

# They Went That-a-Way

Traditional thinking holds that bird migration began as a south-to-north movement. Maybe we've got that backwards

By Jay Ingram

is how it has been built: by individuals who share Rathwell's vision and joined his effort, one charger at a time. Sun Country Highway provides the chargers—sometimes for free, sometimes at fee for installation, sometimes through sponsorships—to whoever wants them, be they restaurants, hotels, parking lots, retail stores, even gas stations. It's then up to the owners of the charging stations to decide how to use them. Some may offer the service to customers, others may give it away because, well, there's a lot to like about electric cars.

For Rathwell, grassroots development of the network has been critical to its success. Had the job been left to top-down government management, as infrastructure projects usually are, development would have been larger, slower and more complicated. With a bottom-up approach, the network has instead grown organically and proved itself. Thus, future investment, public or private, can be more nimble, targeted and likely to succeed.

More important, though, the highway breaks through a major challenge in the broader adoption of electric vehicles. Electric vehicles "have always been around in one shape or form, but not to a big degree," Rathwell says. "Why would anyone build an electric vehicle if there were no place to charge them? And why would you put chargers out there if there were no electric vehicles? Somebody had to blink."

And so, Rathwell and his group blinked, and continue to do so. The Sun Country Highway—celebrated in 2013 and 2014 with the cross-country E-Mazing Race events—is expanding rapidly, and Rathwell is developing business plans to make its ongoing work economically self-sustaining.

As for the network itself, it is making inroads in the U.S., especially along the Pacific Coast. In November, Sun Country also announced a partnership to bring its model to Iceland.

For Rathwell, that's all good news for the future of electric transportation. More importantly, though, he sees it as a message of hope. "This was built out by average people, small business and families," he says. "If average people can do this, what else can they do?" 🐾



## WHERE DOES THE JOURNEY START?

*New research in bird genetics is turning the story of migration on its head—at least in many cases.*

**AT** this time of year, three-quarters of all the birds we see in Canada are still hunkered down in their southern overwintering habitats, not yet feeling the hormonal surge that will trigger the northward leg of their migration. But migrate they will, and soon.

We're familiar with the tales of their incredible migratory feats, but what about this question: why did migration start?

We have all kinds of birds that don't bother flying south and they manage quite well. In fact, the 2012 report *The State of Canada's Birds* made it clear that year-round residents are doing better than the migrants. And of course there are plenty of tropical birds that never come north either, so why bother?

Food supply is the No. 1 factor. Fruit, nectar and insect eaters can't make a living in Canada in the winter and so are forced to go where they can. In 1904, Percy A. Taverner, an architect

#### GOING MY WAY?

*New research may help explain why species like starlings are both migratory and sedentary*



#### FACT FILE

## Amazing Journeys

- Arctic terns fly 80,000 kilometres annually during migrations between Arctic and Antarctic habitats.
- Some three billion land birds migrate to Canada's boreal forest each spring.
- Hawks, swifts and waterfowl tend to migrate during the day. Songbirds travel at night.
- Migratory birds tend to have longer, more aerodynamic wings than non-migrators.

and the first ornithologist at the then National Museum of Canada, analyzed migration by beginning with the food issue, but then asked the next question: having embraced the good life in the bountiful tropics, why would birds ever bother to fly north again? Because there are food issues in the south, too. He painted a picture of an overpopulated tropical region incapable of supporting the resident birds plus all the migrants from Canada, especially when breeding began in the spring.

Taverner imagined a slow, gradual expansion of home ranges out of the tropics, prompted by local food pressures—perhaps only a kilometre or so at a time, but eventually leading to species genetically obliged to make two-way journeys.

This “out-of-the tropics” notion has been behind most of the speculation about migration’s origins ever since, albeit with much additional detail.

So for instance: 50 per cent of migrants are closely related to, if not identical with, species that live year-round in the tropics. (Long-lost cousins?) Not only that: those resident species, which include kingbirds, tanagers and thrushes, also indulge in what you might call “migration lite,” moving up the sides of mountains, or cross-country, as fruiting and flowering plants bloom then recede. It seems but a short step to extend such wandering in a purposeful, northward direction.

However, nothing is completely clear-cut. This resident wandering that might be a prelude to all-out migration doesn’t include all birds—insect eaters in the leafy understorey aren’t under the same pressure; their food is available year-round, so they don’t move.

And more: there was a long-held belief that migrants were, at best, subordinate to resident birds in the tropics, flitting here and there and grabbing what they could in marginal habitats. But this observation is also uncertain: migrants are found everywhere, although numbers vary. Some species go so far as to establish a territory in the tropics and even return to it the following year.

Why am I raising these uncertainties? Because there’s another possibility: migrating birds could have originated in the north and established southward migration to ensure adequate food. If that’s true, then the northward leg of their migration is a return home.

If that’s the case, then Taverner’s idea of an overcrowded tropics prompting return flights isn’t needed. Maybe birds return because they can lay bigger egg clutches in temperate zones. Well, yes they do, but survival is reduced too, so those two factors balance each other.

So what is the evidence for this possibility that migrants might originally have been northern species? A recent paper in the *Proceedings of the National Academy of Sciences* combined elegant and elaborate genetics with tons of computation and claimed, by tracing hundreds of species histories, that twice as many groups of migrants originated in the north than the tropics. The paper added that some major lineages of sedentary tropical birds have descended from northern ancestors.

While the study was touted as showing that migration started in the tropics, the ratio of tropical-to-northern origins suggests it has gone both ways.

One scenario I like is that every bird has some migration tendency in it, but often it is below a critical threshold. Birds will slowly disperse and extend ranges in order to maintain adequate diets. If the new areas are sufficient in resources, they will stay. Otherwise, they resort to their migratory toolkit and move on. This helps make sense of the fact that many species, including starlings and the Canada Goose, are neither strictly migratory nor sedentary.

So 110 years after Taverner, we still don’t have a definitive answer. Add the other mysteries of migration—the magical navigational abilities, the mind-boggling metabolic feats, the complexity of the genetics that underlies the ability of first-year birds to find their way to their tropical locale—and you wonder when we will understand it all. 🌐