

Coastwide Nutria Control Program 2018 - 2019

**Nutria Harvest and Distribution 2018-2019
and
A Survey of Nutria Herbivory Damage in Coastal Louisiana 2019**

*Image by
Tanya Sturman*

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**As part of the Coastwide Nutria Control Program*
GWPPRA Project (LA-03b)**

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Section 1

Nutria Harvest Distribution for 2018-2019

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 other states primarily for fur farming. These fur farms failed during the Second World War as a result of poor pelt prices and poor reproductive success. After the failures of these fur farms, nutria were released into the wild. Seventeen states in the US now have feral nutria populations.

The Gulf Coast nutria population originated in Louisiana in the 1930's from escapes and releases from nutria farms. Populations first became established in the western coastal portion of the state and then later spread to the east through natural expansion coupled with 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; farmers complained about damage to crops and levee systems, while 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, Louisiana Department of Wildlife and Fisheries (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 became the backbone of the Louisiana fur industry for the next 20 years, surpassing the muskrat in 1962 in total numbers harvested. 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 annual 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. The harvest peaked in 1976 at 1.8 million pelts worth \$15.7 million to coastal trappers (Figure 1).

The nutria market began to change during the early 1980's. In 1981-1982, the nutria harvest dropped slightly below 1 million. This declining harvest continued for two more seasons; then in the 1984-1985 season, the harvest jumped back up to 1.2 million. During the 1980-1981 season, the average price paid for nutria was \$8.19. During the 1981-1982 season, the price dropped to \$4.36 and then in 1982-1983, the price dropped to \$2.64. Between the 1983-1984 season and the 1986-1987 season, prices fluctuated between \$3.00 and \$4.00. Then in 1987-1988 and again in 1988-1989 prices continued to fall (Figure 1). From 1982 through 1992 the average annual value of the nutria harvest was only \$2.2 million. Between 1988-1989 and 1995-1996 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 1996-1997 and in 1997-1998, 327,286 nutria were harvested at an average price of \$4.13 and 359,232 nutria were harvested at an average price of \$5.17 during those seasons respectively. 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 ruble. During the 1998-1999 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 nutria harvested in 2000-2001 trapping season increased to 29,544. The value of nutria pelts decreased to \$1.75 during the 2001-2002 season, prompting another decrease in harvest to 24,683 nutria. The nutria fur market has never recovered.

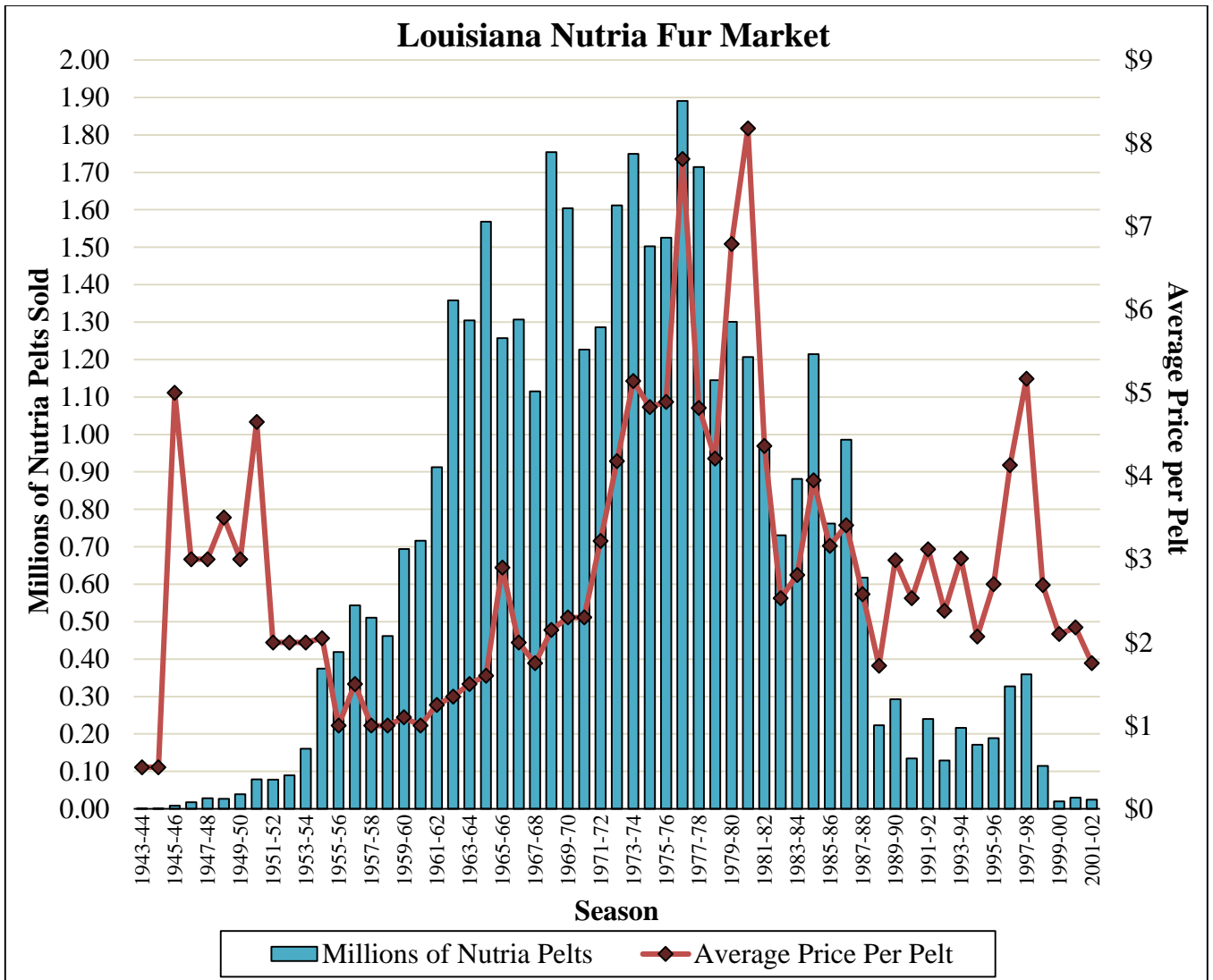


Figure 1. Louisiana fur market 1943 – 2002 (the season prior to CNCP implementation).

During the strong market period for nutria pelts, there were no reports of wetland damage caused by nutria. However, before the market developed and after the market declined, reports of marsh vegetation damage from land managers became common. Such complaints began in 1987 and became more frequent during the early 1990's. In response, the Fur and Refuge Division of the Louisiana Department of Wildlife and Fisheries (LDWF) initiated limited aerial survey flights, particularly in southeastern Louisiana. Survey flights of Barataria and Terrebonne basins were conducted during the

1990's, with initial support from Barataria-Terrebonne National Estuary Program (BTNEP) and later support from Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). From 1993 to 1996 these flights showed acres of damage increasing from approximately 45,000 to 80,000 acres within the basins. The first CWPPRA funded coastwide survey, conducted in 1998, showed herbivory damage areas totaling approximately 90,000 acres. By 1999 this coastwide damage had increased to nearly 105,000 acres. This rapid and dramatic increase in damaged acres prompted LDWF to pursue funding for the Coastwide Nutria Control Program (CNCP) in January 2002.

The project is funded by the CWPPRA through the Natural Resources Conservation Service (NRCS) and the Coastal Protection and Restoration Authority (CPRA) with the LDWF as the lead implementing agency. Task one requires LDWF to conduct an annual aerial survey to evaluate the herbivory damage caused by nutria. Task two of the CPRA 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 CNCP; 2) establish collection stations across coastal Louisiana; 3) count valid nutria tails and present participants with a receipt/voucher; 4) deliver tails to an approved disposal facility and receive documentation that ensures the nutria will be properly disposed of and shall not leave the facility; and 5) process and maintain records regarding participants, number and location where tails were 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 Interstate-10 from the Texas state line to Baton Rouge, Interstate-12 from Baton Rouge to Slidell, and Interstate-10 from Slidell to the Mississippi state line. The project goal is to significantly reduce damage to coastal wetlands attributable to 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 for each nutria tail delivered to established collection centers. Initially, registered participants were given \$4.00 per nutria tail. To encourage participation, the payment was increased to \$5.00 per tail in the 2006-2007 season.

Methods

The application for participation in the CNCP was developed in July 2002 but is modified as needed to obtain better information about the location of nutria harvest. It was made available through the LDWF offices and website, as well as LSU Cooperative Extension offices. In order for a participant to be qualified, the individual must complete the application, obtain written permission from a landowner or land manager with property in the program area, complete a W-9 tax form and provide LDWF with a complete legal description of the property to be hunted or trapped. A map outlining the property boundaries was an added requirement of participants beginning with the 2003-2004 season. 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 develop and maintain the program database, collect nutria tails, and distribute incentive payment checks to participants for tail harvests. The contract with CEI, which began with the 2002-2003 season, was extended to include the 2003-2004 through 2006-2007, with the option to renew for 3 years thereafter. CEI's first renewal season was 2007-2008, the second renewal season was 2008-2009, and their third renewal season 2009-2010, and their fifth season under their second contract was 2014-2015, which began in 2010. The current contract with CEI included their sixth season (2015-2016) and CEI chose to extend this contract through April

2019. Tail collection sites were originally established at Rockefeller Refuge, Abbeville, Berwick (Morgan City), Houma, and Luling. Slidell and St. Bernard has since been added. Collections were made once a week at most sites except Abbeville were by appointment only, Slidell and St. Bernard were scheduled biweekly, and there were only three scheduled pickups at Rockefeller Refuge due to low numbers of participants in these areas.

Louisiana's open trapping season began on November 20, 2018. Nutria tail collections began November 21, 2018 and continued through April 5, 2019, which was 1 week after the season closed. Collections were made utilizing a 16 foot by 8 foot trailer containing a freezer, sorting table and desk. Participants reported to the collection site of their choice, presented their nutria control program registration card, and presented their tails to a CEI representative.



One CEI representative conducted an exact count of the nutria tails, which was then verified with the participant to ensure they were in agreement. At that time, the counted tails were placed into a plastic garbage bag labeled with the participant's CNCP registration number and the number of tails contained in that bag. Another CEI representative filled out a voucher on a tablet PC for the number of tails delivered, checking to make sure the mailing address of the participant was correct. The participant was asked a wide range of questions including method of take, location of take, and method of disposal (Figure 17). When complete, the voucher was signed using a stylus by the participant who would also indicate on a detailed map of their lease the location or locations where the nutria were harvested. The CEI representative would use a stylus to draw a polygon around the indicated area in a mapping program and save an electronic copy of the completed voucher. A copy of the voucher was printed and given to the participant. LDWF personnel conducted random audits of collected tails to ensure accuracy in counting and incentive payments.



The information on the voucher was transferred electronically to the CEI main offices via an FTP site for analysis and quality control. The data transfer occurred at the end of each collection day. Collected tails were transported to the BFI waste storage facility in Sorrento, Louisiana, at the end of each collection week or more frequently if necessary. The CEI representative checked in at a guard station

where the vehicle containing the tails was weighed. The vehicle was also weighed when exiting the disposal site in order to calculate the exact amount of waste deposited at the facility. The tails were deposited into a biohazard waste pit under supervision of a BFI employee. The number of bags disposed, as well as weight deposited, was recorded on a receipt given to the CEI representative. Copies of the receipts for all disposals made were supplied to LDWF.

The digitized vouchers and maps went through a rigorous QA/QC process each week which would end with the data being compiled and sent in a weekly report to LDWF detailing each transaction, including digital maps exported from ArcMap 10.4 of that week’s trapped/hunted areas. Each Monday morning, after receiving a weekly report and bill, LDWF sent a payment to CEI for the amount of tails collected and services rendered. CEI in turn sends participants checks through the mail for the amount of tails turned in. Louisiana’s open trapping season ended on March 31, 2018, and nutria tail collections continued until the first Friday of April. After the conclusion of the season, CEI provided LDWF with all the transaction information for the entire season from November to March. This final report contains information recorded on the vouchers, the digitized trapped/hunted area, the nutria control program database and an ArcMap project map with related information.

Results and Discussion

Participant Totals

We registered a total of 392 participants in the program for the 2018-2019 season. A total of 223,155 nutria tails worth \$1,115,775 in incentive payments were collected from 241 active participants. The fewest number of tails turned in by a single participant was 8 and the greatest number of tails by a single participant was 10,994. Approximately 32% of active participants turned in 800 or more tails (Figure 2A). Of the 78 participants who turned in 800 or more tails, 4% turned in more than 4,000 tails (Figure 2B).

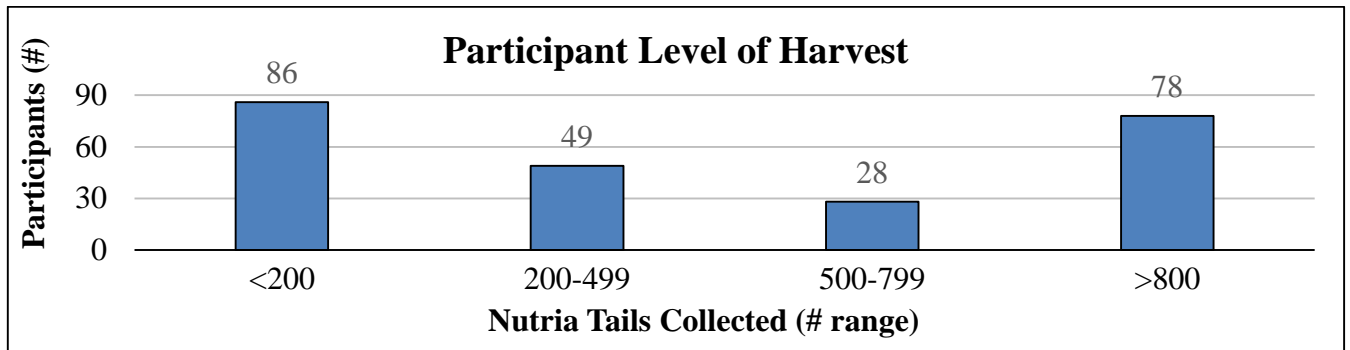


Figure 2A. Participant level of harvest for all 241 active participants.

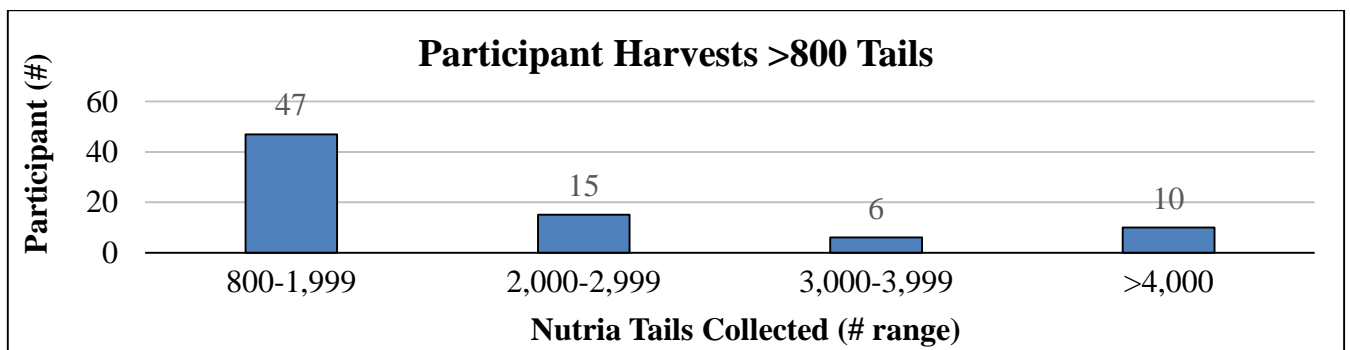


Figure 2B. Participant level of harvest for the 78 participants who harvested more than 800 tails.

Harvest by Month

The 2018-2019 trapping season began November 20th, 2018 and continued through March 31st, 2019. Seventy-five thousand three hundred and seven (75,307) tails were collected in the month of February making it the most active month of the season. Tails that were presented at the collection sites through the first week of April are included in the March harvest (Figure 3).

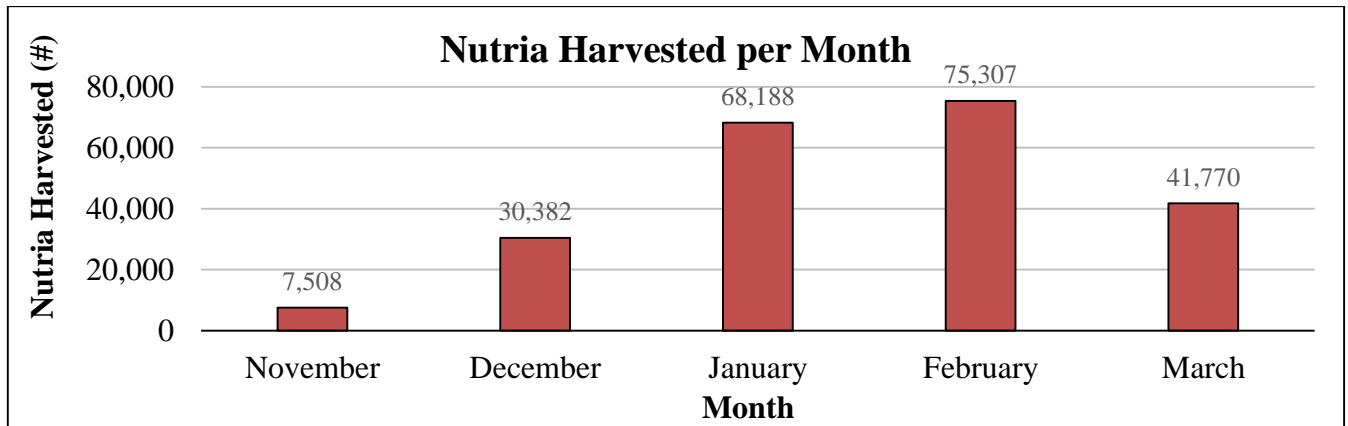


Figure 3. CNCP nutria harvest per month.

Harvest by Marsh Type

Harvest data were classified by marsh type: Fresh Marsh; Intermediate Marsh; Brackish Marsh; Salt Marsh; Swamp; and Other. The category Other includes developed properties and agricultural areas. During the 2018-2019 season, 40% of nutria were harvested from Fresh Marsh, followed by Swamp (22%), Intermediate (16%), Brackish (12%), Salt (7%), and Other (13%; Figure 4). During the first 15 seasons, we reported harvests for a category called Open Water, which were leases having more acres of open water than land acres. We eliminated Open Water during the 2016-2017 season because that category was too vague and instead these harvests are included in the marsh type category that comprised the most land acres within the lease area.

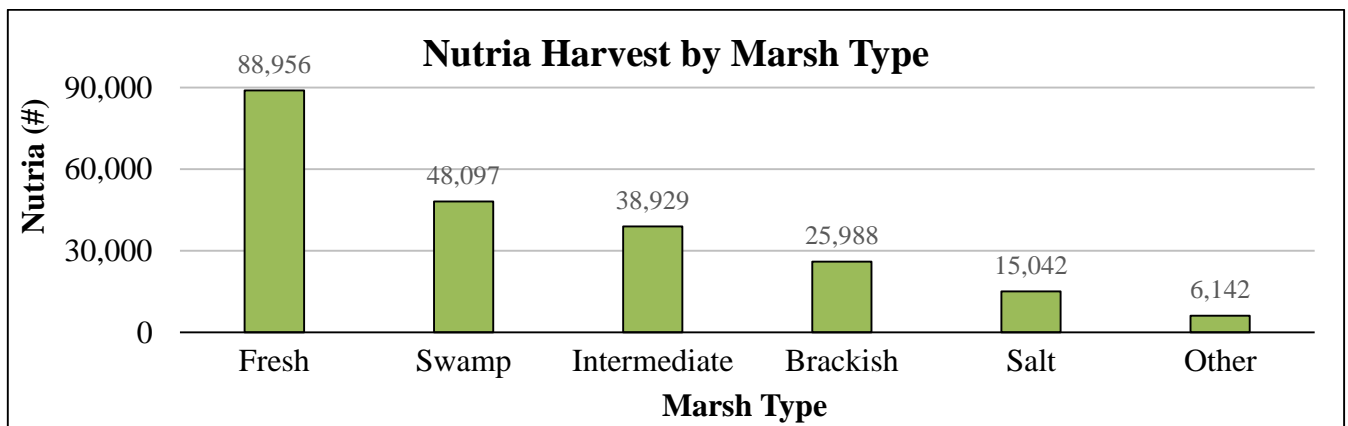


Figure 4. CNCP nutria harvest by marsh type.

Method of Take

During collection transactions, program participants indicated their method of take: trapped; shot with rifle; or shot with shotgun. The predominant method of take used in the 2018-2019 season was shooting with a rifle (Figure 5).

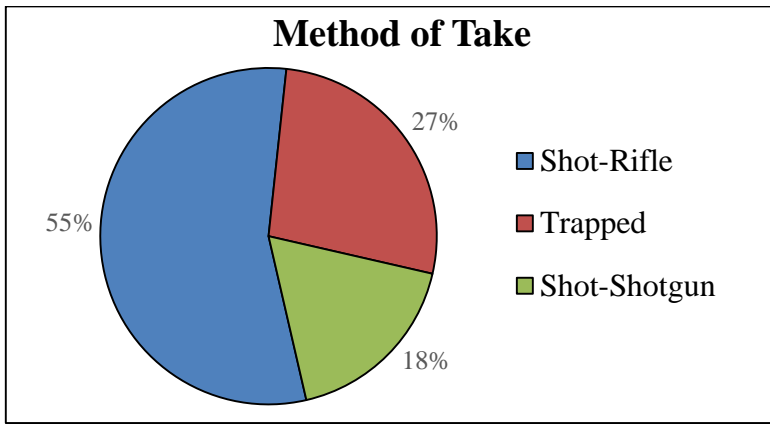


Figure 5. Method of take.

Harvesting with a rifle is the most common method of take used in all marsh types (Figure 6).

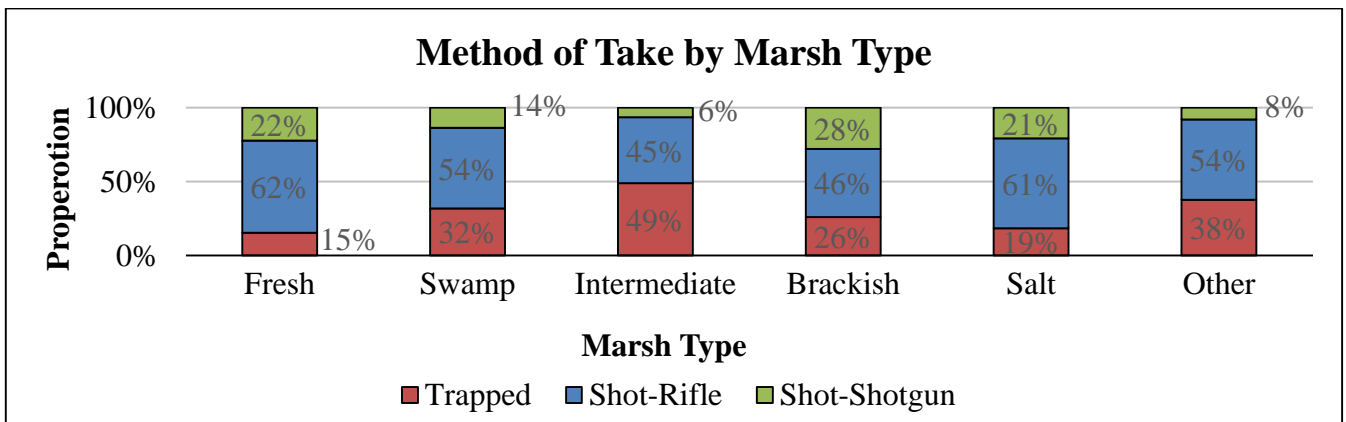


Figure 6. Method of take within each marsh type.

Carcass Use/Disposal

Use or method of disposal for nutria carcasses was recorded for each participant transaction. Overall, 7% of the nutria harvested were kept as whole carcass, of which no hides or meat were sold. The remaining 93% of nutria carcasses were disposed of by approved methods, which include burying carcasses, placing carcasses in heavy overhead vegetation, or sinking the carcasses in the water (Table 1). All interested participants were supplied a fur buyer/fur dealer list to encourage the use of animals for the fur and meat.

Marsh Type	Whole Carcass	Hide	Meat	Abandoned-Buried	Abandoned-Vegetation	Abandoned-Waterway
Fresh	5,823	0	0	54,500	16,433	12,393
Swamp	2,224	0	0	41,766	1,607	2,500
Intermediate	1,623	0	0	28,787	4,387	4,133
Brackish	3,912	0	0	12,041	8,685	1,349
Salt	1,953	0	0	7,487	494	5,108
Other	587	0	0	4,706	616	233
Total	16,122	0	0	149,287	32,222	25,716

Table 1. CNCP nutria carcas use or disposal. The total number within each category was estimated from percentages reported by participants.

Harvest by Parish

Twenty parishes were represented in the 2018-2019 season of the CNCP, with nutria harvests ranging from 163 to 51,960 nutria. Terrebonne Parish reported the highest number of tails with 51,960 followed by Plaquemines, St. Mary Parishes, and Lafourche Parishes with 39,657, 31,257, and 19,458 tails respectively (Figure 7).

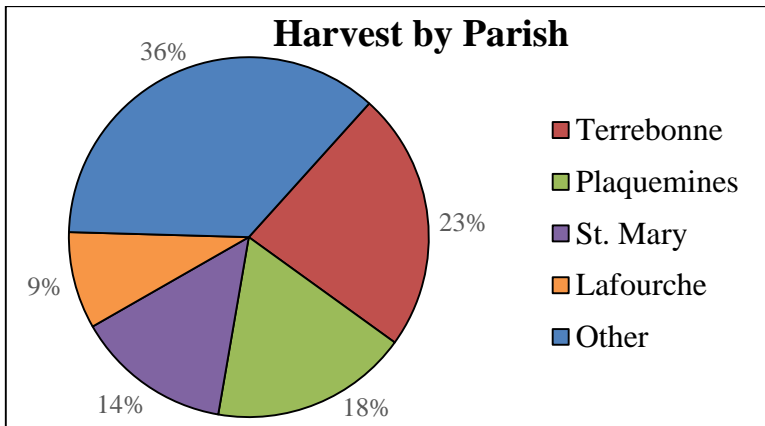


Figure 7. CNCP harvest by parish.

Section 2

A SURVEY OF NUTRIA HERBIVORY DAMAGE IN COASTAL LOUISIANA IN 2019

Introduction

Herbivory damage was noticed in the late 1980s by landowners and land managers when the price of fur dropped and the harvest of nutria all but ceased. The LDWF was contacted to investigate the problem. 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 BTNEP. The objectives of the aerial survey were to: (1) determine the distribution of damage along the transect lines as an index of region wide damage, (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 with more than 15,000 acres of marsh impacted along the transects with 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 extrapolated acreage of 77,408 acres across the study area. (The extrapolated coastwide estimate is derived by multiplying the observed acres by 3.75 to account for area not visible from the transect lines.) All of the 1993 sites were evaluated again in 1996, but 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 coastwide nutria herbivory survey was flown, as part of the Nutria Harvest and Wetland Demonstration Program (LA-03a). A total of 23,960 acres of damaged wetlands were located at 170 sites along the survey transects, with an extrapolated coastwide estimate of 89,850 acres. In 1999, the damage increased to 27,356 acres located at 150 sites, with an extrapolated coastwide estimate of 102,585 acres. In 2000, the damage slightly decreased to 25,939 acres located at 132 sites, with an extrapolated coastwide estimate of 97,271 acres. In 2001, the damage decreased to 22,139 acres located at 124 sites, with an extrapolated coastwide estimate of 83,021 acres. In the 2002 survey, which was the first survey funded as part of the CNCP and the survey which preceded implementation of the CNCP incentive payments, the damage decreased again, but only slightly to 21,185 acres located at 94 sites, with an extrapolated coastwide estimate of 79,444 acres. During the 2003 survey, a total of 84 sites had some level of vegetative damage and covered a total of 21,888 acres, with an extrapolated coastwide estimate of 82,080 acres. In summary, the coastwide estimates of nutria herbivory damage prior to implementation of the CNCP incentive payments (from 1998 to 2003) ranged from 79,444 to 102,585 acres.

Vegetative damage caused by nutria has been documented in at least a dozen 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 throughout coastal Louisiana.

The previous extrapolated estimates of 79,444 to 102,585 acres of marsh damaged was conservative because only the worst sites (most obvious) can be detected from aerial surveys; the actual 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 and/or storms. If damaged areas do not revegetate quickly, they may become open water as tidal scour removes soil and thus lowers elevation. This is evident as the damaged sites that converted to open water over the last five years have been in the intermediate and brackish marsh types. Frequently the plant's root systems are also damaged, making recovery through vegetative regeneration very slow.

In an effort to create an incentive for trappers and hunters, the CNCP was implemented. Task number 1 of the LDNR 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's impact of nutria herbivory. Survey techniques followed Linscombe and Kinler (1997), and CNCP funded surveys, have been conducted each spring from 2003 to present. Results were analyzed and the numbers of acres impacted or recovered were determined.

Methods

The 2019 coastwide nutria herbivory survey was conducted April 2nd – May 23rd. Typically, the survey is flown in consecutive days and weeks, weather permitting, but a number of weather events, helicopter mechanical issues, and scheduling conflicts delayed completion of this survey for several weeks. North-South transects were flown throughout the fresh, intermediate, and brackish marshes of coastal Louisiana. Annually, a total of 155 transects (covering 2,354.7 miles) are 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. Due to low nutria population density, salt marsh habitat was not included in the survey and neither were swamp and other (developed areas and agricultural land) because nutria damage in these habitats cannot be reliably identified from the helicopter. Depending upon visibility and vegetative conditions, an altitude of 200-300 feet was considered optimum. At this altitude, vegetative damage was identifiable and allowed for a survey transect width of about 1/4 mile on each side of the helicopter. Flight speed was approximately 80 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 line and the other observer recorded all pertinent data.



When vegetative damage was identified, the helicopter landed at the site and the following information was recorded:

- 1) Location of each site was determined by recording latitude and longitude utilizing GPS equipment. A real time differential corrected (WAAS Enabled) GPS (Garmin GPSmap 696) was utilized to allow for accurate location of damaged sites. The open-source software DNRGPS, provided by the Minnesota Department of Natural Resources was used in conjunction with ArcView 10.2 to determine the size of each damage site, by logging polygons using stream digitizing with the GPS equipment.

- 2) The abundance of nutria sign was placed in one of the following nutria relative abundance rating (NRAR) categories: **(0) no nutria sign visible, (1) nutria sign visible, (2) abundant feeding, or (3) heavy feeding.**
- 3) The extent of damage to the vegetation was placed in one of the following vegetative damage rating categories: **(0) no vegetative damage; (1) minor vegetative damage** which is defined as a site containing feeding holes, thinning vegetation and some visible soil; **(2) moderate vegetative damage** which is defined as a site that has large areas of exposed soil and covers less than 50% of the site; **(3) severe vegetative damage** which is defined as a site that has more than 50% of the soil exposed; or **(4) converted to open water.**
- 4) The dominant plant species were identified and recorded for damaged areas, recovering areas and in the adjacent areas.
- 5) The age of damage and condition is determined by considering feeding activity and vegetation condition. The age of damage and condition was placed in one of the following categories: **(0) recovered, (1) old recovering, (2) old not recovering, (3) recent recovering, (4) recent not recovering, or (5) current (occurring now).**
- 6) The prediction of vegetative recovery is made considering feeding activity, age of damage and the extent of damage. The prediction of vegetative recovery by the end of 2013 was characterized by one of the following categories: **no recovery (0), full recovery (1), partial recovery (2) or increased damage (3).**
- 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. Damaged site locations are provided on the attached herbivory map and a data summary in Appendix B.

Results and Discussion

There were 25 nutria damage sites observed during the 2019 vegetative damage survey compared to the 21 damage sites observed during the 2018 survey. Four of the observed damaged sites were new and the remaining 21 were sites observed in previous years' surveys. No sites were identified as recovered since the 2018 vegetative damage survey (Figure 8).

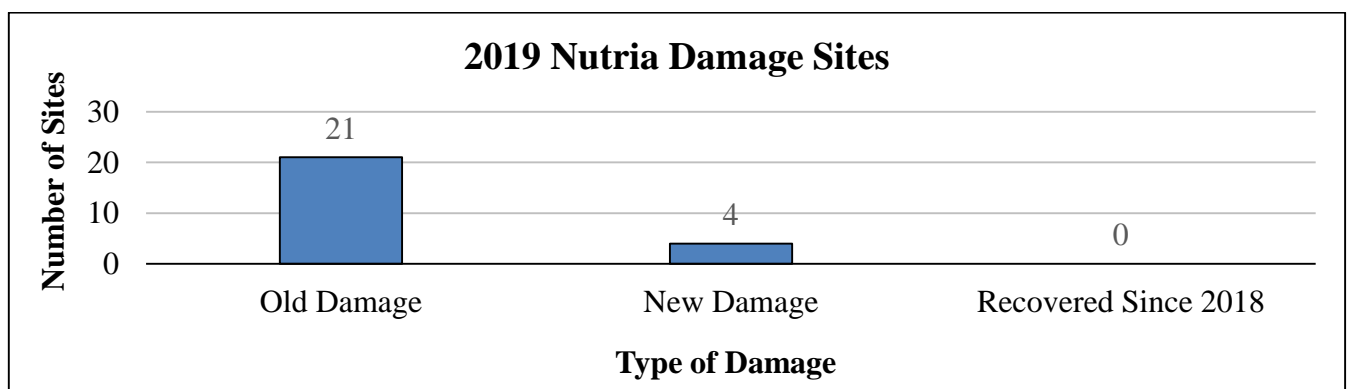


Figure 8. 2018 vegetation survey damage sites located along transect lines.

Nutria Damage

The following discussion details the 25 sites that had observable nutria damage during the 2019 survey (Appendix A). A total of 3,907 acres along transects, extrapolated to 14,652 acres coastwide were identified as impacted by nutria feeding activity. This represents approximately a 11% decrease in acres impacted by nutria since 2018 (4,380 acres, extrapolated 16,424 acres coastwide.) There were 11 damage sites documented during the 2018 survey that have since partially converted to open water with a total of 910 observed acres converted (Figure 12 and Tables 10A-10C).

Damage by Parish

Four parishes were observed to have damage in 2019. Most of the observed damaged acres were in Terrebonne Parish (3,319ac; 18 sites), followed by St. Mary Parish (378ac; 4 site), Cameron Parish (117ac, 2 site), and St. Charles Parish (93ac, 1 site; Figure 9).

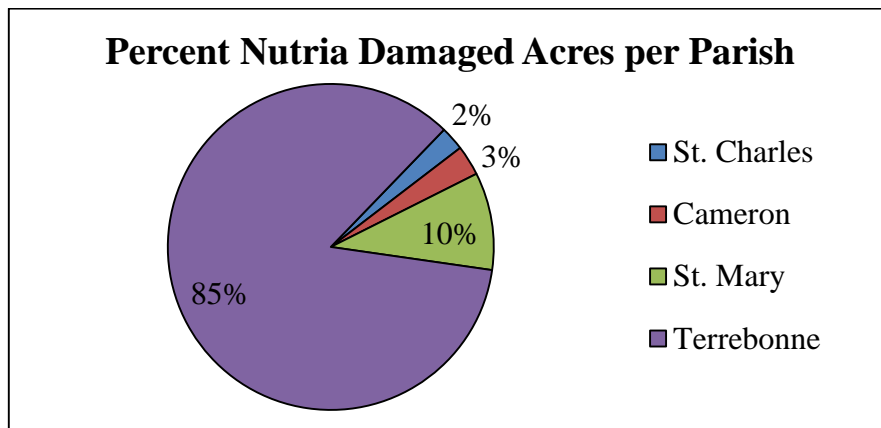
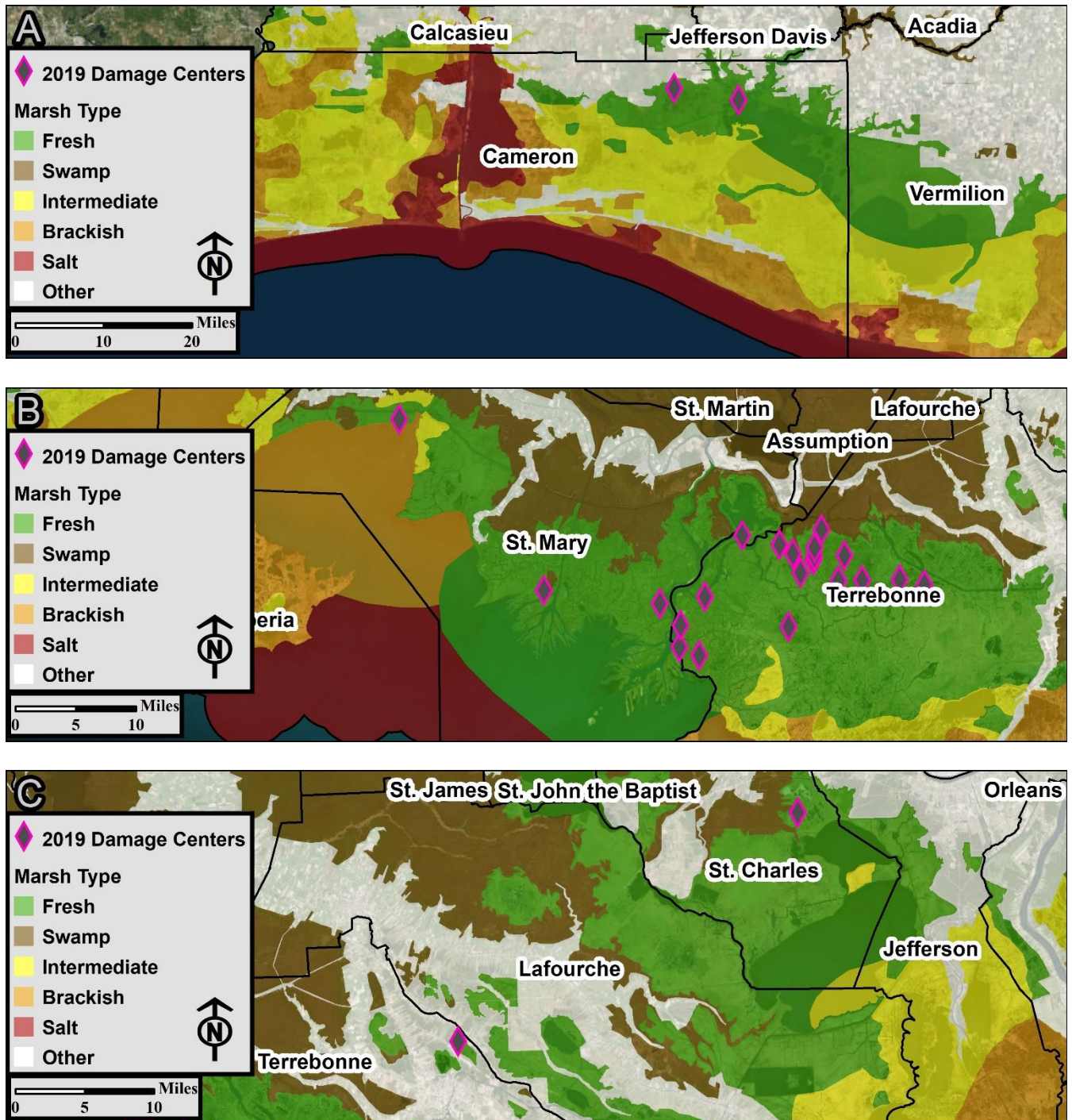


Figure 9. 2019 vegetation survey damaged acres by parish.

Damage by Marsh Type

Marsh type, based on Vegetation types in coastal Louisiana in 2013 (Sasser, Visser, Mouton, Linscombe, and Hartley 2014), was recorded for each damage site (Figures 10A-10C).



Figures 10A-C. 2019 Vegetation survey damage centers. (A) 2 sites in Cameron Parish (B) 4 sites in St. Mary Parish and 17 sites in western Terrebonne Parish (C) 1 site in eastern Terrebonne Parish and 1 site in St. Charles Parish.

All observed sites damaged by nutria herbivory were located in fresh water marsh. The typical vegetation impacted in fresh marsh was *Eleocharis* spp., *Hydrocotyle* spp, and *Bidens laevis*.

Nutria Relative Abundance Rating

A nutria relative abundance rating (NRAR) was used to quantify the abundance of nutria at each site. Categories include: (0) no nutria sign visible, (1) nutria sign visible, (2) abundant feeding sign, and (3) heavy feeding sign; sites converted to open water are not given a NRAR (Figure 11.)

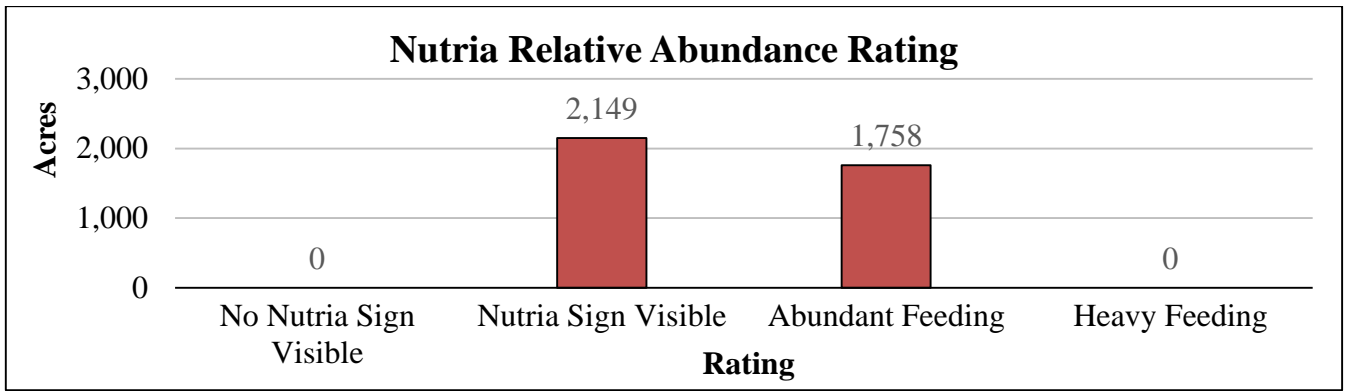


Figure 11. Nutria relative abundance ratings for 2019 nutria damaged sites.

Vegetative Damage Rating

Vegetative damage was also evaluated at each site. A rating system was developed to quantify nutria vegetative damage. The vegetative damage rating (VDR) has five categories: (0) no vegetative damage, (1) minor vegetative damage, (2) moderate vegetative damage, (3) severe vegetative damage, (4) converted to open water (Figure 12). Nine of the damage sites contained greater than one VDR as different portions of each site may be more or less damaged than other areas within the same site. The acres impacted is estimated from the proportion of each site impacted at each rating level.

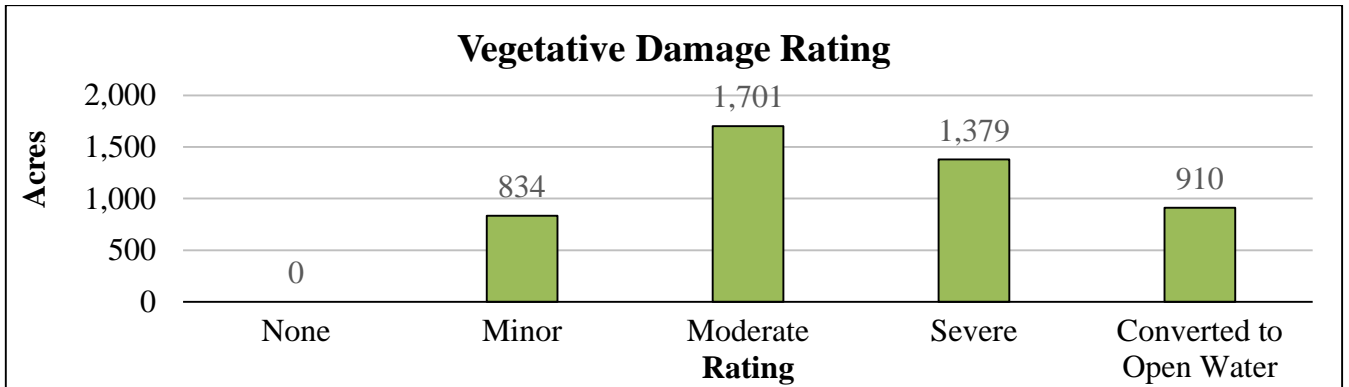


Figure 12. Vegetative damage ratings for 2019 nutria damaged sites.

Age of Damage Rating

Categories for the age of damage and condition rating include: (0) recovered, (1) old damage-recovering, (2) old damage not recovering, (3) recent damage-recovering, (4) recent damage-not recovering, and (5) current damage (Figure 13).

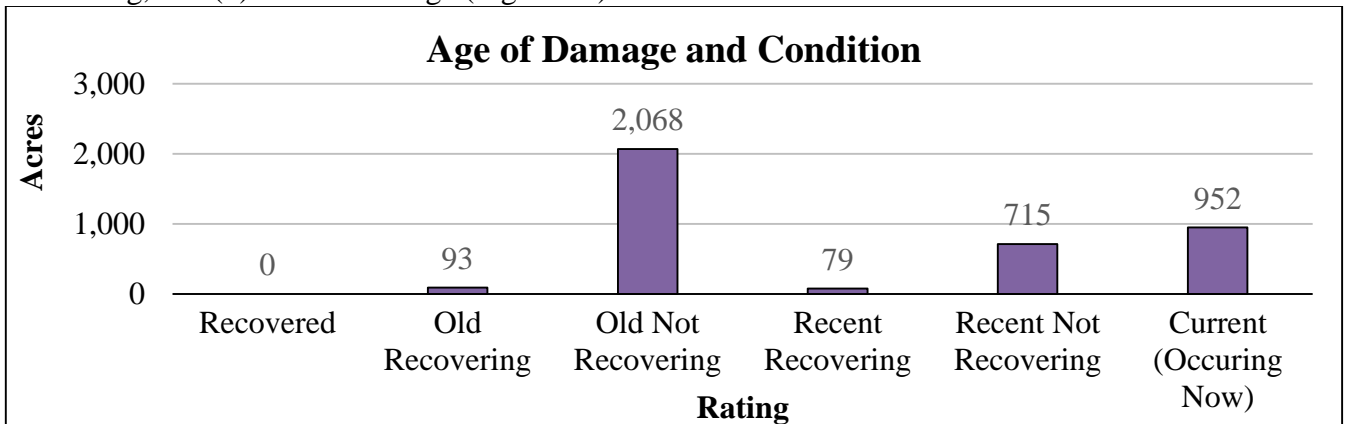


Figure 13. Age of damage and condition of 2019 nutria damaged sites.

Prediction of Recovery

For each site with current damage, the degree of recovery by the end of the 2019 growing season was predicted. These categories include: (1) full recovery, (2) partial recovery, (3) increased damage and (4) no recovery predicted (Figure 14).

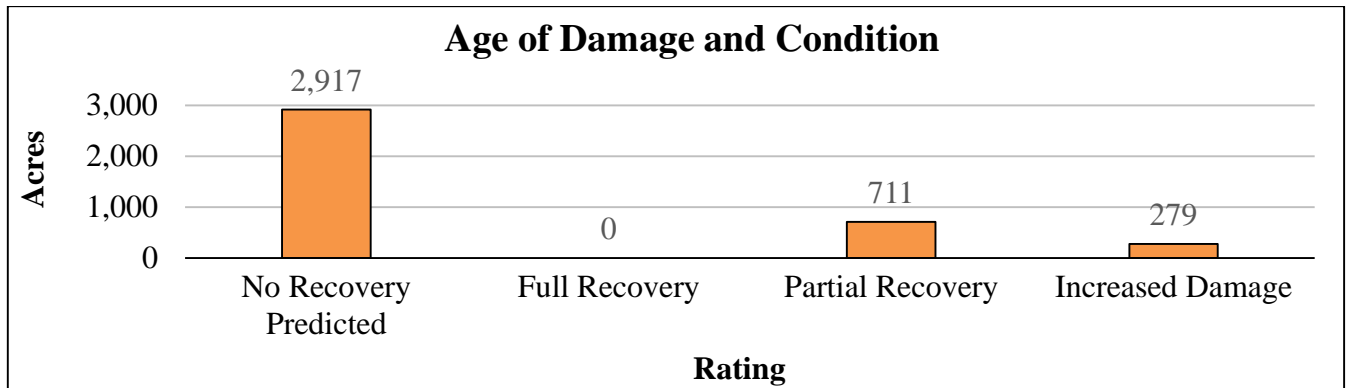


Figure 14. Prediction of recovery by the end of the growing season for the 2019 nutria damaged sites.

Conclusions

The 2019 vegetative damage survey yielded a total of 3,907 acres of nutria damage along transect lines. When extrapolated to the entire program area, an estimated 14,652 acres were impacted coastwide at the time of survey. When compared to the 2018 survey (4,380 acres, extrapolated to 16,424 acres coastwide), there was approximately a 11% decrease in the number of damaged acres.

Due to the distance between survey lines, all areas impacted by nutria herbivory could not be identified. Additionally, there were areas along survey lines where nutria activity was observed but marsh conditions did not warrant a damage classification (i.e., nutria present but no damage observed or damaged areas <1ac are too small to record). Only the most obvious impacted areas were detected and recorded so the total impact of nutria was probably underestimated.

Section 3

Summary of Results (2002-2019) and Adaptive Management

In total, 5,340,741 nutria have been harvested from coastal Louisiana through 17 seasons of the CNCP. Throughout much of the CNCP, seasonal nutria tail collection, which is how we determine harvest, has ranged between 300,000 and 400,000. From the beginning of the CNCP through 2011, estimated coastwide nutria damage declined nearly every year and then from 2011-2017, the damaged areas stabilized between 4,000 and 6,500 acres. Unfortunately, nutria harvest during the 2016-2017 and the 2017-2018 seasons was 216,059 and 170,471, respectively, which is substantially lower harvest than years prior. Subsequently, estimated coastwide nutria damage increased from 5,866 acres in 2017 to 16,424 acres in 2018. Harvest during the 2018-2019 season was higher with 223,155 nutria than the previous 2 seasons, but still lower than the average harvests of normal seasons (Figure 15). Although the total damaged acres decreased from 16,424 in 2018 to 14,652 in 2019, the number of damage sites increased from 21 to 25 and approximately 910 acres were converted to open water.

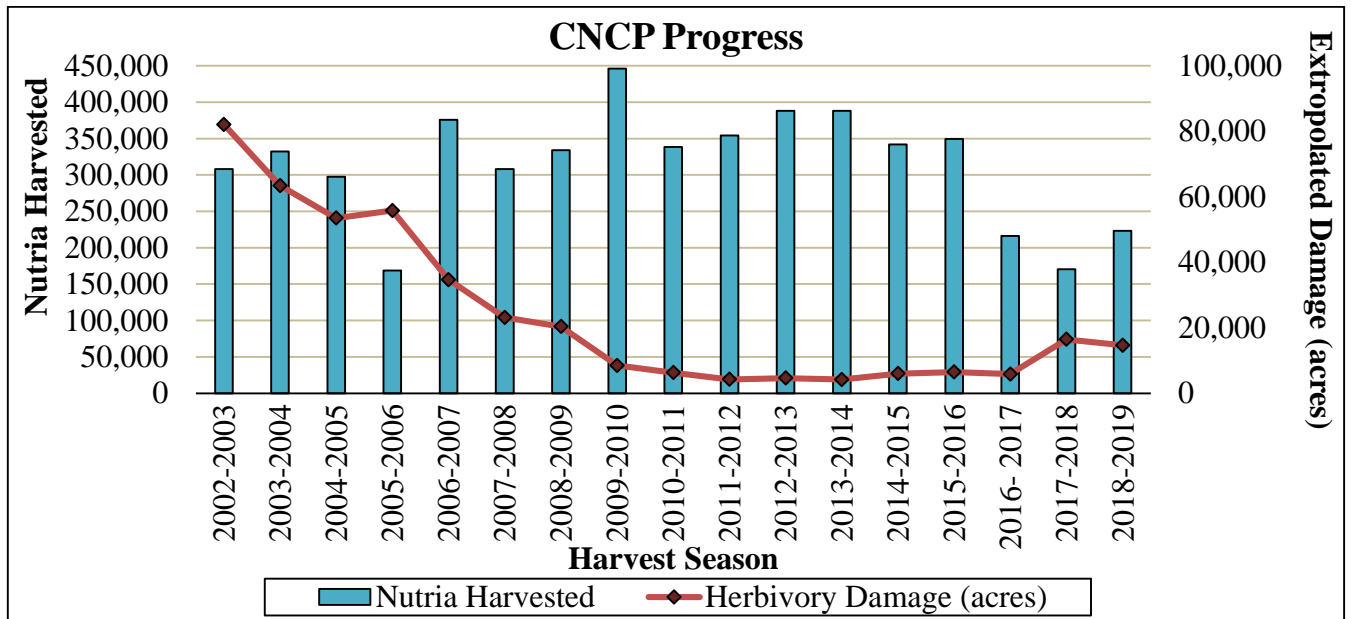


Figure 15. Nutria harvest and coastwide nutria herbivory damage. The low harvest during the 2005-2006 season is attributed to the coastwide disruptions caused by Hurricane Katrina in August 2005.

Prior to implementation of CNCP incentive payments, nutria harvest was below 30,000 per season and coastwide nutria damage ranged between 79,000 and 98,000 acres.

Harvest Season	Nutria Harvested	Year of Survey	Herbivory Damage (acres)
1999-2000	20,110	2000	97,271
2000-2001	29,544	2001	83,021
2001-2002	24,683	2002	79,444

Table 2. Nutria harvest and herbivory damage in years prior to CNCP.

Harvest Season	Nutria Harvested	Total Incentive Payments	Year of Survey	Herbivory Damage (acres)
2002-2003	308,160	\$1,232,640	2003	82,080
2003-2004	332,596	\$1,330,384	2004	63,398
2004-2005	297,535	\$1,190,140	2005	53,475
2005-2006	168,843	\$675,372	2006	55,755
2006-2007	375,683	\$1,878,415	2007	34,665
2007-2008	308,212	\$1,541,060	2008	23,141
2008-2009	334,038	\$1,670,190	2009	20,333
2009-2010	445,963	\$2,229,815	2010	8,475
2010-2011	338,512	\$1,692,560	2011	6,296
2011-2012	354,354	\$1,771,770	2012	4,233
2012-2013	388,160	\$1,940,800	2013	4,624
2013-2014	388,264	\$1,941,320	2014	4,181
2014-2015	341,708	\$1,708,540	2015	6,008
2015-2016	349,235	\$1,746,175	2016	6,496
2016- 2017	216,052	\$1,080,260	2017	5,866
2017-2018	170,471	\$852,355	2018	16,424
2018-2019	223,155	\$1,115,775	2019	14,652
Total	5,340,741	\$26,703,705		

Table 3. Nutria harvest and herbivory throughout 17 seasons of the CNCP.

Adaptive Management

The low nutria harvest throughout the 2016-2017, 2017-2018, and 2018-2019 seasons has resulted in increased nutria damage throughout coastal Louisiana. Responses to participant surveys mailed during the summers of 2017 and 2018 indicated that raising the amount of the incentive payment would increase participation and nutria harvest. Therefore, CNCP managers and partners decided to raise the incentive payment from \$5/tail, which has been the price since 2005, to \$6/tail to be implemented during the 2019-2020 CNCP season.

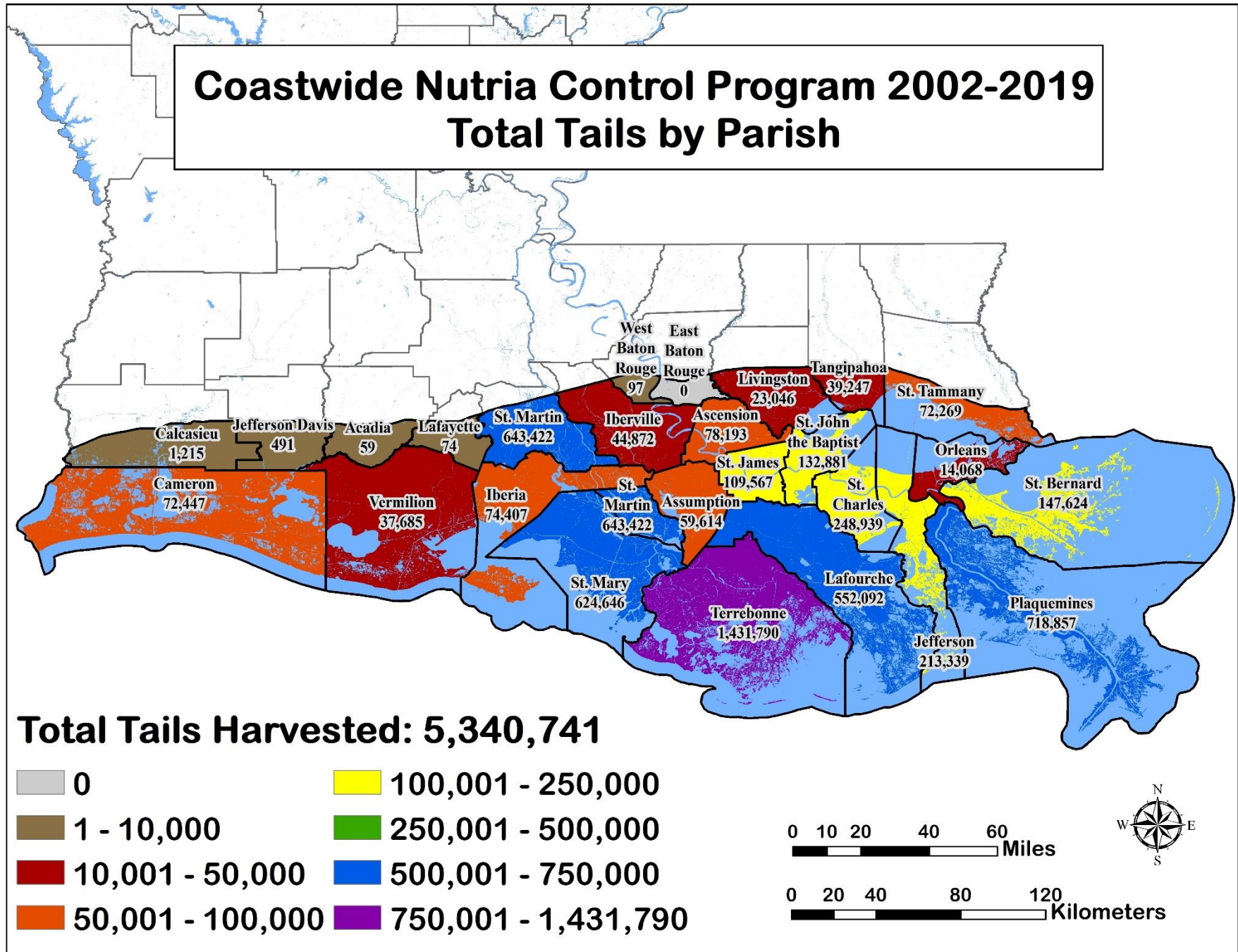


Figure 16. Total nutria harvest during 17 seasons of CNCP.

RNCP #: Transaction #: Date:

Participant Name: Number of tails accepted:

Transaction Information
 Number of tails rejected:

Reason for rejection: (check all that apply)
 short spoiled
 other (specify)

Method of Tail Collection (Take): (check all that apply)
 Trapped %
 Shot, rifle %
 Shot, shotgun %
 other (specify)

of days trapped avg # of traps/day
 # of days hunted # of hunters
 Retrieval Rate % Total Days

Month of Tail Collection:
 Nov % Feb %
 Dec % Mar %
 Jan % Apr %

Disposal of carcass: (check all that apply)
 Took whole carcass %
 Hide % Meat %
 Buried %
 Left in overhead vegetation %
 Left in waterway %
 Night Hunt %

Additional Notes: (optional)

Figure 17. Screenshot of the digital datasheet used by Coastal Environments Inc. during the tail collections.

Appendix A.
A Comparison of Seasons 1-17
(2002-2019)

PARISH	2002-2003		2003-2004		2004-2005		2005-2006		2006-2007		2007-2008	
	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage
Acadia	0	-	0	-	0	-	0	-	0	-	0	-
Ascension	2,710	0.88%	5,474	1.65%	1,855	0.62%	1,678	0.99%	2,226	0.59%	1,957	0.63%
Assumption	3,128	1.02%	814	0.24%	427	0.14%	2,307	1.37%	2,095	0.56%	3,863	1.25%
Calcasieu	143	0.05%	374	0.11%	447	0.15%	58	0.03%	19	0.01%	19	0.01%
Cameron	7,851	2.55%	8,701	2.62%	16,592	5.58%	3,744	2.22%	1,725	0.46%	649	0.21%
East Baton Rouge	0	-	0	-	0	-	0	-	0	-	0	-
Iberia	1,412	0.46%	1,960	0.59%	3,516	1.18%	3,014	1.79%	18,910	5.03%	6,119	1.99%
Iberville	0	-	1,567	0.47%	5,551	1.87%	2,360	1.40%	9,172	2.44%	2,105	0.68%
Jefferson	20,529	6.66%	24,896	7.49%	11,019	3.70%	2,875	1.70%	10,405	2.77%	11,299	3.67%
Jefferson Davis	121	0.04%	85	0.03%	175	0.06%	110	0.07%	0	-	0	-
Lafayette	39	0.01%	25	0.01%	10	0.00%	0	-	0	-	0	-
Lafourche	28,852	9.36%	51,736	15.56%	32,362	10.88%	24,668	14.61%	28,038	7.46%	25,473	8.26%
Livingston	2,631	0.85%	357	0.11%	910	0.31%	1,921	1.14%	1,250	0.33%	695	0.23%
Orleans	597	0.19%	0	-	537	0.18%	0	-	575	0.15%	1,333	0.43%
Plaquemines	63,208	20.51%	86,720	26.07%	38,984	13.10%	1,816	1.08%	5,815	1.55%	41,072	13.33%
St. Bernard	5,769	1.87%	13,344	4.01%	4,337	1.46%	0	-	291	0.08%	4,150	1.35%
St. Charles	11,169	3.62%	12,672	3.81%	15,843	5.32%	13,807	8.18%	18,690	4.97%	18,271	5.93%
St. James	95	0.03%	487	0.15%	2,837	0.95%	4,912	2.91%	7,111	1.89%	9,604	3.12%
St. John the Baptist	18,450	5.99%	6,137	1.85%	8,391	2.82%	6,384	3.78%	15,786	4.20%	6,728	2.18%
St. Martin	11,425	3.71%	15,039	4.52%	31,608	10.62%	15,903	9.42%	113,629	30.25%	54,726	17.76%
St. Mary	26,004	8.44%	16,277	4.89%	20,908	7.03%	21,023	12.45%	34,693	9.23%	34,210	11.10%
St. Tammany	4,638	1.51%	3,756	1.13%	5,167	1.74%	1,423	0.84%	2,067	0.55%	4,356	1.41%
Tangipahoa	1,245	0.40%	745	0.22%	564	0.19%	826	0.49%	1,843	0.49%	2,323	0.75%
Terrebonne	92,831	30.12%	72,846	21.90%	81,012	27.23%	57,756	34.21%	99,433	26.47%	78,934	25.61%
Vermilion	5,313	1.72%	8,584	2.58%	14,481	4.87%	2,258	1.34%	1,813	0.48%	326	0.11%
West Baton Rouge	0	-	0	-	0	-	0	-	97	0.03%	0	-
Total	308,160	1	332,596	1	297,535	1	168,843	1	375,683	1	308,212	1

Table 4. Nutria harvested by parish seasons 1-17, Coastwide Nutria Control Program.

PARISH	2008-2009		2009-2010		2010-2011		2011-2012		2012-2013		2013-2014	
	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage
Acadia	0	-	0	-	0	-	0	-	59	0.02%	0	-
Ascension	7,029	2.10%	7,049	1.58%	3,435	1.01%	0	-	0	-	7,889	2.03%
Assumption	1,093	0.33%	2,930	0.66%	3,244	0.96%	3,582	1.01%	6,302	1.62%	7,904	2.04%
Calcasieu	0	-	0	-	0	-	0	-	0	-	0	-
Cameron	1,245	0.37%	1,177	0.26%	1,076	0.32%	413	0.12%	174	0.04%	1,446	0.37%
East Baton Rouge	0	-	0	-	0	-	0	-	0	-	0	-
Iberia	978	0.29%	1,206	0.27%	286	0.08%	1,384	0.39%	5,360	1.38%	12,157	3.13%
Iberville	231	0.07%	6,065	1.36%	886	0.26%	1,688	0.48%	3,062	0.79%	3,046	0.78%
Jefferson	12,515	3.75%	11,506	2.58%	5,945	1.76%	6,178	1.74%	16,152	4.16%	10,244	2.64%
Jefferson Davis	0	-	0	-	0	-	0	-	0	-	0	-
Lafayette	0	-	0	-	0	-	0	-	0	-	0	-
Lafourche	48,252	14.45%	39,564	8.87%	37,137	10.97%	37,415	10.56%	47,723	12.29%	42,061	10.83%
Livingston	444	0.13%	2,186	0.49%	738	0.22%	0	-	0	-	3,405	0.88%
Orleans	656	0.20%	1,756	0.39%	2,279	0.67%	1,238	0.35%	1,006	0.26%	929	0.24%
Plaquemines	42,212	12.64%	69,294	15.54%	80,241	23.70%	71,879	20.28%	22,171	5.71%	21,808	5.62%
St. Bernard	13,965	4.18%	3,543	0.79%	29,278	8.65%	27,053	7.63%	4,073	1.05%	5,201	1.34%
St. Charles	21,215	6.35%	27,221	6.10%	16,069	4.75%	10,830	3.06%	14,347	3.70%	14,164	3.65%
St. James	8,990	2.69%	19,226	4.31%	9,167	2.71%	15,450	4.36%	14,455	3.72%	5,443	1.40%
St. John the Baptist	10,189	3.05%	6,642	1.49%	9,447	2.79%	2,678	0.76%	6,832	1.76%	3,237	0.83%
St. Martin	44,972	13.46%	63,619	14.27%	23,551	6.96%	36,562	10.32%	40,356	10.40%	54,027	13.92%
St. Mary	34,811	10.42%	67,631	15.17%	43,533	12.86%	45,859	12.94%	64,386	16.59%	58,229	15.00%
St. Tammany	5,680	1.70%	8,855	1.99%	6,562	1.94%	6,417	1.81%	1,217	0.31%	1,485	0.38%
Tangipahoa	4,974	1.49%	267	0.06%	448	0.13%	141	0.04%	1,864	0.48%	4,637	1.19%
Terrebonne	74,587	22.33%	106,226	23.82%	65,190	19.26%	85,587	24.15%	138,305	35.63%	130,952	33.73%
Vermilion	0	-	0	-	0	-	0	-	316	0.08%	0	-
West Baton Rouge	0	-	0	-	0	-	0	-	0	-	0	-
Total	334,038	1	445,963	1	338,512	1	354,354	1	388,160	1	388,264	1

Table 4 (Continued). Nutria harvested by parish seasons 1-17, Coastwide Nutria Control Program.

PARISH	2014-2015		2015-2016		2016-2017		2017-2018		2018-2019	
	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage	Nutria Harvested	Percentage
Acadia	0	-	0	-	0	-	0	-	0	-
Ascension	16,013	4.69%	4,693	1.34%	1,777	0.82%	1,353	0.79%	1,537	0.90%
Assumption	7,603	2.22%	3,096	0.89%	2,372	1.10%	1,555	0.91%	1,886	1.11%
Calcasieu	0	-	0	-	0	-	154	0.09%	0	-
Cameron	2,848	0.83%	2,607	0.75%	2,534	1.17%	5,805	3.41%	13,835	8.12%
East Baton Rouge	0	-	0	-	0	-	0	-	0	-
Iberia	7,296	2.14%	4,516	1.29%	2,514	1.16%	1,683	0.99%	2,469	1.45%
Iberville	1,076	0.31%	2,930	0.84%	419	0.19%	2,379	1.40%	4,122	2.42%
Jefferson	12,855	3.76%	12,239	3.50%	20,025	9.27%	11,060	6.49%	13,695	8.03%
Jefferson Davis	0	-	0	-	0	-	0	-	0	-
Lafayette	0	-	0	-	0	-	0	-	0	-
Lafourche	29,190	8.54%	31,810	9.11%	18,249	8.45%	10,388	6.09%	19,458	11.41%
Livingston	1,279	0.37%	0	0.00%	1,879	0.87%	1,538	0.90%	2,539	1.49%
Orleans	485	0.14%	1,103	0.32%	1,077	0.50%	334	0.20%	163	0.10%
Plaquemines	23,883	6.99%	46,672	13.36%	33,684	15.59%	29,474	17.29%	39,657	23.26%
St. Bernard	5,410	1.58%	12,939	3.70%	11,094	5.13%	3,533	2.07%	3,729	2.19%
St. Charles	16,355	4.79%	13,685	3.92%	11,602	5.37%	5,626	3.30%	7,350	4.31%
St. James	769	0.23%	7,651	2.19%	3,005	1.39%	2,226	1.31%	2,600	1.52%
St. John the Baptist	3,394	0.99%	18,412	5.27%	6,351	2.94%	6,416	3.76%	5,717	3.35%
St. Martin	50,392	14.75%	50,202	14.37%	9,838	4.55%	14,746	8.65%	13,263	7.78%
St. Mary	40,045	11.72%	28,585	8.19%	32,102	14.86%	26,869	15.76%	31,257	18.34%
St. Tammany	1,481	0.43%	9,562	2.74%	5,244	2.43%	2,020	1.18%	2,331	1.37%
Tangipahoa	6,758	1.98%	4,894	1.40%	2,998	1.39%	1,331	0.78%	3,387	1.99%
Terrebonne	114,373	33.47%	93,301	26.72%	48,411	22.41%	40,581	23.81%	51,960	30.48%
Vermilion	203	0.06%	341	0.10%	877	0.41%	1,400	0.82%	2,201	1.29%
West Baton Rouge	0	-	0	-	0	-	0	-	0	-
Total	341,708	1	349,235	1	216,052	1	170,471	1	223,155	1

Table 4 (Continued). Nutria harvested by parish seasons 1-17, Coastwide Nutria Control Program.

PARISH	2002-2003			2003-2004			2004-2005			2005-2006		
	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun
Acadia	0	0	0	0	0	0	0	0	0	0	0	0
Ascension	0	2,306	404	0	4,093	1,381	100	1,678	80	470	908	300
Assumption	284	2,786	58	47	767	0	188	106	134	1,454	711	143
Calcasieu	0	143	0	0	374	0	213	24	212	57	1	0
Cameron	3,611	4,210	30	4,974	3,639	89	5,779	8,961	1,877	1,362	583	1,799
Iberia	0	1,353	59	636	1,324	0	1,286	1,310	926	1,215	449	1,350
Iberville	0	0	0	717	850	0	4,348	1,211	0	1,156	622	582
Jefferson	5,869	14,094	566	12,991	11,835	70	6,286	4,307	443	2,234	477	164
Jefferson Davis	121	0	0	82	0	0	158	16	0	109	1	0
Lafayette	19	10	10	0	25	0	0	10	0	0	0	0
Lafourche	11,807	16,826	219	28,516	22,780	440	12,221	18,212	1,977	9,213	11,050	4,598
Livingston	0	2,631	0	0	336	21	0	911	0	0	1,921	0
Orleans	287	219	91	0	0	0	538	0	0	0	0	0
Plaquemines	9,899	52,933	376	34,683	51,302	735	18,121	20,642	280	343	843	630
St. Bernard	2,877	2,892	0	5,412	7,783	149	727	3,617	0	0	0	0
St. Charles	2,099	8,706	364	2,801	9,543	329	1,279	13,958	631	1,863	10,915	1,029
St. James	48	47	0	97	350	40	32	2,752	57	278	4,239	395
St. John the Baptist	1,505	11,132	5,813	2,517	2,200	1,420	2,971	4,788	645	2,165	3,488	538
St. Martin	1,497	9,593	335	5,784	8,790	465	10,684	9,703	11,269	4,137	5,355	6,412
St. Mary	11,073	14,849	82	6,616	9,619	42	9,700	10,798	442	9,266	11,202	554
St. Tammany	3,088	1,529	21	2,687	1,069	0	2,692	2,483	0	533	800	90
Tangipahoa	335	894	16	577	169	0	35	530	0	142	638	46
Terrebonne	46,761	45,317	753	44,419	26,335	2,092	31,730	45,893	3,512	28,132	25,577	4,047
Vermilion	2,370	2,729	214	5,119	3,435	30	5,580	7,900	572	1,075	1,182	0
West Baton Rouge	0	0	0	0	0	0	0	0	0	0	0	0
Total	103,550	195,199	9,411	158,675	166,618	7,303	114,668	159,810	23,057	65,204	80,962	22,677

Table 5. Method of take by parish for seasons 1-17, Coastwide Nutria Control Program. Totals may not be exact due to reporting of percentages.

PARISH	2006-2007			2007-2008			2008-2009			2009-2010		
	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun
Acadia	0	0	0	0	0	0	0	0	0	0	0	0
Ascension	0	2,008	218	0	1,905	52	217	6,751	61	338	6,712	0
Assumption	354	686	1,056	634	2,944	285	85	933	75	546	1,916	469
Calcasieu	19	0	0	19	0	0	0	0	0	0	0	0
Cameron	347	902	477	509	70	70	1,060	128	55	1,174	0	0
Iberia	6,695	4,635	7,580	3,623	1,248	1,247	258	524	196	932	274	0
Iberville	4,907	460	3,860	754	508	843	103	0	128	4,051	1,670	344
Jefferson	4,731	5,568	106	3,901	6,456	943	4,185	8,146	184	3,164	8,202	140
Jefferson Davis	0	0	0	0	0	0	0	0	0	0	0	0
Lafayette	0	0	0	0	0	0	0	0	0	0	0	0
Lafourche	12,260	11,460	4,259	9,701	11,425	4,345	32,373	13,324	2,555	21,796	16,310	1,458
Livingston	0	1,250	0	0	695	0	0	444	0	460	1,726	0
Orleans	575	0	0	1,333	0	0	656	0	0	1,658	71	27
Plaquemines	3,200	2,554	61	30,093	10,609	0	21,394	19,372	1,447	25,379	43,480	436
St. Bernard	146	146	0	4,071	79	370	9,790	4,131	43	3,177	240	126
St. Charles	6,637	9,401	2,652	3,607	13,366	1,298	6,111	14,036	1,068	7,712	18,593	916
St. James	203	6,439	469	425	9,128	51	597	7,862	531	572	17,805	849
St. John the Baptist	4,223	9,215	2,348	2,323	3,834	572	1,490	8,372	327	2,856	3,776	10
St. Martin	39,972	35,737	37,920	27,937	17,123	9,666	21,134	17,512	6,326	43,341	12,952	7,326
St. Mary	12,810	19,997	1,886	10,783	21,304	2,123	13,357	18,480	2,974	13,026	51,170	3,435
St. Tammany	1,452	529	86	1,736	2,216	404	3,377	1,848	456	2,604	4,945	1,307
Tangipahoa	542	1,189	113	563	1,760	0	321	4,530	124	0	267	0
Terrebonne	36,867	51,357	11,209	28,055	45,000	5,879	25,846	46,139	2,602	40,669	62,264	3,292
Vermilion	1,174	494	145	262	65	0	0	0	0	0	0	0
West Baton Rouge	0	97	0	0	0	0	0	0	0	0	0	0
Total	137,114	164,124	74,445	130,329	149,735	28,148	142,354	172,532	19,152	173,455	252,373	20,135

Table 5 (continued). Method of take by parish for seasons 1-17, Coastwide Nutria Control Program. Totals may not be exact due to reporting of percentages.

PARISH	2010-2011			2011-2012			2012-2013			2013-2014		
	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun
Acadia	0	0	0	0	0	0	18	41	0	0	0	0
Ascension	0	3,107	0	0	0	0	0	0	0	368	7,482	39
Assumption	327	2,520	407	1,003	2,449	129	1,249	4,844	210	2,113	5,251	539
Calcasieu	315	0	0	0	0	0	0	0	0	0	0	0
Cameron	0	72	0	413	0	0	174	0	0	1,446	0	0
Iberia	1,103	46	89	222	1,163	0	1,602	2,862	896	5,579	5,906	671
Iberville	150	348	42	404	727	558	1,014	1,680	368	1,546	1,368	132
Jefferson	494	4,059	109	1,655	4,496	27	2,630	11,349	2,173	2,389	7,796	59
Jefferson Davis	1,872	0	0	0	0	0	0	0	0	0	0	0
Lafayette	0	0	0	0	0	0	0	0	0	0	0	0
Lafourche	0	23,326	43	9,573	27,574	267	11,260	33,137	3,326	9,924	31,266	870
Livingston	13,713	738	0	0	0	0	0	0	0	985	2,420	0
Orleans	0	115	0	1,202	36	0	1,006	0	0	929	0	0
Plaquemines	2,162	67,649	557	25,139	46,498	241	8,347	13,641	182	6,265	15,449	95
St. Bernard	12,021	11,489	12	16,226	10,826	0	1,214	1,276	1,584	3,228	1,974	0
St. Charles	17,764	10,155	671	2,425	8,240	165	2,473	9,748	2,125	3,806	9,587	771
St. James	5,225	9,016	115	0	15,417	33	157	13,199	1,099	32	5,410	0
St. John the Baptist	35	5,922	327	1,366	1,312	0	397	6,401	35	510	2,645	82
St. Martin	3,191	11,902	1,548	11,596	17,696	7,269	12,270	19,881	8,205	15,574	33,631	4,822
St. Mary	10,115	36,334	246	7,450	36,295	2,113	13,393	44,951	6,042	6,503	46,810	4,917
St. Tammany	6,928	2,947	899	4,817	1,123	477	579	588	50	1,312	174	0
Tangipahoa	2,711	398	0	0	142	0	0	1,205	659	2,211	2,426	0
Terrebonne	50	31,676	8,499	32,570	45,238	7,782	57,953	64,349	16,002	39,868	82,356	8,728
Vermilion	24,953	0	0	0	0	0	130	186	0	0	0	0
West Baton Rouge	0	0	0	0	0	0	0	0	0	0	0	0
Total	103,129	221,819	13,564	116,061	219,232	19,061	115,866	229,338	42,956	104,588	261,951	21,725

Table 5 (continued). Method of take by parish for seasons 1-17, Coastwide Nutria Control Program. Totals may not be exact due to reporting of percentages.

PARISH	2014-2015			2015-2016			2016-2017			2017-2018		
	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun	Trap	Rifle	Shotgun
Acadia	0	0	0	0	0	0	0	0	0	0	0	0
Ascension	551	15,259	202	257	4,226	209	159	1,505	112	184	947	221
Assumption	1,088	5,555	959	1,263	1,117	716	41	1,996	335	1,107	281	167
Calcasieu	0	0	0	0	0	0	0	0	0	118	0	36
Cameron	2,848	0	0	2,607	0	0	2,310	224	0	5,008	545	252
Iberia	3,464	3,148	684	1,321	2,854	341	60	1,394	1,060	427	656	599
Iberville	229	809	39	0	2,420	510	63	136	220	1,297	783	299
Jefferson	2,913	9,481	462	3,228	8,590	421	5,188	11,403	3,435	2,581	7,464	1,015
Jefferson Davis	0	0	0	0	0	0	0	0	0	0	0	0
Lafayette	0	0	0	0	0	0	0	0	0	0	0	0
Lafourche	7,737	21,453	0	7,820	23,783	207	6,352	11,177	720	4,115	6,145	128
Livingston	0	1,279	0	0	0	0	192	1,587	99	194	1,106	238
Orleans	485	0	0	1,045	58	0	1,077	0	0	283	50	0
Plaquemines	6,570	17,193	120	12,362	33,110	1,200	6,052	25,136	2,496	4,518	20,482	4,474
St. Bernard	4,346	1,064	0	7,828	4,995	116	7,028	3,892	175	1,825	1,580	128
St. Charles	3,592	12,659	104	2,682	9,047	1,956	4,772	6,205	626	774	3,844	1,008
St. James	133	635	0	790	6,059	802	264	2,550	191	303	1,563	361
St. John the Baptist	1,055	2,226	113	3,794	13,511	1,107	1,043	5,280	28	1,274	3,880	1,263
St. Martin	20,118	25,891	4,384	23,973	22,706	3,523	5,562	2,002	2,274	4,196	5,405	5,145
St. Mary	6,003	29,024	5,019	1,363	24,494	2,729	6,029	20,622	5,450	6,618	17,099	3,152
St. Tammany	1,282	69	131	726	8,229	607	1,142	1,092	3,010	1,092	928	0
Tangipahoa	28	6,731	0	23	4,870	0	784	2,185	29	238	955	138
Terrebonne	36,381	65,519	12,471	21,032	57,978	14,291	12,517	25,830	10,064	10,134	23,602	6,846
Vermilion	101	101	0	73	268	0	159	718	0	134	1,241	26
West Baton Rouge	0	0	0	0	0	0	0	0	0	0	0	0
Total	98,924	218,096	24,688	92,186	228,316	28,733	60,794	124,934	30,324	46,421	98,555	25,495

Table 5 (continued). Method of take by parish for seasons 1-17, Coastwide Nutria Control Program. Totals may not be exact due to reporting of percentages.

PARISH	2018-2019		
	Trap	Rifle	Shotgun
Acadia	0	0	0
Ascension	274	1,234	29
Assumption	644	1,143	98
Calcasieu	0	0	0
Cameron	13,314	521	0
Iberia	518	1,187	765
Iberville	1,077	2,545	501
Jefferson	4,650	6,236	2,809
Jefferson Davis	0	0	0
Lafayette	0	0	0
Lafourche	7,575	11,329	553
Livingston	536	1,959	43
Orleans	75	88	0
Plaquemines	4,846	24,351	10,460
St. Bernard	767	2,789	173
St. Charles	2,283	4,972	95
St. James	454	2,112	33
St. John the Baptist	1,486	4,231	0
St. Martin	5,833	3,442	3,987
St. Mary	6,345	20,505	4,406
St. Tammany	1,059	1,187	85
Tangipahoa	1,078	1,942	367
Terrebonne	6,777	30,073	15,110
Vermilion	415	1,578	209
West Baton Rouge	0	0	0
Total	60,006	123,426	39,723

Table 5 (continued). Method of take by parish for seasons 1-17, Coastwide Nutria Control Program. Totals may not be exact due to reporting of percentages.

Year	Number of Sites Surveyed	Number of Sites with Current Damage	Number of Sites Converted to Open Water	Sites with Vegetative Recovery
2002	108 ¹	86	8	12
2003	100	81	3	16
2004	93	68	1	24
2005	78	47	2	29
2006	52	31	9	12
2007	34	23	3 (partial sites)	11 ²
2008	23	16	1 (partial site)	6
2009	24	19	1 (partial site)	5 ²
2010	20	11	0	9
2011	11	10	0	1
2012	12	11	0	1
2013	14	12	0	2
2014	13	11	0	2
2015	12	11	0	1
2016	10	10	4 (partial sites)	0
2017	17	16	5 (partial sites)	1
2018	25 ^{1,3}	21	6 (partial sites)	2
2019	25	25	11 (partial sites)	0

Table 6. Status and number of nutria herbivory sites surveyed from 2002 to 2019.

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

² Total includes 1 site with partial recovery.

³ Two separate sites from previous season merged together to form single site

PARISH	2002		2003		2004		2005		2006	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Terrebonne	41	12,951	34	12,521	27	7,679	18	4,541	14	7,340
Lafourche	8	1,222	7	610	5	381	2	127	0	0
Jefferson	17	3,003	10	1,805	9	1,718	7	1,383	5	874
Plaquemines	10	882	13	2,540	7	2,494	7	1,850	7	1763
St. Charles	6	768	6	1,266	9	2,564	6	4,690	5	3249
Cameron	0	0	0	0	0	0	0	0	1	233
St. Bernard	6	921	5	918	5	1,035	4	882	4	1,004
St. John	0	0	1	20	2	111	2	240	2	241
Iberia	0	0	0	0	0	0	1	158	0	0
St. Tammany	4	752	2	360	0	0	0	0	0	0
Orleans	2	686	2	962	0	0	0	0	0	0
St. Mary	0	0	0	0	0	0	0	0	0	0
Vermilion	0	0	4	886	5	924	2	389	1	76
Jefferson Davis	0	0	0	0	0	0	0	0	1	88
St. John the Baptist	0	0	0	0	0	0	0	0	0	0
Total	94	21,185	84	21,888	69	16,906	49	14,260	40	14,868¹

Table 7. Number of nutria damaged sites and acres damaged along transects by parish in coastal Louisiana, 2002 - 2018.

¹This figure represents acres damaged along transects only. Actual damage coastwide is approximately 3.75 times larger than the area estimated by this survey.

²This figure includes 2,553 acres of marsh previously impacted by nutria that was likely converted to open water in Plaquemines and St. Bernard Parishes due to tidal scour from Hurricane Katrina.

³These figures include acres from sites that were partially converted to open water.

PARISH	2007		2008		2009		2010		2011	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Terrebonne	12	5,915	12	3,768	10	3,162	10	2,241	9	1,591
Lafourche	2	328	2	338	2	207	1	19	1	88
Jefferson	3	177 ²	2	69	1	29	0	0	0	0
Plaquemines	0	0	1	11	1	9	0	0	0	0
St. Charles	4	2,216 ²	5	2,215 ²	4	1,895	0	0	0	0
Cameron	1	167	0	0	1	120	0	0	0	0
St. Bernard	1	225 ²	0	0	0	0	0	0	0	0
St. John	0	0	0	0	0	0	0	0	0	0
Iberia	0	0	0	0	0	0	0	0	0	0
St. Tammany	0	0	0	0	0	0	0	0	0	0
Orleans	0	0	0	0	0	0	0	0	0	0
St. Mary	0	0	0	0	0	0	0	0	0	0
Vermilion	0	0	0	0	0	0	0	0	0	0
Jefferson Davis	1	81	0	0	0	0	0	0	0	0
St. John the Baptist	1	135	1	70	0	0	0	0	0	0
Total	25	9,244²	23	6,471²	19	5,422	11	2,260	10	1,679

Table 7 (Continued). Number of nutria damaged sites and acres damaged along transects by parish in coastal Louisiana, 2002 - 2019. This figure represents acres damaged along transects only. Actual damage coastwide is approximately 3.75 times larger than the area estimated by this survey.

¹This figure includes 2,553 acres of marsh previously impacted by nutria that was likely converted to open water in Plaquemines and St. Bernard Parishes due to tidal scour from Hurricane Katrina.

²These figures include acres from sites that were partially converted to open water.

PARISH	2012		2013		2014		2015		2016	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Terrebonne	10	1033	10	1212	9	1078	10	1586	10	1716
Lafourche	1	96	0	0	0	0	0	0	0	0
Jefferson	0	0	0	0	0	0	0	0	0	0
Plaquemines	0	0	0	0	0	0	0	0	0	0
St. Charles	0	0	0	0	0	0	0	0	0	0
Cameron	0	0	0	0	0	0	0	0	0	0
St. Bernard	0	0	0	0	0	0	0	0	0	0
St. John	0	0	0	0	0	0	0	0	0	0
Iberia	0	0	0	0	0	0	0	0	0	0
St. Tammany	0	0	0	0	0	0	0	0	0	0
Orleans	0	0	0	0	0	0	0	0	0	0
St. Mary	0	0	2	21	2	37	1	16	1	16
Vermilion	0	0	0	0	0	0	0	0	0	0
Jefferson Davis	0	0	0	0	0	0	0	0	0	0
St. John the Baptist	0	0	0	0	0	0	0	0	0	0
Total	11	1,129	12	1,233	11	1,115	11	1,602	11	1,732²

Table 7 (Continued). Number of nutria damaged sites and acres damaged along transects by parish in coastal Louisiana, 2002 - 2019. This figure represents acres damaged along transects only. Actual damage coastwide is approximately 3.75 times larger than the area estimated by this survey.

¹This figure includes 2,553 acres of marsh previously impacted by nutria that was likely converted to open water in Plaquemines and St. Bernard Parishes due to tidal scour from Hurricane Katrina.

²These figures include acres from sites that were partially converted to open water.

PARISH	2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES
Terrebonne	13	1,283	17	3,578	18	3,319
Lafourche	0	0	0	0	0	0
Jefferson	1	174	0	0	0	0
Plaquemines	0	0	0	0	0	0
St. Charles	1	72	1	504	1	93
Cameron	1	35	2	74	2	117
St. Bernard	0	0	0	0	0	0
St. John	0	0	0	0	0	0
Iberia	0	0	0	0	0	0
St. Tammany	0	0	0	0	0	0
Orleans	0	0	0	0	0	0
St. Mary	0	0	1	224	4	378
Vermilion	0	0	0	0	0	0
Jefferson Davis	0	0	0	0	0	0
St. John the Baptist	0	0	0	0	0	0
Total	16	1,564²	21	4,380²	25	3,907

Table 7 (Continued). Number of nutria damaged sites and acres damaged along transects by parish in coastal Louisiana, 2002 - 2019. This figure represents acres damaged along transects only. Actual damage coastwide is approximately 3.75 times larger than the area estimated by this survey.

¹This figure includes 2,553 acres of marsh previously impacted by nutria that was likely converted to open water in Plaquemines and St. Bernard Parishes due to tidal scour from Hurricane Katrina.

²These figures include acres from sites that were partially converted to open water.

MARSH TYPE	2002		2003		2004		2005		2006		2007	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Fresh	41	11,593	36	10,871	37	10,565	26	9,811	23	11,273	21	8,842
Intermediate	39	7,416	31	8,086	25	5,128	19	3,789	16	3,421	3	298
Brackish	14	2,176	17	2,931	7	1,213	4	660	1	174	1	104
Total	94	21,185	84	21,888	69	16,906	49	14,260	40	14,868	251	9,244¹

Table 8A. Number of nutria damaged sites and acres damaged, by marsh type along transects in coastal Louisiana during 2002 to 2019; numbers include sites converted to open water. Continued through Tables 8A-8C.

¹ Total includes sites that were partially converted to open water.

MARSH TYPE	2008		2009		2010		2011		2012		2013	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Fresh	21	6,127	17	5,384	11	2,260	10	1,679	11	1,129	12	1,233
Intermediate	2	44	2	38	0	0	0	0	0	0	0	0
Brackish	0	0	0	0	0	0	0	0	0	0	0	0
Total	23	6,471¹	19	5,422	11	2,260	10	1,679	11	1,129	12	1,233

Table 8B.

MARSH TYPE	2014		2015		2016		2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	SITES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Fresh	11	1,115	11	1,602	11	1,716	15	1,390	21	4,380	25	3,907
Intermediate	0	0	0	0	0	0	0	0	0	0	0	0
Brackish	0	0	0	0	0	0	1	174	0	0	0	0
Total	11	1,115	11	1,602	11	1,716	16	1,564	21	4,380	25	3,907

Table 8C.

NUTRIA RELATIVE ABUNDANCE RATING	2002		2003		2004		2005		2006		2007	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No nutria sign visible	21	5,990	23	5,972	13	3,569	12	2,992	4	519	2	73
Nutria sign visible	31	4,379	26	3,562	29	6,040	28	6,748	26	11,223	12	3,402
Abundant feeding	17	4,198	19	6,682	19	5,251	4	4,113	1	573	5	1,495
Heavy feeding	17	5,568	14	5,599	7	2,026	1	273	0	0	4	3,658
Total	86	20,135	81	21,815	69	16,886	47	14,126	31	12,315	23	8,628

Table 9A. Number of nutria damage sites and acres damaged by revised nutria relative abundance rating in coastal Louisiana during 2002 to 2019; numbers do not include sites converted to open water. Continued through Tables 9A-9C.

NUTRIA RELATIVE ABUNDANCE RATING	2008		2009		2010		2011		2012		2013	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No nutria sign visible	0	0	0	0	0	0	0	0	0	0	0	0
Nutria sign visible	13	2,234	6	517	0	0	1	139	3	117	6	198
Abundant feeding	8	3,522	8	1,169	7	640	9	1,540	8	1,012	6	1,035
Heavy feeding	2	415	5	3,736	4	1,620	0	0	0	0	0	0
Total	23	6,171	19	5,422	11	2,260	10	1,679	11	1,129	12	1,233

Table 9B.

NUTRIA RELATIVE ABUNDANCE RATING	2014		2015		2016		2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	SITES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No nutria sign visible	0	0	0	0	0	0	0	0	0	0	0	0
Nutria sign visible	2	22	3	59	7	581	14	1,136	13	2,084	19	2,149
Abundant feeding	9	1,093	7	741	6	1,077	3	429	7	2,134	6	1,758
Heavy feeding	0	0	1	802	1	74	0	0	1	161	0	0
Total	11	1,115	11	1,602	3193	1,732	3193	1,564	21	4,380	25	3,907

Table 9C.

VEGETATIVE DAMAGE RATING	2002		2003		2004		2005		2006		2007	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No vegetative damage	1	30	0	0	0	0	0	0	0	0	0	0
Minor vegetative damage	28	3,498	26	8,732	35	6,675	34	8,070	21	7,621	17	4,021
Moderate vegetative damage	44	13,156	41	9,221	29	9,536	12	5,905	9	4,581	6	4,607
Severe vegetative damage	13	3,451	14	3,862	4	675	1	151	1	113	0	0
Converted to open water	8	1,050	3	73	1	20	2	134	9	2,553	3 ¹	616 ¹
TOTAL	94	21,185	84	21,888	69	16,906	49	14,260	40	14,868	26¹	9,244¹

Table 10A. Number of nutria damage sites and number of acres by the vegetative damage rating in coastal Louisiana 2002 to 2019. Continued through Tables 10A-10C.

¹ Total includes sites that were partially converted to open water.

VEGETATIVE DAMAGE RATING	2008		2009		2010		2011		2012		2013	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No vegetative damage	0	0	0	0	0	0	0	0	0	0	0	0
Minor vegetative damage	17	5,402	15	5,102	11	2,260	10	1,679	11	1,129	7	285
Moderate vegetative damage	5	640	4	320	0	0	0	0	0	0	3	726
Severe vegetative damage	1	129	0	0	0	0	0	0	0	0	2	222
Converted to open water	1 ¹	300 ¹	1 ¹	90	0	0	0	0	0	0	0	0
TOTAL	24¹	6,471¹	20¹	5,512	11	2,260	10	1,679	11	1,129	12	1,233

Table 10B.

VEGETATIVE DAMAGE RATING	2014		2015		2016		2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
No vegetative damage	0	0	0	0	0	0	0	16	0	0	0	0
Minor vegetative damage	8	898	9	772	2	39.93	10 ¹	850 ¹	12 ¹	1,832 ¹	12 ¹	834 ¹
Moderate vegetative damage	3	217	2	830	6 ¹	558 ¹	5 ¹	540 ¹	11 ¹	1,472 ¹	9 ¹	1,701 ¹
Severe vegetative damage	0	0	0	0	3	1134	1	174	2 ¹	208 ¹	9 ¹	1,379 ¹
Converted to open water	0	0	0	0	4 ¹	125 ¹	5 ¹	76 ¹	6 ¹	867 ¹	11 ¹	910 ¹
TOTAL	11	1,115	11	1,602	15¹	1,857¹	16¹	1,656¹	31¹	4,380¹	41¹	4,824¹

Table 10C.

AGE OF DAMAGE AND CONDITON RATING	2002		2003		2004		2005		2006		2007	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Recovered	12	1,119	16	1,674	24	6,049	29	4,169	13 ¹	1,341 ¹	11 ¹	1,783 ¹
Old Recovering	51	7,694	51	14,382	53	12,338	39	10,878	21	9,429	14	5,011
Old Not Recovering	31	11,449	17	5,375	5	2,898	2	656	4	1,519	5	2,874
Recent Recovering	0	0	0	0	1	35	1	10	0	0	0	0
Recent Not Recovering	0	0	0	0	0	0	0	0	1	285	0	0
Current Damage	4	992	13	2,058	9	1,615	5	2,582	5	1,082	4	743
Total	98	21,254	97	23,489	92	22,935	76	18,295	44¹	13,656¹	34¹	10,411¹

Table 11A. Number of nutria damage sites by age of damage and condition rating in coastal Louisiana in 2002 to 2019. Continued through Tables 11A-11C.

¹ Total includes sites that were partially recovered.

AGE OF DAMAGE AND CONDITON RATING	2008		2009		2010		2011		2012		2013	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Recovered	6	736	5 ¹	673 ¹	9	1,914	1	62	1	36	2	96
Old Recovering	15	3,852	16	5,321	10	2,198	5	1,270	8	1,033	1	29
Old Not Recovering	3	1,914	2	57	0	0	4	224	1	53	8	1,168
Recent Recovering	0	0	0	0	0	0	0	0	0	0	0	0
Recent Not Recovering	0	0	0	0	0	0	0	0	0	0	0	0
Current Damage	5	405	1	44	1	62	1	185	2	43	3	36
Total	29	6,907	23¹	6,095¹	20	4,174	11	1,741	12¹	1,165¹	14¹	1,329¹

Table 11B.

AGE OF DAMAGE AND CONDITON RATING	2014		2015		2016		2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Recovered	2	34	1	23	0	0	1	16	0	0	0	0
Old Recovering	7	259	3	60	3	109	4	307	2	87	1	93
Old Not Recovering	3	833	7	1,481	8	1,624	6	481	7	1,687	9	2,068
Recent Recovering	0	0	0	0	0	0	1	35	0	0	1	79
Recent Not Recovering	0	0	0	0	0	0	0	0	0	0	4	715
Current Damage	1	23	1	61	0	0	5	740	12	2,606	9	952
Total	13¹	1,149¹	12¹	1,625¹	11¹	1,732¹	17¹	1,580¹	21¹	4,380¹	25¹	3,907¹

Table 11C.

PREDICTION OF RECOVERY BY END OF GROWING SEASON	2002		2003		2004		2005		2006		2007	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Full Recovery	7	919	8	4,238	10	338	6	443	4	828	2	350
Partial Recovery	59	13,950	64	14,497	50	13,440	36	10,073	27	11,487	21	8,278
Increased Damage	5	1,086	6	1,646	6	2,811	5	3,610	0	0	0	0
No Recovery Predicated	15	4,180	3	1,434	2	297	0	0	0	0	0	0
TOTAL	94	21,185	84	21,888	69	16,906	49	14,260	31	12,315	23	8,628

Table 12A. Number of nutria damage sites and acres damaged, by prediction of recovery rating in coastal Louisiana in 2002 to 2019. Continued through Tables 12A-12C.

PREDICTION OF RECOVERY BY END OF GROWING SEASON	2008		2009		2010		2011		2012		2013	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Full Recovery	1	80	2	1,588	2	84	0	0	0	0	0	0
Partial Recovery	22	6,091	16	3,543	9	2,176	10	1,679	11	1,129	3	665
Increased Damage	0	0	1	291	0	0	0	0	0	0	9	568
No Recovery Predicated	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	23	6,171	19	5,422	11	2,260	10	1,679	11	1,129	12	1,233

Table 12B.

PREDICTION OF RECOVERY BY END OF GROWING SEASON	2014		2015		2016		2017		2018		2019	
	NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF		NUMBER OF	
	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES	SITES	ACRES
Full Recovery	0	0	1	16	7	1,550	3	107	1	35	0	0
Partial Recovery	2	22	3	61	0	0	1	122	6	506	7	711
Increased Damage	9	1,093	7	1,525	3	109	1	159	5	1,305	2	279
No Recovery Predicated	0	0	0	0	1	74	12	1,176	9	2,533	16	2,917
TOTAL	11	1,115	11	1,602	11	1,732	17	1,564	21	4,379	25	3,907

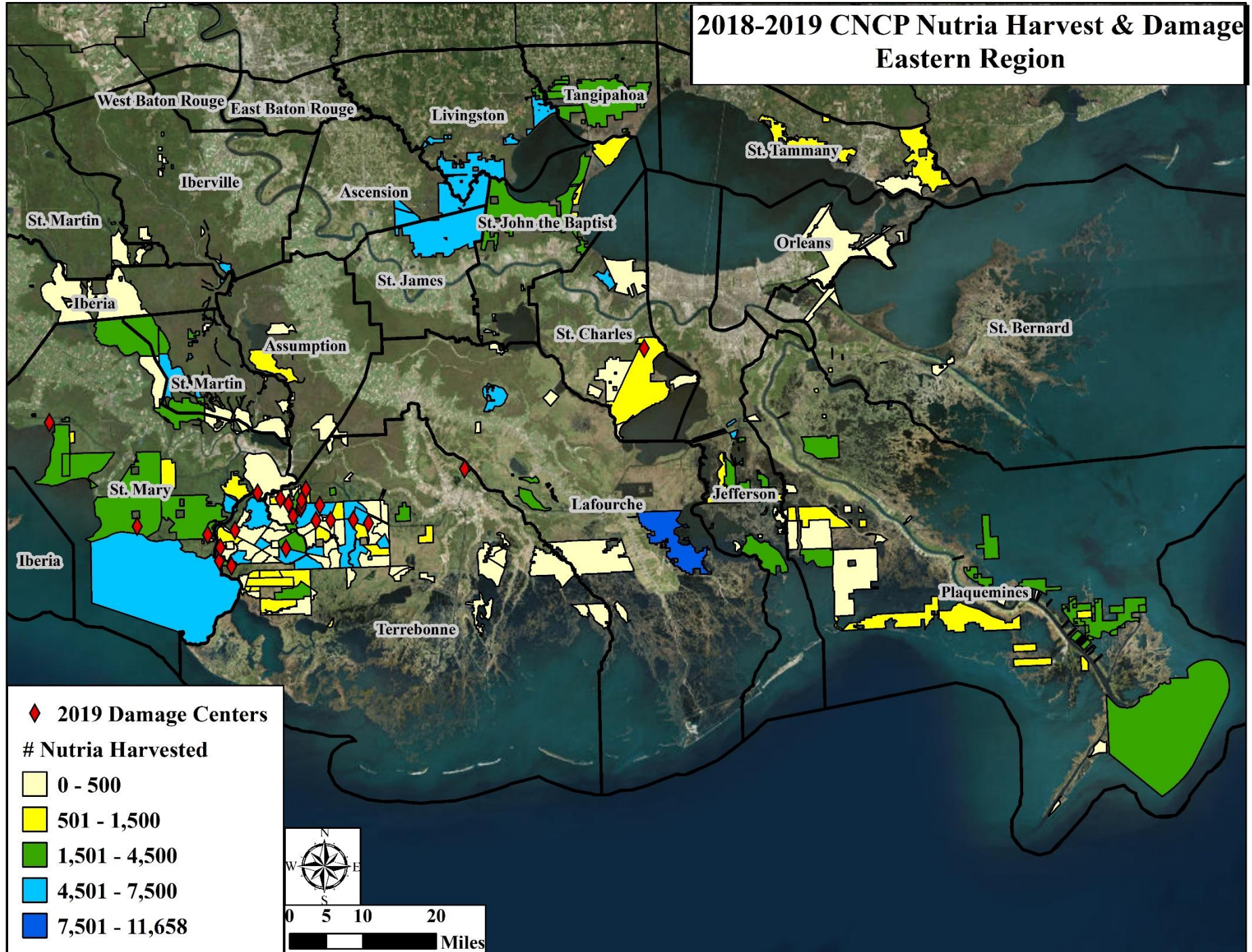
Table 12C.

APPENDIX B.
2019 Nutria Vegetative Damage Sites

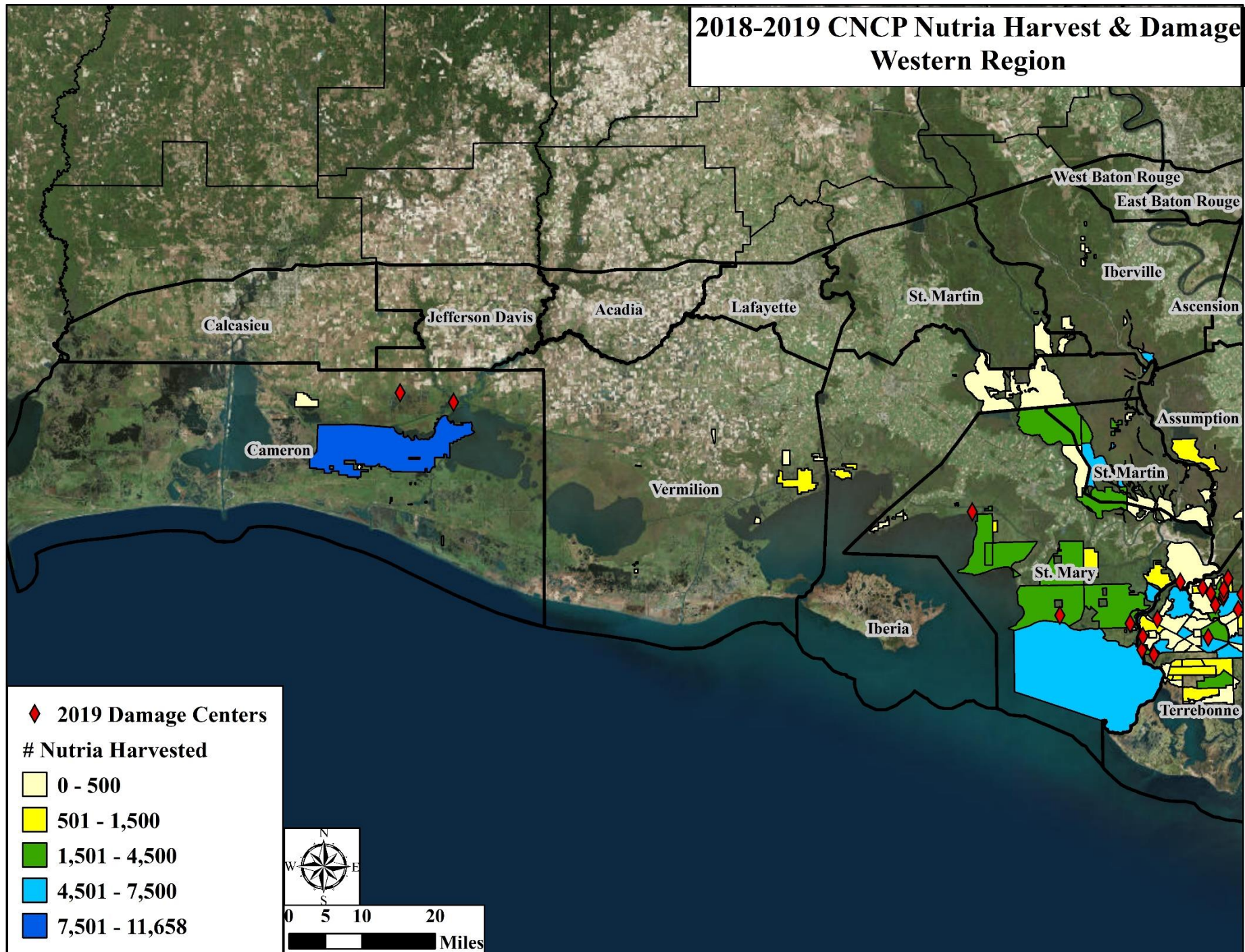
SITE NUMBER	MARSH TYPE	LATITUDE	LONGITUDE	DAMAGE TYPE	SECONDARY DAMAGE	DAMAGED ACRES	ACRES TO OPEN WATER	NRAR	VDR	AGE OF DAMAGE & CONDITION	PREDICTION	NUMBER OF NUTRIA OBSERVED
9	Fresh	29.5892	-91.1226	Nutria	*	66.68	33.34	1	1,4	2	2	2
17	Fresh	29.5363	-91.0478	Nutria	*	455.57	227.80	2	2,4	2	0	176
120	Fresh	29.6159	-91.0737	Nutria	Hog	435.09	435.10	1	4	2	0	90
400	Fresh	29.5815	-91.1087	Nutria	*	308.00	*	2	2,3	2	3	160
418	Fresh	29.5798	-91.0222	Nutria	*	114.09	57.05	2	2,4	2	0	41
434	Fresh	29.4921	-91.1054	Nutria	*	120.03	60.02	1	1,4	2	2	7
436	Fresh	29.5512	-91.0915	Nutria	Hog	187.59	*	1	2	2	3	153
437	Fresh	29.5747	-91.0732	Nutria	*	319.75	*	1	1	5	3	400+
438	Fresh	29.5801	-91.0728	Nutria	*	161.36	53.79	3	2,3,4	5	0	330
439	Fresh	29.5469	-91.0061	Nutria	*	51.00	*	1	2	1	2	7
441	Fresh	29.8609	-90.2936	Nutria	Hog	503.71	*	1	1	5	0	25
442	Fresh	29.9919	-92.9478	Flood	Nutria	35.48	*	1	1	1	1	2
443	Fresh	29.4765	-91.2569	Nutria	*	571.99	*	2	1,2	5	0	147
444	Fresh	29.5294	-91.2317	Nutria	*	54.36	*	1	1	5	0	19
445	Fresh	29.4584	-91.2336	Nutria	*	130.11	*	1	1	5	2	43
446	Fresh	29.6108	-91.1572	Nutria	*	224.40	*	2	1	5	3	65
447	Fresh	29.5909	-91.0761	Nutria	*	265.57	*	2	2	5	3	116
448	Fresh	29.5539	-90.9453	Nutria	Apple Snails	194.26	*	2	1,2	5	0	31
449	Fresh	29.5368	-90.9252	Nutria	Muskrat	99.61	*	1	1,2	5	2	29
450	Fresh	29.6421	-90.6989	Nutria	*	42.62	*	1	2	5	0	19
451	Fresh	29.9729	-92.8236	Nutria	*	38.33	*	1	1	5	2	4

Table 13. 2018 Nutria Vegetative Damage Sites. Nutria relative abundance rating (NRAR): (0) no nutria sign visible, (1) nutria sign visible, (2) abundant feeding sign, and (3) heavy feeding sign; sites converted to open water are not given a NRAR. Vegetative damage rating (VDR): (0) no vegetative damage, (1) minor vegetative damage, (2) moderate vegetative damage, (3) severe vegetative damage, (4) converted to open water. Age of damage and condition: (0) recovered (1) Old recovering (2) old not recovering (3) recent recovering (4) recent not recovering (5) current (occurring now). Prediction: (0) no recovery predicted (1) full recovery (2) partial recovery (3) increased damage. * indicates a null value in this category.

2018-2019 CNCP Nutria Harvest & Damage Eastern Region



2018-2019 CNCP Nutria Harvest & Damage Western Region



APPENDIX C.
Data collected at each damage site during the 2019
vegetative damage survey.

SITE NUMBER	MARSH TYPE	LATITUDE	LONGITUDE	DAMAGE TYPE	SECONDARY DAMAGE	DAMAGED ACRES	ACRES TO OPEN WATER	NRAR	VDR	AGE OF DAMAGE & CONDITION	PREDICTION	NUMBER OF NUTRIA OBSERVED
9	Fresh	29.592717	-91.12135	Nutria		235.26	55.63	1	3, 4	2	3	24
17	Fresh	29.548567	-91.041183	Nutria		301.80		2	2, 3	2	0	60
120	Fresh	29.610483	-91.063017	Nutria	Hog	426.04		1	1, 2	2	0	13
400	Fresh	29.581933	-91.1031	Nutria		432.07	106.19	2	3, 4	4	0	81
418	Fresh	29.578667	-91.032433	Nutria		69.44	75.3	1	3, 4	5	0	6
434	Fresh	29.494567	-91.110683	Nutria		78.71		1	1	3	0	6
436	Fresh	29.558533	-91.09295	Nutria		122.16	72.66	1	3, 4	4	0	61
437	Fresh	29.57365	-91.075183	Nutria		579.93		2	2	2	0	202
438	Fresh	29.57895	-91.07375	Nutria		150.49	36.08	2	2, 3, 4	2	0	101
439	Fresh	29.548467	-91.008517	Nutria		44.22	34.94	1	1, ,	2	3	3
441	Fresh	29.8765	-90.29015	Nutria		93.03	133.19	1	2, 4	1	2	0
442	Fresh	29.993017	-92.942433	Nutria		62.42	35.84	1	3, 4	4	0	14
443	Fresh	29.471783	-91.261283	Nutria	Hog	350.01		1	2	5	2	25
444	Fresh	29.53205	-91.225033	Nutria		55.10		1	1	5	2	8
445	Fresh	29.46155	-91.234233	Nutria		49.94		1	1	5	2	14
446	Fresh	29.6049	-91.1722	Nutria		127.77	168.46	1	3, 4	5	0	95
447	Fresh	29.589	-91.0734	Nutria		201.46	96.93	2	2, 3, 4	2	0	45
448	Fresh	29.548717	-90.9569	Nutria		65.14	95.01	0	1, 4	2	0	14
449	Fresh	29.542	-90.9232	Nutria	Hog	64.03		1	1	2	2	12
450	Fresh	29.645433	-90.7031	Nutria		44.19		1	1, 2	4	2	6
451	Fresh	29.97405	-92.820783	Nutria	Hog	54.43		1	1	4	2	19
452	Fresh	29.749967	-91.642	Nutria		113.74		1	2	5	0	100
453	Fresh	29.542333	-91.44595	Nutria		92.30		2	1	5	0	27
454	Fresh	29.524183	-91.287017	Nutria		44.31		1	1	5	0	11
455	Fresh	29.498367	-91.258783	Nutria		49.21		1	1	5	0	15

Table 14. 2019 Nutria Vegetative Damage Sites. Nutria relative abundance rating (NRAR): (0) no nutria sign visible, (1) nutria sign visible, (2) abundant feeding sign, and (3) heavy feeding sign; sites converted to open water are not given a NRAR. Vegetative damage rating (VDR): (0) no vegetative damage, (1) minor vegetative damage, (2) moderate vegetative damage, (3) severe vegetative damage, (4) converted to open water. Age of damage and condition: (0) recovered (1) Old recovering (2) old not recovering (3) recent recovering (4) recent not recovering (5) current (occurring now). Prediction: (0) no recovery predicted (1) full recovery (2) partial recovery (3) increased damage.

2019 NUTRIA VEGETATIVE DAMAGE SURVEY

DATE: _____

SITE # _____

PHOTOGRAPHY

NEW SITE Y N

FRAME# _____

TRANSECT# _____

TIME start: _____

MARSH TYPE _____

TIME finish: _____

NOTES:

LOCATION DESCRIPTION

ON TRANSECT # _____

EAST OF TRANSECT _____

WEST OF TRANSECT _____

LAT: _____

LON: _____

NUTRIA RELATIVE ABUNDANCE

RATING

___ NO NUTRIA SIGN VISIBLE (0)

___ NUTRIA SIGN VISIBLE (1)

___ ABUNDANT FEEDING (2)

___ HEAVY FEEDING (3)

NUTRIA SIGHTED _____

DAMAGE TYPE

___ DAMAGE NOT RELATED TO NUTRIA

___ DAMAGE - STORM

___ DAMAGE - MUSKRAT

___ DAMAGE - NUTRIA

___ DAMAGE - OTHER _____

___ SUBJECT TO TIDAL ACTION: Y N

VEGETATIVE DAMAGE RATING

___ NO VEG DAMAGE (0)

___ MINOR VEG DAMAGE (1)

___ MODERATE VEG DAMAGE (2)

___ SEVERE VEG DAMAGE (3)

___ CONVERTED TO OPEN WATER (4)

PLANT SPECIES	COMMON NAME	seen?	PLANT SPECIES	COMMON NAME	seen?
Alternanthera philoxeroides	alligatorweed		Juncus spp.	rushes	
Aster spp.	asters		Ludwigia spp.	water primrose	
Bacopa spp.	water hyssop/bacopa		Lythrum lineare	purple loosestrife	
Bidens laevis	smooth beggar's tick		Panicum hemitomon	maidencane	
Cephalanthus occidentalis	button bush		Pluchea spp.	camphorweed	
Colocasia esculenta	elephant-ear		Sagittaria spp.	bulltongue/wapato	
Decodon spp.	water willow/loosestrife		Scirpus spp.	3-cornered grass/bullrush	
Distichlis spicata	saltgrass		Spartina alterniflora	oystergrass	
Eichhornia crassipes	water hyacinth		Spartina patens	wiregrass	
Eleocharis cellulose	gulfcoast spikerush		Typha spp.	cattail	
Eleocharis parvula	dwarf spikerush				
Hydrocotyle spp.	pennyworts				
Iris virginica	blue flag iris				

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

GROWING SEASON

___ NO RECOVERY PREDICTED (0)

___ FULL RECOVERY (1)

___ PARTIAL RECOVERY (2)

___ INCREASED DAMAGE (3)

_____ CHECK NEXT YEAR

CODES FOR NUTRIA HERBIVORY SURVEY DATA

¹Marsh Type

Fresh	F
Intermediate	I
Brackish	B

²Nutria Relative Abundance Rating

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

³Vegetative Damage Rating

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

⁴Age of Damage and Condition

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

⁵Prediction of Recovery by End of 2019 Growing Season

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