Mink

Mustela vison

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DESCRIPTION

Taxonomy and Basic Description

Schreber first described the American mink, *Mustela vison*, in 1777. Mink are classified in the order Canivora, family Mustelidae and further categorized into the subfamily Mustelinae. Photo by Phillip Jones, SCDNR.

The mink, like other members of the weasel family, has short legs and a long cylindrical body. Body mass ranges from 0.55 to 1.25 kg (1.2 to 2.75 pounds.) and overall length is 470 to 700mm (18.5 to 27.5 inches.) Males are approximately 10 percent larger than females. Pelage is typically dark brown with white markings on the throat, chest and belly. The tip of the tail is markedly darker than the rest of the body (Jackson 1961).

Mink have two anal glands that produce a strong odor. When stressed, mink can release secretions from these glands, as a defense mechanism (Brinck et al. 1978). Feces are usually deposited in prominent places as territorial markers.

Mink are polygamous, and courtship and mating in mink can often be aggressive. Mating usually occurs from January through March and, because of delayed implantation, the gestation period ranges from 40 to 75 days. Birth of the young occurs 30 days after implantation. Young are typically born from April to June. Weaning occurs at eight to nine weeks, though the young may remain with the female as a family group until fall.

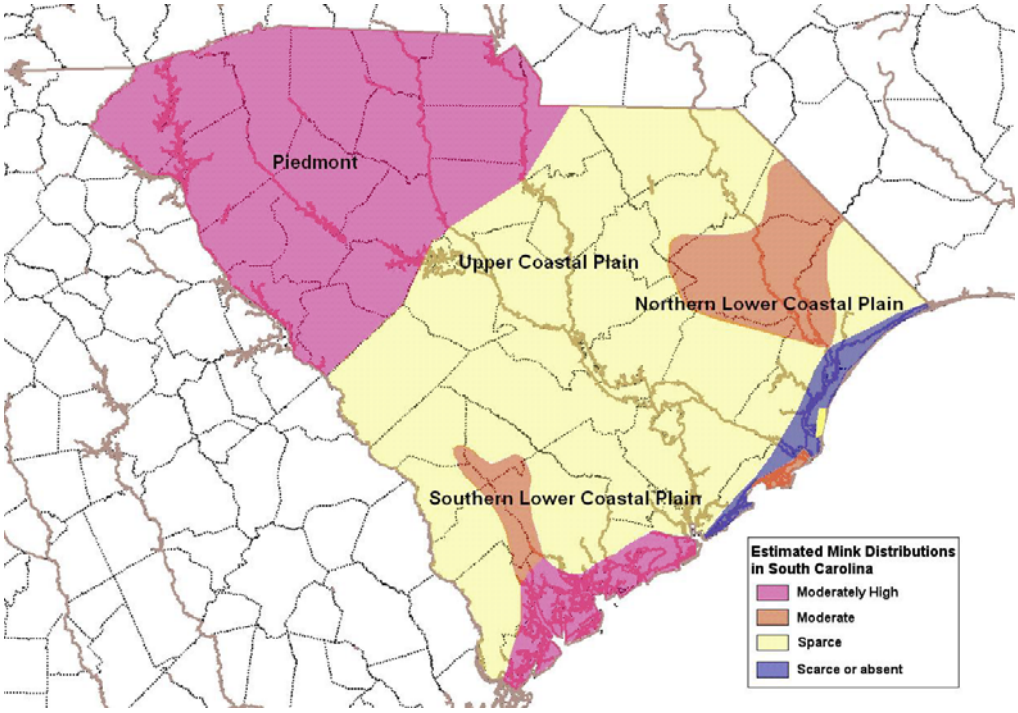
Status

Although no official status has been given to the mink, South Carolina's population is considered to be in decline statewide (Baker 1999).

POPULATION DISTRIBUTION AND SIZE

The mink's range extends throughout Canada and much of the eastern United States. Historically, mink occurred throughout South Carolina in varying densities. The piedmont region and southern coastal marsh areas have had relatively abundant populations of mink. Much of the upper and lower coastal plain regions contain sparse densities, with moderately higher concentrations of mink in the Lynches/Pee Dee and Salkahatchie/Combahee river corridors. Mink are scarce or absent in the northern coastal marshes. Recent survey data

indicates mink are essentially absent in the northern coastal marshes where population restoration by SCDNR has not taken place and are possibly declining throughout the remainder of the state (Baker 1999).



A recent ecological characterization of hammock islands in South Carolina's coastal zone suggests that these islands may provide denning habitat for coastal mink (Whitaker et al 2004). One researcher noted one diurnal sighting of mink as well as tracks on the islands. Additionally, he found many clusters of clapper rail feathers and a few piles of small mammal hair in grasslands on hammocks near salt shrub collars and logs on hammock uplands, suggesting mink use the islands for foraging and feeding (McCord, personal communication May 24, 2005).

Annual commercial fur harvest data indicated a 30-year average harvest of 108 animals per year by commercial trappers and hunters. However, this average does not adequately reveal the decline in harvest data over the last few years. From the 1975 season to 1989, the average mink harvest was 197 animals. Since the 1990 fur harvest season, the average take has been only 19 mink (SCDNR 2004 unpublished data).

A considerable amount of anecdotal information has been received from older trappers who report declining mink numbers. Numerous experienced mink trappers have noted that the species is rare or absent from areas of former abundance even though the habitat is seemingly intact. One trapper from Lancaster County reported that he had not caught a mink in over 20 years from a trap line that once produced as many as 30 mink per year. Furbearer biologists from the Georgia Department of Natural Resources and the North Carolina Wildlife Resources Commission reported similar comments from trappers about declines in mink numbers in their states (Greg Waters, GA DNR and Perry Sumner, NC Wildlife Resources Commission, personal communication).

In a mail survey of South Carolina sportsmen who caught mink during the 1988 trapping season, over 40 percent of the respondents perceived the mink population to be declining (SC Wildlife and Marine Resources Department, unpublished data).

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Mink are typically associated in habitats with some type of water component. These areas include swamps, rivers, streams, ponds and saltwater marshes. Mink typically live in dens located in rock piles, under tree roots, bridge crossings and stream bank holes. Mink in saltwater marsh habitat may rarely utilize dens because of tidal fluctuations.

Mink are carnivorous and their diet often reflects prey availability, opportunity and location. Statewide, fish may make up 40 percent of the mink's diet. However, mink will also consume small rodents, rabbits, muskrats, squirrels, crabs, crayfish, insects, snails, frogs, snakes and waterfowl (Baker 1999).

CHALLENGES

Because of the lack of historic data on habitat conditions in South Carolina, it is difficult to quantitatively evaluate how mink habitat has changed over time. While the integrity of some streams has clearly been altered, others appear reasonably pristine. There has been no attempt to correlate mink densities with habitat alteration. Future studies should compare mink densities with existing habitat suitability index models.

While habitat alterations may be a contributing factor in South Carolina mink population declines, it is doubtful that habitat conditions alone are responsible. Elsewhere throughout the mink's range the species is reported to be adaptable in its use of habitats, tolerating both human activity and habitat changes (Allen 1984). Additionally, some of the areas in South Carolina where mink have declined are in stream drainages, which appear to be intact.

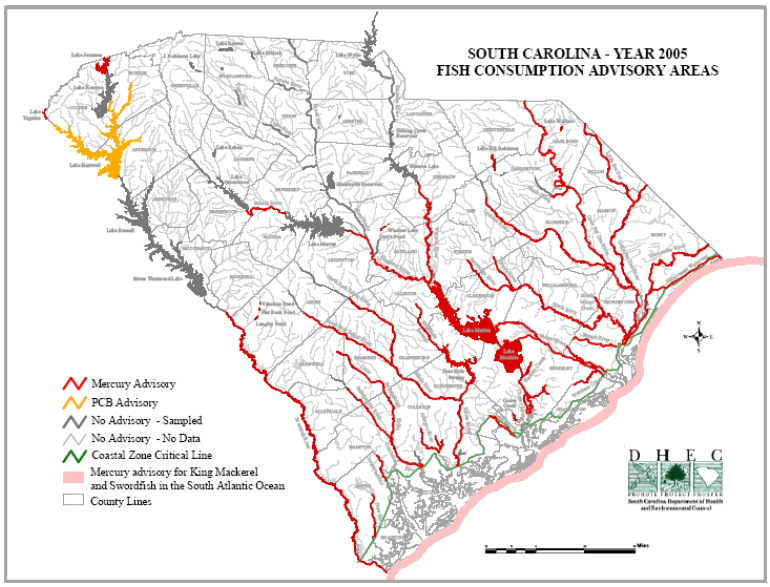
Environmental pollution has long been recognized as a biological hazard to wildlife. Industrial pollutants, pesticides and heavy metals are known to exhibit biomagnification as they pass up the food chain. The mink occupies a niche at or near the top of the food chain; therefore, this species would be especially vulnerable to environmental contaminants. Mink population decline in other regions of North America, most notably in the Great Lakes Region, have been associated with environmental contaminants. Numerous studies have demonstrated the mink's high level of sensitivity to pollutants, particularly organic mercury compounds (Aulerich et al. 1974; Woberser et al. 1976) and polychlorinated biphenyls (PCBs) (Platonow and Karastad 1973; O'Shea et al. 1981).

In 1987, the Furbearer Project initiated studies to evaluate contaminant levels in trapper harvested mink carcasses from South Carolina (Carmichael and Baker 1989). The University of Georgia Riverbend Research Center performed chemical analysis under contract to the SCDNR. Mink samples were screened for a total of 21 chlorinated hydrocarbon pesticides plus PCBs. Tests for ten heavy metals were also conducted. Residues of DDE, PCBs and mercury were detected in mink tissue samples from South Carolina. Residue levels were generally lower than those reported for other wild mustelid populations and did not approach levels published for mink that suffered mortality in laboratory studies. However, the effect of low levels of these contaminants on reproduction and survivability in wild mink remains uncertain. Ringer (1981)

stated that reproduction in mink would normally not be impaired by chlorinated hydrocarbon pesticides such as DDT at levels typically encountered in the environment. However, small doses of PCBs and mercury, singly or in combination, are of concern. Fish in most rivers and lakes throughout the country are now contaminated with PCBs (Jacknow et al. 1986); dietary levels as low as 0.64 parts per million (ppm) have been shown to seriously impair reproduction (Platonow and Karastad 1973). Forty-three percent of the mink sampled in our studies had detectible residues of PCBs with a mean level of 0.56 ppm.

Additionally, mercury is widespread in the environment due both to human activities such as coal burning power generation as well as to naturally occurring mercury in the state's soils. One ppm mercury in the mink diet for as little as two months is known to be lethal (Kirk 1971). Smaller doses would likely have sublethal effects on reproduction and behavior of mink.

Health advisories posted by the South Carolina Department of Health and Environmental Control (SC DHEC) in January of 1995 indicated that mercury contamination of fish in 18 rivers and 9 lakes in South Carolina were high enough to prompt warnings about human consumption of fish. The advisory included all of the stream drainages of the coastal plain and reported mercury levels in many drainages that are above the levels known to be lethal to mink. Mercury levels for some fish species in the Black River and Pee Dee River were nearly three times higher than known lethal dietary levels for mink. The 2005 Health Advisories from DHEC show a worsening problem as now 26 rivers, 11 creeks or canals and 16 lakes or ponds have at least partial fish consumption advisories.



While the mean levels of mercury detected in mink from the piedmont region of South Carolina (0.53 ppm) were below levels expected to cause direct mortality, a small sample of coastal plain mink (3) exhibited levels considered to be greater than normal background levels (6.01 ppm).

The current Environmental Protection Agency (EPA) limit for fish deemed safe to consume by humans is 2 ppm for PCBs and 1 ppm for mercury. Wild mink eating fish containing PCBs or mercury at these or lower levels are at risk. The situation becomes very complex when synergistic or combined effects of environmental contaminants are considered. Lab studies with mink have shown reduced survival in kits born to mink that received both PCBs and mercury simultaneously (Wren et al. 1987). Over 40 percent of mink sampled in South Carolina contained residues of both PCBs and mercury. If other negative impacts are present, such as food shortages, extreme climatic conditions (cold weather or

drought) or parasite burdens, contaminant tolerance levels may be very low for a species like the mink (Wren et al. 1986; Wren et al. 1987).

In 1990 the Furbearer Project continued its investigations into the impact of environmental toxicants on mink by expanding the sample area in the coastal plain (Osowski et al. 1995). Samples from Georgia and North Carolina were included due to similar concerns about mink population declines by the wildlife agencies in those states. The Clemson University Institute of Wildlife and Environmental Toxicology conducted chemical analysis for the tri-state study.

Of the organochlorine pesticides tested, only dieldrin was detected at significantly higher levels in South Carolina's coastal plain than in the piedmont. Liver PCB concentrations were also found to be significantly higher than the piedmont reference group; many samples contained dieldrin in concentrations higher than those known to cause mink reproductive dysfunctions.

This study also revealed mercury concentrations from mink kidney tissue to be elevated in the Georgia, North Carolina, and South Carolina coastal plain compared to the piedmont reference. The concentrations detected were high enough, according to Wren et al. (1986), to cause sub-lethal effects on most physiological functions, including reproduction, growth and behavior. Of the three states, South Carolina had the highest mean level of detectable mercury (3.51 ppm).

CONSERVATION ACCOMPLISHMENTS

The Furbearer Project spent a number of years determining the status of mink populations in South Carolina and the causes of their decline. Research revealed that mink populations had been lost entirely in the tidal marshes from Charleston Harbor north to the South Carolina/North Carolina line. Beginning in 1999, the Furbearer project initiated restoration efforts with South Carolina's coastal mink population. Fortunately, mink remain abundant in the marshes along our state's southern coast. The marshes in the North Edisto River, the ACE Basin and in the vicinity of Hilton Head Island have served as mink population sources for capture efforts. The first restoration effort in the Cape Romain National Wildlife Refuge (NWR) in 1999 and 2000 was hugely successful, thanks in part to the hard work of then Clemson graduate student Jason Peeples and Dr. Tim Fendley of Clemson University. Based on the success of this effort in Cape Romain NWR, the mink restoration project moved up the coast in 2002.

The Furbearer Project has relied on many cooperators, including private citizens, landowners and property owner associations, as well as other governmental personnel to facilitate mink research and restoration efforts. Continued cooperation is envisioned in the future.

Mink restoration along the coast has been fairly well publicized. Several newspaper articles have been written about these efforts. An article has also appeared in the SCDNR's magazine, *South Carolina Wildlife*. SCDNR staff has provided information to residents during mink releases at Dewees Island with the cooperation of Arla Jessen, education coordinator of Dewees Island. Any additional releases in the Murrell's Inlet area would likely involve Huntington Beach State Park personnel and visitors.

In 2002, the goal was to complete mink stocking at North Inlet in Georgetown County. Thanks to many cooperators, trapping efficiency was so effective in 2002 that stocking efforts in North Inlet were completed and efforts were focused on the next target area, Murrells Inlet. All totaled, 17 adults and 35 kits were stocked in North Inlet and 25 adults were stocked in Murrells Inlet.

In 2002 a new mink indexing technique was tested for measuring marsh mink populations. Lisa Vandiver a work-study student from the College of Charleston conducted this work. The Kiawah Island Natural Habitat Conservancy provided funding for the studies. The mink indexing research focused on testing a floating track board design. Overall, visitation rates by mink were 42 percent, indicating that this technique has significant value as a population-monitoring device. The current technique used for monitoring marsh mink involves spotlight flood tide surveys. The shortcoming of the flood tide surveys is that it can only be performed several days per season. This technique is also problematic as it is must be conducted during flood tides when work should be concentrated on trapping mink. The track board technique will allow greater latitude in population monitoring.

Earlier research suggested that the decline in mink populations from South Carolina's northern coastal region was related to environmental contaminants. Therefore, investigations were initiated to determine if similar problems existed in mink populations of the southern coastal areas. SCDNR partnered with the Clemson University Department of Environmental Toxicology for these investigations. While this research did reveal concentrations of mercury, organochlorine pesticides, PCBs, dioxins and furans in tissues of mink at levels that may have some adverse effect on individual animals, the overall levels were not considered to be high enough to have adverse effects on the mink population.

Age structure work on ACE Basin mink suggests good survival rates and good recruitment rates within this population.

The Furbearer Project enlisted the assistance of SCDNR’s Marine Division scientist David Knott to conduct food habits studies of mink in the ACE Basin. Marine organisms in mink scats and stomach contents collected throughout other studies were identified. This data will allow evaluation of prey abundance in prospective restoration sites. Further, environmental contaminant uptake in potential prey can be tested without sacrificing mink. Data from these food habit studies will also allow for better explain of mink population fluctuations, which may be tied to changes in food availability. Results of the studies revealed that mink are very opportunistic. Some general observations of the common food items in their diet include: small fish, blue crabs, fiddler crabs, insects, mud minnows, marsh hens and marsh rice rats.

During the May flood tides in 2003, follow-up surveys were conducted in North Inlet and Murrells Inlet to evaluate the success of 2002's mink stockings. Observations in North Inlet were very encouraging. In the course of a two-hour flood tide five adult mink were counted. Three of these were females with young. For mink to survive the stress of relocation and still be fit enough to reproduce the first year indicates good environmental conditions. Results from the Murrells Inlet surveys were disappointing. Two evening surveys were conducted; although no mink were detected, neither survey was considered a “complete” survey. Two incomplete surveys are not sufficient to demonstrate absence of mink. A mink sighting report from staff

from Huntington Beach State Park in the summer of 2004 provides encouragement that the released mink may still be present in the area.

Prerelease surveys in the vicinity of Dewees and Capers Islands support the belief that mink are absent in that area, the next restoration site. A total of 13 mink (1 unknown adult, 3 females with 9 young) were released into the marshes of Dewees Island during the June 2004 flood tides. One adult female was predated by a marsh hawk and witnessed by staff. The remaining 2 young were taken to a rehabilitator; one survived and was released later in 2004. The number of released animals at Murrells Inlet will be supplemented in the future unless additional surveys indicate that additional releases are not warranted.

CONSERVATION RECOMMENDATIONS

- Encourage large-scale conservation easements and focus areas, such as those in the ACE Basin area, and consider purchase of important riparian properties to protect habitat for mink.
- Continue reintroduction efforts to restore mink populations in the northern coastal marshes.
- Conduct additional research to fully support the contention that environmental contaminants are associated with the decline in mink populations in South Carolina. From the results of the studies conducted thus far, the list of suspected contaminants can be narrowed to mercury, PCBs, DDE and dieldrin.
- Continue to assess and implement track board surveys and investigate their applicability to other areas of the state for mink survey need.

MEASURES OF SUCCESS

Continue monitoring through the use of flood tide surveys and track board surveys to assess the success of current reintroduction projects in the northern coastal marshes of South Carolina. Additionally, continue to monitor commercial fur harvest of mink to look for long-term harvest increases as signs of successful conservation efforts.

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