
Recent Literature

Compiled by C. John Ralph (If you would like to help review articles of interest to banders, please contact cjr2 “at” humboldt.edu, and feel free to mention if you have a particular journal or geographic area of interest).

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ANALYTICAL METHODS

Selection on VPS13A linked to migration in a songbird. Daniel P.L. Toews¹, Scott A. Taylor, Henry M. Streby, Gunnar R. Kramer, and Irby J. Lovette. 2019. *Proceedings of the National Academy of the Sciences* 116:18272-18274. bb. Department of Biology, Pennsylvania State University, University Park, PA, US. ¹toews@psu.edu.

The premise is that the behavior of birds to make long distance migrations of thousands of kilometers from northern latitudes to Latin America is hard wired into the DNA of birds. The argument is that Hatching Year birds who are fresh out of the nest and are making their first trip (without the aid of maps or GPS) have never been to their winter grounds and no time to learn.

The Golden-winged Warbler (*Vermivora chrysoptera*) has two distinct populations: the Great Lakes region population that migrates to Central America and the Appalachian/Northeast region population that migrates to Columbia and Venezuela in northern South America. Its congener is the Blue-winged Warbler (*V. cyanoptera*) which breed, in general terms, between the two Golden-winged Warbler populations; the Blue-winged Warbler winters in Central America, like the Great Lakes population of the Golden-winged Warbler.

In searching for a gene controlling this migration, the idea is that the Great Lakes population of Golden-winged and the Blue-winged warblers should have the same DNA to lead both species to Central America. Meanwhile, although the two Golden-winged Warbler populations are the same species, the DNA will be different, leading

birds to winter in different locations. Comparing blood sample from birds from the two regions, the authors found a difference in one particular region of the Z chromosome. Narrowing their search led to a single gene called *VPS13A*. Although this is very early speculation, it might be possible to genetically change the migratory behavior of some Great Lakes birds to recolonize the population to the east, which is in decline. WHS

IDENTIFICATION, MOLTS, PLUMAGE, WEIGHTS, AND MEASUREMENTS

Sexually dimorphic plumage characteristics in the northern Black Swift. Carolyn Gunn¹, Kevin J. Aagaard, Kim M. Potter, and Jason P. Beason. 2018. *Western Birds* 49:214–225. <https://doi.org/10.21199/WB49.3.4>. ¹wolverine1.cg@gmail.com.

Determining the sex of captured birds is a fundamental step in the banding process usually accomplished by observation of breeding characteristics or plumage differences. For northern Black Swifts (*Cypseloides niger borealis*) Pyle (1997) states that the cloacal protuberance is not developed and the brood patch is only “probably” reliable for sexing. This leaves plumage differences, and the authors describe how these differences (or lack there of) have been debated for this species since 1857. They captured 34 adult males and 38 adult females from 2004 through 2017 in Colorado, New Mexico, and Arizona. For each bird they recorded eight variables: wing chord, flat wing, r5 length, r1 length, r5 minus r1 (tail fork difference), length of white tipping on the abdomen and undertail coverts, and body weight. Blood and feather samples were independently analyzed for sex determination by two laboratories, which had 100% concurrence. Difference in length of rectrices alone accounted for 99% of the variance between the sexes. With the exception of three males in the study, tail fork depth (difference in length between the inner and outer rectrices) was a nearly conclusive metric for differentiating the sexes, as well as being easy to obtain and repeatable. This study is a good example of how

careful, targeted data collection can help fill in the gaps where “more study is needed.” CMS

Attraction of other species by Bluethroat *Luscinia svecica* song playback during autumn migration: an experimental test using bird-ringing data. Iván De La Hera¹, Philippe Fontanilles, Lucas Delalande, Anouk Glad, and Tom Sarraude. 2017. *Ardeola* 64:91-99.

Observatoire d'Intérêt Scientifique Ornithologique (OISO), Cami deth Sailhetou, 65400 Lau Balagnas, France. School of Biological, Earth and Environmental Sciences, University College, Cork, Ireland. ¹Ivan.delaaahera@ucc.ie

Playing vocalizations to attract migrants during mist-netting operations is a very common practice at many stations in Europe, but much less often used in the Americas. In addition to attracting considerable numbers of the same species for capture during mist-netting sessions, it is also well-known to have the potential to bias the sample of conspecifics, with respect to sex, age, or body condition. However, the possibility that playback affects heterospecific captures has not been well explored and lacks solid experimental evidence. In this study, they used an experimental approach to test whether Bluethroat song playback altered the overall number of individuals of other species captured during autumn migration in a wetland in southwestern France. They found that playback increased the capture rates of species that were not the direct target of the playback. Playback is a powerful tool that would be well used to get larger statistically-reliable samples at migration stations. CJR

Estimates of wear rates in metal bird bands, with applications for survival and movement models of marked individuals. Shane M. Baylis¹, David Drynan, Naomi Clark, Michelle Van, Paul Sunnucks, and Rohan H. Clarke. 2018. *Journal of Ornithology* 89:393–406. <https://doi.org/10.1111/jofo.12268>.¹shane.m.baylis@gmail.com.

I am sure that most readers of *NABB* have replaced a few worn bands over the years. I first came across this while working with Harlequin Ducks (*Histrionicus histrionicus*) where the aluminum bands we first used quickly wore from

exposure to salt water and harsh environments, and so we switched to using stainless steel bands. Understanding band wear and loss is important when using recapture/recovery data to assess parameters such as survival, recruitment, and migration rates, among others. The authors examined bands retained (or returned unused) or returned (usually from dead birds) to the Australian Bird and Bat Banding Scheme between 1963 and 2005, and estimated wear rates for bands applied to 173 species, 5 types of metal, and 236 species/band size/band metal combinations. The band metals were: aluminum, a magnesium-aluminum alloy, a copper-nickel alloy (monel), a nickel-chromium alloy (incoloy), and stainless steel. They determined wear rates by rigorously cleaning each new and used band and weighing it to ± 0.0001 g. Differences in wear rates among band metals was correlated to the functional species group; for example, aluminum bands on passerines, seabirds, and waterfowl generally wear faster than aluminum bands on raptors, non-passerines, and waterbirds (shorebirds, herons, and ibises) (~ 3 %/yr vs ~ 0.05 %/yr, respectively). The most interesting point, I thought, was that the authors found their rates to be lower than other published wear rates, suggesting, a publication bias that favors higher wear rates. The most likely reasons are that researchers publish rapid wear rates as a warning to other researchers, and there is little incentive to publish low wear rates (non-results). CMS

NORTH AMERICAN BANDING RESULTS

***Accipiter* hawks of the Laurentian Upland and Interior Plains undertake the longest migrations: insights from birds banded or recovered in Veracruz, Mexico.** Enya Astrid Córdoba-Cuevas, Sara Patricia Ibarra-Zavaleta, and Ernesto Ruelas Inzunza¹. 2020. *Journal of Field Ornithology* 91:275–284. <https://doi.org/10.1111/jofo.12341>. ¹ruelas.uv@gmail.com.

The authors utilized 80 recapture and recovery records for Sharp-shinned (*Accipiter striatus*; $n=31$) and Cooper's (*A. cooperii*; $n=49$) hawks that were either banded or recovered at the Cansaburro Banding Station in Veracruz, Mexico,

to determine their breeding, migration and non-breeding locations and estimated migration distances. The distribution of the recaptures and recoveries strongly correlated with breeding locations in the Laurentian Upland (the eastern portion of Canada's boreal forest, particularly around Lake Superior) and the Interior Plains (the Great Plains and northern expanses of the Mississippi River basin) physiographic regions. As both species tend to avoid flying over large bodies of water, they migrate along the Central Flyway into eastern Mexico and northern Central America. The mean distance between breeding season locations and Cansaburro was 3,374 km for Sharp-shinned Hawks, and 2,926 kms for Cooper's Hawks; however, by combining banding and observation records, the authors estimate that both species may travel >10,000 km during their round-trip migrations. The records were skewed significantly towards females and juveniles for both species. The authors put forward a few hypotheses to explain this: there may be different migration routes for adults and juveniles, with the latter migrating along shorelines (such as where Cansaburro is located) more frequently; males may stay closer to their breeding territories and not migrate as far south as females, and/or; more females may be captured because being larger, they are able to hunt the large prey species used as lures at banding stations. I found it interesting that 94% of the Cooper's Hawks records were mortalities, whereas <20% of Sharp-shinned Hawk records were mortalities. CMS

Using continental-scale bird banding data to estimate demographic migratory patterns for Rufous Hummingbird (*Selasphorus rufus*).

Josée S. Rousseau¹, John D. Alexander, and Matthew G. Betts. 2020. *Avian Conservation and Ecology* 15(2):2. <https://doi.org/10.5751/ACE-01612-150202>. ¹jsr@klamathbird.org.

In a massive use of hummingbird banding data, the authors investigated demographic patterns of Rufous Hummingbirds during migration, such as timing, speed and route differences among age/sex categories. If birds in different age/sex categories face different conditions in habitat,

phenology and weather, the projected increases in novel climates may impact these demographic categories differently. Starting with a dataset of 116,433 banding records from 3,044 different banding locations in Canada, the USA and Mexico, between 1998 and 2013, the authors removed unknown age/sex categories, those with unknown dates or poor locations, and spring records (very small sample size). To avoid age/sex biases in sample size (e.g., there were 1.8 fewer captures of adult males than adult females), they then drew 100 random subsample datasets of the other age/sex categories to match the number of adult males. The final dataset for analyses was slightly over 17,000 records. Their models used age, sex, year and week categories.

Results showed three main fall migration routes: young males and females migrated south mostly through California, while adults migrated through the Rocky Mountains, with males farther east than adult females. Migration timing was significantly different: adult males started and ended migration 3-5 weeks earlier than the other age/sex categories. While adult females started migrating only slightly earlier than young birds, they ended migration significantly earlier. The authors did not detect any difference in migration speed between age/sex categories, averaging 38 km/day (SD=15.5). Adult hummingbirds travelled shorter distances (mean=1,176 km) than young hummingbirds did (mean=1,279 km). The authors hypothesized that difference in migration routes between demographic categories may reflect adaptation to spatiotemporal differences in plant phenology (e.g., nectar sources may be greater in California later in the season when young migrate). They identify the next step as assessing whether these age/sex differences cause differences in survival rates or breeding success. A key recommendation was that banders should document sampling effort as the frequent lack of such made it impossible to make broader inferences from their data. This is a defect that I have noticed in many *NABB* reports, which give raw capture numbers, not capture rates standardised by effort, making year-to-year comparisons difficult. CMS

Bird health in California's central coast: Interactions between agricultural land use and avian life history. Victoria Marie Glynn. 2019. *Berkeley Scientific Journal* 23:59-67. <https://escholarship.org/uc/item/4sf483vj>.

The focus of this paper is on assessing how bird health is being impacted by changing landscape matrix composition, where agriculture replaces natural habitat, in this case the central coast of California, east of Monterey Bay. The landscape was categorized using National Agricultural Imagery Project photographs. The author relied on immunology, specifically the ratio of two white blood cell types (heterophils and lymphocytes; H:L ratio), to infer a bird's present and future state of health. High H:L ratios are associated with birds in poor health. The author also assessed each captured bird's "reproductive readiness index," which was a proxy score of 0-4 based on size, color and texture of the cloacal protuberance or brood patch. Then they ran a linear mixed-effects model where bird health (H:L ratio) was the predictor variable, farm location was a random effect, and three interactive variables (proportion of agriculture, proportion of natural habitat, and reproductive readiness score). Glynn captured birds at 20 farms in three areas over a 2-month period, but focused only on four common "agricultural" species ($n = 200$) found on 13 of the farms: House Finch (*Haemorhous mexicanus*), Dark-eyed Junco (*Oreganus*) (*Junco hyemalis*), Song Sparrow (*Melospiza melodia*), and Spotted Towhee (*Pipilo maculatus*). The model results suggested that Song Sparrow were in marginally better health on farms with a higher proportion of agriculture, whereas there was no significant trend for the other three species. There are a number of study limitations which may have influenced these results: limited sample size and spatial replication, no control group in an area of just natural habitat, extended period of sampling (thus a range of reproductive readiness scores for each species and different levels of agricultural activity from fallow fields to harvesting), the H:L ratio may not be as strong an indicator of health as previously assumed, and the reproductive readiness index is a fairly crude score and may not adequately categorize the level of sexual activity.

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North American Bird Bander

There are no generalizations possible from this study, only that one species fared slightly better than three others in the landscape matrix in that specific area. CMS

Non-North American Banding Results

Rapid colonization and turnover of birds in a tropical forest treefall gap. Henry S. Pollock¹, Todd M. Jones, Corey E. Tarwater, et al. 2020. *Journal of Field Ornithology* 91:107–117. <https://doi.org/10.1111/jof.12328>. ¹henry.s.pollock@gmail.com.

This study is a good example of using a long-term data set to answer an unforeseen question: "what happens when a tree falls in the forest?" From 1994 to 2019, researchers mist-netted birds at two 2-ha plots in Soberania National Park in central Panama. In the fall of 2015, a tall tree fell over in a storm, causing a cascade of disturbance that resulted in a 1-ha treefall gap in one of the study plots. Instead of bemoaning the "destruction" of half of their study plot, the researchers seized the opportunity of a natural experiment. They analyzed pre- and post-treefall capture data to explore how the disturbance affected specific foraging guilds, as well as abundance and alpha diversity. They identified 10 guilds within the resident bird community: ant-follower, canopy/second-growth, granivore, mixed-flock, nectarivore, omnivore, piscivore, raptor, understory frugivore, and understory insectivore. In the year after the treefall, alpha diversity and abundance increased dramatically (within five months) compared to the control plot, primarily due to the presence of nectarivorous hummingbirds and understory frugivores. While they had no pre- nor post-treefall plant community data they attributed these increases to the increased abundance of flowering and fleshy-fruited plants that are known to colonize such early successional gaps. Avian diversity returned to pre-treefall levels within 1 year, and abundance within 4 years post-treefall. This work suggests that treefall gaps are ephemeral resources and continual periodic natural disturbance is necessary to maintain local diversity in tropical forests. The authors warn

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readers that a natural treefall gap should not be conflated with increased fragmentation of forests from anthropogenic disturbance such as logging, which is on an entirely different scale. CMS

Longer-lived tropical songbirds reduce breeding activity as they buffer impacts of drought.

Thomas E. Martin¹ and James C. Mouton. 2020. *Nature Climate Change* 10:953-958 University of Montana, Missoula, MT. ¹tom.martin@umontana.edu.

In this interesting paper, the authors combined different ornithological data collection techniques and population parameters to understand how birds responded to drought years in tropical forests. They used databases from two tropical countries, Venezuela and Malaysia, consisting of nest-search and banding data. The authors estimated fecundity (based on the number of nests found) and survival rates (from the banding data) and analyzed how these parameters responded to the amount of rainfall during the breeding seasons. Negative impacts of drought on survival are well documented and they also expected that the reduced breeding activity might limit the decrease in survival. They were extremely surprised to find that not only did reductions in breeding activity mitigate costs to survival, many long-lived species actually experienced higher survival rates during the drought year than during non-drought years. In contrast, shorter-lived species that kept breeding during the drought faced strong reductions in survival. The results showed a clear correlation between survival and reproduction: birds that in drought years had reproduction rates similar to the rates in wetter years had a decrease in survival rate, while birds that decreased their reproduction rate in dryer years had a similar or even higher survival than in years with higher rainfall. In general, longer-lived birds tended to have more elasticity in their reproductive rates, and shorter-lived birds tended to keep this rate stable, independent of rainfall. Birds that occupied wetter habitats did not follow this rule, and had lower reproduction and survival rates in dryer years. Based on these results, the authors predicted the effects of different climate change scenarios in the population sizes of the studied species. This article is a good example

on how banding data can be used in conjunction with other datasets to answer questions related to the bird's life history and responses to weather changes. PVM

Bird-banding records reveal changes in avian spring and autumn migration timing in a coastal forest near Niigata.

Alima Dorzhieva, Makoto Nakata¹, Keisuke Takano, Youki Fujihiko, Yasuo Ito, Kiyoshi Akahara, Katsuyoshi Tachikawa, Yasuko Ichimura, Yaeko Furukawa, Hiroshi Sato, Mikiko Fujisawa, Mika Okamoto, and Takechiko Shimizu. 2020. *Ornithological Science* 19:41-53. ¹Nakata@agr.niigata-u.ac.jp.

Long-term banding records are critical in looking at climate change as climate change affects the timing of migration in birds. Here the authors analyzed 27 years of bird-banding data in a coastal forest near Niigata in central Honshu, Japan. Birds were divided into seven types of migration: (a) Residents, (b) Resident and Wandering birds, (c) Wandering, (d) Short-distance migrant (winter visitors), (e) Long-distance migrants (summer visitors), (f) Long-distance migrants (winter visitors), and (g) Passage visitors. It is not clear how some separations were made. The authors specifically say birds in the (c) Wandering category breed in the nearby mountains and "migrate" to warmer regions or the lowlands in winter. It is not clear how these birds differ from the (d) Short-distance migrants (winter visitors). There were 28 and 26 species selected for spring and fall migrations respectively, and most birds were analyzed based on fewer than the 27 years (due to small or no samples in some years).

Changes were measured using the median capture date. Data was presented as \pm days/ $^{\circ}$ C; however, except for the mean temperature over the 27 years, no temperature change data is presented. Some data was \pm days/year with no explanation on how days/year were calculated, and data for only a few species were presented (see below). Data for some birds were presented as days/ $^{\circ}$ C while data for other birds were presented as days/year with no clear way to compare.

Changes in the timing of spring migration.-
-The spring arrival date of the Japanese White-eyes (*Zosterops japonicus*), a resident and wandering

bird, was delayed 0.157 days/year, or ~4 days over the 27 years. The arrival of Narcissus Flycatchers (*Ficedula narcissina*) and Japanese Thrush (*Turdus cardis*), both long-distance summer migrants, shifted earlier 0.337 and 0.233 days/year or ~9 and ~6 days over the 27 years, respectively. The authors reported long-distance summer migrants had later median capture date compared to other migratory types without supporting numbers. But why compare migratory types, when the authors divided the birds in migratory types in the first place? One would expect difference, based on environmental changes along the migratory route or winter grounds, as stated by the authors.

Changes in the timing of autumn migration.- Black-faced Buntings (*Emberiza spodocephala*), wandering birds, arrive 0.46 d/year or ~12 d earlier over the 27 years. Japanese Robins (*Luscinia akahige*) and Eastern Crowned Leaf Warblers (*Phylloscopus coronatus*), both long-distance summer visitors, arrive 0.210-0.276 d/year or ~6-7 d later over the 27 years. Eyebrowed Thrushes (*Turdus obscurus*), passage visitors, arrive later by 0.516 d/year or ~14 d later over the 27 years.

Although climate changes correlate with these shifts, other factors seem to be involved. The authors emphasize that ecological forest succession has occurred over the 27 years, and climate change itself drives some of the vegetation changes. **WHS**

Changes in *Emberiza* bunting communities and populations spanning 100 years in Korea. Chang-Yong Choi, Hyun-Young Nam¹, Han-Kyu Kim, Se-Young Park, and Jong-Gil Park. 2020. *PLoS ONE* 15(5): e0233121. <https://doi.org/10.1371/journal.pone.0233121> ¹stern0223@hamail.net.

In an interesting use of banding data, the authors examined the declining *Emberiza* bunting populations in Korea over the last 100 years, by collecting data from three disparate sources. (A) Bird banding data provides quantitative numbers, but only dates back to the 1960s in Korea. (B) Available museum specimens dating back to the 1900s are in both Koreas. Since specimens collected in Korea often ended up in foreign museums, VertNet was used to search out specimens in the collections of the major museums in the United States. Similar databases were also available for

Japan and the United Kingdom. (C) Since 1986, formal bird survey work has been conducted across Korea.

Since sampling varied, simple presence-absence data for 17 bunting species were collected in Korea from 1910-2019, for over 3,000 specimens about equally divided between domestic and foreign museums. Data were divided into three periods: Period I (1910s-1940s), Period II (1950s-1980s), and Period III (1990s-2010s). Analysis showed that the composition of the bunting community did not differ between the museum data and bird-banding data, while the composition of the bunting community did differ between the three periods of time.

Overall, the change in the proportions of most of the species was relatively small. Increases in the Yellow-throated and Black-faced buntings (*E. elegans* and *E. spodocephala*) population played the most important role in changes in the bunting communities between Periods I and III. Between Periods II and III, the decline in Rustic and Chestnut buntings (*E. rustica* and *E. rutila*) and the rise in the two species mentioned previously affected the bunting populations. This has resulted in the bunting population now being dominated by three species, the Yellow-throated, Meadow (*E. cioides*) and Black-faced buntings.

The presence-absence data indicates six species in decline, including the Yellow-throated and Meadow buntings. Another is the Yellow-breasted Bunting (*E. aureola*), considered a critically endangered species. The Yellow-throated and Meadow buntings are common breeders in Korea and described as fairly common but declining (-1.82%/year and -2.99%/year) rapidly in Korea. Although the Yellow-throated bunting population is declining, its contribution to the overall bunting population is rising, indicating a decline in bunting diversity. In Period II, 3,156 Meadow buntings, a common breeder were banded and 284 were collected, but only 73 were banded and 17 were collected in Period III. The decline has been attributed to habitat loss due to urbanization. The authors concluded at long-term monitoring, international cooperation, and enforcement against illegal hunting and habitat loss are required to stem the decline of buntings in Korea and Asia. **WHS**