

Ecologists discover city is 'uber-forest' for big owls

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It may be news to its bankers, but Charlotte, the biggest city in North Carolina and a major center of the American financial industry, is actually an old growth forest. At least that's the way the barred owls see it.

Charlotte is famous for having two kinds of green. It is home to two of the nation's largest banks and its downtown residential neighborhoods and near-suburbs are also known for their lush yards and green streets, lined with large trees. Less well-known is the fact that the city is almost as well populated with large owls – particularly barred owls – as it is with bankers. Harry Potter would feel very much at home.

In fact, the barred owl population in Charlotte is so strong that the city was chosen to be the site for the most extensive barred owl research study that has ever been attempted, with fieldwork going on in the manicured front lawns and gardened back yards of urban and suburban neighborhoods.

Urban wildlife numbers have been increasing in recent decades, notably in populations of squirrels, Canada geese, raccoons and deer, but the appearance of significant urban populations of barred owls, the third largest owl species in the US, is a surprise to many biologists.

“If you read about barred owls in the textbooks, it says they need large stands of old-growth forest to survive,” notes University of North Carolina at Charlotte ecologist and ornithologist Rob Bierregaard, who

has directed the six-year-old research study. “Either the barred owls in Charlotte haven’t read that book or the book is wrong, because they are really here and apparently doing quite well.”

“We have concluded is that there may be a third possibility: that old suburban neighborhoods in fact are an old growth forest, at least as far as the barred owls are concerned.”

Bierregaard’s study has now found and monitored more than 200 nesting attempts by 78 different pairs in both suburban Charlotte and the surrounding countryside, but the project began when he first considered doing a study of barn owls, which are common in farm country, as a thesis project for a graduate student. A team of volunteers was necessary to support the effort and, unfortunately, they all lived in the city -- a long drive from the proposed rural study sites.

In order to accommodate the volunteers, the researchers pragmatically changed the target species and put up nest boxes in the wooded suburban neighborhood where the volunteers lived. Barred owls, they discovered, were common there.

“Barred owls need old growth forest because they need trees big enough to have holes to nest in,” Bierregaard noted. “They also need a pretty open understory, because their hunting technique is to sit on a branch and wait for something to move. If you have a young forest with a really thick undergrowth, they are not going to be able to see enough to hunt.

“When you look at suburban Charlotte, what do we have? We’ve got giant old willow oak trees with plenty of holes in them and we’ve got mowed lawns and azalea bushes, which is a very open understory, so they can see a long way. The habitat is an ‘uber’ old growth forest for owls because the understory is so open and there are plenty of birdfeeders to attract prey.”

The research study, which began in 2001 and has been sponsored by the Carolina Raptor Center, has been large-scale and in-depth, with researchers monitoring about 40 nesting sites each year and tracking many sets of young as they mature through attached radio transmitters. Using radio telemetry, the team has mapped out a dozen or so owl territories in south Charlotte, each of which is about 200 acres in size. Locating the birds and their nests, normally a very difficult task in wild forests, has been greatly simplified thanks to the reporting of ordinary Charlotteans, who apparently love their city's owls.

“Probably half the nests we’ve found because someone either called in to the Raptor Center and reported young on the ground or we’re wandering around a neighborhood with a tape recorder playing owl calls and someone will ask ‘what are you doing?’ I’ll explain and they’ll say ‘there’s a pair three blocks over that way.’ Since they are so vocal, you can’t be around a barred owl nest and not know it,” Bierregaard said.

Though amused to see the biologists afield in their yards, the Charlotte community seems to have eagerly embraced the project. “Pretty much everybody knows us when they see us and the antennas,” he said. “There aren’t many neighborhoods where we haven’t been.”

Public enthusiasm and interest aside, some very serious science is going on in people’s backyards. One of the most important ecological questions that the study is close to answering is the question of whether or not the barred owls are really as successful in Charlotte as they appear to be.

The answer to the question of whether or not the city’s many owls have been able to be at home is not as obvious as it would seem on the surface. For example, the cooper’s hawk, another raptor known to be common in cities like Charlotte, has been shown not to be able to breed successfully in the urban environment by a recent scientific study.

“Coopers hawks are drawn by the food,” Bierregaard notes. “Everyone’s got birdfeeders up and a birdfeeder is just a two-step hawk feeding platform. The local Coopers hawks have these kamikaze raids where they will fly through a neighborhood at full speed and they will come around a corner where they know there’s a birdfeeder and just see what flies up in front of them. It is like they are trap-lining the local birdfeeders.”

The visiting hawks are not as successful, however, when it comes to nesting. Cities abound with pigeons and doves, which are good prey for hawks but often carry a microbial parasite that is fatal to the hawks’ young. The urban environment thus creates an ecological condition known as a “sink” – the area looks friendly to the birds but is really causing a net loss to the overall hawk population. Birds are attracted into the area but are not able to replace themselves in the next generation.

The situation of barred owls in Charlotte is very different, Bierregaard and his students believe. Though their findings are not fully complete, the researchers have so far found that the urban barred owls are able to reproduce effectively – perhaps significantly more effectively than in wild forests – because their rate of reproduction exceeds their rate of mortality. In the city, owl death tends to happen either from disease or from cars, the owls’ most serious predator.

The researchers have attached miniaturized radio transmitters to young owls. The ecologists then track the movements of the owls as they mature and note where they finally settle among the network of well-mapped territories and nesting sites, establishing a kind of on-going community history of the owl population in south Charlotte.

“If you see an owl in south Charlotte, chances are we know it by name,” said Bierregaard. “There’s a location in Lata Park, for example, that has apparently had barred owls almost forever. But just since we’ve been

studying that pair, it has been replaced by a completely new pair. Three years ago, the male died – he was replaced. The next year, the female died – the male raised the young as a single dad – and then the next year the female was replaced. If we didn't have radios and know those birds, nobody would have known that they were new birds. It's been amazing how quickly they are replaced.”

Bierregaard notes that Charlotte wasn't always such prime owl habitat. A hundred years ago when the city was much smaller, most of the current residential area was farmland – open country with few trees that would be suitable for barred owl nests. As the land was sold for residential neighborhoods, trees were planted which eventually grew to old growth forest size and, apparently, the owls moved in.

Now, as newer suburban continue to mature, the owl habitat is steadily expanding. “As the farms have been abandoned, the new neighborhoods that replaced them have planted trees,” he said. “If you wait long enough, the barred owls are going to expand their territory, as the trees start to grow up in the newer suburban neighborhoods.”

Other mysteries of urban owl life are beginning to emerge, including the question of what it is that city birds most like to eat – squirrel or cardinal, crawfish or koi? In the last couple of seasons the researchers have installed video recorders in some of the nest boxes, and Cori Cauble, one of Bierregaard's graduate students, has been researching a thesis on the owl's food habits and how they compare to owls in the wild.

Before the video cameras, the researchers had noted the prominence of bird feathers in the nest boxes, but were unwilling to draw any conclusions because they noted that feathers were more likely to be left and preserved from kills than other kinds of remains. The videos of owl home life answered the question.

“We scaled back our estimation on how important birds are in their diet until the first day we had a video camera in a box: they brought in eight prey items and four were birds. That result has held – for two years we have had cameras in four or five different nests. They have diverse diets, depending on territory,” he noted. “We have one nest we call the ‘sushi box’ because they bring in so many fresh fish, but even there the owls bring in a lot of birds.”

All-in-all, the researchers think a picture is emerging of barred owls that are nearly as happy in cities as people are, though like the humans, they hate and fear the traffic, and living space is at a premium.

“The biggest source of mortality in an urban environment is flying into cars,” Bierregaard noted. “We’ve had a couple die of diseases, but for most of the birds that we have had tagged, where we know how they died, they flew into a car. But it seems that mortality even from that isn’t that high.

“It certainly seems that they are cranking out enough young to more than make up the difference. We are getting to the point now where young that we radio-tagged back in 2002 are having young. It’s neat to watch how the young birds that we tagged wander around and find a spot where there is a vacancy, where a bird has died. There are enough birds floating around that when a bird dies, that spot is filled really quickly.”

In the world of urban owls, it would appear, there is no downturn in the real estate market.

Source: University of North Carolina at Charlotte

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