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# BYE blackbird BYE

Rusty blackbirds are vanishing from our southern swamps and northern forests.

BY RUSSELL GREENBERG

Winter is a quiet, gentle time in the southern swamp. Gone are the biting insects, venomous snakes, and toothy alligators, so wading in the swamp is relatively easy and safe. At first, the swamp seems dead, swept clean of summer's teeming life. But as your hip waders quietly slosh through the puddles and pools, bird life slowly reveals itself. At first, you hear it: the chatter of chickadees, the soft chip notes of yellow-rumped warblers (*Dendroica coronata*) drifting through the canopy, the tapping of a woodpecker, and the explosive "tea kettle, tea kettle, tea kettle" of a Carolina wren (*Thryothorus ludovicianus*). Then come the visuals: a flock of American robins (*Turdus migratorius*) dropping into a fruiting holly, or the black-and-white flashing wings of a pileated woodpecker (*Dryocopus pileatus*).

If you walk long enough, occasionally—very occasionally—a black bird slightly smaller than a robin might pop up in the tree branches and peer at you with piercing white eyes.

If you then silently scan the ground, you may see a troop of these birds, some blackish, others a rich rusty color. They will be diligently marching around the edges of leaf islands and wading the puddles, methodically searching the mud, flipping leaves, vigorously shaking wet green globs of vegetation in their bills, then pecking madly for any exposed invertebrates. Every so often, one of them wins a grand prize—a large, juicy insect larva—rapidly swallows it, and unceremoniously hunts on. A flock of birds at work.

Despite the activity, the flock is oddly quiet, uttering only a few soft contact calls. Then they are gone, as if sucked back into the mire. If you have such a chance encounter, you should feel very lucky. Seeing the highly elusive rusty blackbirds (*Euphagus carolinus*) is special. They are sighted less and less often, and the size of the flocks has dwindled from the thousands to the tens.

Birders often know special spots where the odds of sighting wintering rusties are greatest. Around Washington, D.C., the Jug Bay wetlands on the Patuxent River or the McKee-Beshers Wildlife Management

Area along the Maryland shore of the Potomac River often host small flocks. So do the Kenilworth Aquatic Gardens in the District and Huntley Meadows Park in Virginia. But it wasn't always so hard to find rusty blackbirds.

### A History of Decline

At the beginning of the last century, most observers noted rusty blackbirds as common to abundant. But as their bottomland hardwood habitats disappeared, so did the birds. After the Civil War, ornithological pioneer Elliott Coues described the bird as an abundant winter resident of Washington, D.C., and the surrounding region. Not anymore. Now most ornithologists describe them as rare or uncommon, and unpredictable throughout their winter range, which covers much of the southeastern United States.

Like most North American birds, rusty blackbirds are migratory. They breed in boreal forest wetlands in summer, slowly drift south from October through December, then rush back north in late March and April to claim territories. These seasonal treks bring them to the favorite haunts of the Northeast's armies of birders. This is when most rusty blackbird sightings occur—and when the decline of the species is most obvious.

Although birders still regularly see small groups of these birds, it would be hard to imagine reading reports like the following on your favorite birding listserv. Almost 130 years ago, the minister-ornithologist J. H. Langille reported:

*On the first day of May 1880, as I stood on an iron bridge crossing a sluggish stream of*

*Tonwanda Swamp, I saw the Rusty Grackles constantly trooping by in immense numbers.... The sombre wave, this constantly rolling on, must have carried hundreds of thousands over this highway in a day....on being alarmed, either in the fields or in the bushes, these Grackles would rise in a dense, black cloud, and with a rumbling sound like that of distant thunder.*

At about the same time, Frank E. Beal, a U.S. Biological Survey scientist and founder of the field of economic ornithology, wrote:

*One of the most familiar sights to the New England schoolboy, and one which assures him that spring is really at hand, is a tree full of blackbirds, all facing the same way and each one singing at the top of its voice. These are rusty blackbirds.... In their migration they are seen in immense numbers, especially in the Mississippi Valley.*

And the following quote from Ernest Thompson Seton, intrepid naturalist of the Manitoba wilderness, is my favorite of this genre:

*An enormously abundant migrant.... The thousands of Grackles have been increased to tens of thousands. They blacken the fields and cloud the air. The bare trees on which they alight are foliated by them. Their incessant jingling songs drown the music of the Meadow Larks and produce a dreamy, far-away-effect, as of myriads of distant sleigh bells.*

Rusty blackbirds may not have been as abundant as passenger pigeons (*Ectopistes migratorius*), immense flocks of which darkened the skies for hours on end, but it does appear that the birds' numbers aren't what they used to be. Given a breeding distribution that stretches from Maine to the tree line in Alaska, the species would appear on a map to be widespread and abundant.

However, the historical record suggests a catastrophic decline in numbers, a record all the more sobering because American history is replete with once-abundant birds that suffered catastrophic declines, some all the way to extinction.

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### The Science of Decline

However compelling and poetic the accounts of naturalists of the past, conservation biologists are hard scientists who demand hard data—quantitative estimates, trend lines, population projections—to ensure that an apparent decline is real. Fortunately, although rusty blackbird populations are difficult to survey, two broad-scale survey programs and several more local studies provide a paint-by-numbers picture of the last few gloomy decades of the rusty blackbird's history.

More than 40 years ago, visionary ornithologist Chandler Robbins and his colleagues at the Patuxent Wildlife Research Center (now part of the U.S. Geological Survey or USGS) established the continent-wide Breeding Bird Survey (BBS), which organizes volunteers to survey birds along some 3,000 miles of secondary roads each summer. Because there are few roads and even fewer birders in much of the rusty blackbird's summer range, the BBS data on this species are spotty and meager. Population trend estimates are based on fewer than 100 routes scattered from Maine to Alaska. Still, USGS and Canadian Wildlife Service (CWS) statisticians show a robust decline



Rusty blackbirds (*Euphagus carolinus*) might be spotted in shallow swamp waters, poking through the muck for their meals, or perched on trees.



About a century ago, massive flocks of migrating rusty blackbirds darkened the skies, but now birders rarely see such impressive sights.

in rusty numbers that surpasses almost all other North American birds in the steepness of its descent. The 40-year trend for the species is phenomenally depressing: 12 percent per year, or a whopping total decline of more than 97 percent over four decades.

The wintering ground, located largely in the southeastern United States, is mostly accessible, making annual winter counts there much more complete, thanks in part to one of the greatest events on the bird-watching calendar for the past 50 years—the Christmas Bird Count (CBC). Birders participating in a CBC record all the feathered creatures they encounter in one day within a 15-mile-diameter circle. The rusty blackbird's winter range is dotted with more than 1,600 "count circles" within which the birds' relative abundance has been reported over the past 40 years. National Audubon Society ornithologist Daniel Niven, working with John Sauer at the Patuxent Wildlife Research Center, has kept tabs on the CBC numbers for the rusty blackbird. The story is clear: The estimated annual decline is 4.5 percent per year, or an 85 percent decline over the past four decades.

Finally, rusty blackbirds have not only declined in numbers but appear to have disappeared from significant portions of their former breeding range. Experiencing this myself is what captured my interest in the species. In the mid-1990s, I was comparing the ecology of boreal forest birds in Russia with those in Canada. My field teams and I spent two summers surveying and recording foraging information on birds in the southern portion of the Northwest Territories and the boreal zone of Ontario. Despite accumulating a very complete species list for the region, we failed to see any rusty blackbirds in the Northwest Territories. We found just one pair in Ontario. I found this frustrating and embarrassing because earlier regional accounts described the bird as reasonably common.

Since then, however, the CWS has conducted far more comprehensive bird surveys in nearby Alberta and Saskatchewan with a similar result: a handful of sightings among thousands of systematic point surveys scattered throughout the boreal zone. Other surveys in Maine and other northern U.S. states and in the Maritime

Provinces of Canada also recently revealed that rusties have disappeared from parts of their former range. The only good news is that similar surveys in western Canada and in northern Ontario have failed to find any signs of decline in these far north regions.

### Slow Response but Picking Up Speed

Despite its near-catastrophic magnitude, ornithologists and conservationists were a bit slow in recognizing and reacting to the rusty blackbird free fall. In 1999, USGS scientist Sam Droege and I published a paper in *Conservation Biology* that outlined the evidence of the species' demise. But it would be at least six years before a comprehensive effort would be mounted to understand what was going on with this bird.

The reasons for the delay are simple. The species is pretty obscure and, until recently, birders probably didn't think much about them. More important, the rusty blackbird is a blackbird, related to species such as the red-winged blackbird (*Agelaius phoeniceus*) that benefit from human development and take full advantage of the fruits of

American agriculture. In fact, as a group, blackbirds are often legally classified as pest species and subject to control efforts. For example, as part of a U.S. Department of Agriculture (USDA)-APHIS control program, surfactants, which destroy the insulating ability of feathers, were sprayed on 83 wintering multispecies roosts in three states between 1974 and 1992, freezing to death more than ten million blackbirds. These included an estimated 100,000 rusties, even though rusty blackbirds are not pests, but primarily insect-eaters and feed on grain only on occasion. Although blackbird control at such a grand scale is no longer practiced, rusties often roost with other blackbirds and get caught up in the slaughter. So, given that rusty blackbirds are just another blackbird and that blackbirds are perceived as, at best, very successful around humans and, at worst, as economic pests, it was hard to imagine that this particular species could be in trouble.

Making up for lost time, conservation biologists now pay a lot of attention to the rusty decline. In 2005, a team of more than 20 Canadian and U.S. scientists formed the

International Rusty Blackbird Technical Working Group (IRBTWG), which spawned research and monitoring projects in Alaska, the southeastern United States, New England, and Canada.

The group's research has taken flight in the last two years. Winter work, conducted primarily in the Lower Mississippi Alluvial Valley (LMAV), but soon to expand to the Carolinas, has focused on banding and radiotracking birds in different habitats. Using these techniques, Claudia Mettke-Hofmann, a biologist from John Moores University in Liverpool and a Smithsonian National Zoo research associate, and her colleagues have found that rusties feeding in more disturbed habitats join enormous mixed blackbird roosts in cities, where they are subject to control efforts and harassment, whereas forest birds spend the night in small country roosts in old fields. Other scientists are developing statistically sound ways to monitor populations and are attempting to tie population declines to land-use changes in the region.

Studies are also well underway at the extreme edges of the breeding grounds,

where studies of habitat use and nesting outcomes reveal surprisingly high levels of nesting success, suggesting that reproductive failure may not be playing a role in the decline. In another effort, scientists mapped the migratory paths of rusty blackbirds and discovered that rusty blackbirds use two distinct flyways: Birds wintering in the LMAV come from western Canada and Alaska and birds found in the Atlantic Coastal Plain originate in eastern Canada or the northeastern United States.

### Why Are Rusties Disappearing?

To figure out how the rusty blackbird arrived at its current perilous state, we have to figure out what unique aspects of its ecology might make it vulnerable. Basically, despite their taxonomy, rusties are the un-blackbird. On the wintering grounds, they are ecological specialists. There, they seem to favor shallow, fluctuating surface water, beneath or surrounded by the forest canopy, where they forage in recently exposed mud and detritus. Think of them as forest shorebirds. They appear to like it

best when this muck and mire warms up, perhaps explaining their slow drift to the south as winter progresses.

As an alternative to invertebrates, they also feed on the tiny acorn mast, or tree nuts, that accumulate on the ground beneath water-loving oaks such as the willow oak (*Quercus phellos*). The mast may provide sustenance when conditions aren't right for searching for insects and small fish in vernal pools.

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A taste for tree nuts also leads rusties to the most important agricultural crop in the LMAV, farmed pecan trees. Mettke-Hofmann found that dominant individuals in prime condition, mostly adult males, feed on pecan scraps left after common grackles (*Quiscalus quiscula*) process the large, tough nuts.

Thinking about habitat from the blackbird perspective, not only has at least 75 percent of the bottomland hardwoods in the southeastern United States been converted to agriculture and other land uses, but the flood waters of rivers and creeks—whose ebbs and flows create the ephemeral wetlands the species seems to crave—have been tamed. For example, about 90 percent of the mighty Mississippi's floodplain is now bound and controlled by levees, where the soils may have too much or too little water and fluctuations are dampened.

Then there are the boreal breeding grounds. Because of the boreal forest's vastness and inaccessibility, conservationists until recently were not too concerned about it. But that is changing. For instance, a new Boreal Songbird Initiative is examining the impact of increasing development, as well as global climate

change and environmental pollutants, on the birds of this anything-but-pristine region. It is particularly disturbing that other boreal wetland species, from sandpipers to ducks, are in decline.

Rusty blackbirds breed in a variety of boreal wetlands and depend upon aquatic macroinvertebrates, such as dragonfly larvae, to feed themselves and their young. Changes in the ecology of these macroinvertebrates often indicate ecological

disturbance. For example, an increase in subarctic temperatures has led to wetlands drying up and permafrost melting in boreal wetlands. Evidence suggests that this causes a major shift from a system in which aquatic plants are grazed by macroinvertebrates to one in which plankton—tiny floating plants and animals—dominates. Such a change in the food chain could easily affect the ability of rusty blackbirds to grow and fatten their young. Robin Corcoran of the U.S. Fish and Wildlife Service has already documented detrimental effects of this change on boreal-breeding ducks.

Finally, rusty blackbirds often breed in peat wetlands, which are particularly sensitive to acid rain. Mercury is another industrial pollutant that is carried through the atmosphere and deposited in the boreal wetlands, particularly in eastern Canada and New England. Mercury is very toxic to birds (and people) and appears to accumulate high sub-lethal doses in rusty blackbirds and other invertebrate foragers in these systems, according to recent research by David Evers at the Biodiversity Institute in Maine.

Winter habitat loss and degradation, as well as climate change, environmental

pollutants on the breeding grounds, and the effects of past blackbird-control efforts are among the possible reasons for the decline of the rusty blackbird. People in the know have proposed other plausible causes. When a species declines so precipitously and you don't know why, anything is possible. And it may be like Agatha Christie's *Murder on the Orient Express*, in which all of the suspects did it.

### First Steps

Clearly, much more research is needed. In terms of acquiring basic knowledge of the birds, we've been trying to accelerate from virtually zero to sixty in no time flat. Furthermore, all of the hypotheses to account for the rusties' decline must be crafted into specific predictions and rigorously tested, a process that has just begun. However, as practical-minded conservationists faced with a crisis, we can also take some common-sense management actions based on what we already know.

The clearest area for action is management and recovery of the bird's winter habitat. The protection of bottomland hardwood habitats is a very hot conservation topic, thanks in part to the buzz around

ivory-billed woodpecker (*Campephilus principalis*) habitat recovery plans. But simple protection of bottomland hardwoods alone might not do it. Habitat needs to be restored and improved.

Much of the remaining hardwood forests on some of the wettest agricultural lands in the LMAV was cut down and replaced with soy bean farms in the 1970s. But the recent collapse of soy bean prices has led to concerted efforts to replant these forests. Research on how to enhance recovery areas with willow oaks and other mast species that will support blackbird populations should be an immediate management objective.

Finally, water levels in the very same impoundments that tamed the natural, ephemeral flooding of southern rivers and creeks could be drawn down so they are low and fluctuating during critical parts of the winter, and thus managed for rusty blackbirds and other wildlife that take advantage of this highly productive system. Of course, some of the threats haunting blackbirds—such as airborne contaminants, acid rain, and global warming—require major societal solutions that go well beyond the management of a particular species or even ecosystem.

### Fear of the Unfamiliar?

I often think about what accounts for winners and losers in rapidly changing human-dominated landscapes. It is entirely possible that the way that specialized species, such as rusty blackbirds, approach the world psychologically differs fundamentally from that of more ecologically adaptable species, such as most other blackbirds. Mettke-Hofmann ran some fascinating field experiments to see if blackbird species differed in neophobia, or their fear of novelty. By placing novel objects next to feeding stations, she showed that, of all the blackbirds she tested, rusty blackbirds are the most fearful of feeding near unfamiliar objects. In a practical way, these results explain why it has proven so tricky to catch and, hence, study the birds: They are wary of any new additions to their environment, such as traps or mist net poles, in a way that other blackbirds are not. But from an ecological perspective, the results may also provide insight into a species that is simply more mentally conservative than its relatives and less able to cope with rapidly changing habitats.

With these thoughts in mind, it is with some irony that I close with the story of where I acquired my life-list rusty black-

bird. I found it while birding with my family on a crisp November day almost 30 years ago, at the alkaline pool of Saratoga Springs at the southern tip of Death Valley, California. Many migratory birds occur as vagrants outside their normal range—even the declining rusty blackbird. I was fascinated to watch a species, so typical of the wettest habitats in North America, busily foraging in a desert that receives less than two inches of rain per year. Without apparent fear of its alien surroundings, the lost blackbird was hunting endangered desert pupfish (*Cyprinodon macularius*) in the shallows, just as it would fish for minnows in a swamp. At the time, I felt sorry for the threatened fish population being depredated by a blackbird, of all things. But looking back, I understand I was watching two casualties in the battle between biodiversity and human development—a fact that took me two decades to figure out. Z

—Russell Greenberg is head of the Smithsonian Migratory Bird Center at the National Zoo and a founding member of the International Rusty Blackbird Technical Working Group. Go to <http://nationalzoo.si.edu/goto/RustyBlackbird.htm> to learn how you can help.

**Some studies show that rusty blackbirds act fearful of new environments. Habitat recovery is crucial to their survival.**

