

BEARS AND OTHER CARNIVORES

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The movements of carnivores are governed largely by the movements of their prey, and the need to find living areas away from where they were born. When food supplies fail, certain carnivores, particularly bears, travel great distances in search of nourishment, before returning home.

A young male timber wolf (*Canis lupus*) suddenly moves 886 kilometers (550 miles) away from its lifelong range. A young female lynx (*Lynx canadensis*) moves 483 kilometers (300 miles) away from a place that usually abounds with snowshoe hares. An 11-year-old male black bear (*Ursus americanus*) moves 200 kilometers (125 miles) outside his home area, but returns two months later. These are unusual movements for animals that generally live in areas less than 40 kilometers (25 miles) in diameter, but with the aid of radiotelemetry such movements are being revealed more and more frequently.

Modern studies have given new insights into the travels and capabilities of bears and other carnivores. Their long-range movements usually fall into one of three categories. They are either annual migrations to hunting or feeding areas, unusual movements in years of widespread food failures, or permanent migrations to new living areas.

ANNUAL MIGRATIONS TO HUNTING OR FEEDING AREAS

Annual migration for most animals involves movements to feeding or breeding sites, and is usually tied to changes in season and to the availability of plant or invertebrate animal

foods. Most members of the order Carnivora, however, are one step removed from this process, in that their movements are dictated primarily by the movements of their prey. The most common prey of mammalian predators are relatively sedentary mammals, reptiles, amphibians, fish, invertebrates, and ground-dwelling birds, with nesting waterfowl and other seasonally migrant birds sometimes giving a seasonal dietary boost.

Since most prey species do not show seasonal migrations, neither do most carnivores. Exceptions are wolves, lions (*Panthera leo*), and other carnivores whose survival in some locations depends upon seasonally migratory prey like caribou, elk, bison, and African antelopes.

Arctic wolf packs (*Canis lupus tundarum*) follow migrating caribou hundreds of kilometers, and the wolves that formerly occupied the great plains of North America probably followed nomadic herds of bison just as some tribes of Indians did. Lions that live on less mobile prey remain within home ranges of 25 to 400 square kilometers (10 to 155 square miles), but other lions, mostly males, follow migrating herds of wildebeest and other herbivores of the African plains,

moving up to 13 kilometers (8 miles) per day. Spotted hyenas (*Crocuta crocuta*) are also flexible in their migratory habits. Of those studied on the Serengeti Plains, some established territories, some followed migratory wildebeest and some commuted up to 80 kilometers (50 miles) from their dens to wherever the main concentrations of game were at the time. In other parts of the world, mountain lions (*Felis concolor*), snow leopards (*Panthera uncia*), and other mountain-dwelling predators follow prey to high elevations in summer and to low elevations in winter.

Carnivores that live in harsh climates are well adapted for the weather. Wolves, foxes, lynxes, Siberian tigers (*Panthera tigris altaica*) and others endure extreme cold by growing thick winter pelts. Some of these animals burrow under the snow for extra protection in the worst weather. Others, like black bears, grizzly bears (*Ursus arctos*), skunks (*Mephitis mephitis*), and badgers (*Taxidea taxus*) reduce their metabolisms to varying degrees and spend their winters mostly underground, hibernating. The same animals withstand summer heat by shedding their underfur and seeking shade, water, or cool burrows. In Arctic summers, polar bears (*Thalarctos maritimus*) sometimes burrow down to the permafrost in order to cool off.

Seasonally migrant carnivores must have a sedentary period in which to raise their young. At birth, their offspring have their eyes closed and are unable to walk, and they require several weeks or months of intensive parental protection and feeding before they can travel. In contrast, the mobile animals on which these carnivores prey give birth to young that can follow a herd within a few days of birth. In some species, like the lions of the Serengeti Plains of Africa, it is

primarily males without parental responsibilities that follow the herds of migrating herbivores.

Migrations by carnivores tend to be less predictable than migrations by herbivores and birds because carnivores are less directly tied to the seasonal cycle of plant growth and insect abundance. Black bears are most likely to show regular seasonal migrations' because they are omnivorous, feeding on vegetation in spring, berries and nuts in the summer and autumn, and to some extent on flesh and insects. But migrations even by black bears are unpredictable and local, depending upon local food distribution and individual knowledge of distant food sources

Bear migrations are by individuals, or by mothers and cubs, and not by large groups. Loose gatherings of competing bears may form where there is plenty of food, and in fact the closest associations between black bears are seen where food is most abundant. At garbage dumps bears sometimes feed less than a meter (3 feet) apart and some bears find partners to wrestle and play with. In natural feeding areas, where food is less plentiful, bears usually stay more than 100 meters (330 feet) apart, even in places well known for black bears. One such place is Mukwonago (derived from the Indian words *mukwa*, bear and *onohko*, fat), in Wisconsin, which was famous for the large number of bears that gathered to eat acorns in the white oak stands of that area in the early 1800s. Indians and white men would converge on the area from considerable distances to hunt the bears—a migration of human predators.

Along the north shore of Lake Superior, food is most plentiful inland in early summer, and near the shore in late summer and autumn. Some of the inland bears were radio-collared and followed to learn whether they

explored outside their usual living areas and found the richer food supplies near the shore in season. Forty percent of 105 females and 69 percent of 32 males left their usual ranges each year, on the average, and foraged 7 to 92 kilometers (4 to 57 miles) away, sometimes abandoning abundant food at home. Not all the trips were pure exploration. Some of the bears had learned the food-rich area near the shore from their mothers and returned to it as independent adults. Seventy percent of the trips were to that area. One mother had found an oak stand near the shore, 30 kilometers (18 1/2 miles) outside her territory, and led litter after litter to it over the years. She and her cubs fattened on acorns in years when more sedentary bears were without this food. The cubs returned to the stand in subsequent years and became the fastest growing, earliest maturing bears in the study area, their clan reproducing more rapidly than the sedentary clans.

FORCED MOVEMENTS

In years when there has been widespread failure of their normal foods, starving carnivores have made spectacular journeys. Canadian lynxes are noted for their southward migrations during years when snowshoe hare numbers are low in their usual range. Lynxes are seldom seen in the United States, but during these years they become common in northern Minnesota and are seen occasionally as far south as Minneapolis, more than 400 kilometers (250 miles) south of the Canadian border. Lynxes fresh from Canada are seen crossing roads, watching traffic from the roadside, and moving through people's yards. After a year or so the lynxes disappear, either because they have been trapped, shot, or killed on the roads, or they have returned to the forests of Canada. A young adult female lynx that was ear-tagged in Minnesota on 5

November 1974, during an invasion, moved 483 kilometers (300 miles) northwest into Canada, where she was caught on 20 January 1977. Her movement is the longest on record for a lynx. The next longest movement recorded was for a male that lost a foot and was nursed back to health in captivity. By the time he recovered, another male had moved into his former territory. The homeless lynx then wandered on three legs until he was shot raiding a farmer's poultry an astonishing 164 kilometers (100 miles) away.

Migrating black bears have been making news in eastern North America for more than a century. These migrations differ from the more regular, shorter migrations made by bears visiting known feeding areas or exploring the region surrounding their territories. In years when there is widespread failure of berry, nut, and acorn crops, starving black bears may leave a region in large numbers and move to an area that is ecologically different. Black bears in northern forests can move into temperate deciduous forest regions or even beyond, to the prairie edge. Today, prairies have mostly been converted into farms and cities, and when a bear moves to the suburbs of Minneapolis it is likely to be killed. The same was true in the 1880s when waves of bears moved through populated areas. In years of mass movements, bears were commonly found along water barriers such as the Atlantic Ocean, the Mississippi River, and the Great Lakes. They moved along the shorelines until they encountered cities, where they were often killed. Bears are still found on a few of these old migration routes. For example, 160 black bears were killed in 1985 on one such route on the outskirts of Duluth and Thunder Bay, both cities on the north shore of Lake Superior.

PERMANENT MOVES TO NEW LIVING AREAS

Many young mammals leave their birthplaces for good before breeding. This movement outward from the maternal range is often called dispersal. The longest movements on record for most species involve adolescent animals seeking places to begin their adult lives. Dispersal is primarily by males in promiscuous or polygamous mammals, but involves both sexes in monogamous mammals, such as the timber wolf and dwarf mongoose (*Helogale parvula*).

In group-living animals, such as wolves and lions, mating success is achieved primarily by being a member of a group, so dispersal for these species is more a matter of intergroup transfer than simply finding a suitable location in which to establish an adult range. Lone wolves or groups of male lions may roam for months or years before integrating with new packs or prides. Young wolves or lions lucky enough to find mates and space may form new packs or prides of their own.

Dispersal may be voluntary or forced, depending upon social circumstances. In a group of male lions in Tanzania, all left their natal prides before mating. Some left voluntarily to rove in search of new prides to take over. Others were forced out when roving males took over their prides. Subadult females may also be ousted during these takeovers and often become the nuclei of new prides in adjoining areas. Females that reach sexual maturity before their pride is taken over by a new group of males may remain in that pride for life.

Dispersing lions or wolves may settle in adjacent living areas or travel to the limits of the species' range. Of 10 young wolves radio-tracked in northeastern Minnesota, four (two males and two females) took over territories

adjacent to their parents' territories, three (two males and one female) moved more than 190 kilometers (120 miles), and three (two males and one female) traveled intermediate distances. Of the last-mentioned, one explored up to 80 kilometers (50 miles) away, returned home, and then settled adjacent to his natal territory. The 886 kilometer (550 mile) movement by one of these wolves—the young male mentioned at the beginning of the chapter—is probably the longest migration on record for a land carnivore. The wolf moved from near International Falls, Minnesota, to near Nipawan, Saskatchewan, in less than 10 months. The second longest movement by a carnivore was also by a young male wolf. He moved 670 kilometers (416 miles) from near Great Slave Lake, Northwest Territories, to near Cold Lake, Alberta, in less than 81 days.

Dispersal by black bears is almost entirely by males. Males travel with their mothers for nearly one and a half years, remain in their mothers' territories for up to two years after that, and leave home when they are 1 1/2 to 3 1/2 years old. The fastest growing males leave home earliest, sometimes soon after they leave their mother's side. Although in this species leaving the mother's territory is voluntary, and occurs whether or not there is ample food, continuing travel outside her territory often takes place because older males and females chase, attack, and sometimes even kill strange bears. This aggression can channel dispersing young bears into suburban areas where they avoid bear trouble but instead get into trouble eating from garbage cans, fruit trees, gardens, bird feeders, and dog food bowls. The bears most often seen during dispersal are young males weighing between 30 and 80 kilograms (66 and 176 pounds).

In northeastern Minnesota, young males settle an average of 61 kilometers (38 miles) away from their birthplaces, with some going no further than 13 kilometers (8 miles) and some traveling as far as 219 kilometers (136 miles). The longer dispersal movements may take more than a year. One male spent a year moving 145 kilometers (90 miles) and then moved another 74 kilometers (46 miles) the next two weeks. Along the way, he settled briefly near a residential area where there were fruit trees, garbage, and a few other bears. Young males approaching mating age do not settle permanently where there are no females. They begin mating between 3 1/2 and 4 1/2 years of age.

Young females usually stay near their birthplaces, growing to maturity within their mothers' territories. When the young females reach adulthood and require additional space, their mothers shift their own territories away include new areas. In this way, they both protect their daughters and help them obtain living space. Where there is crowding, mothers prefer to battle non-relatives for territory rather than attack their own daughters, whom they continue to recognize.

Dispersal, exploration, and annual migration are similar in that each may involve long movements from the usual living areas. They differ in that dispersal usually involves a one-way migration to a new, more or less permanent, living area, while exploration and annual migrations typically are round trips.



A young North American black bear. Adult carnivores are, on the whole, less migratory than other large mammals, but youngsters may travel great distances in search of suitable living spaces. In the black bear this post-natal migration is especially marked in males. Young females tend to remain in their mothers' territories, and may ultimately inherit them.

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