

# THE RELATION OF CATTLE AND CATTLE GRAZING TO MARSH WILDLIFE AND PLANTS IN LOUISIANA

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The firm marsh soils along the Southwestern Louisiana coast are very fertile and supports dense growth of vegetation, and as such serve as ideal cattle range. Also, the long growing season provides year round grazing and frequently range cattle can maintain their weight even during winter months. However, these marshes are also very productive to various wildlife species such as migratory waterfowl, rails and snipe (*Capella gallinago*) plus numerous fur-bearing animals.

This area each year winters over 2 million ducks or 30 per cent of the ducks in the Mississippi Flyway. In addition some 300,000 blue and snow geese winter in this area plus untold number of snipe, coots (*Fulica americana*) and rails. The fur harvest has declined in recent years but is still valued at over \$1 million.

There are many conflicting ideas concerning the effects of cattle on marsh animal and plant life. In 1958 a study was begun on Marsh Island Wildlife Refuge with the primary objectives aimed at determining the effects of cattle on the vegetative composition and vegetative coverage of various marsh types, cattle usage of various marsh types and to evaluate a cattle range as a wildlife habitat.

For the purpose of this study, 19 cattle enclosures were constructed on Marsh Island. These enclosures measured 30' x 30' and created the condition which would exist without the presence of cattle. The enclosures and adjacent graze areas were sampled annually beginning in 1958.

The enclosures were sampled in August each year. Line transects and quadrats were used in sampling. Eight transects, each 5 feet long, were made in each enclosure and control area, and plant types and openings were tabulated to the nearest one-tenth foot as they occurred along the transects. In addition, stem counts were made on species occurring in 8-one square foot quadrats in each impoundment and control area.

The cattle range on Marsh Island Wildlife Refuge was of three primary types based on elevation and vegetation. The first type was the high marsh which extended inland from the beach from 1,000 to 2,000 feet. This type was characterized by firm, well-drained soil with salt tolerant vegetation usually growing in short, sparse stands. The second type was characterized by fairly firm soil but the drainage of this type was slower than that of the high marsh. Water may remain for some time after rain but drainage was complete. This type or the intermediate type ran east and west in a strip about 2,000 feet wide beginning about 1,500 feet from the beach. The third type on the cattle range was the low marsh and began about 4,000 feet from the beach and extended northward from this point about 3,000 feet. The soil of this type lacked the firmness of the other types and cattle usually sank from 6 inches to 8 inches. This type was poorly drained and normally covered with water ranging from the marsh surface to several inches in depth. Vegetation characteristic of this type require brackish conditions and consists primarily of tall grasses growing in dense stands.

**Cattle Usage.** As indicated by tract counts and general observation the cattle spent 50% of their time on the high marsh, 30% on the intermediate, and 20% on the low marsh. The reason for this was evident since the firm marsh offered easier movement and also served as a bedding ground.

**Plant Species Composition.** The study revealed that certain plant species increased under grazing while others decreased. Also new plants or invaders appeared which formerly were not present in certain areas but were encouraged by grazing. Although valuable wildlife food plants were lost through grazing, others benefitted. Under

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moderate grazing in tide water marshes this usually balanced out with no serious effects on wildlife.

Grazing reduced plants with high forage value, thus favoring non-palatable species, and often species which were practically non-existent were increased by grazing. Unfortunately, the invader species were usually worthless to wildlife as well as cattle. Such species include needle grass (*Juncus roemerianus*), rattlebox (*Daubentonia drummondii*) and sump weed (*Iva frutescens*). Seashore paspalum (*Paspalum vaginatum*) was the only species to increase by grazing that was of value to ducks.

Plants with high forage value for cattle such as marshhay cordgrass (*Spartina patens*) and seashore saltgrass (*Distichlis spicata*) were of practically no value to ducks. However, the roots and rhizomes of these species were used by geese whenever burned or grazed to remove dense roughs.

Light or moderate grazing often encouraged the growth of certain valuable wildlife food plants. Three-cornered grass (*Scirpus olneyi*) increased under moderate grazing but was destroyed by over-grazing. This species, as well as the annual grasses and sedges, are secondary in the plant succession processes, and grazing sets back succession much like cultivation, burning, flooding storm tides, etc. Consequently, light or moderate grazing very often benefits these species.

**Plant Density.** On areas where cattle grazed, the vegetation was shorter and sparser than in the enclosures. This resulted from both grazing and trampling. In many areas the effect of trampling, particularly in soft marshes, often equaled or exceeded that of grazing. Cattle sank to a depth of 2 to 8 inches depending on the firmness of the soil, and during the study it was not uncommon to count as many as four hoof prints per square foot of marsh surface.

The hoof print not only destroyed the vegetation that it included in soft soils, but these did not become revegetated for several months. This resulted from both compaction and excessive flooding.

In marshes supporting dense stands of tall, mature vegetation such as marshhay cordgrass and roseau cane (*Phragmites communis*), closely regulated grazing and trampling was beneficial to wildlife. This created openings, permitted annual grasses to grow and made the area and the food present more available to most species of waterfowl and snipe. Also, cattle grazing on firm marshes serve much the same purpose as burning in attracting geese to an area.

**Seed Production.** Cattle open up dense stands of climax vegetation in freshwater marshes, thus exposing the soil and permitting annual grasses to grow. However, in many marsh areas cattle are grazed on annual grasses during the summer and early fall. This seriously retards seed production in valuable waterfowl food plants such as millet (*Echinochloa sp.*), nut grass (*Cyperus sp.*), sprangle-top (*Leptochloa fascicularis*), fall panicum (*Panicum dichotomiflorum*), etc. Where coastal marshes are not grazed during the summer months because of insects and the danger of tropical storms, this does not occur.

One study was conducted to determine the effects of cattle grazing on annual grasses. This area selected was grazed with moderate stocking during the summer. Sampling was done in August and stem counts were made on plots in grazed and adjacent non-grazed marsh.

The results showed that annual grasses occupied both areas, but the density and height was far greater in the non-grazed area. Fall panicum and wild millet, both excellent duck foods (Junca, 1962), were dominants in the non-grazed area. Longtom (*Paspalum lividum*) and bermuda grass (*Cynodon dactylon*), increases under grazing, were dominants in the grazed area. The density of fall panicum was over 3 times greater in the non-grazed area, and wild millet did not show up in grazed area, but had 7 stems per square foot in the non-grazed.

**Other Effects.** Low marsh levees have been constructed in various places along the Louisiana coast with spoil from canals dug for navigation, drainage, access and pipe lines. Also, levees have been used to form impoundments specifically for wildlife management.

The levees serve a very beneficial purpose for cattle and wildlife in preventing salt water intrusion from such canals into adjacent marshes, thus stabilizing water levels

and salinities. Because of the fluid nature of marsh soil, problems of subsidence, shrinkage and erosion limit the life expectancy of levee systems (*Nichols, 1959*). The problem of erosion is solved by establishing suitable grass cover on the levee. Where cattle use such levees as a walkway or travel lane they usually prevent grass cover from becoming established. This permits water erosion, a gradual lowering, and reduces the life expectancy of the levee.

An enclosure was constructed on a levee used heavily by cattle for travel on the Marsh Island Wildlife Refuge. When the enclosure was constructed the crest of the levee was only 2.5 per cent vegetated. After 3 years the crest of the levee was only 10 per cent vegetated inside the enclosure. Portions of the levee not used as travel lanes by cattle became vegetated soon after construction of the levee. Once a levee has been severely compacted by cattle it will take many years before the grass will invade the compacted area.

Marsh drainage to produce cattle range, a program attracting increasing interest in Louisiana, has a serious effect on most wildlife. Its effects are particularly detrimental to certain species such as ducks, alligators (*Alligator Mississippiensis*) and fur-bearing animals. Frequently marshes are drained to provide winter grazing; however, it is at that time that ducks use the marshes and require flooded conditions. Geese will use de-watered marshes for feeding and are not especially affected by this type of cattle range management.

Marshes drained during the summer then flooded from 4 to 6 inches deep during the winter would offer ideal conditions for all waterfowl, but its value as cattle range may be limited. Heavy cattle grazing during the summer, however, would affect seed production in annual grasses.

**Burning.** Marsh burning is a common range management practice along the Louisiana coast. Burning removes heavy accumulations of plant debris and old growth of mature vegetation. The resulting sprout growth of marshhay cordgrass provides excellent cattle grazing and attracts blue and snow geese. While spring and summer burning destroys the nests and young of many species, burns properly timed are not harmful to most marsh wildlife.

#### SUMMARY AND CONCLUSIONS

The relationship between cattle grazing and wildlife varies considerably, depending upon the cattle stocking rate, months that grazing is done, plants present and the wildlife species concerned. This relationship can be manipulated to a large degree by the landowner to suit the desired land use practice.

The following summation is a list of the various game species and their relation to cattle and cattle grazing in the coastal marshes of Louisiana.

**Blue and Snow Geese.** These birds benefit by moderate cattle grazing. They feed primarily on tender, new growth of marsh grasses plus roots and rhizomes that they dig from the soil, and are attracted to clean areas where dense stands of mature vegetation has been removed. Not only is more food available in such areas, but also the birds prefer areas having an unobstructed view and offering protection from approaching danger.

**Ducks.** Unlike geese, ducks have feeding habits and habitat requirements differing greatly from cattle. Whereas cattle depend mainly on the foliage of marsh grasses, ducks feed on seeds and aquatic vegetation.

Many marshes are too soft to support the weight of cattle, but where cattle can graze they open up dense stands of mature vegetation and permit sub-climax species to grow. Also these openings provide feeding areas for ducks.

Annual grasses are excellent cattle forage. Also, the seeds of these grasses are choice duck foods. Therefore, where cattle are permitted to graze annual grasses throughout the summer, seed production is greatly reduced.

Ideal duck habitat should contain from 4 to 6 inches of permanent water throughout the winter. Then, de-watering fresh-water marshes during the late spring and summer will afford conditions favorable for the germination and growth of annual grasses. However, the permanent de-watering of fresh, brackish or salt marshes

to develop cattle pasture simply removes that much area from duck usage and the marsh condition no longer exists.

*Snipe*. Probably no game species benefits more by cattle grazing than does the wilson snipe. This species feeds on earthworms, insects, snails and occasionally seeds and prefers exposed moist soil with no overhead cover. In fact the largest concentrations of snipe are usually found on over-grazed marsh range.

*Rails*. Louisiana has several species of rails but none are affected by moderate cattle grazing. This species likes an "edge effect" and will do well where cattle have opened up dense stands of mature vegetation. The rail must have adequate escape cover but seldom are marshes so heavily over-grazed that such is not available.

*Fur-bearing Animals*. At one time the fur industry in Louisiana was a multi-million dollar industry; but, with the gradual disappearance of the muskrat its value has steadily declined. However, in areas which still have muskrat and suitable habitat, anything more than light to moderate grazing would be detrimental.

O'Neil (1949) reported that cattle grazing in muskrat (*Ondatra zibethicus*) marshes seriously handicapped the harvest. Cattle snapped traps, broke down cane markers and trampled rat runs, making it difficult to make sets. Also, cattle bedding down on muskrat houses and hooking the houses killed young muskrats and caused the old to move.

Landowners in certain areas supplement their income by trapping nutria (*Myocastor coypu*). Nutria are grazing the browsing animals and as such a certain amount of competition takes place between cattle and nutria. However, marsh ranges are seldom grazed to the extent that this would be noticeable. Also, most range management practices, other than permanent de-watering, will benefit this species as well as cattle.

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## POTHOLE BLASTING IN MARYLAND WETLANDS<sup>1</sup>

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#### ABSTRACT

Approximately 90 potholes were blasted with ammonium nitrate and fuel oil mixtures on a fresh marsh and a saline marsh in the Chesapeake Bay area of Maryland. Work covered a 3-year period in fresh marshes and one growing season in saline marshes. Number of ANFO charges used per pothole ranged from 1-15 varying in gross amounts per pothole from 20-415 lbs. Detonation was by dynamite using either primacord, cap and fuse or electric caps. Depth of charge holes varied from 8-36 inches. Available data are presented on size and depth of potholes, sloughing of spoil, soil types and plant invasions.

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