When birds go to town

Urban settings offer enterprising critters new opportunities — if they can cope with the challenges

By Susan Milius
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Anne Clark and Kevin McGowan are discussing, perfectly seriously, how a crow might be able to recognize a car. Not tell a car from, say, a cat, but pick out the red Subaru from other cars in the parking lot.


ENLARGE

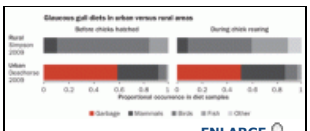
Paris crows feast on some human leftovers. They're not the only birds that have learned to like garbage. WITT/SIPA/Associated Press

Clark, an animal behaviorist at Binghamton University in New York, is sitting in her own red Subaru with McGowan, of Cornell's Laboratory of Ornithology in Ithaca. Neither bothers to mention — it's apparently so routine — that when Clark pulled into the lot, two crows flapped over to nearby trees. Country crows often back away from human doings, but these birds lingered as if people-watching.

Clark and McGowan are running a long-term study of what urban life is like for a group of Ithaca's crows, tagging and following them as they grow up, take over or lose territories, and succeed or not in raising the next generation of research subjects. Even in a university town, the birds probably aren't lured to the Subaru by the thrill of scientific discovery, but rather by the scientists' occasional ploy of flinging peanuts and dog food out the window to engineer some bird activity.

"They know us," McGowan says. There isn't another Subaru in the lot to test the birds' discriminatory abilities, but McGowan has inadvertently conducted his own experiment. He sold his car and bought a new one. McGowan was temporarily invisible automotively, but the birds caught on eventually. And the old car's new owner reported that a crow appeared to be following him to work. It was OK; the driver just provisioned the car with peanuts for an occasional fling.

New food sources are just one of the opportunities that organisms of all kinds — including ants, birds and cockroaches on down to zoysia grass — encounter when they take up life around people. As human populations boom, more and more plants and animals are becoming city dwellers, a shift that intrigues biologists fretting over the practical problems of nuisance critters as well as theoreticians musing over how organisms adapt to new environments. For even a green town presents plenty of novelty unknown in any species' evolutionary history.


ENLARGE

DROPPING DIETARY CLUES

View larger image | Glaucous gulls living around the town of Deadhorse, Alaska, get much of

The considerable number of birds that now share cities and suburbs offer as good a focus as any for scientists trying to understand what happens when animals go to town. Though some birds are seizing new opportunities, the lifestyle often comes with costs. Biologists are now beginning to see how birds respond to some of the major facts of city life, from discarded french fries to

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their food in the form of human garbage, researchers recently found. This part of the diet proved particularly important to the gulls during chick rearing. Rural birds studied in Simpson, Alaska, appeared to get their dinner elsewhere.
E.I. Weiser and A.N. Powell/Condor 2010

relentless low-pitched noise.

And other studies are showing how, by encouraging species that can cope and filtering out those that can't, urban areas are creating mix-and-match combos of inhabitants that have never had to deal with each other in quite the same way before. Odd juxtapositions of predators, competitors, prey and, oh my, people become a challenge in themselves.

Feed me

Clark and McGowan didn't intentionally train Ithaca's crow population to car watch, and the researchers throw food only when other attempts to coax a bird to cooperate have failed. Still, Team Crow's adventures in the parking lot turn out to be a classic example of the new crow-human dealings that emerge where people abound. One of the big attractions of these urban environments is all the leftover and left-outside human food just waiting for the enterprising forager.

Clark, McGowan and Binghamton graduate student Jennifer Campbell-Smith are searching for this year's nests so McGowan or another tree climber can band nestlings. The nestlings will be included in a database of crow families going back more than two decades. Crow family territories in Ithaca are smaller and nestle together much more densely than they do in rural New York, and the family sagas are complex. A day riding around on a spring nest survey is like dropping in from Mars and having to pick up the plotlines of *The Sopranos*, *Lost* and a lot of Shakespeare, all with feathers.

All morning Clark has proved almost clairvoyant at driving in traffic along Ithaca roads and suddenly veering onto the shoulder after glimpsing the dark form of a nest among the many dark forms in conifers half a block away. The woods by the parking lot are tough even for the clairvoyant, though. A crow pair nested here last year, but the team never determined which tree held the young.

ENLARGE

Urban birds deal with new surroundings in innovative ways. This hummingbird nest is in a power plant's boiler feed return pipe.
Jon Ridler, Cornell Lab of Ornithology, www.CelebrateUrbanBirds.org

Crows are nesting in the same clump of trees this year, and the dilemma calls for flinging food in hopes that the birds it draws will take some back to the nest. They readily flap down to the asphalt to pick up the goodies and fly off with bulging beakfuls. A few loads get ferried into the dense tangle of branches in an uphill corner of the pines, but again, spotting which tree has the nest proves tricky.

There's another handful of peanuts. And another. After more than an hour of observation from the parking lot, the woods and two vantage points in a cemetery across the street, there's still no obvious tree. The crows have gotten a fine lunch but have managed to keep their nesting address private. One might ask who trained whom.

For birds such as these Ithaca crows, which can balance a natural wariness with some strategic boldness, the world is their garbage dump. A 2010 study of glaucous gulls found that birds in northern Alaska towns rely heavily on human garbage, with up to 85 percent of regurgitated pellets and breeding-season bird remains including human leftovers. In Seattle it's "roadkills, Cheetos and french fries, and Kentucky Fried Chicken — all the favorites," says John Marzluff of the University of Washington.

In an upcoming article in *Studies in Avian Biology*, Marzluff discusses classic studies of three bird populations that picked up the knack of opening, and drinking from, milk bottles delivered to people's

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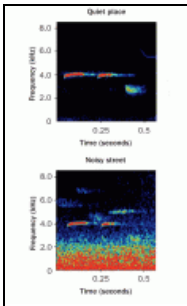
doorsteps in the morning. He says Seattle's crows even know what time the keepers at the zoo throw fish to the penguins, and the birds show up to vie for the handouts.



ENLARGE

OVER THE GRUMBLE

The sounds of the city can drown out the lower ranges of a bird's songs (figures show a great tit song in a quiet forest and the same song masked by urban rumblings). Recent studies suggest birds try to accommodate in various ways.

H. Slabbekoorn

On the other side of the Pacific, birds known as jungle crows have visited a shrine in Kyoto and helped themselves to some of the thousands of fat-rich, potentially crow-edible candles set out along the paths. Video recordings revealed that the crows don't shrink from flames, says Hiroyoshi Higuchi of the University of Tokyo. Crows carried still-smoldering candles away, suggesting an explanation for puzzling fires in fields nearby.

Human food, even when it's not aflame, may not be so good for birds, though. In a 2009 study comparing the effects of available food on chick rearing in suburban and rural places, Clark, McGowan and Rebecca Heiss, a graduate student at Binghamton at the time, reported evidence that nutrient deficits in suburbia may be limiting the growth of young crows there. Suburban crows lag behind country cousins in size, and offering suburbanites high-protein, high-calcium supplements boosted nestling growth. What startled the researchers, though, was what happened when they set out supplemental nestling food in the countryside. Crows that took home the best nutritional formula used by specialists in nursing orphan chicks ended up with noticeably punier youngsters than neighbors relying entirely on wild food. Even the best food that humans could concoct fell short of a natural diet.

What human nutrition does for birds seems to depend on the species, meaning some dive and others thrive. Abundant human garbage, for example, is proposed as one of the drivers behind population booms in urban gulls worldwide over the last 50 years. The garbage in the diets of those glaucous gulls in northern Alaska turned out to be important in successfully raising chicks, according to an analysis in the fall 2010 issue of the *Condor*.

Yet the glaucous gulls also hunt other birds. Work done at the University of Alaska Fairbanks by Emily Weiser and Abby Powell has confirmed that remains of more than a dozen at-risk bird species turned up along with the garbage in gull nest debris. While garbage may be a boon for the gulls, their rising numbers may lead to more predation on rare birds — changing the circumstances for these already stressed populations.

Even the abundant food that human enthusiasts set out on their feeders comes with complications, writes Darryl Jones of Griffith University in Nathan, Australia, in the spring 2011 issue of *Emu*. Evidence so far suggests that feeding birds during the winter increases their chance of survival and advances the timing of nesting and egg laying come spring, meaning more time for raising young. Yet feeding can also push birds out of sync with natural food supplies and may encourage migratory species to stick around all year, possibly competing with winter residents.

"There is absolutely no doubt that this amount of human provisioning is having massive and widespread influences on bird populations," Jones says, "and we really need to know what is happening."

ENLARGE

BEWARE THE

Sounds of the city

Fine urban dining options often come with unnatural noise. But oddly enough, studies in the 1990s didn't find that rumbling traffic affected the way city birds sing, says Hans Slabbekoorn of Leiden University in the Netherlands.

Unaware of those negative results at the time,

Slabbekoorn went about carefully checking noise in male great tit territories. The more traffic noise competing with a male's arias, the higher their minimum frequency, Slabbekoorn's team reported in 2003. Much of the cacophony of urban environments, the cars and air conditioners and leaf blowers and such, growl and grind in the lower frequencies. Studies now suggest that birds can show some musical accommodation.

The frequency change that human hubbub prompts in great tits doesn't come from singing the same songs at a different pitch, Slabbekoorn and graduate student Wouter Halfwerk announced in 2009. In a study designed to get at the mechanism of the song accommodation, the team experimented with individual birds, analyzing their normal songs and then playing some recorded urban rumble-grumble. Great tits have individual repertoires of up to nine songs. "Peta peta peta," Slabbekoorn sings, a song heard from the same bird that also does "petati petati." Lower pitches, prone to get drowned out, dominate some of these songs but not others. During the sessions of recorded urban noise, males sang fewer of the songs with substantial lower notes, showing off more of the high end of the repertoire.

CAVEMAN

Birds seem to be capable of recognizing threatening people, and can pass that concern on to others. The map below shows sites in Seattle where researchers in caveman masks captured crows and locations where the same masks elicited scolding from birds more than two years later.

H.N. Cornell et al/Proceedings of the Royal Society B 2011, adapted by T. Dubé

As an additional test, the researchers played what they call reverse urban noise, an artificially created opposite to traffic sounds that puts most of the sound energy at the higher frequencies instead of the lower ones. Confronted with this vexation, the males abandoned the higher-pitched tunes in their repertoire and returned to the lower ones.

Song switching may be the great tit way, but researchers are finding it's not the only way birds get around extra sound. Nightingales tend to sing louder in loud places, and European robins grow more likely to sing at the formerly unrobinlike hours of the relatively quiet urban night.

While birdsong may be music to human ears, to the birds themselves it's, "Get your foul feathered rump out of my territory right now," "Choose me, baby" or some other vital communication. Disrupting such important messages or sabotaging some other aspect of sound could be exacting costs even for birds that readily live in the din. It's a tricky matter to test, but Slabbekoorn's group has some evidence. Great tits nesting at various distances from a Dutch motorway fledged fewer offspring in noisier territories, his team reported in the February *Journal of Applied Ecology*. Though tits persist, they're paying a price for their urban homes.

And, like any other bit of city living, noise can affect different dwellers differently. Investigating that variability has been challenging because shrubbery, food, pollution, people and plenty of other factors vary along with city noise. For a cleaner test, one team turned to another kind of noisy environment: land around natural gas wells. In piñon-juniper forests of the southwestern United States, some wells run thundering compressors around the clock while others in the same kind of woodlands don't. Loud compressor zones had about the same number of bird nests as quiet sites, but only 21 nesting species instead of 32, says Clinton Francis of the National Evolutionary Synthesis Center in Durham, N.C.

One of the species conspicuously rare around compressors was the Western scrub jay, which raids nests of a variety of species and eats the eggs. Low risk of jays may have had something to do with why several species such as black-chinned hummingbirds appeared to favor noisy sites. And low numbers of jays likewise might explain why the bird community that tolerates relentless compressor roars overall reproduces more successfully than the quiet community. Ability to cope or not has rejiggered the dynamics of the bird mix.

The living city

The inevitable species in all of these mixes is *Homo sapiens*. Humans, for all their generosity with garbage, have a dark side as far as a bird is concerned. They're not just predators, they're opinionated

predators with technology.

Crow shooting, for example, used to be much more common around Ithaca. McGowan hypothesizes that crows living in the city now descend from those that were willing to take a chance and move closer to people as shooting waned. Several decades ago, old-timers told him that crows hardly ever appeared in town. These days, he and Clark have banded more than 2,000.

Crows may have gotten cozier with people, but the birds don't forget insults. Crows even appear to recognize and remember the faces of upsetting humans, Marzluff and his colleagues reported in *Animal Behaviour* in 2010. Marzluff and other experimenters trapped wild Seattle crows just once while wearing rubber masks sold on the Internet as caveman faces. More than two years after the incident, people of various genders and ages and with different body sizes and walking gaits attracted shrieking, dive-bombing crows when wearing the masks. Yet the same people could walk unmasked with hardly any attention from crows.

Crows can even learn grudges from other crows, the Marzluff team reported in June online in the *Proceedings of the Royal Society B*. Five years after the original trapping episode, crows that weren't among the offended birds — and crows that weren't even hatched at the time of trapping — now scold people wearing the masks. The tendency to mob someone wearing the dangerous face has become twice as common at some Seattle sites and spread at least a kilometer from the original study area, apparently via crow information networks.

Crows are celebrated as clever birds, but some capacity for distinguishing among individual people has even turned up among birds of more humble reputation: free-ranging pigeons. When two similar-looking people wearing coats of different colors routinely set out food in a park in Paris, the pigeons could still tell the friendly one from the one that chased them even when the people switched coats, Ahmed Belguermi of Université Paris Ouest and colleagues reported online in *Animal Cognition* in June. Birds hopping around sidewalks and city parks know about more than human clothing. When Clark is viewing an especially edgy bird, she sometimes puts it at ease by facing off at an angle and pulling out her cell phone for a mimed conversation. Crows seem to assume that people on cell phones ignore their surroundings.

Such studies of urban birds are telling a nuanced tale of animal reactions to previously unencountered environs. A casual observer might assume that animals thriving in the city are just the oblivious, bold species that don't happen to notice or care if people tramp among them. But that doesn't appear to be the case.

Instead, Clark says, "living in a city is probably very cognitively complicated." A bird in the country seems to flourish with just a few simple rules about humans. "People — bad! Fly away!" as she puts it. To survive among the urban wonders and terrors, though, metropolitan animals are using their native cognitive abilities to distinguish the opportunities from the perils. In the city, it's caveman — bad, Subaru driver — good.