

# ScienceNews *for* Students

## ANIMALS ECOLOGY

### Standing out helps barn owls on the hunt

White feathers reflect moonlight, stunning their prey

BY ALISON PEARCE STEVENS NOV 5, 2019 — 6:45 AM EST



Barn owls can be quite white, quite red — or somewhere in between.  
Isabelle Henri

Owls are silent hunters. Their soft-edged feathers hardly make a sound as the birds fly through the night in search of a meal. Given that stealth, it would make sense that owls are also well camouflaged. It's no good to sneak up on your dinner only to have it make a quick escape because it saw you coming. But for barn owls, blending in isn't always the advantage you might think. Having lighter feathers actually helps white owls hunt, a new study finds.

Barn owls can be found all over the world. These crow-sized birds have reddish-brown wings with patches of gray. But their faces, bellies and the undersides of their wings range from all white to all red. That's true for both males and females. These silent hunters search out voles, mice and shrews, mainly at dusk and dawn. But when they have owlets to feed, they'll hunt all night long to get enough food for everyone in the family.

Red and white barn owls sometimes catch different amounts of prey. Luis M. San-José works at the University of Lausanne in Switzerland. As an evolutionary ecologist, he studies how species have adapted to their environments. And he wondered if an owl's coloring had anything to do with its ability to nab dinner.



Members of San-José's team check a nest box mounted on the outside of a barn.

Jérémy Bierer

To find out, he teamed up with Alexandre Roulin, another evolutionary ecologist at the University of Lausanne. Roulin had been studying barn owls in western Switzerland since 1991. He has hundreds of nest boxes on farms in the area. Those owls use the nest boxes. That makes it easy for the scientists to find their nests, catch the birds and study their behaviors.

San-José and Roulin set up night-vision video cameras or camera traps outside 131 of the nest boxes. The pair then recorded activity for three or four nights at each nest box. By studying the video and camera images, they could tally the prey that each owl caught.

The scientists also caught each bird and measured the color of its feathers. They did this using a color key. It rated the hue of the birds' feathers from very red to very white. Lastly, they recorded the phase of the moon on each night of hunting. San-José says they figured the owls might be well concealed during new moon nights, when the sky is dark. During the brightness of a full moon, they expected white owls would stand out more. That might mean they'd catch fewer rodents than dark-red owls.

All of the owls hunted well during a new moon. The darkness did, in fact, make it easier for these birds to sneak up on their prey. During a full moon, it was the red owls that struggled to catch dinner. White owls had no problem — even though their white feathers reflected the light of a full moon.

Further study showed that their extra meals might have had a real benefit: Those white barn owls raised more young than red owls did.

### Frozen with fear?

San-José and Roulin were surprised by their findings. Why were white owls so good at hunting, even when they shone like a beacon in the moonlight? Perhaps, they thought, it had something to do with the behavior of their prey. To explore, they set up an experiment with voles. These short-tailed, mouse-size rodents make up more than half of a barn owl's diet.

The team set up a room with three long sections separated by black cloth. At one end, San-José would place a vole. Hidden at the other end of the room were two taxidermied (stuffed) owls. One was red, the other white. Each had been prepared with its wings out, so they appeared to be flying.

The team uncovered one stuffed owl and then ran it down a zip line. This was to mimic it flying. It also brought the owl straight toward the vole, as if it were about to strike. One hour later, the vole was tested again, this time with the owl of the other color. Tests were run once while the light was low, as if it were a new moon, and again in bright light to mimic a full moon.

Most voles didn't react differently to red or white owls when the light was low. But in bright light,

they easily spotted the red owls coming and hid. More unexpectedly, when approached by a brightly-lit white owl, the voles froze. This is similar to when a deer freezes in front of a car's headlights. In the wild, this would have given the white owls plenty of time to snatch up some dinner.

In a final experiment, the team coated the feathers of one of the white taxidermied owls with wax. That cut down how much light the feathers reflected. The researchers then ran their tests using the wax-coated owl and an untreated white owl. Voles didn't freeze when the wax-coated owl swooped across the room. This confirmed that it was **light reflecting off the white feathers that "stunned" the rodents** (<http://www.nature.com/articles/s41559-019-0967-2>).

The findings appeared September 2 in *Nature Ecology & Evolution*.

"This is one of the first studies to show to us how little we know about living in the dark," says Robert Zink. He is a bird biologist at the University of Nebraska–Lincoln who was not involved with the study. Diurnal creatures are active most often during the day. "We humans are diurnal creatures for the most part," he points out. And as such, he says, that makes "it hard for us to understand how nocturnal animals make a living."

San-José doesn't know why voles respond to white owls the way they do. But he plans to find out in future studies. "Nocturnal life is far more colorful than we see with our limited vision," he says. "Many discoveries are awaiting us out there in the dark."

## Power Words

([more about Power Words \(https://www.sciencenewsforstudents.org/power-words-aid-stem-literacy\)](https://www.sciencenewsforstudents.org/power-words-aid-stem-literacy))

**behavior** The way something, often a person or other organism, acts towards others, or conducts itself.

**camera trap** A still or video camera set to activate when motion is detected. The device is often used to monitor wildlife. It can also be used to record poachers.

**diet** The foods and liquids ingested by an animal to provide the nutrition it needs to grow and maintain health. (verb) To adopt a specific food-intake plan for the purpose of controlling body weight.

**diurnal** An adjective for some activity that is done during the day, or some organism that is active during the day.

**ecology** A branch of biology that deals with the relations of organisms to one another and to their physical surroundings. A scientist who works in this field is called an **ecologist**.

**evolution** (v. to evolve) A process by which species undergo changes over time, usually through genetic variation and natural selection. These changes usually result in a new type of organism better suited for its environment than the earlier type. The newer type is not necessarily more "advanced," just better adapted to the particular conditions in which it developed.

**evolutionary ecologist** Someone who studies the adaptive processes that have led to the diversity of ecosystems on Earth. These scientists can study many different subjects, including the microbiology and genetics of living organisms, how species that share the same community adapt to changing conditions over time, and the fossil record (to assess how various ancient communities of species might be related to each other and to modern-day relatives).

**new moon** The phase of the moon that appears fully dark, when viewed from Earth. At this time, the moon will sit between the earth and sun. So the lunar face lit by the sun is turned away from us.

## Scientists Say: Nocturnal and diurnal

(<https://www.sciencenewsforstudents.org/blog/scientists-say/scientists-say-nocturnal-and-diurnal>)

**nocturnal** An adjective for something that is done, occurring or active at night.

**owlet** A baby owl, usually one that has only recently hatched. It hasn't developed the feathers needed for controlled flight, so it tends to stay in or near its nest, where parents offer it food and security.

**prey** (n.) Animal species eaten by others. (v.) To attack and eat another species.

**range** The full extent or distribution of something. For instance, a plant or animal's range is the area over which it naturally exists.

**rodent** A mammal of the order Rodentia, a group that includes mice, rats, squirrels, guinea pigs, hamsters and porcupines.

**shrew** A mouse-sized, insect-eating mammal. Related to moles, it's chiefly active at night. Shrews have a long, pointed snout and tiny eyes. Despite looking somewhat mouse-like, a shrew is not a rodent (which a mouse is).

**voles** Small rodents with a stout body, small ears and somewhat flattened nose. They live in yards, meadows and tall-grass prairies. Unlike many rodents, they tend to pair up for long-lasting relationships, where they can produce many litters and both parents contribute to feeding and caring for their young. Farmers and home gardeners, however, may view these animals as pests because of their tendency to burrow beneath plants and chew on their roots.

## Readability Score:

6.0

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