THE FIRST YEAR OF NUTRIA INVESTIGATIONS ON THE MOBILE DELTA

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Proc. Annu. Conf. Southeast. Assoc. Game & Fish Comm. 3:98-104

Nutrias *(Myocastor coypus)* are also known as swamp beavers, South American Beavers or coypus. The original habitat of the animal is the coastal areas and the larger rivers in southern Brazil, Paraquay, Bolivia, Uruguay and Argentina. The introduction and establishment of the nutria as a furbearer in the United States has been described by Ashbrook (1948).

The animal resembles a small beaver with a long round tail. The four large front teeth are orange in color and deeply set. The short round ears and the long whiskers around the mouth make the head look broad and heavy like that of a guinea pig or groundhog. The front legs are short and the claws are stout. The hind legs are longer and the feet are webbed like those of a muskrat. The body is broad and covered with a dense coat of dark brown hair. A full grown male is said to weigh about 20 pounds while the female is a little smaller.

In southern Alabama, extending from the open Mobile Bay to the union of the Alabama and Tombigbee Rivers, a distance of about forty miles in a straight line is a region about ten miles wide which is essentially a delta. Unlike a typical delta, however, it is hemmed in on both sides by high land. The lower one-quarter of this delta is a combination of treeless marsh and open bays with other bays in the process of becoming bayous. Heavy rainfall (a seventy three year average of 61.76 inches per year has been exceeded in each of the past four years), moderate temperatures, and a relatively long growing season are characteristic of this region. The waters, at least in years of relatively high rainfall, remain fresh most of the year but are slightly brackish for about six weeks or more in the Fall. There is a single tide daily. From the lowest to the highest tide of each month, there is a difference of approximately four feet. The average daily fluctuation, however is nearer 1.55 feet.

Most of the vegetation of the lower delta is that which grows in fresh or only slightly brackish situations. The vegetation is lush throughout the marsh and the density of the plants appear to be a factor in preventing the use of the marsh by waterfowl. Nutrias were introduced to the delta as an experiment to see if they would be beneficial in controlling the vegetation.

The nutria studies are a phase of the Mobile Delta Waterfowl and Muskrat Research Project (Federal Aid in Wildlife Restoration Project 7-R). For administrative assistance to said project I wish to thank Mr. Bert E. Thomas, Director of the Alabama Department of Conservation, Mr. C. Graham Hixon, Chief of the Division of Game, Fish and Seafoods, and Mr. Ernest C. Martin, former Federal Aid Coordinator.

METHODS

Pen Construction

In order to confine the animals to a definite area so that their affect on the area could be studied, two pens, each approximately 100 feet square, were built of

six feet sections of aluminum sheeting placed with three feet of each section below the surface of the marsh. Creasoted posts, seven feet in length were placed at ten foot intervals around the marsh to be fenced. Three rails of treated one by fours of rough pine were nailed to these posts, and then the roots of the marsh vegetation were cut by a special tool devised for that purpose. The sheeting was placed in these cuts and, protected by wooden blocks, was driven to the desired depth. When nailed to the rails, these sheets made a tight fence. Except for discoloration of the sheeting and some fire damage to the lower rail in one pen, the materials have withstood the elements quite well the first year.

Pen Locations

The first pen built, and called Pen 1 in this report, was built in a zone where there is some tidal variation almost every day. Cutgrass *(Zizaniopis miliacea)* and alligator grass *(Achurantus philozeroides)* were the predominant plants but pickerel weed *(Pontederia cordata),* three square, (*Scirpus americanus)* cowpea (*Vigna repens),* bindweed *(Convolvulus repens),* cattail *(Typha angustifolia),* and cane *(Phragmites communis)* were also present as were a few sedges, grasses and small forbes. This pen is located about 200 feet west of a game warden's camp and can be observed from that camp.

Pen 2 was built on the higher marsh which is unaffected by tidal change except during spring and storm tides. The ground is not covered with water most of the time, but the water table is close to the surface. Feather grass *(Panicum virgatum),* salt-reed grass *(Spartina cynosuroides)* and three square covered about 70 percent of the area. Cane was the predominate plant on the other 30 percent. Cowpeas, royal fern *(Osmunda regalis)* mallow *(Hibiscus* sp.) and a needle rush *(Juncus* sp.) were additional plants on this area.

Original Stock

Eight nutria were purchased from Avery Island, La., and brought to the delta. Two males and two females were releasted in each pen on September 18, 1949. These animals were weighed as a group then released.

Live Trapping and Weighing

In late January, 1949, it was believed that it might be of value if weights of the animals could be obtained at intervals. Experimental models of a number of different types of live traps were tried. The animals were able to find their way out of funnel traps and out of trap with a weighted inclined door.

The following trap was found to be successful. Basically the trap is an elongated cage in which stepping upon or disturbing a metal treadal released a spring closed door. Materials needed are one inch by two inch welded wire fabric, sheet metal for door and treadle, and the springs from a common (house) rat or mouse trap. No. 9 wire for the trigger is satisfactory. The original traps were 10 inches by 10 inches by 36 inches. Traps as small as 6 inches by 6 inches by 26 inches have been used successfully but are probably too small for the largest individuals. Eight inches by 8 inches by 30 inches should be suitable for almost all nutria. The bait used has been sweet potatotes; but sweet corn has also been satisfactory.

Weights were obtained by taking trap and all to a nearby fish market and weighing on their scales. Weights were recorded in tenths of pounds.

Vegetation Studies

The effect of vegetation was not only studied by general observations but also by counting five one-foot square samples on 20 predetermined ten-foot plots within each pen. Controls of five samples on eight predetermined plots immediately outside the pens were also counted. Data on food preferences were obtained by placing two or more species of plants in the pen and seeing which plants, if any, were eaten.

Other Notes

A wide variety of notes were kept both on the affect on vegetation and the observations made on the nutria.

RESULTS

Pen 1

Pen 1, built in the tidal marsh, was denuded in approximately seven months. There was not only a decrease in the total number of plants within the pen but most species were actually eradicated.

The nutria were placed in the pen on September 18. On September 20 resting platforms of cowpea and dead cane had been constructed. By October 4 there were at least eight mounds of vegetation apparently constructed as resting platforms. Some cutting of pickerel weed and cutgrass was noted. The tips of most of the alligator grass growing in the open had been nipped off, and there was evidence that what little *Sagitaria* had been in the pen was now gone. Cutgrass stems and occasionally the roots of cane were being taken at that time.

By October 20 the cutting of alligator grass was noticeable even from a distance. Many of these plants were being trampled into the mud. Paths along the north side of the pen were noticed for the first time. By November 8, the animals were eating the alligator grass at the base of the cane. Previously this had been left alone, apparently because of the difficulty in getting through the dense vegetation. Cutgrass was still being eaten. By November 15 the animals were occasionally eating the roots of the cane as well as alligator grass. The pen was showing definite signs of use. Paths were noticed on the north and north west sides.

By the end of December enough of the vegetation had been cleared that the animals were visible. Cutgrass was apparently the only food eaten in early January. There were not many green leaves on the alligator grass stems but there were enough of these stems on the surface to hold up the weight of the project leader when he made inspections. During late January and early February, many of these ground stems were eaten and others decomposed. It became almost impossible to walk inside the pen. By late February the pen was almost devoid of any green vegetation.

During this period the animals apparently used a house built by muskrats prior to the time the nutria were place therein. The nutria made no attempt to repair this house until it had settled to the point where it was covered by high tides. Then they gathered old stems of cane and other debris to make a platform on which to rest.

During March and April the nutrias ate the alligator grass as soon as it grew. By the first week in May, from a distance, the pen appeared to be a uniform sea of mud. Close inspection revealed a very few green leaves of alligator grass. To save the animals they were released.

During February, when the vegetation in Nutria Pen 1 was at a very low ebb, an experiment was conducted to see just what the animals would eat or what they preferred to eat. Two or more different species of plants were put into the pen at one time. The food preferences of these penned and apparently starved animals were as follows. Three square, alligator grass, and cutgrass were the choice foods. Placed in the pen in equal quantities all would be eaten. Cattail was avoided if any or all the previously mentioned plants were present in quantity. The roots of Juncus, buggy whips *(Scirpus californicus)* and sawgrass *(Caldium jamaicensis)* were taken when the more desirable foods were not present. Cane stems were refused in early February but was one of the preferable foods in early March. Turnip roots, but never leaves, were taken occasionally. Foods offered that were not touched were water hyacinths, golden-clug, dewberry stems, and Iris. Tops of carrots were also refused. There was a tendency to avoid foods covered by water. Even sweet potatotes — which probably rate A-1 as far as preference is concerned — were not eaten for two or three days if continually covered by water; but if the water receeded enough to expose even a small portion of it, the sweet potatoe disappeared.

Within three days after the last nutria was released, May 7, the pen had a greenish cast. Within ten days there was a thin mat of alligator grass over the higher portions of the pen. At the end of three weeks alligator grass covered most of the pen except where deep runs had been established. Bladder pots *(Glottidium)* had sprouted, and two clumps of cutgrass were growing. One clump of Juncus had established itself in the corner where the preference experiments had been conducted.

In mid July, about 70 days after the animals were released, alligator grass covered most of the pen. Wild millet, however, covered over 10 percent of the area and other small stems were beginning to stool. What was believed to be seedling sawgrass but later turned out to be a sedge was beginning to grow and there were 8 distinct bunches of pickerel weed. There were only about 4 clumps of cutgrass (against an estimated 380 clumps before the experiment) visible. There were at least 10 plants of Sagittaria at this time as well as some three square and a round stemmed rush or juncus. No cane or vines were visible.

In mid August Alligator grass was still the predominant plant but wild millet and some flowering sedges had increased in abundance.

Unlike the previous year the millet "stooled" and headed out. No cane and very little cutgrass grew during the past growing season. In all fairness to the project, however, it should be noted that there was pracitcally no cane and very little cutgrass on the south side of the pen where it is believed that muskrats had produced an "eatout." In April and May, just prior to the time that the animals were released, six blue wing teal and a variety of shorebirds used this pen. They

did not use the area immediately around the pen. Sora have been observed both within and without this pen during the summer.

Pen 2

In Pen 2, built on a higher portion of the marsh where the water covers the ground only during an extremely high tide, cane was apparently the first plant eaten. Throughout late September, October and early November, it appeared to be the chief food. Roots were seldom eaten. The stems were apparently ridden down, cut off where the tender portion began and that tender portion eaten. The *Panicum* and *Spartina* grasses were used first as materials for a house and some resting platforms. The paths were built along all sides of the pen within the first four weeks.

By early February most green plants were cut off close to the ground. There was some digging for roots, apparently of cane and feather grass. There was a decided tendency to avoid dense masses of dead, or even green vegetation. The pattern was to widen and extend paths or openings through the denser feather grass.

From March through September the animals ate the green more succulant plants almost as fast as they grew. Three square in particular was kept relatively close cropped. Cane appears to be taken almost as soon as it gets to any height. Only a few stems have been able to survive. The *Spartina-Panicum* grasses tend to be avoided, except that the roots appear to be eaten when waters are at the lowest. Although cowpea is kept cropped, there is little evidence of eating — it appears to be used for resting platforms.

Animals Condition

While the vegetation was undergoing the changes described above just what were the animals doing? When the experiment started the animals in Pen 1 weighed a total of 35 pounds. One animal was found dead in this pen on October 4. The flesh had slipped from the bones and it was impossible to sex the animal. Because of the location found it was known that the animal was probably alive on September 27. Trapping of the remaining animals in the pen revealed that the dead nutria was a male.

Animal 1, a male, weighed 11.5 lbs. on February 3, 11.0 lbs. on March 23 and 9.6 lbs. on May 5. This animal did not have the ragged coat or lack of sheen often associated with starvation in March but both characteristics were noticeable in May. It was released just outside of Pen 1 on May 5.

Animal 2, a female, weighed 11.1 lbs. on February 4, 9.6 lbs. on March 23 and 8.8 lbs. on May 5. Coat characters were the same as Animal 1.

Animal 4, a female, weighed 9.8 lbs. on February 4, 9.3 lbs. on March 24 and 9.2 lbs. on May 7. Coat characters were the same as Animal 1.

On March 21, high wind driven tidal waters covered the marsh of the Mobile Delta Area. The animals in this pen were forced to use a ramp built for that purpose to stay out of the water. They could also use a floating 4" × 8" × 16' plank for that purpose. The waters got within 11 or 12 in. of the top of the pen. The animals were in the pen at dark March 21 but were not there on the morning

of March 22. It is assumed that they escaped by getting on the floating plank, reaching the top of the pen and then pulling themselves over.

On March 22, the three traps were set along the south wall of the pen, sweet potatoes were cut up and scattered the full length of the outside of the pen. The next morning two animals were recaptured and returned to the pen. The procedure of baiting was again used. The morning of the 24th, the third animal was recovered. The plank was removed from the pen.

Of the three animals released we know little about two of them. The male (Animal 1) released at Pen 1 was taken on the outside of Pen 2 on July 20. This was about one and one-half miles from the point of release. Traps were set on the outside of the pen after definite signs of nutria activity were noticed in the cane cuttings and path making. This animal was taken back to the outside of Pen 1 and released on July 21. It was retrapped at Pen 2 on August 1 (weight 13.5 lbs.). Again released outside of Pen 1 it was taken inside of Pen 2 on September 20 (weight 11.2 lbs.). Released outside of that pen it was retaken inside on September 17. It is believed that this animal was using some cowpea vines along one side of the pen as a ladder.

Animal 2, a female, has not been trapped since it was released but Animal 4, also a female, was recovered outside of Pen 2 on September 9. The coat was glossy and luxurient; the weight at that time was 14.5 lbs.

Of the animals in Pen 2, Animal 3, a male was first caught on February 3. It weighed 7.8 lbs. It was found dead on March 3. Although decomposition had set in it was possible to make positive identification as to sex. No external cause of death could be noted and the carcass was beyond the stage where postmortums could be made.

Animal 5, a female was first weighed on February 5. It weighed 10.0 lbs. On Feb. 21, 9.4 lbs., March 18, 7.7 lbs., April 5, 7.8 lbs., June 29, 8.3 lbs., and Aug. 3, 8.1 lbs. On September 9 it weighed 8.3 lbs. but showed the ragged coat and lack of sheen often found in starved animals. It was retaken on five more occasions between September 9 and September 19 when it was found dead in the trap. It weighed only 7.3 lbs. at that time. Apparently one mamma had been lactating rather recently and there were six fetuses estimated from 7 - 10 mm long. Although the animal could not have been in the trap more than 23 hours and probably had not been in there for much more than 12, it had already started to swell. Some post mortem changes had occured before it was opened. Whether the animal died from a perforated stomach or the perforation occurred at the time of skinning was unknown. No stomach parasites were found and no possible cause of death was determinable.

Animal 6, a male was weighed on February 18 with a weight of 10.8 lbs. March 17, 10.3 lbs., June 29, 11.7 lbs. and August 1, 11.0 lbs. This animal was not trapped during September despite an abundance of traps and sweet potatoes. No raggedness was noticed at any time.

Animal 8, a female weighed 11.0 lbs. on February 5. When retrapped on February 7, a young nutria left the side of the trap and it is believed that it was the mother of a recent litter. Other weights were Mar. 18, 10.2 lbs., April 5, 10.2 lbs., June 29, 11.0 lbs. August 1, 9.5 lbs. and September 9, 9.5 lbs. This animal was ragged on August 1 and at later dates.

Animal 9, tentatively sexed as a male, weighed 1.6 lbs. on March 18. On August 1 it weighed 3.8 lbs. and on September 9 it weighed the same. On this

date it was quite ragged and was released on the outside of the pen. It was recaught on the outside on September 10 & 11 but on the 13th it was recovered on the inside of the pen. Released again on the outside it was taken on September 17 and again on the 18th on the inside.

Animal 10, a male, weighed 2.2 lbs. on April 6 and on July 30 it weighed 4.0 lbs. It was almost lifeless in the trap when the traps were visited that morning. Released it scarcely moved and six hours later it was taken to the freezer. However, post mortum changes had taken place so that cause of death could not be determined at the Veterinary school in Auburn.

Animal 11 has not been sexed, the weight was 1.2 on September 11 and was undoubtedly of a recent litter. It was not caught later.

CONCLUSIONS

The nutrias have shown a decided preference for three of the weed plants of the Delta. Cane, cutgrass, and alligator grass have all been utilized by these animals. Although muskrats also utilize these plants, any additional utilization may lead to habitat improvement more favorable to waterfowl.

As there are no dikes or farm crops in or immediately adjacent to the Delta, any damage resulting from the release of these animals cannot be foreseen. The ease with which the nutria can be trapped should prevent extensive damage by these animals. Therefore it is advocated that additional animals be released on the Mobile Delta marsh.

LITERATURE CITED

Ashbrook, F. G. 1948. Nutrias grow in the United States. J. Wildl. Manage. 12: 87-95.