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OREGON'S NUTRIA PROBLEM

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ABSTRACT: The nutria or coypu, *Myocastor coypus*, is a large semi-aquatic rodent that superficially resembles an overgrown muskrat or a stunted beaver. They were introduced into Oregon from about 1930 to the 1950's. At one time Oregon had more than 600 fur farmers raising these animals for fur; now there are none. Some animals escaped and many others were released into the wild when it became apparent that pelt values were nonexistent and production costs greatly exceeded profits. Being prolific and quite mobile the nutria quickly spread through much of western Oregon. By the 1960's damage to agricultural crops was common to severe in western Oregon. Crops damaged included seed, grain, forage, hay and trees. Burrowing damage to stream banks, field borders and farm ponds was reported in many areas. Growth and reproduction data for Oregon nutria are included. Methods for controlling feral nutria including the use of prolin, red squill, strychnine alkaloid and zinc phosphide are reported. Fur trapping and adverse weather as factors in population reduction are discussed.

The nutria or coypu, *Myocastor coypus*, is a large semi-aquatic rodent that superficially resembles an overgrown muskrat or a stunted beaver. Most Oregon nutria are dark amber-brown to black in color with an occasional dirty white specimen appearing in feral populations. They were brought to Oregon from about 1930 to the 1950's by fur farmers and promoters selling breeding stock to fur farmers. At one time there were more than 600 nutria farms in the State; today there are probably none. Some animals escaped but many were released when it became apparent that fur values did not approach the get rich quick claims made by the promoters. Being prolific, quite mobile and aided by periodic flooding during winter months, the nutria quickly spread and established feral populations throughout much of western Oregon with greatest concentrations in the Willamette Valley. Nutria have been reported from every county west of the Cascade mountains and from several counties in eastern Oregon. By 1960 damage to agricultural crops caused by these large rodents was commonplace though many farmers blamed other animals for their losses.

Between 1965-1967 more than 600 animals were trapped from the Corvallis area and examined to obtain general life history data with emphasis on reproduction and growth rates (Peloquin 1969). Body weights of maximal sized males and nulliparous females were 24.0 and 16.0 pounds respectively. Sexual maturity was attained from 6 to 9 months of age in males and from 4 to 9 months of age in females. Mean body weights at the onset of sexual maturity for males and females was 6.1 and 4.1 pounds respectively. Successful pregnancies last about 130-132 days with peak birth periods occurring in January, March and May, with a lesser peak in October. Litters averaged 5.0 kits at birth with a 1:1 sex ratio. Prenatal mortality was observed in 24.6 percent of 60 pregnancies examined. Gravid after resorption averaged 4.9 fetuses per female. Based upon 55 pairs of ovaries, 7.6 corpora lutea were observed per ovary. Differences between corpora lutea and fetuses that survived prenatal mortality indicated a total embryonic loss of about 33 to 35 percent. Weaning occurred in feral kits seven weeks after birth. Kits forceably weaned when two to eight weeks old survived but grew at a somewhat slower rate than normal kits. Nine kits, less than one week old when forceably weaned, suffered a depleted condition and six died. Even so, this indicates the tremendous capacity of the nutria to survive.

INTRODUCTIONS

Introductions of nutria into the United States occurred from about 1889 to 1955. Since first introduced into North America, feral populations have been reported in 40 states and 3 Canadian provinces and still persist in at least 20 states (Evans 1970). Oregon's first feral nutria were probably introduced by fur farmers though some may have been brought into the State in a futile attempt to control Brazilian water weed, *Elodea densa*, and other aquatic plants that choke several of our coastal lakes. In 1937 a number of animals were apparently released by a fur farmer in Tillamook county (Larrison 1943). While no authentic records exist to show the exact time or place of other escapes and releases, by 1946 wild

populations were established in several localities. Colonies were reported in the Portland area, between Toledo and Elk City in Lincoln county (Larrison 1943) and along the Nestucca, Columbia, and Willamette Rivers in western Oregon and the Umatilla and Grand Ronde Rivers east of the Cascades (Mace 1970).

During the 1950's at least three organizations: Oregon Purebred Nutria Associates, Nutria Incorporated, and Purebred Nutria Association actively promoted the sale of nutria to prospective fur farmers throughout the State. Magazine and newspaper articles extolled the riches to be gained by the sale of these "gold nuggets in fur". By 1955, when the promotion was at its peak, over 400,000 wild nutria pelts from Louisiana sold for an average price of \$1.00 each (Evans 1970). Nevertheless, Oregonians convinced by promoter demonstrations at the "Home Show" in Portland, the State Fair in Salem, and many county fairs throughout the State, continued to buy breeding animals. The Oregon Purebred Nutria Associates, Inc. set up associate offices in Portland, Salem and Grants Pass to handle the sale and registration of their "purebred" animals to gullible buyers. At that time a breeding pair was priced at \$950 and a "trio" of two females and one male listed for \$1,550.

By the late 1950's and early 1960's the nutria market had become so depressed that furs were worth as little as fifty cents to one dollar with no buyers. During that period most of the nutria farmers gave up their operations and many animals were either released or escaped captivity due to poorly constructed holding pens. A prolific, mobile rodent, this South American furbearer quickly established residence in the wild. Highest numbers were in the rich agricultural lands in the Willamette Valley of western Oregon with scattered colonies showing up in Wai Iowa, Union, Baker and Malheur counties in eastern Oregon.

Oregon's licensed fur trappers are required by law to file an annual report indicating numbers of each species caught. As early as the 1945-46 season nutria were being recorded as "incidental catch". These early reports are considered to be overly conservative and probably inaccurate as many trappers seeking beaver, muskrat, mink and otter did not pelt or even record the numbers of nutria accidentally trapped. Such records may indicate a population "trend" as nutria catch reports have increased sharply from 29 in 1957-58 to 5,950 in 1971-72 (Oregon State Game Commission Annual Reports). During the 1972-73 trapping season, and at least into January of the present season, large nutria pelts of good quality have sold for as much as \$7 (J. Tabor, pers. comm.) and trappers have increased their efforts to catch nutria for their fur. While only one of several methods of population reduction, this added pressure is believed to be significant in keeping nutria numbers at present levels.

DAMAGE

During the 1960's damage to agricultural crops was reported from nearly every county in western Oregon though some farmers, not yet aware of the presence of feral nutria, blamed the native beaver and even blacktailed deer for their crop losses.

Nutria are semi-aquatic and prefer to feed in the general vicinity of their burrow systems. Fresh water is not required and slow moving or even stagnant pools and ponds are quite acceptable as habitat. Some colonies continued to occupy burrow systems near alfalfa and other field crops for several weeks after all adjacent ditches and water courses had become dry.

Crop damage in the Willamette Valley was typical of that reviewed by Evans (1970) and Schitoskey et al. (1972). Damage occurred to nearly every crop grown in the area including alfalfa, grass seed, wheat, barley, oats, field corn, sweet corn, carrots, table beets, cauliflower, cucumbers, melons and sugar beets. Nutria also girdled fruit trees, nut trees, deciduous forest trees and occasionally conifers. Even Oregon oak, *Quercus garryana*, generally shunned for food even by beaver, was girdled where it occurred along stream courses.

No attempts were made to assess total damages caused by these animals though individual accounts of "\$100 damage to commercial cauliflower field", "\$50 damage to home garden", "\$60 damage to cannery beets" were reported by county agricultural agents. One Corvallis farmer listed one third of his sugar beet crop, being grown for seed, as destroyed during a two week period. He estimated his loss at \$2,500. Another beet grower near St. Paul lost one fourth of his 30 acre crop and estimated his loss at \$4,500.

Numerous instances of burrowing damage to stream banks, field borders and farm ponds were reported. One local farmer had to hire a wrecker three times during a two year period to pull his tractor from collapsed nutria burrows near his field border. A two year heifer

was lost when it broke through a nutria burrow undermining its pasture. Unable to get out of the pit, it was dead when discovered by the owner. As damage complaints piled up requests for methods of controlling the excessive numbers of feral nutria increased.

CONTROLS

During the course of this study several control methods were investigated. Shooting and dead trapping with steel traps, set to permit the captured animal to drown, were methods used by local farmers but proved time consuming and ineffective. Live traps measuring 9 x 9 x 32 baited with fresh carrots were used to capture many animals. Multiple sets with as many as four traps fastened to a single floating raft frequently resulted in catches of 3 or 4 animals per night. Again this method was time consuming and the floats were cumbersome and difficult to move from place to place.

Four common rodenticides dusted on pieces of raw carrot were used in both laboratory and field trials. These included prolin and red squill which are frequently recommended for controlling commensal rodents and strychnine alkaloid and zinc phosphide which have proven effective for controlling most field rodents including pocket gophers, porcupines and field mice. Most prolin rat bait formulas call for a 0.025% concentration (1 part prolin concentrate containing 0.5% active ingredient mixed with 19 parts of cereal type bait). Daily feedings of prolin at 0.5, 0.025 and 0.0125 percent levels dusted on raw carrot baits all produced death to caged nutria 8-12 days after first feedings. Post-mortem examinations revealed crystalline plugs in nostrils, yellow-green coloration of the lips, massive haematomas in axillary and thoracic regions and evidence of bleeding from penis, nostrils and lips. Prolin appears to be as effective for killing nutria as it is for Norway rats even at one half the strength normally recommended for rats. It does require multiple feedings of at least 12-14 days. Unless baits are scattered into many small feeding stations, even longer periods would be required to control feral nutria as the larger more aggressive adults quickly clean up every piece of carrot available thus depriving smaller immature individuals the opportunity of getting any treated baits. Prolin is recommended only in situations where more lethal rodenticides cannot be safely used.

Red Squill, prepared from the lily like plant *Urginea maritima*, has long been recommended for the control of Norway rats. The effectiveness and safety of squill in rat control may be due to the fact that rats can't vomit while to man and most domestic animals squill acts as an emetic. Apparently nutria do not vomit either. Red squill (300 mg/kg) dusted on raw carrot pieces coated with glycerine for a sticker at a 1:15 ratio proved to be very lethal for caged nutria. Other dilutions were also effective though requiring longer time periods to kill. Since squill is not now readily available, this method is not recommended.

Strychnine alkaloid is a rodenticide familiar to most farmers in this area and one commonly used for controlling ground squirrels, pocket gophers and other rodent pests. When local farmers reported little or no success in their efforts to control nutria with strychnine we tested it on caged animals and found them to be quite resistant to its effects. Strychnine is not an effective rodenticide for controlling nutria and because improperly exposed baits could be hazardous to non-target species it is not recommended for nutria control.

Technical grade (94 percent) zinc phosphide is a highly concentrated rodenticide that has been used for many years for controlling rats and some field rodents, particularly field mice. As pointed out by Evans (1970); Schitoskey et al (1972); and Hood (1972) it is effective, relatively safe and is presently registered for the control of nutria. The LD₅₀ for nutria is 5.6 mg/kg (Hood 1972). Evans (1970) described in detail the proper method of using this chemical for nutria control. Two inch chunks of raw carrot dusted thoroughly with 0.75 percent zinc phosphide produces a dull black, unattractive bait with a strong odor of garlic. Such baits are avoided by nearly every marsh inhabitant including muskrat but are eaten with apparent relish by nutria. Floating rafts for bait placement, as described by Evans (1970), provide an added safety factor and make the baits generally unavailable to most land mammals sharing the area with nutria. By careful bait placement, well-used nutria trails leading to and from aquatic habitats may also be baited without undue hazard to non-target species. Secondary poisoning to carnivores and raptorial birds is almost nil. Many of the poisoned nutria die within their burrow systems and are thus unavailable to most scavengers. We believe this method to be the most effective and one of the safest to use for controlling excessive populations of feral nutria in Oregon.

WEATHER

Some wildlife biologists are of the opinion that feral nutria cannot survive during extreme cold weather, particularly if ponds or other water courses freeze over thus forcing the animals to expose themselves in search of food. Newson (1966) went so far as to state, "In England the adults have few natural enemies but are unable to withstand more than a few days severe frost." Both Newson (1966) and Norris (1967) reported between 80 and 90 percent mortality following the cold weather in January and February, 1963. Though most native habitats in South America lie within a mild temperate zone, even there some parts of the range are subject to hard freezes and severe winter weather (Ashbrook 1949).

Evans (1970) states that nutria have adapted to a wide variety of conditions and continue to persist in areas previously claimed as unsuitable for their existence including at least three Canadian provinces. Even so, extreme changes in temperature or unusually cold weather with snow and icy conditions appear to be quite detrimental to feral nutria in Oregon. Such conditions were present during the first two weeks in December, 1972.

Due to the influence of the low coastal mountains on the west and the much higher Cascades on the east, much of western Oregon is considered to be in an area of rather moderate winter climate during normal winters. Daily normal temperatures for the Corvallis area in December range from about 39-43°F dropping to the 30's at night. Average temperatures for December, 1972 were the coldest at most weather stations in the State since 1948 with the Willamette Valley and North Central stations recording their coldest since 1924 and 1919. Temperatures dropped below freezing for 10-14 consecutive days in the western valleys. Portland recorded its second longest cold spell since 1890. On December 8 and 9 temperatures at the OSU Hyslop Farm Micro station reached -7 and -6 degrees. At Eugene, Salem and Vernonia temperatures reached an all-time record low of -12 (U. S. Dept. Commerce 1972; Olson and Bates 1973).

Fruit trees, ornamentals, English walnuts, cane berries and many other plants suffered heavy freeze damage throughout much of western Oregon; apparently so did the nutria. Reports of dead animals, animals with frozen feet and tails and animals wandering aimlessly about in search of food were common. Many perished though the temperatures moderated during the last two weeks of December and above normal precipitation melted snow and ice and restored watery habitats. Fur trappers reported almost no nutria in their catch following the December freeze though the general trapping season remained open through February 15. While we have no records to substantiate an 80-90 percent loss as reported by Norris (1967), all indications were that Oregon's feral nutria population suffered heavy losses during the winter of 1972.

To summarize, nutria were introduced into Oregon between 1930 and the 1950's by fur farmers and get-rich-quick promoters. Escapes and released animals permitted this prolific, mobile furbearer to quickly spread and establish feral populations in much of western Oregon and parts of eastern Oregon. Oregon nutria breed throughout the year with birth peaks occurring in January, March and May with a lesser peak in October. Young are precocial and can survive on their own after about one week of age. Crop damage was common to severe by the 1960's with nearly every agricultural crop grown in western Oregon subject to some damage. Various control methods were tested including shooting, trapping and poisoning. Zinc phosphide treated raw carrots proved to be the most effective bait for reducing large populations. Freezing weather in December, 1972 caused heavy losses and present populations are considered to be at a moderately low level.

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