by Paul Hess • Natrona Heights, Pennsylvania • phess@salsgiver.com

Bird's DNA Reveals a First State Record

If morphology is inconclusive, and if vocalizations and behavior are not known, how might a first state record be established? By DNA, for New Mexico's first Long-billed Murrelet.

The small alcid was discovered dead in a brine pool at a potash mine in southern Eddy County on 12 July 2009, preserved by salt in the water. A year later, Christopher C. Witt, Matthew S. Graus, and Hira A. Walker reported genetic evidence that established the identification and uncovered an intriguing biogeographical possibility (*Western Birds* 41:160–167).

The bird was tentatively identified as a Long-billed Murrelet, but morphological characters were not entirely consistent with either a Long-billed or any other alcid, including Marbled Murrelet. Several aspects of the underwing coverts, breast, and tail coloration were puzzling, and a combination of wing, tail, bill, and tarsus measurements was not diagnostic.

The specimen's mitochondrial DNA (mtDNA) sequence in the cytochrome-*b* gene was compared with sequences published for other alcids to assess its divergence from other taxa. Within the genus *Brachyramphus*, the New Mexico bird diverged 0.5% from previously reported Long-billed Murrelet sequences, 8.4% from Kittlitz's Murrelet, and 9.8% from Marbled Murrelet. Divergence was greater from birds in other alcid genera: 10.1% from *Cepphus* (guillemots), 11.5% from *Fratercula* (puffins), and 11.8% from *Synthliboramphus* (other murrelets). The specimen also grouped closely with Long-billed Murrelet in a phylogenetic analysis designed to indicate relative evolutionary relationships.

Asia's **Long-billed Murrelet** is similar enough to Marbled Murrelet that the two possibilities could not be distinguished by the morphological features of a dead bird found in New Mexico. DNA analysis determined that it was a Long-billed—the state's first record. *Dawlish, Devon, United Kingdom; November 2006. Photo by © Stuart Elsom–VIREO.*

An intriguing possibility arises from the slight divergence from sequences in Long-billed Murrelets collected at the Sea of Okhotsk in the Russian Far East. Witt and his colleagues suggest that this difference, along with the specimen's anomalous plumage and measurements, may reflect undescribed geographic variation within the species.

Genetic analysis has produced a variety of outcomes in evaluations of potential first records. Sometimes it confirms other factors in establishing an identification. For example, vocalizations as well as DNA recently documented Michigan's first record of Tropical Kingbird <tinyurl.com/29t5nj4>. Along with bill color, DNA was important in separating California's only Nazca Booby (*Sula granti*) from Masked Booby—although the species was placed on the state's supplemental list because the bird was a ship-assisted visitor riding a fishing boat into the U.S. from Mexican waters <tinyurl.com/2fmhq7q>.

Sometimes, as with Maryland's famous Kelp Gull <tinyurl.com/46ccpsh>, molecular analysis is unsuccessful for technical reasons, and acceptance is based on other characters. Sometimes DNA produces irony instead of identification, as happened in Great Britain with the first two supposed Brown Skuas (*Stercorarius antarcticus*) ever recorded in the North Atlantic; see *Birding*, December 2004, p.574 <tinyurl.com/2g3o7xv>. The authors retracted the published results when supplementary DNA evidence failed to confirm the species; see *Birding*, November/December 2007, p. 12.

And sometimes molecular analysis creates a puzzle, as in the case of a Maryland wood-pewee in the National Museum of Natural History. The specimen collected in 1967 is labeled as a Western Wood-Pewee but cannot be distinguished from Eastern Wood-Pewee by measurements. The Maryland/District of Columbia Records Committee asked researchers at the museum to attempt a genetic identification. Cytochrome-*b* analysis showed a relatively close relationship with Western Wood-Pewee specimens from California. Yet it also showed a sequence divergence of 3% from those specimens—a previously

unknown variation roughly equivalent to divergence between the two wood-pewee species. The records committee tells the complete story online <tinyurl.com/25ul7jv>.

Wood-warbler Phylogeny

Taxonomic revisions based on genetic data are comforting when they affirm traditional beliefs and jarring when they do not. A major revision within the wood-warbler family Parulidae published in 2010 triggers both responses.

Irby J. Lovette at the Cornell Lab of Ornithology and 11 colleagues from the U.S., Central America, and South America have produced the most comprehensive genetically based family tree yet attempted for the New World warblers (*Molecular Phylogenetics and Evolution* 57:753–770). Using a large suite of mitochondrial and nuclear DNA sequences, the study reveals evolutionary relationships among 107 North American, Middle American, Caribbean, and South American species.

The authors regard these species as members of a "core Parulidae" defined by Lovette and Eldridge Bermingham in 2002 (*Auk* 119:695–714) as a monophyletic group separate from all other songbirds. Not included are Olive Warbler and Yellow-breasted Chat, which a number of previous analyses have placed outside the parulid "core."

The 107 species are reclassified into 14 genera, each genus representing a phylogenetic clade—an evolutionarily distinct group whose members are more closely related to one another than to any other birds.

In a taxonomic order reflecting the new findings, the genera are *Seiurus*, *Helmitheros*, *Mniotilta*, *Limnothlypis*, *Protonotaria*, *Parkesia*, *Vermivora*, *Oreothlypis*, *Geothlypis*, *Setophaga*, *Myioborus*, *Cardellina*, *Basileuterus*, and *Myiothlypis*. The Ovenbird, now alone in the genus *Seiurus*, is separated as an "outgroup" anciently divergent from the lineage that led to all other wood-warblers. All of those genera except *Myiothlypis* are represented in the *ABA Checklist*.

Conspicuously absent are our long-familiar genus names *Parula*, *Dendroica*, *Oporornis*, and *Wilsonia*. These are subsumed under other names assigned to the reorganized genera by rules of priority in scientific nomenclature.

A particularly fascinating case involves *Dendroica*, currently the largest ABA area genus of parulids, whose list spans 21 species from Yellow Warbler to Cerulean Warbler. In the new phylogeny, its clade includes Northern Parula, Tropical Parula, American Redstart—and, amazingly, Hooded Warbler. All of those are united in *Setophaga*, which is named by priority for the American Redstart's genus. Surprisingly, the Hooded Warbler is genetically nested well within this group, far divergent from its traditional companions in the genus *Wilsonia*, the Wilson's

Galveston County, Texas; April 2003. Photo by © Brian E. Small.

Galveston County, Texas; April 2010. Photo by © Brian E. Small.

In a recent phylogenetic study of the wood-warbler family, one analytical method produced the surprising result that the **American Redstart** (right) and **Hooded Warbler** (above) are "sister species," more closely related to each other than to any other species.

Warbler and the Canada Warbler.

What of *Wilsonia*? The new system places Wilson's and Canada together with Red-faced Warbler, Red Warbler (*Ergaticus ruber*) of Mexico, and Pink-headed Warbler (*E. versicolor*) of southern Mexico and Guatemala. These species—some yellow, some red—are placed in *Cardellina*, named by priority for the Red-faced Warbler's genus.

And whither *Oporornis*? Its Kentucky, Connecticut, Mourning, and MacGillivray's warblers are placed in a revised genus *Geothlypis* together with Common Yellowthroat, Gray-crowned Yellowthroat, and seven other yellowthroat species in Mexico, Middle America, and The Bahamas. In mind-boggling fashion, the clade also includes Semper's Warbler (*Leucopeza semperi*), a probably extinct endemic on the island of St. Lucia in the Lesser Antilles. Entirely dull grayish and whitish, it is apparently the sister species of Connecticut Warbler!

Those changes are the major surprises primarily involving ABA Area species. The new phylogeny retains all other *ABA Checklist* parulids in their currently recognized genera, which include revisions adopted in 2010 in the 51st Supplement to the American Ornithologists' Union (AOU) *Check-list of North American Birds*. These revisions classify Ovenbird in the monotypic genus *Seiurus*, place the two waterthrushes in the new genus *Parkesia*, and resurrect a genus named *Oreothlypis* comprising Tennessee, Orange-crowned, Nashville, Virginia's, Colima, and Lucy's warblers, which are moved from *Vermivora*, and Flame-throated Warbler and Crescent-chested Warbler, which are moved from *Parula*.

A study of adult **Glaucous Gull** diets at nesting colonies in Alaska showed a positive correlation between reproductive success and the proportion of garbage in parents' diets: the more garbage, the more young were fledged. *Homer, Alaska; March 2008. Photo by © Rick Bowers.*

Lovette and his colleagues emphasize that the new phylogeny is hypothetical and awaits further study, but they believe their basic conclusions about ecological and evolutionary variations within the core Parulidae are strongly supported by the data. Lovette plans to propose the revisions formally to AOU classification committees for North and Middle America and for South America.

A WebExtra to this "News and Notes" column contains additional commentary by Lovette in response to questions from other ornithologists about his suggested nomenclature for the genera. Also included is one of several phylogenetic trees produced by the authors to illustrate their interpretations of wood-warblers' evolutionary lineages and relationships.

Gulls and Garbage

For Glaucous Gulls, garbage dumps may mean more than an easy meal. A recent study on Alaska's arctic coastal plain suggests that a diet high in proportion of garbage to natural food may also offer a breeding advantage.

Emily L. Weiser and Abby N. Powell at the University of Alaska compared Glaucous Gulls' diets and reproductive rates at colonies in four areas in 2008 and 2009. Availability of garbage differed among sites: dumped into landfills at Deadhorse/Prudhoe Bay, incinerated before disposal at Barrow and at Alpine Oilfield, and not present at Simpson. Dietary proportions were determined by contents of adults' disgorged pellets and remains of food around nests. At the same nests, the authors monitored gulls' reproductive rate—the number of young fledged per pair.

After statistically analyzing an array of 17 biological, dietary, environmental, and geographic factors potentially relevant to the gulls' reproductive success, Weiser and Powell reported their results in 2010 (*Condor* 112:530–538). The percent of garbage in adults' diet during the chick-rearing period was second only to the number of eggs per pair in explaining variation in numbers of fledged young. In fact, by direct correlation, the proportion of garbage showed an even closer positive relationship to fledging rate than did the number of eggs.

The key question is why garbage would enable higher productivity than Glaucous Gulls' natural foods—including fish, birds, rodents, and mollusks—that are high in nutrients. Weiser and Powell offer several hypotheses. Garbage can be high in energy and protein, which could directly benefit chicks' health and growth. High-energy garbage might improve parents' health and ability to care for the young. Ease of obtaining garbage at predictable locations could decrease foraging time, allowing parents to spend more time incubating, brooding, and protecting the nest from predators.

The authors note that factors such as predation rate, weather, and disturbance have not been studied and would likely contribute to variations in reproductive success. Nevertheless, Weiser and Powell add that the benefit of a "human-subsidized" diet of garbage could also improve survival of juveniles and subadults long after the period when chicks are fed by their parents.

The end result, in the authors' view, could be greater population growth than would otherwise occur—which could point to a potential conservation problem. On the positive side, availability of garbage could mean less predation pressure on natural prey. On the negative side, many Glaucous Gulls in a growing population may disperse to breed at locations with no garbage. There, increasing numbers would feast on natural prey, perhaps including shorebirds and waterfowl species of conservation concern.

J. P. Myers, then National Audubon's vice president for science, addressed such a situation in 1989. In a column titled "Gulls are what gulls eat" (*American Birds* 43:207–209), he suggested that controlling a predator's population may be necessary to enable the survival of a prey species. Myers predicted that the column would be controversial, and it was. One reader replied, "Good intentions are no excuse for allowing the sacrificing of one population for another..." (*American Birds* 43:392). It is a debate without end.

Odd Migration Route

Spectacular spring landbird fallouts on the northwestern Gulf coast are so coveted in anticipation and so powerful in memory that fall migration phenomena in the coastal region receive little notice by comparison. Kenneth P. Able and Sidney A. Gauthreaux, Jr., two of America's foremost experts on migration, have lamented this lack of scientific attention. In *Gatherings of Angels*, a compilation of papers on migration ecology edited by Able in 1999, Gauthreaux called the importance of conducting further fall studies in the region "obvious."

The studies may not only be important; they may also offer unexpected excitement, as a 2010 report by Peter H. Yaukey shows. Yaukey documents the discovery of massive diurnal songbird movements at Lake Pontchartrain, Louisiana, about 100 kilometers north of the Gulf (*Wilson Journal of Ornithology* 122:738–743). What's interesting is that most of these throngs are flying northeastward.

The first indication of the phenomenon came on 22 November 2002 after passage of a cold front when Yaukey witnessed a continuous movement of birds northeastward along a peninsula in the lake. He estimated the two-hour passage at 25,000 birds, mostly American Robins, Cedar Waxwings, and Yellow-rumped Warblers. The next morning he estimated 18,500 birds, primarily those same species, passing within three hours.

In retrospect, Yaukey suspected that several substantial flights of neotropical migrants earlier in the fall had represented the same phenomenon. Systematic counts by volunteer observers from 2003 to 2009 documented further movements of both short-distance and neotropical migrants. Most notable was a flight on 5 September 2003 estimated at 35,000 Eastern Kingbirds. The species is known to form huge staging flocks in the southeastern U.S. before departing to South America.

Clearly, the northeastward-bound birds were not departing to cross the Gulf; in fact, they often flew head-on into northeasterly winds after cold fronts. Why would these diverse species undertake that struggle?

Yaukey suggests three possibilities: They were attempting to head eastward but detoured northward to avoid the open Gulf and marshes east of the lake. They were searching locally for stopover habitat in which to rest and feed. They were correcting their flight path to compensate for navigational errors or wind drift that had pushed them too far southwestward.

He favors the corrective hypothesis, noting that flights in directions away from expected routes are documented for many species in coastal North America and Europe. Perhaps wind drift caused the Louisiana migrants to overshoot appropriate habitat, and they were returning inland after encountering inhospitable coastal marshes. Yaukey suggests that backtracking could serve both trans-Gulf migrants and arriving birds intending to winter in the region.

Whatever the reason, Yaukey's findings open a new window for potentially interesting autumn birding in Louisiana's coastal region. The sights may not match the rainbow of red, orange, yellow, and blue songbirds perched wearily in a shrub or small tree after landfall in spring. But discoveries about fall migration behavior can be satisfying, too.

Observers in Louisiana discovered that American Robin, **Cedar Waxwing,** and Yellow-rumped Warbler flocks regularly fly northeastward in autumn along Lake Pontchartrain. Questions awaiting answers are why large numbers travel in that direction in the fall and exactly where they go. *Beaver County, Pennsylvania; August 2010. Photo by © Geoff Malosh.*