



**ART AND
ILLUSTRATION
FOR SCIENCE
COMMUNICATION**

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FOREWORD

Art and science might be humankind's two most noble enterprises, and they have lived culturally hand-in-hand ever since our first applications of paint to depict animals, people, and action on the walls of caves. The great mathematician-philosopher Jacob Bronowski wrote passionately about these two enterprises, arguing that they share common origins within the human psyche, driven at once by two parallel and powerful inner forces: our persistent curiosity and our uniquely vivid imagination. In Bronowski's words from *The Ascent of Man*, "The symbol and the metaphor are as necessary to science as to poetry," and "The discoveries of science, the works of art, are explorations... of hidden likeness. The discoverer, or the artist, presents in them two aspects of nature and fuses them into one. This is the act of creation, in which an original thought is born, and it is the same act in original science and original art."

As scientists, we organize and codify our explorations, building upon the organized curiosities of our forebears. As artists, we craft our "data of the senses" into expressions of curiosities and perceptions, interpreting and evoking human emotions. Both of these endeavours involve experiment and vision, and both also involve mistake and failure. Science advances by pushing the boundaries of observation, evidence, and logic while staying aware that error is inevitable, and ideas are vulnerable. Art advances along remarkably parallel tracks, relentlessly probing boundary zones between observation, interpretation, and imagination, sometimes achieving extraordinary brilliance, and other times falling flat.

Humans' relationship with birds tracks Bronowski's theorem throughout the ages. During 1505-06, for example, Leonardo da Vinci wrote *Codex on the Flight of Birds*, having studied how birds fly and imagining how humans might mimic them. His ideas about human flight were abject failures, but his copious illustrations became timeless masterpieces of imaginative engineering. By the 18th and 19th centuries, visionary ornithologist-explorers such as Mark Catesby, William Bartram, Alexander Wilson, and John James Audubon were making fundamental scientific contributions while also exploring previously uncharted artistic spaces. For example, it was the British Museum's ornithologist

OPPOSITE: Bizarre Tyrant Flycatchers by John W. Fitzpatrick

John Gould – famous for ground-breaking lithographs largely created by his wife Elisabeth – who first recognized multiple distinct species among finches and mockingbirds collected by Charles Darwin on the Galapagos Islands, helping pave the way for Darwin's foundational insights about evolution by natural selection. Indeed, to this day the world's great natural history museums routinely bring artists and scientists together in order to catalogue and understand the natural world, and to inspire the public about its wonders. Pioneering naturalist painters of the early 20th century like Liljefors, Fuertes, Rungius, Jaques, Sutton, and Peterson graced both the walls of museums and the pages of influential books, blurring the distinctions between science and art in our discipline.

The interweaving of art with science at the Cornell Lab of Ornithology owes its origin to a newly appointed Cornell professor who understood that birds possess two great powers. Arthur A. Allen recognized that birds offer universal accessibility and striking variety, making them outstanding subjects for scientific breakthroughs about form, function, and ecological relationships in the natural world. Equally, however, Allen appreciated how deeply birds appeal to the human imagination, thus making them focal subjects in painting, sculpture, poetry, song, and folklore through all ages and cultures. Long before Allen's era, John James Audubon had revolutionized natural history art by capturing the dramatic souls of birds in vivid color and life size on double elephant folio paper. But Audubon was also a scientist, studiously documenting essential biological attributes of birds and their habitats in his journals. As luck would have it, the junction of 19th and 20th centuries produced a remarkably gifted young bird artist named Louis Agassiz Fuertes, who is often referred to as "Audubon's successor." Fuertes lived in Ithaca, attended Cornell University, and became fast friends with Arthur Allen. This influential friendship helped reinforce the young professor's recognition of how powerfully birds stimulate the human psyche – both as subjects of science and as inspirations of art.

It is tempting to speculate that Allen's recognition of the binary powers of birds reflected a naturalist's intuition that birds activate both sides of our brain, an idea that would take scientific shape much later with the advent of neurobiology. We now understand that for most of us, our left-brain manages important features of our intellect, speech, logic, and reasoning, while the right-brain plays a dominant role in our less linear functions – the artistic, emotional, and spiritual components of our personality. Birds possess the extraordinary power to light up both sides, often simultaneously. We study them, count them, even learn nature's secrets from them (left brain), even as we marvel at them, write songs and poetry about them, love them, and sometimes even worship them (right brain). Thus, more than any other group of organisms in nature, birds co-mingle our intellect with our aesthetics, endowing them with the power to capture both our minds and our hearts.

While making significant contributions in ornithology and higher education, Arthur Allen increasingly focused on pioneering nature photography, natural history filming, sound recording, and studio productions for the general public during his long career at Cornell. The dozens of undergraduate and graduate students studying ornithology under Doc Allen included a number of talented artists such as Robert Mengel and George Misch Sutton, whose scientific careers were

OPPOSITE: Peregrine Falcons with Eastern Meadowlark by Louis Agassiz Fuertes



profoundly enhanced by incorporating sketches, technical illustrations, and color paintings into their publications. Allen's launch of an annual journal called *Living Bird* in 1960 was a milestone in ornithology, in large part because each issue interspersed dozens of line-drawings, scratchboards, paintings, and even verse among its dozens of technical papers.

Living Bird in its original form was a scientific and artistic success, but at its peak was only circulating to a few hundred scientists, supporters, and libraries. By the time Charles Walcott arrived at the Lab to become its new Director in 1981, birdwatching was rapidly gaining momentum as a popular outdoor pastime for millions of people. Seeing the public's growing interest in birds as a timely opportunity, Walcott made the bold move (controversial within the ornithological community at the time) to convert *Living Bird* from a limited-circulation technical journal into the award-winning color quarterly magazine that it remains to this day. As the Lab's signature magazine, *Living Bird* continues to feature extraordinary color photography and science visualization alongside top-flight science journalism written to stimulate, educate, and inspire a broad public audience about the wonders of birds and their places, habitats, behaviors, and vulnerabilities. Every issue of our magazine thereby strives to be a quintessential melding of art and science.

Today the halls, walls, and grounds of our beautiful Johnson Center for Birds and Biodiversity building are adorned with paintings, prints, and sculptures by dozens of fine artists varying from the traditional realism of Louis Agassiz Fuertes and Frances Lee Jaques to the witty, colorful avian graphics of Charley Harper. Two sprawling murals grace the walls of our Visitor Center. Inspired by Roger Tory Peterson's iconic endpapers from *A Field Guide to the Birds*, James Prosek's Wall of Silhouettes pays homage to the role of birdwatching in the scientific study of birds and their habitats. Jane Kim's *From So Simple a Beginning* is a monumental 2,500 square-foot mural presenting a visually stunning journey through 375 million years of evolution, beginning with the earliest marine tetrapods and ending with a magnificently colorful celebration of modern birds and their global prevalence. Maya Lin's elegant *Sound Ring* is an interactive audio-sculptural component of her *What is Missing?* memorial to threatened and extinct biodiversity around the world. The renowned sculptor's gift to the Lab was in honor of the Macaulay Library's ongoing participation in her inspiring project whatismissing.org. In 2013, the Lab named local Finger Lakes sculptor, and former Cornell professor, Todd McGrain as its first official Artist-in-Residence, following his creation of the dramatic 5-piece *Lost Bird Project*. Today McGrain's evocative two meter tall Passenger Pigeon longingly faces skyward just outside the Lab's entrance. Hidden along a forested trail amidst Sapsucker Woods is a captivating, egg-shaped stone obelisque donated and constructed in situ by the world-famous artist Andy Goldsworthy. Closer to the building, a life sized, gleaming stainless steel Whooping Crane entitled *Invitation to the Dance* by internationally acclaimed sculptor Kent Ullberg was unveiled in 2018 to honor Dr. George Archibald for his research on cranes as a Cornell graduate student, and his subsequent founding of the International Crane Foundation. (The Ullberg crane dances at the site of the previous Cornell Lab building along the edge of Sapsucker Woods Pond.)

OPPOSITE: *From So Simple a Beginning* by Jane Kim/Ink Dwell, photographed by Karen Rodriguez, Noah Warnke, and Jeff Szuc



All of the preceding art-science-birds-Cornell context sets the scene for the subject of the present book, which owes its origins to two of the Lab's most beloved friends and supporters, Phillip and Susan Bartels. Long-time supporters of the intersection of science and art at the Lab, Phil and Susan are indirectly responsible for the modern Lab's distinctive sapsucker logo. The connection began as we opened the new building in 2003, when the Bartels – both huge fans of Charley Harper – donated dozens of Harper's ingenious and playful bird prints to help decorate our behind-the-scenes hallways. The relationship deepened when the Bartels commissioned Charley Harper to design an original collage and poster honoring the Lab and its history. Harper answered the call in spectacular fashion in 2005. His imaginative result, titled *We Think The World Of Birds*, features 39 bird species each of which had deep connection with research at the Lab over our first century. Sadly, this would be the next to last of Harper's last major commissions, as he passed away not long after visiting us in Ithaca to dedicate the work. The Lab would later honor Charley Harper's genius by incorporating his distinctive graphical design into the flying Yellow-bellied Sapsucker at the center of our logo.

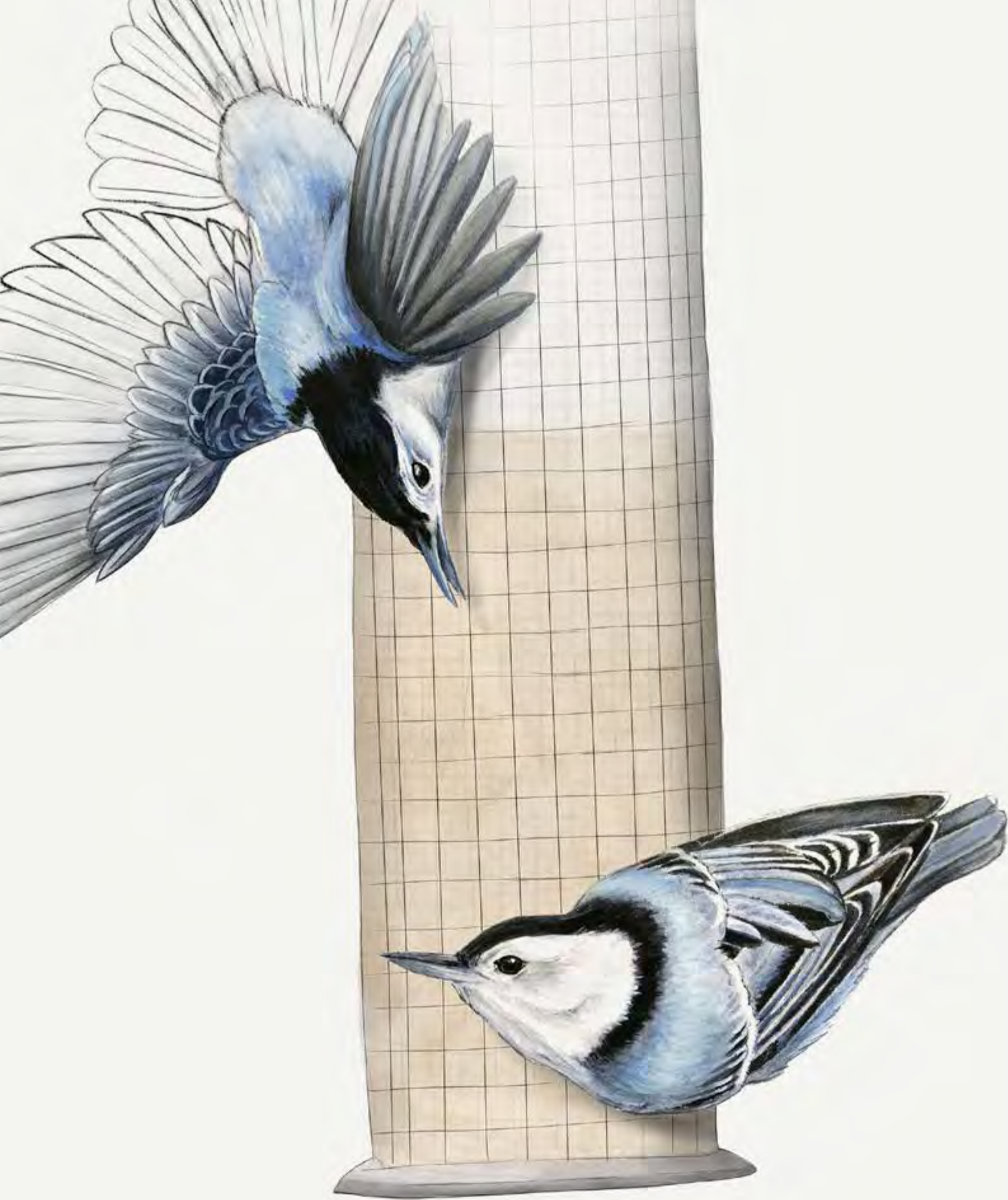
Far and away, Phil and Susan's most visionary and lasting influence on percolating art throughout our sciences at the Lab has been their 2003 establishment of the Bartels Science Illustration Residency Program. This unique and highly competitive annual fellowship has allowed the Lab to host a truly remarkable series of early-career artists who join us in Ithaca for periods of up to a year. Artists come from all corners of our country, challenging themselves and the many scientists around them to explore both sides of our brains. Their styles and favored media are as varied as art itself, and over the years their contributions to the Lab's scientific and public outputs have been prodigious indeed. While learning from Lab experts and our scientific collections exactly how birds are shaped and feathered, Bartels Illustrators have given back to the Lab and the greater science communities in rich and diverse ways. They have created local field guides, citizen science project materials, posters and wall decorations, graphic designs, data visualizations, web pages, technical illustrations, playful cartoons, anatomical drawing, and even cover art for magazines and journals.

Among our most wonderful privileges for living and working at the Cornell Lab of Ornithology, Bartels Illustrators remind us constantly that ornithology in all its forms represents an extraordinarily visual science. Most of us fell in love with birds because they stimulated our imagination and captured our hearts as well as our minds. As every new Bartels Illustrator arrives to work at the Lab, they open their imagination to us and invite us in. As they explore and evolve while working among us, they stimulate our own imaginations to explore the subjects of our research and our story-telling in creative new ways. In short, having Bartels Illustrators in our midst reminds us of Bronowski's profound insight that creativity and evolutionary progress in both science and art stem from the same, remarkably human union of curiosity and imagination. The very existence of the Cornell Lab of Ornithology is a celebration of this union.

John W. Fitzpatrick
Professor, Ecology and Evolutionary Biology, Cornell University
Emeritus Director, Cornell Lab of Ornithology



OPPOSITE: *We Think The World Of Birds* by Charley Harper



INTRODUCTION

The Bartels Science Illustration Program is a truly unique artist residency and training program that has welcomed over 30 early-career illustrators since its inception in 2003. The program offers temporary paid positions to early-career illustrators seeking to gain experience in the fields of science visualization and ornithological illustration. Hosted at the Cornell Lab of Ornithology in Ithaca, NY, artists join the Lab community for periods of six months to one year.

During their time at the Lab, Bartels Illustrators make significant contributions to the Lab's mission to conserve bird populations through research, education, and citizen science. The work of Bartels Illustrators regularly enriches articles for our award-winning *Living Bird* magazine and AllAboutBirds website, and all programs across the Lab frequently commission artwork for educational and scientific purposes.

As a former Bartels alumna myself, I am fortunate to be able to view the program through the lens of once having been myself an early-career artist in a field where professional opportunities are limited. The Bartels Program empowers visiting illustrators to strengthen their skills and portfolios while connecting them to a diverse range of endeavors and experts at the Cornell Lab of Ornithology. The cross-disciplinary collaborations that arise from these connections make profound contributions to the many forms of science communication produced by Lab researchers, educators, and editors. Furthermore, many Bartels Illustrators have continued these collaborations with the Lab far beyond the scope of their residency, fostering important connections at a crucial stage when the artists are just beginning to build their professional networks. A wonderful outcome is that many artists go on to successful freelance practices or find positions within scientific organizations, museums, or graphic design studios.

The cumulative products of this residency testify to the breadth and diversity of artistic styles and visual languages employed by the participants. Although scientific illustrators are often tasked with representing subjects with a high level of accuracy, every artist brings their own personal style and perspective to their projects. The goal of science illustration is not to create a facsimile of nature

OPPOSITE: White-breasted Nuthatches by Jillian Ditner

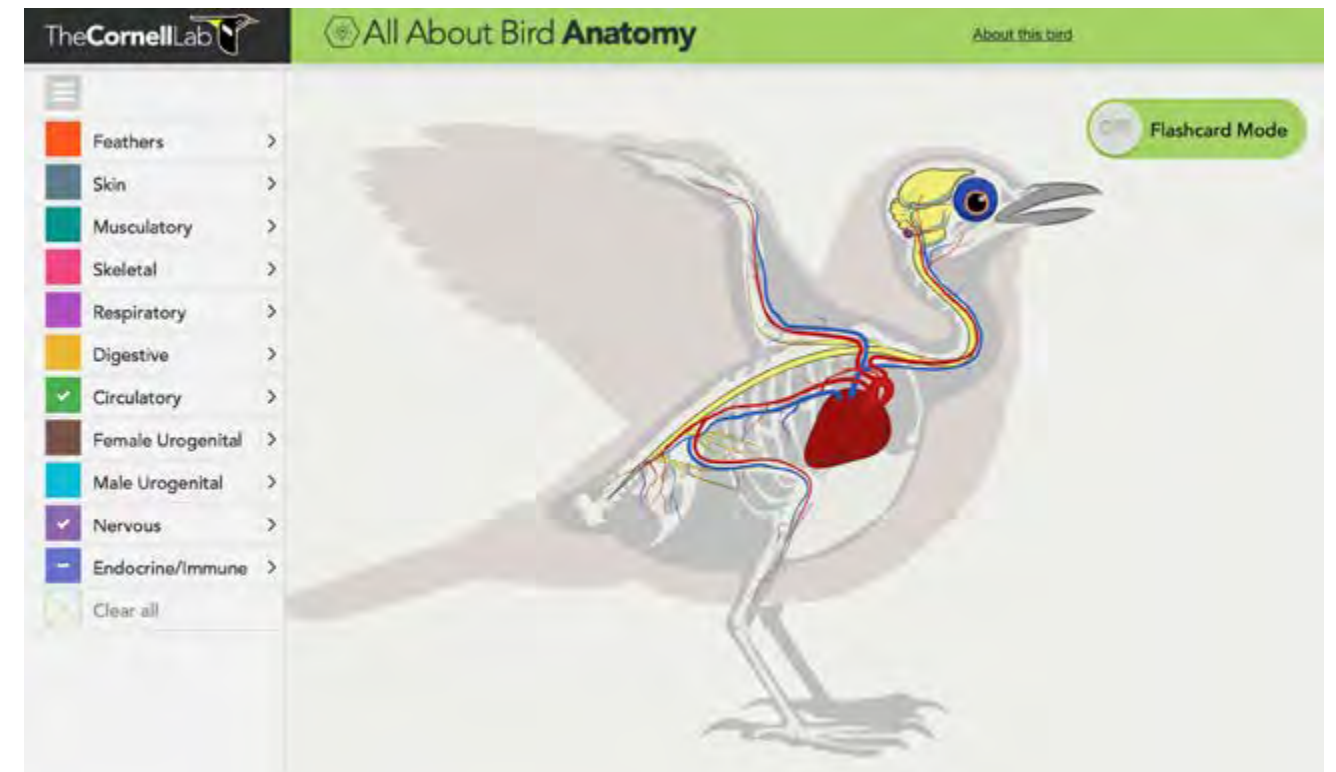
but to apply art and design skills in close observation to translate a personal view of a subject into art that illustrates and supports scientific findings and concepts. By employing varying and appropriate levels of scientific detail, Bartels Illustrators are able to communicate information effectively and engagingly to their audiences. For example, creating artwork that inspires viewers to care about the life of a bird involves aesthetic decisions about composition, lighting, simplification, or exaggeration. On the other hand, depictions that are highly accurate and detailed are key to communicating technical findings and research. It is across this broad spectrum that Bartels Illustrators craft their work for broader audiences.

Through the work of past Bartels participants, it is possible to see how these artistic choices influence the reading of the projects. For example, Evan Barbour, the very first Bartels Illustrator, produced a complete field guide to the birds of Sapsucker Woods at the Cornell Lab of Ornithology. His highly detailed paintings were created for identification purposes and focus on important features and plumages. These illustrations have since been deployed in many of the Lab's communication materials over the years. Likewise, Pedro Fernandes created 72 illustrations for the Lab's NestWatch posters that present visual information on habitat, nest, and food type by showing an interaction between birds on a nest. This ability to tell a story through graphic composition is an important aspect of the Lab's communication with the public.

On yet another axis are illustrations that favor expressive and playful depictions of birds for younger audiences. Work by Frances Alvares shows how these images can capture the imagination of children and young adults, encouraging them to care about endangered species. Alvares' work graces the 14 full-page spreads for *An Eagle's Feather*, an oversized children's picture book that tells the story of Kalayaan, an endangered Philippine Eagle. Artists who prioritize accuracy in their work may also insert a sense of playfulness and storytelling, often suitable for editorial pieces. Misaki Ouchida's illustrations depicting differences between Adélie Penguin and Gentoo Penguin species for the Winter 2016 *Living Bird* article "The Penguin Revolution" are a great example of this. In fact, many artists who create work for *Living Bird* magazine understand it is imperative to bring viewers into the lives of birds by visualizing tantalizing concepts rather than creating coldly technical illustrations. As just one exemplar among many, Megan Bishop's illustrations for the article titled "Surviving Winter" for *Living Bird's* Winter 2019 issue, take a wonderfully imaginative angle that describes the world as birds see it.

As the field of science illustration continues to expand to keep pace with technological advances, a growing number of artists employ digital painting and principles of graphic design in their pieces. Andrew Leach's digitally generated illustrations for Bird Academy simplify bird subjects to their most basic parts. In doing so, the illustrations become easily animated and can be further used for explaining complex bird anatomy and physiology. This is a great example of how biological illustration continues to evolve by absorbing techniques that initially emerged in other disciplines and now are used to better communicate about science.

The projects available to artists through the Bartels residency are wide-ranging. The need for



OPPOSITE TOP: Bird Academy's All About Bird Anatomy interactive, illustration by Andrew Leach
 OPPOSITE BOTTOM: *Living Bird*, Winter 2019, illustrations by Megan Bishop

effective science communication is fully understood and deeply felt across the Lab, and many artists have returned to complete or participate in projects initiated during their residencies. The Wall of Birds mural by alumna Jane Kim is a brilliant example; another is the extremely popular Nature Journaling Bird Academy course featuring Bartels alumna Liz Clayton Fuller, which was inspired by the Galapagos-themed field course that Liz co-led three times for Cornell undergraduates.

Founded in 2003 through the generosity of Phil and Susan Bartels, the Bartels Program has grown over the years to include opportunities that aid illustrators in their future careers. Approaching the program's twentieth anniversary, the Lab is proud to present this overview of Bartels Illustrators and the many ways they intersect with the Lab's broader mission. Meanwhile, the Lab's connections between art and science have reached into additional realms, including the Galapagos-themed Beagle courses, and to the wider Cornell student community through our Ars Aviaria courses. In this book, we celebrate the intersection of all of these endeavors, and feature the Bartels Illustrators who have lent their talents to furthering the Lab's mission to conserve bird populations, and who increasingly engage with new generations of Cornell students and the broad community at the Lab. We invite you to browse through this overview of how art and science weave together at the Lab and to enjoy many highlights of the portfolios of past Bartels participants.

Jillian Dittner
 Bartels Residency Coordinator, Cornell Lab of Ornithology
 Ars Aviaria Coordinator, Cornell Lab of Ornithology
 Bartels Illustrator alumna 2017



OPPOSITE: Splendid Fairywrens by Tara Atluri, student coursework from The Art and Science of Birds, 2021



Specimens from Cornell University Museum of Vertebrates



ABOVE: Bird Nest by Justine Lee Hirten

ORIGINS

Since the inception of the Bartels Program in 2003, the role of the Bartels Illustrators has grown and flourished in amazing ways. Phil and Susan Bartels' appreciation of art and science catalyzed this program, and the culture of the Lab has allowed it to expand in impact beyond the direct contributions of the visiting illustrators. The program was initially housed within the communications department, where it was created and overseen by Diane Tessaglia-Hymes, the long-standing graphic designer for the Lab who recruited a diverse and talented group of illustrators from all over the world. Diane matched illustrators to projects and often encouraged those with graphic design experience to help with projects that would further enhance their portfolios. Within the communications department, the artists had close access to the *Living Bird* team where they learned about the editorial side of the illustration world. The program accordingly grew along a scientific communication theme in which artists contributed work to both print and online articles. These editorial connections and strengths continue to the present day. Bartels Illustrators now work with the Lab's higher education group, in recognition of their role as trainees as well as contributing professionals. Today's artists are broadly connected to all of the Lab's programs, collaborating with the broadest possible range of Lab staff, faculty, and students on projects that advance the Lab's mission through visual media and communications. The program retains its emphasis on being a launch-pad for the careers of the illustrators, empowering them with skills-enhancing and portfolio-building experiences that help them establish themselves professionally in a highly competitive field.

Since its early days, the program has had a hybrid format merging a paid internship, an artist residency, and a training program. Artists explore their interests through self-directed projects, while also working on dedicated assignments that expand their talents and create impactful media for Lab programs and publications.



RESOURCES

The experiences of Bartels Illustrators and Cornell student artists are enhanced by the many special resources available to them through the Cornell Lab and from across Cornell University, including the 2 million study specimens in the Cornell University Museum of Vertebrates; expert project oversight and mentorship; collaborations with scientists and researchers; participation in the Lab's sophisticated science communication, education, and conservation media groups; access to Cornell University's extensive library system; and the opportunity to study original art by Louis Agassiz Fuertes, George M. Sutton, Andrew Goldsworthy, Charley Harper, Maya Lin, Jane Kim, James Prosek, the impressive community of former Bartels Illustrators, and many others.

CORNELL UNIVERSITY MUSEUM OF VERTEBRATES

The Cornell University Museum of Vertebrates (CUMV) is a natural history collection co-located with the Cornell Lab in the Johnson Center for Birds and Biodiversity. The CUMV contains 2 million specimens spanning all vertebrate groups: birds, mammals, reptiles, amphibians, and fishes. This collection supports many kinds of biodiversity science while serving as an important resource for undergraduate and graduate education, including our undergraduate courses in bird illustration. Illustrators frequently make use of the CUMV's bird skin specimens, skeletal specimens, wings, feathers, and eggs. These physical materials are extremely valuable to illustrators who seek accurate information on plumage color and pattern, skeletal and body size measurements, the exact size and shape of a bird species' beak, or other anatomical details evident from real specimens. Most of our Bartels Illustrators never previously had direct access to any kind of museum collection and see this as a unique opportunity of substantial value. These materials are also regularly brought out to serve as models in our art courses with scientific themes.

OPPOSITE: Specimens from the Cornell University Museum of Vertebrates

ART COLLECTION

The Cornell Lab's long association with ornithological art is displayed across the walls of the Imogene Powers Johnson Center for Birds and Biodiversity, and even more of the Lab's art collection is archived within the Cornell library system. This wonderful collection of historical and contemporary artworks focused on birds includes sketches, watercolor and oil paintings, and murals. The Lab's art collection includes works from notable artists such as John James Audubon, Louis Agassiz Fuertes, George M. Sutton, Roger Tory Peterson, and modernist Charley Harper. In the last two decades, the collection has grown from classic works to include the art produced by Bartels Illustrators and, in some cases, by former Bartels Program alumnae. One outstanding example is the Wall of Birds mural by Jane Kim of InkDwell that covers an entire wall of the Lab's Visitor Center. On the opposite wall, another impressive mural is composed of bird silhouettes, created by artist James Prosek.

EXPERT CONSULTATION

Nowhere else could Bartels Illustrators and students have access to such deep expertise on all aspects of birds and avian biology. Cornell Lab staff provide information and feedback on active art projects, ensuring that bird anatomy is depicted accurately and that birds are featured in appropriate habitats and postures. This in-person expertise is complemented by the Macaulay Library's holdings of over 34,000,000 photo, audio, and video recordings. This media collection is the world's premier scientific archive of avian natural history recordings, photographs, and videos, providing a direct window onto the behavior and natural history of the world's birds.

BARTELS ILLUSTRATION ARCHIVE

Bartels Illustrators have generated hundreds of artworks during the past two decades. Each participant's artwork has been carefully documented and archived in digital form. Original artwork is scanned at high resolution and digitally-created artworks are uploaded directly. This archive creates a permanent record of the contributions of these individuals during their Bartels residencies and allows the Lab to reproduce these pieces for future scientific, outreach, and educational purposes.



OPPOSITE: From *So Simple a Beginning* by Jane Kim/Ink Dwell, photographed by Karen Rodriguez, Noah Warnke, and Jeff Szuc



ARS AVIARIA

The Lab's **Ars Aviaria program** brings together art and science to create powerful learning and life-enrichment opportunities for Cornell students. The name of this program speaks directly to the power of combining birds, science, and art: the Latin *Aviaria* means 'of birds,' while the Latin *Ars* has no direct equivalent in modern English; it refers to a combination of specialized intellectual knowledge, artistic expression, and skilled handiwork, reflecting the ancient linkages among these spheres of understanding that we now treat as distinct. The mission of the *Ars Aviaria* program is to embed artistic training in classes that crosstalk between the sciences and art, leveraging the skill and passion of the Lab's staff artists and Bartels Illustrators and teachers and role models. We thereby help science-minded students see birds through the lens of artistic representation and art-minded students understand some of the science behind the avian diversity that they illustrate and enjoy.

THE ART AND SCIENCE OF BIRDS

This flagship course offering in the *Ars Aviaria* program is aptly entitled *The Art and Science of Birds* (Bioee1130). Offered every spring, it explores aspects of bird diversity and anatomy through a semester of hands-on art lessons. The course is extremely popular, attracting a waiting list of 60+ students beyond the 20 spots available. Taught by Jillian Ditner, the Lab's Illustrator and Bartels program alumna, it also provides Bartels Illustrators a professional credential by giving them the chance to contribute to class lectures and art demonstrations.

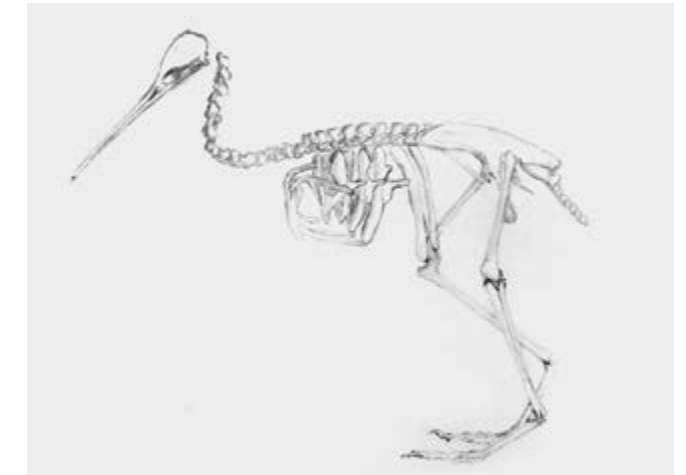
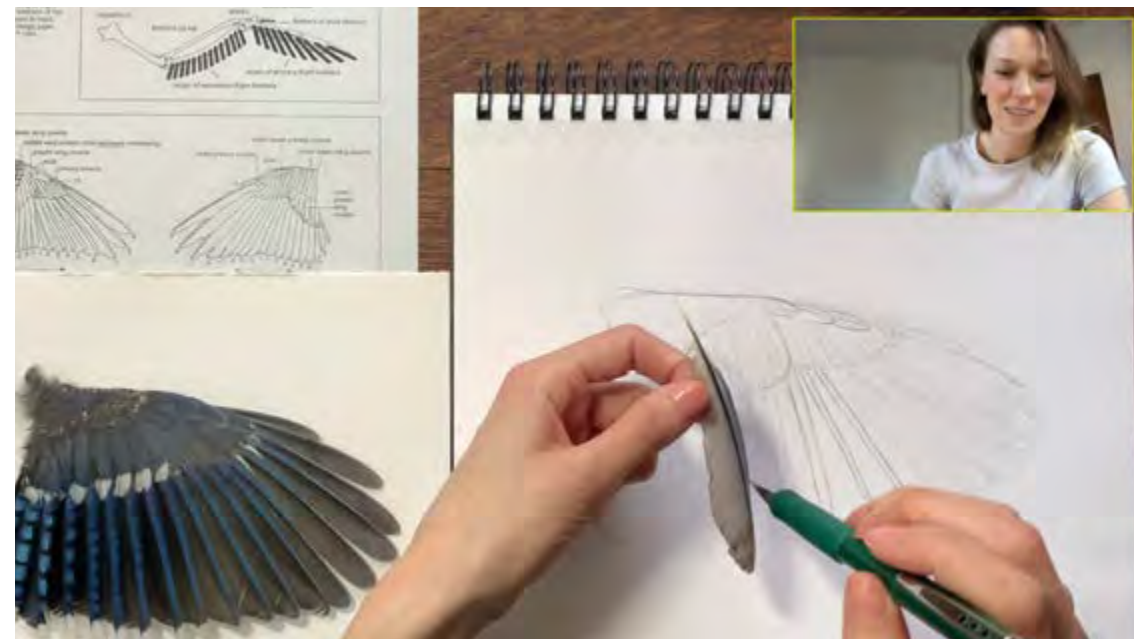
This art practicum on sketching and watercolor techniques is reinforced by lectures and short videos that introduce avian biology content related to each week's art lessons. For example, students learn about the biology of feather coloration at the same time they are developing their skills in watercolor painting. Students then spend most of their in-class and homework time on a progressive series of art assignments designed to refine their skills in sketching and painting birds, and which make them closer observers of avian form and function.

The capstone course assignment challenges the students to combine their newly acquired art skills and knowledge of various aspects of bird anatomy and morphology to create a watercolor study of a chosen species. Intended to broaden understanding of how individual bird species have evolved vastly different physical adaptations to suit a range of environments, this assignment requires students to make biological notes directly on the page to annotate their visual research.

OPPOSITE: Student work created for The Art and Science of Birds Course

A NEW FORMAT AND EXPANDED LESSON PLANS

In March 2020, we faced an unanticipated change to our instructional approach when all Cornell classes suddenly switched to remote instruction halfway through the semester. Although initially daunting, the conversion to online classes ended up working out well for both the instructors and participants. Many of the students told us that their drawing practice became even more important as a stress-relieving activity in a time when so many of their normal routines were disrupted. We carried on with most of the course content and activities as they were originally planned, moving the class sessions to Zoom where Jillian gave a short lecture and demonstration and then engaged with students as they worked on their art assignments, answering questions and offering feedback and advice. One major adjustment came after we discovered that many of the students had travelled home without taking their watercolor kits with them (we had not yet come to the painting modules when the pandemic campus closure was implemented). We turned this into an opportunity to delve deeper into bird anatomy as a way to strengthen the students' drawing and observational skills. In addition to a class on avian skeletal structure, Jillian taught lessons focused on wing anatomy, feet and leg anatomy and skull morphology. These changes have endured as part of the course curriculum. As the students have told us, one big benefit of this course extends far beyond what they are putting on paper with their pencils and brushes: they found that art can be a helpful way to focus on the present, especially during particularly stressful periods in a student's life.



OPPOSITE: Instruction in the Zoom classroom in 2020

TOP AND LEFT: Student homework assignments focused on bird anatomy

BELOW: Class photo on last day of course in 2022. Students hold up their final watercolor projects.



GALAPAGOS FIELD COURSE

Since 2012, the Lab has sponsored a special curriculum for first-year Cornell biology students via a series of full-semester classes linked to a trip to the Galapagos archipelago. This curriculum has always included a special Galapagos-themed version of Evolutionary Biology and a first-year writing seminar that explores human perspectives on those islands. In 2016 we added a third course (Biog1250) on field sketching and journaling that now serves as the fulcrum for the entire curriculum, challenging students to look very closely at the natural history of the animals and landscapes they experience in the Galapagos and providing them a platform to express their own perspectives about this otherworldly environment.

Taught in its first three offerings by then-Bartels Illustrator Liz Clayton Fuller and now by Jillian Ditner, this art practicum course meets weekly during the spring semester. Students learn basic sketching and watercolor techniques that can be deployed in a field setting. Once in the Galapagos, daily assignments revolve around journaling and art opportunities. The wildlife of the Galapagos is unafraid of humans, so students can sit quietly just a few yards from a booby, sea lion, or marine iguana while they sketch or paint intricate details of those animals and write detailed notes about their observations.

Students relate that these sketching opportunities cause them to experience the Galapagos in a much deeper and richer way, immersing them in the moment and giving them a sense of place that they would never have experienced through the lens of a camera. Many Galapagos curriculum alumni continue to practice their art after the semester is over; one later landed a permanent job as a National Park Service ranger owing in part to her talents in using art to create interpretive materials for the public.

ART AS A LEARNING TOOL

Our courses centered on art and science have highlighted how sketching and painting can serve as extremely powerful forms of learning enrichment. We have now added a similar art component to various other classes that require close observation of birds or other biological themes. For example, our Global Avian Diversity course (Bioee4750) centers on weekly laboratory sessions that present specimen examples of all 240 avian taxonomic families. In earlier offerings, students would scramble to memorize the names and attributes of these taxonomic groups, often without really looking closely at the birds themselves; the students' flashcards were their primary learning tool, not the specimens. In fall 2021 we added a sketching component to the lab sessions, in which the students drew and annotated representatives of each avian group in their lab notebooks. They were then allowed to use these sketchbooks on the laboratory practical exams, removing the need for rote memorization and emphasizing a deeper and more observational and interactive understanding of avian biodiversity. The students greatly appreciated this alternative learning approach and responded by spending extra time on working with the specimens in the lab sessions. Not all students in this class came in with art training, but all were able to use their sketches as a vehicle for close observation.



ON THIS PAGE: Student field sketching journals with watercolor sketches and written notes



HUBBARD BROOK FIELD ORNITHOLOGY AND ART RESIDENCY

The Lab's Hubbard Brook Field Ornithology Program is our flagship field-based research and training program in ornithology for undergraduates. The field components are based at the Hubbard Brook Experimental Forest in the White Mountain of New Hampshire, which since 1969 has hosted the longest-term study of migratory songbirds. A highly interdisciplinary team of scientists, educators, and students from the Cornell Lab of Ornithology, Smithsonian Migratory Bird Center, and other external partner institutions study how migratory birds respond to changes in their environment.

Led by Lab scientist Dr. Sara Kaiser, a team of Cornell undergraduates currently work on projects related to the choices Black-throated Blue Warblers make in response to climate change, including changes in the timing of key events in their annual cycle, which could directly impact their population dynamics. Students simultaneously create their own independent research projects. Most recently, Sara has partnered with the broader Hubbard Brook Ecosystem Study to create a new student artist residency to bring scientists and artists together for collaborative projects that can help to better understand and visualize natural systems.

Inspired and informed by the Lab's Bartels Science Illustration Program, this residency offers student artists the opportunity to create professional level scientific illustrations to accompany ongoing research projects. Working with Jillian Ditner as the art advisor and Sara as the science advisor, the artist attends weekly lab meetings throughout the semester to develop an illustration project in collaboration with undergraduate student research. The artist is supported through regular meetings with Jillian to receive feedback on their artwork. The end result is that the student artist gains experience collaborating with students as clients to produce materials that visually explain aspects of their science.

The program invited its first artist in residence in 2022. Raisa Kochmaruk, a recent graduate of Cornell (Class of 2021, as an Environment and Sustainability major) inaugurated this program. Raisa produced not one, but three main projects: a series of technical illustrations depicting female plumage variation in the Black-throated Blue Warbler including a spread wing; a graphic showing nestling growth stages for use in the field to help systematize research protocols for students tasked with checking nest status; and an impressive large-scale indoor mural of the Hubbard Brook Experimental Forest celebrating species under study and featured prominently at the USDA Forest Service Northern Research Station, headquarters for the community of Hubbard Brook scientists.

Through the Hubbard Brook Undergraduate Artist Residency Program, artists learn that they are an indispensable part of the scientific community. The ability to translate ideas into visuals that can be used to communicate scientific information is crucial for sharing complex concepts in an engaging and easily understandable way.

TOP LEFT: Nestling development stages guide by Raisa Kochmaruk
 TOP RIGHT: Black-throated Blue Warbler spread wing in dorsal view by Raisa Kochmaruk
 BOTTOM: Hubbard Brook Mural and details by Raisa Kochmaruk



ART FOR ALL LAB PROGRAMS

In keeping with the interplay between art and science that has enriched ornithology since the origin of the discipline, the Bartels Science Illustration Program collaborates with all Lab programs to produce artwork for specialized applications, spanning highly technical illustrations that accompany scientific papers, to humorous and playfully presented depictions of birds and birders used for outreach to the public. Along the way, resident artists of the program gain experience across a range of artistic skill sets, approaches, and types of media, thereby building their portfolios in ways that enhance their subsequent careers as professional illustrators.

LIVING BIRD AND BEYOND: COMMUNICATING ABOUT SCIENCE

Some of the most prominent projects contributed by Bartels artists are those that reach audiences of hundreds of thousands via the Lab's print and online media outlets, particularly via features in *Living Bird* magazine. Through working closely with *Living Bird* authors and the Lab's editorial team, artists create compelling visual stories that help readers understand complicated topics, or that draw them in to urgent conservation topics. As with the Lab as a whole, the goal for these science communication pieces is to communicate reliably, authoritatively, and compellingly about the subject matter, even if it is challenging to understand or potentially controversial.

Gus Axelson, Editor of *Living Bird*, notes, "The art of science illustration can make our stories far more understandable and meaningful for the reader. Art can engage the brain and touch the heart, which is why our readers have memorable experiences when they read a story that features the talents of a Bartels Science Illustrator. At a magazine I worked at previously, we could afford to run only one or two science illustrations per year, due the cost and difficulty of working with freelance artists in faraway places. The opportunity to have such talented science illustrators right here in the Cornell Lab, where they can fully integrate and collaborate with the editorial team—and the luxury of being able to commission multiple science illustrations for each issue—was a game changer for *Living Bird*, and helped set our magazine apart in how we tell stories."

Living Bird readers often write in to extol the beauty and power of the artwork that accompanies these articles, offering comments such as, "Quality scientific content that is easy to understand. Amazing graphics and art that are ideal teaching aids as well." And, even more straightforwardly, "My favorite magazine with thought-provoking articles, great photography, and wonderful illustrations!"

Miyoko Chu, Senior Director of Science Communications notes "The Bartels Science Illustration Program enables early-career artists to enliven the work of the Lab and expand its impact, while building portfolios to launch their professions. Many artists have remained collaborators through the years, helping the Lab to create its iconic mural, coloring books, puzzles, field guides, live art workshops, graphic novel for children, and so much more, continuing to give life to art that inspires people around the world to love and protect nature."



OPPOSITE TOP: *Living Bird*, Autumn 2019 issue, design and graphics by Jillian Ditner, Bartels Program alumna 2017
 OPPOSITE BOTTOM: *Living Bird*, Winter 2022 issue, illustrations by Virginia Greene, Bartels Program alumna 2017

PARTNERSHIPS WITH LAB SCIENTISTS

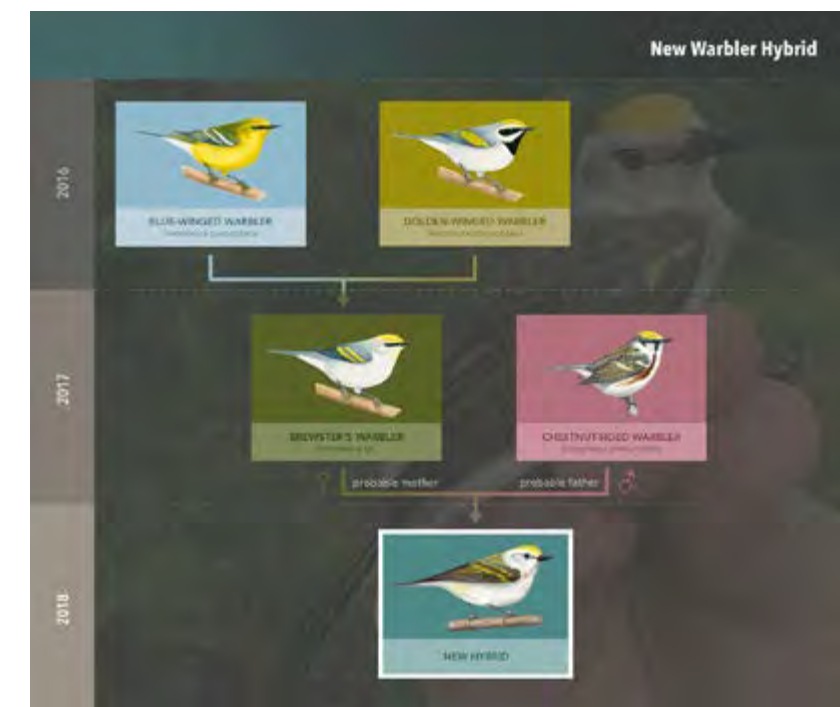
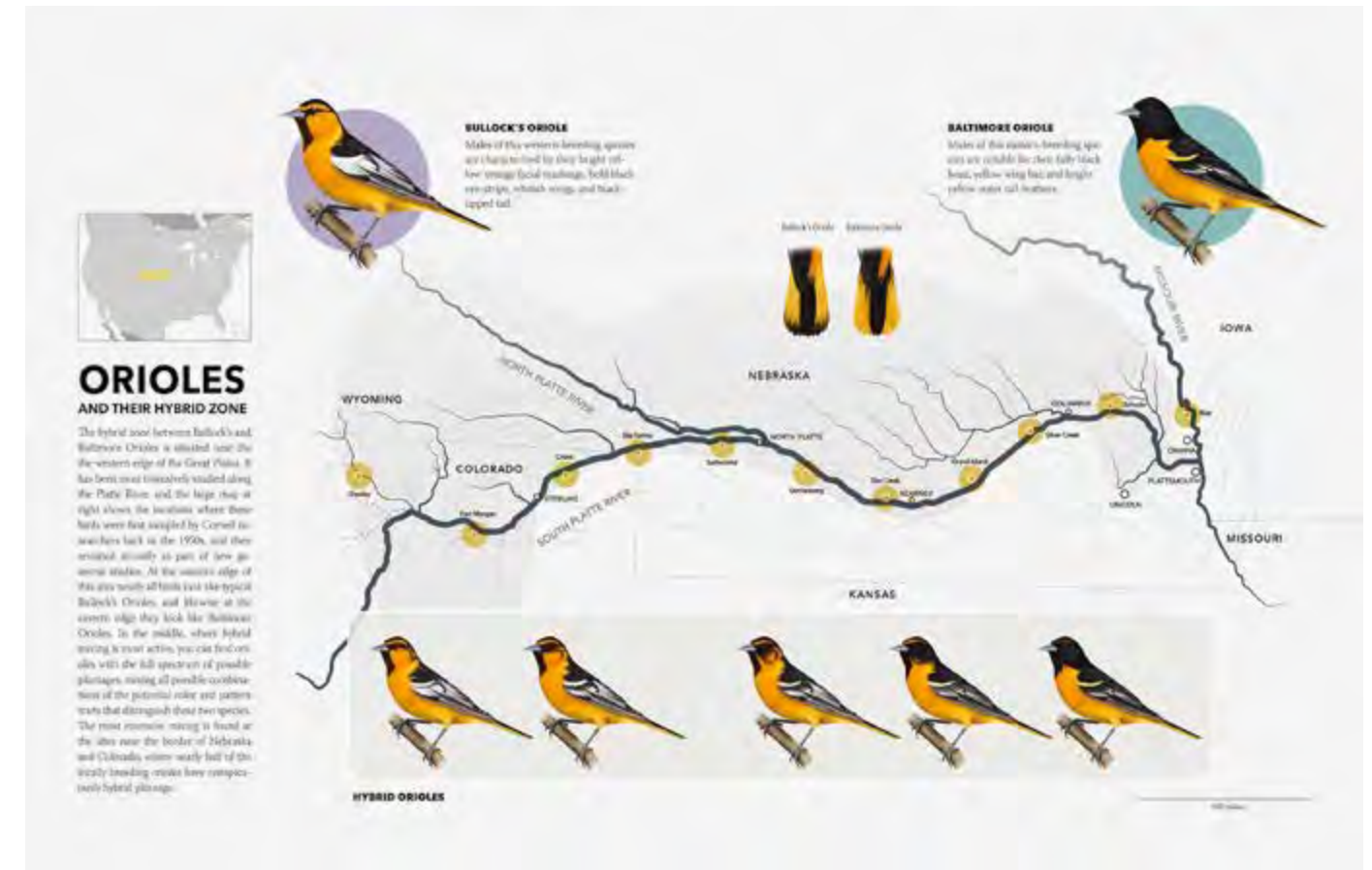
Biological illustration has great power in help researchers explain their findings to their peers and colleagues, and in helping elevate a scientific discovery in ways that make it interesting to broader audiences. The Bartels artists regularly work collaboratively with scientists from all Lab programs to create visuals for scientific papers, and for the press releases and public articles that accompany them. This kind of partnership requires careful attention to the precise details of the discovery being illustrated, combined with the artist's expert understanding about how art, layout, and design can best lead observers to a deeper understanding.

During the shut-downs of the Covid-19 pandemic, the return of the Bartels Program was mentioned frequently as one of the top desires of the Lab's community of scientists, from graduate students to the most senior faculty. As put by Rose Postdoctoral Fellow Dr. Sabrina McNew, "The Bartels Residency is one of the most amazing programs at the Lab. Having professional illustrators in-house who can help us communicate and share our science is simply incredible. I am always blown away by their talent and ability to visualize and share the natural world. Their work makes my papers and presentations so much more sophisticated, polished, and effective. I don't know what I'll do when I leave the Lab of Ornithology, since it's so rare to have access to in-house illustrators!"

Former Lab graduate student Jake Berv, now a postdoc at the University of Michigan, is similarly complimentary about his collaboration with the Bartels Program. As Jake relates, "The value of thoughtful visual representation of data or study organisms really cannot be overstated, especially when it comes to natural history research. In the context of research programs that are increasingly computational, it also is easy to become aesthetically divorced from the organisms we study, and to become so focused that we start to lose our appreciation of beauty in the natural world." Jake worked with Bartels illustrator Phillip Krzeminski to create a moving depiction of a dinosaur-era bird fleeing from the meteor impact that ended the Cretaceous Period, an illustration that graced the cover of the eminent journal *Current Biology* in which Jake's associated paper appeared (page 91). Jake goes on to say, "In addition to receiving direct feedback on how best to present my research to diverse audiences, being able to interact with the Bartels artists during my time at the lab was incredibly helpful in reminding me that there are many ways to appreciate the organisms we study. These art-and-science interactions were a true highlight of my experience as a graduate student associated with the Cornell Lab!"

Oftentimes, the imagery created by Bartels artists for scientific publications also finds its way into the public sphere, via social media or other channels. This has a feedback effect on increasing the prominence of the original research reports. Former Lab postdoc Dr. David Toews, now an Assistant Professor at Penn State University, hits on this theme in noting, "I always love the framing of Edward Tufte, who describes well-illustrated science as "beautiful evidence." Without the Bartels Program a lot of our papers wouldn't have included such visually impactful science! For example, by just doing a Google image search "plumage genes and little else" you can immediately see the long public reach the golden-winged / blue-winged warbler illustrations have had!"

OPPOSITE TOP: *Living Bird*, Spring 2022 issue, oriole illustrations by Megan Bishop, design and map by Jillian Ditner
 OPPOSITE BOTTOM: *Living Bird*, Winter 2019 issue, graphic by Jillian Ditner featuring illustrations by Liz Clayton Fuller



BIRD ACADEMY

The Lab's Bird Academy provides online courses that serve birders, nature enthusiasts, and budding ornithologists by helping them develop the skills and confidence needed to feed their passion. Public engagement and education have been part of the Lab since its founding, and Bird Academy continues this century-old tradition by engaging modern audiences through cutting-edge online course offerings.

Bird Academy was initially sparked by moving the Lab's venerable Home Study Course in Bird Biology to an online platform, while simultaneously upgrading it to become the framework for the Lab's flagship Comprehensive Bird Biology course. This and subsequent courses developed by the Lab required technical yet broadly comprehensible scientific illustrations and animations. Bartels illustrators like Andrew Leach and Jillian Ditner created many compelling visuals that were embedded within the platform's first online courses. In return, artists gained this additional dimension in their own professional portfolios. Some of these pieces were also deployed in the associated 3rd edition of the Lab's *Handbook of Bird Biology* textbook, and the work of many more Bartels illustrators will grace the pages of the forthcoming 4th edition. Meanwhile, more than 8,500 online students have enjoyed these biological illustrations and animations as they have worked towards completing their Comprehensive Bird Biology coursework.

Bird Academy founder Mya Thomson says, "The Bartels Program has been integral to the success of our online courses. By partnering with these talented artists, we have been able to support our students in visualizing tough concepts and learn from the deep beauty inherent in bird biodiversity. One of Andrew Leach's stunning feathers has been my constant companion throughout the pandemic, backing me up on Zoom as a reminder of the beauty and wonder of birds."

Connections between the Bartels Program and Bird Academy became even more direct with the launch in 2019 of the Nature Journaling and Field Sketching course led by Bartels alumna Liz Clayton Fuller. This offering has been one of Bird Academy's most popular courses, reaching more almost 10,000 online students! Liz first designed this teaching approach as part of her in-person teaching of the Lab's Galapagos curriculum for Cornell undergraduates, which she initiated during her Bartels residency.

The Bird Academy development team then worked with Liz to expand these instructional modules for a wider public audience. Bird Academy project manager, Laura Helft says, "Nature Journaling remains one of our most well-liked courses, primarily because Liz is such a warm and knowledgeable instructor. The Bartels Program is essential for connecting us with these sorts of talented teachers and practitioners of art." Online students who have taken the course similarly sing its praises: "I would like to thank Liz for the miracle that she made happen by teaching me how to draw. Prior to the class I only drew terrible stick figures! She gave me a lifelong skill!"

Bartels Program connections to Bird Academy are continuing through multiple channels, with current Bartels illustrators continuing to generate artistic content for courses under development, and Bartels alumna Jane Kim serving as the instructor for the forthcoming *How to Draw and Paint Birds*.



OPPOSITE TOP: Feather illustrations by Andrew Leach for Bird Academy's All About Feathers Resource

OPPOSITE MIDDLE: Field sketching notebooks by Liz Clayton Fuller for the Bird Academy course Nature Journaling and Field Sketching

OPPOSITE BOTTOM: Hairy Woodpeckers by Jillian Ditner for the Bird Academy course Think Like a Bird: Understanding Bird Behavior

INSPIRING GIFTS FOR LAB MEMBERS

Bartels artists create spectacular art that is featured on gifts for new and continuing Lab of Ornithology members in the form of cards, coffee mugs, tote bags, and more. "The beautiful art created for us by the Bartels Illustrators sets our thank-you gifts apart," lauds Cornell Lab Membership Director Jessica Cassidy. "They are truly special. Many of our members tell us that they join at a higher giving level just to get those special thank-you gifts."

For Bramble Klipple, the Lab's Senior Director of Advancement, it is the cards created by Bartels Illustrators that have the greatest personal impact "Those cards are just so lovely," Bramble says. "They each reflect the personal style of the individual artist, while having a consistency that makes them collectively a symbol of the Lab's power to use art to celebrate the joy that birds bring to our everyday lives. Someday I plan to frame at least a dozen of those cards and hang them on my wall at home!"

The feedback we receive from Lab members echoes these sentiments. "I received my first mailer from you and enclosed were three of the most charming greeting cards," wrote one new member. Like many who write to us about those cards, she wanted to know how to obtain even more: "Is it possible to buy a set or several? They are so lovely!" The Bartels Illustrator tote bags are equally popular: "Normally I decline the free gifts so more money goes to the cause, but I really liked the artwork and people at the store routinely remark that it is the nicest bag they have ever seen." And not to be left out, the illustrated Bartels mugs have a wide fan-base among our members. As one member emailed to our membership team, "I love sipping my morning coffee from my CLO mug depicting Black-capped Chickadees in a winter scene while enjoying the morning birds on my back deck. It's just not the same in some random mug."



OPPOSITE: Membership greeting cards with art by Megan Gnekow
 TOP LEFT: Holiday cards with art by Jillian Ditner (left) and Jen Lobo (right)
 TOP RIGHT: Grocery tote with artwork by Liz Wahid
 BOTTOM: Mug with artwork by Megan Bishop

BARTELS
SCIENCE
ILLUSTRATORS
2003-2022

Cedar Waxwings by Ann-Kathrin Wirth





Evan Barbour

Evan came to the Cornell Lab of Ornithology from the Scientific Illustration Graduate Certificate Program at the University of California, Santa Cruz. For his residency, he created the illustrations for, and designed the book *The Birds of Sapsucker Woods*, a field guide to 100 common birds. During the 18 months of his residency, he created all the original watercolor paintings for the book and several pen-and-ink drawings that were used in *BirdScope* and other Lab publications. His original watercolors, which have been used for a bird-identification kiosk at the Cayuga Waterfront Trail in Ithaca, New York, and the book, *Maine's Favorite Birds*, published by Tilbury House Publishers, now hang in the Lab's hallways and offices.

After leaving the Lab, Evan illustrated several publications, including two books for John E. DuPont, *Birds of the South Pacific* and *New Caledonia Birds*. Evan then earned his MFA in Studio Art from Mills College where he was mentored by the late Hung Liu. Utilizing his background in science illustration, Evan's conceptual paintings, sculpture, and photographs have now been featured in exhibitions throughout the Bay area. This pivot to fine art led Evan to a career producing exhibits for institutions such as the Oakland Museum and the Aquarium of the Bay in San Francisco.

Evan currently resides in the Sierra Nevadas, freelancing as an exhibit fabricator, and continuing his work as a bird illustrator and naturalist. At the heart of all his pursuits lies a fascination with the under-appreciated aspects of nature and a desire to share that curiosity with others.



ABOVE: Golden-crowned Kinglets
OPPOSITE: Various species for *The Birds of Sapsucker Woods Guide*



Katherine Smith

Katherine arrived at the Cornell Lab of Ornithology wanting to draw birds after receiving her Scientific Illustration Graduate Certificate from the University of California, Santa Cruz. During her time at the Lab, Katherine painted and designed our first guide to the Autumn trails of Sapsucker Woods and created illustrations for the Lab's quarterly newsletter, *BirdScope*. Upon completion of her residency, she remained at the Lab to finish the trail guides for winter, spring, and summer.

"My internship turned into a year of my dream job," she said. "Living in a new part of the country, making friends at the Lab, and participating in so many different projects was as rich an experience as I could have hoped for. In particular, I invested a huge amount of my time in the trail guides, cramming as many animals as possible into them!" Another piece of her work that had far reach was a pencil illustration of a Sooty Shearwater. Originally created for *BirdScope* (Autumn, 2006) it was later used for the cover of a book about the natural history of the Sooty Shearwater, coffee-bean packaging for Shearwater Coffee, and the cover of a memorial journal made by a family in Istanbul, Turkey, to honor a notable woman whose favorite bird was the Sooty Shearwater.

After leaving the Lab, Katherine returned to California to create production art for a medical brochure company and later turned her illustration skills to making flashcards and worksheets when she lived in Japan as an English teacher. She now works as a finance analyst for the California Department of Forestry and Fire Protection (CAL FIRE) and in her free time continues her passion for illustration. She has written and illustrated a series of fantasy novels and children's books. Yet, even in the fantasy world she creates, she strives to include as much scientific accuracy as possible.



OPPOSITE: House Sparrow

ABOVE: Autumn Trail Guide to Sapsucker Woods

LEFT: Summer Trail Guide to Sapsucker Woods



Pedro Fernandes

Pedro, an illustrator from Portugal, received his training from the Scientific Illustration Graduate Certificate Program at the University of California, Santa Cruz. For his primary project, he created two posters for the Lab's NestWatch citizen-science project. For these, Pedro painted 75 birds using an unusual technique of pencil and gouache on translucent Mylar paper, adding details with colored pencils. Pedro and his special technique were featured in a video made at the Lab about the Bartels Science Illustration Program.

After completing the program, Pedro taught a Masters-level course on Science Illustration and offered a workshop in science illustration and sketching. He has participated in citizen-science projects and bird-monitoring projects around the world (United States, Turkey, Morocco, and Croatia), and has served as the editor for eBird Portugal. He has been prolific as a freelance artist, illustrating the *Birds of the Azores*, as well as European and West African species. Pedro was later hired to create illustrations for the Cornell Lab Publishing Group's *All About Backyard Birds* field guide series.

Pedro credits the program and NestWatch poster project with offering him the chance to plan and create a large, long-term, complex project. This project allowed him to delve into the trove of resources at the Lab such as the bird-skin collection in the Cornell University Museum of Vertebrates. "This was a wonderful collection," he said. "Often there is little or no option at all to gain first-hand access to such resources. And the chance to discuss directly with staff ornithologists how the illustrations could be improved was also invaluable."

Pedro is currently living in Croatia where he teaches, participates in urban sketching and science illustration workshops, and continues to watch and paint birds.



OPPOSITE: American Goldfinches created for NestWatch poster for nesting birds of the Western and Eastern North America

TOP: NestWatch poster, side 1

ABOVE: NestWatch poster, side 2

LEFT: Tree Swallows detail, NestWatch poster



Megan Gnekow

Megan received her training through the Scientific Illustration Graduate Certificate Program at the University of California, Santa Cruz. Her delicate watercolor style was perfect for creating a poster depicting the hummingbirds that visit feeders for Project FeederWatch. She also painted a series of twelve birds for greeting cards. She tells this story about the process of creating the poster, and how it helped her develop as an artist.

“At the beginning of the project, I sat down with David Bonter (Project FeederWatch leader at that time), and we talked about the various species and what he wanted included in the poster. He provided me with a list of species and a hummingbird field guide to help me focus on the important field marks. I also spent a lot of time in the collection, looking at study skins and doing color studies, and reviewing photos in the Lab’s collection.” She goes on to say, “It was an excellent challenge to build my resilience as an artist. I’ve had a lot of tough illustration projects since then, yet I’ve never encountered the kind of generosity that the FeederWatch folks offered me during my Bartels Illustration experience.”

After leaving the Lab, Megan returned to California where she now works as a freelance illustrator while also dedicating time to local bird conservation efforts. She has volunteered for the Golden Gate Raptor Observatory as a hawkwatcher during fall migration and has worked with raptors and California Condors at Pinnacles National park, assisting with monitoring the breeding habits of the dozen or so raptor species that breed in the park and helping with the recovery of California Condors. “It’s a privilege and a thrill to be able to do my small part to help conservation efforts for wild birds here in this little corner of central California.” She has also been an Artist-in-Residence at Elkhorn Slough on Monterey Bay and in the Plumas National Forest.

ABOVE: Rufous Hummingbird for Cornell Lab greeting cards



Natalie Koscal

As a student of biology at Cornell University, Natalie felt at home as a Bartels Science Illustrator, where she was able to employ her skills and knowledge of both art and science, her two life-long passions. As a Bartels Illustrator, she produced paintings for the *Four Keys to Bird ID* poster that was published in the Lab’s newsletter *BirdScope*, as well as two watercolor paintings for the K. Lisa Yang Center for Conservation Bioacoustics Elephant Listening Project.

Since completing the program, Natalie graduated with a B.S. in biology from Cornell and earned her M.A. in Medical and Biological Illustration from The Johns Hopkins University School of Medicine. Since 2013 she has worked as a full-time Senior Medical Illustrator within the Graphic Arts Department at the *New England Journal of Medicine*. She also takes on freelance illustration work in her spare time. Despite her current focus on the medical field, she says that she never lost her love of birds, and she gets out into nature whenever she can.

ABOVE: Painting for the K. Lisa Yang Center for Conservation Bioacoustics Elephant Listening Project



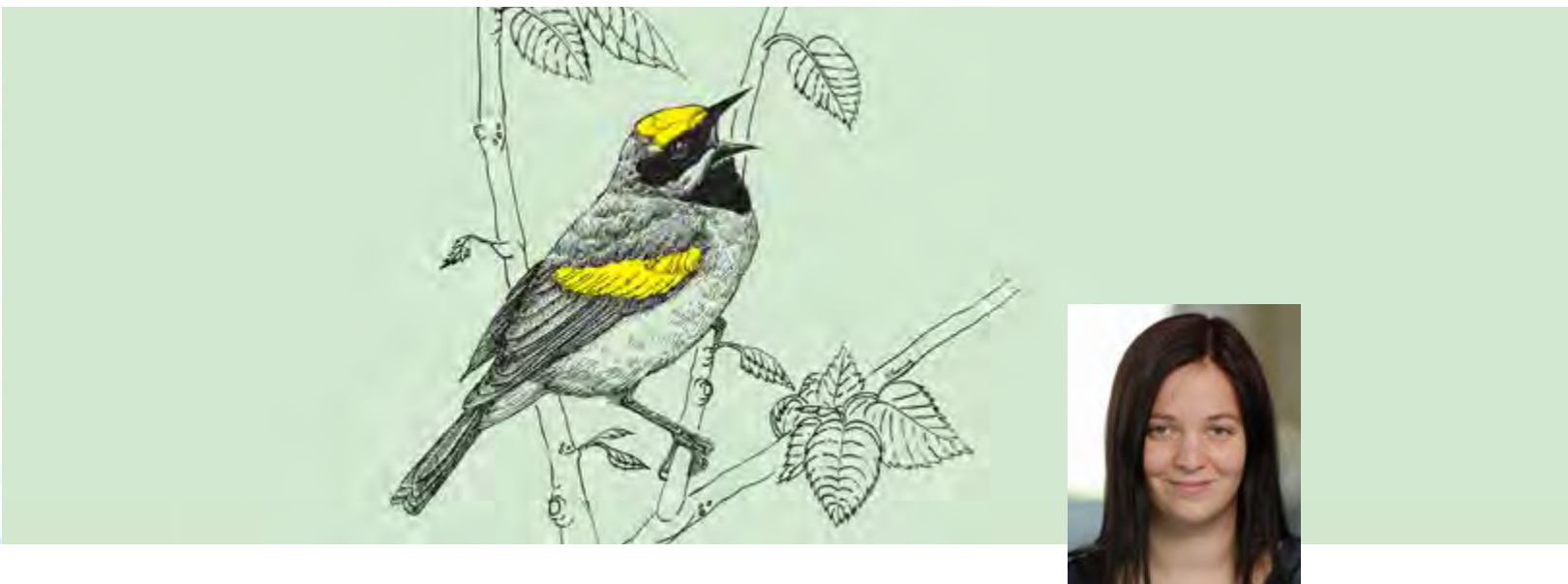
Carly Hodes

Carly was a Cornell University senior studying ornithology when she completed her residency at the Cornell Lab of Ornithology. Her projects resulted in several illustrations for the Lab's *BirdScope* newsletter, sparking her interest in editorial production and launching her career in science communication and later in health product marketing.

After graduation Carly took a job as a communications specialist at the Cornell University College of Veterinary Medicine, where she was able to combine her many talents. Her articles have been published locally and worldwide, from India to New Zealand to the Netherlands. She later completed an MBA program at the S. C. Johnson Graduate School of Management at Cornell. After graduating she was able to use her science communications experience and marketing tools from her MBA to explain and expand how organizations use scientific innovation to better the health of people and the planet. She credits the Lab, and the Bartels Science Illustration Program for starting her on this path. Carly is now Director of Product Marketing at Vida Health in San Francisco.

In addition to having a knowledge and love of birds, Carly is skilled at figure drawing, graphic design, composing music, and writing.

ABOVE: Adelle Penguins for *BirdScope*, Summer 2010

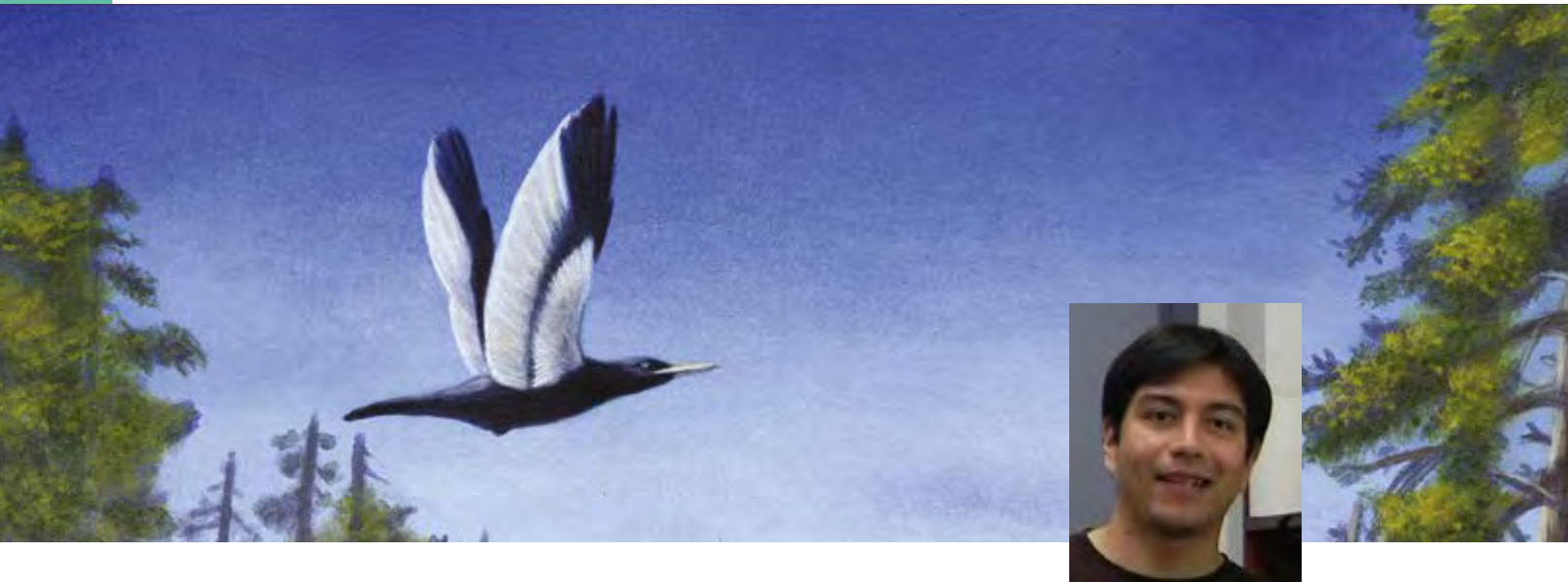


Sabine Freiermuth

Sabine had extensive training in medical illustration and zoological illustration from the Lucerne School of Art and Design, Switzerland, when she applied to the Cornell Lab of Ornithology as a Bartels Science Illustrator. However, it was her comic illustration style that caught our initial interest. We felt her bold, vibrant colors, and edgy, youthful style would complement the Lab's Celebrate Urban Birds citizen-science program, and the brochure and fliers she created did exactly that.

After completing the Bartels Science Illustration Program, Sabine participated in a medical illustration internship in Perth, Australia, and then provided the illustrations for an e-learning program at the school of human biology there. She then returned to Zurich, Switzerland, to work as an infographic designer for the *Neue Zürcher Zeitung* newspaper. Since 2014 she has worked as a medical illustrator for AO Surgery Reference, creating illustrations for the AO Surgery Reference App and website and also illustrating operation manuals for surgeons. In her spare time, she continues to do freelance illustration and has authored and illustrated a series of graphic novels.

ABOVE: Golden-winged Warbler



Evaristo Hernández Fernández

Evaristo is a biologist and self-taught artist from Mexico whose passion is birds. His careful and accurate painting style and his familiarity with western Mexico made him the ideal person to paint the Imperial Woodpecker for the cover of the October, 2011, (volume 128, number 4) issue of *The Auk* that featured an article by Lab researcher Martjan Lammertink and colleagues. Evaristo also created many other paintings for the Lab, including portraits of several species of manakins, as well as guides for Project FeederWatch to help in the identification of similar species.

Just before becoming a Bartels Science Illustrator, Evaristo was accepted into a M.S. program at the University of Guadalajara in Western Mexico. However, deciding to become a Bartels Illustrator at the Lab first was an important opportunity that allowed him to grow as a bird illustrator and to learn from, and interact with, many top scientists and students at Cornell. The experience provided him the opportunity to clarify the project he wanted to develop as a graduate student. After completing the Bartels Program, Evaristo returned to Mexico where he received his M.S. degree studying woodpeckers and other cavity-nesting birds, an interest he developed from working on the Imperial Woodpecker project. "That project was so meaningful to me, not only because the Imperial Woodpecker was the largest woodpecker in the world, but also because it was also an endemic to the old mature pine forests of western Mexico, a region that is special to me because that is where I first became interested in ornithology in college."

Since then, Evaristo has been working as a freelance illustrator, focusing on the specific and accurate plant species and vegetation associated with the bird species he paints.



OPPOSITE: Detail from Imperial Woodpecker cover for *The Auk*

TOP: Left-to-right, Wire-tailed Manakin, Red-capped Manakin and Striped Manakin

LEFT: Imperial Woodpecker cover for *The Auk*

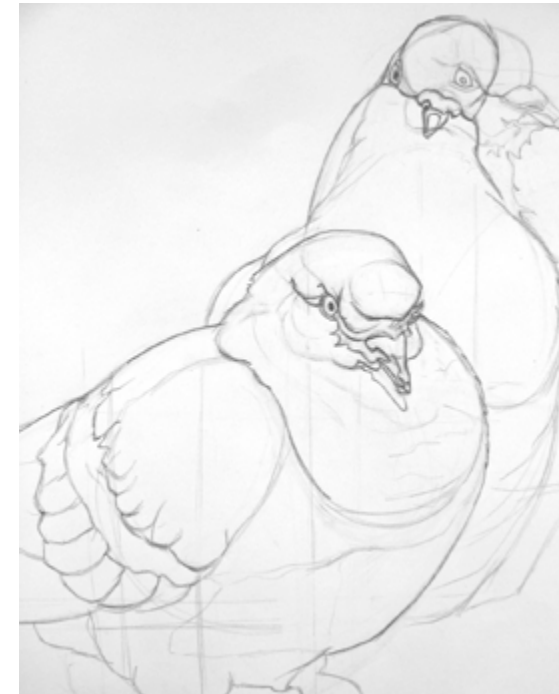
ABOVE: Eurasian Collared Dove for Project FeederWatch



Laura Hines

Laura received her training in the University of Washington's Natural Science Illustration Certificate Program and came to the Lab through her passion for scientific illustration and her interest in contributing her skills as an illustrator to educational outreach programs. For her project, she created a game board and game pieces for a K-12 Education activity to teach children about the effects of human impacts on habitat.

After leaving the Lab, Laura participated in the School of Visual Art's summer residency program in Illustration and Visual Storytelling in New York, NY. She worked as an Assistant Illustration Editor at *Juxtapoz Magazine* and has exhibited in Seattle, Tucson, New York City, Italy, and New Zealand. Her work has appeared in *Creative Quarterly Magazine*, *In These Times*, and *Juxtapoz Magazine*. She is a former resident artist at Creative Gateways in Sedona, AZ, and Lost Spirits Distillery in Los Angeles, CA. Laura is currently working as a freelance illustrator in Flagstaff, AZ.



OPPOSITE: Great Horned Owl
TOP LEFT: Rock pigeon sketches
TOP RIGHT: Downy Woodpecker
LEFT: Mallard ducklings
BOTTOM LEFT: Ring-billed Gulls

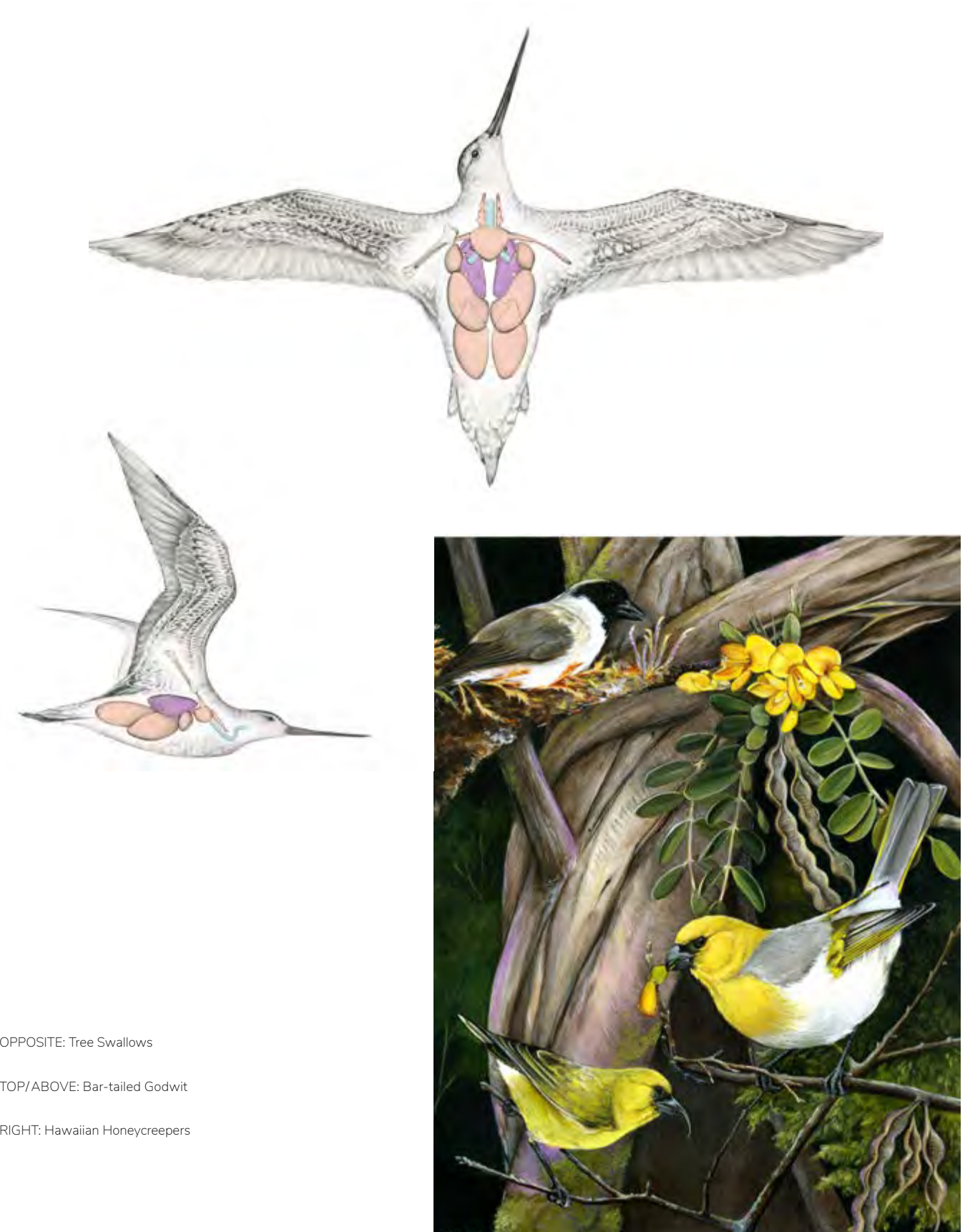


Jane Kim

Jane Kim came to the Cornell Lab of Ornithology after graduating from the Science Illustration program at the California State University, Monterey Bay. Her highly accurate and detailed drawings are also beautifully artistic. In addition to concept illustrations for the third edition of the *Handbook of Bird Biology*, Jane created several technical illustrations showing how a transmitter is attached to a Bar-tailed Godwit. These illustrations were then animated and used in a video about Bar-tailed Godwit migration. As a Bartels Illustrator, one of her most memorable experiences was learning how to prepare specimens. She believes that there is no better way to learn anatomy than by handling a real specimen.

After leaving the program, Jane established herself as a freelance illustrator, specializing in murals. In 2012, she officially launched an art studio called InkDwell. One of the studio's first commissions was *From So Simple a Beginning: The Evolution and Diversity of Birds* (also known as *The Wall of Birds*) at the Cornell Lab. "It was through this program that I had the privilege of working with Fitz to fulfill his lifelong dream of creating an epic mural representing the evolution and diversity of birds on the walls of the Lab's Visitor Center," she said. "It has and will continue to remain one of the most important works I have created."

Jane credits the Bartels Science Illustration program as being foundational to her career as visual artist and science illustrator. Her experience at the Cornell Lab further cemented her passion to approach art with curiosity, to seek scientific expertise, and to spread knowledge and wonder. Jane and InkDwell have continued to create art to inspire people to love and protect the natural world through murals, books, products, and lectures.



OPPOSITE: Tree Swallows

TOP/ABOVE: Bar-tailed Godwit

RIGHT: Hawaiian Honeycreepers

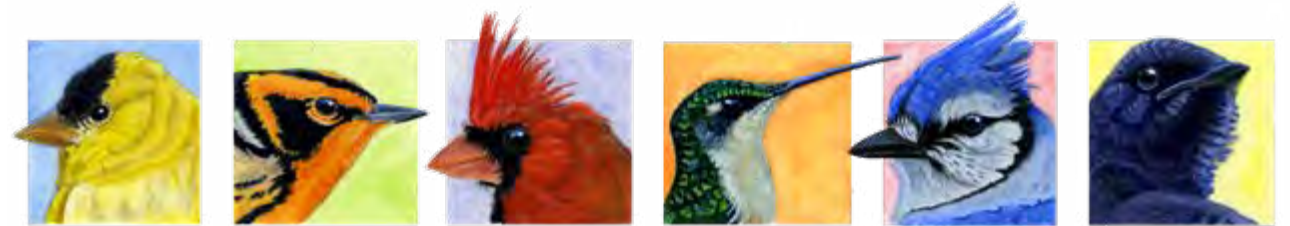


Ann-Kathrin Wirth

Ann-Kathrin (“Fritzi”) is a biologist, naturalist, and artist from Luxembourg. She has an M.S. from Exeter University, Cornwall, U.K., in Biodiversity and Conservation, and an M.A. in Visual Design as Creative Practice from Blackpool & The Fylde College. As an artist, she strives to use her skills to create beautiful works that share her fascination and interest in the natural world, and which also promote awareness and concern for endangered species. During her residency, she was responsible for the cover art and interior illustrations for the Best Management Practices for Golden-winged Warbler Habitat in the Great Lakes Region, and several other illustrations. Fritzi also painted the Cedar Waxwing that is featured on a mug and tote bag used as membership thank-you gift.

The program helped her observe and study birds more carefully than ever before while teaching her much about bird anatomy. Because the Lab was such a welcoming place for “bird nerds,” she said she felt right at home, and is very grateful to have been given the chance to write this important chapter in the story of her life.

For the past six years Fritzi has been working for the Ministry of Spatial Planning in Luxembourg (Ministère de l’Énergie et de l’Aménagement du territoire), where, as part of her work, she was able to provide illustrations for her region’s pitch for UNESCO Man and the Biosphere classification, showcasing charismatic animal species that live in its nature reserves. The illustrations help educate visitors about the unique biodiversity in these former open-cast mining areas. “It makes me happy to know that even in an office job that usually fills a day with meetings, emails, and typing documents, there is a space for art and nature to enrich various projects,” she says.



OPPOSITE: Cedar Waxwing

TOP: Rainbow Birds

ABOVE LEFT: Golden-winged Warbler Habitats in the Great Lakes Region Guide

RIGHT: K-12 Education HomeSchool Curriculum, rainforest habitat (top) and wetland habitat (below)



Reyn Ojiri

Reyn, a native of Hawaii, obtained his Bachelor's Degree in Plant and Environmental Biotechnology from the University of Hawaii at Mānoa and then attended the Graduate Certificate Science Illustration Program at California State University, Monterey Bay. He is particularly interested in scientific illustration of birds because of the role it can play in promoting conservation in Hawaii, his home. The Bartels Program was important to Reyn's art career by allowing him to work with staff in a professional capacity and by providing an opportunity to collaborate and work together with scientists to complete projects. He also obtained more experience working with digital art, and has since continued to hone his skills with traditional painting and drawing media.

As a Bartels Science Illustrator, Reyn's main project was to create a cover illustration for the *Best Management Practices for Golden-winged Warbler Habitat in the Appalachian Region*, an important document helping land managers manage habitat for the declining Golden-winged Warbler. He also produced the illustrations for the *Creating a Garden for Birds* for BirdNote, a challenging project that required a detailed, full-page illustration.

Reyn currently lives in his hometown of Hilo, HI, where he paints birds, focusing on native Hawaiian wildlife. He sells his paintings in galleries and through contacts in Hawaii. In 2016 he entered a juried art contest in Hawaii and won Best of Show for his painting of the Alalá, which was also featured in the Gallery section of *Living Bird* in 2018. After returning home, Reyn decided to obtain a master's degree in teaching. He currently teaches third grade at a public school in Hilo, integrating art into his class as much as possible.



OPPOSITE: Cover illustration for the *Best Management Practices for Golden-winged Warbler Habitat in the Appalachian Region*

ABOVE: Blackburnian Warbler for membership tote bag, 2012

LEFT: American Goldfinch on Sunflowers for BirdNote

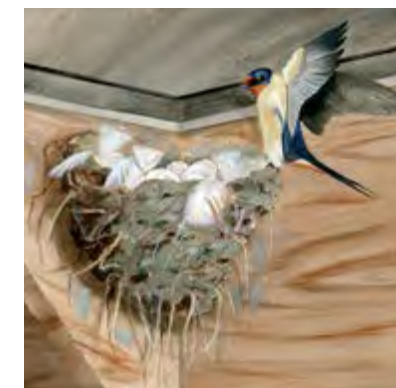


Caitlin Turner

Caitlin graduated in 2011 from the Rhode Island School of Design where she received a BFA in painting. Art and nature have been an integral part of her life since childhood, when she would spend her days sketching in the wooded backyard of her Massachusetts home. Birds were a big part of her childhood, and her house and yard were filled with binoculars, bird books, feeders, photographs, and more. Working as a Bartels Science Illustrator at the Cornell Lab of Ornithology allowed her to mesh her passions for art and birds in a way that was personally fulfilling and beneficial and educational for the community. Caitlin created many paintings for several projects, including a poster of backyard birds, a pocket guide to nesting birds, a brochure on feeding birds in winter, and a full-color illustration of a Golden-winged Warbler.

Following her participation in the Bartels Science Illustration Program, Caitlin graduated from the Maryland Institute College of Art with a post-baccalaureate degree in graphic design. She currently resides in Baltimore, MA, where she works as a full-time graphic designer at Mission Media, a graphic design studio in downtown Baltimore, and has done work for clients such as the Baltimore Museum of Art, DreamWorks, George Mason University, and National Public Radio.

Caitlin views the time she spent as a Bartels Illustrator to be life-changing, as well as part of her identity. Although she is now pursuing graphic design as a career, her bird painting continues to influence her life. When applying for her current graphic designer position (which she has held for six years) she included some bird paintings in her portfolio. Those paintings helped get me the job, and her boss was so impressed that he asked her to paint a large bird mural in the office. "Everybody in my office knows me as the 'girl who's really really good at painting birds,'" she said, "and I love that."



OPPOSITE: Bee Hummingbird on Showy Chalicevine

TOP: BirdSleuth K-12 Education Guide

ABOVE, LEFT: Details from NestWatch flier identifying common birds and their nests



Andrew Leach

Andrew's skills and background are varied and versatile. He earned a B.S. degree in landscape architecture from Temple University and a BFA with a concentration in painting from the University of Pennsylvania, Kutztown. In 2012 he received a Graduate Certificate in Scientific Illustration from California State University, Monterey Bay.

As a small child Andrew drew and painted birds and other animals, but as he grew older he explored other creative fields—craftsman, designer, picture framer, woodworker, registered landscape architect, and fine artist—although his work has always explored the topics of native versus non-native species, wild habitat loss, and extinction. Andrew's strong illustration skills and his background in landscape architecture made him ideally suited to create behavioral graphics for the Lab's Birds-of-Paradise Project website, working with Tim Laman, Edwin Scholes, and other staff at the Lab. Andrew cites this collaborative, creative, and high-profile work as being among the most rewarding projects he did as a Bartels Illustrator.

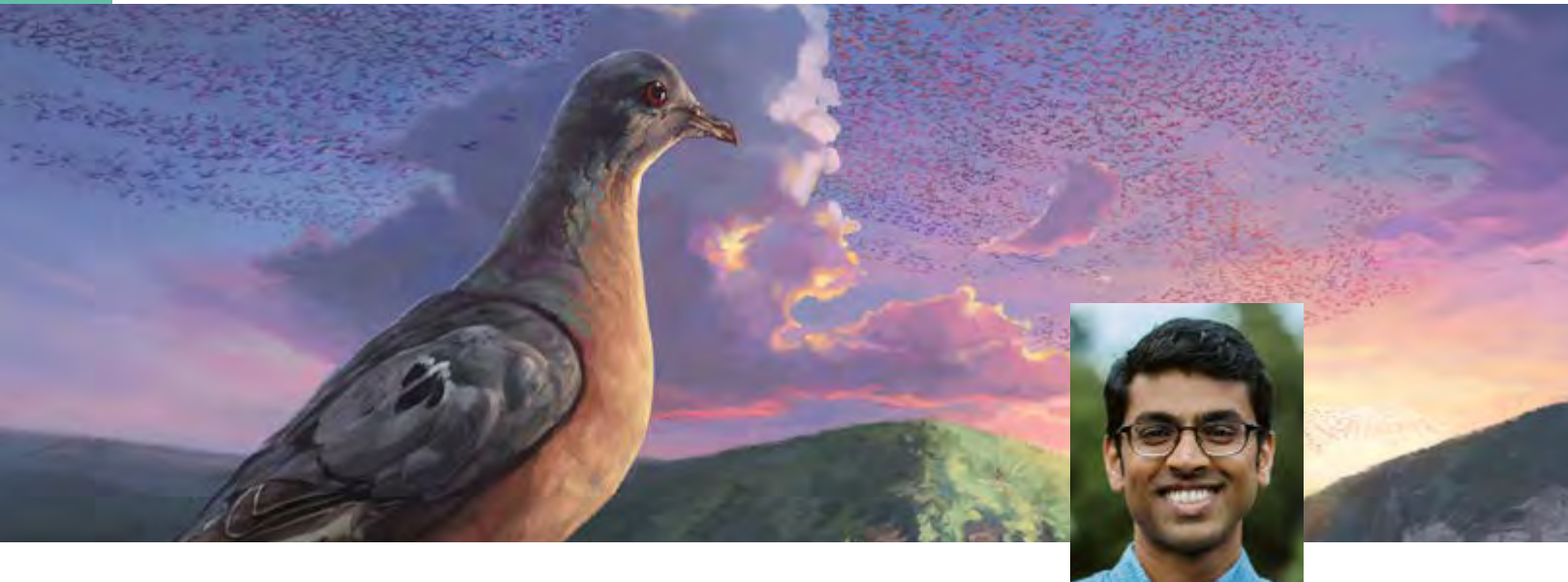
Following his participation in the Bartels Science Illustration Program, Andrew was hired as an illustrator for the All About Bird Biology website. He then went on to illustrate a coloring book about the Birds-of-Paradise and to work as a full-time freelance illustrator. After leaving the Lab, Andrew combined his landscape architecture and science illustration skills to pursue a career in zoo habitat design, working for SHR Studios on Bainbridge Island, WA, where he designs master plans and habitats for zoos around the world. He writes, "I have created a niche for myself in the field as not only a designer but also as an illustrator of wildlife habitats and visitor experiences," and he credits the program with helping him fine-tune his skills and identify his illustration strengths.



OPPOSITE: Pileated Woodpecker

ABOVE: Birds-of-Paradise icons

LEFT: Superb Bird-of-Paradise display postures



Benlin Alexander

Benlin has a degree in Fine Arts Illustration from the Rochester Institute of Technology and worked as a freelancer, creating illustrations and paintings for various clients. Benlin loves to inspire and motivate others through art, whether he's portraying people, beautiful landscapes, or wild birds.

"As a Bartels Illustrator," he said, "I had the honor of using my art to inspire others. It is my hope that my work will lead viewers to take a new interest in the natural world." One of his largest projects was an illustration of the Passenger Pigeon created as a memorial of the 100th year anniversary of the species' extinction. "I still remember being able to look at and hold a real taxidermy specimen of a passenger pigeon that the Lab had as reference for that painting," he said. "Learning to paint birds realistically became a rare skill that would help me stand out to clients around the world."

After leaving the Lab, Benlin was discovered by Vetafarm, a bird seed supplier in Australia, who (after seeing his painting of the Passenger Pigeon) asked him to create a total of nine packaging illustrations of pet birds. In 2019, he was also contacted by Callisto Media, who hired him to illustrate a book on raising backyard chickens; immediately afterward he was asked to illustrate a book on beekeeping. In 2019 he worked for the historic Morehead Planetarium at the University of North Carolina, Chapel Hill, to illustrate the story of Tony Jenzano, who was instrumental in training the first 62 NASA astronauts from 1960 to 1975. In 2020, he was hired again by Vetafarm to illustrate a series of six birds back-to-back for a new group of packaging redesigns. Their sales had risen exponentially, likely because the stay-at-home orders in Australia may have encouraged more people to get birds as pets.



OPPOSITE: Passenger Pigeon for Membership tote bag

THIS PAGE (top-to-bottom): Window clings of American Goldfinch, Black-capped Chickadee and Rufous Hummingbird



Justine Lee Hirten

Justine Lee Hirten is a skilled illustrator and wildlife rehabilitator from Connecticut. She studied science illustration under the guidance of artists-in-residence at the Field Museum of Natural History in Chicago where she also worked as an intern in their ornithology lab preparing, organizing, and illustrating specimens. She then went to graduate from the California State University, Monterey Bay Science Illustration program in 2013. She believes that research, conservation, and education about birds are an essential part of preserving the natural world and that birds are some of the best ambassadors for nature.

Justine spent time at the Lab as a Bartels Illustrator in 2013, where she created graphics for our *All About Birds* newsletter, our *BirdNotes* brochures, and *Living Bird* magazine. She returned to the Lab again in 2017 to offer her artistic talents as a volunteer for an article in *Living Bird* to illustrate the unusual feeding habits of North American warblers on their wintering grounds. "The warbler piece was significant for me," she wrote. "I really enjoyed the research about the habitat and behavior for this project, and I also enjoyed the collaboration. It was a very interesting and unique experience."

Justine now teaches at the Science Illustration Graduate Certificate Program at California State University, Monterey Bay, where she instructs in digital media, zoological illustration, and professional practices to help students start their careers as science illustrators.

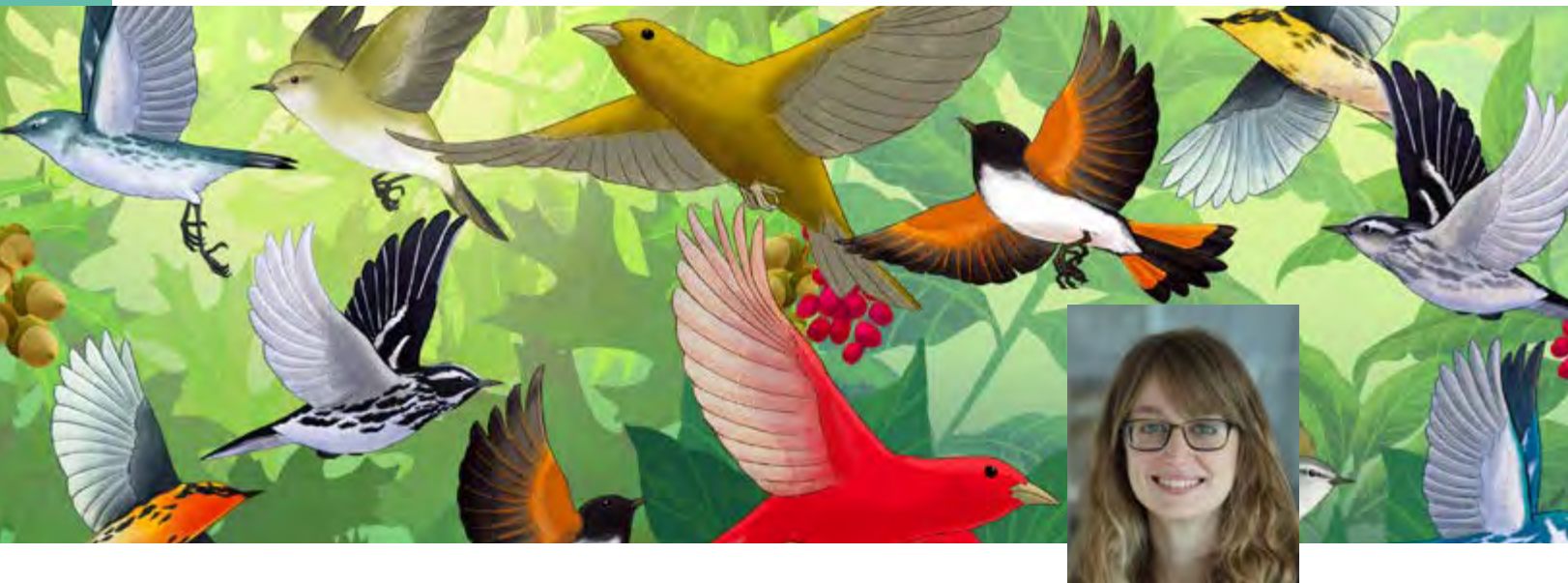


OPPOSITE: Red-backed Fairywrens

TOP LEFT: Picky Eaters for the *All About Birds* quarterly newsletter, Winter 2014

TOP RIGHT: House Wrens for *BirdNotes* 19

LEFT: Blue-breasted Fairywren and Gray Butcherbird



Anna Rettberg

Anna is an illustrator from Upstate New York. She graduated in 2012 from Syracuse University's illustration program where she worked on a wide range of projects, from children's books and visual development to logo design. Her love of birds led her to the Bartels Science Illustration Program where she created works for Bird Cams, K-12 Education, NestWatch, All About Bird Biology, and the Membership department in her engaging, playful, graphic style. Anna works by first making a pencil sketch, then scanning it, and finally adding color and texture in Photoshop.

Anna's style was a departure from traditional scientific illustration, but at that time it was exactly what the Bartels Program needed. The illustrations she did for K-12 Education were used repeatedly and set the look for that program. Soon, other programs also started to see the possibilities for art that was graphically eye-catching and informative.

She writes, "The Bartels Science Illustration Program was a fantastic learning experience for me. It was still very early in my career, and I was happy to have the opportunity to work on so many projects. Looking back, I'm impressed with just how much art I made, and how many different styles I experimented with. I still really enjoy the illustrations I made for K-12 Education, in particular."

Not long after she left the program, she was offered a job in Seattle, Washington, as an artist at Molly Rocket, a video game developer. She has been working there ever since and is now the lead character artist. She is also illustrating a middle-grade graphic novel series, Meow the Infinite. In her free time she hikes in the Cascades, watching the birds of the Pacific Northwest.



OPPOSITE: Artwork for membership tote bag

TOP LEFT: Red-backed Fairywrens

TOP RIGHT: Golden-winged Warbler

ABOVE RIGHT: Blackburnian Warbler

RIGHT: Osprey art for Bird Cams





Stef den Ridder

Stef graduated in 2013 from the Art Academy in the Netherlands. Living a life that revolves around animals, Stef strives to share that fascination and interest with others through art and illustration. Stef's interest in birds began after she completed graduation project about how birds can help explain evolutionary theory, and it has continued to grow since then.

As a Bartels Science Illustrator, Stef's primary project was creating an illustration for the cover of the 2014 State of the Birds report, a project that, Stef said, "made me look again at how fragile our wildlife and birds are. I already knew that, but working on a project that was centered around the extinction of the most abundant bird there ever lived (the Passenger Pigeon) is something else." Working with 20 different authors all over the world, Stef also created 15 highly detailed, black-and-white pencil drawings for the chapter heads for the book *Cooperative Breeding in Vertebrates*.

After leaving the Lab, Stef illustrated the book *Stef's Grote Neuzenboek*, (*Stef's Big Nose Book*), a Dutch children's book about everything related to animal noses. Two other books followed in 2017, *Vogels en de Liefde* (*Birds and Love*), a book that contains surprising love facts about dozens of birds; and *De Nieuwe Biesbosch* (*The New Biesbosch*), about the National Park de Biesbosch in the Netherlands. The latter is a collaboration with a park ranger and highlights the most recent changes that have occurred in the park.

Stef also teaches illustration to children. "My inspiration to create art comes from several sources," Stef wrote. "Being outside with my dog while birdwatching; reading books and articles about animals, nature or natural history; and looking at illustrations from great artists like Audubon, John Gould, or Rien Poortvliet—these all motivate me."



OPPOSITE: Cover artwork for The State of the Birds Report 2014

TOP: Detail from original artwork

LEFT: The State of the Birds Report 2014, full cover artwork



Luke Seitz

Ever since a male Scarlet Tanager captured Luke's attention when he was six, he has been drawing birds and watching their every move. As a student at Cornell, he was an active participant on the Cornell Lab of Ornithology's Redhead birding team and was involved in many other Lab projects in addition to the Bartels Science Illustration Program.

Luke has a special interest in illustrating field guides, and for his main project he illustrated a map of the world, depicted as bird heads representing each region. This art was used on a tote bag for Cornell Lab members promoting Global Big Day. Luke also created several silhouettes of birds for use on our All About Birds website, in addition to art for our publications, and he continues to create art for Global Big Day.

Luke graduated from Cornell University in 2016. Since then, he has been exploring the nooks and crannies of the Andes and Amazon as a tour leader for Wings Birding Tours Worldwide, enjoying birds while photographing them, and enjoying the challenge of illustrating them in the field. Recently, Luke has expanded his interest in global birding with expeditions to Australia, China, Southeast Asia, and Ethiopia.

His illustrations have been used in many publications including *Birding* and *Birder's Guide* magazines, and even after his time in the Bartels Science Illustration Program had ended, Luke has continued to illustrate the feature bird for the World Series of Birding and eBird's Global Big Day initiatives. Luke also currently serves as a member on the Maine Bird Records Committee.



OPPOSITE: Artwork for Global Big Day Campaign 2015

ABOVE: Eastern Bluebirds for NestWatch wallpaper

LEFT: Golden-collared, Golden-collared bearded, hybrid, White-collared Manakin



Misaki Ouchida

Misaki is a natural science illustrator from Japan who is curious about the world and how things work. After obtaining her Ph.D. in particle physics from Hiroshima University in Hiroshima, Japan, she transferred to the University of Washington, where she concurrently completed a certification in Natural Science Illustration and a M.A. in Anthropology. She realized her calling to become a science illustrator when she noticed that her lecture notebooks contained more illustrations than notes.

Combining her background in paleontology and anatomy with her interest in birds, as a Bartels Illustrator, she worked on several illustrations for the *Handbook of Bird Biology*, *Raptor Guide Book*, a poster, and website materials. For *Living Bird Magazine's* Autumn 2015 issue, Misaki created artwork for the article *Soul Mates: Nutcrackers, Whitebark Pine, and a Bond That Holds an Ecosystem Together* by Gustave Axelson.

After finishing the program, Misaki created illustrations for the 2016 State of the Birds report and worked as an assistant to Jane Kim to help paint the Wall of Birds. She then started a six-month science illustration internship at the Smithsonian National Museum of Natural History. She returned to Japan in 2016 to work at Kyoto University as a science communicator. In 2019, Kyoto University recognized the importance of science illustration as a tool for science communication and changed her job title to "science illustrator," making her the first official science illustrator hired by a national university in Japan. Misaki continues to derive great satisfaction from using her artistic abilities to help others understand science through art.



OPPOSITE: Clark's Nutcracker on whitebark pine for *Living Bird*, Autumn 2015

ABOVE: Adélie Penguin and Gentoo Penguins compared for *Living Bird*, Winter 2016

LEFT: Harpy Eagle for *The State of Birds Report* 2016



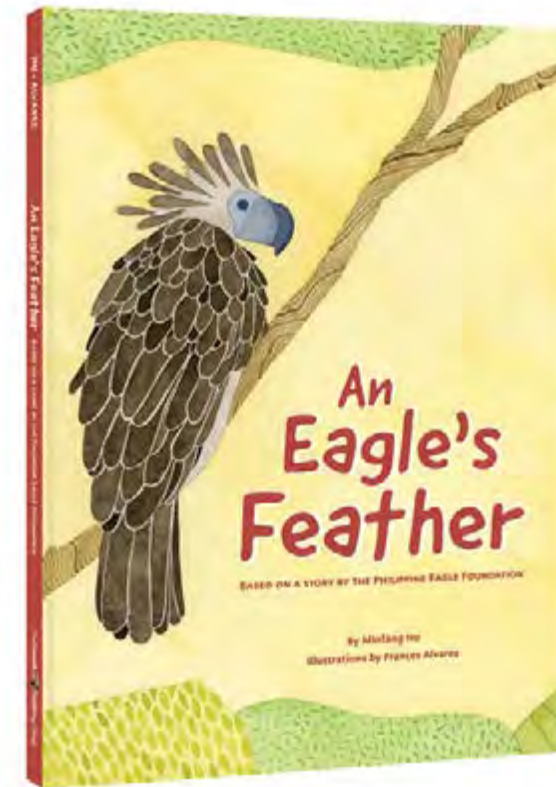
Frances Alvarez

Frances is a graphic designer and illustrator from Manila, Philippines, whose work is inspired by nature, especially species endemic to the Philippines. She graduated from the Ateneo de Manila University with a BFA in Information Design and received an award for Graphic Design at the Loyola Schools Awards for the Arts.

When the Lab worked with the Philippine Eagle Foundation to create a book about the Philippine Eagle, Frances was perfectly positioned to contribute to the project. As a Bartels Science Illustrator, Frances painted 14 large, full-page spreads for *An Eagle's Feather*, an over-sized children's picture book that tells the story of an injured Philippine Eagle. This book is used by the Philippine Eagle Foundation for outreach in elementary schools and villages, helping teach children about the importance of protecting their national bird. It was later published in a smaller size and made the short-list for the 2019 Green Earth Book Awards.

Upon leaving the Lab, Frances returned to Manila to work as an artist and illustrator at the illustration and design house, Studio Dialogo, where she had worked before becoming a Bartels Illustrator. She is also a member of Ang Ilustrador ng Kabataan, an organization of Filipino artists dedicated to designing and illustrating children's books, and is currently a volunteer for both the East Asian-Australasian Flyway and the Philippine Taxonomic initiative.

She writes that she is inspired by nature, music, childhood memories, and day-to-day life. She works in both digital and traditional media, while also experimenting with other techniques such as embroidery and printmaking. "Looking back, I see how much I've grown as an illustrator who wants to contribute to science," she says, and she dreams of someday drawing all the birds of the Philippines.

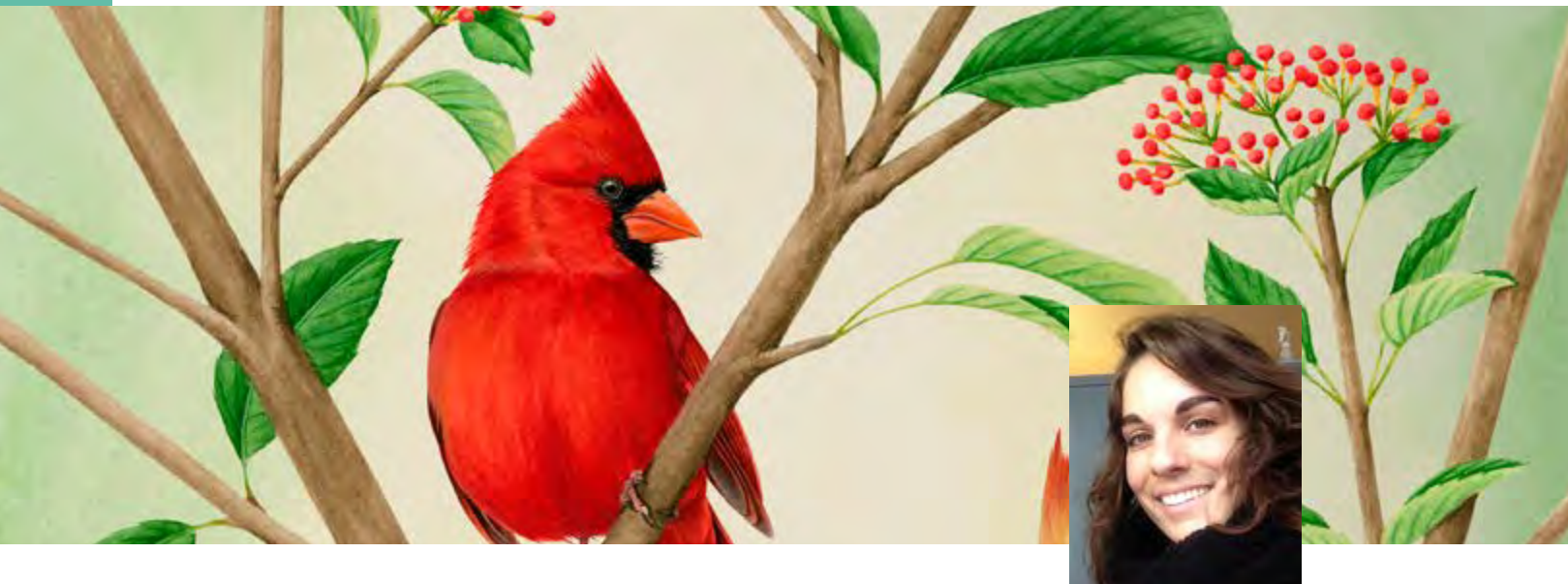


OPPOSITE: Detail from *An Eagle's Feather* book about conservation of the Philippine Eagle

LEFT: Cover of *An Eagle's Feather*

BELOW: Spread from *An Eagle's Feather*





Liz Clayton Fuller

Liz comes from a rigorous art background that includes a BFA in Illustration from Savannah College of Art and Design and a certificate in Natural Science Illustration from the University of Washington. A deep, intrinsic love and respect for nature has always inspired her. Liz uses her skills to connect with the community and help others rekindle a sense of awe in the natural world. In recent years her artwork has focused on ornithology, and her residency at the Cornell Lab of Ornithology strengthened her resolve to make bird illustration her life's work.

As a Bartels Illustrator, Liz created over 50 illustrations for Lab projects including BirdNotes 02: Attracting Hummingbirds, the Celebrate Urban Birds bird-ID guide, and *Living Bird* magazine. She developed and taught an undergraduate Field Sketching seminar to a group of Cornell freshmen in the Biology Scholars Program, and then traveled with them to the Galapagos Islands where she helped them hone their artistic and observational skills through field sketching. Following her time as a Bartels Illustrator, she returned in two successive years to continue teaching the field sketching course that she developed, which later inspired the extremely popular Bird Academy Nature Journaling and Field Sketching course where Liz is featured as the instructor.

"It was so incredible to turn the Cornell course that I developed into an offering through Bird Academy that anyone around the world could take!" says Liz. "It has been so gratifying to give folks the opportunity to incorporate art into their lives through my course. I've had many complete beginners reach out to me and express how excited they are to be doing art for the first time. How can I quantify the impact that this program has had on my life? It taught me so many lessons—not only about art, but also what I am capable of as an individual. I continue to feel the rippling positive effects to this day."



OPPOSITE: Northern Cardinal

TOP: Details from BirdNotes 02: Attracting Hummingbirds

ABOVE: Poster for BirdNotes 02: Attracting Hummingbirds



Chloe Lam Ohmori

As a young girl, Chloe accompanied her mother on nature walks or bird watching tours, where the two would spend time together sketching ducks and wildlife. Through these experiences Chloe learned to express her appreciation for wildlife and species diversity through art. In college she studied birds and assisted with bird-banding research while taking reference photos whenever she had the chance. She then pursued a graduate program in natural science illustration at the University of Washington, where she was able to advance her skills in scientifically accurate traditional illustration, digital illustration, website-building, and photography.

Chloe approaches illustration with the goal of educating people about their interactions with the wildlife around them. As a Bartels Science Illustrator, Chloe contributed many illustrations for *Living Bird* magazine. For the Summer 2016 issue, she painted a series of warblers for *Spruce-Woods Warblers Revisited: 60 Years Later, The Cast Of Characters Has Changed* by Irby J. Lovette, and three behavioural illustrations for *A Noble Vision Of Gulls* by David Bonter and Shailee Shah. Chloe also created highly detailed graphics for *Celebrate Urban Birds*.



OPPOSITE: Herring and Great Black-backed gulls for *Living Bird*, Summer 2016

ABOVE: Western Bluebirds for *Celebrate Urban Birds*

LEFT: Warblers of MacArthur's Spruce Woods, *Living Bird*, Summer 2016



Virginia Greene

Virginia is an illustrator and biologist with a strong interest in birds. With a B.S. in Biology from Virginia Tech, an M.S. in Biology from the College of William and Mary College, and an MFA in illustration from the Savannah College of Art and Design, Virginia brought a depth of scientific understanding and technical ability to her work as a Bartels Science Illustrator. Virginia has a versatile style that makes use of a variety of media: watercolor, gouache, graphite, ink, and digital painting. Her illustrations are inspired by study of the natural world and are often infused with a sense of humor. She also incorporates fantasy in her art by creating short stories and illustrations that feature intelligent, cloak-wearing, magical songbirds as characters in a fantastical North American forest setting. She acknowledges real bird biology and behavior (with fictional flourishes) in these stories, providing entertainment and education for readers.

Virginia appreciated the collaborative attitude that brings together artists, scientists, and the public at the Lab to celebrate and protect birds, and this allowed her the opportunity to create a wide variety of illustrations for several Lab projects as well as for graduate students. She designed posters and materials for K-12 Education, created digital graphics for the NestWatch app, produced paintings for membership gifts, created illustrations for *Living Bird*, and even painted warbler decoys in accurate, lifelike plumage for a graduate student's research project.

She wrote, "Wonderful things happened in my life as a result of being a part of the Bartels Illustration Program: I was in the presence of great bird art every day, from the work of Louis Agassiz Fuertes to Jane Kim's Wall of Birds. And I got to know many wonderful bird-loving people!"



OPPOSITE: Carolina Wren for membership greeting card

ABOVE: Illustration for *Living Bird* Magazine, Spring 2017

LEFT: Black-capped Chickadees for Bird Cams

RIGHT: Eggs of North American Birds Poster for NestWatch

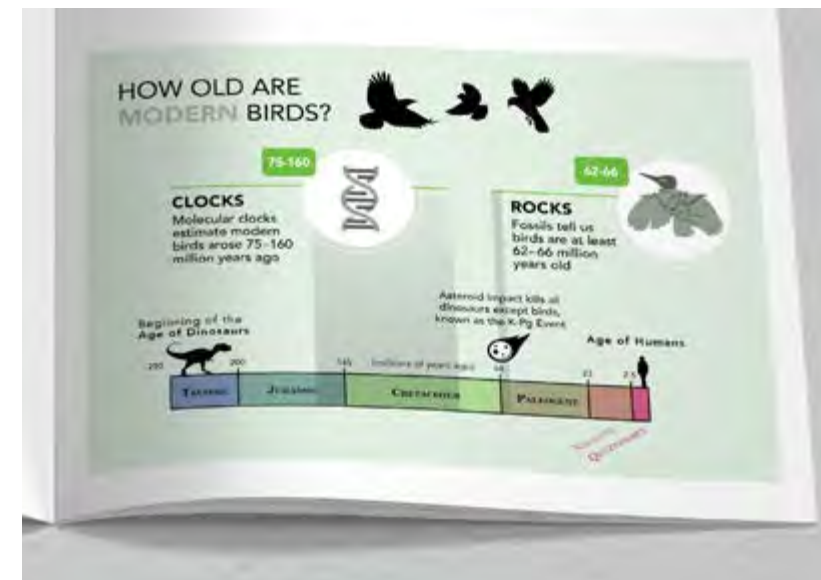


Jillian Ditner

Combining a passion for visual communication and strong interest in ornithology, Jillian joined the Bartels Program after completing a graduate certificate in Science Illustration from California State University, Monterey Bay. During her studies, Jillian honed her observational skills and pursued an interest in naturalist subjects, most notably bird behavior and anatomy. Before becoming a scientific illustrator, Jillian pursued fine art and graphic design. She received a BFA from the Ontario College of Art and Design University and a Master's degree Design Studies from York University in Toronto, Canada. Jillian's freelance work has been featured in books, editorials, and campaigns throughout North America.

During her Bartels residency, Jillian worked on a range of projects, from infographics and scientific figures to conceptual editorial illustrations. Jillian completed a series of illustrations for the Lab's Bird Academy course Feeder Birds: Identification and Behavior, which describes species-specific body postures birds display at feeders to signal aggression or dominance. Jillian also contributed graphics to *Living Bird* during her residency, including a conceptual illustration for an article describing dominance hierarchy at bird feeders.

Upon completion of her appointment, Jillian stayed on at the Lab to produce illustrations for the *Handbook of Bird Biology*. In 2019 she began her current position as Graphics Editor for *Living Bird* magazine and staff scientific illustrator at the Cornell Lab. She works closely with the Communications team at the Lab to produce graphics for important press releases, including the Three Billion Birds campaign (2019). As the *Ars Aviaria* coordinator and the supervisor of the Bartels Program, Jillian greatly enjoys teaching, and she regularly invites Bartels Illustrators to help with demonstrations and lessons in her undergraduate class *The Art and Science of Birds*.

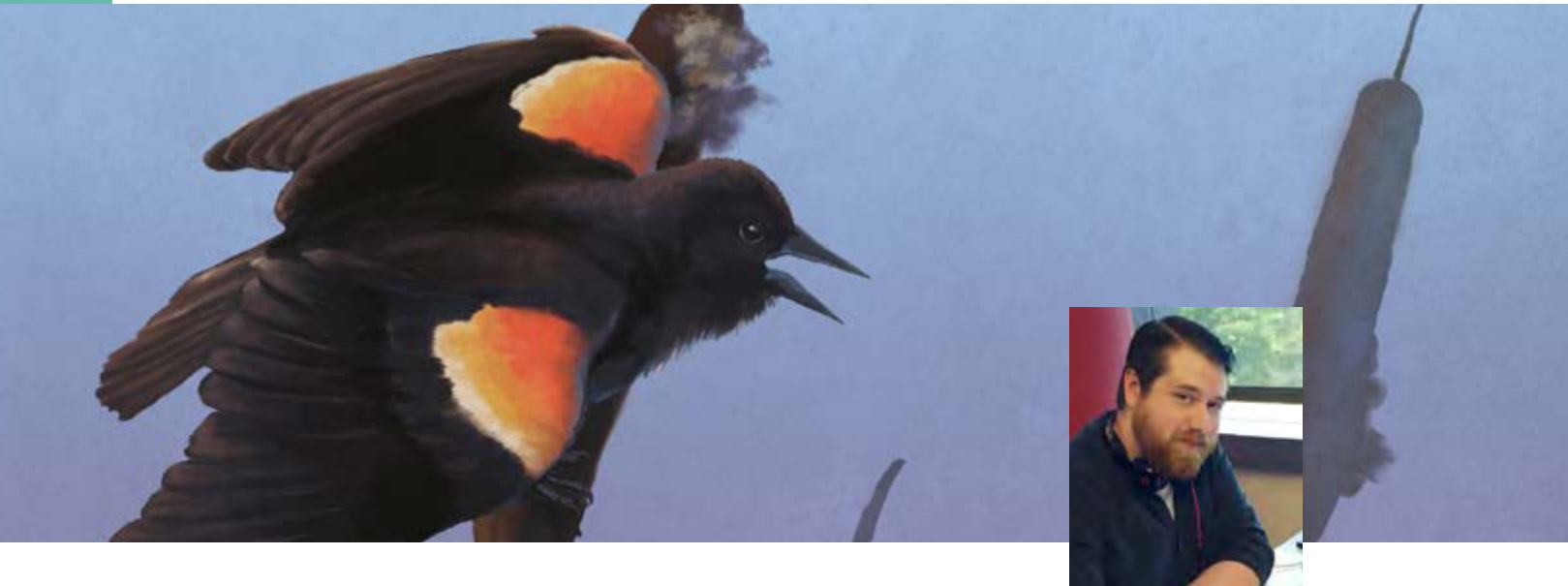


OPPOSITE: Canada Jay for *Living Bird*, Winter 2018

TOP: Steller's Jays for Bird Academy course *Think Like a Bird: Understanding Bird Behavior*

ABOVE: Design and illustration of special feature insert *Evolutionary Explosions* by Irby J. Lovette and Jillian Ditner created for *Living Bird*, Winter 2018

LEFT: Infographic for press release in *Cornell Chronicle*, September 21, 2017



Phillip Krzeminski

Phillip is a naturalist and science illustrator with strong visual communication skills. After developing his artistic skills in college, he taught art at a public high school. As a skilled metalworker and carpenter, he later managed a blacksmith business and then went to work for the Yale-Peabody Museum of Natural History, where he sculpted nearly a dozen models of birds to help restore the museum's Connecticut Bird Hall and North American Dioramas. After deciding to pursue a career in science illustration, he attended and graduated from the Scientific Illustration program at California State University, Monterey Bay. Phillip has also volunteered for the National Audubon Society, assisted with bird-banding initiatives, participated in numerous citizen-science projects, and worked as a docent for the Pacific Grove Museum of Natural History in California.

As a Bartels Illustrator, Phillip created illustrations for the Visitor Center's educational materials, membership thank-you gifts, and other projects. However, he believes that the work he did for *Living Bird*, and an illustration he created for the cover of the June 2018 issue of *Current Biology* (to accompany an article that proposed how birds evolved after the End-Cretaceous extinction event) were among his most meaningful projects. "The cover for *Current Biology* was a career landmark for me," he wrote, "and I believe that it led to future work. The work on *Living Bird* was also great preparation for working on a major journal and probably helped rank me higher for my current job over others who applied."

After leaving the Lab, Phillip worked as a freelancer for clients such Cambridge University, the Yale-Peabody Museum, and the Museum of the Earth in Trumansburg, NY, before accepting a position as senior illustrator at *Cell Press*, where he is charge of art production for their flagship journal.



OPPOSITE: Red-winged Blackbirds for membership tote bag

TOP LEFT: Downy Woodpecker

TOP RIGHT: Golden-winged Warblers

RIGHT: Cover illustration for *Current Biology* June 2018



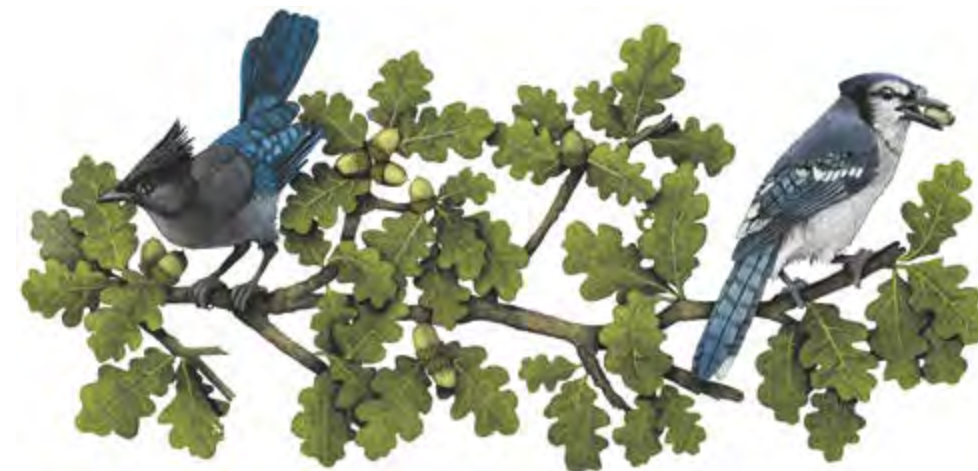


Megan Bishop

Although birds were a focal point for Megan as a child, she eventually went on to enroll as a botany student at Humboldt State University, Arcata, CA, where she worked with scientists as both a researcher and illustrator. She was inspired to share her interest in the sciences with others through her favorite form of communication: art. When some of the illustrations that she created at Humboldt were published in a scientific journal, Megan's self-realization that she could use her illustration skills to provide an educational service motivated her to pursue a career in science illustration. After graduation she enrolled in the Science Illustration Program at California State University, Monterey Bay, where many of her illustrations focused on plants and birds, and where she developed a love for both grebes and scratch board technique.

Megan's experience working with scientists helped her understand the value of asking incisive questions, doing thorough research, and ensuring scientific accuracy.

Megan's preferred illustration technique is pen-and-ink, which she has mastered beautifully. As a Bartels Science Illustrator, Megan created several infographics and pen-and-ink illustrations for *Living Bird*. Her illustrations for *How Do Birds Survive the Winter?* featured in the Winter 2019 issue were described as "gorgeous" and greatly enhanced the article. She also created an illustration of jays for a mug used as a membership thank you gift and an illustration for the Lab's 2018 holiday card. Megan had the opportunity to enhance her teaching skills through joining the Art and Science of Birds course and regularly offered formal and informal art workshops for the staff and student community at the Lab.



OPPOSITE: Common Raven for *Living Bird*, Winter 2019

TOP LEFT: Pileated Woodpecker for *Living Bird*, Winter 2019

TOP RIGHT: Western Tanager for membership greeting card

RIGHT: Steller's Jay and Blue Jay for membership mug



Jessica French

Jessica is an illustrator with an inherent curiosity about nature. She comes from an artistic background, with a B.A. in Art & Design from the University of Michigan and a graduate certificate in Science Illustration from California State University, Monterey Bay. As a young girl, she studied animals and plants by drawing them meticulously. But it wasn't until college, when she took a field course in ornithology, that she considered illustrating birds professionally. Now an avid birder, she finds drawing an indispensable tool for learning about birds, and she hopes to use her artwork to help others discover the variety of birds in the world. Before being accepted to the Bartels residency, Jessica illustrated an exhibit about California Condors for Ventana Wildlife Society and has worked for scientists in a variety of fields, including paleontology and biomedical engineering.

As a Bartels Illustrator, Jessica created several graphics and illustrations for *Living Bird*, one of which was later used to create a membership tote bag. However, her major project was illustrating a Hawk ID poster for Project FeederWatch, which involved painting 19 detailed individuals representing 7 species of hawks that can be seen at or near feeders.

Currently, Jessica is living in Charlotte, N.C., where she has been doing freelance work in scientific or fine art illustration, including creating illustrations for Lab's Bird Academy. As part of her fine art path, Jessica has recently also branched out into painting beautiful, life-like, custom pet portraits.



OPPOSITE: Lazuli Buntings for membership tote bag

TOP LEFT: Common Backyard Hawks and Falcons illustrations for Project FeederWatch poster

TOP RIGHT: Common Yellowthroat

LEFT: Red-backed Fairywrens



Jen Lobo

Art has long been Jen Lobo's primary tool for studying all manner of life forms, from birds to botanicals to reptiles. It continues to be a means of displaying her reverence for and curiosity about the natural world. Her interests in animals and plants have driven her on a variety of ventures, from work with animal rescue organizations in Los Angeles, to raising sheep and llamas in rural Arizona, and to her current home on a small flower farm on Sauvie Island in Portland, OR, a popular birding destination.

With work exhibited both nationally and internationally, Jen's illustrations have appeared in *The Portland Mercury*, *The Village Voice*, and books including *The Story of Pines*, *The Tall Trees of Portland*, and *To Come and Go Like Magic*. She is interested in publishing opportunities and would like to find ways to bridge science illustration, education, and art in widely approachable applications.

Jen earned a BFA from Otis College of Art & Design in Los Angeles before shifting her illustration career towards science-based work with a particular focus on conservation and education. She attended the University of Washington and received a certificate in Natural Science Illustration. She relates that she was both humbled and thrilled to be working at the Lab with access to its vast collections and network of researchers.

As a Bartels Science Illustrator, Jen created watercolor and gouache illustrations for a range of projects. Her illustrations for *The Winter Finch Almanac* by Hannah Hoag in the Winter 2020 issue helped bring to life a story about winter finch forecasting. She also created illustrations of the White-tailed Ptarmigan for a species profile in the same issue. Jen's art was featured on the membership holiday card as well as the membership tote bag for 2020.

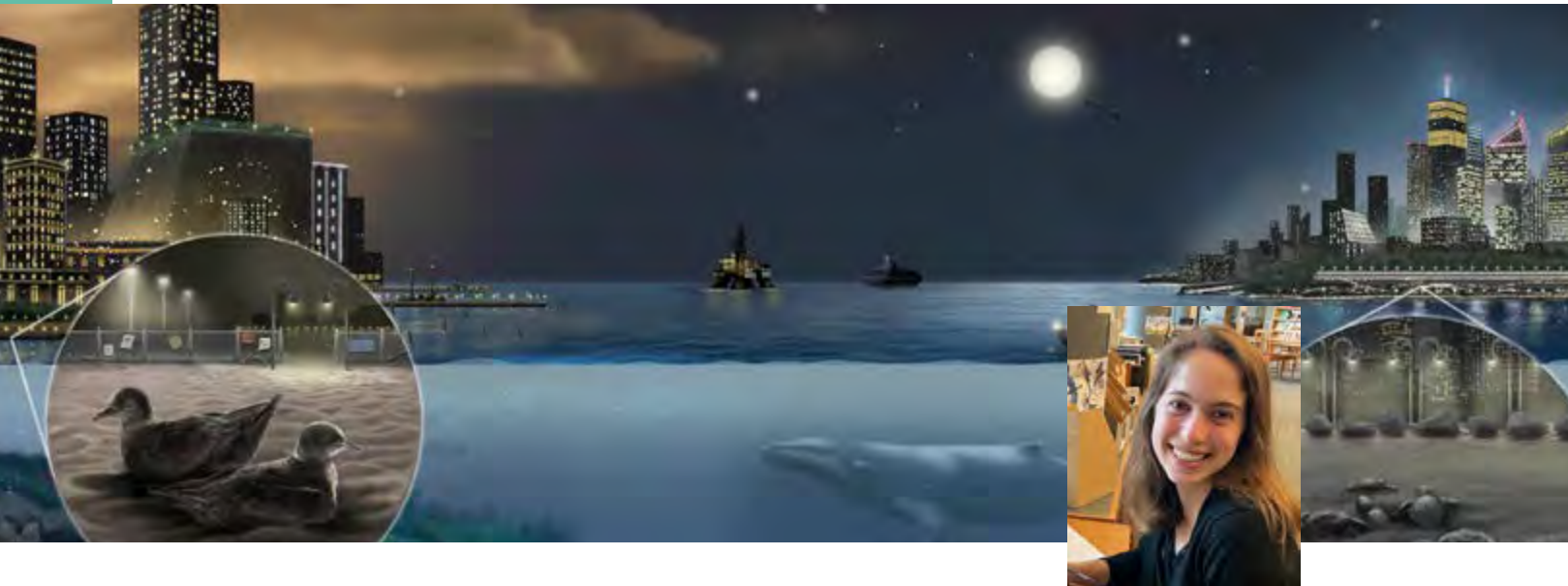


OPPOSITE: Winter finches for *Living Bird*, Winter 2020

TOP LEFT: Barn Owl for Membership holiday card

ABOVE: Violet-green Swallows for Membership tote bag

LEFT: White-tailed Ptarmigan



Charlotte Holden

Charlotte is a detail-oriented illustrator with a deep interest in the sciences. Nearly twenty years of dance training inspired Charlotte's passion for anatomy and understanding how internal structure informs external form and function. She enjoys researching her subjects to fully understand both their external and internal design.

Charlotte attended Rhode Island School of Design where she earned her BFA in illustration in 2018. Through her coursework at RISD and her position as a teaching assistant for the first medical illustration course at the Warren Alpert Medical School of Brown University, Charlotte discovered she could combine her love of art and science. Charlotte works with institutions, companies, and individuals across multiple disciplines that depend on science illustration. Her projects include work with researchers in entomological illustration at the American Museum of Natural History, and botanical illustration at the New York Botanical Garden.

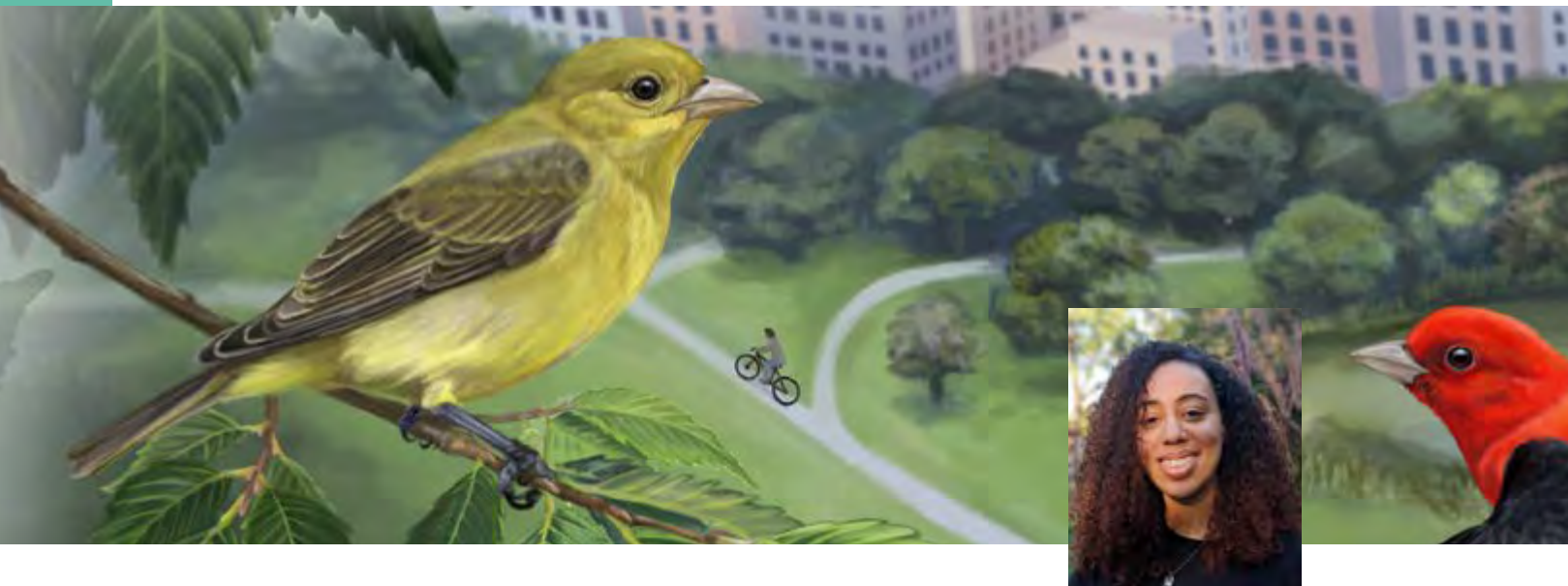
As an artist and avid bird watcher, Charlotte is thrilled to be a part of the Bartels Illustration community. As part of her residency, Charlotte created an illustration for a story on Marbled Murrelets called *Sounds Like Home* by Carrie Arnold, which appeared in *Living Bird Magazine's* Spring 2022 issue. Charlotte has also contributed to textbook graphics and academic figures for Cornell postdoctoral researchers. Through her work, Charlotte hopes to inspire discovery and curiosity with the aim of creating a larger community whose mission is to protect and defend our world and all the life that inhabits it.



OPPOSITE: Marine Light Pollution

TOP: Black-headed Grosbeaks and Rose-breasted Grosbeaks on Blackberries

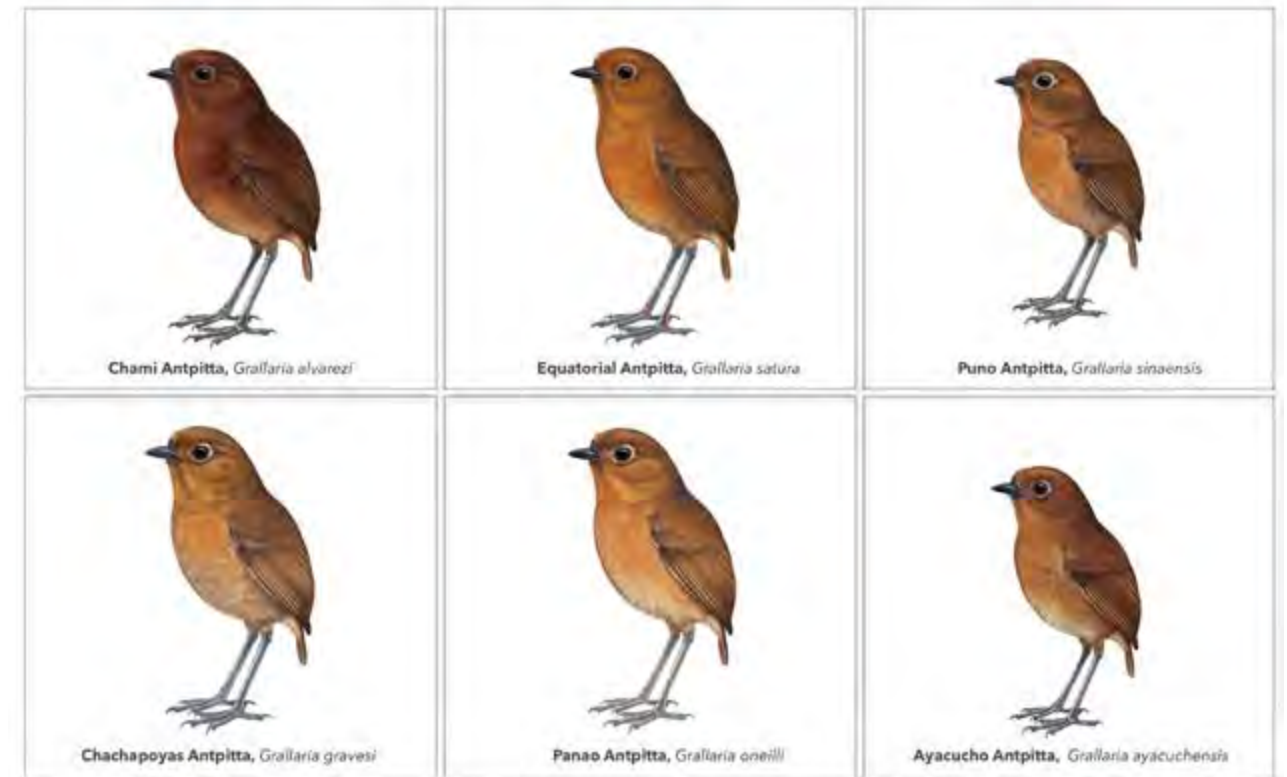
LEFT: Marbled Murrelet for *Living Bird*, Spring 2022



Liz Wahid

Wildlife and environmental conservation have always been at the forefront of both Liz Wahid's art and studies. She attended Cornell University where she continued to study fine art while earning a B.S. in Animal Science. It was through her involvement with the Cornell Raptor Program that she found a passion for ornithology, and while working for the Elephant Listening Project at the Cornell Lab, she became aware of the Bartels Science Illustration Program as well as a new career path in scientific illustration. After graduating from Cornell University, Liz focused on shifting her art into a more informative style and went on to attend the Graduate Science Illustration Program at California State University, Monterey Bay. She graduated in 2020 and has since been working as a freelance illustrator, completing avian illustrations for *Scientific American*, the National Audubon Society, and Black Birders Week.

The primary focus of Liz's work is to spark curiosity for birds in hopes viewers will become more interested in the uniqueness of different species and more aware of conservation issues surrounding local avifauna. Her illustrations are inspired and informed by her hands-on experience with the care of captive bird species and the banding of wild birds, as well as her adventures birdwatching. Liz has contributed to many projects during her residency and is especially excited to be working with the *Birds of the World* team to complete illustrations for the identification of newly discovered species and recent taxonomic splits.



OPPOSITE: Scarlet Tanagers for Big Day 2022 Campaign

TOP: Antpitta illustrations for *Birds of the World* species accounts

LEFT: *Alor myzomela* illustration for *Birds of the World* species account reprinted on promotional poster