FRIENDS OF ORNITHOLOGY

Newsletter

Number 17
Dec 2021

Grus, The Crane (Willughby & Ray 1678)

UNIVERSITY OF ALASKA MUSEUM OF THE NORTH

From the Curator

Kevin Winker

Who could have predicted that we'd still be in the depths of the second year of a pandemic? Science has done its part, with rapid development of impressive, effective vaccines. But we humans are a confused lot, and our collective inability to adopt effective public health measures is extending the suffering. In a recent survey, *Nature* found that 99% of U.S. scientists responding had been vaccinated. The science is strong, and scientists are voting with their feet (and shoulders). The CDC is reporting that unvaccinated people die at 14 times the rate that the vaccinated do from the disease. And about one third of people recovering from infection experience prolonged symptoms—long covid. I just hope that the coming year finally brings things back closer to normal. In the meantime, careful implementation of common-sense public health recommendations has kept our group well.

I am so glad I study birds! Because no matter how frustrating things can be at times, there is never-ending fascination to be found in the world of birds. And while it seems like everything takes longer to do with the pandemic need to limit in-person activities (and with growing Zoom fatigue), we're still getting a lot of really interesting work done, both in wrapping up projects and in getting new ones going. Sometimes the final steps of a project can take literally years to complete. For example, turning thesis chapters into published articles requires running an obstacle course of life changes, reviews and revisions, and then often more reviews and revisions. And while revisions generally improve a work, when you've done as many as reviewers and editors require, you're often tired of the article and just happy to see it done and gone. We've had a good deal of such cheer lately. And new work is always exciting.

Thanks to you all for your ongoing support!

The Department of Ornithology

Our existence and many of our activities are centered around the Bird Collection, but it is the people involved who make it all happen:

Residents

Kevin Winker (Curator)
Jack J. Withrow (Collections Manager)

Students

Fern R. Spaulding
Symcha Gillette
Kathleen Collier

Research Affiliates

Daniel D. Gibson
Johannes Erritzoe
Rose A. Z. Meier
Kevin G. McCracken
Christin L. Pruett
Kyle K. Campbell
Matthew Miller

Volunteers

David W. Sonneborn
Jennifer Jolis
Alaska Checklist Cmte.
Elizabeth Schell

A SAMPLING FROM STAFF

Jack Withrow

A lot of birds pass through our doors, most with advance knowledge about what they are and where

they are coming from. All are valuable to one degree or another, but some stand out as exemplars both for scientific interest and for the human fascination with rare events. Thus, it was an especially exciting day indeed when we learned about and received a first-for-North-America Hooded Crane (*Grus monacha*) in October 2020. What a surprise! The crane was taken by a hunter in Delta Junction in late September who turned it over to the Alaska Department of Fish & Game, who recognized its scientific value and donated the bird to the state's bird collection here.

It was prepared as a round skin (Fig. 1) and spread wing, with associated tissues, skeleton, gastrointestinal tract, and parasites. Buccal and cloacal swabs were also saved for disease screening. It was a male in its second fall. It is perhaps the only modern, wild, data-rich (e.g., with tissue sample) Hooded Crane specimen in a North American collection.

Figure 1. Dorsal and ventral views of the Hooded Crane specimen (UAM 45,000). The right leg remained with the partial skeleton.

Hooded Crane has an interesting history in North America. From April 2010 to February 2012 one (or more?) Hooded Cranes were seen in Idaho, Nebraska, Tennessee, and Indiana. There was debate about the wild origins of that (those?) bird(s), but most authorities characterized the situation as "best considered unresolved." This new bird, in its second fall and migrating with Sandhill Cranes, pointed strongly towards a wild origin. One theory is that it took up with some of the increasing number of Sandhill Cranes that winter in Japan, went north with them in spring past traditional Hooded Crane nesting areas, and then migrated on to Alaska like the bulk of the Asian-breeding population of Sandhill Cranes.

We worked with the hunter to publish a short note on this interesting occurrence. It appeared earlier this spring in Western Birds (52:160–164). This is but one example of how Alaska is an important gateway to North America. The work we do here often has implications for phenomena happening far to the south in more populated areas.

A Bit about Bones

Symcha Gillette

(Masters student)

In 2020, the museum finished construction of a new state-of-the-art Bone Lab for cleaning skeletons. This facility replaces one in an old building off-site that had been condemned for the better part of two decades. In light of this momentous development, it seems appropriate to feature skeletons here. We preserve the skeletons of all important bird specimens. These skeletons must be cleaned of all flesh and connective tissue. For this we rely on the free labor of dermestid beetles and bacteria (and the paid labor of students with strong noses and stomachs). The beetles first eat the dried flesh from the bones. Then, in a foul-smelling process called maceration, the skeleton is soaked in water and any residual tissue is rotted off by bacteria. Once maceration is complete, the bones are rinsed thoroughly with clean water, dried, and boxed up to be archived in the collections range.

A dedicated lab space is essential for this work. This space should be separate from the museum to prevent the beetles from getting into the collections range and elsewhere, where they will eat valuable specimens. Large-scale skeleton-cleaning operations produce vile odors and require vast numbers of beetles, both of which must be contained for the sake of other building occupants. A poor setup allows the beetles and the stench to overwhelm an entire building. For over two decades, we had such a set-up, in an ATCO trailer complex

several minutes' drive from the museum. There were many ways in which the ATCO was exceptionally unsuited for use as a bone lab, but in essence it simply could not manage the odors or contain the beetles. By the time it was finally demolished in 2020, dead beetles were everywhere—piled on the floors, in the light fixtures, between the window panes—and the overpowering stench permeated everything and was so potent that dogs walking by outside could smell it. One year, with heightened terrorism concerns (e.g., 9/11, anthrax), the university hosted a hazardous environments training exercise using the building for agents dressed in environmental suits. It was well suited for this purpose. Needless to say, it was not a pleasant work environment.

Left:The Ornithology department's room in the old ATCO lab. Right: The new Bone Lab (Symcha Gillette).

In contrast, the new lab is much closer to the museum. It was thoughtfully designed with lots of features that make skeleton cleaning a great deal more pleasant, including excellent ventilation, covered temperature-controlled maceration tanks, and a maximum-security beetle room. It has already facilitated some fine work—the bowhead whale skeleton that was recently suspended in the museum lobby was cleaned there, as well as over 1,000 bird skeletons to date.

Insufficient time, space, and human effort allocation has meant that skeleton processing has been neglected to varying degrees, and this neglect was exacerbated by the fact that working in the old ATCO lab was so disagreeable. As a result, the backlog of skeletons needing to be cleaned is large. Those are skeletons that cannot be used for research until they are processed. And because we cannot track the location of individual skeletons within the backlog, it is a painstaking process to bring high-priority skeletons to the front of the line.

The more time we can spend getting these skeletons research-ready, the better, and the new lab is helping us do that. We still face human resource limitations, but having a good place to work makes a big difference. It's a lot easier to find time for skeleton work when the lab is close and you don't have to mentally steel yourself every time you open the door. I have even grown to enjoy it, something I never expected. But the more skeletons I handle, the more interesting they become to me. There is an astounding amount of variation among different taxa—you can tell a plover from a sandpiper, a swift from a swallow, or a gull from a petrel, just by its skeleton (without even looking at the bill). Cleaning the flesh from the bones uncovers interesting features, such as the fact that unlike in other birds, the sclerotic rings (bony rings in birds' eyes) of woodpeckers are fused around the outer margin, which I hypothesize serves as extra reinforcement to help their eyes withstand all that head banging. Sometimes I come across healed broken bones, and marvel at how the bird managed to survive such an injury. And it's always satisfying to come across rarer specimens, such as Asian vagrants collected in the Aleutians, or the tinamou skeleton that was the first of its order (Tinamiformes) to resurface from the backlog. Browsing the skeletons in the range, one can find all sorts of cool specimens, such as the only Philippine Eagle Owl skeleton in any museum collection.

Hopefully, the new lab will also help other students get past the initial ickiness of the work and develop an appreciation for the skeletons themselves. For most, processing skeletons may never quite equal the appeal of preparing study skins in the Bird Lab, but you can't have one without the other. We save the important skeletons because they provide information that skins and tissues cannot. They are an important component of the bird

collection, and researchers are increasingly finding them useful for their questions. Recent studies have used skeletons from UAM and other institutions to study the deposition of medullary bone by females during the breeding season (Canoville et al., 2020), and to compare the bone structure of migratory vs. non-migratory subspecies of Dark-eyed Junco (Louis et al., 2021). Additionally, as I write this, the UAM Archaeology Department is using our skeletons as reference material for identification of ancient midden remains. These are just a few examples of the many ways skeletal material can contribute to science. In our lab, we plan to continue to explore this potential by pairing genomic data from tissues with morphometric data from skeletons.

For all its faults, this past year was a good one for the skeletons of UAM!

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Louis, L.D., R.C.K. Bowie, and R. Dudley. 2021. Wing and leg bone microstructure reflects migratory demands in resident and migrant populations of the Dark-eyed Junco (*Junco hyemalis*). Ibis. https://doi.org/10.1111/ibi.13008

Brooks Range Rosy-Finches

Kathleen Collier
(Masters student)

In my perfectly impartial opinion, the single best part of any biology job is the fieldwork, and any biologist who disagrees is either a liar or possessed of tragically poor taste. As such, it was exciting news when I learned that our lab was planning to conduct a mid-July survey along the Elliot and Dalton Highways north to Deadhorse.

That enthusiasm may have flagged slightly as, later, Symcha Gillette and I sat (slightly damp and with visible breath) in my car in a driving midday sleetstorm at Atigun Pass. The mountain cirque, which had been clear-albeit-chilly not twenty minutes ago, seemed to have decided that some early winter was in order and acted accordingly. Looking out the windshield in breaks between word puzzles, it seemed incredible that birds could survive here year-round.

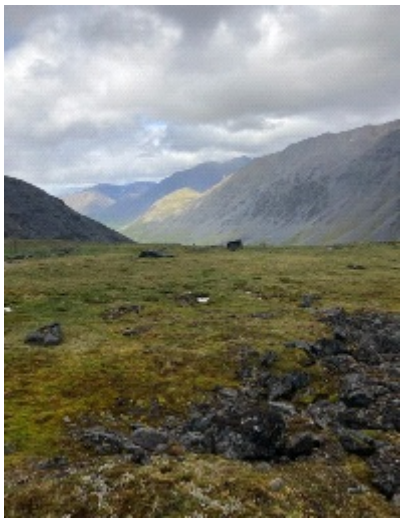
Not all birds, naturally—even outside of the peak migration season, we saw a dazzling variety of migrants. However, as the storm passed and the clouds cleared, little flashes of movement became apparent. From their hunkered-down positions in the surrounding talus slopes and patches of snowpack, birds flitted to the mossy pools of meltwater and set industriously to foraging. Atigun Pass was teeming with Gray-crowned Rosy-Finches. Clearly, these birds were not just surviving, but thriving.

That pattern continued as we continued up into the Arctic Coastal Plain. Through the unrelenting clouds of mosquitoes, tundra birds filled the land and soundscape. Yellow Wagtails (no doubt celebrating the mosquitoes), bull-necked Northern Shrikes, and tiny, nervous Semipalmated Plovers were common, and we may have seen more Greater White-fronted Geese than humans in Deadhorse. A pair apiece of nesting Pomarine Jaegers and Tundra Swans, and a single, stately (and titanic) Yellow-billed Loon, were personal highlights, but the most interesting find of the trip was entirely accidental.

It's easy to miss things when you're the one driving, so when Symcha asked me to stop the car, I assumed I would be scanning or listening for a bird in the field. Instead, she scrambled down the side of the berm into the wet polygon tundra, and came back with a large, white something: a freshly-dead gull. With its wingtips as a diagnostic aid, it turned out to be a hybrid Herring/Glaucous Gull—not unknown on the North Slope, but fascinating nonetheless. We packed our find into the cooler, turned back around to Deadhorse for more ice, and then started the long trip back to Fairbanks.

Finds and experiences like this provide an excellent complement to our studies back in the lab. Seeing and searching for birds in the field not only provides useful data in terms of abundance, species,

and distribution, but it pulls together and gives context to more specialized analyses which might otherwise seem disjointed. It's one thing to know from your data that birds hybridize or migrate according to certain patterns, and another to see it played out in real life. Similarly, the questions and observations generated from observing your study system firsthand necessarily increase your level of understanding of that system, guiding your interpretation of the data. It's just fortunate that our fieldwork is as incredible an experience as it is.



Brooks Range tundra (Kathleen Collier)

ANNUAL REPORT - ORNITHOLOGY, FY21

The COVID pandemic remained the dominant external force on all of us this year. The fiscal situation effectively leveled out with CARES Act and other inputs, so, thankfully, furloughs have been left behind and we were able to be more active in our labs and offices. Fern Spaulding defended her Masters thesis—congratulations, Fern! And two new graduate students begin with us in the fall. We've had more specimen loan requests than usual. We think it's probably a result of lockdowns and people completing old projects and setting up new ones. We've been doing that ourselves, and it's been great to see some of our good work get published this year. Writing up our work for publication went well—research led both by our group and by collaborators. This is perhaps the lone silver lining of pandemic-related changes in time management.

Bird lab activities included moving into a new Bone Lab facility, increasing skeleton production again. This part of our collection has been increasingly important to researchers here at the university and elsewhere in the world. Again this year, despite COVID precautions, staff and students were able to get into the field, sampling on the Yukon River, Kodiak Island, the Steese and Taylor highways, and several locations around the Interior.

Use of the collection has been strong, and the steady output of the scientists using it is impressive. This can be seen here: https://bit.ly/3D6g3Tr (click on Year to sort the data and see the most recent productions). As always, many thanks to our students, volunteers, collaborators, and the Friends of Ornithology for your ongoing support and encouragement.

Volunteer hours	545
Acquisitions	1,645
Publications	14
Reports	10
Loans	22
Data requests	205*
Professional visitors	5
Student visitors	1
Public contacts	few

Students working with collections

PhD	10
MS	2

* Excludes > 83,000 electronic database requests downloading > 20 million records.

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If you know of someone who might like to become a member, please pass along a copy of the enclosed membership materials or point them to our web page:
www.universityofalaskamuseumbirds.org

RECENT PUBLICATIONS

(FY21)

Withrow, J. J. and M. Lenze. 2021. A Hooded Crane (*Grus monacha*) at Delta Junction, a first for Alaska. Western Birds 52:160-164.

Winker, K. 2021. An overview of speciation and species limits in birds. Ornithology 138: ukab006 1-27. https://doi.org/10.1093/ornithology/ukab006

Determining avian species limits can be a difficult but fascinating problem. Under the biological species concept, lineages that remain essentially independent in sympatry are species. There is no other clear line to mark this stage of the divergence and speciation process. And, with more data, species limits often require reevaluation. Translating what we understand of the speciation process into taxonomic names can therefor be quite challenging. This paper reviews some of the most important issues at play. Hybridization and gene flow are more important than ever, and our taxonomy has not caught up with this aspect of speciation research. There is no silver bullet for species delimitation, and it's unlikely there will ever be one. Careful work using integrative taxonomy in a

comparative framework is the best way forward.

Winker, K., and P. C. Rasmussen. 2021. Perspective: Species limits and taxonomy in birds. Ornithology 138: ukab017.

Graham, A. M., J. L. Peters, R. E. Wilson, V. Muñoz-Fuentes, A. J Green, D. A. Dorfsman, T. H. Valqui, K. Winker, and K. G. McCracken. 2021. Adaptive introgression of the beta globin cluster in two Andean waterfowl. Heredity https://doi.org/10.1038/s41437-021-00437-6

Graham, E. B., C. Averill, B. Bond-Lamberty, J. E. Knelman, S. Krause, A. L. Peralta, A. Shade, A. Peyton Smith, S. J. Cheng, N. Fanin, C. Freund, et al. 2021. Toward a generalizable framework of disturbance ecology through crowdsourced science. Frontiers in Ecology and Evolution 9:76. https://doi.org/10.3389/fevo.2021.588940

Miller, M. J., E. Bermingham, B. L. Turner, S. E. Lipshutz, J. C. Touchon, A. B. Johnson, and K. Winker. 2021. Demographic consequences of foraging ecology explain genetic diversification in Neotropical bird species. Ecology Letters 24:563-571. https://doi.org/10.1111/ele.13674

Comparisons of divergence among 58 lineages of Middle American birds reveal that diet is the most important driver, with insectivore and mixed-diet populations diverging more than plant-dependent species (mostly fugivores and nectivores). We propose and test a model for why this occurs and find support for dispersal and demographic expansion periodically reuniting plant-dependent species across this geographic space. Thus, local ecological and demographic factors here scale up to macroevolutionary phenomena.

Chesser, R.T., S. M. Billerman, K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, N. A. Mason, P. C. Rasmussen, J. V. Remsen Jr., D. F. Stotz, and K. Winker. 2021. Addendum to the sixty-first supplement to the American Ornithological Society's *Check-list of North American Birds*. Ornithology 138 ukaa074 https://academic.oup.com/auk/article/138/1/ukaa074

Funk, E. R., G. M. Spellman, K. Winker, J. J. Withrow, K. C. Ruegg, E. Zavaleta, and S. A. Taylor. 2021. Phylogenomic data reveal widespread introgression across the range of an alpine and arctic specialist. Systematic Biology 70:527–541. https://doi.org/10.1093/sysbio/syaa071

Withrow, J. J. 2020. Plumage variation in Bering Sea *Plectrophenax* buntings and the specific status of McKay's Bunting. Western Birds 51:174-189.

McLaughlin, J. F., B. C. Faircloth, T. C. Glenn, and K. Winker. 2020. Divergence, gene flow, and speciation in eight lineages of trans-Beringian birds. Molecular Ecology 29: 3526-3542. https://doi.org/10.1111/mec.15574 .

Contrasts of UCE-based genomic estimates of divergence and demographic processes in co-distributed high-latitude taxa having divergence levels from populations to full species show that gene flow is a predominant factor in avian speciation in this region. In addition, these taxa are discontinuously distributed on the speciation continuum, showing two clusters in a divergence space defined by F_{ST} and gene flow.

McLaughlin, J. F., and K. Winker. 2020. An empirical examination of sample size effects on population demographic estimates in birds using single nucleotide polymorphism (SNP) data. PeerJ 8:e9939 DOI 10.7717/peerj.9939

Winker, K. 2020. Foreword to C. M. Lochner's *Henry's 1000 Birds and Other Creatures Collected and Preserved for Science and Education*. B. Kim, Copy Alaska, Anchorage, Alaska. ISBN-13:978-0-578-56793-8.

Rheindt, F. E., S. T. Ahyong, V. M. Azevedo-Santos, M. Bertling, P. Bouchard, N. Evenhuis, M. Harvey, M. Irham, F. T. Krell, T. Pape, A. T. Peterson, D. M. Prawiradilaga, R. Pyle, P. Rasmussen, F. H. Sheldon, F. Welter-Schultes, and K. Winker. 2020. Response to O'Connell et al. (2020): Adapt taxonomy to conservation goals. Biodiversity & Conservation 29: https://doi.org/10.1007/s10531-020-02086-3

Chesser, R.T., S. M. Billerman, K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, N. A. Mason, P. C. Rasmussen, J. V. Remsen Jr., D. F. Stotz, and K. Winker. 2020. Sixty-first supplement to the American Ornithological Society's *Check-list of North American Birds*. Auk 137:1-24. https://doi.org/10.1093/auk/ukaa030

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