



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Mark Belton, Secretary
Joanne Throwe, Deputy Secretary

August 22, 2018

The Honorable Thomas V. Mike Miller, Jr.
President, The Senate of Maryland
State House, H 107
Annapolis, MD 21401-1991

The Honorable Michael E. Busch
Speaker, Maryland House of Delegates
State House, H 101
Annapolis, MD 21401-1991

Re: Submission of Report on Implementation of the Nutria Management Plan
Agency: Maryland Department of Natural Resources
Report Authority: § 10-202.1(c) of the Natural Resources Article (MSAR #869)

Dear President Miller and Speaker Busch:

Enclosed is this year's annual report on implementation of the nutria management plan.

To date, more than 14,000 of these invasive South American rodents have been removed from Maryland. Today very few Nutria remain in the State of Maryland. Although we have not captured a nutria for more than a year, successive years of monitoring Maryland wetlands is required before we can claim a major victory has been won for wetland conservation and the Chesapeake Bay restoration effort.

Should you have any questions or comments regarding this report, please feel free to contact DNR's Legislative and Constituent Services Director, Allison Cordell, directly at 410-260-8112, or by email at Allison.cordell@maryland.gov.

Sincerely,

Mark Belton
Secretary

Enclosure

cc: Sarah Albert (5 copies)

Chesapeake Nutria Control Effort

Annual Report 2017

MSAR #869



Maryland Department of Natural Resources

October 2017

Introduction

Nutria (*Myocaster coypus*) are invasive, non-native, semi-aquatic, South American rodents which were first released into Dorchester County, Maryland in 1943. Since nutria did not evolve in Maryland's wetland ecosystems, there are no predators or natural conditions that control their population. Since their release, nutria numbers increased dramatically, invading at least eight Maryland counties and parts of Delaware and Virginia.

Feeding by nutria damages or destroys the root mat that binds the marsh together. When this fibrous root network is lost, marshlands are quickly reduced to unconsolidated mudflats. These areas, in turn, are highly susceptible to erosion and are eventually converted to open water. This marsh loss represents a significant loss of habitat for nesting waterfowl, including black ducks, which are declining in population, wetland birds, including the endangered black rail, and a variety of song birds. Fish and crabs depend on salt marsh for shelter and protection from predators and as a source of food, since the plants and sediment support many insects and other invertebrates. The loss of these species, in turn, reduces the value of these areas for commercial fisheries and for local ecotourism. The importance of local ecotourism is evident with the Blackwater National Wildlife Refuge as it brings \$15 million each year from visitors.

Nutria pose a significant threat to the health of the Chesapeake Bay. Since 2002, the Chesapeake Bay Nutria Eradication Project has been trapping nutria and creating restored nutria-free marsh in Maryland. More than 14,000 have been trapped in this effort. Today very few nutria remain in the State of Maryland. Although the nutria team has not captured a nutria for more than a year, successive years of monitoring Maryland wetlands is required before we can claim victory.

Synopsis of Progress to Date

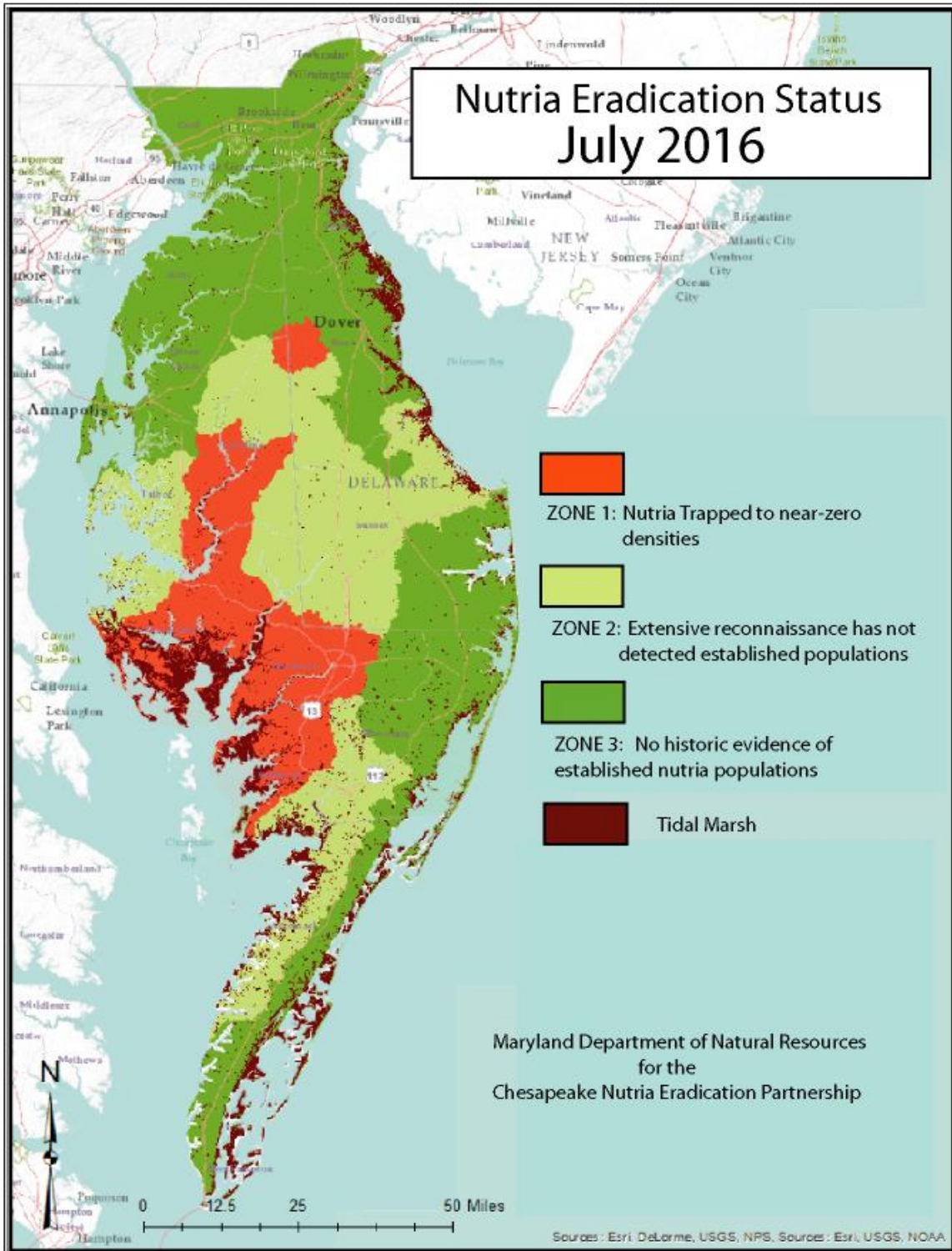
The spring of 2016 brought about a remarkable landmark in the history of the nutria invasion in Maryland. Despite concentrated efforts of experts in nutria management, no nutria were trapped on the Delmarva Peninsula. As of the writing of this report, it has been more than two years since our team has captured a nutria.

Maryland has been at the forefront of nutria eradication since 1998, when the Chesapeake Bay Nutria Eradication Project (the Project or the Partnership or CBNEP) began experimenting with methods to eliminate the invasive rodents from critical marsh habitats on the Eastern Shore. Two years later, a Maryland Department of Natural Resources (MDNR) effort trapped approximately fifty animals from a marsh in Calvert County, eliminating the only nutria population on the western shore and demonstrating that localized permanent eradication was possible. From 2002 until 2014, the Partnership, using funding from the U.S. Fish and Wildlife Service and professional trappers and scientists from the U.S. Department of Agriculture, systematically eliminated nutria from most of the infested areas on the Eastern Shore.

Every watershed in Maryland has now undergone the ‘knockdown’ phase of nutria eradication. Today nutria still exist only in small, isolated populations and are on the verge of disappearing completely. If the current level of effort is continued for one more year – and if the nutria-free zone is monitored for some years after the removal of the last population – the entire Eastern Shore, including previously infested areas of Delaware and Virginia, will be nutria-free.

In FY 2016 and FY 2018 the Maryland Department of Natural Resources was able to allocate \$50,000.00 in Federal Aid (Pittman-Robertson funds) to the expansion and support of the nutria detector dog program. This federal funding and a small amount of Wildlife Management and Protection Funds (WMP) are the only funding sources provided to the 1.5 million dollar annual project budget. All other funds are derived directly through Federal agencies.

Continued monitoring of the two western shore sites in Calvert County that were the site of cross-Chesapeake nutria infiltration in 1999, discovered no new activities since the eradication program of 1999-2000 eliminated those populations. This evidence suggests that those escapes were a result of high nutria densities in the Blackwater/Fishing Bay marsh complex. The current threat to western shore wetlands is from the potential northward advance of Virginia nutria populations moving northward from the Hampton Roads area. The Mid-Atlantic Panel of the Aquatic Nuisance Species Task Force has been funding efforts to monitor and stop the expansion of western shore Virginia populations.



Innovative Techniques and Technology

At the same time that the Partnership has reached completion of the ‘knock-down’ stage of nutria eradication, we have also implemented innovative techniques to find nutria as they become increasingly scarce on the landscape. There are four major fields of endeavor in this effort:

1. The ‘Judas Nutria Project’

The Project has long maintained captive nutria at its Blackwater National Wildlife Refuge headquarters for research purposes. Beginning in 2010, a number of nutria were surgically sterilized by a veterinarian and outfitted with GPS tracking/transmitting collars. These animals were subsequently released into the wild in areas with small remaining population of nutria in the hope that the radio-collared nutria would find and associate with the remaining wild nutria. This technique proved very effective and led to the discovery and capture of isolated surviving pockets of nutria. It also led to a wealth of new discoveries regarding the movement and habitat of nutria. Nutria had previously been considered generally sedentary, but this practical research project proved that individual nutria are prone to nocturnal wanderings of many miles, and of travelling for more than ten miles in a night when seeking other nutria in a landscape with no nutria population.

2. The development of scent attractants

The use of scents in trapping probably began thousands of years ago and it is a standard technique of modern trappers. Furbearing animals are finely attuned to scent and rodents in particular make use of scents in social interactions. The Project has used various biological products from captive nutria to experiment with chemical lures to attract nutria to monitoring platforms or traps.

3. The use of artificial resting platforms

Nutria like to haul out onto small islands or hillocks in their marshland habitat. The project has taken advantage of this tendency by deploying over a thousand artificial islands in nutria habitat. Just over a meter square and made from plywood fitted with a foam floatation core, these portable ‘islands’ can be placed in marsh channels and will be visited by passing nutria. While exploring the island, the nutria will encounter a camera, a DNA-collecting hair snare, or a lethal trap.

4. The implementation of the ‘Detector Dog’ program:

The project is currently working with the National Detector Dog Training Center (NDDTC) to develop a “detector dog” program using wildlife scent detector dogs. Up to six dogs will be trained to detect and respond to nutria scat throughout Delmarva. These dogs will be crucial in the final stages of the CBNEP when nutria densities are low and detections are most challenging and will be a valuable tool for determining areas as “nutria-free.”

Candidate dogs for detection work are between the ages of 1-3 years, have a high toy drive and no history of aggression. Dogs are usually procured from local shelters,

rescues, breeders, or are personally owned pets up for adoption. Hunting dog breeds such as labs, golden retrievers and mixes generally make good candidates because of their temperament and physical characteristics. Before being accepted into the training program, all dogs undergo a specialized temperament test and are medically screened.

While undergoing training, dogs are paired with one handler for 10 to 13 weeks to build rapport and learn to work together as a team. Dogs are trained to give a bark response when they find scat and are not used to actively hunt nutria. Upon completing handler training, the dog/handler pair will work all across Delmarva as part of the Chesapeake Bay Nutria Eradication Project (CBNEP) team. Detector dogs will be housed overnight in a new agency-owned kennel and will work with their handler daily. CBNEP will be following protocols developed by the National Detector Dog Training Center (NDDTC) to ensure the health, safety and wellbeing of program dogs. Dogs that are accepted into the program but are unable to complete the training are adopted out through the NDDTC's Adoption Program and are not taken back to shelters unless requested. If a CBNEP dog reaches retirement age or cannot continue work during his/her career then his/her handler has first rights to adoption. If the handler is unable to adopt the dog, it is then adopted out through the NDDTC.

All Chesapeake Bay Nutria Eradication Project dogs receive exceptional physical, mental and medical care. All reinforcement is exclusively positive in the form of treats, toy rewards, attention, praise, etc.

While the primary goal of the project has always been the complete eradication of nutria from the Delmarva Peninsula, the innovative techniques developed in working toward that goal have lasting value that extends far beyond the Eastern Shore. These techniques and technologies will be a vital part of efforts to eradicate nutria in other US states and other countries where this rodent has become an invasive threat to native ecosystems.

History of the Chesapeake Bay Nutria Eradication Project

Efforts to control nutria began in the mid-1950s shortly after the first animals that had been introduced for research and fur-farming were released or escaped from captivity. Varying levels of control were achieved over the next twenty years, but populations continued to expand despite these efforts. In the mid-1970s, populations crashed during the severe winters of 1977-78. However, during the next decade, the nutria population significantly increased to the point where these ravenous invasive rodents were contributing to unprecedented marsh loss. In 1989, Blackwater National Wildlife Refuge initiated a trapper rebate program whereby trappers were paid \$1.50 for each nutria they killed. The money was then applied to offset the cost of leasing federal lands for muskrat trapping. In 1990, both MDNR and U.S. Fish and Wildlife Service (FWS) began research projects to estimate nutria numbers.

Multi-agency partnerships are frequently formed to solve natural resource issues that would be difficult for any agency to tackle alone. In 1993, MDNR and FWS established the first multi-agency task force to investigate potential approaches to combat feral nutria populations. In 1994, Dr. Morris Gosling visited from Great Britain where he had successfully led a program to eradicate nutria. Dr. Gosling assessed the problem and affirmed that eradication was an achievable goal. Dr. Gosling stated that nutria could be controlled in Maryland if additional information were collected on how nutria behave and reproduce in Maryland's habitats, which are distinctly different from habitats found in Great Britain. Two major questions, however, needed to be answered before the United States Congress would appropriate funding: "Were nutria a major factor in causing marsh loss?" and "If nutria were eradicated, would the marsh recover?" In 1995, MDNR and FWS, with assistance and direction from the U.S. Geological Survey (USGS), initiated a study that statistically addressed these two questions; it provided scientific proof that nutria were the primary cause of recent marsh loss and that the damaged marshes would recover within one year after their removal.

In June 1997, MDNR and FWS convened the "Nutria Control Summit" in which representatives from 17 federal, state, and private organizations were invited to develop ideas for nutria eradication in Maryland. This effort culminated in July 1998 with the development of a 3-year pilot plan entitled *Marsh Restoration: Nutria Control in Maryland* to evaluate nutria eradication. The objectives of the plan were to: 1) develop methods and strategies to reduce nutria populations in Chesapeake Bay wetlands to the point where nutria are unable to maintain a sustainable population; 2) restore marsh habitats; and 3) promote public understanding of the importance of preserving Maryland's wetlands. Strategies included development of accurate population estimates, determining effective trapping strategies to maximize nutria harvest and minimize impacts to non-target species, evaluating the effects of population control on nutria home range and movement patterns, determining how population control affects nutria reproductive behavior, and determining if the health of nutria populations would be influenced by intense harvest pressure.

The plan suggested a 3-pronged approach including management, research, and public education. The overall budget necessary to implement the plan over 3 years was estimated at \$3.8 million. However, the partners identified \$902,280 of in-kind contributions to support this initiative and sought additional funding of \$2.9 million from federal, state and private sources to implement the plan. First year implementation was estimated at almost \$1.4 million.

H.R. 4337 was introduced by Congressman Wayne Gilchrest during the 105th Congress and was signed into law by President Clinton as Public Law 105-322 on October 30, 1998. PL 105-322 authorized appropriation of up to \$2.9 million to the Secretary of the Interior, beginning in fiscal year 2000, to achieve the objectives of the nutria plan. The Pilot Project began on January 1, 2000 and ended in December 2002. The project's management team included the Maryland Cooperative Fish and Wildlife Research Unit, Maryland Department of Natural Resources, University of Maryland Eastern Shore, Tudor Farms, and the U.S. Fish and Wildlife Service.

On February 3, 1999, President Clinton signed Executive Order 13112 to control invasive species and to minimize the economic, ecological, and human health impacts that invasive species cause to agricultural crops and natural ecosystems. In 1999, the Partnership was also successful in obtaining a Capacity Building Grant from the U.S. Department of Agriculture (USDA) for almost \$300,000 for a portion of the research component of the nutria plan. In the fiscal year 2000 budget, Congress earmarked \$500,000 in the FWS budget to support implementation of the first year of the pilot program. To implement the first year of the 3-year pilot program at a reduced scale, the Partnership agreed to combine these resources (approximately \$800,000). By March 2000, the Partnership had expanded and included 23 federal, state, and private partners. The pilot program answered the elemental questions of whether or not nutria can indeed be eradicated from the Chesapeake Bay ecosystem, and what level of effort is required to do so.

In April 2002, the eradication phase was fully implemented. USDA Animal and Plant Health Inspection Services (APHIS) Wildlife Services, assumed primary responsibilities for project implementation. The total cost of the nutria project, since its inception in 2000, has been approximately \$15.8 million through fiscal year 2014.

Without this considerable effort, nutria would clearly continue to destroy wetlands throughout the region. Recognizing this, President George W. Bush signed the Nutria Eradication and Control Act of 2003, which authorized the expenditure of \$4 million per year for five years to eradicate nutria from the Chesapeake and Delaware Bays.

The nutria eradication project is overseen by the Nutria Management Team, consisting of the FWS Chesapeake Bay Field Office, Chesapeake Marshlands National Wildlife Refuge Complex, APHIS Wildlife Services, MDNR, USGS, the University of Maryland Eastern Shore, and Tudor Farms.

Last Strongholds

Throughout the years that the project has been working on nutria eradication, the public and landowners have been overwhelmingly supportive of the effort. However, a few landowners have been resolute in preventing what is seen as unwelcome government intrusion onto their lands. The partnership has dealt with the in-holdings by isolating these refuge islands, cordoning off the perimeter areas with traps to capture any nutria that might escape. It is difficult to know how many nutria may remain on inaccessible land, but the project can never be completed while even a few nutria remain in the landscape. Maryland law allows the Secretary of Natural Resources to declare an invasive species in a nuisance state on private land and hold the landowner responsible for the cost of remediation, but this law is untested in natural resources management. Such forceful remediation efforts are much more common in agricultural settings with commercial crop pests and arresting irresponsible livestock management. The partnership has proceeded with intensive negotiation with the very few landowners who refuse to cooperate with the eradication effort.

Federal Agency Funding History of the Project

Chesapeake Bay Nutria Project – Budget History as of July 2017

Fiscal Year	FWS ES-PFW (Congress)	FWS ES-PFW (Base)	FWS Refuges (Base/Ear Mark)	Total FWS Direct Funding
2000	\$200,000	0	\$300,000	\$500,000
2001	\$200,000	0	\$300,000	\$500,000
2002	\$749,000	0	\$299,300	\$1,048,300
2003	\$694,457	0	\$268,000	\$962,457
2004	\$652,000	0	\$304,000	\$956,000
2005	\$684,000	0	\$287,489	\$971,489
2006	\$492,644	\$663,997	\$295,940	\$1,452,581
2007	\$490,535	\$693,185	\$297,000	\$1,480,720
2008	\$491,910	\$693,000	\$297,355	\$1,482,265
2009	0	\$1,183,720	\$297,000	\$1,480,720
2010	0	\$1,184,000	\$297,000	\$1,481,000
2011	0	\$1,183,720	\$297,000	\$1,480,720
2012	0	\$1,157,145	\$297,000	\$1,454,145
2013	0	\$1,081,000	\$240,114	\$1,321,114
2014	0	\$1,081,000	\$150,000	\$1,231,000
2015	0	\$1,081,000	\$150,000	\$1,231,000
2016	0	\$1,044,109	\$150,000	\$1,194,109
2017	0	\$1,044,109	\$75,000	\$1,119,109
Total	\$4,654,546	\$12,089,985	\$4,602,198	\$21,346,729

Maryland State Funding for the Project

MDNR has made \$50,000 in Pittman-Robertson funds available for fiscal 2018, the second recent year of funding at this level. However, this surge in funding is miniscule in comparison to the monies that have been provided by the FWS. Throughout the partnership effort, fiscal support from the State of Maryland has been nominal.

Next Steps:

Maryland's FY2018 contribution to the project will allow a comprehensive reevaluation of the mission and methodology of the effort. Under this agreement Maryland Department of Natural Resources and the U.S. Fish and Wildlife Services's Chesapeake Bay Field Office will contract with Landcare Research, one of New Zealand's crown research institutes, that has developed this process. Landcare will analyze surveillance data to quantify the probability of eradication for a treated management zone (MZ) which

will then be used to inform an operational decision to reallocate resources to other MZs, and progress across the entire Delmarva region. After a MZ has been operationally declared free of nutria, Stage II surveillance commences to detect MZ-level failures, and to estimate the broadscale surveillance sensitivity and a corresponding probability of total eradication. From the information gained, a computer algorithm will be applied to identify cost-optimal Stage I and II surveillance strategies for the larger Delmarva area. The project will assess (1) the balance between local surveillance intensity and spatial coverage; (2) the number of years to finally declare success in Stages I and II; (3) the stopping probability of eradication (Stage 1); and (4) the optimal strategy given variation in the starting-over cost, should a MZ be erroneously declared free of nutria. This approach will provide guidance for implementing optimal bio-economic surveillance strategies and an objective basis for decision-making to declare ultimate eradication.