Best Management Practices for the New England Cottontail). 1) eliminate existing threats to the ecosystem: To create young forest habitat and to eliminate existing threats to the ecosystem there are a variety of different methods that can be used. These methods include: - Tree/shrub cutting - Heavy-Duty Mowing/Mulching - Field Mowing - Forest Harvesting - Controlling Invasive Plants - Prescribed Burning. These methods are used to cut down or eliminate trees/plants that are shading out any understory that is need for the NEC to live and thrive. They are used to mimic the natural disturbances that occurred periodically throughout history before the land was urbanized. 2) reinstate appropriate physical conditions (e.g. hydrology, substrate): Once the threats are eliminated, young forest is created with the hope that natural regeneration will take place and a dense thicket will grow in this newly disturbed area. At this time the site will also be assessed for invasive species and they will be treated as needed to insure that the habitat that grows back is predominately native. 3) achieve a desirable species composition : To establish a desirable species composition a twelve step guide is followed which is outlined in the Best Management Practices for the NEC. (New England Cottontail Regional Technical Committee. 2017. Best Management Practices for the New England Cottontail): These steps include: 1. Manage, maintain, and create patches of habitat at least 10 acres in size and ideally 25 acres or larger. 2. On sites occupied or potentially occupied by NEC, conduct management in incremental phases, ensuring that enough suitable habitat is left while work is being completed on nearby or adjoining habitat. 3. Manage vegetation on known NEC sites from September to March to avoid disturbances during the species nesting season. 4. Where possible, maintain at least 25 acres of good NEC habitat in a local area at all times. 5. Maximize the ratio of patch size to edge effect by creating roughly circular or square habitat patches rather than long linear ones. 6. Provide a minimum of 20,000 stems per acre of woody vegetation at a height of 3 to 15 feet to offer ample food and cover when converting mature forest to young forest habitat. 7. Where possible, create and maintain habitat patches within 3 kilometers (approximately 2 miles) of each other. 8. Where possible, create habitat patches connected by travel corridors (shrubby utility rights-of-way, shrubs growing along roadways, forests with dense shrub understories, streamside brush, shrub swamps, and forested swamps with a shrub understory) that NEC can use to disperse to other suitable habitat. 9. In old fields and shrublands, selectively remove trees larger than 3 inches in diameter ate breast height or 15 feet high to prevent them from shading out lower thick vegetation. 10. Where cover is limited or will be reduced following habitat management actions, construct brush piles to provide NEC with shelter from predators and inclement weather. 11. Where possible, retain low-growing native shrubs, low-branching conifers, evergreen shrubs with limbs close to the ground, and rock piles, all of which provide good hiding cover to NEC. 12. Where appropriate on given property, maintain 10 to 20 percent, or a minimum of 10 acres, in young forest or shrubland habitat less than 15 years. 4) reinstate structural diversity (e.g. strata, faunal food webs, spatial habitat diversity): After the creation of the young forest site following the 12 step guide and some years of regeneration, the structural diversity should be reinstated to that of a young forest structure. This habitat will support the NEC and other wildlife that uses the young forest as a habitat. Reintroducing rabbits from the captive breeding programs will also be a part of re-instating structure by increasing populations. The range-wide population goal for the species is 13,500 animals. (Fuller, S. and A. Tur. 2015. New England Cottontail Conservation Progress). 5) recover ecosystem functionality (e.g. nutrient cycling, plant-animal interactions, normal stressors): If regeneration struggles to occur at a single site, a series of seeding and plantings will be conducted. This will help create and return functioning flora to the site so that a suitable young forest can take root and grow. This will create a thick understory that will allow a suitable habitat for NEC populations to inhabit and reproduce. 6) reestablish external exchanges with the surrounding landscape (e.g. migration, gene flow, hydrology): Metapopulations of the NEC need 25 acres of land for a successful habitat that are a minimum of 10 acres and contain patches within 2 miles of other good habitat. This is important for the dispersal of the NEC, so that populations do not become isolated. In some areas where there are forests stands adjacent to shrubs or a field, this can be used as a shrub corridor that serves as dispersal route for NEC. These corridors need to be maintained regularly by controlling tree cover to assure they can be used efficiently and effectively by the NEC when traveling to adjacent patches. In addition, it is important that these patches allow for enough sunlight to promote shrub growth and regeneration to create the shrub thicket that is needed for protection and food supply.

Project Outcomes

Eliminate existing threats to the ecosystem: As of the New England Cottontail Regional Initiative 2016 Performance Report, 10,365.2 of the 27,000 acres goal set by the USFW of habitat management and restoration have been planned or implemented (Ecosystem Attribute Category 1). It is estimated that over 40% of the acres reported have been fully implemented. In addition, over 10,000 acres of naturally self-sustaining habitat have been recognized. Vegetation surveys are completed yearly in every sub focus area that has been created. Studies measuring vegetation and population responses appear encouraging but additional time is needed to affirm that prescribed management is working (Ecosystem Attribute Category 2&3). Reinstate structural diversity: Information provided from the New England Cottontail Conservation Progress report has identified that 15 focus areas meet the population size criteria, and their goals total 10,500 rabbits (Ecosystem Attribute Category 4). Six additional focus areas are believed to have population levels approaching their individual goal levels and, this combination with 21 other focus areas will exceed the 13,500 goal and meet the population configuration requirements established by the USFWS (Fuller, S. and A. Tur. 2015. New England Cottontail Conservation Progress) (Ecosystem Attribute Category 4 & 5). In addition to creating habitat, ongoing captive breeding programs are assisting with increasing wild populations by breeding NECs and reintroducing them. Results from New England Cottontail Regional Initiative 2016 Performance Report show that in captivity there was only 33.8% survival rate of produced zoo rabbits. There were also 31 rabbits in 2016 that have been captured to augment the captive populations. In addition, reproduction has been confirmed at two out of five release sites (Ecosystem Attribute Category 4). Recover ecosystem functionality: In addition to creating habitat, ongoing captive breeding programs are assisting with increasing wild populations by breeding NECs and reintroducing them. Results from New England

Cottontail Regional Initiative 2016 Performance Report show that in captivity there was only 33.8% survival rate of produced zoo rabbits. There were also 31 rabbits in 2016 that have been captured to augment the captive populations. In addition, reproduction has been confirmed at two out of five release sites (Ecosystem Attribute Category 4). Captive facilities at Roger Williams Park Zoo in Rhode Island and two outdoor pens at Great Bay,New Hampshire and Ninigret National Wildlife Refuges in Rhode Island have been established. These facilities supported the release of 131 NEC to NH and Patience Island in RI (Fuller, S. and A. Tur. 2015. New England Cottontail Conservation Progress). These populations are being monitored yearly and assessed for reproduction and survival rates through fecal collections and genetic testing. Factors limiting recovery of the ecosystem: In the conservation strategy approved in 2012, six key uncertainties are discussed as to how they could be possible limiting factors throughout the duration of the project with possible monitoring solutions suggested. These uncertainties are still being evaluated yearly in the annual performance reports (Fuller, S. and A. Tur. 2012. Conservation Strategy for the New England Cottontail (Sylvilagustransitionalis) pg.114-116). 1. Efficacy of management techniques for creating quality NEC habitat. This uncertainty addresses the issue of naturally self-sustaining shrub habitats and if they are productive NEC habitat. These habitats can consist of pitch-pine and scrub-oak barrens. This is important and an uncertainty that needs to be addressed because pitch pine and scrub-oak barrens are maintained as a fraction of the cost of creating other renewing habitats. Management actions that will help monitor the success of these habitats may include retrogressive vegetation management (through timber harvesting, chipping, or brontosaurs mowing), establishing shrublandsm(through seeding or transplanting), and converting invasive - to native – shrub dominated shrublands (through selective herbicide application, mowing, and planting) 2. Survival of NEC in augmented and reintroduced populations The captive breeding and reintroduction programs are resource-intensive actions that may not always result in the increase of the targeted populations. Variations that can assist in the increase of growth rate of NEC populations are the use of hardening pens(outdoor breeding pens), soft release, predator control, reducing competition, supplementing nutrition, and the quality of habitat that individuals are released into. Individuals will be monitored after release by evaluating body condition, individual growth rates, reproduction, and survival by recapturing and pellet collections that will genetically tested. 3. Competition with the Eastern Cottontail While the Eastern Cottontail may have some competitive advantages over NEC, not much more is known about their interaction in the wild. This could imply that by creating habitat for the NEC,Eastern Cottontail habitat is increased as well. To address this, the species abundance trends, response to management, and interactions between species will be assessed. This will be monitored through determining the distribution of the NEC and Eastern Cottontails across the NEC range and designing experiments that will reveal the response of both species to different population and habitat- management scenarios. 4. Productivity of captive breeding The basic life history of the NEC has already been extensively researchedhowever, the success of the NEC in captive breeding is unknown. The efficiency of this will depend on effective control of disease, high quality forage, successful mating, managing genetic of captive population, and survival of offspring. This will be monitored by examining captive populations to determine genetic and individual health and reproductive output. 5. Landscape-scale response to the conservation effort It is still unknown whether the habitat system created within each focus area with effectively support a functioning and persistent metapopulations. To monitor this, the NEC occupancy abundance in habitats across the species range will be evaluated. This may be done by assessing the quality and quantity of habitat available annually;percentage of patches occupied by NEC, rate of dispersal rate between patches, and trends in Eastern Cottontail abundance. 6. Genetic monitoring and management of NEC populations It is still unknown how the fragmentation of the NEC habitat will affect the species genetically. This will be monitored be managing wild and captiveNEC populations by capture and release to detect the loss of genetic variation. This can be detected and managed by minimizing reductions in effective population size,minimizing reductions in gene flow between populations, minimizing the loss of small populations, and maintaining normal environmental processes that create and maintain suitable habitat. Another limiting factor of the project is the cooperation with landowners to manage the land. In order to have the required amount of NEC habitat, habitat creation and management must take place on 7,000 to 15,000 acres of privately owned land(Fuller and Tur 2012, section 4.3). This may be limiting because the public has the tendency toprotest actions such as clear cut and prescribed burn. It remains a challenge to explain to land owners how these actions can be an immense benefit for the local wildlife. Time also becomes a limiting factor when considering the amount of labor hours that are needed on the ground and in the field to create these habitats, impacting the cost of the overall project. In addition, site to site variation requires developing site-specific management plans. This is the most costly aspect of this strategy and can become a significant limiting factor when all funding has been identified yet. Economic vitality and local livelihoods: Creating healthy young forest will not only benefit the wildlife it supports, it will also provide ecosystem services to people. Some of these benefits include increased revenue through wildlife supports, improved conditions for wildlife watching, and the generation of jobs to people who contribute to the project. About 39.6 million people took part in wildlife activities in 2016 according to the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. The expenditures of these outdoor recreations totaled 156.3 billion and this revenue is a large contributor to the nation's economy and can only increase further by creating young forest. Provision of basic necessities such as food, water, timber, fiber, fuel, etc.: In addition, foresters and loggers are needed for every site that a habitat is being created on. This generates jobs for the local communities and allows the timber to be used as a reusable source. The timber that is cut can be used for house construction and making furniture, wood chips for biomass power generation, and firewood for heating homes. Cultural dimensions including recreational, aesthetic and/or spiritual values: Furthermore it is a great way to create camaraderie for individual communities. About three quarters of shrubland and young forest are privately owned which requires effective communication between partners and local communities. Due to the large parcels of land needed for the creation of young forest, there can be resistance from the initial proposal. It is vital to be relatable to these communities and assist them in understanding how the creation of young forest will help sustain a variety of declining wildlife in addition to the NEC.

Monitoring and Data Sharing

Does the project have a defined monitoring plan?:

YES

Monitoring Details:

The NEC project is still in the early stages of creating habitat for the NEC and is assessing monitoring protocols on a yearly basis to improve their accuracy. A Research and Monitoring Work Group was created to prioritize 8 main monitoring objectives for the project. These objectives are listed below (Fuller, S. and A. Tur. 2017. Conservation Strategy for the New England Cottontail (Sylvilagus transitionalis) pg.54-55): Objective 201: Quantify Extent of Habitat Conservation Partners must develop a standardized definition of NEC habitat, along with monitoring methods to establish baseline habitat levels. Clear nomenclature and monitoring protocols will let conservationists periodically evaluate the quantity and location of potential habitat, including at the landscape level. They will help managers identify trends in habitat availability, such as a loss of habitat to development, which may limit the effectiveness of this Strategy. Objective 202: Develop Regional Monitoring Protocol To determine habitat occupancy rates by NEC based on data from collecting fecal pellets, conservationists must develop protocols that lead to accurate surveys. Pellet survey detection protocols are being developed and refined by researchers at the University of New Hampshire. The next step, anticipated to be completed by scientists with the U.S. Geological Survey, is to incorporate the detection protocols in a range-wide survey design to ensure high quality presence/absence data at a patch-scale resolution that may be used to assess our landscape design and detect landscape-scale population trends. Objective 203: Measure Habitat Occupancy Rates In the future, intensive pellet sampling may be used to derive a population index. NEC pellet surveys generate a growing dataset useful in monitoring the genetic health of populations. Genetic monitoring is also incorporated in the zoo captive-breeding program (objective 403) to manage the risk of inbreeding and outbreeding in wild populations that may be augmented through the release of captive-born NEC. Objective 204: Presence/Absence Distribution Surveys Although the current distribution of the NEC is well documented (Litvaitis et al. 2006), wildlife biologists need to conduct ongoing research to determine any changes in the distribution of the species. Confirming the presence of NEC in given habitat areas may signal that the conservation effort is working; conversely, decreases in NEC presence may raise additional concerns that need to be addressed. Objective 205: Measure Vegetation Response to Management Assessing The response of vegetation to management is critical to determine the effectiveness of management techniques in generating habitat suitable for NEC. Such vegetation monitoring will also let researchers and managers asses the condition of the habitat in targeted stands so that they can efficiently plan future management actions. Objective 206: Monitor Effectiveness of Vegetation Management The work group will conduct quality control activities to determine the effectiveness of vegetation management and recommend any necessary modifications to the vegetation management protocol. Objective 207: Monitor Disease and Parasitism Conservationists must evaluate both captured individual NEC and populations of NEC to determine the presence of diseases and parasites and, if needed, judge their possible impacts on NEC populations. There is little evidence to suggest that disease or parasites have been or are a limiting factor for NEC; therefore, no conservation measures to manage these factors have been proposed. Objective 208: Monitor Genetic Health of Small Populations To effectively manage small populations and to inform decision-making on the identity of founders for captive breeding, it is necessary to monitor the genetic health of small populations of NEC. The Techcom and work groups will coordinate this monitoring on an on-going basis, as needed.

Open Access URL:

()

Long Term Management

STAPER