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# FRIENDS OF ORNITHOLOGY

## Newsletter

Number 9  
November 2012



Grus, The Crane (Willughby & Ray 1678)



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### From the Curator

*Kevin Winker*

This year I am writing from Fairbanks in between two important meetings in Alaska. The first is the biennial Alaska Bird Conference, and the second is the national meeting of the American Indian Science and Engineering Society (AISES). Both are in Anchorage this year, and we were involved with presentations at both conferences. There is a lovely blanket of snow on the ground here in the Interior, and most birds have long headed south for the winter. Some of those remaining are regular customers at our bird feeders. It is fun to enter winter, despite the short days, because we get to go skiing again, students are back and busy, and we get to work with birds!

Several developments this past year are keeping our excitement levels high. We were involved in several presentations at the North American Ornithological Conference (NAOC) in Vancouver in August, where student research in particular was well received. We've spearheaded a new opportunity for undergraduates, the Museum Research Apprenticeship program (MRAP), in which undergrads can do research in the museum and receive academic credit for their studies. And the salvage stream of birds found dead in Alaska and sent on to us for preservation has been rich in important birds to add to the collection, particularly from the Southeast region of the state. So, while field work has been lower than usual this past year, activity levels in other areas have been high and productive. We have a lot to report, and great deal of thanks to relay to you as a Friend of Ornithology. We very much appreciate your ongoing support.

### The Department of Ornithology

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

#### Residents

*Kevin Winker* (Curator)

*Jack Withrow* (Collections Manager)

#### Students

*Jack Withrow* (MS student)

*Kyle Campbell* (MS student)

#### Research Associates

*Heinrich Springer*

*Johannes Erritzøe*

*Rose A. Z. Meier*

*Kevin McCracken*

*Christin Pruett*

*Daniel Gibson*

#### Volunteers

*David Sonneborn*

*Luke DeCicco*

*Steven Heintz*

*Isaac Helmericks*

*Margaret Oliver*

*Joe Morris*

*Brittany McCraw*

*Takae Nakajima*

*Arvia Glass*

*Joey Fricilone*

*Bennett Wong*

*Aurora Hoefflerle*

*Barbara Logan*

*Hayden Nevill*

*Rebecca Dunne*

### FROM STAFF, ETC.

#### Jack Withrow

We often take an opportunity to share work that students and staff here at the museum are doing.

This is of course an important part of our activities, however, much of what we do is geared toward providing research material to a broader group for use in questions we could never have anticipated. Here I outline several examples of our recent loan activities that represent the incredible breadth of research questions that can be answered using specimen material.

Many of our recent loan requests are for tissue samples for use in studies of avian evolutionary genetics. This is currently a hot area of bird research, but at any given time we usually have several tens if not hundreds of skins out on loan to various institutions where they are being used by researchers to answer more traditional questions. For example, we recently sent a sample of Lapland and Smith's longspurs and McKay's and Snow buntings to Eric Atkinson at Northwest College in Powell, Wyoming for use in an undergraduate research project involving morphometric comparisons in relation to habitat structure within *Calcariidae* buntings.

Analysis of stable isotopes to assess life history questions is another popular area of research in birds. We recently loaned samples of talon sheaths from Northern Saw-whet Owls (*Aegolius acadicus brooksi*) from the Queen Charlotte Islands, Canada to Jonathan Moran of Royal Roads University, Victoria, British Columbia. Because this is a species of conservation concern in Canada, he is using isotopic signatures from portions of the talon sheaths to better understand the habitat use patterns of these owls in relation to their use of marine food resources during the year. Results of this study may aid in the management of this endemic taxon. Genetic material from these same owls is being used in my Masters thesis work, a good example of how we often use multiple parts from every specimen. All of these owls were salvaged when found as road kills.

Material in the collection is often used as a reference point or to provide context in the course of research otherwise not directly associated with it. For example, Trevor Haynes, a graduate student in the School of Fisheries and Ocean Sciences here at UAF, studied the diets of Pacific and Yellow-billed loons through identification of fish DNA in fecal samples. To do this he needed to control for inadvertent

amplification of the predator's (i.e., loon) DNA versus that of the prey. We loaned him several fresh loon tissues to help him acquire the needed reference sequences for his study.

Along with the projects led by the curator and graduate students, the collection also provides innumerable smaller projects for interested high school and undergraduate students. This past summer Aurora Hoefflerle, a high school student in the Rural Alaska Honors Institute, and Bennett Wong, an undergraduate student at UAF, used our holdings of Arctic Warblers to determine the taxon that spends the winter in the Philippines. They used a genetic analysis of mitochondrial DNA and reflectance spectrophotometry of plumage characteristics to assign individual wintering birds to one of three clades based on published data. This is a good example of how combining a collection of birds from both wintering and summering localities can increase the collection's overall usefulness.

This has been just a sampling of research currently being conducted on birds from UAM. You really cannot tell where the next request for material will come from, nor which taxa or parts thereof a researcher will request. Dead birds really do tell many tales.

Look for the 19<sup>th</sup> Alaska Checklist early in the New Year, with potentially four additions since last year.



Jack Withrow prepares a ptarmigan in the field (Mark Withrow).

## Kyle Campbell

As my masters thesis draws near a close and graduation looms just around the corner, I find it comforting to look back over what I have already accomplished with the Ornithology Department while pursuing my degree. Not only have I traveled to the Philippines, twice, working with birds and meeting unforgettable people along the way, I have: completed an internship at the National Museum of Natural History in Washington, D.C.; amplified and sequenced over 700,000 basepairs of DNA from over 600 birds from 50 species; performed phenotypic and morphometric comparisons of study skins from over 100 bird populations; and, perhaps most importantly, I have had the opportunity to train, mentor, and educate hundreds of students of varying ages as part of my graduate studies. Whether in the bird lab at the museum or in a K-12 classroom as part of my CASE NSF GK-12 fellowships in 2010-12, I always strive to foster an appreciation for and a curiosity about birds. Most of the time it's simple: exude so much excitement and fascination about the avian world that the students can't help but be intrigued themselves.



### An education kit on birds of prey (K. Campbell)

However, when working with Lathrop High School students last year, I encountered a different sort of reaction. While teenage students did enjoy commenting on and questioning my dedication to ornithology, they seemed more interested in their

teacher's apparent obsession with birds than in the birds themselves. Fortunately, I had some extra tricks up my sleeve. Last year I completed the education kits I wrote about in the 2010 Friend's of Ornithology Newsletter, and I was able to use them as a hands-on addition in the high school classrooms I was working with. It was rewarding to watch teenagers excitedly sort through the study skins and lesson plans I had prepared for the Museum Education Kits. Students that rarely engaged in classwork were fascinated and on task, and it was apparent that specimen-based education kits are effective teaching tools.

I presented the kits at the UA Museum's first annual Educator's Night last year and was pleased with the level of interest expressed by local teachers. I even flew down to Washington D. C. to present some of the kits at the national GK-12 conference last spring and was asked repeatedly whether the kits could be borrowed by teachers outside of Alaska. There are four bird kits available through the Museum Education Department, and so far this year the kits never seem to get any downtime. The kits represent several hundred hours of work by me and undergraduate volunteers, and include over one hundred individual specimens with hundreds more prepared and waiting to be incorporated into the kits. Lessons range from evolution and taxonomy to adaptation and variation, all with an emphasis on the incredible birds found in Alaska. To see a complete list of the education kits and the materials included in each, please visit the UA Museum's website at <http://tinyurl.com/bb4ou9k>.

In addition to working with K-12 students in their classrooms, I mentored high school students on research projects at the museum using study skins and genetic sequence data to answer questions about migration in Alaskan birds. I introduced specimen-based research methods to students in the Alaska Summer Research Academy with an avian murder mystery in which feather samples and DNA from the crime scene (the bird lab) needed to be compared with each of the suspects (study skins) to solve the avicide. I am



proud of the education and outreach work I have accomplished during my graduate studies, and plans are in motion for me to continue developing my role as a science educator in the future. However, I have not lost sight of my central focus, the distribution of diversity and the conservation concerns facing birds in the Philippines and Southeast Asia. As I look to the years ahead, I see continuing graduate studies with bigger questions, larger datasets, and even greater opportunities to interact with students and the public to inspire new generations of curious, bright young minds. I would like to thank the Friends of Ornithology for helping me to accomplish so much, and for helping to foster a fascination and appreciation for birds in the many students affected by the UAM Ornithology Department.



**Aurora Hoefflerle and Kyle Campbell studying Arctic Warbler plumage reflectance (Todd Parrish)**

### **Joey Fricilone**

Dear Friends of Ornithology, my name is Joey Fricilone, and I am a freshman at West Valley High School. I have been volunteering in the bird lab at the UA Museum since September 2011. I became involved in the lab while doing a project for school last year, when Kyle Campbell offered to help me do a project on birds. Kyle took me to the museum's bird collection to look for specimens of migratory Alaska birds that were well represented in the collection with birds

sampled from wintering populations. We selected species that wintered in the Philippines as well as in Central America to work with, and we compared body masses from birds collected at either end of their migrations. I found that, on average, the birds I sampled lost between 8% and 17% of their body mass during fall migration!

After being introduced to the ornithology department through this project, I loved working with birds and preparing study skins so much that I decided to continue volunteering and began regularly attending skinning nights. Kyle trained me on my first five birds and helped me get used to the process in which the birds are measured, skinned, and prepared as study skins to be cataloged into the collection. I started learning how to better identify birds, and I even began learning their songs. I started to go birding more often and was able to better identify the birds I was seeing around Fairbanks. It was great to finally have a place where I could talk about all the awesome birds I was seeing, and listen to others talk about all the amazing birds they had seen recently. With each bird I prepared in the bird lab, I learned more about ornithology, such as the scientific names, geographic ranges, and taxonomic relationships among birds in Alaska. After volunteering in the bird lab through most of the school year and preparing about 15 study skins, Kevin Winker asked me to help Bennett Wong, a UAF biology student who has been volunteering in the bird lab since before I began, with a genetics project on the phylochronology of Swainson's Thrush, *Catharus ustulatus*, in Central America. I worked with Bennett in the molecular genetics lab to extract DNA from frozen tissue samples. We cut the tissues from their tubes, put them in solutions and buffers and used a centrifuge to separate the DNA from the rest of the tissue, before performing polymerase chain reactions (PCR) to amplify our target mitochondrial DNA. Once we had what we needed, I helped Bennett and Kyle prepare the DNA samples to be sequenced. Soon Bennett and I will process the sequence results and finish the project.

Ever since I started going to the bird lab I have been doing exceptionally well in school, and I have begun really thinking about what I want to go to college for. I enjoy my experiences in the lab so much that I think I want to go to school for biology, but possibly another field of science. I am considering going to Cornell University to pursue a degree in biology, focusing in ornithology. Going to the bird lab has opened my eyes and given me an opportunity to do things I didn't even think a 14 year old could do. I am thankful to be able to volunteer in such an exciting place where I can learn and have fun at the same time while working with awesome birds.

### Subspecies or Species? A Teal Tale

*Kevin Winker*

One of the most interesting avian puzzles in Alaska is the fact that we have three subspecies of Green-winged Teal (*Anas crecca*) in the state: nominate *crecca* from Eurasia, the New World *carolinensis*, and the Aleutian *nimia*. The two continental forms are noticeably different in male breeding plumage (see figure at right), and British authorities consider them to be two different species. The American Ornithologists' Union has kept them as subspecies of a single biological species because they hybridize. However, the simple presence of hybridization alone is not indicative of species limits—low levels of hybridization are accommodated in our working concept of biological species. We try to assess the nature and degree of hybridization (gene flow) to determine species limits when two distinct forms like this interbreed when they come in contact. Western Alaska provides an ideal opportunity to do this between *crecca* and *carolinensis*, and we recently completed such a study examining mitochondrial DNA and eight nuclear loci.

The unglaciated history of Beringia is important here. Ice-free conditions during previous glacial maxima and a rich fauna of birds and mammals (including famous Pleistocene animals such as mammoths, saber-toothed cats, camels, and steppe bison) make it highly likely that these migratory teal have bred across Beringia for a long period of time. In other words, their present contact is probably not of recent origin. This distributional condition of two forms in contact at one

edge of their ranges is called 'parapatry,' and our study found that this may be a rare case in which parapatric speciation is occurring. But it has apparently been going on for a very long time, and it is not yet complete. While these two forms of teal began diverging about 2.6 million years ago, at the Pliocene-Pleistocene transition, and they have distinct mtDNA, there is nonetheless a moderate amount of nuclear gene flow between them, mostly coming out of Eurasia into North America. The levels of gene flow that we found, about 20 individuals per generation coming into *carolinensis* from *crecca*, are too high to achieve evolutionary independence, causing the two taxa to be sort of stuck together in evolutionary time through the 'glue' of gene flow. And so, for the foreseeable future, we will continue to consider these two forms to be subspecies of a single biological species (*Anas crecca*), one that we call Green-winged Teal and the Eurasians call Common Teal.



The Eurasian (top) and North American (bottom) forms of Green-winged Teal.

### ANNUAL REPORT— ORNITHOLOGY FY12

It has been another productive year for our group. Department staff, students, and research associates produced 14 publications this fiscal year, and the collection grew by 1,500 specimens. Fieldwork was conducted in Interior Alaska and on Kodiak and Baranof islands. We worked together with other

curators to establish a new museum research apprenticeship program (MRAP) that provides opportunities for students to study with us in the lab and collection, and we hosted several MRAP students. We also hosted two high-school students doing research in our lab. The number and diversity of specimen loans that we make to students and researchers remains relatively high, and the science that this supports is both scientifically and geographically dispersed. We keep a list of publications that have used the collection on our web site (<http://tinyurl.com/8f8o2vd>). In addition to this sort of bread-and-butter science that the collection supports, we also maintain the State bird checklist, and that is downloaded from our site 1,000-2,000 times per year. This year the Bird Collection completely ran out of cabinet space. We are revising a proposal to the National Science Foundation to rectify this situation. As in the past, we've been fortunate to have excellent volunteers again this year. We thank them and the Friends of Ornithology for their ongoing support, which is so critical to being able to achieve such a high level of activity.

Volunteer hours	1,509
Acquisitions	1,500
Publications	14
Reports	12
Loans	20
Data requests	258*
Professional visitors	36
Student visitors	105
Public contacts	~220**

Students working with collections

PhD	2
MS	5
Undergrad & highschool	3

\* Excludes 11,532 electronic database requests.

\*\* Excludes Halloween (745) and Open House (481) events.

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Robert W. Dickerman

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**Contributors**

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Terry J. Doyle  
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Warren R. Jones  
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please pass along a copy of the enclosed membership materials  
or point them to our web page at*

[www.universityofalaskamuseumbirds.org](http://www.universityofalaskamuseumbirds.org)

### Bird Collection featured in new work

During the summer, Tara Champion came to our lab from the United Kingdom to interview us and take photographs of what we do as part of her Masters

thesis in Biological Photography and Imaging. Tara's thesis, which is on Alaska wildlife and conservation, includes an article about our work in the museum entitled "*Collecting for the Future*," which is featured on her web page here:

[www.championimagery.com/collecting-for-the-future/](http://www.championimagery.com/collecting-for-the-future/)

### RECENT PUBLICATIONS (ANNOTATED)

(**Bold** denotes our students)

Peters, J., K. McCracken, C. Pruett, S. Rohwer, S. Drovetski, Y. Zhuravlev, I. Kulikova, D. D. Gibson, and K. Winker. 2012. A parapatric propensity for breeding in teal (*Anas crecca*, sensu lato) precludes the completion of speciation. *Molecular Ecology* 21:4563-4577. *Speciation is a process, but there is no rule for how long it may take. Even low levels of gene flow hinder divergence, so taxa may be poised at the threshold of speciation for long periods of evolutionary time. The Eurasian common teal (Anas crecca crecca) and the North American green-winged teal (A. c. carolinensis) have a complex genomic relationship, but despite beginning to diverge ~2.6 Mya, moderate levels of gene flow may stall this process short of completion. Species delimitation using a single marker oversimplifies the complexity of speciation.*

Crawford, N. G., B. C. Faircloth, J. E. McCormack, R. T. Brumfield, K. Winker, and T. C. Glenn. 2012. More than 1000 ultraconserved elements provide evidence that turtles are the sister group of archosaurs. *Biology Letters* 8: doi:10.1098/rsbl.2012.0331.



Undergraduate volunteer Bennett Wong hosts visitors in the Bird Lab during the Halloween open house event (Carla Willetto).



Srivastava, A., K. Winker, T. I. Shaw, K. L. Jones, and T. C. Glenn. 2012. Transcriptome analysis of a North American songbird, *Melospiza melodia*. DNA Research 19:325-333. doi: 10.1093/dnares/DSS015. *An effective way to understand the genomics of divergence in non-model organisms is to use the transcriptome to identify genes associated with divergence. We examined the transcriptome of the song sparrow (Melospiza melodia) to 1) obtain a functional annotation of a substantial portion of it; 2) compare transcript divergence; 3) efficiently characterize SNP/indel markers possibly fixed between song sparrow subspecies; and 4) identify the most common set of transcripts in birds using the zebra finch as a reference.*

Peters, J. D., T. Roberts, K. Winker, and K. G. McCracken. 2012. A genomic transect of non-coding DNA reveals strong deviations from selective neutrality in holarctic gadwalls. PLoS ONE 7:e31972

Miller, M. J., M. J. Lelevier, E. Bermingham, J. T. Klicka, P. E. Escalante, and K. Winker. 2011. Phylogeography of the Rufous-tailed Hummingbird (*Amazilia tzacatl*). Condor 113:806-816.

Shaw, D., and K. Winker. 2011. Spring stopover and refueling in migrant passerines in the Sierra de Los Tuxtlas, Veracruz, Mexico. Wilson Journal of Ornithology 123:575-587.

Winker, K. 2012. [Review] *Measuring Birds*. Auk 129:565-566.

AOU Committee on Classification and Nomenclature (one of 12 members). 2011. Fifty-second supplement to the American Ornithologists' Union *Check-list of North American Birds*. Auk 128:600-613.

McCracken, K. G., L. A. Alza, T. G. McCracken, and M. M. Smith. 2012. Joint incubation/takeover of Upland Goose (*Chloephaga picta*) nest by Yellow-billed Pintail (*Anas georgica*). Ornitologia Neotropical 23:287-290.

Wilson, R. E., M. D. Eaton, and K. G. McCracken. 2012. Plumage and body size differences in Blue-winged Teal and Cinnamon Teal. Avian Biology Research 5:107-116.

Bulgarella, M., J. L. Peters, C. Kopuchian, T. Valqui, R. E. Wilson, and K. G. McCracken. 2012. Multilocus coalescent analysis of hemoglobin differentiation between low- and high-altitude populations of crested ducks

(*Lophonetta specularioides*). Molecular Ecology 21:350-368.



Young visitors look at the morphology of a Great Horned Owl and watch as Kyle Campbell prepares a scientific specimen during the museum's 2012 Open House (T. Bakker).

Wilson, R. E., M. D. Eaton, S. A. Sonsthagen, J. L. Peters, K. P. Johnson, B. Simarra, and K. G. McCracken. 2011. Speciation, subspecies divergence, and paraphyly in Cinnamon Teal and Blue-winged Teal. Condor 113:747-761.

McCracken, K. G., and R. E. Wilson. 2011. Gene flow and hybridization between numerically imbalanced populations of two duck species in the Falkland Islands. PLoS ONE 6:e23173.

Sonsthagen, S. A., S. L. Talbot, K. T. Scribner, and K. G. McCracken. 2011. Multilocus phylogeography and population structure of common eiders breeding in North America and Scandinavia. Journal of Biogeography 38:1368-1380.

Gibson, D. D., S. C. Heinl, A. J. Lang, T. G. Tobish, Jr., and J. J. Withrow. 2012. Checklist of Alaska birds, 18<sup>th</sup> edition.

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*Friends of Ornithology*  
*The birds of Alaska have never been in better hands.*

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