Strategic Plan for the Mid-Atlantic Nutria Management Program (MANMaP)

October 31, 2013 Version 1.4

Finding provided by Maryland Sea Grant

through a grant from the US Fish and Wildlife Service's

Mid-Atlantic Panel on Aquatic Invasive Species

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Introduction

This strategic plan was developed to advance the activities of the *Ad hoc* Virginia-North Carolina Nutria Management Steering Committee towards the creation and implementation of the Mid-Atlantic Nutria Management Program (MANMaP). This program is necessary to coordinate and implement an effective nutria management strategy in Virginia and North Carolina. The immediate goal of this effort is to reduce the threat nutria pose to wetlands, and the ecosystem benefits they provide, by preventing further expansion.

This document provides a basic overview of the nutria invasion in the Mid-Atlantic region, current understanding of their distribution and status within Virginia and North Carolina, and a summary of management actions taken to specifically address this issue. This is followed by a strategic planning section that outlines the goals, objectives, and immediate tasks that can, and should, be followed by the MANMaP to advance nutria management in Virginia and North Carolina.

We gratefully acknowledge the support of the US Fish and Wildlife Service Mid-Atlantic Panel on Aquatic Invasive Species (MAPAIS) in funding this project.

The Threat of Nutria

Nutria (*Myocaster coypus*) are invasive to the United States and pose a threat to the health of coastal marsh systems wherever they occur. Nutria can reproduce at 6 months of age, and females may have 3-4 litters per year each containing 4 -5 young (although litters with as many as 13 offspring have been documented).

Nutria can be very destructive to wetlands. Their foraging behavior damages or destroys both the above-ground vegetation and the root mat of emergent aquatic plants. The loss of root mat fibers results in erosion, which can lead to the conversion of marsh vegetation to unconsolidated mud flats. These areas are highly susceptible to continued erosion and can eventually remain as open water. This loss of coastal marshes negatively impacts habitat for a number of terrestrial and aquatic species. Important wetland ecosystem functions, like sediment and contaminant buffering, are also impacted.

The health of coastal economies is dependent on the quality of its marshes and tidal wetlands. Maryland estimated that economic losses from wetland degradation by nutria totaled $4 million in 2004, and predicted losses would exceed $30 million per year by 2050 if nutria populations were left unchecked. Though no formal estimates of potential economic loss have been calculated for Virginia and North Carolina, the size of the area suggests that the economic impact may be even greater in this region.

In addition, nutria are known to damage agricultural crops and cause damage to personal property by burrowing into bulkheads and other water control structures but the annual economic costs of this damage is unknown.

Once nutria populations have been established and are allowed to grow, eradication can be a difficult and costly endeavor. Nutria were successfully eradicated in Great Britain through a time consuming and expensive program. In the United States, the Chesapeake Bay Nutria Eradication Project (CBNEP) has demonstrated that nutria may be eradicated over large areas; however the costs are high.

Nutria in the Mid-Atlantic

Nutria were likely introduced to the region from captive populations bred for fur. Established populations have increased in both size and range throughout the Coastal Plain of Maryland, Virginia, and North Carolina since the 1930's.

Maryland (excerpted from the CBNEP)

Efforts to control nutria in Maryland began in the mid-1950's 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 were reduced during the severe winters of 1977-1978; however, during the next decade, the nutria population significantly increased to the point where they were contributing to unprecedented marsh loss. In 1989, the Blackwater National Wildlife Refuge (NWR) initiated a trapper rebate program whereby trappers were paid $1.50 for each nutria they killed. In 1990, both the Maryland Department of Natural Resources (MDNR) and U.S. Fish and Wildlife Service (FWS) began research projects to estimate nutria population numbers and their impacts on marsh vegetation.

In 1993, the MDNR and the 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 and determined that eradication in Maryland was feasible assuming two major questions could be answered; "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 addressed these two questions and 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 July 1998, the FWS, with the collaboration of several agency partners, developed 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 they are unable to maintain a sustainable population;

2) restore marsh habitats; and

3) promote public understanding of the importance of preserving Maryland's wetlands.

The plan suggested a three-pronged approach including management, research, and public education. The specific 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.

In April 2002, the necessary funding was secured and the eradication phase was fully implemented. The USDA Animal and Plant Health Inspection Services (APHIS)-Wildlife Services assumed the primary responsibilities for project implementation. The total cost of the nutria project was approximately $13.8 million through fiscal year 2011 and is ongoing.

Using APHIS staff, the project has expanded far beyond the Blackwater NWR and into the adjacent state and privately-owned marshlands (approximately 150,000 acres). Full eradication of nutria will require further expansion into the 250,000 remaining wetland acres on Delmarva Penninsula (including portions of Delaware and Virginia). The CBNEP has continued to expand its efforts into surrounding marshlands while preventing re-infestation of the core area on the Blackwater NWR and other previously-trapped state and private lands. The project has demonstrated that eradication is achievable, but the eradication effort must be completed in order for the tidal marshes of the Eastern Shore of the Chesapeake Bay and beyond to be protected and restored.

Virginia

Nutria were documented in Virginia as early as 1956 in the area now encompassed by the Back Bay National Wildlife Refuge. This population was most likely the result of nutria expanding throughout the Albemarle-Pamlico watershed originating in North Carolina. Available evidence suggests that nutria populations have persisted at low levels in this region since that time despite pressure from fur trappers and periods of extreme cold.

Until recently, nutria populations in Virginia were thought to to be relatively static, but are now showing signs of expansion. Since 2011 there have been sporadic (but credible) reports of nutria occupying river systems on the North side of the James River; once considered a major geographic barrier to nutria expansion. There is an abundance of potential, presently unoccupied, wetland habitat on the western shore of Chesapeake Bay that now should be considered as vulnerable to nutria invasion. In addition, a continued northward spread could jeopardize areas where eradication efforts of the CBNEP have been successful.

The true contemporary distribution of nutria in Virginia is unknown. In 2003, the Chesapeake Bay Nutria Working Group stated that:

> "Population numbers and distribution are limited. Individuals have been sighted and trapped at Saxis Wildlife Management Area and Back Bay National Wildlife Refuge."

The Virginia Invasive Species Management Plan (Virginia Invasive Species Council 2005) remarked:

> "We informally monitor the spread of this species but have not noticed any range expansion much beyond the Back Bay NWR and surrounding vicinity."

Since 2005, nutria have certainly persisted in the areas described above and their range appears to be expanding. An individual was confirmed through trapping near Hog Island Wildlife Management Area (Surry County, Virginia) in January 2011. In addition, there have been credible reports of nutria captures near Smithfield (Isle of Wight County), Courtland (Southampton County), and in the Chickahominy River near its confluence with the James River in Virginia. At minimum, nutria are considered to be established in an area bounded by the intersection of Route 13 and Interstate 264 south to the North Carolina state line and east to the Atlantic Ocean (S. Barras and M. Fies, personal communication 2011). Colonization events establishing populations in areas outside of this area are increasingly likely (Figure 1).

The preferred habitat of the nutria can be found widely throughout southeastern Virginia. These habitat patches are often connected by numerous waterways (e.g., canals, ditches, water control structures) that can facilitate the movement of nutria. The wetland systems found on the western shore of the Chesapeake Bay and its estuaries are thought to be nutria-free at present, although these areas are considered to be prime nutria habitat and, at minimum, would provide conditions suitable for sustaining populations.

North Carolina

Nutria have been established in North Carolina for a number of decades, perhaps since the 1930's. The North Carolina Wildlife Resources Commission (NCWRC) has been tracking nutria distribution at the county level with information supplied by licensed trappers since at least 1990 (Figure 1). The North Carolina US Department of Agriculture Animal Plant Health Inspection Service - Wildlife Services (USDA APHIS-WS) office has documented occurrence over a large portion of North Carolina by recording the incidental take of nutria as part of their beaver management activities.

More information on the distribution of nutria in North Carolina is needed. The present expansion front is poorly understood; particularly along the southern edge near the South Carolina state border and inland for all affected river systems. What is apparent is that the nutria population is expanding within these areas and shows no sign of decrease in areas where they are thought to be established.

Nutria are listed as “of concern” in the Comprehensive Conservation Plans for numerous NWRs in coastal North Carolina Nutria including Mackay Island, Currituck, and Mattamuskeet.

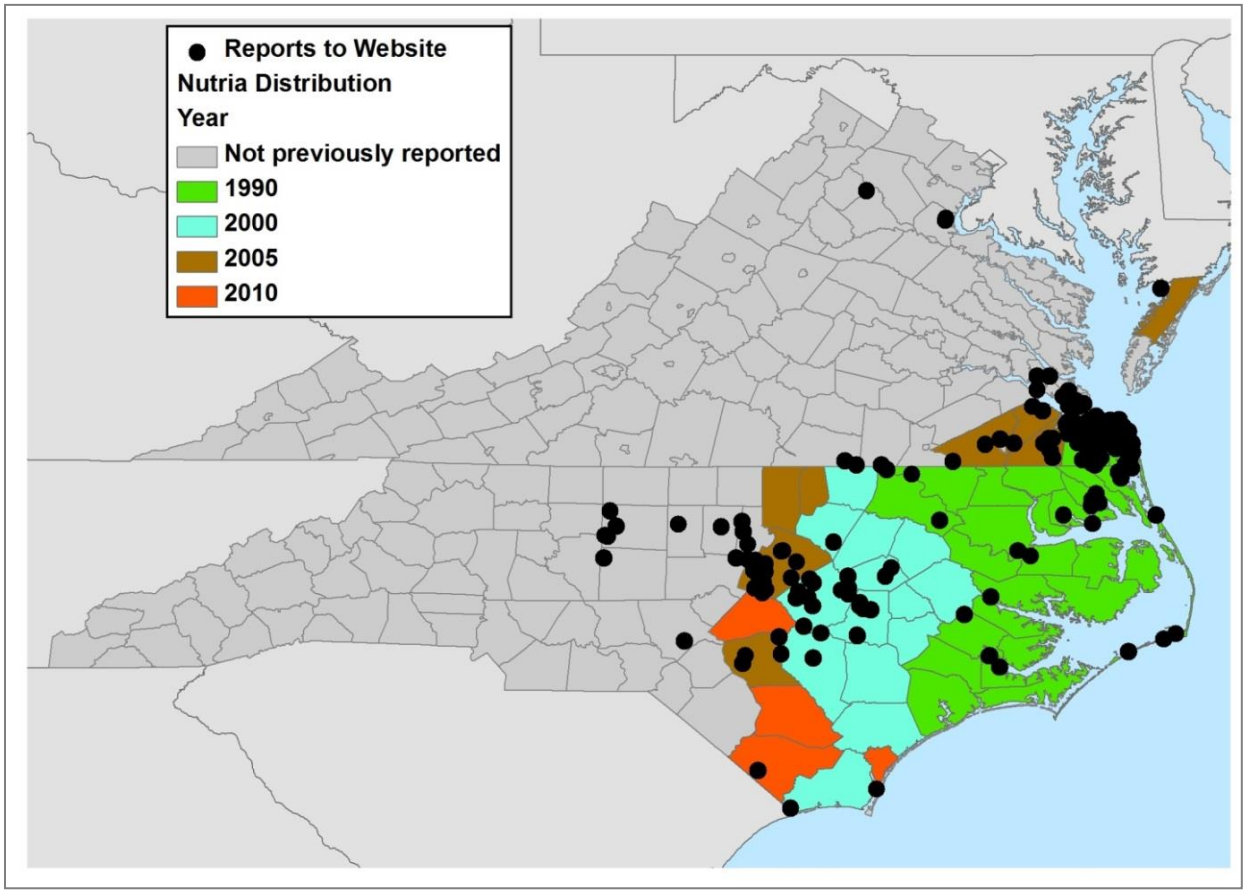

Figure 1. Range expansion (county level) distribution of nutria in Virginia and North Carolina, with public report records collected from the nutria reporting website in 2012-2013 (www.ReportNutria.org).

Ongoing Management of Nutria in Virginia and North Carolina

Much of the management and control focused on nutria in Virginia and North Carolina has been site-specific. Nutria trapping has been carried out in instances where property and crop damage complaints have been received by the USDA-APHIS Wildlife Services in both Virginia and North Carolina. Nutria control efforts on the NWRs, and similar privately-held conservation properties, has been sporadic and directed at reducing local populations. No comprehensive nutria control efforts have been initiated beyond legal recreational trapping.

While these practices have reduced nutria numbers at the local level (at least temporarily), it is unlikely that the greater population has been impacted. Increasing concerns for nutria persistence and range

expansion resulted in the initiation of a multi-agency dialog on nutria. In 2012, The Virginia Department of Game and Inland Fisheries (VDGIF), United States Department of Agriculture- Animal and Plant Health Inspection Services (APHIS) Wildlife Services, United States Fish and Wildlife Service (USFWS), and the Conservation Management Institute at Virginia Tech (CMI) established a multi-agency steering committee to investigate potential approaches to managing nutria populations. Soon after, representatives from the North Carolina Wildlife Resources Commission and USDA-APHIS from North Carolina were added to form a seven-member *ad hoc* steering committee to coordinate nutria management .

VA-NC Nutria Steering Committee

The steering committee is comprised of 4 seats representing the state wildlife management agencies (i.e., VDGIF and the NCWRC), and the state offices of the USDA APHIS WS for both Virginia and North Carolina. The remaining 3 seats are "at-large" and are filled by volunteers or appointment (by the 4 agency seats) and may be drawn from any agency or organization. A chair is selected from the 4 agency seats for a 2 year term (current members (2013-2015) of the steering committee are presented in Table 1).

The steering committee shoulders the responsibility for providing review and comment on actions related to managing nutria in Virginia and North Carolina. Specifically, the steering committee is charged with:

- coordinating response actions and procedures

- maintaining databases and records of nutria sightings

- prioritizing future collaborative efforts

- acting as the primary outlet for nutria information

Additional by-laws and/or procedures have not been adopted by the Committee, nor has any formal memorandum of understanding been implemented to guide future activities and actions.

In 2011, a project funded by the USFWS MAPAIS resulted in a preliminary plan for early detection and rapid response to expanding nutria populations in Virginia (representatives from NC were involved, but resulting management decisions did not incorporate lands in NC). Through consultation with the CBNEP staff, the group also began to plan actions around 3 distinct phases of nutria management; delineation, population reduction, and evaluation.

Table 1. Mid-Atlantic steering committee members (2013-2015) as of September 1, 2013.

Name	Committee Designation	Affiliation
Barras, Scott	USDA-VA Agency Seat, Chair	USDA-APHIS Wildlife Services -VA
Fies, Mike	VDGIF Agency Seat	VA Dept. of Game and Inland Fisheries
Gaydos, Emily	USDA –NC Agency Seat	USDA-APHIS Wildlife Services - NC
Olfenbuttel, Colleen	NCWRC Agency Seat	NC Wildlife Resources Commission
Todd Englemeyer	At-Large	VA Dept. of Game and Inland Fisheries
Vacant	At-Large	
St. Germain, Mike	At-Large	Conservation Management Institute - Virginia Tech

Delineation is the first phase where the extent of the population is determined. This is accomplished at various spatial scales so management efforts can target the expansion fronts and identify the source locations of the population on the landscape. Population reduction and elimination (i.e., knock down) targets specific areas for depopulation using a variety of techniques with the intent to eradicate. The final phase is evaluation (i.e., mop up) and monitoring of the depopulated area to determine whether eradication has been achieved. This may require continuous monitoring of an area for 2-3 years after the last nutria has been observed.

Management Actions in Virginia

The steering committee has made some progress towards building a coordinated nutria management effort. As part of the aforementioned project, the steering committee took initial steps to delineate the nutria area into management response zones based largely on geography and the extent of the contemporary range. These responses apply to specific regions in the state (Figure 2) and actions:

Zone 1. Nutria Established

The "Established" zone is delineated as the area where nutria populations are established and are likely to persist without active and comprehensive management efforts. A comprehensive eradication strategy (i.e., Operational Plan) that will outline the necessary techniques,

processes, and logistical steps required to effectively remove nutria from this area is needed. This zone contains areas of dense human population that may require the development of new control approaches if management activities are to be effective. Certainly local ordinances, regulations, and laws that may prevent the implementation of some management techniques (e.g., trapping and shooting) will need to be identified and addressed. For the present time, the Steering Committee will continue to record nutria reports from this area and the appropriate agencies will respond to landowner damage complaints as necessary.

Zone 2. Delineation

The "Delineation" zone is defined as an area where nutria may presently occur, or could be established through expansion in the near future. As such, the Steering Committee determined that reports of nutria in these areas should be inestigated with a site visit to determine whether nutria are, in fact, present. Site visits will be conducted by either VDGIF or USDA-WS and the results of their findings would be reported back to the Steering Committee. Any reports received for the Delineation zone on the Delmarva Peninsula in Virginia would be investigated by CBNEP staff.

Zone 3. Early Detection-Rapid Response

The "Early Detection-Rapid Response Zone" is identified as the area of the western shore of the Chesapeake Bay north of the James River. This area is considered to be of concern due to the large quantity of suitable nutria habitat likely found there. Any reports of nutria coming from this zone will be investigated by the VDGIF or USDA-WS to determine validity, and will receive swift management action if verified. While no specific actions were specified by any of the agencies, all agreed that verified populations of nutria in this region should be eradicated as quickly as possible and that resources could likely be brought to bear to accomplish this.

As of 2013 there have been no formal nutria management activities in North Carolina. The Steering Committee continues to identify potential sources of funding to complete similar population and management zone delineations in North Carolina. These efforts have not yet been successful, but efforts are ongoing.

Strategic Planning

The Steering Committee also identified the need to develop a strategic plan to outline the vision, goals, objectives, and action items that will guide effective implementation of the MANMaP. The effort to develop this plan was funded with assistance from the MAPAIS (2013) and will be based on the strategic plan developed by the CBNEP.

The Strategic Plan will provide the framework necessary to advance the MANMaP to a point where funding for specific actions can be justified and pursued. It will also allow the collaborating agencies to adopt a more substantial course of action to control nutria in the Mid-Atlantic region.

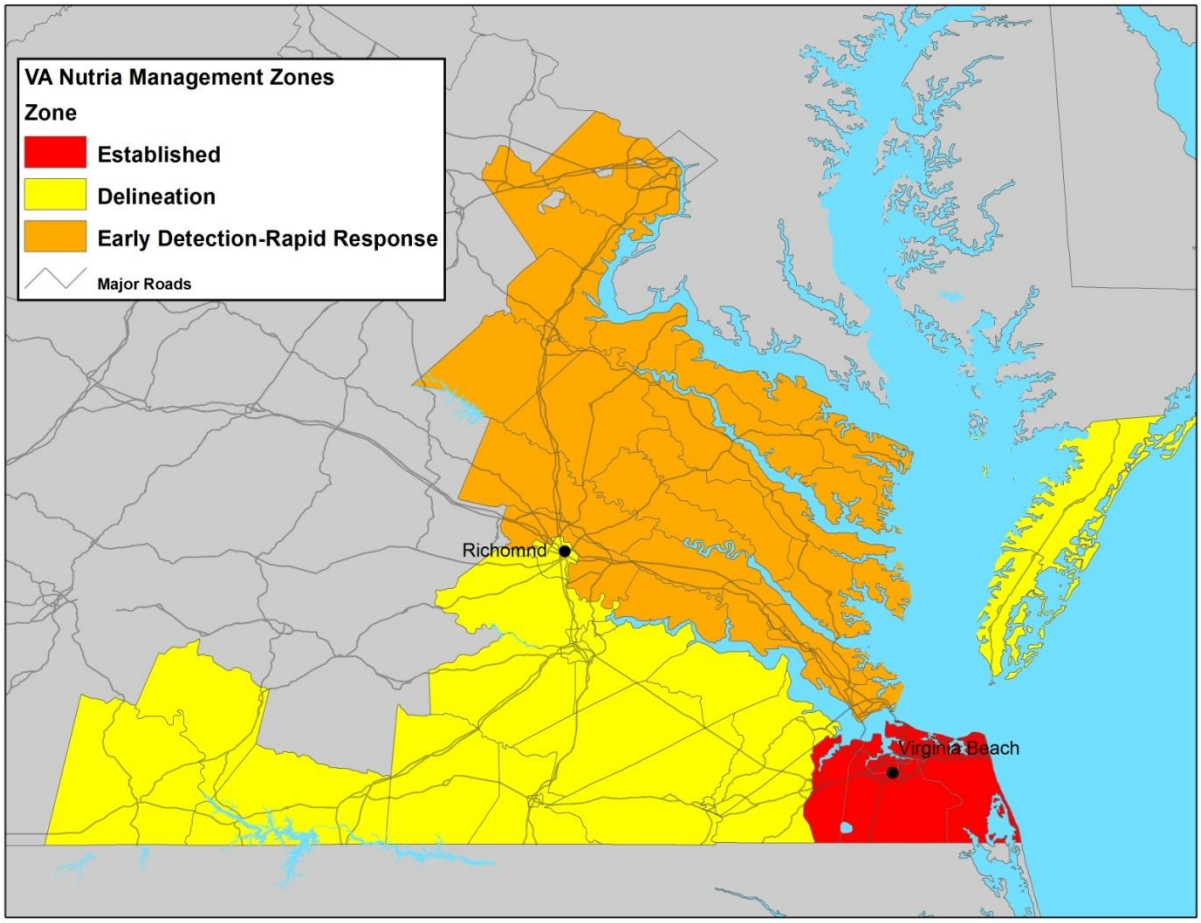

Figure 2. Nutria management zones established in 2012 for Virginia.

Strategic Plan: Mid-Atlantic Nutria Management Program

Preface

The goal of this strategic plan is to outline the priorities of the VA-NC a*Ad hoc* Nutria Steering Committee for providing information, coordinating, and establishing a program for managing the invasive nutria (*Myocaster coypus*) in the Mid-Atlantic region. There has been a great deal of successful work completed to date by the joint USDA-US Fish and Wildlife Service Chesapeake Bay Nutria Eradication Project (CBNEP) in Maryland. This effort is intended to complement and expand those efforts to the larger range of nutria on the Atlantic Coast.

This strategic plan was developed under the direction of the VA-NC *ad hoc* Nutria Steering Committee, and with significant input from the Nutria Management Team of the CBNEP. Specific elements of this plan have been derived from the CBNEP Strategic Plan where appropriate. This plan is designed to guide the future course of what we are calling "the Mid-Atlantic Nutria Management Program (MANMaP)".

This plan is a dynamic document that allows for innovation, creativity, and adaptability as the MANMaP evolves. This plan will I frequently change, so users should ensure they are referencing the most current version.

Vision

We envision a system of wetlands in the Mid-Atlantic region that provide ecological, cultural and economic benefits for all citizens under no threat of degradation or destruction by nutria.

Mission Statement

The mission of the MANMaP is to stop the spread of nutria within the Mid-Atlantic region.

Goals

A set of goals has been established to guide the completion of the mission. Each goal has a set of objectives which provide specific, measureable, action items to achieve it. Objectives are comprised of tasks which provide additional specificity. The list of tasks is not comprehensive for achieving the objective. The tasks described represent actions that can be taken immediately to further nutria management in the region.

The goals of the MANMaP are:

1. to develop a coordinated effort to stop the spread of nutria
2. to identify the present range of nutria in Virginia and North Carolina
3. to improve our understanding of the threat nutria pose to wetland systems and personal property

4. to educate decision makers and the public about the threat of nutria, and the potential benefits of nutria control, and;
5. to develop options for reducing, or eradicating, nutria within Virginia and North Carolina

Objectives

Within each of the stated goals of the MANMaP there are a number of specific, quantifiable objectives that will be achieved. These objectives contain specific tasks that can be assigned to collaborators and provide additional guidance on time and resource constraints.

Goal 1. Develop a Coordinated Effort to Stop the Spread of Nutria

If nutria are permitted to expand beyond their present range, the task of controlling them becomes more costly and eradication increasingly difficult. The MANMaP should prioritize the development of a strategy to limit further range expansion in Virginia and North Carolina.

Objective 1.1 – Design and implement a multi-agency body to coordinate MANMaP actions.

Task 1.1.1 – Solicit input from federal, state, and non-governmental entities for establishing a steering committee.

Task 1.1.2 – Develop operating rules and procedures for the steering committee

Task 1.1.3 – Identify representatives to occupy seats on the steering committee

Objective 1.2 – Engage federal, state, and local agencies and organizations as active partners in the MANMaP.

Task 1.2.1 – Establish specific parameters to help identify agencies and organizations and potential partners for the MANMaP effort.

Task 1.2.2 – Identify additional agencies and organizations to engage in MANMaP.

Task 1.2.3 – Provide basic information on the MANMaP to each of the agencies and organizations on how they can participate.

Objective 1.3 – Inventory the assets and contributions available from each of the MANMaP collaborators related to limiting nutria expansion.

Task 1.3.1 – Ask each collaborator to quantify the resources they are able to allocate to MANMaP efforts.

Task 1.3.2 – Use the information provided to identify the most efficient/effective uses as well as identify resource gaps.

Goal 2. Identify the present range of nutria in Virginia and North Carolina

The MANMaP needs to finalize a contemporary representation of the geographic distribution in Virginia and North Carolina. This distribution should be based on credible evidence and be of sufficient scale to permit informed decision making.

Objective 2.1 – Develop and maintain a contemporary distribution of nutria based on the best available information.

Task 2.1.1 – Solicit reports of nutria presence from land managers within the potential range of nutria in North Carolina (and Virginia).

Task 2.1.2 – Solicit observation information from citizens (i.e., hunters, fisherman, naturalists) on nutria distribution.

Task 2.1.3 – Review available management plans, property records, etc. for references to nutria presence.

Task 2.1.4 – Identify effective techniques for detecting and monitoring nutria presence over wide geographic areas.

Objective 2.2 – Identify those areas where nutria are most likely to expand in the near term.

Task 2.2.1 – Use available information to assess and identify areas with the greatest risk for infestation in the next 5 years.

Task 2.2.2 – Monitor areas where nutria are likely to expand for occupancy and appropriate management response (i.e., early detection- rapid response).

Goal 3. Improve our understanding of the threat nutria pose to wetland systems and personal property

Nutria have been shown to negatively impact coastal wetlands elsewhere in the United States, but the immediate threat to unique systems in Virginia and North Carolina is unknown. Some deductions can be made from other population impacts, but ultimately this information should come from examples within the range of this population.

Objective 3.1 – Describe the habitats used by nutria in Virginia and North Carolina.

Task 3.1.1 – Complete field assessments aimed at describing the characteristics of nutria habitat in Virginia and North Carolina.

Task 3.1.2 – Compare characteristics of nutria habitat in Virginia and North Carolina to those of similar areas in other nutria infested areas.

Objective 3.2 – Determine how nutria are impacting wetland systems in Virginia and North Carolina.

Task 3.2.1 – Employ available techniques for measuring and monitoring nutria populations in areas of known occupancy.

Task 2.3.2 – Monitor known populations for changes in both managed and unmanaged situations.

Task 3.2.3 – Provide examples of real nutria damage to wetlands in Virginia and North Carolina.

Objective 3.3 – Develop metrics for the ecological and economic impacts of nutria on wetland services and goods.

Task 3.3.1 – Use available information (e.g., aerial photography) to understand how rapidly and/or completely nutria impact specific wetland communities.

Task 3.3.2 – Use available information on economic benefits and ecological services/goods provided by impacted wetlands before and after nutria infestation.

Objective 3.4 – Develop estimates of damage caused by nutria to agricultural crops and water control infrastructure.

Task 3.4.1 – Use available information to quantify the damage done by nutria to personal property (e.g., water control structures).

Task 3.4.2 – Identify specific agricultural crops damaged by nutria with accompanying estimates of cost.

Task 3.4.3 – Identify significant agricultural and water control infrastructure at risk from expanding nutria populations.

Goal 4. Educate decision makers and the public about the threat of nutria, and the potential benefits of nutria control

The nutria infestation and the threats it poses to wetland systems, local economy, and private property is poorly recognized. The MANMaP will establish itself as the primary source of nutria information for Virginia and North Carolina to ensure accurate and consistent messaging to various audiences.

Objective 4.1 – Develop consistent, effective messages for target audiences.

Task 4.1.1 – Identify specific audiences for nutria information and effective means of communicating nutria information to them.

Task 4.1.2 – Utilize social media strategically and effectively to provide sound information on nutria and nutria control options.

Task 4.1.3 – Develop a list of well-conceived "talking points" for use by all project collaborators.

Task 4.1.4 – Be proactive about identifying which elements of the MANMaP are the most interesting to audiences and address those concerns/questions directly.

Objective 4.2 – Investigate and understand existing legislation related to nutria control and management.

Task 4.2.1 – Review state and local ordinances related to nutria control, management activities, and other regulatory issues.

Task 4.2.2 – Identify potential conflicts or restrictions within existing regulations and determine options for mitigating impacts to effective nutria management.

Task 4.2.3 – Seek additional clarification or interpretation where necessary to ensure any planned nutria control activities fully comply with state and local regulations.

Objective 4.3 – Educate each target audience regarding the importance of wetland health and the threats associated with invasive species like nutria.

Task 4.3.1 – Develop specific messaging for each audience related to important themes such as wetland functions, invasive species control methods, etc.

Task 4.3.2 – Identify multiple methods or approaches for effective education on nutria management.

Task 4.3.3 – Identify specific ways in which each audience can contribute to effective nutria management in Virginia and North Carolina.

Objective 4.4 – Understand public perception and opinion regarding nutria and nutria control options.

Task 4.4.1 – Take steps to engage representatives of differing opinions or positions on active nutria management.

Task 4.4.2 – Develop effective mechanisms for soliciting input from the public regarding nutria management.

Task 4.4.3 – Conduct regular perception surveys in specific communities as a tool for gauging program successes, or information needs.

Goal 5. Develop options for reducing, or eradicating, nutria within Virginia and North Carolina

Successful nutria management will undoubtedly require several approaches given the range of conditions and landscapes encompassed by the Virginia/North Carolina population. Techniques that are effective in one region may be prohibited or ineffective in others. Obstacles and procedures for operating an efficient, effective, and responsible control program need to be identified.

Objective 5.1 – Identify obstacles to applying existing nutria control practices in Virginia and North Carolina.

Task 5.1.1 – Identify techniques that have been used successfully in other nutria management efforts and evaluate their feasibility for Virginia and North Carolina.

Task 5.1.2 – Outline the steps related to implementing specific techniques to identify potential obstacles such as local regulations, access, and ordinances.

Objective 5.2 – Develop guidelines for implementing control and eradication activities within Virginia and North Carolina.

Task 5.2.1 – Develop specific strategies for implementing nutria control activities at the local/population level throughout the Virginia and North Carolina range.

Task 5.2.2 – Establish best management practices for nutria monitoring, research, and management.

Task 5.2.3 – Develop realistic management goals/strategies for specific locations within Virginia and North Carolina and provide cost estimates for implementation.

Objective 5.3 – Prioritize research needs for implementing effective nutria control and eradication.

Task 5.3.1 – Articulate research needs specific to nutria biology, movement, and management in Virginia and North Carolina.

Task 5.3.2 – Prioritize a research agenda for the MANMaP and identify strategies for securing funding.

Conclusion

The nutria is a significant and present threat to the continued health and productivity of coastal wetlands in the Mid-Atlantic region. Efforts to eradicate the nutria from Maryland have been successful; however the persistence of this species in areas of Virginia and North Carolina continues to threaten wetlands, agriculture, and human communities.

This problem can be addressed through a coordinated, multi-agency effort. Successes realized in Maryland can be adapted, and improved upon, for use in Virginia and North Carolina but it will require a coordinated to extended these successes to the entire region. The Mid-Atlantic Nutria Management Program can, and should, provide the leadership and coordination necessary for this effort.

This document will allow the MANMaP to take the next steps toward articulating what can be done with the resources available, and prioritize actions related to advancing nutria management towards full nutria population control. The MANMaP will accomplish this by:

- engaging key stakeholders to form a strong partnership under a common purpose
- better understanding the extent and magnitude of the population in Virginia and North Carolina
- developing clear, effective communications to the public and decision makers
- using the best available information to develop effective and efficient management responses; and,
- securing the resources necessary to successfully achieve nutria control objectives.

With this Strategic Plan, the steering committee of the MANMaP has a simple, effective framework to begin to implement this ambitious but critical effort.