

Lights, Camera, Action!

Nest Box Cam technology reveals rarely seen events

BY TINA PHILLIPS AND CAREN COOPER

In 1999, The Birdhouse Network set up Nest Box Cams so that anyone with Internet access could witness the nesting cycles of a variety of breeding birds in real time. The cams have been a great success, attracting 250,000 Internet viewers annually and allowing them to learn more about the lives of cavity-nesting birds. We were also delighted to discover the scientific value of the Nest Box Cams, evidenced by the fascinating array of behaviors we have captured from still images uploaded to our web site. In some cases, these snapshots have revealed events never witnessed before!

The 2005 nesting season was particularly busy for the cams. We deployed 10 cameras in 6 states and recorded breeding activities of Ospreys, Barn Owls, Elf Owls, Eastern Bluebirds, Western Bluebirds, and Prothonotary Warblers. In early February, the pair of Barn Owls from California began copulating inside the box—a lot! Our cameras (which have infrared capability and take a snapshot every 30 seconds) captured them mating 14 times in one 24-hour period. Not to be outdone, however, a Barn Owl pair from Texas was also breeding and before long, we were following the

development of six young owls in each of the two Barn Owl boxes.

Then, on May 10 at about 6:30 P.M. (when the chicks were between 34 and 43 days old), the camera in Texas captured an eerie image of a chick's legs dangling in the air. In the next image 30 seconds later, we saw a large eastern rat snake constricting this owlet inside the box, attempting to consume it.

The cam revealed a fascinating series of events. First, the rat snake must have climbed 15 feet to a nest box suspended in the middle of a series of slick metal rafters. Then as the other owlets looked on, the snake proceeded to constrict a chick, which was nearly the same size as an adult Barn Owl. As the snake tried to get its jaws around the chick, one of the owlets gripped the snake with its talons (see facing page).

The next image, served up 30 seconds later, was a blurry mass of feathers. A few hours later, the owlets moved away from the camera, revealing the body of their dead sibling on the floor of the nest box. Nature proved itself fierce in beak and claw when, the next day, the owlets consumed their dead sibling.

There is no question that terrestrial snakes are formidable predators, able to consume a wide variety of animals, including birds, mammals, reptiles, and amphibians. What makes this event

so interesting is that most birds consumed by North American snakes are small songbirds. Observations of snakes taking birds of prey have been rare. We did find one published account by Jerome Jackson and Opal Dakin, who witnessed a large gray rat snake inside a box with four Barn Owls, 8-16 days old (*Raptor Research*, 1982, 16: 60-61). In this encounter, however, Jackson and Dakin removed the snake and foiled its attempt at an avian meal.

A less dramatic, but equally fascinating string of events was also captured by our camera in the Huachuca Mountains of southeastern Arizona. This bluebird-style nest box, outfitted with an infrared "night vision" camera, was intended to attract Elf Owls, which are the world's smallest owls, less than six inches in length. For nearly a month beginning on March 25, we captured images of one or both Elf Owls in the nest box. During this time, other species also periodically entered the box, including Acorn Woodpeckers, Bridled Titmice, and Eastern Bluebirds. Still, we were hopeful that we would see the first ever Internet-recorded Elf Owl egg-laying event.

Suddenly, on May 4, we were surprised to see a half-completed nest built by an Eastern Bluebird. Things got really interesting on May 18, while the female bluebird was incubating her four eggs.

To help fund a Nest Box Cam image storage system, see page 19.



Elf Owl, SE AZ 4/2/05 8:29:15 PM

April 2: An Elf Owl spends most of the evening going in and out of the nest box.



Elf Owl, SE AZ 4/25/05 1:51:44 PM

April 25: After widening the entrance hole, an Acorn Woodpecker checks out the box.



Elf Owl, SE AZ 4/26/05 9:02:20 AM

April 26: The Elf Owl, Acorn Woodpecker, and Violet-green Swallow (above) all visit the nest box on the same day.

During the early morning hours, an Elf Owl entered the box and a physical altercation ensued for about a minute. The Elf Owl exited the box, leaving the female bluebird with her four eggs.

Fifteen minutes later, the Elf Owl returned and our camera captured eight images spanning six minutes, with the owl and bluebird in the box together. Finally, after another skirmish, the Elf Owl exited the box. Ten minutes later, the female bluebird left the box. Neither bird was ever captured on camera again.

A few days later, the cam host reported finding a dead female bluebird near the nest box. Although these events had unfortunate outcomes for the birds, they highlight extraordinary behaviors that could go unnoticed and might never be discovered, if not for Internet technology and digital infrared cameras.

Beyond the small sampling of images mentioned here, we have more than two million archived cam images that can be used to explore and study well-known behaviors. For example, Suzanne Stachnick, a recent Cornell graduate, used archived images as part of her honors thesis research. Suzanne was particularly interested in understanding the role of male bluebirds during nesting.

With guidance from The Birdhouse



Texas Barn Owl 5/10/05 6:32:54 PM
A snake constricts a Barn Owl chick as its siblings look on. The left arrow shows where one of the owls is trying to grab the snake with its talons. The right arrow points to the snake's head.

Network team, Suzanne analyzed still-frame photographs of Eastern Bluebirds in North Carolina, Maryland, and Kentucky, and Western Bluebirds in Oregon, between 2000 and 2004. Suzanne focused her observations on the incubation period, sifting through 60,000 images! A detailed account of Suzanne's research will be published in an upcoming issue of *BirdScope*.

Because nest observers rarely get to witness first hand what happens inside cavity nests, there are few examples in the literature of predatory events or competition that include chronological, visual evidence. Using cameras to document behaviors at nests is becoming a more widely used, accurate, and

economical way to detect predatory events and other incidental behaviors than traditional forms of behavioral research.

We are hopeful that with improved equipment and the future potential for streaming live video, our nest cams will become as valuable scientifically as they are educationally. Meanwhile, as long as there is demand, we will continue to serve up the secret world of nesting birds to awestruck Internet viewers around the world. Stay tuned for next season with Nest Box Cam at <www.birds.cornell.edu/birdhouse>. You never know what you might see!

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Eastern (Azure) Bluebird - AZ 5/16/05 11:16:46 PM
May 16: An Eastern Bluebird lays her third egg in the morning, then spends the night roosting above the eggs.



Eastern (Azure) Bluebird - AZ 5/18/05 4:10:20 AM
May 18: The owl returns in the morning to find a bluebird laying eggs in the nest box! The ensuing scuffle destroys two eggs.