

## **Nutria as an Invasive Species ways of population restriction**

### **Myocastor coypus**

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**My first acknowledgment to nutria was during some paper work I had to deliver on invasive species. After reading little on the subject I got to know the consequences of an uncontrolled and unsupervised import of a foreign species to a new place. I decided to focus on nutria since I got to know this was the case also in my country.**

#### **Brief review on the species:**

Nutria is a mammal, members of the Myocastoridae family. Originally they came from South America (Brazil, Bolivia, Paraguay, Argentina and Chile).

Nowdays, has spread to other areas: North America, Europe, the Soviet Union, Africa, Japan and the Middle East.

Nutria was first imported to North America for their fur and in some countries was used as a control method of undesirable vegetation.

**The nutria escapes into the wild** Because of the fall of the world economy during W.W.2 (and because of the anti fur movement) the fur business collapsed leading to an uncontrolled release of the nutria into the wild.

Nutria scattered around Louisiana and southeast Texas because of a hurricane disaster in the late 1940's.

Its habitat in general is the semi aquatic environment (between land and permanent water), they are herbivorous- eat almost any earth plants or aquatic green plants, opportunistic feeders with an extremely varied diet.

Their main activity during midnight and Mostly move in the winter, when there is a shortage of food.

#### **Damage caused by the Nutria**

- Destruction of vegetation from the roots: this is known as “eat outs” and can turn productive wetlands into mud flats which cannot be re-vegetated.
- They burrow and dig the water- retaining levees used for agriculture.

- Dig up lawns and golf courses
- Feed on crops such as corn, sugar, oats.

Nutria disrupts the balance of the ecosystem where they are situated:

- A) Removes habitat for other native wildlife
- B) Marshes can no longer maintain clean water and act as nurseries for young fish.
- C) Can be infected with several parasites that can be transmitted to humans, livestock and pets.

### **Ways to control Nutria population nowadays**

- Predators: They are the prime food source for adult alligators.
- Traps: most commonly leg hold traps
- Toxicants: zinc phosphate on carrots e.g.
- Shooting: very effective at night. Sharpshooters have been professionally trained, and were offered \$0.25 per head.
- Exclusion such as protection of small areas with partially buried fences.
- Habitat Modification: Eliminate standing water in drainages to reduce their attractiveness to nutria.
- Baits

### **The main problem with the control of nutria population is**

1. They have no natural predators in their invasive area.
2. They have a high reproductive capacity.
3. They are opportunistic feeders with an extremely varied diet!

### **Research is helping find ways to deal with the Nutria**

- Research to determine population size, physiological status, and behavior.
- Research of wetlands to estimate the distraction of plants in the invested area.
- Research on nutrition preferences of nutria.

The first research I reviewed shows the connection between the distraction of plant and biomass to invasive nutria species in Pearl River area, Louisiana ("journal of ecology, 1998, 86, 974-982).

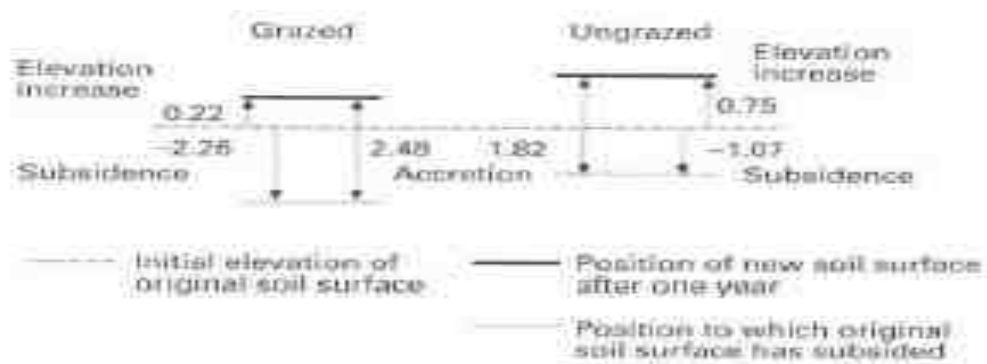
#### **1. Effects of vertebrate herbivores on soil processes, plant biomass, litter accumulation and soil elevation changes in coastal marsh.**

- The objective of this study was to examine the effects of herbivores, predominantly nutria on processes controlling soil elevation in coastal marshes.
- Effects were assessed by the use of paired fenced and unfenced plots. They measured the above ground biomass, soil elevation, root biomass

## Results

- **Above ground** biomass reduced in the grazed plot 142 gm<sup>2</sup> compared to the ungrazed plot 460 gm<sup>2</sup> after one year.
- Soil elevation increased less in grazed than in ungrazed plots.
- Grazing had no significant effects on soil organic matter.
- Nearly 75% of ambient light reached soils in the grazed plot, while only 17% reached the soils in the ungrazed plots.
- Changes in vegetation species richness.
- Root biomass diversity along the years 1993 till 1995

**Below – ground** biomass production was significantly reduced by grazing. As a result root zone expansion was less in the presence of nutria.



Results indicate that herbivores can have a negative effect on soil building process, and may lead eventually to destruction of habitat.

This following research tries to estimate (find out) the reason why nutria choose to live and eat in the vicinity of aquatic plants

### **2. Foraging behavior of *myocastor coypus* : why do coypus consume aquatic plants?**

(Acta ecologica 24(2003), 241-246)

#### **Main 2 hypothesis were suggested:**

- The nutritional benefit.
- Behavioral trade off hypothesis – process of microhabitat selection rather than a product of choosing plant type.

**Foraging observation indicate that coypus primarily fed in the pond (99.8% of 1572 recordings).**

**The few times that animals were observed foraging outside the pond they were within 5 m from the pond edge.**

**No significant differences were found in the nitrogen content of the plants in the three vegetation zones**

## **Other studies & Discussion**

Coypus remained in water even under the freezing condition of temperatures; that indicates that feeding sites in coybus could be modulated by predation risk avoidance, even if this behavior may incur nutritional or thermo regulatory costs.

The last research I reviewed tries to see if the nutria population function as metapopulation in the invested region (means the all come from small group of nutria that invested the area) if this is the case eradication programs which do not allow recolonization to supervent can be developed.

### **3. Microsatellite DNA markers for the study of population structure and dynamics in nutria** (molecular ecology notes (2005) 5, 124-126)

- They wanted to determine the levels of allelic diversity because their presumption was that if nutria population do function as meta population, eradication programs which do not allow recolonization to supervene can be developed.
- They documented 27 microsatellite DNA markers from nutrias in the BNWR , maryland.

#### **Results**

- In a survey of 63 nutria from BNWR the founding are:
- Low genetic diversity in the averaged of 2.8 alleles per locus , compared to the pool collection (BNWR, Louisiana and Argentina) that have the average diversity of 5 alleles per locus.
- Average individual Heterozygosity among the pooled collections was 46% compared to 35% among BNWR animals.

#### **Conclusion/Dealing with the Nutria**

- The DNA analysis can be instrumental to eradication programs that attempt to prevent decolonization among subpopulations.
- Coybus are not a threat to agricultural systems in their native range : This is probably because these areas e.g. in the Pampas region, have an area of natural vegetation between the water body and crop. It is there fore recommended, in addition to trapping, to leave a 5-M wide fringe of natural vegetation near the water edge.

**Nutria, as many uncontrolled species importation caused a lot of agricultural damage that could be prevented if only the right research and planning ahead would be done.**

**My believe is that many research should be done on a small ecosystem environment before releasing new species into the wild in a new environment.**

## References

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<http://www.mdsg.umd.edu> "Invasive Species in the Chesapeake Watershed".

<http://www.fws.gov/blackwater/nutriafact.html> "Nutria at Blackwater National Wildlife Refuge".

<http://www.dnr.state.md.us/wildlife/invnutriaproj.asp> "Maryland Marsh Restoration/Nutria Project Partnership: Partnership & Pilot Program FAQs.