

BEAR NAVIGATION

LYNN L. ROGERS

Bears have a mysterious ability to determine which way is home when they roam into unfamiliar areas. It is not piloting based on familiar landmarks, nor is it the ability to move in a particular direction without using landmarks. It is a form of true navigation—the ability to orient homeward, or toward a place beyond sensory contact, from a previously unvisited area. Attempts to account for bears' mental map and compass abilities include speculation that a bear senses the Earth's magnetic field and extrapolates its position from local magnetic gradients.

Bears show incredible memory of important locations. Cubs that followed their mother 32 kilometers (20 miles) to an oak stand to eat acorns one fall returned there to feed three and five years later as adults. Black bears that had become used to human observers in northeastern Minnesota showed that they knew most or all of the waterholes, refuge trees, feeding areas, and trails in their home range. The bears moved directly to preferred locations, whether those places were upwind, downwind, or out of sight.

When berry crops failed in the home range of one male black bear, he moved a record 200 kilometers (125 miles) into unfamiliar range. Researchers wondered if this 11-year-old, radio-collared bear would retrace his rather indirect route when he returned home to hibernate. He did not. One day in October, he began moving directly homeward. His route demonstrated that he knew his location relative to home and that he possessed compass sense. By ignoring trails and roadways and by blundering through rough terrain, farmland, and residential neighborhoods, he showed that he was unaware of pathways and dangers along the way. He moved only at night, when territorial bears are sleeping and most people are indoors. He apparently did not use the night sky for navigation because he continued in the right direction regardless of whether the sky was clear, overcast, or obscured by trees. His ignorance of terrain and trails may have slowed him down because he averaged only 19 kilometers (12 miles) per 24 hours, compared with 32 kilometers (20 miles) for a bear traveling through familiar range. Nine days after beginning his homeward trek, he reached familiar ground and his behavior changed. He began walking mainly on roads and trails, and he continued moving in daylight. Later that day, he left the trail he was following, went over a hill, and entered a den for the winter.

"Nuisance" bears have been able to find their way home after being tranquilized and transported up to 270 kilometers (168 miles) away. Of 54 bears that were transported 64 to 120 kilometers (40 to 75 miles) from home, 35 moved homeward after release, and of 23 that were transported 120 to 270 kilometers (75 to 168 miles) from home, 17 did so. Homing did not depend upon familiarity with release areas, upon random movement, or upon expanding search patterns. Whatever navigation methods bears do use, they apparently have a distance limit, because bears that were transported 1,400 kilometers (870 miles) from Minnesota to Arkansas moved in random directions after release.