NUTRIA HARVEST DISTRIBUTION 2002-2003

And

A SURVEY OF NUTRIA HERBIVORY DAMAGE IN COASTAL LOUISIANA IN 2003

Conducted by

Fur and Refuge Division
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as part of the

Coastwide Nutria Control Program*
CWPPRA Project (LA-03b)

submitted by

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Section 1

NUTRIA HARVEST DISTRIBUTION 2002-2003

Introduction

The nutria (Myocastor coypus) is a large semi-aquatic rodent indigenous to South America. The first introduction of nutria to North America occurred in California in 1899, however it was not until the 1930's that additional animals were introduced in seven states. These importations, primarily for fur farming, failed during the Second World War as a result of poor pelt prices and poor reproductive success. As a result of these fur farm failures, nutria were released into the wild. Sixteen states now have feral populations of nutria.

The Gulf Coast nutria population originated in Louisiana in the 1930's from escapes and possible releases from nutria farms. Populations first became established in the western coastal portion of the state, then later spread to the east through natural expansion as well as stocking. During the mid-1950s muskrat populations were declining, nutria had little fur value, and serious damage was occurring in rice fields in southwestern Louisiana and sugarcane fields in southeastern Louisiana. The agriculture damage became a serious problem with rice and sugarcane farmers complaining about damage to crops and levee systems, and muskrat trappers blamed the nutria for declining numbers of muskrats. In 1958, the Louisiana Legislature placed the nutria on the list of unprotected wildlife and created a $0.25 bounty on every nutria killed in 16 south Louisiana parishes, but funds were never appropriated.

Research efforts were initiated by the federal government in the southeastern sugarcane region of the state to determine what control techniques might be successful. This research conducted by the U.S. Fish and Wildlife Service during the 1960's examined movements in relation to sugarcane damage and recommended shooting, trapping, and poisoning in agricultural areas. Ted O'Neil, Chief of the Fur and Refuge Division, LDWF, believed that the problem could only be solved through the development of a market for nutria pelts. A market for nutria developed slowly during the early 1960's and by 1962 over 1 million pelts were being utilized annually in the German fur trade. The nutria surpassed the muskrat in 1962 in total numbers harvested and became the backbone of the Louisiana fur industry for over 20 years. In 1965, the state legislature returned the nutria to the protected list. As fur prices showed a slow rise during most of the 1970's and early 1980's, the harvest averaged 1.5 million pelts and complaints from agricultural interest became uncommon. From 1971 through 1981 the average value of the nutria harvest to the coastal trappers was $8.1 million. The nutria harvest in Louisiana from 1962 until 1982 remained over 1 million annually. In 1976 the harvest peaked at 1.8 million pelts worth $15.7 million to coastal trappers.

However, the market began changing during the early 1980's. In 1981-82, the nutria harvest dropped slightly below 1 million. This declining harvest continued for two more

seasons, then in the 1984-85 season, the harvest jumped back up to 1.2 million. During the 1980-81 season, the average price paid for nutria was $8.19. During the 1981-82 season, the price dropped to $4.36, then in 1982-83, the price dropped to $2.64. Between the 1983-84 season and the 1986-87 season, prices fluctuated from slightly over $3.00 to slightly under $4.00. Then in 1987-88 and again in 1988-89 prices continued to fall (Figure 1). From 1982 through 1992 the average value of the nutria harvest was only $2.2 million. Between 1988-89 and 1995-96 the number of nutria harvested annually remained below 300,000 and prices remained at or below a $3.00 average. Due to a strong demand for nutria pelts in Russia in both 1996-97 and in 1997-98, 359,232 nutria were harvested at an average price of $5.17. In September 1998 the collapse of the Russian economy and general instability in the Far East economies weakened the demand for most wild furs including nutria. The demand for nutria pelts in Russia declined quickly due to the devaluation of the Russian rubble. During the 1998-99 trapping season, pelt values fell to $2.69 and harvest decreased to only 114,646, less than one third of the previous year. During the 1999-2000 trapping season there was virtually no demand for nutria pelts. The harvest decreased to 20,110 nutria. This was, by far, the lowest nutria harvest on record since the mid 1950s. The number of pelts harvested in 2000-2001 trapping season increased to 29,544 nutria. The value of nutria pelts decreased to $1.75 during the 2001-2002 season that prompted another decrease in harvest to 24,683 nutria.

During the strong market period for nutria pelts, no wetland damage caused by nutria was reported. Before the market developed and after the market declined, nutria caused damage to agriculture and wetlands that they inhabited. Reports of marsh vegetation damage from land managers became common again in 1988. Such complaints became more routine during the early 1990's, so the Fur and Refuge Division of the Louisiana Department of Wildlife and Fisheries initiated limited aerial survey flights, particularly in southeastern Louisiana. Survey flights conducted during the 90's, with initial support from Barataria-Terrebonne National Estuary Program (BTNEP) and later support from Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), showed acreages of damage increasing from 60,000 to 100,000 acres. For this reason, the Coastwide Nutria Control Program (CNCP) began in January of 2002.

The project was funded by the CWPPRA through the Natural Resources Conservation Service (NRCS) and the Louisiana Department of Natural Resources (LDNR) with the Louisiana Department of Wildlife and Fisheries (LDWF) as the lead implementing agency. Task number 2 of the DNR and LDWF Interagency Agreement No. 2511-02-29 for the CNCP requires LDWF to conduct general project operation and administration. LDWF is required to 1) conduct and review the registration of participants in the Nutria Control Program, 2) establish collection stations across coastal Louisiana, 3) to count valid nutria tails and present participant with a receipt/voucher, 4) to deliver tails to an approved disposal facility and receive documentation that ensures the nutria shall be properly disposed of and shall not leave the facility and 5) process and maintain records regarding participants, number and location of origin of tails collected. Task 3 requires LDWF to provide incentive payments to program participants and task 4 requires LDWF to provide a report regarding the distribution of the harvest by township.

The program area is coastal Louisiana bounded to the north by I-10 east from the Texas state line to Baton Rouge, I-12 east from Baton Rouge to Slidell, and I-10 east from Slidell to the Mississippi state line. The project goal is to significantly reduce damage to coastal wetlands resulting from nutria herbivory by removing 400,000 nutria annually. This project goal is consistent with the Coast 2050 common strategy of controlling herbivory damage to wetlands. The method chosen for the program is an incentive payment to registered trappers/hunters of $4.00 for each nutria tail delivered to established collection centers. **This section reports on the Nutria Harvest Distribution for 2002-2003.**

Methods

To inform the landowners and the public about the program, public meetings were held in Cameron, Abbeville, Patterson, Houma, Chalmette and Harvey. During the meetings, details about the program, such as the registration requirements, tail collection process, collection locations and payments to participants were discussed. Contact information was also released to any interested party.

An application for the Coastwide Nutria Control Program (CNCP) was developed in July 2002. The application was made available through the LDWF offices and website as well as LSU Extension offices. In order for a participant to be qualified, the individual must have completed the application, obtained written permission from a landowner or land manager that had property in the program area, completed a W-9 tax form and provided LDWF with a legal description of the property to be hunted or trapped. Once an applicant was accepted, the participant was mailed information on the program's regulations, collection sites for nutria tails, contact information and a CNCP registration card.

Coastal Environments Inc. (CEI) was selected as the contractor to maintain the program database, collect the nutria tails and provide payments for tails to participants. Collection sites were established at Rockefeller Refuge, Abbeville, Morgan City, Houma, Luling and Chalmette. Collections were made once a week at each site, except for Rockefeller Refuge and Abbeville where collections were made on alternating weeks.

Louisiana's open trapping season began on November 20, 2002 and nutria tail collections began a week later. Collections were made in a 16x8 foot trailer with a freezer, sorting table and desk inside. A participant reported to a collection site, presented his nutria control program registration card and presented his tails to a CEI representative. One CEI representative counted the tails turned in and verified with the participant that the count was correct. Another CEI representative filled out a voucher for the number of tails the participant turned in and checked to make sure the mailing address of the participant was correct. The CEI representative asked the participant questions concerning the nutria harvest including: 1) the method of taking the nutria and 2) the method in which the nutria carcass was used or abandoned. After the voucher was

completed, the participant would sign and then indicate on a 1:100,000 topographic map where the nutria were harvested. The CEI representative checked to make sure that the participant had permission to take nutria off of the indicated township and range then write the number of nutria taken and the participant's CNCP number on the map. Using the hard copy voucher, the CEI representative entered all pertinent information into a laptop computer.

When storage for the tails in the trailer was full, a CEI representative transported the nutria tails to the BFI waste storage facility in Sorrento, Louisiana. The tails were weighed and mixed with other waste by the BFI representative. The BFI representative gave the CEI representative a receipt for the disposal of the tails. Copies of the receipts for all disposals made were supplied to LDWF.

At the end of the collection week, the maps and the voucher data was transfered to CEI's office in Baton Rouge. The hunted areas that were outlined on the topographic maps were digitized into ArcView GIS 3.2a and the information in the database on the laptop was transferred to the main database at CEI. CEI sent a weekly report to LDWF detailing each transaction and included a map of that week's digitized hunted areas. After LDWF received a weekly report from CEI, LDWF sent a payment to CEI for the amount of tails collected and services rendered. CEI in turn sent participants checks through the mail for the amount of tails turned in. Louisiana's open trapping season ended on March 31, 2002 and nutria tail collections continued for a week into April. After the conclusion of the program, CEI provided all of the transaction information for the entire program from November to March. This final report includes all information recorded on the vouchers, the digitized hunted area, the nutria control program database and an ArcView 3.2 project with related information.

Results and Discussion

A total of 308,160 nutria tails, worth over 1.2 million dollars in incentive payments, were collected from 342 participants. One-hundred sixteen participants (34%) turned in less that 200 tails, 86 participants (25%) turned in between 200 and 499 tails, 35 participants (10%) turned in between 500 and 799 tails and 105 participants (31%) turned in over 800 tails. There were 22 parishes represented in the program with harvests ranging from 39 to 92,831 nutria. Approximately 90% of the harvest came from the southeast portion of Louisiana and the main method of harvest was by shooting with a rifle. Overall, the percentage for each method of taking nutria was 34% trapping, 63% shooting with a rifle and 3% taken with a shotgun. February was the most active month for tail collections (91,917 tails) while December (22,652 tails) was the least active month (Fig. 2).

Harvest by Marsh Type

Harvest data was compiled by fresh marsh, intermediate marsh, brackish marsh, salt marsh and other. The category of "other" included swamp, mixed forest and agriculture land types. Fresh marsh produced over half of all of the nutria that were harvested during

the program followed by intermediate marsh (Fig. 3). This was not a surprising statistic since the majority of the nutria damage in 2002 occurred in fresh (55%) and intermediate (35%) marsh.

The method of take was recorded for each participant transaction. The participants had a choice of trapped, shot with a rifle or shot with a shotgun. Shooting with a rifle was the most popular method of taking nutria in the fresh, intermediate and brackish marsh types (Fig. 4). In fresh marsh 56% of the nutria were shot with a rifle and 40% were trapped. In intermediate marsh, 64% of the nutria were shot with a rifle and 35% were trapped. In brackish marsh, 74% of the nutria were taken with a rifle and 23% were trapped.

The use or abandonment of the nutria carcasses was also recorded for each participant transaction. The choices for when an animal was used were use of the meat, use of fur, use of meat and fur. When the carcass of the animal was abandoned, the abandonment method was recorded and the choices were buried carcasses, placed in heavy overhead vegetation or placed in water. Most of the nutria were abandoned either by burying them or placing them in heavy overhead vegetation. In fresh marsh 27,003 (17%) of the nutria were used for meat, fur or both while 64,641 (40%) were buried, 61839 (40%) were left in overhead vegetation, and 2,643 (3%) were left in the water (Table 1). In intermediate marsh there was an improvement of carcass use. Fifty-seven percent of the nutria were used for meat, fur or both, and only 21% and 22% of the carcasses were abandoned in vegetation and buried respectively. In brackish marsh, 41% of the nutria were used for meat and/or fur while 29% were buried and 29% were left in overhead vegetation.

All of the participants were supplied with a fur buyer/fur dealer list to encourage the use of animals for the fur and meat. The reason for the high percentage of abandonment of animals in fresh marsh (80%) could be a factor of fur quality and economics. Fur quality in the fresh marsh could have been affected by "fourchette" damage which is caused by the seeds of Bidens laevis. The seed is covered with small hook-like protrusions which help the plant with seed dispersal. Whenever a seed becomes entangled in the nutria's pelt and comes in contact with the skin, a small pustule is formed rendering the pelt useless. Participants with permission to take nutria in this habitat could have harvested the highest number of animals, but not attempted to sell the fur because of pelt quality. The high amount of nutria vegetative damage found in the fresh marsh (50%) appears to confirm the higher density estimates in this habitat found in other studies. Since the intermediate marsh has a lower density of animals, participants in this area could have turned in the carcasses to get the money for the meat and fur thereby increasing the value of each nutria. Since the participants in the fresh marsh area had to deal with "fourchette", they may have decided to harvest more nutria and abandon the carcass.

Harvest by Parish

The greatest number of nutria were harvested in Terrebonne Parish (30%) followed by Plaquemines (20.5%), Lafourche (9.4%) and Jefferson (6.7%) (Table 2). In the 2002 Nutria Vegetative Damage Survey (Mouton et al.), 83% of the damaged acres found

along the coast were in these four parishes. Since these four parishes made up the majority of the harvest, they will be the ones discussed in this section.

Of these four parishes, Terrebonne showed the greatest percentage of animals taken by trapping with 46,761 (50%) trapped and 45,317 (49%) taken with a rifle (Table 3). Plaquemines Parish showed the greatest percentage of animals taken by shooting with a rifle (84%) and 16% trapped. The percentage of animals taken by trapping and shooting with a rifle in Jefferson Parish was 29% and 69%, respectively. The method of take in Lafourche Parish was 41% trapped and 58% taken with a rifle.

The use or abandonment of the carcass varied by marsh type and not necessarily by parish. The majority of the harvest in Terrebonne Parish came from fresh marsh so the majority of the carcasses were abandoned. In Plaquemines Parish the majority of the nutria harvest took place in the intermediate marsh and 47% of the carcasses were used for meat and/or fur (Table 4). As stated in the marsh type section, fur quality and economics played a role in the use or abandonment of the carcass.

Harvest by Township

The intent of tracking nutria harvest by township was to determine if the harvest areas coincided with the pre-CNCP damage sites as identified by the 2002 Nutria Damage Survey. Appendix A contains a series of maps that illustrate townships, harvest areas, and damage sites. Of the 94 damage sites for 2002, 81 sites (19,323 acres) were located within 34 townships that received some level of trapping/hunting. Within those 34 townships, 148,693 nutria (48% of total) were harvested. Of the 94 damage sites for 2002, 13 sites (1,862 acres) were located within 10 townships where no trapping/hunting occurred. Because a standard township contains 23,040 acres, and damage sites and trapping/hunting leases are much smaller, it was determined that tracking nutria harvest by township is not an effective method to determine if nutria are being harvested from damage sites. Refer to Section 3 of this document for a discussion of efforts to increase trapping in the vicinity of damage sites and to improve harvest tracking methodology.

Section 2

A SURVEY OF NUTRIA HERBIVORY DAMAGE IN COASTAL LOUISIANA IN 2003

Introduction

The first region-wide aerial survey became possible because of the interest and concern of many state and federal agencies, coastal land companies and, in particular, funding provided by the Barataria-Terrebonne National Estuary Program (BTNEP). The objectives of the aerial survey was to: (1) determine the distribution of damage along the transect lines as an index of damage region wide, (2) determine the severity of damage as classified according to a vegetative damage rating, (3) determine the abundance of nutria by the nutria relative abundance rating (4) determine the species of vegetation being impacted and (5) determine the status of recovery of selected damaged areas (Linscombe and Kinler 1997).

Helicopter surveys were flown in May and December 1993 and again in March and April 1996 across the Barataria and Terrebonne Basins. During the December 1993 survey, 90 damaged sites were observed amounting to over 15,000 acres of marsh impacted along the transects and an estimated 60,000 acres across the study area. In 1996, a total of 157 sites were observed. The damage observed along the transect lines increased to 20,642 acres and an estimated 80,000 plus acres across the study area. Of all the 1993 sites evaluated again in 1996, only 9% showed any recovery. Clearly, the trend identified was a continued increase in both the number of sites and the extent of nutria damage in the Barataria and Terrebonne Basins.

In 1998, the first coast wide nutria herbivory survey was flown, as part of the Nutria Harvest and Wetland Demonstration Program. A total of 23,960 acres of damaged wetlands were located at 170 sites along the survey transects. In 1999, the damaged increased to 27,356 acres located at 150 sites. In 2000, the damage slightly decreased to 25,939 located at 132 sites. In 2001, the damage decreased to 22,139 acres located at 124 sites. In the 2002 survey, the damage decreased again, but only slightly to 21,185 acres located at 94 sites. When extrapolated to a coastwide estimate, the acres impacted over these years ranges from 102,585 to 79,444 acres (damaged acres x 3.75). The 3.75 multiplication factor comes from the area actually surveyed along transect lines (0.5 miles) and the distance between transect lines (1.87 miles).

Vegetative damage caused by nutria has been documented in at least 11 Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) project sites in the Barataria and Terrebonne Basins. Nutria herbivory is only one of many factors causing wetlands loss, but the additional stress placed on the plants by nutria herbivory may be very significant

in CWPPRA projects sites and across throughout coastal Louisiana. The previous estimate of 80,000 acres of marsh damaged was conservative because only the worse (most obvious) can be detected from aerial surveys. The number of acres being impacted was certainly higher. When vegetation is removed from the surface of the marsh, as a result of over grazing by nutria, the very fragile organic soils are exposed to erosion through tidal action. If damaged areas do not revegetate quickly, they may become open water as tidal scour removes soil and thus lowers elevation. Frequently the plant's root systems are also damaged, making recovery through vegetative regeneration very slow.

In an effort to increase the incentive to trappers and hunters, the Coastwide Nutria Control Program (CNCP) was implemented. Task number 1 of the DNR and LDWF Interagency Agreement No. 2511-02-29 for the CNCP requires LDWF to conduct annual coastwide aerial surveys during spring/summer to document the current year impact of nutria herbivory. Survey techniques will follow Linscombe and Kinler (1997), and was conducted in the spring of 2002-2003. Results are analyzed annually and the number of acres impacted or recovered are determined. **This section reports on the 2003 Coastwide Nutria Herbivory Survey.**

Methods

A coast wide nutria herbivory survey was conducted May 7-9, 14, 17-24 and June 2-3, 2003. North-South transects were flown throughout the fresh, intermediate and brackish marshes of coastal Louisiana. Portions of Cameron, Vermilion, St. Mary, Terrebonne, Lafourche, Jefferson, Plaquemines, St. John, St. Charles, St. Bernard, Orleans, St. Tammany and Tangipahoa Parishes were included in the survey. A total of 155 transects were surveyed for damage; the transects were spaced approximately 1.8 miles apart, starting at the swamp-marsh interface and continuing south to the beginning of the salt marsh. These transects have been used for vegetative, waterfowl, and alligator surveys. Due to low nutria population density, salt marsh habitat was not included in the survey. Depending upon visibility and vegetative conditions, an altitude of 300-400 feet was considered optimum. At this altitude, vegetative damage was identifiable and allowed for a survey transect width of about1/4 mile on each side of the helicopter. Flight speed was approximately 60 mph.

Two observers were used to conduct the survey, each positioned on opposite sides of the helicopter. In addition to locating vegetative damage, one observer navigated along the transect and the other observer recorded all pertinent data.

When vegetative damage was identified, the following information was recorded (Figure 5).

1) Location of each site was determined by recording latitude and longitude utilizing GPS equipment. A differential GPS (Trimble Ag 124) was utilized to allow for accurate location of damaged sites. The software used was GPS View, operating in ArcView 3.2.

The size of each damage site was recorded by logging polygons using stream digitizing with the GPS equipment.

2) The abundance of nutria was classified in one of the following nutria relative abundance rating categories: **no nutria sign visible (0)**, **nutria sign visible (1)**, **abundant feeding (2)**, **heavy feeding (3)**.

3) The extent of damage to the vegetation was classified in one of the following vegetative damage rating categories: **no vegetative damage (0)**, **minor vegetative damage (1)**, **moderate vegetative damage (2)**, **severe vegetative damage (3)** or **converted to open water (4)**.

4) The dominant plant species were identified and recorded for the damaged areas recovering areas and in the adjacent areas.

5) The age of damage and condition was classified in one of the following categories: recovered, old recovering, old not recovering, recent recovering, recent not recovering or current (occurring now).

6) The prediction of vegetative recovery by the end of 2003 was characterized by one of the following categories: no recovery, full recovery, partial recovery or increased damage.

7) The number of nutria observed at each site was recorded.

In addition to searching for new damaged sites, all previously identified damaged sites were revisited to assess extent and duration of damage or to characterize recovery. All data were entered into a computer for compilation and transferred to the National Wetlands Research Center (NWRC), National Biological Survey in Lafayette, Louisiana. Damaged site locations are provided on the attached herbivory map and a data summary is provided in Appendix B.

Results and Discussion

In summer 2003, a coast wide aerial survey was conducted covering the coastal parishes of Louisiana. A total of 100 sites were visited, of which 10 were new sites in 2003 and 90 were previously classified as damaged in the 2002 survey. The 90 sites previously identified as having nutria damage, 74 were identified as still having visible nutria herbivory impacts and 16 sites were classified as recovered (Table 5). The following discussion will detail the 84 sites that currently have nutria damage.

A total of 21,888 (extrapolated to 82,080 coast wide) acres were impacted by nutria feeding activity along the transects (Table 6) as compared to 21,185 acres in 2002. Of the 84 sites showing impact, Terrebonne Parish contained 34 sites (40 %) and 12,521 damaged acres (57 %). Lafourche Parish had a decrease in acreage this year and

accounted for 7 sites (8 %) and 610 acres (3%) of damaged marsh. Ten sites (12 %) and 1,805 acres (8%) were located in Jefferson Parish, down from previous years. Plaquemines Parish had the most dramatic increase in acres impacted of all the parishes. Plaquemines accounted for 13 sites (15 %) and 2,540 acres (12 %). St. Bernard Parish had only 5 sites (6%) with 918 acres (4%) impacted. Smaller amounts of damaged wetlands were located in St. Charles, St. Tammany and Orleans parishes. As in 2002 Terrebonne, Jefferson, and Plaquemines, continue to be the parishes most affected by nutria herbivory.

Marsh vegetative type (based on the Linscombe and Chabreck 2001 survey) was recorded at each damage site (Table 7). Fresh marsh continued to be the most affected by nutria herbivory with 36 sites (43 %) covering 10,871 acres (50%). Intermediate marsh contained 31 sites (37 %) but accounted for 8,086 of the damaged acres (37 %). Brackish marsh was still the least affected and accounted for 17 sites (20 %) and 2,931 damaged acres (13 %). The typical vegetation impacted in fresh marsh was Eleocharis spp. and Hydrocotyle spp., while Scirpus olneyi and Eleocharis spp. were commonly impacted species in intermediate and brackish marshes.

The NRAR is used to classify the abundance of nutria at a site (Table 8). The categories were: (0) no nutria sign visible, (1) nutria sign visible, (2) abundant feeding sign, and (3) heavy feeding sign. During the 2003 survey, 25 sites (30 %) covering 6,045 acres (28 %) showed no nutria sign visible. Twenty-six sites (31 %) covering 3,562 acres (16 %) showed nutria sign visible. Nineteen sites (23 %) covering 6,682 acres (30 %) had abundant feeding signs and fourteen sites (17 %) covering 5,599 acres (26 %) had heavy feeding signs.

The vegetative damage rating was developed in order to classify damage to vegetation by nutria (Table 9). The vegetative damage rating (VDR) has five categories. They are as follows: (0) no vegetative damage, (1) minor vegetative damage, (2) moderate vegetative damage, (3) severe vegetative damage, (4) converted to open water. During the 2003 survey, there were no sites categorized as having no vegetative damage. Twenty-six sites (31 %) covering 8,732 acres (40 %) were classified as having minor vegetative damage. The majority of the sites, 41 sites (49 %) covering 9,221 acres (42 %), had moderate vegetative damage. The acreage that was classified as having moderate damage was down from 2002 figure by 20 %. The classification of severe vegetative damage had 14 sites (17 %) over 3,862 acres (18 %). The worst category, converted to open water, was the most encouraging as it had only 3 sites (4 %) and covered only 73 acres.

The age of damage and condition rating was used to characterize each of the damage sites (Table 10). The six classifications included (1) current damage, (2) recent damage-recovering, (3) recent damage not recovering, (4) old damage-recovering, (5) old damage-not recovering, and (0) recovered. During the 2003 survey, 13 sites comprising 2,058 acres were classified as having current, ongoing nutria herbivory impacts, which was double the 2002 figure. A total of 51 sites containing 14,382 acres were classified as old damage sites that were recovering. Twenty sites were classified as old damage and not recovering containing 5,448 acres. These areas will probably not recover and are

being converted from vegetated wetlands to open water ponds. A total of 16 sites, comprising 1,674 acres, out of the 100 sites visited were classified as recovered.

For each site with current damage, the degree of recovery by the end of the 2002 growing season was predicted (Table 11). These ratings were (1) full recovery, (2) partial recovery, (3) increased damage and (4) no recovery predicated. The majority of the sites were projected to recover partially by the end of the 2003 growing season (64 sites and 14,497 acres). For six sites, containing 1,507 acres, including three converted to open water sites, no short term recovery was predicted. Eight sites were predicted to fully recover by next year, while six damaged sites were predicted to worsen.

During the survey, several marsh areas that were damaged by muskrat were observed. Some information was collected for the muskrat damage sites. In addition to the 84 nutria damage sites, a total of 16 muskrat damage sites were observed totaling 9,985 acres. A vegetative damage rating was collected for these sites: 1 site had minor vegetative damage covering 61 acres; five sites covering 684 acres had moderate vegetative damage and 10 sites covering 9,230 acres showed severe vegetative damage.

Conclusion

During the 2003 survey, a total of 21,888 acres of coastal marshes were identified along survey transects as being negatively impacted by nutria activity. When extrapolated, the impacted acres of marsh by nutria total a conservative 82,080. When compared to 2002 (21,185 acres), there was a 3.3 % increase in the number of damaged acres in 2003. Due to the distance between survey lines, all areas impacted by nutria herbivory could not be identified.

Additionally, there were survey miles where nutria activity was observed but marsh conditions did not warrant a damage classification. Again, only the most obvious impacted areas were seen so the total impact of nutria was probably underestimated. The overwhelming bulk of the damage is located in southeastern Louisiana with only isolated small areas of damage in southwestern Louisiana (Appendix B).

The most significant findings include: 1) impact of nutria herbivory in southeastern coastal marshes continues to play a role in vegetated marsh loss; 2) the damage is rated as moderate or severe for 13,083 (60 %) of the damaged acres, which is down 3,423 acres (18 %) from 2002; 3) damage identified at 51 sites containing 14,382 acres was classified as old damage but recovering, which is double the 2002 figure; 4) only three of the sites surveyed converted to open water (73 acres); and 5) damage at 73 sites containing impacted acres amounted to 17,577 acres, which may or may not become more severely impacted. Finally, one of the present concerns is the sites classified as “old not recovering” (5,448 acres) can potentially convert into open water over the course of time. These acres of “old not recovering” criteria decreased by 44% from the previous year, 12,499 in 2002 to 5,448 in 2003. The decrease is a positive note, however the sites that are still classified as “old not recovering” could potentially be converted to open water.

Survey results strongly support the need for the CNCP to facilitate significantly higher nutria harvest than would be present without such a program.

The Coastwide Nutria Control Program has demonstrated its impact on nutria populations in problem areas of coastal Louisiana by drastically increasing harvests to over 300,000 animals. Through time this increase in harvest should equate to fewer acres impacted in these coastal areas.

Section 3

CNCP: Summary of 2002-2003 and Adaptive Management for 2003-2004

Nutria herbivory is playing a role in the coastal marshes of Louisiana, with a coastwide estimate of 82,080 impacted acres during 2003. Direct vegetation removal contributes to permanent loss of vegetated wetlands, however, vegetative loss is not the only impact observed. Nutria are currently, and are suspected to have historically, played a major role in affecting plant species composition throughout the coast. Of great concern is that only a small fraction of damaged sites have recovered since initial surveys began is 1993. Most areas identified during those initial surveys are still being impacted in 2003. The initiation and implementation of the Coastwide Nutria Control Program (CNCP) has dramatically increased the trapping effort in coastal Louisiana especially in areas of damage. In the three prior trapping seasons, less than 25,000 nutria were harvested per year in the coastal zone. This increased trapping pressure could, over time, potentially decrease the amount and severity of damage along the Louisiana coast. The annual Coastwide Nutria Damage Survey will be used to determine if increased trapping pressure will result in reduced damage.

The CNCP, during the 2002-2003 open trapping season, collected 308,160 nutria tails collected from 342 participants for a total incentive payment of $1,232,640. By habitat type, the nutria harvest was distributed as follows: fresh marsh – 51%, intermediate marsh – 22%, brackish marsh – 7%, salt marsh – 1%, other – 19%. Nutria were harvested from 22 parishes, with the greatest numbers harvested in Terrebonne Parish (30%), Plaquemines (20.5%), Lafourche (9.4%), St. Mary (8.4%) and Jefferson (6.7%) .

Of the 94 damage sites for 2002, 81 sites (19,323 acres) were located within 34 townships that received some level of trapping/hunting. Within those 34 townships, 148,693 nutria (48% of total) were harvested. At a finer scale, a total of 85,090 nutria (28% of total) were actually harvested from 50 of the 94 damage sites for 2002, as indicated on the maps by CNCP participants. Although the remainder of the harvest (159,467 nutria) came from townships without visible nutria damage, the harvest was undoubtedly beneficial. As mentioned in section 2, only the most obvious damage areas can be seen during the aerial survey. As shown in previous exclosure studies, nutria had an impact on vegetation even in areas where no visible damage was seen.

The 2003 Nutria Damage Survey identified 84 nutria impact sites covering 21,888 acres, yielding a coastwide estimate of 82,080 acres impacted compared to 2002 with 94 sites covering 21,185 acres and a coastwide estimate 79,444 acres impacted. In 2003, 57% of the impacted acres occurred in Terrebonne Parish, 12% in Plaquemines, 8% in Jefferson, and 6% in St.Charles. By marsh type the distribution of nutria impacted acres is fresh marsh – 50%, intermediate marsh – 37%, and brackish marsh – 13%.

While there was a slight increase in impacted acreage from 2002 to 2003, the overall damage shifted from 78% (16,506 acres) classified as moderate to severe in 2002 to only

60% (13,083 acres) classified as moderate to severe in 2003. It was generally observed that the overall health of the marsh in 2003 was improved from 2002. This improved condition and decreased severity of nutria damage can not specifically be attributed to the CNCP because damage severity differences were not detected between harvested and unharvested areas. LDWF continues to predict that three to four years of sustained harvest would be necessary to produce a noticeable reduction in nutria damage.

While the severity of nutria damage decreased in 2003, it should be noted that large areas of Scirpus olneyi were observed in the southwestern portion of the coastal zone, along with isolated populations of muskrat and nutria. These areas need to be monitored for a potential population increase in nutria and muskrat. Given time and the right conditions nutria and muskrat may respond to this increase in desirable vegetation in the southwest.

After the first year of the Coastwide Nutria Control Program, it is evident that some changes are necessary to improve the accuracy of information collected. To improve the accuracy of the harvest locations, participants will be required to submit a map and a complete legal description for the property they have permission to trap / hunt. Trapping / hunting locations will be entered into a GIS database and hard copy maps will be taken to the collection centers. When a participant comes to the collection site, he will indicate on the map of his lease where the nutria were harvested. This will allow GIS-based tracking of harvest locations, possibly down to the section (640 acres) versus to a township (23,040 acres) as was tracked for 2002-03.

Another improvement for the program's second year is that LDWF will attempt to contact landowners in areas where nutria damage was observed in the 2003 Vegetative Damage Survey but where little or no nutria were harvested during the 2002-2003 trapping season. LDWF will coordinate with trappers and fur buyers / dealers to encourage the maximum use of the entire animal.

Additional public meetings will be held prior to the 2003-04 open trapping season to inform landowners and the public on the results of the 2002-03 CNCP. These meetings will allow LDWF to possibly increase participation by landowners and trappers / hunters. This adaptive management should increase the harvest in areas where nutria are causing the most damage.

LOUISIANA NUTRIA INDUSTRY
HARVEST AND AVERAGE PELT VALUE

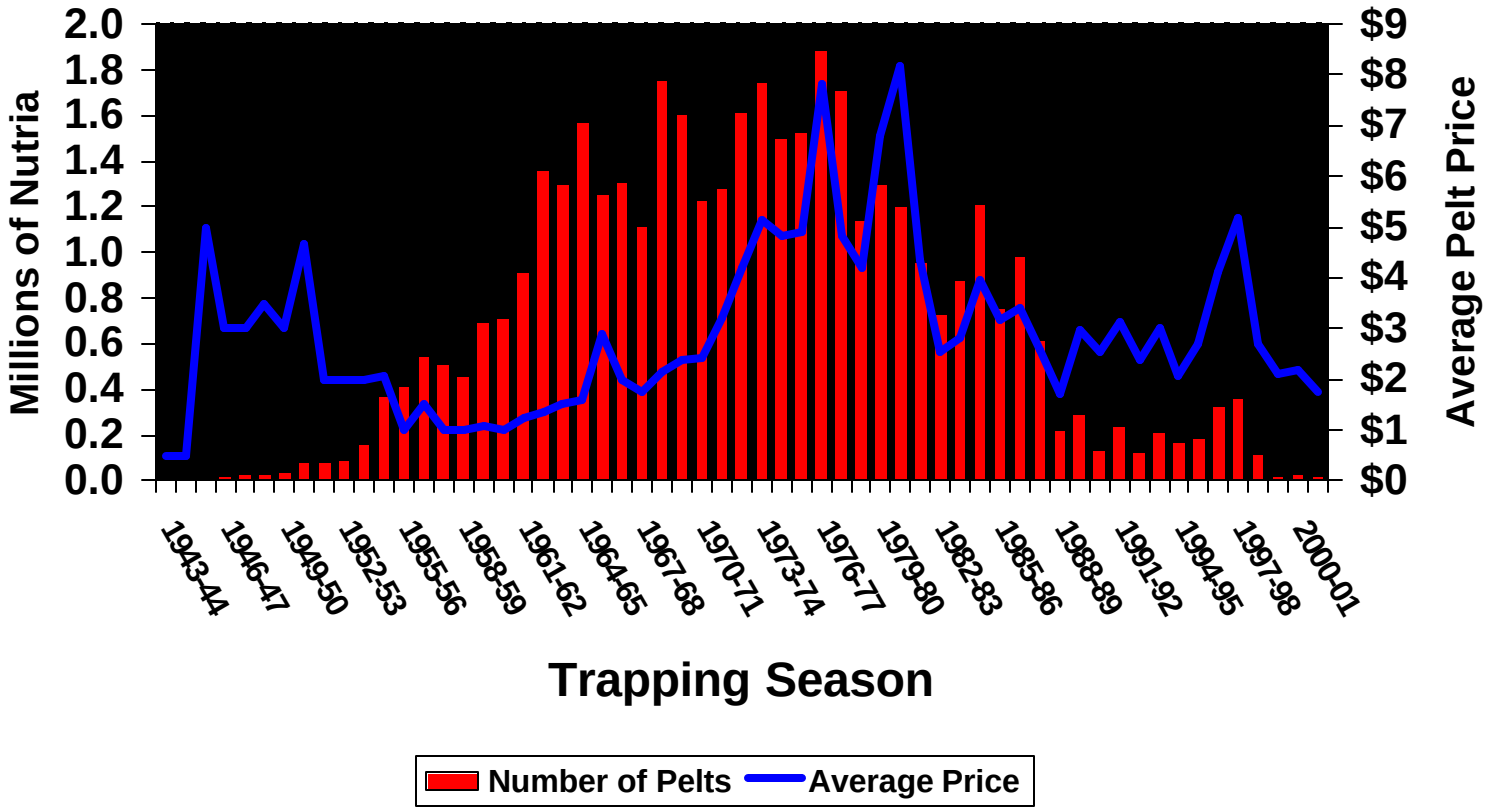


Figure 1. Annual harvest and average price of nutria from 1965-2002

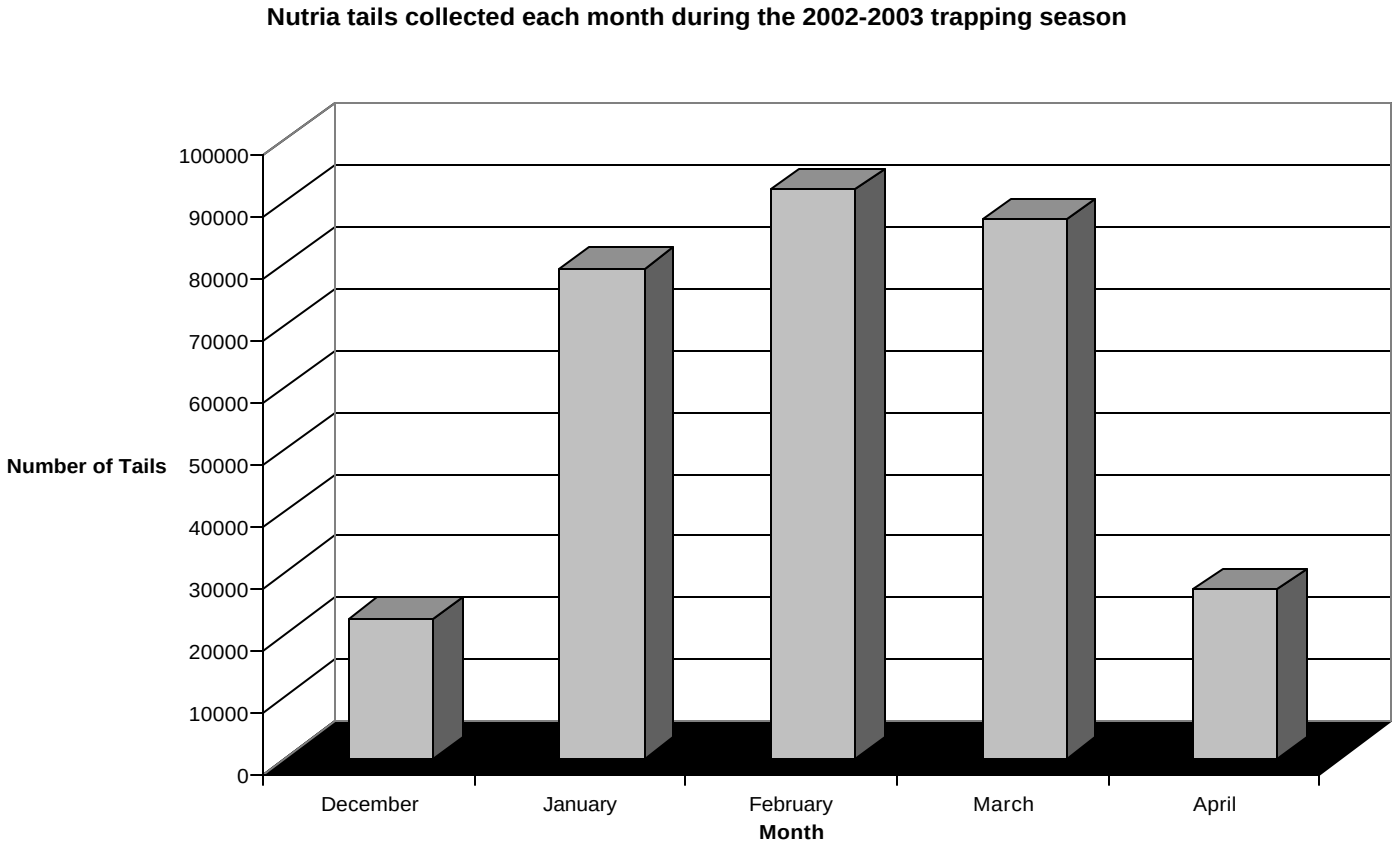


Figure 2. The number of nutria tails collected each month during the 02-03 Coastwide Nutria Control Program, 02-03 trapping season.

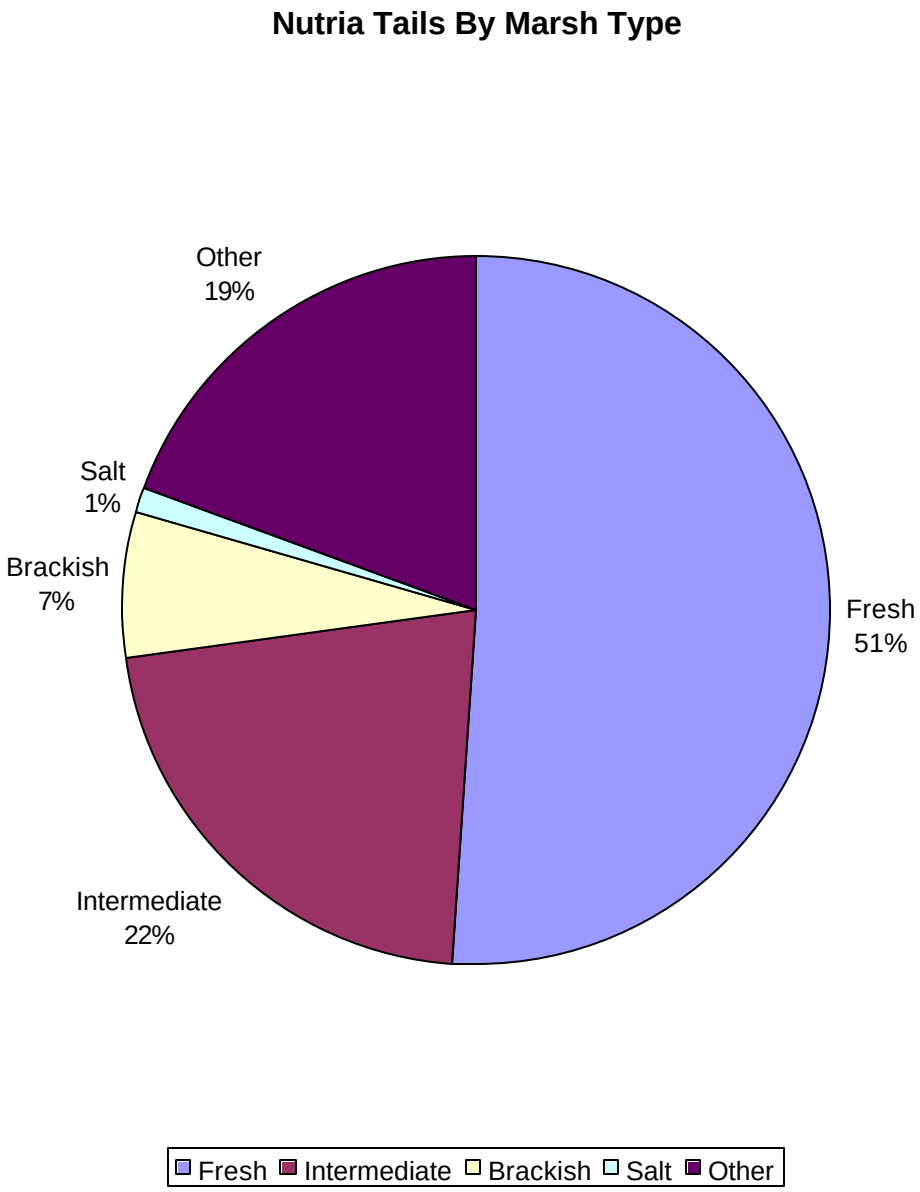


Figure 3. Percentage of nutria taken from coastal Louisiana during the 02-03 Coastwide Nutria Control Program.

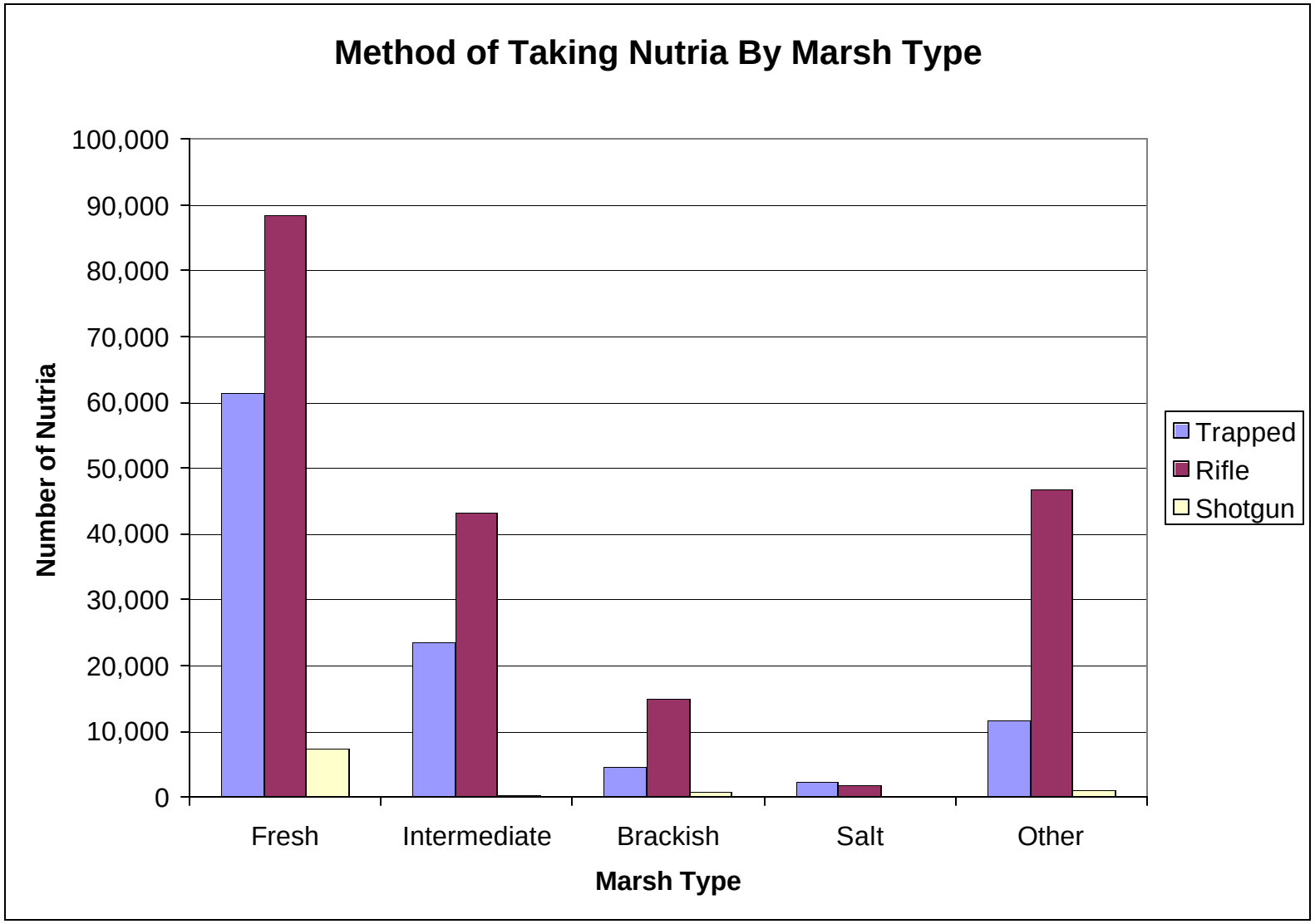


Figure 4. The method of take by marsh type during the 02-03 Coastwide Nutria Control Program.

Figure 5. Data Sheet utilized for 2003 nutria herbivory survey.

2003 NUTRIA VEGETATIVE DAMAGE SURVEY

DATE:_____
TRANSECT#:_____ PHOTOGRAPHY

MARSH TYPE:_____ FRAME #_____

LAT:_____ LAT:_____

LON:_____ LON:_____

LOCATION DESCRIPTION
ON TRANSECT_____
EAST OF TRANSECT_____
WEST OF TRANSECT_____ SITE#_____

DAMAGE TYPE

_____DAMAGE NOT RELATED TO NUTRIA FEEDING
_____DAMAGE - STORM RELATED
_____DAMAGE - MUSKRAT
_____DAMAGE – NUTRIA
_____DAMAGE – OTHER_____
_____DAMAGED AREA SUBJECT TO TIDAL ACTION:____YES____NO
_____**ESTIMATED SIZE OF AREA (ACRES)**

NUTRIA RELATIVE ABUNDANCE RATING

_____ NO NUTRIA SIGN VISIBLE (0)
_____NUTRIA SIGN VISIBLE (1)
_____ABUNDANT FEEDING (2)
_____ HEAVY FEEDING (3)

VEGETATIVE DAMAGE RATING

_____NO VEGETATIVE DAMAGE (0)
_____MINOR VEGETATIVE DAMAGE (1)
_____MODERATE VEGETATIVE DAMAGE (2)
_____SEVERE VEGETATIVE DAMAGE (3)
_____CONVERTED TO OPEN WATER (4)

NUTRIA VISIBLE IN AREA

_____WERE NUTRIA SIGHTED:_____YES_____NO
_____IF YES, HOW MANY?_____

PLANT SPECIES IMPACTED

PLANT SPECIES RECOVERING
PLANT SPECIES ADJACENT

AGE OF DAMAGE AND CONDITION

_____ RECOVERED (0)
_____OLD RECOVERING (1)
_____OLD NOT RECOVERING (2)
_____RECENT RECOVERING (3)
_____RECENT NOT RECOVERING (4)
_____CURRENT (OCCURRING NOW) (5)

PREDICTION OF RECOVERY BY END OF 2003 GROWING SEASON

_____NO RECOVERY PREDICTED (0)
_____FULL RECOVERY (1)
_____PARTIAL RECOVERY (2)
_____INCREASED DAMAGE (3) **_____CHECK NEXT YEAR**

Table 1. Carcass use by marsh type for 02-03 Coastwide Nutria Control Program.

MARSH TYPE	2002						
	Meat	Fur	Meat and Fur	Abandon Buried	Abandon Vegetation	Abandon Water	Abandon Other
Fresh	4,731	11,591	10,681	64,641	61,839	2,643	1,179
Intermediate	616	8,415	28,959	14,601	14,263	154	0
Brackish	78	1,786	6,383	5,943	5,843	125	0
Salt	68	292	1,868	939	921	0	0
Other	1,374	3,557	5,325	24,495	23,720	1,130	0
							0
Total	6,867	25,641	53,216	110,619	106,586	4,052	1,179

Table 2. Nutria harvested by parish for the 02-03 Coastwide Nutria Control Program.

PARISH	2002	
	Nutria Harvested	Percentage
Ascension	2,710	0.9%
Assumption	3,128	1.0%
Calcasieu	143	-
Cameron	7,851	2.6%
Iberia	1,412	0.5%
Jefferson	20,529	6.7%
Jefferson Davis	121	-
Lafayette	39	-
Lafourche	28,852	9.4%
Livingston	2,631	0.9%
Orleans	597	0.2%
Plaquemines	63,208	20.5%
St. Bernard	5,769	1.8%
St. Charles	11,169	3.6%
St. James	95	-
St. John the Baptist	18,450	6.0%
St. Martin	11,425	3.7%
St. Mary	26,004	8.4%
St. Tammany	4,638	1.5%
Tangipahoa	1,245	0.4%
Terrebonne	92,831	30.1%
Vermilion	5,313	1.7%
Total	308,160	99.9%

Table 3. Method of take by parish for the 02-03 Coastwide Nutria Control Program.

PARISH	2002		
	Trapped	Rifle	Shotgun
Ascension	0	2,306	404
Assumption	284	2,786	58
Calcasieu	0	143	0
Cameron	3,611	4,210	30
Iberia	0	1,353	59
Jefferson	5,869	14,094	566
Jefferson Davis	121	0	0
Lafayette	19	10	10
Lafourche	11,807	16,826	219
Livingston	0	2,631	0
Orleans	287	219	91
Plaquemines	9,899	52,933	376
St. Bernard	2,877	2,892	0
St. Charles	2,099	8,706	364
St. James	48	47	0
St. John the Baptist	1,505	11,132	5,813
St. Martin	1,497	9,593	335
St. Mary	11,073	14,849	82
St. Tammany	3,088	1,529	21
Tangipahoa	335	894	16
Terrebonne	46,761	45,317	753
Vermilion	2,370	2,729	214
Total	103,550	195,199	9,411

Table 4. Carcass use by parish for the 02-03 Coastwide Nutria Control Program.

PARISH	2002					
	Meat	Fur	Meat and Fur	Abandon Buried	Abandon Vegetation	Abandon Water
Ascension	84	0	129	1,179	1,180	139
Assumption	117	0	0	1,505	1,506	0
Calcasieu	0	0	143	0	0	0
Cameron	0	5,387	306	1,079	1,079	0
Iberia	0	182	59	585	586	0
Jefferson	0	0	4,269	8,130	8,130	0
Jefferson Davis	0	121	0	0	0	0
Lafayette	0	0	0	19	20	0
Lafourche	1,489	1,634	7,698	8,841	8,755	435
Livingston	0	0	0	1,214	1,214	204
Orleans	0	0	414	91	92	0
Plaquemines	430	4,547	24,635	17,015	16,399	182
St. Bernard	147	1,566	2,123	977	956	0
St. Charles	0	305	1,084	4,890	4,890	0
St. James	0	0	0	47	48	0
St. John the Baptist	1,577	0	576	6,437	6,963	2,896
St. Martin	0	0	905	5,480	4,988	52
St. Mary	233	3,021	3,343	10,249	8,574	583
St. Tammany	72	1,044	2,824	349	349	0
Tangipahoa	561	0	0	342	342	0
Terrebonne	1,852	6,231	3,894	40,894	39,220	740
Vermilion	305	1,603	814	1,296	1,295	0
Total	6,867	25,641	53,216	110,619	106,586	5,231

Table 5. Status and number of nutria herbivory sites surveyed in 2002 -2003.

Year	Number of sites surveyed	Number of sites with current damage	Sites with vegetative recovery
2002	108[1]	94	12
2003	100	84	16

[1] Two sites could not be evaluated due to high water.

Table 6. Number of damaged sites and acres damaged along transects by Parish in coastal Louisiana, 2002 - 2003.

PARISH	2002		2003	
	Number of		Number of	
	Sites	Acres	Sites	Acres
Terrebonne	41	12,951	34	12,521
Lafourche	8	1,222	7	610
Jefferson	17	3,003	10	1,805
Plaquemines	10	882	13	2,540
St. Charles	6	768	6	1,266
Cameron				
St. Bernard	6	921	5	918
St. John			1	20
Iberia				
St. Tammany	4	752	2	360
Orleans	2	686	2	962
St. Mary				
Vermilion			4	886
Total	94	21,185[1]	84	21,888[1]

[1]This figure represents acres damaged along transects only. Actual damage coast wide is approximately 4 times larger than the area estimated by this survey.

Table 7. Number of damaged sites and acres damaged by marsh type along transects in coastal Louisiana during 2002 and 2003.

HABITAT TYPE	2002		2003	
	NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES
Fresh	41	11,593	36	10,871
Intermediate	39	7,416	31	8,086
Brackish	14	2,176	17	2,931
Total	94	21,185	84	21,888

Table 8. Number of nutria damage sites and acres damaged by revised nutria relative abundance rating in coastal Louisiana during 2002 and 2003.

NUTRIA RELATIVE ABUNDANCE RATING	2002		2003	
	NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES
NO NUTRIA SIGN VISIBLE	29	7,040	25	6,045
NUTRIA SIGN VISIBLE	31	4,379	26	3,562
ABUNDANT FEEDING	17	4,198	19	6,682
HEAVY FEEDING	17	5,568	14	5,599
TOTAL	94	21,185	84	21,888

Table 9. Number of nutria damage sites and number of acres by the vegetative damage rating in coastal Louisiana 2002 and 2003.

VEGETATIVE DAMAGE RATING	2002		2003	
	NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES
NO VEGETATIVE DAMAGE	1	30	0	0
MINOR VEGETATIVE DAMAGE	28	3,498	26	8,732
MODERATE VEGETATIVE DAMAGE	44	13,156	41	9,221
SEVERE VEGETATIVE DAMAGE	13	3,451	14	3,862
CONVERTED TO OPEN WATER	8	1,050	3	73
TOTAL	94	21,185	84	21,888

Table 10. Number of damage sites by age of damage and condition rating in coastal Louisiana in 2002 and 2003.

AGE OF DAMAGE AND CONDITION RATING	2002		2003	
	NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES
Old Recovering	51	7,694	51	14,382
Old Not Recovering	39	12,499	20	5,448
Recent Recovering	0	0	0	0
Recent Not Recovering	0	0	0	0
Current Damage	4	992	13	2,058
Total	94	21,185	84	21,888
Recovered	12	1,119	16	1,674

Table 11. Number of damage sites and acres damaged by prediction of recovery rating in coastal Louisiana in 2002 and 2003.

PREDICTION OF RECOVERY BY END OF 2003 GROWING SEASON	2002		2003	
	NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES
Full Recovery	7	919	8	4,238
Partial Recovery	59	13,950	64	14,497
Increased Damage	5	1,086	6	1,646
No Recovery Predicated	15	4,180	3	1,434
*****Converted to Open water	8	1,050	3	73
TOTAL	94	21,185	84	21,888

*Sites that have "Converted to Open Water" are considered to be in the "No Recovery Predicted" category.

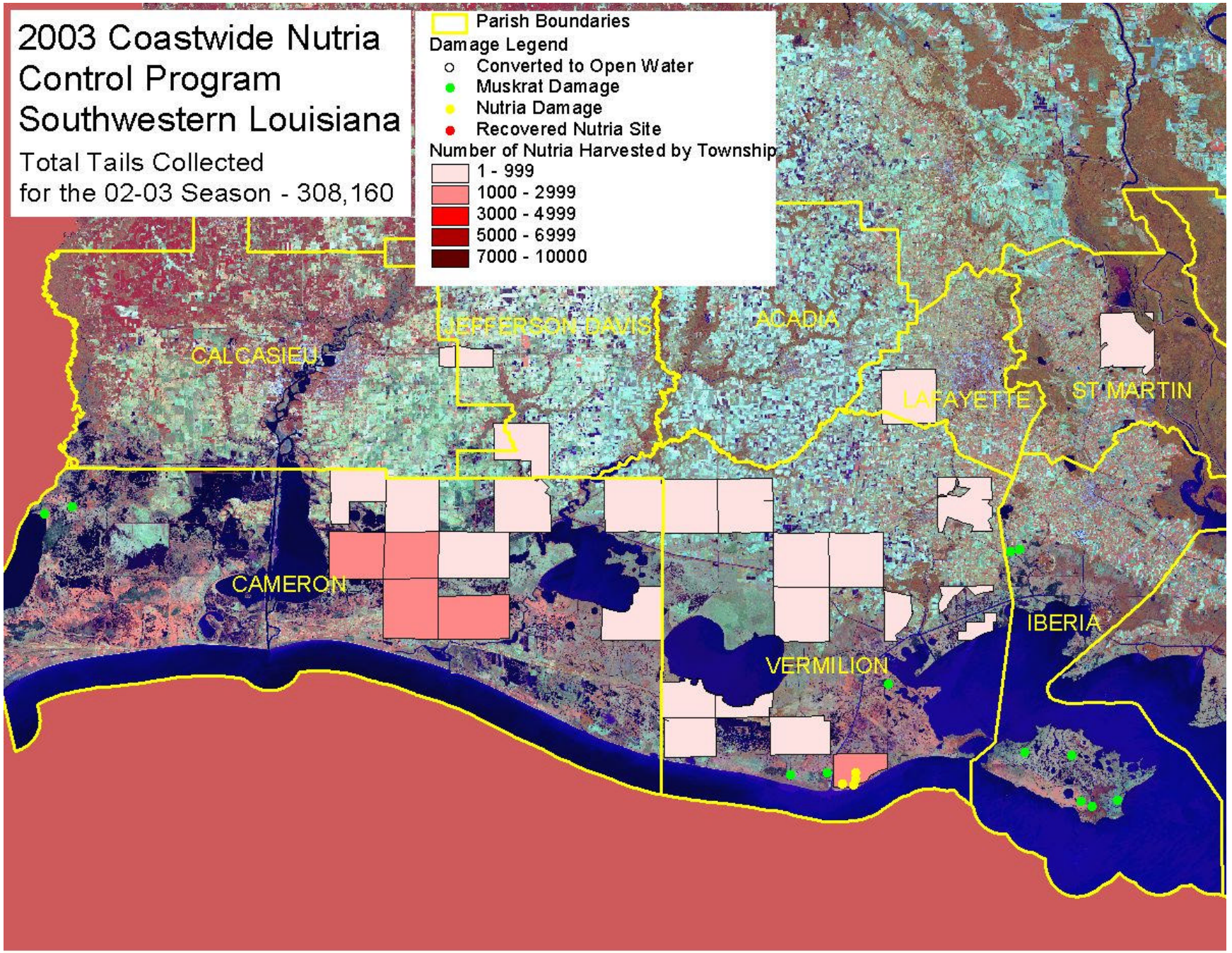
APPENDIX A. 2002 Nutria vegetative damage sites and harvest by township and range.

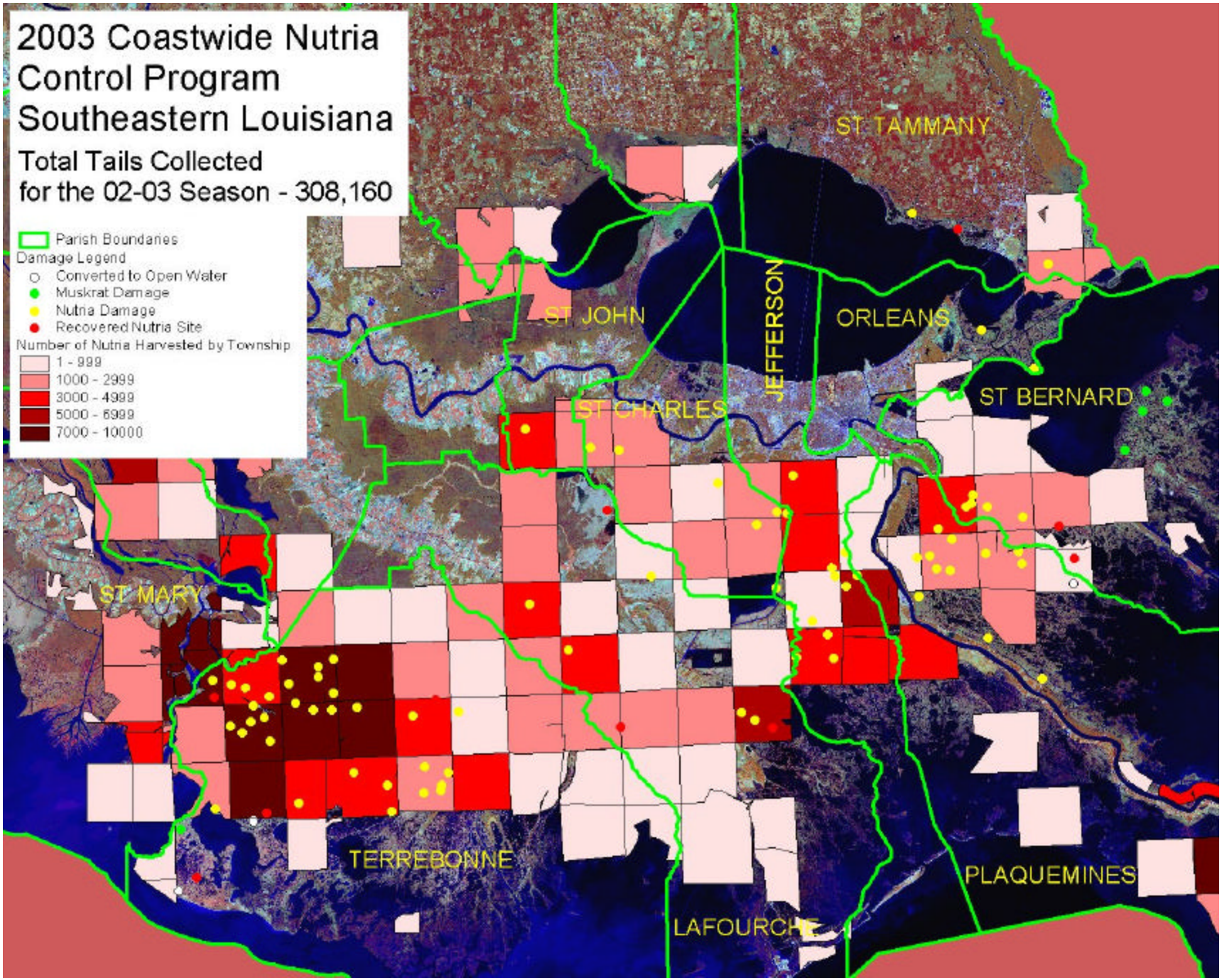
SITE #	MARSH TYPE	DAMAGE TYPE	DAMAGED ACRES	ACRES TO OPEN WATER	PARISH	TOWNSHIP AND RANGE	TAILS FOR EACH TOWNSHIP AND RANGE
286	B	Nutria Damaged Sites	130	0	ST TAMMANY	T10SR15E	2431
285	B	Nutria Damaged Sites	50	0	ORLEANS	T11SR14E	0
356	B	Nutria Damaged Sites	636	0	ORLEANS	T12SR15E	0
358	B	Muskrat Damage	1666	0	ST BERNARD	T12SR17E	0
359	B	Muskrat Damage	366	0	ST BERNARD	T12SR17E	0
357	B	Muskrat Damage	381	0	ST BERNARD	T13SR16E	0
238	F	Nutria Damaged Sites	10	0	ST CHARLES	T13SR19E	1108
171	F	Nutria Damaged Sites	200	0	ST CHARLES	T13SR20E	1800
250	I	Nutria Damaged Sites	300	0	ST BERNARD	T14SR13E	4131
258	I	Nutria Damaged Sites	396	0	ST BERNARD	T14SR13E	
259	I	Nutria Damaged Sites	149	0	ST BERNARD	T14SR13E	
260	I	Nutria Damaged Sites	277	0	ST BERNARD	T14SR13E	
338	I	Nutria Damaged Sites	10	0	ST BERNARD	T14SR14E	1434
355	B	Nutria Damaged Sites	86	0	ST BERNARD	T14SR14E	
341	B	Nutria Damaged Sites	3	0	ST BERNARD	T14SR15E	1072
42	F	Recovered Nutria Sites	200	0	LAFOURCHE	T14SR19E	0
170	F	Nutria Damaged Sites	100	0	LAFOURCHE	T14SR19E	0
94	F	Nutria Damaged Sites	400	0	ST CHARLES	T14SR21E	867
332	I	Nutria Damaged Sites	10	0	ST CHARLES	T14SR22E	1432
39	F	Nutria Damaged Sites	5	0	JEFFERSON	T14SR23E	4089
40	I	Nutria Damaged Sites	123	0	JEFFERSON	T14SR23E	
346	F	Nutria Damaged Sites	34	0	JEFFERSON	T14SR23E	
252	I	Nutria Damaged Sites	100	0	PLAQUEMINES	T15SR13E	12386
256	I	Nutria Damaged Sites	292	0	PLAQUEMINES	T15SR13E	
336	I	Nutria Damaged Sites	5	0	PLAQUEMINES	T15SR13E	
356	I	Nutria Damaged Sites	74	0	PLAQUEMINES	T15SR13E	
248	I	Nutria Damaged Sites	10	0	PLAQUEMINES	T15SR14E	10936
339	I	Nutria Damaged Sites	5	0	PLAQUEMINES	T15SR14E	
354	I	Nutria Damaged Sites	41	0	PLAQUEMINES	T15SR14E	
331	I	Nutria Damaged Sites	25	0	ST CHARLES	T15SR22E	2823
177	F	Nutria Damaged Sites	392	131	JEFFERSON	T15SR23E	4586

244	I	Nutria Damaged Sites	176	0	JEFFERSON	T15SR23E	
279	I	Nutria Damaged Sites	15	0	JEFFERSON	T15SR23E	
245	F	Nutria Damaged Sites	600	0	JEFFERSON	T15SR24E	659
337	I	Nutria Damaged Sites	25	0	PLAQUEMINES	T16SR12E	7447
320	I	Recovered Nutria Sites	5	0	PLAQUEMINES	T16SR14E	2883
322	I	Recovered Nutria Sites	112	0	PLAQUEMINES	T16SR14E	
323	I	Recovered Nutria Sites	10	0	PLAQUEMINES	T16SR14E	
340	I	Nutria Damaged Sites	30	0	PLAQUEMINES	T16SR14E	
97	I	Nutria Damaged Sites	80	0	JEFFERSON	T16SR22E	0
48	I	Nutria -Open Water		0	JEFFERSON	T16SR23E	893
49	B	Nutria Damaged Sites	200	0	JEFFERSON	T16SR23E	
175	I	Nutria -Open Water	0	30	JEFFERSON	T16SR23E	
178	I	Nutria Damaged Sites	97	0	JEFFERSON	T16SR23E	
243	I	Nutria -Open Water	0	240	JEFFERSON	T16SR23E	
317	I	Nutria -Open Water	0	15	JEFFERSON	T16SR23E	
333	I	Nutria Damaged Sites	20	0	JEFFERSON	T16SR23E	
60	I	Nutria Damaged Sites	258	0	JEFFERSON	T16SR24E	5906
92	I	Nutria Damaged Sites	687	0	JEFFERSON	T16SR24E	
270	F	Nutria Damaged Sites	10	0	TERREBONNE	T17SR12E	7070
304	F	Nutria Damaged Sites	95	0	TERREBONNE	T17SR12E	
8	F	Nutria Damaged Sites	780	0	TERREBONNE	T17SR13E	3819
9	F	Nutria Damaged Sites	260	0	TERREBONNE	T17SR13E	
127	F	Nutria Damaged Sites	42	0	TERREBONNE	T17SR13E	
138	F	Nutria Damaged Sites	30	0	TERREBONNE	T17SR13E	
139	F	Nutria Damaged Sites	106	0	TERREBONNE	T17SR13E	
271	F	Recovered Nutria Sites	5	0	TERREBONNE	T17SR13E	
327	F	Nutria Damaged Sites	73	0	TERREBONNE	T17SR13E	
120	F	Nutria Damaged Sites	1000	0	TERREBONNE	T17SR14E	7647
142	F	Nutria Damaged Sites	234	0	TERREBONNE	T17SR14E	
143	F	Nutria Damaged Sites	6	0	TERREBONNE	T17SR14E	
233	F	Nutria Damaged Sites	273	0	TERREBONNE	T17SR14E	
274	F	Nutria Damaged Sites	290	0	TERREBONNE	T17SR14E	
310	F	Nutria Damaged Sites	42	0	TERREBONNE	T17SR14E	

311	F	Nutria Damaged Sites	1361	0	TERREBONNE	T17SR14E	
345	F	Nutria Damaged Sites	188	0	LAFOURCHE	T17SR19E	4980
90	I	Recovered Nutria Sites	200		JEFFERSON	T17SR23E	3159
242	B	Nutria Damaged Sites	25	0	LAFOURCHE	T17SR23E	
334	I	Nutria Damaged Sites	10	0	JEFFERSON	T17SR23E	
348	I	Nutria Damaged Sites	33	0	JEFFERSON	T17SR23E	
353	B	Muskrat Damage	3016		IBERIA	T17SR5E	0
351	B	Muskrat Damage	46	0	IBERIA	T17SR6E	0
352	B	Muskrat Damage	159	0	IBERIA	T17SR6E	0
140	F	Nutria Damaged Sites	461		TERREBONNE	T18SR13E	7002
278	F	Nutria Damaged Sites	1068	0	TERREBONNE	T18SR13E	
306	F	Nutria Damaged Sites	302	0	TERREBONNE	T18SR13E	
307	F	Nutria Damaged Sites	508	0	TERREBONNE	T18SR13E	
17	F	Nutria Damaged Sites	170	0	TERREBONNE	T18SR14E	9212
344	F	Nutria Damaged Sites	84	0	TERREBONNE	T18SR14E	
107	F	Nutria Damaged Sites	25	0	TERREBONNE	T18SR15E	8466
109	F	Nutria Damaged Sites	100	0	TERREBONNE	T18SR15E	
150	F	Recovered Nutria Sites	25	0	TERREBONNE	T18SR15E	
113	F	Nutria Damaged Sites	25	0	TERREBONNE	T18SR16E	3214
328	F	Nutria Damaged Sites	258	0	TERREBONNE	T18SR16E	
154	F	Nutria Damaged Sites	294	0	TERREBONNE	T18SR17E	109
95	I	Nutria Damaged Sites	500	0	LAFOURCHE	T18SR20E	1836
164	I	Nutria Damaged Sites	100	0	LAFOURCHE	T18SR22E	5253
329	B	Nutria Damaged Sites	88	0	LAFOURCHE	T18SR22E	
347	B	Nutria Damaged Sites	201	0	LAFOURCHE	T18SR22E	
350	B	Muskrat Damage	374	0	IBERIA	T18SR6E	0
349	B	Muskrat Damage	185	0	IBERIA	T18SR7E	0
67	F	Recovered Nutria Sites	386		TERREBONNE	T19SR13E	8579
272	F	Nutria Damaged Sites	432	0	TERREBONNE	T19SR13E	
343	I	Nutria Damaged Sites	57	0	TERREBONNE	T19SR13E	
117	F	Nutria Damaged Sites	1100	0	TERREBONNE	T19SR14E	4292
104	F	Nutria Damaged Sites	30	0	TERREBONNE	T19SR15E	4246
105	I	Nutria Damaged Sites	3070	0	TERREBONNE	T19SR15E	

108	F	Nutria Damaged Sites	50	0	TERREBONNE	T19SR15E	
111	I	Nutria Damaged Sites	20	0	TERREBONNE	T19SR16E	2926
112	I	Nutria Damaged Sites	20	0	TERREBONNE	T19SR16E	
153	I	Nutria Damaged Sites	50	0	TERREBONNE	T19SR16E	
314	F	Nutria Damaged Sites	19	0	TERREBONNE	T19SR16E	
315	I	Nutria Damaged Sites	18	0	TERREBONNE	T19SR16E	
221	B	Recovered Nutria Sites	5	0	TERREBONNE	T20SR11E	77
224	I	Recovered Nutria Sites	20	0	TERREBONNE	T20SR11E	
342	B	Muskrat Damage	181	0	TERREBONNE	T20SR12E	0
10	I	Nutria Damaged Sites	48	0	TERREBONNE	T20SR13E	0
12	B	Nutria -Open Water		100	TERREBONNE	T20SR13E	0
309	B	Muskrat Damage			TERREBONNE	T20SR13E	0
228	B	Muskrat Damage	0	0	TERREBONNE	T21R12E	0
222	B	Recovered Nutria Sites	1	0	TERREBONNE	T21SR11E	148
227	B	Nutria Damaged Sites	26	9	TERREBONNE	T21SR12E	0
229	B	Recovered Nutria Sites	150		TERREBONNE	T21SR12E	0
326	F	Nutria Damaged Sites	5		TERREBONNE	T21SR13E	0
267	B	Nutria Damaged Sites	75	225	ST TAMMANY	T9SR13E	0
268	B	Nutria -Open Water	0	300	ST TAMMANY	T9SR13E	0
324	B	Nutria Damaged Sites	22	0	ST TAMMANY	T9SR13E	0


2003 Coastwide Nutria Control Program
Southwestern Louisiana
Total Tails Collected for the 02-03 Season - 308,160
Parish Boundaries
Damage Legend
Converted to Open Water
Muskrat Damage
Nutria Damage
Recovered Nutria Site
Number of Nutria Harvested by Township
1 - 999
1000 - 2999
3000 - 4999
5000 - 6999
7000 - 10000
CALCASIEU
JEFFERSON DAVIS
ACADIA
LAFAYETTE
ST MARTIN
CAMERON
IBERIA
VERMILION


2003 Coastwide Nutria Control Program
Southeastern Louisiana
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Damage Legend
Converted to Open Water
Muskrat Damage
Nutria Damage
Recovered Nutria Site
Number of Nutria Harvested by Township
1 - 999
1000 - 2999
3000 - 4999
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7000 - 10000
ST TAMMANY
ST JOHN
JEFFERSON
ORLEANS
ST BERNARD
ST CHARLES
ST MARY
TERREBONNE
LAFOURCHE
PLAQUEMINES

APPENDIX B. Data collected at each damage site during the 2003 survey.

CODES FOR NUTRIA HERBIVORY SURVEY DATA

[1]Marsh Type

Fresh	F
Intermediate	I
Brackish	B

[2]Nutria Relative Abundance Rating

No Nutria Sign Visible	0
Nutria Sign Visible	1
Abundant Feeding Sign	2
Heavy Feeding	3

[3]Vegetative Damage Rating

No Vegetative Damage	0
Minor Vegetative Damage	1
Moderate Vegetative Damage	2
Severe Vegetative Damage	3
Converted To Open Water	4

[4]Age of Damage and Condition

Recovered	0
Old Recovering	1
Old Not Recovering	2
Recent Recovering	3
Recent Not Recovering	4
Current (Occurring Now)	5

[5]Prediction of Recovery by End of 2002 Growing Season

No Recovery Predicted	0
Full Recovery	1
Partial Recovery	2
Increased Damage	3

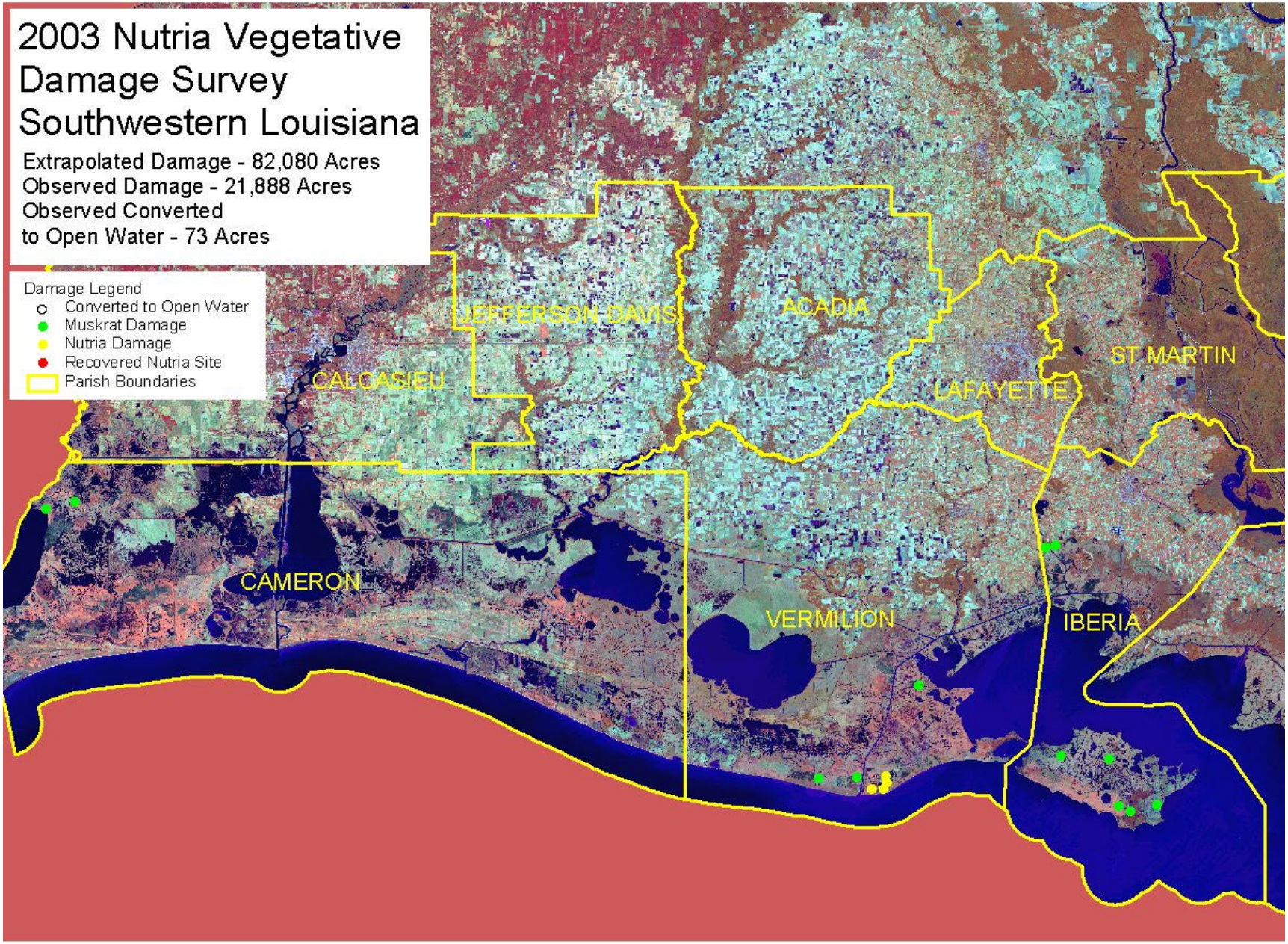
99 – Entry does not apply to this site.

SITE #	MARSH TYPE	LATITUDE	LONGITUDE	DAMAGE TYPE	DAMAGED ACRES	ACRES TO OPEN WATER	NRAR	VDR	AGE OF DAMAGE	PREDICTION	PARISH	TOWNSHIP AND RANGE
8	F	29.56970	-91.16380	Nutria	780	0	3	1	1	2	Terrebonne	T17SR13E
9	F	29.56433	-91.13733	Nutria	260	0	2	1	1	2	Terrebonne	T17SR13E
10	I	29.35900	-91.12783	Nutria	0	48	99	4	99	0	Terrebonne	T20SR13E
17	F	29.53970	-91.05040	Nutria	604	0	2	2	2	3	Terrebonne	T18SR14E
39	F	29.81850	-90.15083	Nutria	5	0	99	99	0	99	Jefferson	T14SR23E
40	I	29.81550	-90.17400	Nutria	123	0	1	2	1	2	St Charles	T14SR23E
49	B	29.64969	-90.13397	Nutria	200	0	0	3	2	0	Jefferson	T16SR23E
60	I	29.71800	-90.05267	Nutria	258	0	3	3	1	2	Jefferson	T16SR24E
92	I	29.70200	-90.07333	Nutria	687	0	1	2	1	2	Jefferson	T16SR24E
94	F	29.86470	-90.29470	Nutria	308	0	3	2	1	2	St Charles	T14SR21E
95	I	29.49350	-90.47650	Nutria	500	0	99	99	0	99	Lafourche	T18SR20E
97	I	29.70120	-90.19650	Nutria	151	0	3	3	2	2	Jefferson	T16SR22E
104	F	29.40983	-90.89017	Nutria	30	0	1	1	1	1	Terrebonne	T19SR15E
105	I	29.36983	-90.88450	Nutria	3070	0	0	1	1	1	Terrebonne	T19SR15E
107	F	29.53050	-90.94200	Nutria	25	0	1	1	2	2	Terrebonne	T18SR15E
108	F	29.43117	-90.94967	Nutria	50	0	0	1	1	2	Terrebonne	T19SR15E
109	F	29.52817	-90.98634	Nutria	100	0	2	1	1	2	Terrebonne	T18SR14E
111	I	29.39783	-90.82633	Nutria	20	0	1	1	1	1	Terrebonne	T19SR16E
112	I	29.40067	-90.79716	Nutria	20	0	1	2	2	2	Terrebonne	T19SR16E
113	F	29.54033	-90.80253	Nutria	25	0	99	99	0	99	Terrebonne	T18SR16E
117	F	29.38460	-91.04790	Nutria	572	0	2	2	1	2	Terrebonne	T19SR14E
120	F	29.60583	-91.07284	Nutria	1000	0	2	1	1	2	Terrebonne	T17SR14E
127	F	29.54855	-91.16078	Nutria	42	0	1	0	0	99	Terrebonne	T17SR13E
138	F	29.58583	-91.09917	Nutria	30	0	99	99	0	99	Terrebonne	T17SR13E
139	F	29.55100	-91.09650	Nutria	106	0	1	1	1	2	Terrebonne	T17SR13E
140	F	29.48183	-91.09566	Nutria	461	0	2	3	2	3	Terrebonne	T18SR13E
142	F	29.59490	-91.00900	Nutria	301	0	2	1	2	2	Terrebonne	T17SR14E
153	I	29.40883	-90.79500	Nutria	50	0	0	1	1	1	Terrebonne	T19SR16E
154	F	29.52184	-90.76283	Nutria	294	0	1	2	1	2	Terrebonne	T18SR17E
164	I	29.48583	-90.20917	Nutria	100	0	99	99	0	99	Lafourche	T18SR22E

170	F	29.82733	-90.49300	Nutria	100	0	99	99	0	99	Lafourche	T14SR19E
171	F	29.91920	-90.46960	Nutria	634	0	2	1	1	2	St Charles	T13SR20E
177	F	29.74400	-90.09200	Nutria	523	0	99	99	0	99	Jefferson	T15SR23E
178	I	29.71733	-90.09117	Nutria	97	0	2	2	1	2	Jefferson	T16SR23E
223	B	29.25370	-91.26130	Nutria		5	99	4	99	0	Terrebonne	T21SR12E
227	B	29.27230	-91.22970	Nutria	26	0	99	99	0	99	Terrebonne	T21SR12E
233	F	29.60630	-90.98210	Nutria	357	0	2	2	2	2	Terrebonne	T17SR14E
238	F	29.92470	-90.52030	Nutria	105	0	3	2	5	2	St Charles	T13SR19E
242	B	29.59390	-90.16320	Nutria	25	0	0	1	1	2	Lafourche	T17SR23E
244	I	29.73080	-90.09700	Nutria	54	0	0	2	1	2	Jefferson	T15SR23E
245	F	29.75400	-90.07240	Nutria	281	0	1	2	1	2	Jefferson	T15SR24E
248	I	29.72890	-89.76150	Nutria	35	0	0	1	1	2	Plaquemines	T15SR14E
250	I	29.78660	-89.90640	Nutria	1214	0	2	3	2	0	Plaquemines	T14SR13E
252	I	29.74550	-89.92383	Nutria	100	0	1	2	1	2	Plaquemines	T15SR13E
256	I	29.77060	-89.88370	Nutria	292	0	1	3	1	2	Plaquemines	T15SR13E
258	I	29.83730	-89.84390	Nutria	396	0	0	3	2	2	St Bernard	T14SR13E
259	I	29.82450	-89.84700	Nutria	149	0	0	2	1	2	St Bernard	T14SR13E
260	I	29.81860	-89.85650	Nutria	277	0	0	2	1	2	St Bernard	T14SR13E
264	B	29.69680	-89.67040	Nutria	21	20	99	4	99	0	Plaquemines	T16SR15E
265	B	29.73470	-89.66770	Nutria	5	0	99	99	0	99	St Bernard	T15SR15E
267	B	30.24680	-89.85750	Nutria	75	0	99	99	0	99	St Tammany	T9SR13E
270	F	29.57606	-91.19589	Nutria	10	0	1	1	1	2	Terrebonne	T17SR12E
272	F	29.51175	-91.12998	Nutria	43	0	2	1	1	2	Terrebonne	T18SR13E
274	F	29.56898	-91.06177	Nutria	290	0	3	2	1	2	Terrebonne	T17SR14E
278	F	29.51800	-91.10546	Nutria	1068	0	3	1	1	2	Terrebonne	T18SR13E
279	I	29.74581	-90.14887	Nutria	15	0	99	99	0	99	Jefferson	T15SR23E
285	B	30.09050	-89.82100	Nutria	326	0	0	1	1	2	Orleans	T11SR14E
286	B	30.18960	-89.69910	Nutria	338	0	0	3	1	2	St Tammany	T10SR15E
304	F	29.55107	-91.19370	Nutria	95	0	1	0	0	99	Terrebonne	T17SR12E
306	F	29.53650	-91.12470	Nutria	302	0	2	1	1	2	Terrebonne	T18SR13E
307	F	29.49550	-91.14580	Nutria	508	0	3	2	1	2	Terrebonne	T18SR13E
310	F	29.57950	-91.01000	Nutria	146	0	2	2	2	2	Terrebonne	T17SR14E
311	F	29.55360	-90.98250	Nutria	1361	0	3	2	2	2	Terrebonne	T17SR14E

314	F	29.43830	-90.82470	Nutria	19	0	1	2	1	2	Terrebonne	T19SR16E
315	I	29.42850	-90.78240	Nutria	95	0	3	2	5	2	Terrebonne	T19SR16E
324	B	30.27420	-89.93850	Nutria	22	0	0	2	1	2	St Tammany	T9SR13E
326	F	29.37869	-91.19480	Nutria	5	0	0	2	1	2	Terrebonne	T19SR12E
327	F	29.55190	-91.13190	Nutria	73	0	99	99	0	99	Terrebonne	T17SR13E
328	F	29.51670	-90.84390	Nutria	258	0	1	1	1	1	Terrebonne	T18SR16E
329	B	29.51060	-90.26340	Nutria	88	0	1	2	1	2	Lafourche	T18SR22E
331	I	29.79960	-90.22870	Nutria	25	0	1	1	1	2	St Charles	T15SR22E
332	I	29.81830	-90.19150	Nutria	71	0	3	3	2	2	St Charles	T14SR22E
333	I	29.67400	-90.17160	Nutria	20	0	1	3	2	0	Lafourche	T16SR23E
334	B	29.59140	-90.09860	Nutria	10	0	0	1	1	2	Jefferson	T17SR23E
336	I	29.72520	-89.91260	Nutria	5	0	1	2	1	2	Plaquemines	T15SR13E
337	I	29.68270	-89.94430	Nutria	154	0	1	1	1	1	Plaquemines	T16SR12E
338	I	29.81790	-89.81940	Nutria	10	0	0	3	2	2	St Bernard	T14SR14E
339	I	29.74700	-89.82390	Nutria	5	0	0	3	2	2	Plaquemines	T15SR14E
340	I	29.61630	-89.82390	Nutria	30	0	0	1	1	2	Plaquemines	T16SR14E
341	B	29.78570	-89.69310	Nutria	3	0	99	99	0	99	St Bernard	T14SR15E
342	B	29.34810	-91.25640	Muskrat	181	0		0	0	0	Terrebonne	T20SR12E
343	I	29.37000	-91.10460	Nutria	57	0	0	99	0	99	Terrebonne	T19SR13E
344	F	29.52830	-91.02000	Nutria	260	0	2	2	5	2	Terrebonne	T18SR14E
345	F	29.61360	-90.56680	Nutria	188	0	3	2	5	2	Lafourche	T17SR19E
346	F	29.87470	-90.16170	Nutria	34	0	2	2	1	2	Jefferson	T14SR23E
347	B	29.49840	-90.24020	Nutria	201	0	2	2	1	2	Lafourche	T18SR22E
348	I	29.62790	-90.10780	Nutria	33	0	1	3	2	2	Jefferson	T17SR23E
349	B	29.51160	-91.77920	Muskrat	338	0	0	3	2	3	Iberia	T17SR7E
350	B	29.50270	-91.82600	Muskrat	463	0	0	3	2	0	Iberia	T18SR6E
351	B	29.58410	-91.86310	Muskrat	46	0	0	2	1	2	Iberia	T17SR6E
352	B	29.51070	-91.84700	Muskrat	196	0	0	3	2	0	Iberia	T18SR6E
353	B	29.58980	-91.94900	Muskrat	3016	0	0	3	1	2	Iberia	T17SR5E
354	I	29.74760	-89.76610	Nutria	110	0	0	2	1	2	Plaquemines	T15SR14E
355	B	29.80070	-89.75760	Nutria	86	0	0	2	1	2	St Bernard	T14SR14E
356	B	30.02860	-89.73070	Nutria	636	0	0	2	1	1	Orleans	T12SR15E
357	B	29.89990	-89.57330	Muskrat	883	0	0	3	1	2	St Bernard	T13SR16E

358	B	29.95860	-89.53910	Muskrat	1666	0	0	3	2	0	St Bernard	T13SR17E
359	B	29.97300	-89.49470	Muskrat	1486	0	0	3	1	2	St Bernard	T12SR17E
360	I	29.72160	-89.88820	Nutria	74	0	1	2	1	2	Plaquemines	T15SR13E
361	I	29.91730	-91.95540	Muskrat	6	0	0	2	3	1	Iberia	T13SR5E
362	I	29.91370	-91.97180	Muskrat	103	0	0	3	5	2	Iberia	T13SR5E
363	B	29.70180	-92.20080	Muskrat	61	0	0	0	3	2	Vermilion	T15SR3E
364	B	29.55990	-92.26100	Nutria	50	0	2	2	5	3	Vermilion	T17SR2E
365	B	29.55020	-92.26060	Nutria	454	0	1	2	5	3	Vermilion	T17SR2E
366	B	29.54050	-92.26590	Nutria	31	0	1	2	5	3	Vermilion	T17SR2E
367	B	29.54150	-92.28630	Nutria	351	0	1	2	5	2	Vermilion	T17SR2E
368	B	29.55990	-92.31310	Muskrat	220	0	0	3	2	2	Vermilion	T17SR1E
369	B	29.55750	-92.38240	Muskrat	240	0	1	2	5	3	Vermilion	T17SR1E
370	I	29.98810	-93.70920	Muskrat	67	0	0	2	2	2	Cameron	T12SR13W
371	B	29.97640	-93.75930	Muskrat	325	0	0	2	2	2	Cameron	T12SR14W
372	F	29.50520	-91.16600	Nutria	3	0	3	2	5	2	Terrebonne	T18SR13E
373	F	29.95500	-90.63440	Nutria	20	0	1	1	5	1	St John	T13SR18E
374	F	29.72400	-90.41760	Nutria	42	0	1	2	5	2	Lafourche	T15SR20E
375	F	29.68510	-90.63310	Nutria	46	0	2	2	5	3	Lafourche	T16SR18E
376	B	29.55130	-89.73090	Nutria	88	0	0	2	1	2	Plaquemines	T17SR15E
377	I	29.74290	-89.94520	Nutria	413	0	3	3	5	2	Plaquemines	T15SR12E
378	B	29.98980	-89.53260	Muskrat	859	0	0	3	1	2	St Bernard	T12SR17E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Extrapolated Damage - 82,080 Acres
Observed Damage - 21,888 Acres
Observed Converted to Open Water - 73 Acres
Damage Legend
Converted to Open Water
Muskrat Damage
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Recovered Nutria Site
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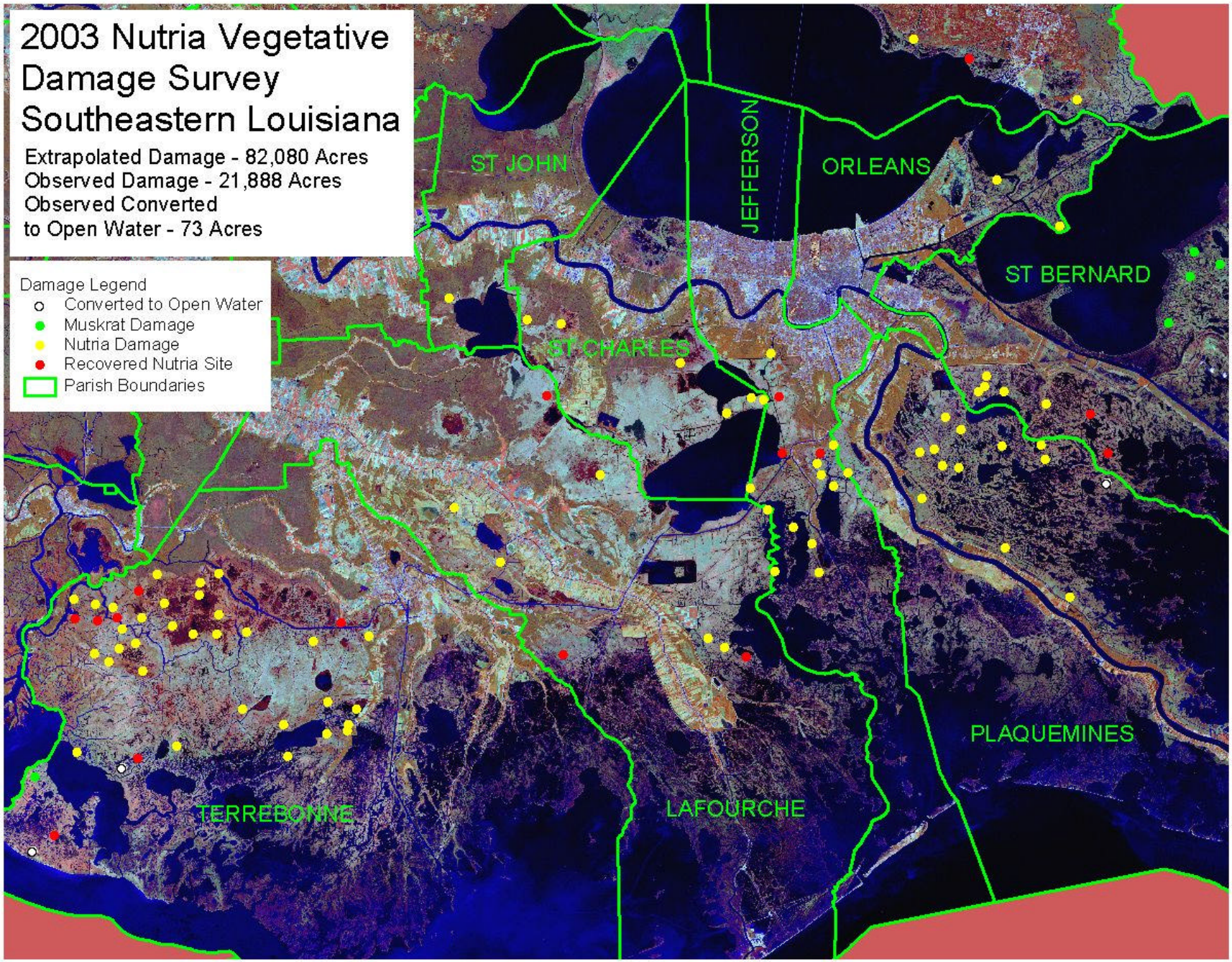
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