



American Kestrel

Falco sparverius

The Windhover and the Wind-frolicker: as nicknames go, these pretty much nail it. Kestrels are incredibly adept at hovering in place while searching for their preferred insect prey species, or the occasional small rodent or bird. They live in semi-open areas like meadows, deserts, parks, farmlands, and some urban areas. Although this robin-sized raptor remains the continent's most common and widespread falcon species, their numbers have declined dramatically over the last half century, and they could sure use some help.

Wind Surfing

Kestrels unmatched ability to ride the wind while keeping their heads stationary as they tilt on the breeze almost appears like a magic trick. Facing into the wind, they'll match forward momentum with wind speed and remain stationary relative to the ground. If winds are stronger they'll "kite," appearing to effortlessly hold their position with almost no wing flapping. They make constant, minute adjustments to the shape and angle of their wings and tail - altering length, width, and curvature to counteract shifts in the wind. In totally still air, Kestrels need to rapidly flap their wings in a unique shallow motion - enough to generate the lift to stay aloft, but that also minimizes forward or backward movement. Their neck musculature and skeletal structure are specially adapted to allow for stable head position despite constant adjustments of their body and wings.

Urine the Crosshairs

While aloft or perched their incredible eyesight, with about 8-12 times the acuity of human vision, can spot insects as small as beetles up to 160 feet away. Amongst many other raptor species like hawks, eagles, and some owls, Kestrels also have the ability to see in the ultraviolet spectrum. The urine secreted by voles and mice in their oft traveled paths make them virtually glow in UV and allow Kestrels to hone in and increase the likelihood of hunting success. Some plumage, fur, and other characteristics can be easier to spot against various backgrounds in UV, and certain fruits or flowers reflectance may help Kestrels detect the presence of insects.

Migration Combobulation

Though they have been spotted for decades on migratory bird surveys, the precise paths Kestrels take and the final winter destinations for many populations remain a mystery. Kestrel exhibit a wide range of migratory and non-migratory strategies. Not surprisingly, those in colder climates tend to migrate to warmer areas for winter, and those in sub-tropical/tropical regions are non-migratory. Some Kestrels are "leapfrog" migrators, where those of northern breeding populations migrate beyond mid-

range populations and become a more southerly group in winter. The University of North Texas (UNT) has been studying Kestrel migration for nine seasons as of 2025. Texas is home to one of the largest concentrations of wintering Kestrels the world over. Advances in GPS technology is helping with the effort, but because of their small size, especially males, it can be difficult to equip Kestrels with them. Up to now, most migration knowledge has come from data collected during only a fraction of their annual cycle when they're relatively easy for volunteers to see. UNT is helping to add to this sparse knowledge base by providing precise locations of Kestrel wintering grounds and beyond, and have tracked the full annual cycle of eight birds—some of the first such precise migration tracks ever. In addition to tracking, the team also bands birds in winter and surveys them year-round. Analyzing all this data will help scientists better determine survival rates, if birds are dying in high numbers during the winter, and if factors like age, sex, and rural versus urban habitat are playing a role in Kestrels' declining numbers. Being able to track more birds throughout the year may also give clues to as whether specific migration routes or stopovers result in lower return rates.

In parts of their range, Kestrels appear to be adapting to shifting climate patterns. In the American West, they are arriving and breeding weeks earlier than they did just since the 1990s. This is likely a by-product of farmers planting crops earlier to avoid ever hotter summer temperatures. This attracts insects and rodents, which in turn attracts Kestrels and other predators to the farm fields. Milder western winters are also leading to more Kestrels opting to stay year-round and not migrate at all.

Snag More Cavities.

Like many bird species in North America, Kestrels are secondary cavity nesters. This means they need tree cavities for nesting, but lack the ability to create their own and so rely primarily on holes drilled by woodpecker species or naturally created cavities.



Male American Kestrel
Danita Delimont



Richard & Susan Day



Elizabeth Boehm



Robert/Adobe Stock



Karine Aigner

Left to right: Though nesting boxes are helping, more natural cavities are needed. | A Kestrel surfs on the wind while hunting. | A female Kestrel is fitted with a tracking device that will allow its migration journey to be followed.

In fact the vast majority of North American cavity-nesting birds - at least 60 out of 85 species, or approximately 70%, are secondary cavity nesters. This means competition for prime nesting sites can be fierce, and much more are needed for all the birds that need them to raise their young.

As the [forest health monitoring program](#) of the [Northeast Temperate Network](#) shows, the national parks in the region carry a disproportionately high number of snags (standing dead trees) that are more likely to have cavities, so they are a very important part of good nesting habitat for Kestrels and dozens of other species of birds. But tree cavities outside of parks are harder to come by in the northeast. The majority of northeastern forests were cutover by the mid-1800's, and though they have been recovering for many decades, they are still relatively young. Important forest ecological features like snags and coarse woody debris (CWD - downed logs, larger branches, and stumps) take time to form on their own.

A Stressful Time for Kestrel

While it's much larger cousin the Peregrine Falcon has fared well since the banning of DDT in the 1970s, American Kestrel numbers continue to drop. Though still the continent's most common falcon, its numbers have nose-dived by an estimated 50 percent since then according to the North American Breeding Bird Survey. One study (Sauer et al. 2019) put the decline at a rate of approximately 1.4% per year leading some to predict a listing as threatened or endangered in the not too distant future. No one disputes this rapid raptor reduction, but the pace of it has some conflicting opinions. A more recent study (Bird and Smallwood. 2023) found the rate has slackened the past few decades. Declines also vary regionally, and the steepest and fastest declines are in the Northeast, as high as 90% according to some estimates. Scientists don't know the exact causes of this Kestrel kerfuffle, but the lack of aforementioned cavity-nesting sites is suspected to play a big part, though there is likely more to it than that. Researchers have tested blood and feathers for chemicals, but haven't pinpointed a prominent pollutant up as a primary culprit. Interestingly, the genetic analysis did reveal five distinct continental Kestrel populations—Alaska, Western, Eastern, Texas, and Florida.

During much of the 1980s and 1990s, the clearing of natural habitats significantly reduced available nesting sites for Kestrels in the Northeast. Even with Kestrel-specific nest boxes growing in popularity, their numbers continue to decline. Other possibilities include the loss of insect prey from climate change and habitat loss. Modern herbicides and pesticides such as paraquat and neonicotinoids also lead to less of insect prey. Another Kestrel killjoy related to pesticides is that besides killing off rodents and insects, they have been shown to affect the small-bodied falcons themselves. Known reproductive issues like failure, reduced fertility, and offspring mortality are all potential impacts from the potent neonicotinoid neurotoxic insecticides which are widely used and spread up the food chain. In addition to these issues, Kestrels face other threats including disease, predation by hawks, and competition for nesting sites with invasive and aggressive European Starlings. In places like Long Island, where these all of these pressures are intense, Kestrel numbers have sharply decreased.

In some ways, Kestrels are adapting to human activity. You may see them patrolling the edges of industrial and real estate developments, which would seem to provide suitable Kestrel habitat. Often there is combination of open undeveloped fields for hunting and human structures full of possible nesting cavities and for roosting. However, development isn't stopping, and all this constant encroachment has created what's known as an "ecological trap", or a situation where an organism is attracted to what it perceives as good habitat, but is in fact of low quality, leading to decreased survival, reproduction, or both. For example a returning Kestrel that spent the previous winter hunting in a field may come back to a transformed landscape of new developments. This could be yet another contributing factor to the decline of Kestrel populations across the country.

For more

- [Download plans](#) for a Kestrel nesting box from the Cornell Lab Nestwatch program

- Learn more about American Kestrel monitoring by [The Peregrine Fund](#)



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