

for each other at this season. In winter, extra bulls may sometimes be permitted to join harem groups, but most form into bachelor bands which are isolated from other animals.

Calves are born during April or May when weather may still be severe in arctic regions. Within a few hours they can follow the mother during her normal movement with the herd. Growth is rapid and a calf weighting 20 pounds at birth may reach as much as 200 pounds at one year. The rate of growth gradually declines, but full size is not achieved until the age of five or more years, when bulls may weight 700 pounds and females about a third less.

Musk oxen have few natural enemies. Polar or grizzly bear may occasionally attack them, but probably are seldom a danger. Wolves are a more significant threat, particularly to lone animals and to calves. Behavior patterns of musk oxen when faced with danger suggest wolves were their chief, natural enemy. When pursuers approach and escape is impossible, musk oxen whirl with military precision and present a veritable array of horns that present some difficulty to an attacking wolf pack. There is a constant shuffling about, as each animal, even calves, attempts to take a position in the front line. Sometimes, in open terrain, the defense formation takes the form of a circle or ring. More frequently, the line forms on the edge of a cliff or against a bank.

At present, other factors are more important causes of mortality than predators or man. Most deaths occur in late winter when shortage of food or other stresses may cause the death of animals which are sick, injured, or perhaps merely old and past their prime. Particularly severe weather conditions, especially deep snow or icing, may cause the loss of large numbers of animals by starvation, and entire herds have been lost in this manner, particularly on islands where the food supply was limited.

Despite the many natural causes of death, adult mortality under normal conditions is low and many animals may live to old age. So few animals have been marked, however, that the single record of longevity is of a female that died in an accident when 23 years old.

Red Wolf Study Inaugurated

One of the most endangered mammals in North America, the red wolf, may have a better chance for survival in the wild through establishment of a cooperative federal-state recovery team. Appointment of the team comes on the heels of reports that the red wolf, which is imperiled by both human persecution and hybridization with the related coyote, is in an even more precarious situation than had been thought. In the early

1970s there were hopes that a last remnant population in extreme southeastern Texas could be stabilized and saved from interbreeding with the coyote. Specimens collected in 1974, however, indicate that the hybridization process now has spread even into this population. The recovery team may soon initiate new conservation measures, possibly including evacuation of red wolves from some areas and introduction into others.

The red wolf, the only one of its kind in the world (all other wolves in the world are subspecies of the gray wolf), was one of six endangered species that the U.S. Fish and Wildlife Service selected for priority treatment when it appointed separate recovery teams for each animal recently. The five other endangered animals are: Delmarva fox squirrel, Indiana bat, Kirtland's warbler, dusky seaside sparrow, and the Mississippi sandhill crane.

The red wolf (*Canis rufus*) is a close relative of the gray wolf (*Canis lupus*) and the domestic dog (*Canis familiaris*). Before the coming of European man, the red wolf was found throughout the southeastern quarter of North America, from central Texas to the Atlantic, and from the Gulf Coast north to the Ohio Valley and Pennsylvania. As was the case with other large predatory animals, the red wolf was intensively hunted, trapped, and poisoned by farmers and ranchers because of its threat to domestic livestock. In the early 20th century, after the species had been largely eliminated east of the Mississippi River, federal and state governments joined in the extermination effort. By the early 1970s, when it finally was legally protected, the red wolf was thought to survive only in a narrow strip of coastal marsh and prairie in extreme southeastern Texas and southwestern Louisiana.

Despite human persecution, the red wolf might have been able to survive in a few remote areas had it not been for the critical hybridization problem. Prior to the impact of modern man, the range of the red wolf was largely separate from that of its western relative, the coyote (*Canis latrans*). When settlers cleared forests and killed off red wolves, they inadvertently opened the way for the coyote to extend its range eastward. As the small, adaptable coyote moved in, some interbreeding occurred between it and surviving red wolves. These initial crosses set in motion a massive process of hybridization which eventually spread throughout much of the former range of the red wolf.

The presence of coyotes and hybrids led many persons to think that the red wolf still survived. Examination of many old and new specimens, however, has enabled biologists to trace the decline of the true red wolf across the continent. Before 1920, hybridization was largely restricted to central Texas. In the 1930s

and 1940s the same phenomenon engulfed Arkansas, eastern Oklahoma, and southern Missouri. By the 1960s, much of eastern Texas and Louisiana had also been taken over by coyotes and hybrids, and it appeared that the red wolf survived only to the south and east of Houston in Texas, and in parts of southern Louisiana. By 1970, the only known pure red wolf population was found in Jefferson and eastern Chambers Counties, Texas, but now this population is in immediate jeopardy.

Hard-pressed federal agents in southeast Texas have for several years been attempting to slow the tide of interbreeding by trapping coyotes and hybrids on and near red wolf range. These men also have been live-capturing stock-killing red wolves in order to moderate ill feelings by local stockmen, as well as to establish a captive breeding pool. The new recovery team may continue these and other conservation operations, and also will try to develop new methods. Some authorities have suggested a large-scale live-capture and reintroduction effort in which some of the last pure red wolves would be removed from southeast Texas and released on certain offshore islands or in other suitable areas far from the range of the coyote.

Coyotes and Sheep: New Data

A Montana study is providing additional information on the old and sometimes heated controversy related to coyote-sheep relationships, according to the Wildlife Management Institute. Data collected from the study indicated that the coyote can inflict significant damage to unprotected domestic sheep herds.

The study was initiated by the University of Montana on an 8,500-acre ranch in the Bitterroot Valley south of Missoula. Funded by the U.S. Fish and Wildlife Service, the investigation was designed to record all sheep losses, both by predators and from natural mortality.

From March to October 1974, no controls were placed on the coyotes. The predators were allowed to take as many sheep as they would. However, 61 coyotes were killed on the area shortly before the study began. About 2,000 sheep were exposed to predation during the six-month reporting period. Coyotes killed 429 sheep, 364 of which were lambs. That amounted to about 86 percent of the total sheep deaths. Two sheep were killed by golden eagles, and two by feral dogs. The dogs also wounded 11 more.

Although the predator kills were high, researchers said that lack of control was part of the cause. "What we have shown," the researchers said, "is that coyotes under certain circumstances do kill sheep. . . . People who want to latch onto our study and flaunt it as proof against coyotes are mistaken. We are just printing the results of a baseline study

which had little or no controls placed on the coyotes. We are not using our data to make generalizations on the coyote-sheep problem everywhere."

The researchers said the coyote problem varies from area to area. In some places they are no problem at all—in others they are. There has to be selective control, they added, and new devices are being developed to help.

What Happened to the Blue Pike?

A unique fish, commercially harvested by the ton as recently as the 1950s, has disappeared. Under authority of the Endangered Species Act, a team of experts is trying to learn where the blue pike went and what might be done to bring it back—if it ever existed at all biologically.

The mysterious blue pike resembles the well-known walleye in all respects except its smaller size and bluish, instead of yellowish, coloring. It once filled the trap nets of commercial fishermen in Lake Erie's eastern basin, where blues were often caught in the same net hauls as walleyes. Oldtimers recall boats docking in Erie's eastern ports with tons of blue pike heaped on board.

Then, some unexpected change in Lake Erie's environment or some other unknown factor caused a sudden crash in blue pike populations. In recent years, although sport fishermen have occasionally reported catching blue pike, not one of these reports has been verified. In fact, some authorities feel that verification is impossible, that the blue pike is nothing more than an unusual color phase of the walleye.

So the first mission of the blue pike recovery team is to prove that the fish exists. To do this, they may offer a reward for the live capture of the fish so that "true blues" can be bred in captivity to prove their genetic identity. If attempts to find and propagate blue pike are successful, an attempt may be made to reintroduce them to selected parts of their original range.

Captive Whoopers Lay First Eggs

Two eggs were laid in late April by captive whooping cranes at the Patuxent (Maryland) Wildlife Research Center, a facility of the U.S. Fish and Wildlife Service. The two layings—ten days apart—are the first known layings by this species while in captivity. Government biologists described the layings as "major events of scientific importance."

Because the eggshells are too thick to candle, it is not known if either egg is viable. Whooping crane eggs require about one month to hatch; meanwhile, they are being artificially incubated.

The parent birds were hatched from eggs

taken from the nest of wild whoopers in northern Canada in 1968. The captive flock was established at the Patuxent center in hopes of restoring wild populations. Only 49 of the species were counted in the wild during the 1974-75 annual winter census.

Elsewhere, in early April, several whoopers were exposed to a commonly fatal disease while en route to their northern nesting grounds. Nine of the birds were forced to earth at the Sacramento-Wilcox Game Refuge, in Nebraska, by a sleet storm. Their arrival coincided with an epidemic of avian cholera that killed at least 15,000 waterfowl at the refuge. It was unknown whether the whoopers caught the disease, since the birds remained in the area for only 36 hours. The incubation period for avian cholera is 24 to 48 hours. From shortly after the birds' arrival, a crew of state and federal game officers went about the area trying to chase them away.

"This is the first anyone can remember them coming through this area," remarked one of the officers. "Who would have believed the biggest bunch ever would have picked such a little spot, the worst spot, of all the places to land?"

Aerial surveys of the crane's nesting grounds in Canada showed that fifteen chicks hatched last summer. But only two immature birds were seen among the forty-nine whoopers counted in early December at Aransas National Wildlife Refuge in Texas. That is an increase of one bird over the 1973-74 count, but still far below the record fifty-nine reported from Aransas in 1971. Biologists, meanwhile, are puzzled over the poor survival rate of nestlings.

These Animals Have Come Back!

The media have given substantial attention in recent years to the plight of animal species threatened with extinction, pointing out that man must mend his ways if they are to survive. We hear little about those that have survived just such a crisis. As recently pointed out by the Wildlife Management Institute, however, a number of species have made remarkable comebacks—thanks to human endeavor—since the turn of the century. Some outstanding examples are the following:

- **Beaver:** 1900—Eliminated from the Mississippi Valley states and all eastern states except Maine; common only in Alaska and a few localities in the Pacific Northwest and Rockies. *Today:* Common to abundant in nearly all states except Hawaii.

- **Pronghorn antelope:** 1925—Authorities estimated 13,000 to 26,000 in U.S.A., most in

Wyoming and Montana. *Today:* Minimum population in all western states is 500,000.

- **Bison:** 1895—800 survivors. *Today:* Population more than 35,000 in North America.

- **Elk:** 1907—Common only in and around Yellowstone National Park; estimated total south of Canada, 41,000. *Today:* About 1 million in 16 states.

- **White-tailed deer:** 1895—About 350,000 south of Canada; extirpated from more than half the states. *Today:* Approximately 12 million in 48 states.

- **Wild Turkey:** 1930—Common in only a few southern states, eliminated from most. *Today:* Restored to 43 states, including establishment in several outside original range of species.

- **Fur seal:** 1911—Official census in Pribilof Island showed 215,900. *Today:* Herd maintained at around 1.5 million under a scientific management program.

- **Egrets and herons:** 1920—Several species on the brink of extinction because of slaughter on their nesting grounds by feather collectors to supply the millinery trade. *Today:* Most species common to abundant over most of the United States.

- **Trumpeter swan:** 1935—73 survivors south of Canada on one wildlife refuge. *Today:* Thriving populations on two national parks and several national wildlife refuges. Removed from the endangered status in the late 1960s.

- **Wood duck:** 1915—Greatly reduced in numbers and considered a candidate for early extinction. *Today:* The most common breeding waterfowl in eastern U.S.A.

- **Sea otter:** 1907—Nearly extinct; a few survivors in Alaska's Aleutian chain and in coastal California. *Today:* Minimum of 50,000; successfully restored to waters of mainland Alaska, Oregon, Washington, and British Columbia, increasing and extending range in California.



In Sapporo, Japan, eight persons successfully sued for damages when their sunlight was cut off by the erection of an eleven-story apartment building.

A geologist reports that the recent collapse of a number of castles and other ancient monuments in Sweden was caused by detergents that turned supporting clay to mud.



1975. "Coyotes and Sheep: New Data." *Field Museum of Natural History bulletin* 46(6), 15–16.

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