Cones, squirrels, and rusty blackbird nests

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Nesting Rusty Blackbirds like this one face a variety of threats. Credit: S. Buckley Luepold

The bird that's experienced the steepest population declines in North America in recent decades is also one that few people have heard of: the

Rusty Blackbird. Rusty Blackbird (*Euphagus carolinus*) populations have decreased by about 95% in the last fifty years, but the reasons are not well understood; it doesn't help that their preferred breeding habitat, stunted conifers deep in the wetlands of the boreal forest, makes finding and studying them difficult.

New research in *The Condor: Ornithological Applications* aims to disentangle some of the interacting factors that may be responsible for the decline. Shannon Buckley Luepold of the SUNY College of Environmental Science and Forestry and her colleagues spent two years collecting data on Rusty Blackbirds nests and their surrounding habitat in Maine and New Hampshire, and uncovered a web of connections between timber harvesting practices, spruce and fir cones, red squirrels, and Rusty Blackbird nesting success.

In the breeding seasons of 2011 and 2012, Buckley Luepold and her co-authors were able to locate 72 Rusty Blackbird nests and install motion-triggered, infrared cameras to watch for predators at 29 of them. Enduring swarms of biting black flies, numerous flat tires, and even a night spent stranded in the woods with a broken ATV, they also collected a variety of data on habitats where the birds nested, including vegetation density, spruce and fir cone production, and red squirrel abundance. After abundant cone production in 2011, squirrel numbers increased significantly in 2012, which is when nest survival was lower and when all of the observed red squirrel predation on eggs and nestlings occurred. A big year for cone production leads to a big year for the squirrels that eat them. This is bad news for Rusty Blackbirds, as their eggs are also on the squirrels' menu.

"What we found was that red squirrels were indeed the most frequent predators of Rusty Blackbird nests, at least in Maine," explains Buckley Luepold. "However, all of the red squirrel predation we observed occurred in the summer of 2012, following an abundant spruce-fir cone

crop in 2011. Our results suggest that nest predation rates in Rusty Blackbirds may be driven more by ecological processes such as masting (years of higher-than-normal cone production), rather than timber harvesting, which we found not to be a strong predictor of nest survival. That said, we also found that dense vegetation was the most important predictor of nest survival, so harvest practices that reduce density of young trees, such as pre-commercial thinning, could potentially be detrimental," says Buckley Luepold. In addition to red squirrels, cameras also caught a hawk, a Blue Jay, and even a white-tailed deer preying on Rusty Blackbird nests.

This camera trap image shows a red squirrel raiding a Rusty Blackbird nest and eating an egg. Credit: S. Buckley Luepold

"Buckley Luepold et al.'s study elegantly chips away at the mystery surrounding what is limiting populations of Rusty Blackbirds, North America's fastest declining songbird," says Luke Powell of the Smithsonian Migratory Bird Center, who first suggested the possibility of a link between cone production, squirrels, and blackbird nest success. "Thanks to their work, we now know that red squirrels are the most frequent predators of Rusty Blackbird nests, and that understanding the complex relationship between red squirrels, cone cycles, and the pre-commercial thinning of softwoods near wetlands may be the key to maximizing next success."

More information: "Habitat selection, nest survival, and nest predators of Rusty Blackbirds in northern New England, USA" will be available on October 7, 2015 at www.aoucospubs.org/toc/cond/117/4.

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