Report of the Maryland Nutria Project

2008

With updates through the1st quarter of 2009

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Introduction

The purpose of this report is to provide a field update to the Maryland Nutria Project Management Team. The USDA Wildlife Services program is responsible for implementing the operational control phase of the Maryland Nutria Project. Following is an account of the progress made to date including land acreage covered, nutria removed, logistical challenges and changes and advancements to methodologies and techniques.

Study Area

From September 2002 through the end of 2006, the nutria eradication pilot project focused on determining the feasibility of landscape level eradication of nutria across southern Dorchester County in Maryland. Approximately ten thousand nutria were removed from one-hundred thousand acres of marshlands on the Blackwater, Little Blackwater, Transquaking, Chicamicomico, and Honga Rivers and Fishing Bay. Based on the success of operations there, the program was expanded into other Maryland counties focusing on areas with known high density nutria populations. In 2007, project staff depopulated Ellis Bay Wildlife Management Area in Wicomico County, Deal Island WMA and surrounding private lands in Somerset County. In 2008, depopulation was initiated on the Choptank River and has continued into 2009.

Methods

Initial Population Reduction

The eradication program is based on the systematic application of intense harvest pressure using hunting and trapping as the primary removal techniques. With nearly half a million acres of wetland habitats on the Delmarva peninsula the first step towards implementing a systematic trapping program is to break potential nutria habitat into manageable work units. A Geographic Information System (GIS) was used to overlay a grid of 40 acre trapping units on a map Delmarva Peninsula. Two removal strategies are implemented dependent on the geographic distribution of marsh habitats: the progressive sweep and the simultaneous removal.

The progressive sweep was used in areas dominated by large contiguous blocks of marsh habitat as in Blackwater National Wildlife Refuge and Fishing Bay. Wildlife Specialists were assigned a row of trapping units and trapping was initiated in a single column, such that a continuous band of intensive trapping activity stretched across the marsh, bridging non-nutria habitat (uplands or open water) on either side. Wildlife specialists used handheld Global Positioning System (GPS) receivers to ensure that they trapped in assigned units. As each column of trapping units was depopulated, specialists moved forward to the next untrapped unit in a coordinated fashion. Each trapping unit underwent four stages of trapping activity: set-up, tending, blockade, and trap removal. As trapping progressed through the tending phase and into the blockade phase, the specialists initiated set up of the next adjacent trapping unit. As a result, a swath of trapping activity was spread across the marsh, 3 to 4 trapping units in depth, with trapping intensity heaviest on the leading edge.

The simultaneous removal strategy is deployed in riparian areas where smaller marshes distributed linearly along rivers do not facilitate the progressive sweep strategy. In these areas,

sections of river frontage were assigned to specialists and entire areas were trapped in a simultaneous blitz approach. In both techniques, a plot was considered to be depopulated after two weeks passed without a capture. Data was collected to measure trapping effort (number of trap nights) on each unit and to document the location, age, and sex of each nutria captured. Species information on each non-target capture also was collected.

During winter months, when freezing conditions impeded trapping efforts, hunting and shooting was used to facilitate population reduction. Areas that were hunted heavily were also trapped once weather conditions permitted.

Monitoring

Following depopulation, trapping units were periodically monitored for signs of nutria activity. The primary techniques used to detect residual populations were: intensive ground searches documented with GPS tracks, searches with detection dogs, and false beds. Upon each survey, specialists determined the population status based on the kind and amount of sign discovered. Plots are assigned to one of three population status categories:

1. **Resident**: presence of well-used trails, bedding and feeding activity and/or the presence of multiple scat sizes indicating the presence of multiple age groups.
2. **Transient**: Transient nutria were defined by sporadic and unfocused activity which indicated nutria were moving through, but not residing, in an area.
3. **Absent**: No evidence of nutria occupation detected.

As the size of the NEZ expands, the amount of work required to monitor previously trapped areas increases proportionately and competes with concurrent needs to continually trap new areas. Accordingly, staff must prioritize areas in need of monitoring. Areas in high risk of re-infestation due to their proximity to source populations and preferred habitat are monitored more frequently than areas of marginal habitat preference or low density.

Dogs

In January of 2004, two wildlife specialists began using dogs to find and detect nutria. The utility of detection dogs for finding nutria at low densities became quickly apparent and the management team developed a policy to encourage specialists to procure and train dogs. Wildlife specialists enrolled in the program received a monetary incentive ($250) to assist in purchasing a dog and obtaining initial veterinary care, as well as a monthly stipend of $50 to pay for food and preventive vet services. Project funds (up to $500/year/dog) are used to cover emergency veterinary bills incurred by job-related injuries. Currently 6 wildlife specialists employ 8 dogs on the project.

Results

Area Covered/Effectiveness of Reduction

National Wetland Inventory maps were used to determine the total amount of wetlands in each county on the Maryland Eastern Shore. Between 2003 and 2008, project personnel depopulated nutria from nearly 150,000 acres of wetland habitat out of 365,645 acres available on Maryland's Eastern Shore (Table 1).

Table 1. Acreage of wetlands available as nutria habitat and acreage depopulated of nutria by County and fiscal year (10/1-9/30) on Maryland portion of Delmarva Peninsula.

COUNTY	Available Wetlands	2003 Zone A	2004 Zone B	2005 Zone C	2006 Zone D	2007 Zone E	2008 Zone F	Total Trapped
Dorchester	134,985	29,005	29,152	16,325	25,337	5,554	625	105,998
Somerset	105,548					16,885	7,168	24,053
Wicomico	32,795					13,523		13,523
Talbot	12,657						3,662	3,662
Caroline	6,695						1,906	1,906
Queen Anne	9,794							0
Kent	6,012							0
Cecil	7,119							0
Worchester	50,039							0
Total	365,645	29,005	29,152	16,325	25,337	35,962	13,361	149,142

The total Depopulation Area (DA) was broken into Zones defined by the new acreage initially depopulated in each fiscal year. The declining number of nutria removed from each DA Zone in successive years indicates the magnitude of the population reduction. Zone A was trapped between September 9, 2002 and September 20, 2003 and yielded nearly 5,000 nutria. Extensive ground searches and follow-up trapping in Zone A yielded only 370 nutria in 2004, 127 in 2005, and 19 in 2008. Determination of trapping cessation is based on the disappearance of fresh sign and lack of captures. Assuming that trapping removed a similar percentage of the existing population each year, the population in 2008 had been reduced by 99.7 percent from its 2003 level. Each zone added to the DA in subsequent years showed a similar population decline in subsequent years. A significant spike in nutria captures occurred in Zone C in 2007 when a landowner who had refused access to his property when the surrounding areas were initially trapped finally gave his consent to access the property (Table 2). More than 100 nutria were removed from his property in February 2008. Unfortunately, a single trapping session is rarely enough to ensure complete removal of all individuals and the landowner has not allowed staff back onto his property to conduct monitoring and removal of residual animals. This property is likely the source of dispersing animals that routinely appear on adjacent private and state lands. In fact, many of the nutria that have been captured in Zones A and B during monitoring efforts are within 7 miles of this property, the documented dispersal distances shown by nutria tagged and recovered during the pilot project.

Table 2. Total number of nutria removed from Depopulation Zones by Fiscal Year (10/1-9/30).

DA Zone (Yr Trapped)	2002*	2003	2004	2005	2006	2007	2008	2009	Grand Total
A (2003)	342	4453	370	127	70	16	19	4	5401
B (2004)		19	3052	290	63	20	41	1	3486
C (2005)				677	108	17	127	22	951
D (2006)		10	3	14	291	32	22		372
E (2007)			4	1	5	802	79	7	898
F (2008)						50	1133	362	1545
Grand Total	342	4482	3429	1109	537	937	1421	396	12653

*September 9-30, 2002.

Trapping Methods

The top five methods accounting for the most nutria during the initial depopulation phase were body-gripping traps, shooting, footholds set on submersion cables, dogs and staked footholds accounting for 68%, 12%, 8%, 4%, and 4% of the total catch of nutria respectively (Table 3). Submersion foothold techniques were incorporated into trapping methodologies in 2004 and replaced the staked foothold trap in most cases.

Table 3. Number and percent of nutria taken by method during the initial trapping phase September 2002 through December 2008.

Method	2002	2003	2004	2005	2006	2007	2008	2009	Total
Body-gripping (Conibear)	214	3294	1612	320	132	776	1041	81	7470
Shooting	17	486	735	39	7	15	14	0	1313
Submersion Foothold	0	46	448	111	114	52	143	13	927
Dog	0	0	245	154	43	12	14	5	473
Staked Foothold	96	322	36	0	0	0	5	1	460
Snare	0	57	5	4	1	15	23	0	105
Floating Conibear	10	34	34	5	1	2	9	2	97
Hand caught	5	42	15	2	1	0	1	0	66
Platform Trap (Foothold)	0	20	6	2	8	1	17	7	61
Platform (Conibear)	0	0	0	0	0	4	11	0	15
Cage	0	5	0	3	0	0	0	0	8
spotlight/shoot	0	5	1	0	0	0	0	0	6
Total	342	4311	3137	640	307	877	1278	109	11001

While the same suite of tools was used by wildlife specialists during monitoring activities, the proportion of nutria taken with the various methods differed from the initial depopulation effort (Table 4). While body-gripping traps still accounted for the most animals, submersion footholds

and dogs contributed to a much larger percentage of take. One possible explanation for the increased importance of submersion footholds is that nutria at low population densities move greater distances along waterways in search of other nutria and therefore are more vulnerable to footholds set at false beds created along waterways.

Table 4. Number and percent of nutria taken by method during the monitor trapping phase January 2003 through February 2009.

Method	2003	2004	2005	2006	2007	2008	2009	Total
Body-gripping (Conibear)	51	84	83	87	45	111	174	635
Submersion Foothold	21	77	166	91	27	16	22	420
Dog	0	58	141	30	10	7	70	316
Shooting	38	27	12	5	3	5	10	100
Foothold	40	22	2	12	0	0	2	78
Platform Trap (Foothold)	8	0	4	4	0	0	0	16
Hand caught	3	0	0	0	0	8	2	13
Floating Conibear	2	1	0	2	0	0	1	6
Snare	1	0	1	0	0	0	0	2
Platform (Conibear)	0	0	0	0	0	2	0	2
Cage	1	0	0	0	0	0	0	1
Total	165	269	409	231	85	149	281	1589

Monitoring Results

Monitoring previously trapped populations remains one of the programs biggest challenges. With 150,000 acres of habitat spread across five counties, returning to these areas on a regular basis requires an exhaustive effort that prohibits expansion into new areas. Expansion into new areas is necessary to reduce the risk of reinvasion of the nutria-free zone. Thus, these priorities compete for limited staff resources and time. Additionally, many private landowners restrict our access during the hunting season from September to the end of January.

Despite these challenges, staff was successful in preventing re-development of significant populations. Residual populations, those that remained or developed after initial population reduction, were typically comprised of small groups ranging in size from 2 to 6 animals, but as many as 41 were discovered in one population. In the latter case, 41 nutria were captured from an area where previous surveys had failed to detect the presence of nutria on repeated occasions for the previous three years. Analysis of the sex and age distribution of the captured nutria led us to conclude that this abnormal concentration of nutria was formed by a small group of 3-6 females that established a breeding colony in the year that had elapsed since the previous monitoring of this area of private land off Shorter's Wharf Road. Fortunately, this small outbreak was contained before it spread into adjacent areas.

Private Lands

Cooperative agreements were signed with more than 406 landowners. Well over half of the nutria taken since September 2002 were removed from private property which illustrated the importance of private landowner cooperation. Private landowners were comprised of timber companies, farmers, sporting clubs, and investors. Most landowners expressed concern about trapping activities interfering with other land uses, primarily hunting, which generates significant income to landowners. These concerns were incorporated into the cooperative agreements by restricting the time of year that trapping and monitoring activities were conducted on the property. Unfortunately, November through April are the most effective times to monitor due to the prevalence of low tides and vegetation die-off. As private lands continue to make up an increasingly greater percentage of the depopulation area, securing year round permission to access private lands will become more important to maintain efficiency. Landowner support of the project has been very high, and most who are approached are quick to sign agreements and grateful that the issues is being addressed. Nevertheless a small number of landowners have refused access to their property and in some cases our only explanation for the occasional reappearance of nutria in previously trapped areas is their proximity to these inaccessible properties. The threat of nutria dispersing from these properties requires intensive effort to prevent re-infestation of adjacent, depopulated areas. As the project expands in geographic scope, securing access to all private lands where nutria reside will be one of the most important challenges to overcome.

Methods Development

Management Driven Research

Wildlife Services has worked in close cooperation with the U.S. Geological Survey and the U.S. Fish and Wildlife Service to conduct management driven research, primarily to develop and enhance methods for detecting nutria at low densities, measure marsh response to eradication, and better understand movement and behavior. The following research areas have been explored:

- Development and testing of passive audio recording device to record nutria vocalizations. Manned call surveys were conducted in areas known to contain nutria to establish spatial, temporal and seasonal patterns of calling frequency. Passive recorders were deployed and resulting soundtracks were examined for nutria calls. Results were inconclusive due to the variation in calling frequency between populations. While some populations were vocal, others were not. Further research is needed to develop this method into a reliable survey tool. Integration of a broadcasted call followed by a recording period may encourage less vocal individuals to respond.
- A micro-GPS collar was designed for short term deployment on free ranging nutria. Design prototypes were tested for fit and wear ability on captive nutria and a beaded collar design was chosen that minimized abrasions and foot entanglement, two problems commonly encountered by other researchers utilizing collar designs for telemetry collars. Due to size constraints and battery life issues, the GPS component only procured positional data for approximately three weeks before the battery expired. Collars were deployed in areas scheduled for depopulation approximately two weeks prior to initiation of trapping so that baseline movement data could be compared to nutria response to trapping pressure. Collars were deployed on 24 nutria at four locations on the Choptank

River between May and November 2008. Data collected from these animals is still being analyzed, but important observations regarding home range overlap, distance traveled and habitat use were made. Recovery rates of tagged animals also indicated high trapping efficiency although a few individuals did avoid capture for extended periods. Results will be presented jointly with Patuxent Wildlife Research Center staff.

- A proposal to develop "Judas" nutria as a management technique to find and remove nutria from previously trapped areas was funded in fiscal year 2009 by the National Fish and Wildlife Foundation for $75,000. The Judas technique has been used successfully on pigs, goats and several other invasive species and involves placing radio tagged and sterilized animals into areas of unknown population status. Gregarious in nature, marked animals are more efficient at finding others of their own species and will lead project staff to the location of unmarked associated animals which can then be removed. Nutria are highly social animals and are often found in groups, which suggests that the Judas technique may have some merit. We hope to conduct initial testing in the summer of 2009.

Summary and Future Direction

To date, more than 12,000 nutria have been removed from nearly 150,000 acres in Dorchester, Talbot, Wicomico, Caroline and Somerset counties on the Maryland portion of Delmarva Peninsula. Concentrations of nutria were highest on the Blackwater River, Fishing Bay, and the Transquaking and Chicamicomico Rivers in Dorchester County. Additionally, substantial populations exceeding one thousand individuals were removed from the Choptank River in Dorchester, Talbot, and Caroline Counties and on Deal Island in Somerset County. Smaller satellite populations have been discovered in other areas, but based on limited reconnaissance, discussion with natural resource managers, and reported sightings, it is unlikely that major populations remain on the Delmarva Peninsula. The program will now concentrate on finding and removing remaining satellite populations. Known populations exist in Fairmount Wildlife Management Area in Somerset County and are likely to occur in the Nanticoke River and Wicomico River watersheds. Unconfirmed reports have been received from Kent Island and portions of Worchester County.

These areas will be searched on a watershed basis in order of proximity to the original source populations in Dorchester County. Feedback from natural resource managers in Delaware and Virginia will be utilized to refine searching strategies and priorities for those states. The program's goal is to have conducted initial depopulation across the entire Delmarva Peninsula by the end of 2013. Monitoring for residual populations will be necessary for several years thereafter.