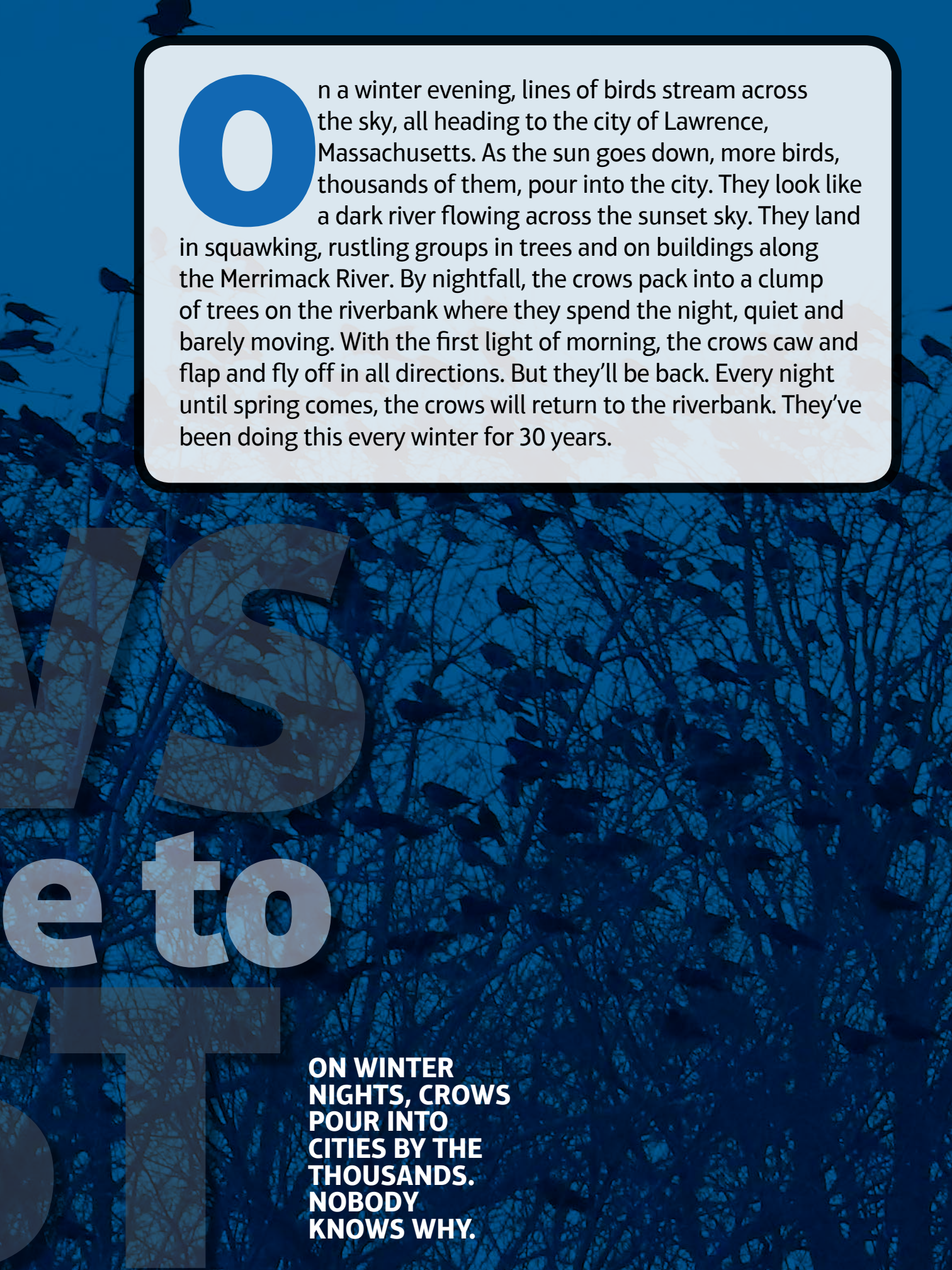
by Joseph Keierleber

When the CROW Come Hom ROOS



On a winter evening, lines of birds stream across the sky, all heading to the city of Lawrence, Massachusetts. As the sun goes down, more birds, thousands of them, pour into the city. They look like a dark river flowing across the sunset sky. They land in squawking, rustling groups in trees and on buildings along the Merrimack River. By nightfall, the crows pack into a clump of trees on the riverbank where they spend the night, quiet and barely moving. With the first light of morning, the crows caw and flap and fly off in all directions. But they'll be back. Every night until spring comes, the crows will return to the riverbank. They've been doing this every winter for 30 years.

ON WINTER NIGHTS, CROWS POUR INTO CITIES BY THE THOUSANDS. NOBODY KNOWS WHY.

When birds settle down to rest or sleep, it's called "roosting." The word "roost" also means a group of birds that is roosting together, like the crows in Lawrence. On nights from fall to early spring, crows form roosts across the United States and Canada. The number of crows in a winter roost can be mind-boggling. It's impossible to count every crow, but good estimates often reach the thousands, sometimes up to 100,000 crows in a roost. A roost site in Oklahoma held 2,000,000 crows!

For more than 200 years, bird watchers and scientists have written with curiosity and awe about North America's winter crow roosts. Early records describe crow roosts in rural locations, such as forests and marches. Since the 1960s, the population of crows in North America has grown, and crows have roosted more often in cities and suburbs.

Lawrence isn't alone in having a crow roost that keeps coming back. Crows have returned to roost for years in Bothell, Washington; Sacramento, California; Danville, Illinois, and many more cities and towns across North America.

Understanding Winter Crow Roosts

Crow roosting behavior is a mystery worth solving. Figuring out how winter roosting helps crows survive could explain what parts of the environment are important for crows as well as other animals. Changes in crow roosting behavior may help us understand how animals react to changes in the environment, such as climate change.

Ecology is a field of science that studies how living things interact with their environment. To understand how animal behaviors are related to the environment, ecologists think up hypotheses. A hypothesis is a possible explanation for the animal behavior, based on observations and measurements. Before a hypothesis is accepted as the best explanation for the behavior, the hypothesis must be tested. The way to test a hypothesis is to make more observations and

measurements, do experiments, and compare the results to what the hypothesis predicted.

Nobody has come up with a best explanation for why crows roost, but several hypotheses have been tested. Here are a few.

Huddling for Warmth

Crows roost during cold months, so maybe cold weather drives crows to crowd together. By perching close together in trees, crows could be sharing body heat and protecting each other from the wind. This hypothesis sounds good, but when scientists compare night temperatures to the number of crows in a roost, it falls apart. The data don't show that crows are more likely to form roosts, or to form bigger roosts, on colder nights.

However, there is evidence that warmth is a reason why roosts often happen in cities. A city's concrete and asphalt absorb heat from the sun during winter days and release the heat at night. Parking lots and streets form "heat islands" that crows may seek for a warmer place to sleep.

Safety in Numbers

One of crows' biggest threats in nature is predatory birds, such as hawks and owls. Crows are smart, and they are known to gang up to scare off predators. So it's possible that crows spend winter nights together for protection. If one crow in the roost spots a predator, it can make a warning cry to the others. A hawk or owl will probably be scared off by the sight and sound of thousands of angry birds.

The Safety in Numbers hypothesis describes a likely a benefit of roosting, but it's probably not the

CROW FUNERALS

When one crow sees another lying dead on the ground, it may swoop down to get a closer look at the dead one and spend time walking around it. The crow may make noises. Soon others swarm around the dead crow. These "crow funerals," can last for a few minutes or several hours. Eventually all the living birds fly away, leaving the dead crow where it is.

Weird, isn't it?

Just wait—it gets weirder.

Animal behavior scientist Kaeli Swift led some experiments to figure out why crows are so interested in their dead. Swift's research needed some props: stuffed animals (the preserved dead kind, not the fuzzy toy kind), rubber masks, piles of cheese puffs, and some brave volunteers (the human kind, not the bird kind).

A pile of cheese puffs got crows to keep coming back to one spot. Once they became regular visitors, Swift had a volunteer wearing a rubber mask stand near the food. The crows ignored the masked person until he or she held a stuffed crow. Then the crows almost always responded by doing funeral behavior: they made noise and gathered around. They responded even more strongly when the volunteer held a dead crow and stood next to a live-looking stuffed hawk—a predator of crows. When the volunteer held a dead pigeon, the crows didn't seem to care.

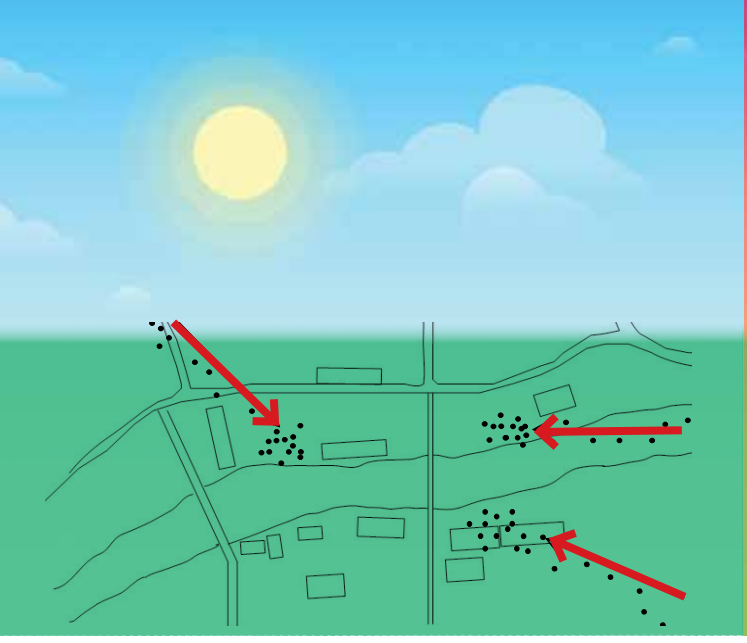
When Swift repeated this experiment with a flock of pigeons, rather than crows, the pigeons barely responded.

The point of the masks was to test whether crows remember the face of a person who held a dead crow. They did. Even six weeks later, any volunteer who came back wearing the same mask got "scolded" and mobbed by crows.

Caption TK.

Swift concludes that crow funerals are a way for crows observe what may have harmed a fellow crow. They pass on that danger information to other crows. When they see the danger again, even if it's just a rubber mask, they sound an alarm to get other crows to help chase it away.

—Joseph Keierleber



In the late afternoon, crows fly along flight paths and gather in scattered staging areas

At sunset the crows move from their staging areas to the main roost site.

entire explanation. Protection from predators could also be a reason why crows roost in cities. Hawks and owls are fewer there. And city lights may give crows a better chance of seeing predators before they attack.

Information Centers

If you're new to a city and you want to find a good place to eat, it's a good idea to ask someone who lives there. Crows may do the same thing. When crows leave their roosts early in the morning, they usually fly to places where they spend the day looking for food, or foraging. Many crows don't know where good forage sites are, because they aren't from the area. In the fall, many crows migrate more than 600 miles (1,000 km) from their summer territory. These migrating crows can find food each morning just by following the local crows. The roost is a food information center.

The Information Center hypothesis is a good explanation for roosts of birds related to crows, such as ravens. But for crows, the hypothesis hasn't been tested much. Crow roosts are huge. It's difficult to keep track of individual birds coming and going. A few studies that tracked a small number of individual crows didn't find evidence of them following each other to food. Furthermore, roosts often are near good food sources, such as garbage dumps, which should be easy for any crow to find on its own. Still, it's possible that roosts serve as a social network for crows. When they gather each night and make noises, they may be exchanging information such as readiness for mating, social status, and danger warnings.

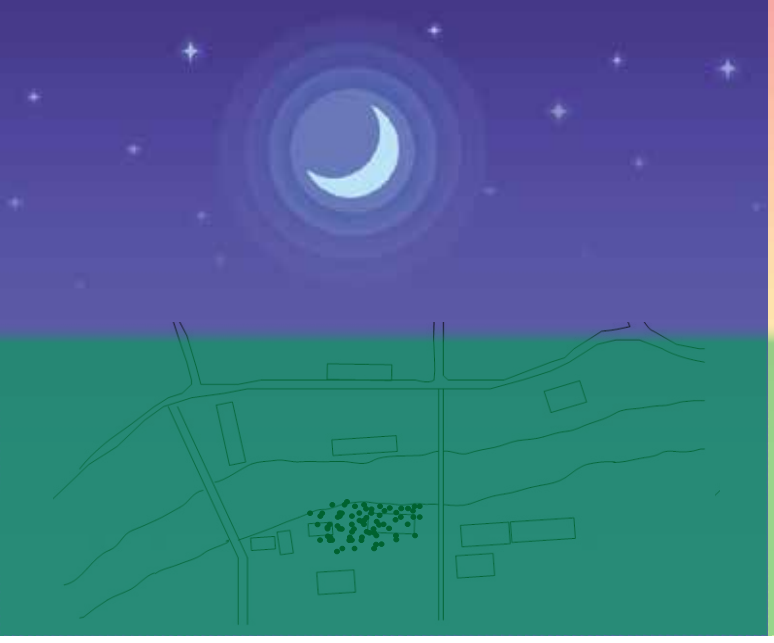
None of the Above?

It could be that none of these hypotheses is a good explanation for crow roosts. Or each hypothesis may explain small part of what makes crows form roosts. The best explanation may be waiting to be discovered. Solving the roost puzzle will need a lot more observation and data. That's where citizen scientists come in.

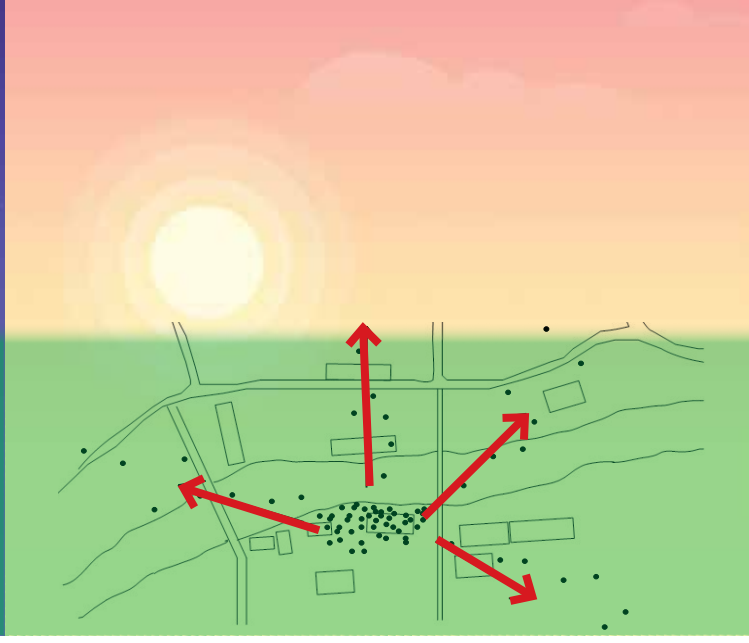
The Citizen Scientists

Dana Duxbury-Fox and her husband Bob Fox are both life-long bird watchers who live near Lawrence, Massachusetts. In 2017, they devoted more time to studying the local crow roost. They invited their friend Craig Gibson, an amateur wildlife photographer, to join them for nightly outings and together established the Crow Patrol. The three of them have been watching the roost, making counts of birds, timing when the roost begins and ends, and locating the areas where groups of crows meet up in the evening before they move on to the

Captions can go in this neat-o box or just hang loosly.



Darkness falls. The crows stay in the main roost through the night.



At sunrise the crows fly off in many directions to feeding sites.

main roost. They post their findings on Gibson's blog and submit data to bird conservation organizations. The Crow Patrol is doing citizen science.

Anybody can be a citizen scientist. You don't have to join a group or have any special training, but often citizen science groups will teach volunteers how to make observations and collect data.

Other citizen science groups are studying crow roosts in Seattle, Washington, and Lancaster, Pennsylvania. The Lancaster group even started a hotline for people to call if a crow roost forms in a nuisance location, like above somebody's house. The crow roost volunteers come out with fireworks to persuade the crows to move to another site.

Craig Gibson, of the Lawrence Crow Patrol, sees two benefits to citizen science. The first is the bump in knowledge about roosts that comes from volunteers' observations. Professional scientists and wildlife managers can do only so much on their own. Volunteers can provide a huge amount of roost data. The Crow Patrol is working to train volunteers so they have the skills to collect good data about the roost. That project includes a plan to work with students from the local high school.

The second benefit of citizen science is community awareness. The goal is to help people understand that their local roost is part of the urban ecosystem. People who live in a city with a crow roost may have never learned what it is.

"Residents who live here have seen the crows for years or decades and wondered, 'What's that all about?'" Craig Gibson says.

To help answer that question, the Crow Patrol launched crow roost events for the Lawrence community, including guided roost-watches. Other community events include a two-month exhibit of crow roost photography and a month-long crow roost project with the local Boys and Girls Club. This event ended with kids showing their crow-inspired art and writing to family, friends, the public.

While previously Lawrence residents may have paid little attention to the roost, the Crow Patrol's work has brought out their curiosity. Gibson says, "When they see the roost up close for the first time, most people are wide-eyed in awe, and they say, 'This is kind of cool!'"

Joseph Keierleber is a biologist who lives in Maine. He once drove all over his town and trudged through knee-deep snow while chasing a crow roost with a microphone. The recording sounded a lot like laughter.