

by Paul Hess

Mourning × MacGillivray's Warblers

Do Mourning Warblers and MacGillivray's Warblers interbreed? If so, to what extent? Satisfactory evidence has eluded ornithologists for nearly a century. Now, a study using DNA analysis demonstrates for the first time that the two do hybridize, perhaps extensively, in at least one area. Individual birds in the Peace River region of northeastern British Columbia have genetic characteristics of both species.

Darren E. Irwin, Alan Brelsford, David P. L. Toews, Christie MacDonald, and Mark Phinney announced the findings in 2009 (*Journal of Avian Biology* 40:539–552). They focused on that region because Phinney had observed both species there for many years.

Uncertainty has plagued past studies for several reasons. Locations of contact between the two are not well known. Plumage characters possibly indicating hybrids are complicated by variations within each species. Slight overlaps occur in measurements that generally separate the two.

Adverbs such as “possibly,” “apparently,” and “probably” have filled the literature ever since Canada's eminent ornithologist P. A. Taverner said in 1919 that he would “almost

unhesitatingly” call one mated pair he found in Alberta a male Mourning and a female MacGillivray's (*Auk* 36:248–265). After extensive research into morphological variation within each species, a doubting Jay Pitocchelli wrote in 1990, “Intermediate individuals simply fall within the normal range of variability for each taxon” (*Auk* 107:161–171). Jon Dunn and Kimball Garrett comment in their *Field Guide to Warblers of North America*, “Most purported hybrids may be variant Mournings.”

Irwin and his colleagues have taken an essential step forward by comparing genetic patterns between contact-zone birds and birds from east and west where both species do not occur together. They analyzed two molecular markers, one involving mitochondrial DNA (mtDNA) inherited only from mothers and the other involving nuclear DNA from both parents via the sex-linked “Z-chromosome.” Where the species overlap, 18 of the 50 individuals sampled had a mixture of Mourning and MacGillivray's markers. Only one of 19 birds sampled from east and west of the zone had such a mixture.

The analysis also included two of the morphological features that typically distinguish the species from each other: prominent, faint, or no eye-arcs; and measurements of wing length minus tail length. Some birds in the zone showed combinations of these characters that are not

typical of either species away from the area of contact. Additionally, seemingly contradictory genotypic and phenotypic combi-



Chetwynd, British Columbia; June 2008. © Darren E. Irwin.

Morphologically, the bird at left is a **MacGillivray's Warbler**, and the bird at right is a **Mourning Warbler**—but researchers in British Columbia recently found that each of these individuals had genetic characters of the other species.



Chetwynd, British Columbia; June 2008. © Darren E. Irwin.

nations appeared: Some birds with mtDNA and nuclear genotypes of MacGillivray's had wing-tail morphometrics characteristic of Mourning Warbler; others with mtDNA and nuclear genotypes of Mourning had strong eye-arcs characteristic of MacGillivray's Warbler.

The morphological "cline"—a geographic transition between the two species' characters across the contact zone—is concordant with the genetic cline, and the hybrid zone is estimated as 150 kilometers wide, centered 86 kilometers east of the crest of the Rocky Mountains.

Although the Irwin team considers its findings to be "clear evidence of hybridization," they do not suggest merging Mourning and MacGillivray's as a single species. The hybrid zone is quite narrow compared to the two species' entire geographic ranges, and there is little evidence that hybridization extends beyond it.

This is also the region where Toews and Irwin recently discovered that western and eastern Winter Wren subspecies occur together but do not interbreed. Toews and Irwin recommend separating the wrens into two species (see *Birding*, March 2010, pp. 26–27).

Plastic Tragedy on the Seas

Cigarette lighters, bottle caps, pens, small tubes, buttons, fasteners, fishing paraphernalia, toys, thousands of unidentifiable shards. They were cast-off plastics, they were floating on the Pacific Ocean, and they were deadly. Stuffed in the decomposed stomachs of Laysan Albatross chicks on Midway Atoll, they emerge now in a gruesome gallery of photographs by Chris Jordan of Seattle <<http://tinyurl.com/ygkqdm6>>. His images speak with stark eloquence beyond words.

Some ABA members are aware of the "Great Pacific Garbage Patch," an immense aggregation of junk trapped in a gyre that spans much of the North Pacific, spawned perpetually by winds and the Earth's rotation. The gyre is located where Laysan Albatrosses have known for millions of years that they will find good food for their offspring. Now, they gulp down the plastic along with the food, soar back to Midway, and regurgitate the ghastly mess to their chicks. The outcomes of a stomach full of plastic may include starvation, suppressed appetite, digestive obstruction, dehydration, defective thermoregulation, and potential poisoning by contaminants.

Carl Safina describes the scene graphically and at length in *Eye of the Albatross: Visions of Hope and Survival* (Holt, 2003),



Plastics that once floated on the Pacific Ocean fill the stomach cavity of this decaying **Laysan Albatross** chick. The parents picked up the debris and fed it to the fledgling as if the trash were food. Photographer Chris Jordan emphasizes that he did not alter the grim scene in any way. *Midway Atoll; October 2009.* © Chris Jordan—courtesy of Kopeikin Gallery.

calling the plastics "technicolor tombstones." For the present article, he laments, "I've been to Midway, Laysan, and French Frigate Shoals and have seen first-hand how the albatrosses' lives are now literally enmeshed in our plastic waste stream—the dead chicks decayed, their ribs packed with plastic."

Despite the death toll, which is unknown, no evidence points to a population collapse. A status assessment by the U.S. Geological Survey in 2009 <<http://tinyurl.com/yjtjpo0>> includes an estimate of 600,000 breeding pairs, more than 90% of them nesting on Midway Atoll, Laysan Island, and French Frigate Shoals. Various sources estimate the total population, including nonbreeding subadults, as high as 2.5 million individuals.

But scientists are wondering how long it will be until a catastrophe occurs. Chandler S. Robbins, who banded Laysans at Midway in the 1950s, recalls seeing plastic bottle caps washed up on beaches even that long ago. Now, he tells ABA members: "I am afraid this has become a worldwide problem and that all the albatross species are being affected. Studies are showing that other seabird species are being affected as well. The problem is bound to get worse before we find a solution."

Worldwide indeed. Ocean-borne plastic is being surveyed extensively in 2010 in the Atlantic and South Pacific as well. Two surveys reported in 2009 document discoveries of ubiquitous plastics in birds off southern Brazil. Fernanda Colabuono and coauthors found plastic in eight tubenose

species, including albatrosses, Southern Fulmar (*Fulmarus glacialisoides*), petrels, and shearwaters (*Marine Pollution Bulletin* 58:93–96). Edison Barbieri found plastic in ten species, including prions (*Brazilian Archives of Biology and Technology* 52:341–348).

Many nonprofit organizations, educational institutions, and government agencies are studying plastic pollution. Their research indicates that seabirds are not the only creatures in harm's way. Bits of micro-plastic are being eaten by many species of marine life, including fish, filter-feeding invertebrates, and perhaps even the zooplankton that crucially underpins the marine food chain.

A News and Notes WebExtra <aba.org/birding/v42n3p32w1.pdf> describes some of the scientific projects and points to their websites. See especially the fusions of hard science and heartfelt commentary in daily blogs written at sea by participants in the “SEAPLEX,” “Kaisei,” and “5 Gyres” cruises.

Bachman's Warbler—or Not?

The last Bachman's Warbler documented with photographs—a female in Florida on 30 March 1977—was evidently not a Bachman's Warbler after all. In August 2009 the Florida Ornithological Society Records Committee (FOSRC) overturned the record, deciding that it was more likely a “Golden” Yellow Warbler of the subspecies *gundlachi*.

The warbler was studied by three observers at Lake Washington near Melbourne in Brevard County. FOSRC accepted the record in 1985 based on a detailed description, five photographs, and opinions of five ornithologists. Robert D. Barber, who discovered it, summarized the documentation in a 1985 article (*Florida Field Naturalist* 13:64–66).

More recently, other experts have been skeptical, most notably Jon Dunn and Kimball Garrett, who comment in their *Field Guide to Warblers of North America* that the identification is “possibly correct, but the photos are not definitive.” They believe the bird represented *gundlachi*, which breeds in southernmost Florida, Cuba, and the Isle of Pines. The ornithologists who were initially consulted had contrasted the bird with at least five other species, but not with Yellow Warbler.

In light of the doubts, FOSRC reopened the record. Comparing photographs of *gundlachi* specimens and the Florida bird, the committee saw features of the Florida bird that were consistent with *gundlachi* but not with Bachman's. These involved edgings on the primaries, tertials, and wing coverts, apparent molt on the wing coverts, and color patterns on the rectrices. The committee voted 6–1 against Bachman's; the dissenter believed that all the specimens available for the original decision



The Florida Ornithological Society Records Committee had to judge a potential rarity from images such as this one. Was it a Bachman's Warbler, as first accepted in 1985, or was it merely a “Golden” Yellow Warbler? The present committee decided that it was more likely the latter. *Brevard County, Florida; March 1977.* © Robert D. Barber–VIREO.

should be viewed again. Secretary Andy Kratter will summarize the long history of deliberations in FOSRC's 19th Report, which will be published in *Florida Field Naturalist* in 2010.

The last undisputed record of Bachman's Warbler remains a multiple-observer sighting near I'On Swamp in South Carolina in the spring of 1962. Two sightings in South Carolina and one in Louisiana in 1977 and 1978 sparked articles in *Birding* (December 1979, pp. 245–250) collected under the headline “Bachman's Warbler: ABA's Most-Wanted Bird.” The introduction lamented, “Unfortunately, none of these reports were verified by either a photograph, tape-recording, or a substantial number of observers.”

Reports continued during the 1980s and 1990s in several states and Cuba, but extensive searches subsequently were unsuccessful. Most recently, the U.S. Fish and Wildlife Service conducted the last systematic survey in 2002 at Congaree Swamp National Wildlife Refuge in South Carolina, after reports there in 2000–2001. Teams spent 166 person-hours searching 3,900 acres and found no Bachman's Warblers <<http://tinyurl.com/y862xj9>>. In a five-year status review under the Endangered Species Act in 2007, the Service recommended thorough investigation of all future reports but delisting the species if it is not detected before the next review <<http://tinyurl.com/ycyyo6x>>.

A few birders continue to seek Bachman's Warbler. Nathan

Dias, Executive Director of the Cape Romain Bird Observatory in South Carolina, is one. “I do not really expect to find any,” says Dias, “but I feel compelled to search just in case there are surviving birds that could benefit from the automatic funding, plus legal and habitat protections that would result from a documented bird. Until the late 1980s, when birding I’On Swamp Road, I used to see birders from all over the U.S. and beyond searching for Bachman’s Warbler. Not so much these days. Perhaps the Ivory-billed Woodpecker search caught everyone’s fancy, and they aimed their ‘rediscovery’ efforts in that direction.”

Cuckoo Parasitism Unfolds

Cuckoos’ diverse nesting strategies are a perennial evolutionary puzzle. One question is why some species are so-called “obligate brood parasites,” which lay eggs *only* in other birds’ nests, whereas others are “facultative brood parasites” that do so only occasionally. Darwin suggested in *On the Origin of Species* that the obligate behavior of his familiar European cuckoos evolved from an “ancient progenitor” that habitually built its own nest but used other birds’ nests occasionally.

Black-billed and Yellow-billed cuckoos employ the latter strategy, occasionally (perhaps sometimes commonly) laying eggs in one another’s nests and rarely also in nests of other species. Are these cuckoos moving on an evolutionary track toward obligate parasitism? Advancement from occasional (or facultative) to obligate behavior through natural selection would require some advantage in survival and productivity.

Darwin reasoned that parasitizing other nests eases the burden of cuckoos’ prolonged egg-laying period, when they must incubate eggs and feed hatchlings at the same time. Charles Bendire suggested in *Life Histories of North American Birds* in 1895 that laying in other species’ better-built nests might make up for loss of eggs from cuckoos’ “slovenly” constructed nests.

Extreme fluctuations in abundance, location, and timing of cuckoos’ favored prey have been proposed as another major factor favoring parasitism. Possible connections between parasitic behavior and high or low food availability have been explored by William J. Hamilton III and Gordon H. Orians in 1965 (*Condor* 67:361–382), Val Nolan Jr. and Charles F. Thompson in 1975 (*Ibis* 117:496–503), and Robert C. Fleischer and associates in 1985 (*Wilson Bulletin* 97:125–127).

On the other hand, North American cuckoos’ parasitism of birds outside their own genus could be a dead-end aberration, offering no advantage at all. Donald C. Dearborn and four colleagues suggest in a 2009 paper that Black-billed and Yellow-billed cuckoos’ parasitism of species other than themselves is exceedingly rare and perhaps simply a case of “mis-

taken identity” (*Behavioral Ecology* 20:517–524). In this hypothesis, the female accidentally mistakes the nest of an unsuitable songbird species for another cuckoo’s nest.

The authors base their evidence for rarity on a huge sample. They monitored 10,197 nests of 50 potential host species in Illinois, Missouri, and Pennsylvania between 1985 and 2004. These included 17 songbird species anecdotally reported as hosts in the past and six species that the authors experimentally determined would accept cuckoo eggs.

The results: Not a single nest was found parasitized by cuckoos, even though virtually all were located at sites where cuckoos were detected. Nor did any relation to feeding ecology appear; the authors found no parasitic egg-laying either amid large cicada and caterpillar outbreaks or in periods of low food abundance.

Dearborn and his associates note that even if rare parasitism outside the cuckoos’ genus is nothing more than mistaken identity, it could still be favored by natural selection and become more common. To evaluate that possibility, the authors envision an experimental test to compare hatching and fledging success of eggs and nestlings of conspecific nests vs. congeneric nests (of the other cuckoo species) vs. non-cuckoo nests. Such a test might tell us whether our North American cuckoos have embarked on an immensely long, slow Darwinian journey.



Old World cuckoos lay their eggs only in the nests of other species; however, **Black-billed Cuckoos** and Yellow-billed Cuckoos very rarely parasitize nests other than those of other cuckoos. A recent study suggests that the two North American species parasitize non-cuckoo nests simply by accident. *Scioto County, Ohio; May 2006.* © Robert Roysce.