Living Bird

Cornell Lab of Ornithology

SUMMER 2011

IMPRESSIVE PERFORMANCE WITHIN REACH

THE NEW CL COMPANION 30

Memorable moments happen when you least expect them. Nature has its own rhythm; chance encounters cannot be planned. For special moments that can be shared and remembered you need more than just a piece of equipment; you need binoculars that are a reliable companion. You need CL Companion binoculars that are always at hand whenever you need them.

ANY TIME
the extremely light, compact construction ensures exceptional manageability and simple handling

PERFECT VIEW
impressive viewing comfort and proven SWAROVSKI OPTIK quality guarantee truly memorable viewing experiences

PERFECT LOOKS
distinctive product design for optimum handling

SEE THE UNSEEN
WWW.SWAROVSKIOPTIK.COM

SWAROVSKI OPTIK NORTH AMERICA LTD.
2 Slater Road, Cranston, RI 02920
Phone 800 426 3089, Fax 401 734 5888
info@swarovskioptik.us
www.facebook.com/swarovskioptiknorthamericabirding

SWAROVSKI
OPTIK

LIVING BIRD

Summer 2011 Volume 30 / Number 3

The Cornell Lab of Ornithology

Our Mission: To interpret and conserve the earth's biological diversity through research, education, and citizen science focused on birds.

Front cover: Tim Kuhn captured this intimate portrait of a singing male Red-winged Blackbird in a local marsh where the birds were singing and displaying, vying for the attention of females.

Back cover: An adult Tree Swallow feeds one of its young. Wildlife photographer Tim Kuhn was kayaking when he noticed the young swallow begging from its parents, and he took several pictures of the bird being fed.

Features

Columns & Departments

LIVING BIRD

Summer 2011 *Volume 30 / Number 3*

Living Bird, ISSN 1059-521-X, is published quarterly, in winter, spring, summer, and autumn, by the Cornell Lab of Ornithology. Periodicals postage is paid at Ithaca, New York.

POSTMASTER: Send address changes to *Living Bird*, 159 Sapsucker Woods Road, Ithaca, New York 14850. Telephone: (607) 254-BIRD. *Living Bird* is free to members of the Lab, a nonprofit membership organization. Our mission: To interpret and conserve the earth's biological diversity through research, education, and citizen science focused on birds.

For more information please write to our Membership Department. Membership is $40 a year. The Lab assumes no responsibility for unsolicited photographs or manuscripts.

Cornell University

ANN C. KERN

Cooper's Hawk Alert

I really enjoyed "Silent Alert" in the Spring 2011 issue of *Living Bird*. We have a Cooper's Hawk that hangs out in our backyard stalking our feeder birds. It is hard for me when I see him dining on a Lesser Goldfinch, leaving a small pile of yellow feathers on the lawn, but I tell myself hawks have to eat, too.

We have enjoyed his antics. He will stand on the grass, gazing up into the bush, and then run under it, causing the little birds to shoot out the top. The Cooper's Hawk has been a great photographer's model, and we really enjoy watching him.

ANN C. KERN
BANNING, CALIFORNIA

Woodpecker Nest Boxes

"Meriwether Lewis Would Be Proud" by Stephen Shunk (Winter 2011) was a timely article. I just spent the day being delighted and informed by two resident Lewis's Woodpeckers. Your details about nesting sites encouraged me to attempt attracting more of them by installing nest boxes. I live in Chaffee County, Colorado, elevation 7,770 feet, a half mile from the Arkansas River, four miles from the Saguache Mountain Range. On my creek there are several mature narrow-leaf cottonwoods and about 20 more mature cottonwoods in the campground next to me. A dozen or more years ago a Lewis's Woodpecker spent two days in one of my tall ponderosa pines but never showed up again. Two years later, a single bird stayed for a few days and then was gone. But then last year, after 10 years without any sightings, two Lewis's Woodpeckers spent the summer here, feeding mostly on beef suet from a weathered wood feeder eight feet up on a dead tree trunk. The birds spent much of their time together, often within two feet of each other. They never came to the suet feeder on the deck. By October they were gone.

This year there were two birds again, briefly, but after being attacked repeatedly by other birds, one woodpecker left and did not reappear. The other took command of the area, driving away all other birds—Red-winged Blackbirds, European Starlings, grackles, House Finches, Black-headed Grosbeaks, Bullock's Orioles, Lesser Goldfinches, Downy and Hairy woodpeckers, anything that came to the feeder or within 10 feet of it. Several times a Stellers's Jay stopped to look—from a distance of 20 feet; for a minute a Clark's Nutcracker perched seven feet above where the Lewis's Woodpecker was feeding. When a Black-billed Magpie came to the feeder tree the Lewis's Woodpecker fled, returning immediately when the larger bird left. In the morning the Lewis's was wary of me, fleeing if it saw me in the window 10 feet away. Gradually, through the day, it gained confidence. By midafternoon I could stand in full view in the window. By evening I could walk outside and stand only 10 feet away. The bird looked at me but never left its perch.

Your article motivates me to try to attract more Lewis's Woodpeckers.

ROMAN BORGERDING
NATHROP, COLORADO

Neighborhood Spats

Neil Losin's "There Goes the Neighborhood!" (Spring 2011),which discussed territoriality in bird communities, was a topic that fit right in with the events taking place in my yard. I had been monitoring a nestbox occupied by Mountain Chickadees, which were already busy raising their young. The female seemed to be staying in the nest most of the time taking care of the young, while the male made frequent trips back and forth. On each trip he would bring a worm or insect and take away the little fecal sacs found inside.

From time to time Violet-green Swallows would swoop past the box and occasionally perch just above or below the box while I photographed all of these goings-on. All of a sudden the drama intensified as one of the swallows headed straight for the hole in the nestbox, apparently intent on taking over the nest for himself. "Nothing doing," said the chickadee as he met the swallow head on in midair. With a little patience and a whole lot of luck, I captured this image.

JESS ALFORD
TIJERAS, NEW MEXICO

JESS ALFORD

From the Editor

We had the pleasure of working with an editorial intern on this issue of *Living Bird*. Only he wasn't the average intern—i.e., a university student on summer break. Far from it. Peter Cashwell is a bird author and distinguished educator in mid-career. When he recently had a chance to take a sabbatical leave from his teaching position at Woodberry Forest School in Virginia, he decided to come to the Cornell Lab of Ornithology to learn how a bird magazine is produced.

I was familiar with Peter's writing and had greatly enjoyed his book, *The Verb, 'to Bird': Sightings of an Avid Birder*, but his résumé really caught my eye...especially some of the items in his list of previous jobs: comic-book critic, rock musician, improv comedy accompanist, radio announcer. So I knew if nothing else he would be an interesting and entertaining addition to the staff—which he certainly was, but he also did journeyman work, writing, editing, proofreading. And he sang a few songs, cracked some good jokes, and became part of the Cornell Lab family. But sadly, all good internships must come to an end, and Peter has since left us and returned to the hinterlands of Virginia from whence he came to rejoin his wife and two sons.

From the staff at *Living Bird*, thank you for all of your help, Peter.

Tim Gallagher
Editor-in-Chief

I found Neil Losin's article "There Goes the Neighborhood" perfect for two purposes. First I started noticing and thinking more about what I see myself when birding—for example, a comparatively small Red-winged Blackbird harassing a huge Great Egret. No one would construe that as mistaken identity. They do occupy the same habitat but probably do not have the same diet. So, what is the conflict over? Equally valuable was the manner in which the article was written, describing the alternate hypotheses about intraspecific aggression and resolving them with evidence.

I think this article would lend itself perfectly to an introductory undergraduate ecology class, as a clearly and engagingly written example of how ecologists think about questions and try to resolve them.

BARBARA SULLIVAN-WATTS
PROVIDENCE, RHODE ISLAND

You are definitely correct, a Red-winged Blackbird would never mistake a Great Egret for another blackbird, and the two species are not competing for the same food source. In this case, the adult Red-winged Blackbird is probably concerned about having such a large bird in the vicinity of its nest. This kind of behavior takes place all the time when hawks, owls, house cats, and other predators come around. But a Great Egret can also be a threat. These large wading birds are opportunistic feeders, and it's not unheard of for them to feed on the eggs or young of various marsh birds. We are glad that the article inspired you to study the behavior of birds more closely.

The Editors

We welcome letters from readers. Write to The Editors, *Living Bird*, 159 Sapsucker Woods Road, Ithaca, New York 14850, or send email to livingbird@cornell.edu.

A Winning Spring

The Cornell Lab trophy shelf is sagging a bit following a winning spring for our three competitive birding teams. Their successes also meant a big win for the birds. Thanks to your support, our teams raised more than $200,000 for the Lab's conservation programs as well as for undergraduate research and training.

The streak began on April 22. The six members of Team Sapsucker packed their scopes and hopes and headed to Texas for what turned out to be a successful bid to break the national record for the number of bird species found in 24 hours. The team recorded 264 species, topping the previous record of 261. Their adventure began at midnight with a Yellow-crowned Night-Heron and a Barred Owl tallied near San Antonio's famed Riverwalk. The Sapsuckers surpassed the previous record with the call of a Clapper Rail after nightfall. Virginia and Black rails soon followed to cap a fast and furious day of birding.

Texas birders were one of the key elements to the team's success, generously sharing their tips and favorite spots in one of the birdiest states.

The Cornell Lab's student team, the Redheads, pulled a three-peat at the World Series of Birding held on May 14 in New Jersey, winning the Cape May County division for the third year in a row with a total this time of 163 species. One notable highlight was sighting a Wilson's Storm-Petrel, a bird of the open ocean that ventured just close enough to land for the Redheads to get it in their scopes. Overcast, rainy weather and the departure of hoped-for migrants made this year's competition especially tough.

The Lab also fielded a team in the Carbon-Footprint category at the World Series. The Anti-Petrels racked up more than 100 miles on foot and by bicycle, tallying 144 bird species to win the division for the second year in a row. Amazingly enough they had no flat tires—but a few ticks did latch on for the ride and there were some frustrating stakeouts for birds seen and heard during scouting that never let out a peep on the Big Day itself.

Congratulations to all of our intrepid birders and sincere thanks to all their supporters. You make it possible for the Cornell Lab to continue its conservation work. To learn more about our teams and the birds on their checklists, visit www.birds.cornell.edu/BigDay.

—*Pat Leonard*

TIM GALLAGHER

The Sapsuckers—from left to right, Marshall Iliff, Tim Lenz, Jessie Barry, Chris Wood, Brian Sullivan, and Andy Farnsworth—set a new national big-day record this past April 22, locating 264 species in 24 hours, three species more than the existing record.

JON REIS

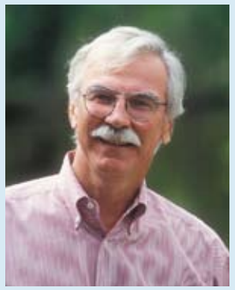
A NEW FACEBOOK PAGE

We're pleased to announce that *Living Bird* now has its own Facebook page. Please take a look at it soon at www.facebook.com/pages/Living-Bird/136517399750495. If you like what you see, be sure to hit the "like" button. You can also visit the Lab of Ornithology's main Facebook page at www.facebook.com/cornellbirds.

The View from Sapsucker Woods

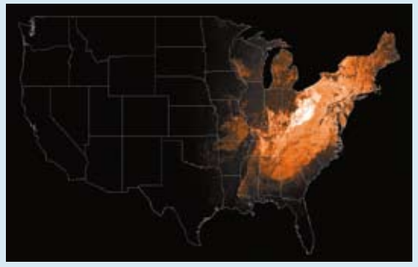
Revolution is in the air, and is being spurred to dizzying new heights by the Internet. No, I am not referring to the social upheaval taking place in the Middle East, but rather to a quiet revolution much closer to home involving tens of thousands of people and tens of millions of observations. This revolution is being generated right here at Cornell, but it is bound to alter forever the way humans look at animal distributions the world over. Already, it has produced a report heralded as a milestone by the U. S. Secretary of the Interior.

The revolution started quietly a few years ago, as bird watchers began entering their observations directly online via the first generation of eBird. As project leaders and back-end programmers worked furiously to improve data-entry interfaces and provide personalized services, eBird steadily gained converts and the drumbeat quickened. Revolutionary forces began assembling, inspired by a union of visionary statisticians, computer scientists, and ornithologists, and fueled by far-sighted funding from the National Science Foundation and the Leon Levy Foundation. Specialists in "machine learning" embraced the exponentially growing eBird data set as an opportunity to develop and test new data-mining algorithms using a biological system challenged by real-world environmental problems. Hundreds of continent-scale data sets reflecting human and environmental variables were brought into the war room, but the revolution still lacked sufficient firepower to take off: too many data; too many variables; vastly too much surface area across which to carry out repetitive, locally tuned statistical procedures. Finally, about a year ago, a long-awaited breakthrough took place. The true revolution exploded into view over this past winter.



The massive breakthrough tool is called the TeraGrid—a remarkable integration of high-performance computers, data resources and tools, and high-end experimental facilities around the United States, touted as "the world's largest, most comprehensive distributed cyber infrastructure for open scientific research" (https://www.teragrid.org/). Our first effort to crunch the huge eBird data set together with hundreds of other continental data resources required thousands of hours of computing time on the TeraGrid.

The resulting visualizations were literally breathtaking—we could call them "next-generation distribution maps." Viewed as static snapshots of distributions at single moments in time (for example, the map at right details the U.S. distribution of Wood Thrushes on June 28, 2009), their detail is stunning. Even more spectacular, for any given species, are 52 weekly maps displayed sequentially to produce spellbinding animations of the entire annual migratory cycle. Never before has such detailed information about animals' distributions been synthesized and visualized so clearly.



Word of these revolutionary distribution maps spread quickly after a collection of them was posted on eBird. Colleagues who thought they'd known everything about bird distributions were transfixed by surprising new details, even about common birds. Potential applications are endless and are just beginning to be explored. Cornell Lab scientists partnered with colleagues at other conservation organizations and federal agencies to quantify the importance of public lands in protecting birds across the United States. Using a grant of 70,000 hours on the TeraGrid, the breeding distributions of 150 bird species were mapped at 30 km resolution and analyzed together with public ownership maps. The resulting report—*State of the Birds 2011* (http://www.stateofthebirds.org/)—clearly reveals the crucial conservation roles played by our national parks, forests, wildlife refuges, grasslands, and BLM lands.

The revolution continues to gather strength. During the month of May 2011, eBird logged 3.1 million observations (more than the number logged during its first three years combined). A new grant providing 3 million hours on the TeraGrid will map all of North America's breeding birds at 3 km resolution, weekly, from 2007 through 2010. Our views of bird distributions will never be the same again, and we anxiously await the day when the data are available for this to be a worldwide exercise. Viva la revolución!

John Fitzpatrick
Louis Agassiz Fuertes Director
Cornell Lab of Ornithology

Thieves with benefits

Fork-tailed Drongos—small passerines common in sub-Saharan Africa—have long been viewed as outright thieves: they follow a group of foraging animals, such as Southern Pied-Babblers or meerkats, wait until the animals turn up some tasty morsels, then give a false alarm call. While the startled foragers look around for the predator, the drongos swoop down and steal the food. Although drongos can capture their own food, stealing provides benefits: stolen food items are often larger than what they capture themselves. Are drongos the pirates of the desert? Perhaps not: surprising new research suggests that, despite their thieving ways, drongos' relationship with pied-babblers may be more one of mutualism than parasitism.

Several interesting studies have illuminated the specialized abilities and behaviors drongos use when parasitizing their hosts. For example, in a study focusing on group-living pied-babblers in the Kalahari Desert, Amanda Ridley and Matthew Child showed that drongos target clumsy, skittish juvenile pied-babblers significantly more frequently than adults—which leads to the interesting conclusion that drongos can distinguish the age of individual babblers and use this knowledge to increase the success rate of their food-stealing.

The relationship between Fork-tailed Drongos (above) and Southern Pied-Babblers (at left, below) may actually be more an example of mutualism than parasitism.

ANDREW RADFORD (2)

In a study published in the *Proceedings of the Royal Society,* Tom Flower found that drongos can mimic the alarm calls of their host species. By playing recordings of alarm calls, he showed that meerkats and pied-babblers were fooled by the false alarm calls, seeking cover more frequently in response to the drongos' alarm calls than in response to other non-alarm calls. When the hosts seek cover, the parasites dive in for the abandoned food. Thus, drongos' ability to mimic the alarm calls of other species seems to be another trait that facilitates their parasitic behavior.

These studies paint a convincing picture of drongos as parasites, with specialized adaptations that allow them to fool hosts and target the most vulnerable hosts for attack. However, surprising new research suggests that the interaction between drongos and their pied-babbler hosts may be closer to mutualism, in which both parties benefit, than parasitism, in which one party benefits at the expense of the other. In an article in the journal *Evolution,* Andrew Radford and his colleagues reported that "sentinel calling" by drongos waiting to parasitize babblers actually allows babblers to increase their foraging efficiency.

Sentinel calls are vocalizations made by birds that are not foraging, but are positioned as lookouts to watch for potential predators. The message of a sentinel call is similar to the Victorian night watchman's call of "All's well," signaling that nothing untoward is happening in the vicinity of the group. Pied-babblers take turns acting as sentinels, so Radford and colleagues compared the foraging efficiency of babblers in the presence of babbler sentinel calls with that of babblers in the presence of drongo alarm calls. It seems that having a babbler sentinel is best, allowing for the greatest foraging efficiency, but having a drongo sentinel is also useful.

Because the presence of drongos can confer benefits on pied-babblers, as well as costs, the image of drongos as out-and-out parasites no longer seems accurate. Instead, Radford and colleagues suggest that the relationship between drongos and babblers may be in the process of evolving from parasitism into mutualism. Famous examples of mutualism include clownfish that live in anemones (think "Finding Nemo"), honeybees that pollinate the flowers they visit, and even humans and pets such as dogs or cats: we provide them with food and shelter, and in return they guard our homes or keep them free of mice. Perhaps one day the interaction between Fork-tailed Drongos and Southern Pied-Babblers will be added to that list.

—*Caitlin Stern*

References

Radford A.N., M.B.V. Bell, L.I. Hollén, A.R. Ridley. 2011. Singing for your supper: sentinel calling by kleptoparasites can mitigate the cost to victims. Evolution 65:900-906.

Can We Save the Spoon-billed Sandpiper?

by David S. Wilcove

The perils of a long-distance migrant

"All animals are equal but some animals are more equal than others," proclaimed the power-hungry pigs in George Orwell's *Animal Farm.* And in a way that's true for birds, too. All birds are interesting, but some birds are just more interesting than others. Most of us have our "quest birds," species we eagerly want to see. A friend of mine literally jumped for joy when she spotted her first Pileated Woodpecker; another buddy chased after the Spruce Grouse for 30 years before finally seeing one in Minnesota. I well remember the ecstatic look on his face when he finally came eye to eye with his quest bird.

As for me, the Spoon-billed Sandpiper has been near the top of my list of "most wanted" birds for decades. The odd bit of cutlery attached to its beak, its remote breeding and wintering grounds (northeastern Russia and southern Asia, respectively), and its rarity all combine to give the Spoon-billed Sandpiper an allure out of proportion to its small size and relatively drab coloration. (I might add that I am not alone in my fascination with this odd little bird. David Allen Sibley and many other bird watchers are similarly smitten.)

I never seriously entertained the notion of chasing after the Spoon-billed Sandpiper until a couple years ago, when a series of research papers and news reports suggested that the species was on the brink of extinction. Estimates of the breeding population dropped from roughly 1,000 pairs in 2000 to only 120-200 pairs by 2009. If I wanted to see one, I shouldn't delay. Last March, therefore, conservation biologist David Edwards and I met up in Bangkok and were joined there by Peter Ericsson, a long-time resident of Thailand and an expert on the country's birdlife. Peter then took us to the little village of Pak Thale, roughly three hours by car from Bangkok.

For generations, people have been harvesting salt in this region by pumping seawater into shallow ponds and allowing the water to evaporate. When those salt ponds have water, they teem with wintering shorebirds, including thousands of Great Knots, Greater and Lesser sand-plovers, Curlew Sandpipers, and Red-necked Stints. Mixed in among the stints are a handful of Spoon-billed Sandpipers, perhaps fewer than a dozen, but their presence every year at Pak Thale makes it perhaps the easiest and most reliable place on earth to see this elusive species.

And, indeed, within an hour of arriving at Pak Thale, while scanning a small flock of snoozing Red-necked Stints, we noticed a sandpiper with a whiter face and a noticeably thicker bill in profile. When the bird in question looked our way, the spoon-shaped tip to its bill instantly confirmed its identity. We spent over an hour watching it and another individual that we found in the same flock, relishing the experience. The next day, we spotted a juvenile Spoon-billed Sandpiper busily feeding at a different salt pond, proof that at least one pair of birds had nested successfully in the previous summer.

As gratifying as our encounter with the Spoon-billed Sandpipers was, we couldn't help but feel a certain amount of sadness, given how rare the species has become. Deducing the causes of its decline—the essential first step to actually saving the species—has not been easy. In fact, the Spoon-billed Sandpiper offers a textbook example of the challenges associated with protecting migratory birds. And, sadly, it's an example we need to learn from, given how many long-distant migrants seem to be declining these days.

Migratory birds are vulnerable to changes on their breeding grounds, their wintering grounds, or any of the stopover sites they use en route. In the case of the Spoon-billed Sandpiper, problems could be lurking anywhere. The species nests in the Arctic, where the effects of climate change are especially pronounced; it migrates through countries such as Korea, China, and Japan, where development of coastal areas has been intense; and it winters in South China, Vietnam, Thailand, Myanmar, and Bangladesh, where coastal development and hunting pressure are increasing. So how does one begin to unravel the causes of the sandpiper's decline?

Fortunately, diligent work by biologist Christoph Zockler and colleagues provides some important clues. Approximately 70 percent of the known breeding sites have been surveyed at least twice since 1970, and one key breeding site, Meynypilgyno, Russia, has been surveyed repeatedly since 2003. The results are grim: Spoon-billed Sandpipers have declined throughout their breeding range. But, interestingly, in Meynypilgyno, the nesting success of the birds, measured in terms of brood size and hatching success, does not appear to have changed. This is important, for it strongly suggests that the main cause of the Spoon-billed Sandpiper's decline lies outside the breeding grounds. (The data, however, are not conclusive. As the birds got rarer, the biologists were able to study fewer nests, making the results less robust).

Monitoring of Spoon-billed Sandpipers has been much less thorough across their extensive winter range. Nevertheless, surveys in recent years have identified a few sites that harbor significant numbers of the birds, most notably the Bay of Martaban in Myanmar, where more than 200 may winter. There, Zockler and colleagues discovered that people were actively catching shorebirds of all kinds for food and for use in religious ceremonies (in some Buddhist cultures, releasing animals back into the wild is a way to demonstrate piety). Hunters interviewed by the scientists were familiar with Spoon-billed Sandpipers and acknowledged having caught them from time to time. The researchers were unable to determine how often Spoon-billed Sandpipers were captured by hunters, and without this information, they could not quantify the threat hunting poses to the species. But the circumstantial evidence certainly points to hunting as a major threat (perhaps the major threat) to the bird's survival.

And what about the stopover sites, the places sandpipers use to rest and refuel during their migration? We know that important stopover sites in Korea and China (and undoubtedly elsewhere) have been destroyed by development, but we don't know enough about the migratory behavior of the species to determine just how significant a threat this is compared with the other threats it faces.

Given what is known—and not known—about the threats to the Spoon-billed Sandpiper, conservationists face some difficult decisions in deciding how to apportion the limited resources (money and manpower) available for its conservation. Reducing hunting pressure on its wintering grounds is an obvious step. Based on their conversations with people in Myanmar and elsewhere, Zockler and colleagues believe that many hunters would happily give up hunting shorebirds if there were other ways to earn money. Hence, some sort of payment scheme could be used to address this particular threat in the short term, although it is probably not a sustainable solution in the long term. Environmentalists can and should target key wintering and stopover sites for protection, but they will have to surmount two significant obstacles: incomplete knowledge of the migratory route and growing economic pressure for further development across much of the bird's range. And to the degree that climate change poses a threat to the Spoon-billed Sandpiper, either by degrading its breeding habitat in Russia or by drowning its winter habitat in southern Asia, that issue, too, will need to be addressed. But that's clearly an issue the entire world must grapple with.

Wisely but sadly, biologists have decided they need to create a captive flock of these birds as a safeguard against their extinction. As I write these words, an international team of conservationists is slogging across the Russian tundra, hoping to gather eventually a few Spoon-billed Sandpiper eggs, which they will incubate in captivity and use to start a captive population. The sandpipers, in turn, are busily setting up their territories, finding mates, and beginning to nest. By the time you read these words, the conservationists will be back home, having succeeded or failed, and the wild Spoon-billed Sandpipers will have traveled thousands of miles across Asia to places like the mudflats of the Bay of Martaban or the salt ponds of Pak Thale. ◆

GERRIT VYN/CORNELL LAB OF ORNITHOLOGY

A Spoon-billed Sandpiper on its breeding grounds at Meynypilgyno, Russia. The Cornell Lab joined an expedition to the site and is documenting the species with HD video and sound recordings.

Recommended Reading:

Christoph Zockler, Evgeny E. Syroechkovskiy, and Philip W. Atkinson. 2010. Rapid and continued population decline in the Spoon-billed Sandpiper *Eurynorhynchus pygmeus* indicates imminent extinction unless conservation action is taken. *Bird Conservation International* 20:95-111.

Christoph Zockler et al. 2010. Hunting in Myanmar is probably the main cause of the decline of the Spoon-billed Sandpiper *Calidris pygmeus. Wader Study Group Bulletin* 117(1):1-8.

See also "Saving the Spoon-billed Sandpiper: Chukotka expedition 2011" at http://sbsproject.wordpress.com/

Bad Vibrations

by Mary Woodsen

In a noisier world, some birds fight noise with noise

o how does an animal whose survival depends on acoustic communication—a bird, say—cope with a relentless urban roar? Well, it could do what a person might: call out during snatches of relative quiet. Pitch its call above the din. Or get out of Dodge.

It's May 2007, and ecologist Clint Francis, binoculars dangling on his chest, is threading his way toward an open grove of pinyon pine in the high mesas surrounding Rattlesnake Canyon in northern New Mexico. He's here to gather evidence on which birds do what, and why, when they are up against nonstop noise. For as vast a wilderness as it seems, this Bureau of Land Management (BLM) tract is pocked with thousands of gas wells tucked among the junipers and pines. Many are decked out with industrial-grade compressors yammering away 24/7, year in and out. For Francis that's good, because this high-altitude pygmy forest has all the attributes of a true natural experiment.

The sun tops the nearest ridge and slants through gaps between the trees, bringing sudden warmth to a chill morning. This grove marks Francis's 12th "point-count" site in a set of 16 sites randomly generated to fall between two imaginary circles. The radius of the inner circle runs 50 meters from the center of the well pad; the outer radius extends 150 meters.

Listening intently, Francis sets his stopwatch. He has seven minutes here—seven minutes to home in on nearby birds and note who's in the 'hood. Right off, a Gray Flycatcher calls in the distance; a Plumbeous Vireo chimes in.

Silence, though not for long. At 41 seconds a Black-headed Grosbeak erupts in song, followed at 59 by the plumbeous; a black-chinned hummer zings by. Francis scans the

Ash-throated Flycatchers (right) seem able to tolerate the noise of an industrial well-pad compressor.

BRIAN E. SMALL

o birds actually nest near the

nearby junipers and rabbitbush, tallying who's flying, perching, or singing and at roughly what distance. (You develop a calibrated eyeball in this business.) At 2 minutes 2 seconds, a Bushtit drops onto a nearby branch, then takes flight again. The grosbeak cuts out at 3:04, but the vireo sings on. At 5:33 a Black-throated Gray Warbler calls, then falls silent; a Mourning Dove sails in, its wings whistling softly. Six…6:20…in comes the hummer, landing briefly. At 7:00 precisely the vireo stops to catch its breath. Francis slides his notebook into his pocket, pulls out the GPS to double-check where his next-to-last stop is, and cuts through a bouldery wash toward a stand of junipers nearly 25 meters upslope, tugging off his jacket as he goes.

Relentless noise over vast stretches of planetary real estate, along with the auditory habitat fragmentation it causes, is an evolutionarily novel force acting now on a host of creatures, says Francis, a post-doc at the National Evolutionary Synthesis Center in Durham, North Carolina. Other than a lone study or two circa 1980, it wasn't until the mid-90s that ecologists began looking at whether noise pollution and declining populations go hand in hand. The logical place to look? Along urban boulevards or busy interstates. The logical study subjects? Birds, though researchers in Europe and Australia have done decisive work on bats and frogs as well. Their evidence suggests that bone-rattling noise and species declines are linked.

KEVIN SMITH/VIREO

CLINT FRANCIS

Gas wells in northern New Mexico (above) provide an unparalleled opportunity for researchers to see how industrial-level noise affects natural communities. The Gray Flycatcher (at left) is one of the species finding it hard to cope as noise pollution amplifies through these previously quiet landscapes.

The trick was controlling for a slew of confounding variables: Moving traffic. Exhaust fumes. Landscape development. Roadkill. Fences and walls that echo sounds. Unpredictably variable rates of noise intensity—not only is it measurably quieter at 6:00 A.M. than at 6:30, but a random pileup could provide a measure of calm even at the busiest hour, once the sirens cease.

Then there was the difficulty researchers faced in assessing the frequency or amplitude of calls while they are themselves awash in noise.

Francis wasn't looking to solve this puzzle back in 2005. But he was tiring of his summer fieldwork gigs, because each winter he had to find some other job to tide him over till the next field season.

Meanwhile Bureau of Land Management wildlife biologist John Hansen needed someone to follow up on a BLM bird survey at natural gas wellheads in Rattlesnake Canyon Habitat Management Area. The survey had indicated that roughly the same numbers of bird species frequented this high-altitude pinyon-juniper forest whether or not the pads were decked out with noisy compressors.

Yet Hansen knew that seeing a bird doesn't mean it's nesting and rearing young. So he called Catherine Ortega, then a biology professor at Fort Lewis College in Francis's hometown of Durango, Colorado. Ortega knew that Francis had surveyed Mexican Spotted Owls and Willow Flycatchers in Utah and that he was thinking of going to grad school. This study, Ortega thought, could make a great thesis project.

To answer Hansen's questions—do birds actually nest near

BRIAN E. SMALL

Biologists long thought that flycatchers could not modify their songs. But now research shows that Ash-throated Flycatchers can adjust their song enough to hold their own in the acoustically fragmented landscapes surrounding gas wells.

the noisiest sites, and if so, what do those avian communities look like?—Francis and Ortega devised a plan that ultimately led to the first conclusive evidence that amped-up industrial-grade noise does indeed have powerful consequences, both for how birds cope and for the richness of natural communities. Francis used the same basic protocols the original BLM team had used on the 18 well pads they surveyed. Half the pads were outfitted with painfully loud compressors; compressorless pads served as controls. His transects—randomly assigned study areas—were rectangular plots 60 meters wide extending 400 meters from each pad. And if the transects weren't utterly uniform the way, say, Siberia or Antarctica or the Sahara might be, their habitat features varied only slightly from one to the next.

The beauty of this scenario? Instead of trying to untangle an array of iffy causative factors, Francis got a tabula rasa of sorts. He got to measure the sole urban element of concern far from sprawling cities and watch how the birds responded. It was as if he took the city to the birds.

Results? To his surprise, nest density was the same across both site types. But although 32 species nested on noise-free sites, only 21—all native to western North America—hung their hats in noisy sites. The math was simple but stark: roughly one-third of birds that normally nested in these high-mesa forests couldn't abide being within 400 meters of compressors. Among those that occupied both types of sites, most nested at a distance from compressors—meaning that even noise-tolerant species prefer being farther from the din.

Other expectations didn't pan out either. Francis supposed that birds nesting near compressors would raise fewer young because they wouldn't hear predators on the make. Not so—not, at least, in the high-elevation forests of northern New Mexico.

And who would've guessed that 94 percent of House Finches and 92 percent of Black-chinned Hummingbirds would choose compressor sites—the closer the better?

The predators, it turned out, were mainly Western Scrub-Jays. Their noise-tolerance quotient hovered near zero, and no other predator took their place. (Similarly, cowbirds parasitized the outliers, the nests farthest from compressors; like scrub-jays, they could be intolerant of heavy-duty noise.) Which led Francis to a new speculation—that perhaps the reproductive success of some urban-adapted birds is shaped, in part, by disrupted interplay between predator and prey. Maybe those finches and hummers keyed into this relatively predator- and competitor-free space when they chose nesting sites.

Plus they seemed to have innate advantages (they're small and have higher-pitched songs) that made them oddly adaptable, able to fill a niche that drove other birds bonkers.

Compressor noise has energy at frequencies that span most of our hearing range. But its low-pitched clamor carries farther than its higher frequencies, which drop out at shorter distances—much like urban and traffic noise. Research by Emily Mockford (Britain) and Hans Slabbekoorn (Netherlands)—and now by Eira Bermúdez-Cuamatzin (Mexico) and Dominique Potvin (Australia)—has suggested that some species get by in sprawling metropolises by pitching their songs higher than their rural brethren or by having naturally high-pitched songs and calls to begin with—by being the Sarah Brightmans, the coloratura sopranos of the bird world. Perhaps the finches and hummers of Rattlesnake Canyon were doing the same.

hy were the Ash-throated Flycatchers unfazed by industrial-grade sound pollution? What allowed

His first study was nearly complete and beginning to turn heads (Francis's research earned three student awards while he was still at work on his Ph.D. thesis), so he wanted to see what else this unexpected opportunity, courtesy of the gas industry, had to offer. If relentless noise compromises natural communities and yet provides indirect benefits to some species, what can we learn about how birds do or don't cope? Because Francis got to track so many species, he'd turned up intriguing data he would have missed had he drilled in on just a few. This in turn led him to focus on two related species with a curious story to tell—the Ash-throated and Gray flycatchers.

Some background first. Flycatchers belong to a suborder of songbirds called "suboscines." ("Songbirds" is a misnomer, actually; more properly these birds are called "passerines"; most are technically "oscines.") Ornithologists believe that suboscines are born knowing just what song to sing to defend a territory or find a mate, unlike most young male songbirds, which learn songs from their fathers or neighborhood males.

So if flycatcher songs are genetically ingrained, wouldn't they have less inherent flexibility where noise pollution is an issue? Be less likely to adjust their songs—sing higher, call louder—depending on the noise levels they need to cope with?

Wouldn't they get out of Dodge?

If you forced Francis to guess, no a priori knowledge allowed, if either flycatcher could nest within the noisy transects, let alone modulate its song, and if so, which one, well, first he'd say that by rights, both birds should avoid all but outlying areas. If you pressed him for which might be less likely to tolerate noisy sites, he just might put his money on the Ash-throated. After all, the Ash-throated Flycatcher is larger; larger birds pitch their songs lower; lower songs are more easily masked by the rumble of compressors, highways, and the like—and other researchers had noted that birds with higher ranges do better in noisy city settings.

But Francis had a posteriori material to work from. His nest surveys showed that Ash-throated males paid scant attention to noise when seeking a place to hang their hat, while Grays on noisy sites nested at the far ends of transects. The 2007 point-count surveys confirmed what Francis saw in the nesting study: Gray Flycatchers kept their distance.

Still, confirmation and explanation are two separate things. Why were the Ash-throated Flycatchers unfazed by industrial-grade sound pollution? What allowed them to compensate despite the tyranny of genetic programming that, in theory at least, made adapting to circumstance harder?

Francis had to go back again.

Which is why at dawn on a chilly May morning in 2009, Francis and his crewmates, Ryan Kennedy and Nate Kleist, shoehorn themselves into Francis's truck. They wind south on Colorado 170 out of Durango, then clickety-clack across the cattle guard where 511 takes over at the New Mexico line.

Even with his seat all the way back, Francis's knees knock against the steering wheel. Good thing he's not any taller. He veers off onto a rutted, unmarked track that winds over a ridge toward a far valley. Though he's easy on the gas, everyone is jouncing around. In the distance they can see five well pads dotting the mesa. They're swapping yarns to pass the time. About that time they got to the base of a hill like this one and saw a gas-company field man, trailering a backhoe, stuck at the bottom. A couple of hours they waited in the hot sun while the guy cussed and kicked the tires and threw his hat on the ground and, finally, got the damn thing to the top. About when sudden cloudbursts turned the fine clay dust to boot-sticking gumbo and everyone was several inches taller by the time they clumped back to the truck. About that day Pete set his camo bag down in a thicket of gambrel oak, stepped out to get a bead on a bird—and the crew spent the afternoon looking for that pack. Had to. The keys were in it.

Once on-site, the three unwind from the cab, stretching, then open the cap on the pickup's bed and drop the tailgate. Out come the shotgun mics and fancy-pants digital recorders, the decibel meters, and GPS units. Each crewmember packs a set.

This year they're making field recordings of bird songs and calls—a first for Francis. They're hitting 37 well pads, nearly twice as many as in previous years. Why more pads? Partly it

has to do with not double-sampling birds; they're recording just one bird per species per site. But partly it's because this year, the compressors stay on. This year, finding birds won't be as easy. And once they're found, crewmembers need to work to within five to fifteen meters, wait patiently for the birds to begin singing (if they do), and then record the entire song or call bout—that is, for as long as the bird sings from one perch.

The three spread apart as far as possible; they don't want to risk sampling the same birds. Once back at the truck, they'll check their findings against each other's notes. If there's any question about double-sampled birds, Francis listens to both recordings, then discards the lower-quality one.

Ecologist Clint Francis records bird songs in his study area to see which ones alter their songs to cope with noise pollution.

While Gray and Ash-throated flycatchers aren't the crew's only quarry, they happen to be the only suboscines in plentiful supply. Meaning Francis can't help but pay them extra heed. And the reward…well, if he's lucky Francis will clear up the mystery of the flycatchers, why the bigger, lower-pitched Ash-throated Flycatcher bucks the trend by its seeming indifference to compressor noise, while its smaller, higher-pitched cousin can't compete with the racket.

Each afternoon as he downloads the recordings onto his computer, Francis randomly picks five songs or calls from each bird. He measures the three main characteristics of each: frequency (both minimum and maximum); peak frequency (the frequency carrying the most energy); and vocalization bandwidth (maximum frequency minus minimum frequency). While his software automatically measures peak frequencies, he has to locate the minimum and maximum frequencies himself.

Luckily the spectrograms on his computer screen—resembling an art piece in chart form—make it easy for Francis to place his cursor at the margins of notes, despite all that background noise. By the time he's put each recording in the context of his decibel readings, by the time he's run the log transformations and analyzed the linear regressions and adjusted the significance thresholds—by then his data are looking good, very good. Because this time his expectations are dead-on. Somebody is modulating its song. And it isn't the higher-pitched Gray.

The Grays uphold family tradition, sticking strictly with the tried and true. The Ash-throateds, however, seem willing to consider their options. When near compressors, they pitch their lowest notes a tad higher—200 hertz—than their kin at a greater distance.

Granted, 200 Hz is a difference too subtle for you and me to hear. We can't hear even a 1,000 Hz jump. But we aren't flycatchers or any of the other species researched in Britain, Belgium, Mexico, and Australia that have been shown to modulate their song where sound pollution is an issue. The adjustments they make range from 100 to 500 Hz—not a lot.

Then again, maybe the pitch shift isn't critical here. The Ash-throated Flycatchers could merely be singing louder, the higher frequency being a secondary effect. Meaning they're sort of like us—the louder we talk, the higher-pitched our voices tend to be. Francis can't measure the singing-louder hypothesis, though, unless he places microphones directly beneath the birds. Good as this natural experiment is, it's not that good.

Meanwhile the smaller Gray Flycatcher's song, while naturally higher, is also softer. Quieter. Perhaps the Gray is already maxed out and couldn't sing louder, even if it tried.

We're back at base in Durango. Outside, trucks are grinding up the four lanes of Goeglein Gulch Road. "Here," Francis says, his laptop open. "Take a look." Google Earth is up. Francis skims his fingers across the trackpad and the high mesas surrounding Rattlesnake Canyon in northern New Mexico zoom into view. "That's our study area."

We were out there just a couple of hours ago, filing past the pinyon pines, threading through the sage. But an eagle would see it like this, if far better: an ancient landscape studded with thousands of natural-gas well pads and crisscrossed with roads leading from one to the next. A landscape with a serious case of the pox.

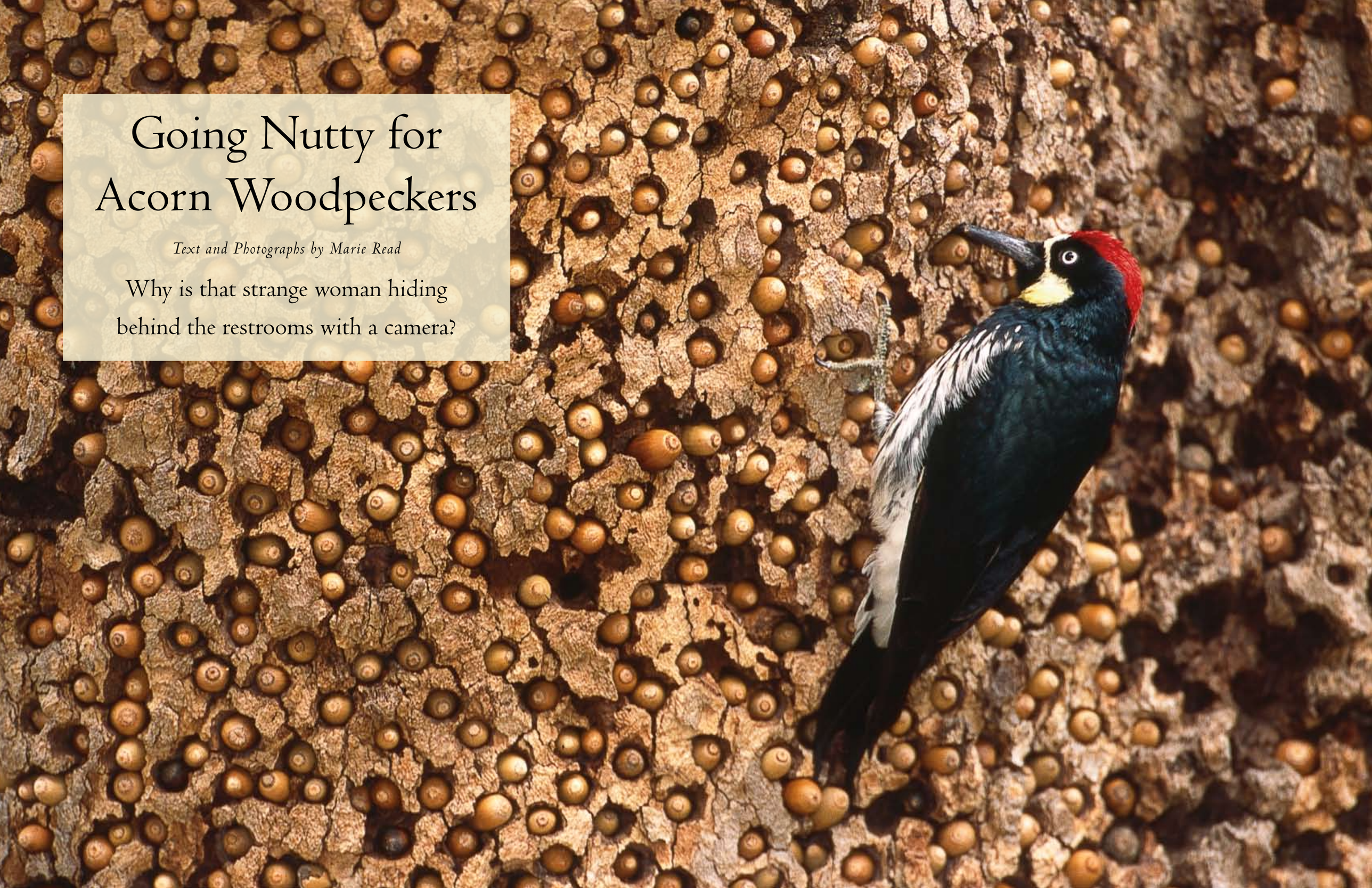
Zooming back out, we see the ropelike web of roads that even here in the fabled West coil through the valleys or cut through every range. Though the nation's population grew by a third during the past 40 years, road traffic nearly tripled. In the contiguous 48 states, 83 percent of all land now lies within two-thirds of a mile of a road. Air traffic has tripled since the early 1980s; it's hard to find places free of high-altitude noise. Even rural and wild landscapes are prone to a new kind of industrialization—scattered, perhaps, and accessible only by crude, rutted dozer tracks—but industry even so.

All of this is *acoustic habitat fragmentation.* Try googling "acoustic habitat fragmentation" (in quotes). You'll get two hits, both for whales—a fair subject, granted, in their own right. Then Google plain "habitat fragmentation": you'll score 249,000 hits. Even accounting for so crude an approximation, don't the numbers suggest fertile research ground for curious ecologists?

Stay tuned. ◆

MARY WOODSEN

Mary Woodsen, a native of New York's Finger Lakes region, writes about the environment, animals, farming, nature, biology—about the ever-evolving fabric of life.



Going Nutty for Acorn Woodpeckers

Text and Photographs by Marie Read

Why is that strange woman hiding behind the restrooms with a camera?

sk me to describe my perfect photographic subject and I'd probably say a bird that is colorful and attractive, with interesting behavior and predictable habits so you can find it fairly easily. Which bird has all these features? The Acorn Woodpecker—a creature that I'm just nuts about!

Strikingly photogenic, it has glossy blue-black upperparts, white wing patches, and a head boldly patterned with red, black, and yellowish-white. Add white eyes punctuating a black facial mask, and it's easy to see why this woodpecker is often described as having a clown-faced look.

What fascinates me more than its appearance, though, is the Acorn Woodpecker's behavior—both its habit of hoarding numerous acorns as a winter food as well as its sometimes-dramatic social interactions. The most gregarious of all North American woodpeckers, throughout much of its range it lives in extended families of a dozen or more individuals, meaning that if you find one, you're likely to find others nearby.

The species is found in western oak and pine-oak woodlands, preferring higher elevations, especially in Southern California where dense live-oak woodlands and oak savannahs are widespread. It is relatively common in urban or suburban areas if oak trees are available. Living in close proximity to people, the bird is often unsuspicious and easily observed. That explains why you might find me skulking around with my camera behind the restrooms of a certain California park that I've visited several times over the years. I'm intently focused on a large tree trunk riddled with hundreds of holes, each containing an acorn—a typical Acorn Woodpecker granary tree.

The Acorn Woodpecker is not alone in stocking up on food for the winter—a number of other birds, including various species of jays, chickadees, nuthatches, and several other woodpeckers, also do it. But no bird gets into hoarding on such a grand scale as the Acorn Woodpecker. A typical granary tree contains hundreds or even thousands of acorns—the largest on record contained around 50,000. Almost every square inch of the tree's trunk and limbs may be covered with acorn-filled holes, the cumulative result of multiple generations of individuals each drilling more and more every year. The Acorn Woodpecker is unique in having a centralized food store constructed and defended communally. An entire family group may rally to defend against such potential acorn thieves as squirrels and jays, as well as against other Acorn Woodpeckers from outside their group.

Any living or dead tree with thick bark is fair game to be a granary tree, but suburban Acorn Woodpeckers aren't picky, cheerfully drilling holes and storing acorns in utility poles, fence posts, and wooden house siding, often to the dismay of humans.

When acorn storage activity begins in autumn, Acorn Woodpeckers suddenly turn into workaholics. Filling those drilled holes is a serious task, not to be done without careful consideration. Poking and prying, the bird wedges its acorn into one hole after another, trying each hole for size, until it finds one with a perfect fit. Then off it goes for another. All this busy-work translates into plenty of fun photo ops for me.

During winter, the stored acorns form much of the birds' diet, but at other times of year Acorn Woodpeckers also feed on tree sap, oak catkins and other tree flowers, and fruit. They also eat insects, including many flying insects that they catch on the wing during sally-flights from a high perch, like a flycatcher.

Just as the kitchen tends to be the hub of our own family lives, the granary is the place for regular Acorn Woodpecker get-togethers, typically noisy affairs with dramatic displays. These elaborate interactions reflect the species' complicated social structure. Acorn Woodpecker society has a double layer of complexity. First, in any group there may be more than one breeder of each sex, in a mating system known as polygynandry. Research in Central California by Cornell Lab senior scientist Walter Koenig shows that same-sex breeders are usually closely related. Several (up to 7) co-breeding males (often a coalition of brothers) breed with 1 to 3 joint-nesting females (often sisters), which lay their eggs in the same nest hole.

Furthermore, there are nonbreeding helpers, often the breeders' grown offspring from previous years, which join in to feed the young, thereby helping raise their own younger siblings. Late one summer, I photographed two fledgling Acorn Woodpeckers begging for food from an adult male. In a monogamous species, he undoubtedly would have been their father, but in this case, he might have been their father, uncle, or older brother.

An Acorn Woodpecker granary tree (right) is a shared resource, constructed over many generations, and may contain thousands of stored acorns—the birds' main food in winter. During other seasons, their diet is more varied. At left, a female feeds on sycamore flowers.

*At left, Acorn Woodpeckers perform the "*waka *display" on a branch at their granary tree. Above, two youngsters beg from an adult male. The species' social complexity makes it difficult to know whether he is their father, uncle, or older brother.*

Furthermore, each youngster might have been related to him differently.

As one might expect from such a socially complex species, the Acorn Woodpecker uses a wide array of calls and displays to communicate with the members of its group. The most dramatic is the "*waka* display" in which the bird stridently calls *waka-waka-waka* while spreading its wings to show its bold white wing patches. This behavior occurs in a number of contexts and at various levels of intensity. It is commonly seen when group members land near each other, in which case it probably acts as a greeting. In its mildest form, the call occurs with the wings held only slightly open. At the other end of the spectrum, though, are what one researcher termed "*waka* gatherings" in which several group members converge on the same spot, all displaying noisily, thereby attracting the attention of others until the whole group has assembled. Such dramatic group displays frequently happen during territorial encounters and boundary disputes.

This brings us back to the restrooms. Behind them stands a large tree with a sizeable Acorn Woodpecker granary where I was hanging around hoping to capture a woodpecker family performing a *waka* display. I had photographs of this from past years. This time my goal was to capture the interaction on video.

Not surprisingly, people are a bit suspicious of someone lurking around restrooms with a large camera. On the other hand, wildlife photographers are often viewed as being a bit nutty. So there I stood hour after hour, trying desperately to appear nonchalant, with my telephoto lens focused on the spot where I'd previously seen a group of woodpeckers interacting. I was determined to remain in this one location and had to resist the agonizing temptation to photograph other woodpecker activity nearby. I knew that if I turned my attention away even briefly, Murphy's Law of Wildlife Photography predicts that my birds would immediately show up, and I would miss the very action I was waiting for.

Finally, after nearly two days of feeling self-conscious, a loudly calling Acorn Woodpecker landed right on target and began displaying, followed by another, and then another, until four were *waka-waka*-ing away together. Success! After reviewing the footage, I walked away elated, grateful to be out of the public eye at last, and offering a heartfelt "thank you" to the epitome of avian entertainment: the Acorn Woodpecker! ◆

Marie Read is a freelance nature photographer and writer and a frequent contributor to this magazine. Visit her website at www.marieread.com. To view Marie's Acorn Woodpecker video footage go to www.youtube.com/user/LabofOrnithology#p/u/12/rKrXQfw7dJw

The Enchanted

A brief sojourn on Ecuador's famed Galá-

Text and Photographs by Gary Kramer

n 1835 British naturalist Charles Darwin disembarked from the HMS *Beagle* and landed on the shores of a unique archipelago some 600 miles off the Ecuadorian coast. At that time called *Las Encantadas* ("The Enchanted"), today we know this group of 19 islands as the Galápagos. Largely as a result of Darwin's writings, *Voyage of the Beagle* (1839) and *On the Origin of Species* (1859), the Galápagos Islands became world famous.

In his journal, Darwin described a mockingbird that landed on a pitcher of water and sipped calmly as he sat inches away and a hawk that allowed him to approach so closely that he pushed the raptor off its perch with the muzzle of the gun he was using to collect specimens. Within minutes of my first Galápagos landing, a pair of mockingbirds approached to within five feet of me to see who was on their beach. Later, as we meandered through a colony of nesting Blue-footed Boobies, we came upon a pair in the throes of a courtship dance that showcased their brilliant blue feet. Although we were just a few feet away from the birds, they refused to step aside, more

On the author's first landing on the Galápagos Islands, a Blue-footed Booby (above) engaged in a courtship display right in front of him. At left, a spectacular view of Bartolomé Island, seen from the top of the central volcano.

27 species—22 land birds and 5 seabirds—are found nowhere else in the world. Among the endemics is the elegant Swallow-tailed Gull, the world's only nocturnal gull.

intent on each other than on the tourists invading their domain. Now, more than 175 years after Darwin first set foot on these shores, the birds and other wildlife seem as unconcerned about humans as they were in his day.

To travel to the Galápagos is to experience one of the world's great wildlife spectacles. Although some of the bird species—such as frigatebirds, boobies, flamingos, and Great Blue Herons—are common elsewhere, nowhere else are they so relaxed and approachable. Visitors can watch male Great Frigatebirds displaying with their inflated red neck pouches as females fly past. Visitors can swim with Galápagos Penguins in the shallows as they chase small fish or watch a Galápagos Mockingbird pick parasites and dead skin from the back of a marine iguana, often from only a few feet away.

By most counts, 58 species of birds live in the Galápagos Islands, a combination of resident land and aquatic birds and migrants—mostly seabirds and shorebirds. The total number is relatively small because the archipelago is so isolated, but 27 species—22 land birds and 5 seabirds—are found nowhere else in the world. Among the endemics is the elegant Swallow-tailed Gull, the world's only nocturnal gull. It has distinctive dark eyes and red eye-rings. Less brilliant is the Lava Gull, one of the world's rarest gulls with its entire population living in the Galápagos Islands. Flightless Cormorants are among the most unusual endemics; in the absence of land predators, they have lost the ability to fly. The Galápagos Penguin is the only penguin found north of the Equator, and the primary breeding area of the Waved Albatross is on Española Island in the Galápagos. Also endemic are the archipelago's only hawk, the Galápagos Hawk, 13 species of Darwin finches, the Galápagos Dove, and the Galápagos Mockingbird.

Swallow-tailed Gulls (at left) forage entirely at night, preying mostly on the tiny fish and squid that come to the surface to feed on plankton. Below, the Galápagos race of Striated Heron.

A short walk brought us to a steep cliff where wave after wave of seabirds flew past at eye level—Brown Pelicans, Swallow-tailed Gulls, Red-billed Tropicbirds, Blue-footed Boobies, and both Great and Magnifi-

As a travel guide, I had booked a one-week trip to the Galápagos for 16 passengers. National Park rules require that a park-certified guide must accompany visitors, and 16 is the largest group one guide can accompany. Visitors can reach the Galápagos by jet from either Quito or Guayaquil, Ecuador. From Guayaquil, the flight takes about 90 minutes. Most flights land at the Baltra Airport, a landing strip originally built by the United States military during World War II.

When we arrived, our guide Charlie greeted us at the airport, and after gathering our luggage, we boarded a bus for the 15-minute ride to Baltra Harbor. Here a Zodiac inflatable was waiting to ferry us to our mobile base of operations—the *Daphne,* a 70-foot motor yacht. For the most part, travelers visiting the Galápagos Islands stay on boats, although Puerto Ayora, the principal town, has some accommodations on land.

Our first full day dawned bright and clear, and after breakfast we boarded the Zodiac for the short run to South Plaza Island. Formed by an uplifted lava fault, this small island supports a variety of birds and other wildlife. Several sea lions lounged near the landing site, glancing up at us unconcernedly before resuming their naps. Almost immediately we spotted a Striated Heron, searching for prey along the shoreline. Nearby, a huge land iguana ate a fallen cactus pad.

A short walk brought us to a steep cliff where wave after wave of seabirds flew past at eye level—Brown Pelicans, Swallow-tailed Gulls, Red-billed Tropicbirds, Blue-footed Boobies, and both Great and Magnificent frigatebirds. As we moved along the cliff face, we saw Swallow-tailed Gulls on nests, some incubating eggs and others feeding downy young.

During the night we traveled southeast to Española Island, arriving just before dawn. As soon as we stepped ashore, Charlie

Just a few of the many avian sights of the Galápagos Islands. At left, a Magnificent Frigatebird glides past; below, three Galápagos Penguins, the only species of penguin living north of the equator.

Traveling to the Galápagos Islands

The Galápagos Islands offer excellent birding and wildlife viewing year round. I scheduled my most recent trip in May, the best time to view and photograph the largest variety of birds and the nesting activity of seabirds. Most seabirds are in residence and nesting from April through July. These months also have some of the best weather of the year, with cooler air and water temperatures.

Because the Galápagos Islands lie astride the equator, the days are about 12 hours long year round. Temperatures vary from the mid-70s to the high 80s, with noticeable humidity. March is the warmest month and August the coolest.

A number of vessels are available for visits, ranging from sailboats that accommodate 8 passengers to cruise ships that carry up to 100. Itineraries vary by boat and are regulated by the Galápagos Park Service. Costs range from $350 to $650 a day per person.

Visitors must first fly to Quito or Guayaquil, Ecuador, and then take a jet to the Galápagos Islands. For general trips to the Galápagos and other South American destinations, contact Latin American Escapes at (800) 510-5999 or visit the company's website at www.latinamericanescapes.com. Author Gary Kramer offers escorted trips to the Galápagos Islands as well as Botswana and Tanzania. Contact him at (530) 934-3873 or visit his website at www.garykramer.net.

pointed out a Galápagos Hawk perched atop a dead tree. No wonder the hawk was there—marine iguanas, a principal prey species, were everywhere. At times it was difficult to distinguish the rocks from the iguanas piled on top of each other.

As soon as we left the beach, we found ourselves in a breeding colony of Blue-footed Boobies. Most were courting, and a few carried nest material. As we walked along the designated trail, we encountered our first Galápagos Dove, a small reddish-brown endemic with a conspicuous turquoise-blue eye ring. A few yards down the path, we spotted a Large Cactus Finch (one of Darwin's finches), searching the shrubs for a morning snack.

The trail took us to an open area at Punta Suarez. Here we came upon the breeding area of the Waved Albatross—huge birds with six-foot wingspans. Some were walking toward the cliff face, where a short run and the updrafts along the cliffs helped them get airborne. Some incubated eggs. And others engaged in courtship displays—facing each other and clacking their bills together like two fencers in a duel, then pointing their bills skyward, repeatedly opening them and snapping them shut. We watched the birds perform the display several times as we sat less than 50 feet away.

On the way back to the landing site we walked through more nesting albatrosses and Blue-footed and Nazca boobies. Just before boarding the Zodiac to return to the *Daphne* we spotted a pair of American Oystercatchers resting on the beach. They barely raised their heads as I photographed them.

Almost every day of our Galápagos sojourn we visited a different island with a different set of fauna. Our next stop was Floreana, one of the southernmost islands in the archipelago. We landed on a sandy beach; the brackish mangrove-lined lagoon behind it is one of the best locations in the Galápagos to see American Flamingos. From the edge of the water we spotted at least 50 of them feeding in the shallows, sweeping their beaks back and forth just below the surface. Soon a group of a dozen flamingos began a mating ritual, strutting back and forth in unison. Sharing the lagoon with the flamingos were Black-necked Stilts and several pairs of White-cheeked Pintails, the only resident waterfowl in the islands.

The island of Santa Cruz is the site of Puerto Ayora, home of the Charles Darwin Research Station operated by the Galápagos National Park. Here visitors can view captive giant tortoises, including Lonesome George, the last remaining tortoise of the Pinta Island race. Researchers believe that the oldest giant tortoises may be more than 170 years old and may well have been around when Darwin visited. One afternoon we drove to the Santa Cruz Highlands, which receives enough rainfall to stay green year-round. Here we hiked trails and eventually came upon several giant tortoises. At first glance they seemed as big as Volkswagen Bugs lumbering through the green vegetation.

The next stop was Genovesa or Tower Island in the northwestern part of the archipelago. We anchored just offshore and boarded the Zodiac for the short run to Prince Phillip's Steps, a steep path leading through a huge seabird colony. It was named after Britain's Prince Phillip, who visited the place several years ago. Steps have been cut into the rock so visitors can ascend the 100-foot cliff. Some palo santo trees stand at the top of the trail, providing nest sites for Great Frigatebirds. We saw action everywhere—male frigatebirds sitting on nests, displaying their inflated red neck sacs to females flying overhead, and Nazca Boobies performing courtship displays only a few feet from the trail.

As we headed inland, we came upon our first Red-footed Boobies—the smallest of the boobies and a tree-nesting species—and also a pair of Lava Gulls. From the center of Genovesa Island we hiked to the east side where we came upon a massive lava flow. Numerous cracks in the flow have been commandeered by Wedge-rumped Storm-Petrels, which nest underground. The area teemed with hundreds of thousands of storm-petrels—so many that they resembled swarming bees. We also spotted two Barn Owls there. The owls have become adept at hiding in the lava cracks and preying on the abundant petrels, often in broad daylight.

That afternoon we landed elsewhere on Tower Island, this time on a coral beach at Darwin Bay. Several sea lions were playing on the beach as we came ashore. Just yards from the landing site we came upon nesting Swallow-tailed Gulls, some with downy young. Farther inland was a large colony of nesting Great Frigatebirds and Red-footed and Nazca boobies. A short hike brought us to a series of tide pools where we watched marine iguanas dive below the surface to feed on algae. The tide pools on Tower Island were the only place we saw Yellow-crowned Night-Herons, and all 10 of them were juveniles.

Our next excursion took us to Bartolomé Island, with its wooden stairway of hundreds of steps leading to the summit of the central volcano. The top of the volcano provides a breathtaking vista of the entire island, but the highlight of Bartolomé Island is the Galápagos Penguins. While cruising the rocky shoreline in the Zodiac we spotted a trio of them sunning themselves. They eventually headed into the water and joined another group of penguins looking for fish.

We landed on Seymour Island on our final morning and soon came upon the largest gathering of Magnificent Frigatebirds in the Galápagos, as well as nesting Blue-footed Boobies and Swallow-tailed Gulls. I set up my tripod near the landing and spent more than an hour photographing frigatebirds, boobies, pelicans, and gulls as they flew past at eye level.

It was a fitting end to a spectacular week. Darwin visited for only 34 days, but his visit changed the world forever. Our stay was short as well, but it was one of the highlights of my life as a birder, photographer, and writer. ◆

Gary Kramer is a freelance writer and photographer based in California. Visit his web site at www.garykramer.net.

Some of the other wildlife species on these islands can be just as interesting to watch as the birds—for example, the famed Galápagos tortoises, above, and the land iguana, at right.

Vortex Razor HD 8x42 Binoculars

With the superb quality of high-end binoculars steadily improving, the cost of owning the latest models has also crept steadily higher—putting the best optics outside the budget of many birders. With their completely redesigned Razor HD binoculars, however, Vortex seriously challenges this trend by offering highest-quality optics at roughly half the cost of the most expensive models. (The online price for this model runs about $1,180.) I was pleased to receive a pair of 8x42 Razor HDs to review, just in time for peak spring bird migration in Ithaca, New York.

These sleek, open-hinge-design roof-prisms immediately lived up to their name, because the image was truly razor sharp and very bright from edge to edge. In fact, after repeated side-by-side comparisons with my own top-of-the-line binoculars, my eyes could not discern a difference in overall image quality. Colors appeared vivid and true as I gawked at my first male Blackburnian Warbler of the season and marveled at the soft yellows on a Philadelphia Vireo. Crisp details were easily resolved, as in the subtle face pattern of a Lincoln's Sparrow, and the very wide field of view (widest of any comparable model) and excellent depth of field made it easier to spot these migrants among the dense new foliage. Focusing down to 8 feet allowed me to study the eye of an incubating Blue Jay nesting just off my back deck. In addition to the excellent optics, Vortex guarantees these binoculars to be completely waterproof and fog-proof.

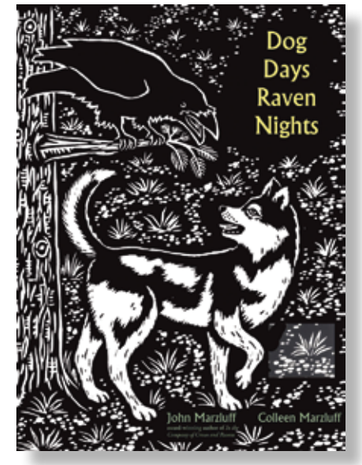
KEN ROSENBERG

The new Razor HDs had a very solid feel, but at nearly 30 ounces they seemed a bit forward-heavy in my hands. The large focus wheel had a nice gripping surface, but on the pair I was testing was very stiff and slow—the five partial turns required to move from Blue Jay nest to treetop warblers gave my index finger quite a workout. My biggest criticism, though, was that these binoculars seemed to have *too much* eye relief; turning the eyecups all the way down produced noticeable black vignetting with my eyeglasses on. In fact, the correct spot for my eyes was somewhere between the first and second (of four) click-stop points, so I just was never able to get rid of those black circles and enjoy a perfect view. Other people, of course (even other eyeglass-wearers), may not experience this annoyance.

So, although they may not be perfect, the Vortex Razor HDs are well worth a look for birders in the market for excellent yet moderately priced binoculars. They also come in a 10x42 model at roughly the same size, weight, and price, as well as larger and heavier 8.5x50, 10x50, and even 12x50 models. I applaud Vortex for challenging the top manufacturers, while bucking the trend toward absurdly high prices. The *unconditional* lifetime warranty offers an additional incentive, because even accidental, user-induced damage will be repaired or replaced at no cost to the owner. Seems hard to go wrong with that kind of deal, and I look forward to even greater innovation from this newcomer to the high-end optics field.

—Ken Rosenberg

Reviews by Stephen J. Bodio



Dog Days, Raven Nights

by John and Colleen Marzluff
(Yale University Press)

Dog Days, Raven Nights is a delightful, slightly schizoid book that attempts to answer the question that it poses on virtually the first page: "Can you make a living from the love of natural science?" Or maybe, can you *still?* The schizoid nature of the book comes from its three inextricably braided themes: the Marzluffs' research into the behavior of ravens in Maine, conducted under the direction of Bernd Heinrich; life in Maine; and, believe it or not, sled dog racing, Colleen's diversion from the stresses of raven work.

The most important theme, and not just for readers of this review, is raven research. Raven study, if fun, is not just fun; it's hard work. The Marzluffs trapped ravens, kept them in aviaries, and observed them closely to study their social communications. The birds consumed incredible amounts of roadkill and rotting animals; scavenging moose and cow carcasses seems to be a large part of the job description. A list of 45 food items includes porcupines, crawfish, big and little snakes, grouse, pumpkins, hot dogs, bananas, and salamanders, and more often than not, the animals were ripe. Heinrich could be a hard taskmaster, though he remains a friend. As John reminds us, "His own intensity in research had cost him two wives." The Marzluffs, who in the beginning "felt like we had watched a documentary about the social life of a rural papermill town" came to feel so at home that 20 years later, they consider moving back. After a weasel killed several of their personal ravens, John muses that "we remain strong advocates for native predators, but we now have some inkling of the stockman's hatred of the wolf."

The project itself might best be described as a study of communication and information in the "culture" of northern woodland ravens. (Further studies would eventually show that other woodland-inhabiting ravens throughout the world use the same signals, whereas desert birds, which do not generally feed on big carcasses, do not.) Whatever the reasons, ravens share information—John hypothesizes that you pay today because tomorrow you may need to receive: *"Hoy por ti, manana por mi*—the golden rule of reciprocity." The researchers tried to maintain a proper scientific distance, so the ravens don't stand out that much as personalities, although one brilliant individual runs off a bullying Bald Eagle by dropping bark on its back. The dogs, self-willed as huskies can be, are far more vivid as characters.

In the end the Marzluffs are lucky: happy with their work, their life, their dogs, and their friends. Looking back they say: "As we sit among old friends and rekindle strong bonds we feel even more a part of Maine." The answer to their question about making a living from a love of nature is more ambiguous. A neighbor's son recently prepared a science project on the raven project, which was turned down because "animal projects were 'no longer sanctioned.' An agenda, driven by important and real concern for animal welfare, has missed its mark…it has dimmed the flame of curiosity."

I should add that the linocuts by Evon Zerbets are absolutely brilliant.

Bird Coloration

by Geoffrey E. Hill
(National Geographic)

Bird Coloration starts off boldly. Across from a stunning full-page photograph of a handsome bird with a cape of iridescent multicolored hackles, the caption announces, "There are no orange, green, or blue pigments in the feathers of this Nicobar pigeon." Hill announces the book's aims: to tell us the whats and whys of bird coloration, and "to communicate in prose accessible to non-scientists what scientists know about the coloration of birds." (Much later, he raises the possibility that color may have "no function at all," though he more or less manages to shoot that one down.)

The well-illustrated book marches briskly through the diverse aspects of bird coloration; of variation, the stuff of birding; of differences between the sexes; of

molts, ages, subspecies; of what birds see; of measuring and describing color; of pigments and structural colors (you can wash the first out with chemicals or even water, but to destroy the second you must "hit it with a hammer" as a grad student correctly answers); of genetics and environment, feather wear, camouflage, and more.

His examples are as vivid as the illustrations, and in some instances work with them. An ultraviolet photograph of a Blue Whistling Thrush, a brilliant species I once saw in Asia, shows a unique pattern

An ultraviolet photograph of a Blue Whistling Thrush, a brilliant species I once

of spots invisible to the human eye. The brilliant yellow face on an Egyptian Vulture is attributed to the nutrients it gets from the guts of dead sheep. A dying albino frigatebird with abraded plumage illustrates why many birds have black wingtips. One of Abbott Thayer's beautiful but deranged oils, purporting to show that a Blue Jay's plumage evolved to camouflage it against blue-tinted snow in the winter, is almost vindicated by a potoo that looks more like a broken limb than a bird. He visits the improbable three-morph male "signaling system" of the Ruff, and explains more of its subtleties.

After a quick look at evolution (carotenoid pigment evolved after the dinosaur-era Ratites and "Galloanserae") and an intriguing "unifying concept" (small birds tend to be counter-shaded, medium spotted, or barred, and large ones have large patches of bold colors) he circles back to "why?" And answers, wisely, that we still don't know. ◆

A Naturalist's Notebook

by John Schmitt

7 May 1996
Little Lake Park
Santa Fe Springs, California

I paused briefly from my walk to watch a pair of Cassin's Kingbirds, hoping that I might have a chance to watch them defend their nest territory against intruders. I didn't have long to wait before I saw them make the first of seven or eight exciting pursuits after some American Crows that dared to fly too close to the kingbirds' nest.

Kingbirds are strong, fast flyers. They easily overtook the fleeing crows and unleashed a rapid succession of darting dives at their heads. In three instances, the kingbirds' attacks were so close and relentless that the crow being chased steadily lost altitude until it was driven to the ground, where it had to endure further diving and vocal abuse from the much smaller kingbirds.

Twice, a kingbird seized a crow by the nape of its neck in midair, using its beak and feet to ride the crow for two or three seconds before letting go and resuming its fierce pursuit.

The attacking kingbird usually broke off its chase abruptly then flew back to join its mate at their nest site near the top of the athletic field lights, where both birds engaged in a flurry of excited vocalizations and wing shuddering.