The Center for Conservation Biology

INSPIRING A NEW GENERATION

Annual Report 2015

CCB's

ONGOING MISSION

The mission of The Center for Conservation Biology, through all of its diverse programs, is to provide the global community with the information needed to drive thoughtful, science-based conservation, to educate and train the next generation of conservation scientists, and to make lasting contributions to the natural world through critical thinking, innovation, and ground-breaking research.

The Center for Conservation Biology is a research unit shared by William & Mary and Virginia Commonwealth University. The Center is a part of the VCU Inger and Walter Rice Center for Environmental Life Sciences. Rice Center scientists conduct cutting-edge environmental research on the James River and around the world.

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On the cover: Recently fledged peregrine falcons along the coast of Virginia. The presence of this resident population has created a conservation conflict with migratory shorebirds–a focus of a recent graduate student research project. Photo by Alex Lamoreaux

A MESSAGE FROM THE DIRECTOR

The air in early May is full of song in the southern Appalachians. In the valley where I grew up, Donnally Hollow was a magical place where you could easily hear 20 species of warblers in a morning. When I was still in elementary school, Polly Bollowe would take me up the wooded trail, whisper a bird name and squeeze my hand every time it sang until I was able to squeeze first. Together, hand in hand, we would walk up Donnally Hollow and through a long list of species. Years later, I would return to lead her up the trail by the hand. Then in her 80s and hard of hearing, I would describe the birds singing around us. She would smile, close her eyes and imagine the chorus. Such is the exchange between generations of people who share a common passion.

We pass on the things we value. Conservation biology is a demanding, interdisciplinary science. For young researchers, there is a bewildering array of technical skills that must be learned before conducting independent research. Few things are more rewarding than seeing the self-confidence rise in a student as they design increasingly complex studies or recognize the implications of a new result. But technical skills are no more than brushes to the painter, merely tools. Greater than technique is curiosity. Greater than curiosity is passion. Greater than all of these is purpose. Purpose forges the tools necessary to clear its own path.

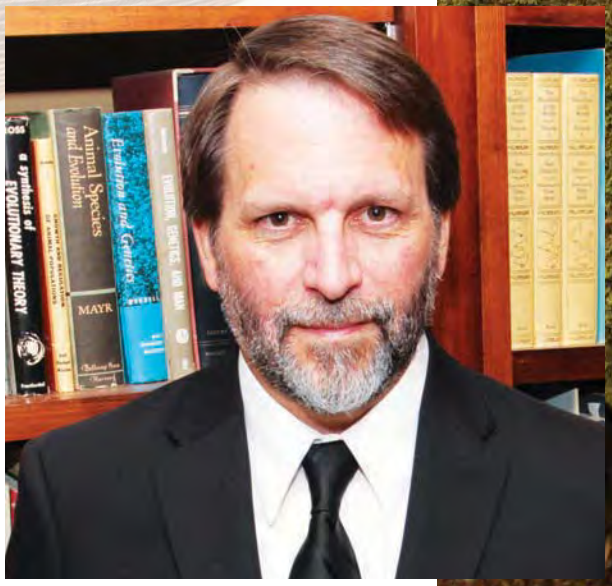
Polly's lessons were not just about bird songs but about the beauty and value of the deep woods that have stood beyond the reach of bulldozers. The central lessons of The Center are not about the techniques required to complete a research project but about why we should be conducting research at all. It is in the why rather than the how that we discover our own purpose.

Help us to inspire a new generation.

Sincerely,

Bryan Watts

Bryan D. Watts
Mitchell A. Byrd Professor of Conservation Biology
Director, The Center for Conservation Biology
Photo by Marian Watts



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Right: Banding western sandpipers at dawn along the upper Bay of Panama. CCB biologists continue to train staff of Panama Audubon Society and local university students in applying basic field techniques. Building local capacity is a critical strategy for protecting birds within one of the premier shorebird conservation sites throughout the Western Hemisphere. Photo by Bart Paxton


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CONSERVATION EDUCATION

The impact of education is like a drop of rain on a still pond. Information spreads from person to person and the ring of knowledge moves out rapidly in all directions. Eventually, the ring collides and joins with others until the entire pond is alive with dance.

Young, aspiring conservation biologists are an integral part of The Center's research mission. We have been incredibly fortunate to host hundreds of talented and dedicated students and technicians who have conducted research at the highest level and who have made lasting contributions to conservation. Many have moved on and found their own unique way to serve and inspire others. We are proud of the collective impact that they have made on the world.

Kristi Lewicki counts nests and broods of brown pelicans and double-crested cormorants in a colony on Smith Island in the Chesapeake Bay. Some large-scale projects involve many technicians to complete and hopefully broaden the experience and skills of young scientists. Photo by Bart Paxton

Right: Current locations of more than 250 (approximately one third) of CCB's students, interns and technicians that have stayed within the United States. These research alumni are having an impact on conservation wherever they go. Map prepared by Marie Pitts

GRADUATE STUDENTS

Just as much as a science, conservation biology is a craft and there is no substitute for practical experience in learning how to effectively solve a complex problem. In addition to the fundamental theories learned through coursework, students who want to practice conservation biology must be shaped by real-world problems and experiences. The process of taking a conservation problem from concept to conclusion requires several stages and many decisions. Consistency in producing meaningful results requires an understanding of several interrelated disciplines.

The Center for Conservation Biology has supported a large number of graduate students on projects that have advanced our understanding of conservation problems. All these students have contributed to the continuing development of The Center. We are very proud of the work that they completed while here and the people they have become. The following pages present a small sample of CCB graduate students that illustrate a cross section of career paths.

Andy Glass measures an osprey nestling along the Rappahannock River. Andy's research found that osprey growth rates were higher in low-salinity compared to high-salinity waters.
Photo by Bryan Watts

Ann Catherine Markham

Catherine Markham holds a young eaglet from a nest along the Mattaponi River before weighing and taking measurements. Her study recorded the highest growth rate of any population to date.
Photo by John DiGiorgio

Catherine Markham received her undergraduate degree in biology from Wake Forest University. She came to CCB as a field technician working on a whip-poor-will tracking project and a passerine migration project among other studies. Her willingness to work in difficult field conditions made her an ideal candidate to work with nesting bald eagles.

WORK WITH CCB

Research Question

Breeding bald eagles are not evenly distributed throughout the Chesapeake Bay. Breeding density varies across the salinity gradient with lower salinity reaches now supporting more than 10-fold higher densities compared to reaches with higher salinities. Low-salinity waters account for a large portion of chick production and support congregations of subadult and migrant eagles throughout the year. These same areas represent spawning grounds for anadromous fish such as American shad and herring. Although the conservation value of low-salinity waters to eagles was, at the time, becoming increasingly clear, linkages to the underlying prey populations had not yet been made. Clarifying the relationships between breeding eagles and prey was critical to making informed management decisions

Thesis Work

Do eagles breeding in different salinity zones use different prey or provision broods at different rates? Does chick growth rate vary with salinity? Catherine investigated these questions by installing video cameras in nests associated with different salinity zones and by climbing into nests repeatedly to measure young. She determined that diet did not vary with salinity but that both provisioning and chick growth rates were influenced by salinity. Chick growth rates in the Chesapeake Bay were the highest ever recorded throughout the species range. Findings have important implications for future management.

WORK BEYOND CCB

After leaving CCB, Catherine earned a Ph.D. in ecology and evolutionary biology with Jeanne Altmann at Princeton University. Her dissertation work focused on spatial movements and interactions between baboon social groups within Amboseli, Kenya. Following graduate work, Catherine was a post-doc at George Washington University studying the behavior of wild chimpanzees. She is now an assistant professor in the Department of Anthropology at Stony Brook University.

Right: As one juvenile savanna baboon forages, another closely inspects his food choice.
Photo by Catherine Markham

"My experiences at The Center were so rich and meaningful that a hunger in me can still be fed by trying to better understand them. Ten years later, I'm still challenged and inspired. And ten years later, I still find joy in remembering what it was like to be a part of such a remarkable community. "– Catherine Markham

"Effective conservation can really only happen with a thorough understanding of the natural history of a biological community, but opportunities to get deeply immersed in an area or a system can be hard to come by these days. Working at the CCB drove home to me the value of careful, detailed natural history study and ultimately to a career path that would allow me to continue this tradition."
– Elizabeth Long

Variable checkerspot, one of Elizabeth's study organisms for her doctoral work. Photo by Zach Smith

Elizabeth Long

Elizabeth Long received her undergraduate degree in biology from the University of Richmond. A love of both rock climbing and peregrine falcons made her an ideal candidate to work with the breeding falcon population in Virginia.

WORK WITH CCB

Research Question

Peregrine falcons were extirpated east of the Mississippi River by the early 1960s due to DDT. As part of a restoration effort, a captive breeding program was initiated and falcons were released in the mid-Atlantic Coastal Plain, a physiographic region with no cliffs and no significant historic breeding population. A population was established on artificial substrates and has grown to 70 breeding pairs. During the spring, the mid-Atlantic coast is a globally important staging site for migratory shorebirds on their way to arctic breeding grounds. Introduction of peregrines, a major predator of these waterbirds, has created a conflict between competing conservation objectives. However, prior to Elizabeth's work, we knew relatively little about the potential impact of introduced peregrines on shorebird populations.

Thesis Work

A pivotal conservation question was, how many shorebirds are peregrine falcons taking? Elizabeth investigated this question by quantifying diet and then projecting the diet to the population level using metabolic models. She collected prey remains from nests and installed video cameras to record prey delivered to broods. She found that 70% of prey items used to raise broods were migratory shorebirds and that the Virginia population alone may take as much as 5% of some passage populations. This information has been used to make management decisions.

WORK BEYOND CCB

After leaving CCB, Elizabeth earned a Ph.D. in ecology with Art Shapiro at the University of California at Davis. Her dissertation work focused on the evolution, ecology and genetics of mimicry in checkerspot butterflies. Following a brief teaching position at Embry-Riddle University she was a post-doc at UCLA where she investigated the effect of urbanization on butterfly and other pollinator populations. She is now the Director of Conservation Science within the Mohonk Preserve in New York.

Brood of peregrine falcons stand on a bed of feathers from prey on the Eastern Shore of Virginia. Elizabeth's research to quantify the diet of this population has helped to better define the conservation conflict between breeding peregrines and migratory shorebirds. Photo by Bryan Watts

Elizabeth Long measures a young peregrine falcon on the Eastern Shore of Virginia as part of her study of prey use. Photo by John DiGiorgio

GRADUATE STUDENTS

Kenneth Andrew Glass

Andy Glass received his undergraduate degree in biology from Berry College and then worked on a variety of field projects on the Outer Banks of North Carolina, in the Bering Sea and throughout California. Andy's extensive field experience prepared him for work with osprey on the Chesapeake Bay.

WORK WITH CCB

Research Question

The Chesapeake Bay supports the largest osprey population in the world. The population had declined by more than 80% by the 1970s and was confined to the high-salinity reaches of the Bay. By 2000, the population was recovering and re-colonizing low-salinity headwaters. Although many studies had been conducted over a 30-year period along the main stem of the Bay, nothing was known about the breeding ecology of osprey within low-salinity waters.

Thesis Work

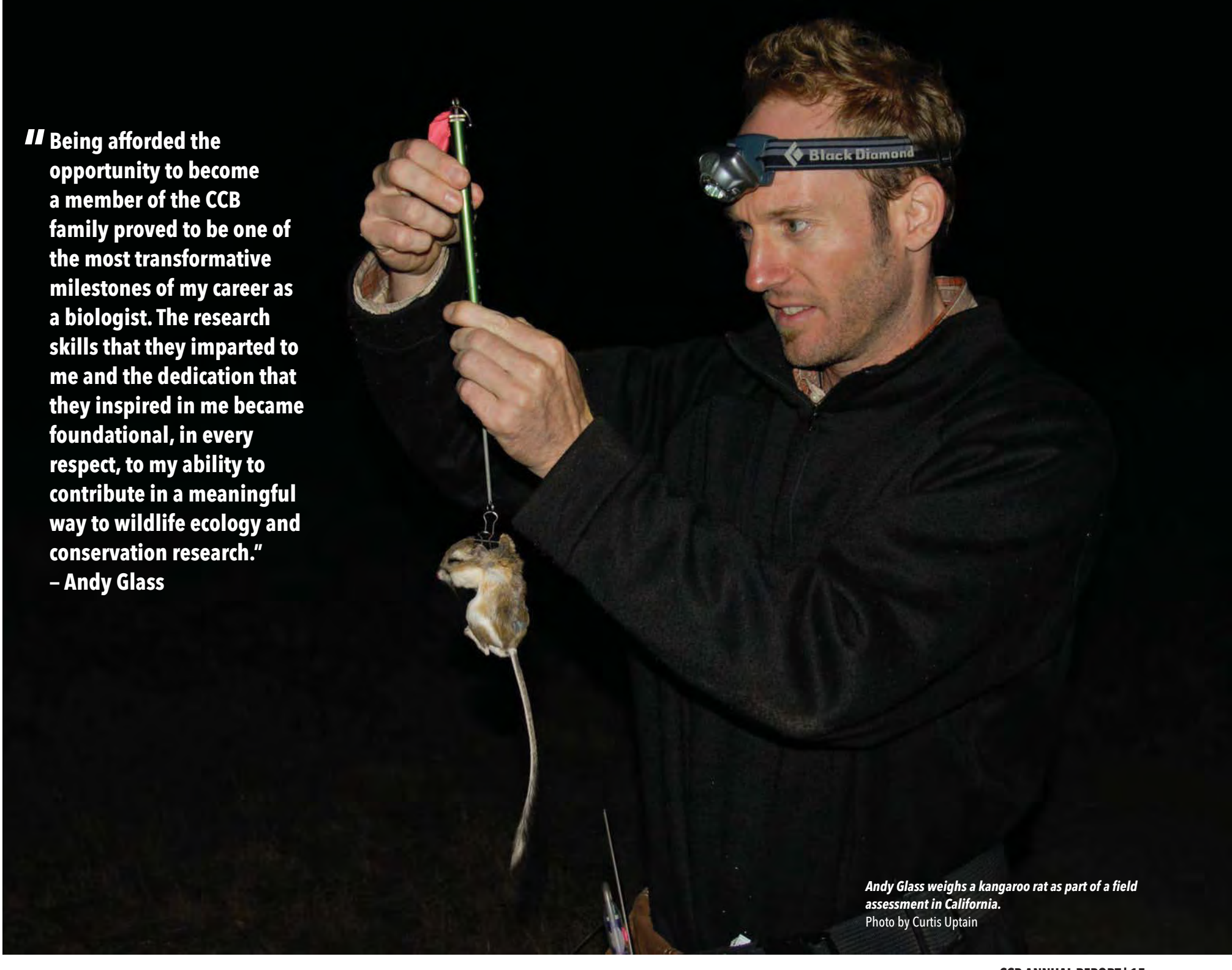
Salinity is a critical habitat characteristic that drives ecological zonation within estuaries. Does osprey breeding biology vary with salinity throughout the Chesapeake Bay? Andy investigated this question by delineating several study areas that varied in salinity and quantified, diet breeding phenology, breeding success, clutch size, brood size and chick growth rate. He found that osprey had rapidly adapted to low-salinity conditions. Pairs in low-salinity waters had different diets, laid clutches several days earlier, had larger broods with chicks that grew faster. His work has been used to inform fisheries management.

WORK BEYOND CCB

After leaving CCB, Andy has worked in California at the interface between conservation biology and our developing world. He currently serves as a senior biologist with Quad Knopf, managing a team of up to 35 biologists working with special-status species, completing biological assessments, evaluating impacts to sensitive species and ecosystems, and developing mitigation plans. This work has a significant influence on the direction of landscape change in the region.

Female osprey on a nest along the upper James River. Andy's research was the first to investigate breeding ecology within the lower salinity reaches of the Chesapeake Bay.
Photo by Bryan Watts

"Being afforded the opportunity to become a member of the CCB family proved to be one of the most transformative milestones of my career as a biologist. The research skills that they imparted to me and the dedication that they inspired in me became foundational, in every respect, to my ability to contribute in a meaningful way to wildlife ecology and conservation research."
– Andy Glass



Andy Glass weighs a kangaroo rat as part of a field assessment in California.
Photo by Curtis Uptain

Amanda Allen Beheler

Amanda Allen received her undergraduate degree in biology from William & Mary. While an undergraduate, Amanda participated in many conservation projects including the restoration of peregrine falcons in the mountains of Virginia. Raised along the shores of the upper Chesapeake, she was well suited for conducting research in salt marshes.

WORK WITH CCB

Research Question

One quarter of all species breeding within the mid-Atlantic region depend on tidal waters, most notably tidal salt marshes. Within salt marshes, natural tidepools offer unique resources and are one of the habitat elements that contribute most to marsh-bird diversity. However, characteristics such as size, depth and edge type vary between tidepools. The influence of these characteristics on tidepool use and their associated relationship to bird diversity within saltmarshes had never been studied within the Chesapeake Bay until Amanda's research.

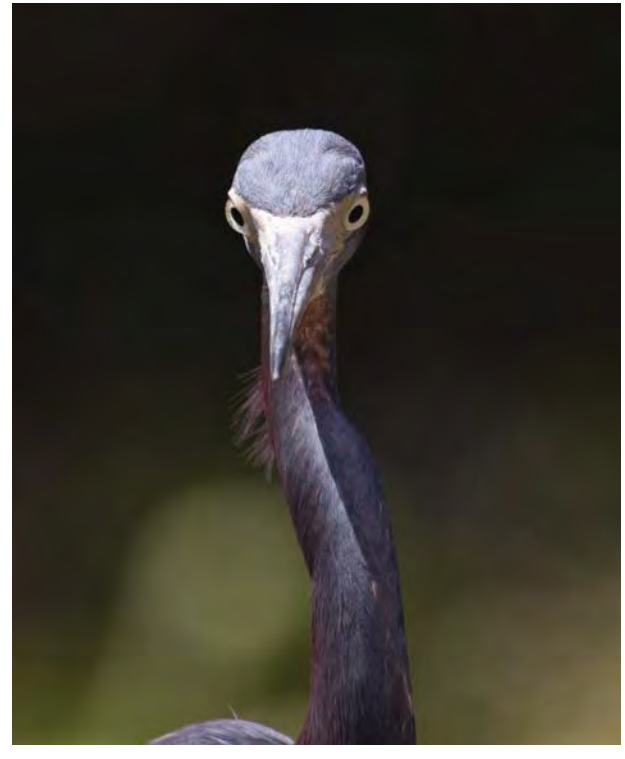
Thesis work

How do tidepool characteristics influence their value to birds? Amanda investigated this question by characterizing more than 300 tidepools in the Chesapeake Bay and surveying them for birds during breeding and migration. Large tidepools with sloped edges and variable depths were more highly preferred than deep steep-sided pools similar to those constructed by wetland managers. Amanda's work remains the only comprehensive treatment of tidepool use by birds throughout the region and has important implications for the impact of sea-level rise on marsh-bird communities and the creation of artificial tidepools.

WORK BEYOND CCB

After leaving CCB, Amanda worked with Bachman's Sparrows at the Savannah River Ecology Lab and then earned a PhD in wildlife ecology with Gene Rhodes at Purdue University. Her dissertation focused on dispersal and mating strategies in eastern phoebes. Following graduate work, Amanda was a post-doc at Purdue working on avian and mammal conservation genetics and then, briefly taught field ecology for Wheaton College. Currently, she is a full-time homeschooling mother sharing her love of the Bay, wildlife ecology and natural resource conservation with her children Phoebe, Callum and Liam.

Tidal marsh in fall with natural tidepools. Amanda's research demonstrated that tidepools are a gathering place for birds during more than just the breeding season. Photo by Bryan Watts



Little blue heron surveys its surroundings. Tidepools are an important foraging habitat for this species within the Chesapeake Bay. Photo by Bryan Watts

"In many ways, working at The Center was like being apprenticed with a master craftsman. Being mentored by such a group of incredibly hard working and visionary individuals not only gave me invaluable insight into ecological research but also fueled my love for natural landscapes, especially the Bay." – Amanda Beheler

Amanda Beheler with husband Brian and children Liam, Callum and Phoebe out on the James River to band osprey. Photo by Bryan Watts

Michael Wilson

Mike Wilson received his undergraduate degree in biology from Indiana University in Pennsylvania and then worked on a variety of field projects including passerine migration on both the Delmarva Peninsula and Gulf Coast and forested wetland bird communities in North Carolina. Mike's diverse field experience prepared him for managing complex projects.

WORK WITH CCB

Research Question

The conservation of species that requires resources exclusive to different habitats is complex because meeting their basic requirements depends on the spatial arrangement of habitat patches within the larger landscape. Many species fall within this category and their conservation requires an understanding of landscape-scale processes. Insuring persistence may be particularly challenging for species within human-altered or managed landscapes. Whip-poor-wills are a declining species that nest in forest patches but forage in open patches and occur within the patch mosaic created by commercial forest lands.

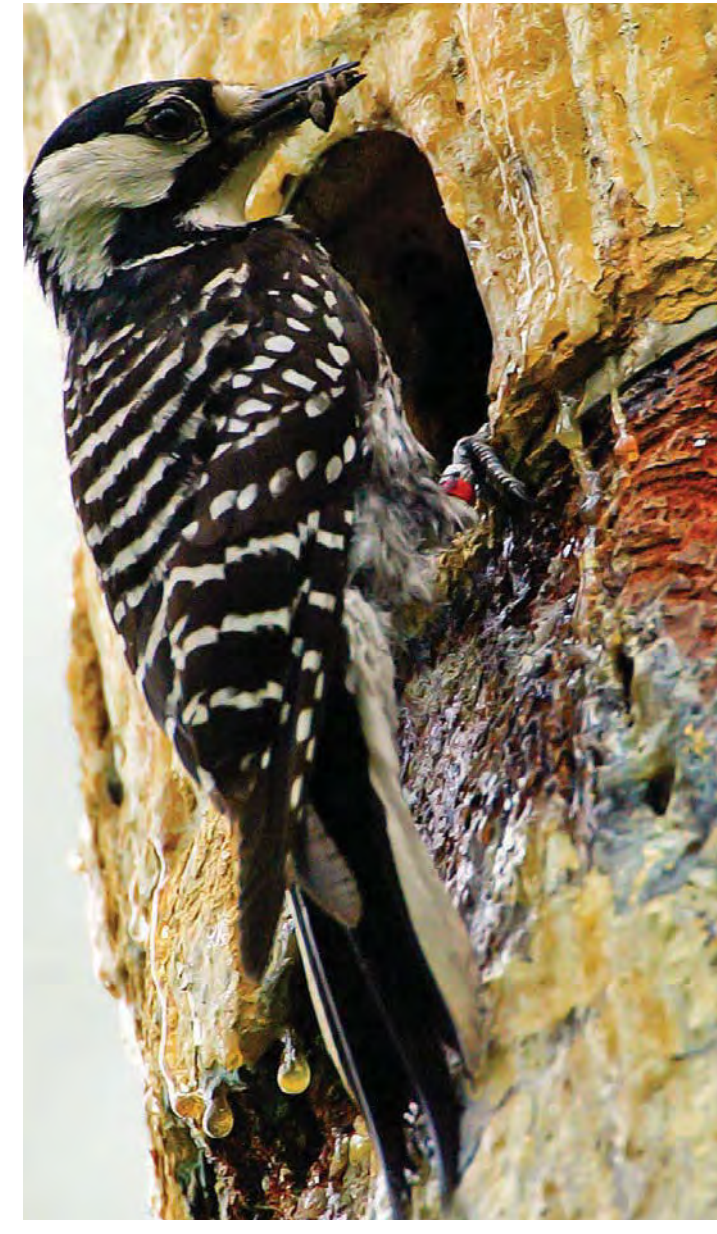
Thesis work

How do second-order habitat attributes such as adjacency influence patch use in the whip-poor-will? Mike addressed this question in the timberlands of North Carolina by surveying forest patches adjacent to open habitats and forest patches adjacent to forest. He demonstrated that patch context matters to breeding whip-poor-wills and that the conservation of this species requires orchestrated management. Mike's work is relevant not only to the management of whip-poor-wills within commercial forests but to many species that require habitat complexes.

WORK BEYOND CCB

After leaving CCB, Mike worked with the Florida Fish and Wildlife Conservation Commission and then as the state-wide avian conservation coordinator with the Virginia Department of Game & Inland Fisheries before returning to CCB as a senior biologist. Mike has worked on a broad range of conservation problems including most recently on sea-level rise and marsh birds, restoration of red-cockaded woodpeckers, habitat requirements of passerine migrants and conservation of eastern black rails.

Whip-poor-will with transmitter. Mike's graduate research showed that whip-poor-wills exist along the interface between pine stands where they nest and in the open patches where they forage. Photo by Catherine Markham



Adult red-cockaded woodpecker brings food back to its nest within the Piney Grove Preserve. As one of the most endangered bird species within Virginia, CCB monitors the population closely. Photo by John DiGiorgio

Above: Red-cockaded woodpecker brood just after banding. Individual marking is a critical component of population monitoring. Photo by Bryan Watts

Right: Mike Wilson bands a brood of red-cockaded woodpeckers in The Nature Conservancy's Piney Grove Preserve. Mike manages CCB's efforts to recover this species in Virginia. Photo by Bryan Watts

"The Center has provided me with the educational and professional experiences that will forever influence my approaches to conservation as a science and a career. To top that, I also know I would never trade away the many positive associations with The Center's students, staff and other close colleagues while working here."
– Mike Wilson

GRADUATE STUDENTS

Alexandra Wilke

Alex Wilke received her undergraduate degree from Bates College and then worked with kittiwakes in Alaska and on several waterbird projects in Massachusetts. Her experience with coastal systems and waterbirds made her an ideal candidate to work with American oystercatchers in Virginia.

WORK WITH CCB

Research Question

The American oystercatcher requires highly restricted coastal habitats during both the breeding and winter seasons. These habitats are under intense pressure from humans for recreational use and development, making the oystercatcher a species of high conservation concern. Both the narrow habitat requirements of oystercatchers and their sensitivity to human activities make them an ideal bioindicator for the health of coastal ecosystems. Historically, information on the status and distribution of oystercatchers and their basic demography was incomplete, posing a barrier to effective management. Work by Alex and a coalition of researchers along the Atlantic Coast has greatly reduced this information gap and opened up new avenues for management.

Thesis work

Work with American oystercatchers had been conducted within specific locations in Virginia prior to Alex's research. However, systematic work needed to characterize population size, distribution and breeding performance was lacking. Alex coordinated surveys of breeding pairs throughout Virginia and delineated populations within the Chesapeake Bay, coastal bays and along the barrier islands. This work determined that Virginia supported the largest breeding population of any state and contributed to range-wide estimates. Her work with breeding performance has been used to design new management programs.

WORK BEYOND CCB

After leaving CCB, Alex took a position working with waterbirds with the Virginia Coast Reserve of The Nature Conservancy. She has continued her long-term research with oystercatchers and is responsible for bird-related work and conservation of waterbirds within the 50 miles of barrier island coastline within the Virginia Coast Reserve.

Flock of American oystercatchers roosting on a shell pile along the Delmarva Peninsula in Virginia. Alex's research has shown that Virginia supports one of the largest winter and breeding concentrations of this species throughout its range. Photo by Alex Wilke

" Completing my graduate work at CCB gave me the solid foundation in ecology and conservation that I needed to successfully begin a career in bird conservation with The Nature Conservancy. Ten years later, I'm proud of the work that I've accomplished and I'm grateful for my experiences at CCB and my continued professional and personal relationships with CCB staff that have contributed so much to my work over the years."
– Alex Wilke

Alex Wilke with adult American oystercatcher along the Virginia barrier islands. Banding oystercatchers with field-readable bands has unlocked a large number of conservation questions about survivorship and connectivity. Photo by The Nature Conservancy

Rhonda Hardesty Sipe

Rhonda Sipe received her undergraduate degree in biology from William & Mary. While an undergraduate, Rhonda conducted research on bald eagles along the Potomac River and participated in several CCB field projects. Being raised in King George County, Rhonda was well- prepared for work on American Kestrels in rural Virginia.

WORK WITH CCB

Research Question

Throughout northeastern North America two-thirds of bird species that depend on open habitats have declined over the past three decades due to conversion of habitat to forest, intensive agriculture or residential development. The American kestrel, a small falcon, has been one of the species leading declines. Although considerable work has been done in this region with breeding kestrels, prior to Rhonda's work, little was known about the importance of landscape context on habitat use during migration and winter.

Thesis work

How does landscape composition influence patch use in American kestrels during migration and winter? Rhonda investigated this question by selecting 86,10-kilometer road segments that ran through landscapes with different amounts of open habitat. She then surveyed these areas for kestrels during migration and winter and quantified the type and amount of habitat surrounding them. She demonstrated that wintering and migratory kestrels used the network of sites in different ways with wintering birds being more selective of landscapes dominated by open habitats. She also demonstrated that use of small open patches was influenced by the composition of the surrounding landscape. These findings have important implications for sustaining kestrels within the region.

WORK BEYOND CCB

After leaving CCB, Rhonda worked briefly for the Virginia Department of Game & Inland Fisheries and as an environmental educator in North Carolina. Rhonda is a biologist with the U.S. Department of Defense (DOD) with extensive experience in environmental hazard modeling and predictive analysis related to oil and gas release. She currently works with a team focused on industrial systems identifying critical components and advanced methodologies for high-profile DOD tasking.

"While working with CCB there were countless opportunities to become involved with a wide range of projects, allowing exposure to multiple species and field techniques. This immersion allowed me to grow as a biologist and fostered an interest in environmental education. I still get excited every time I spot an American Kestrel." – Rhonda Sipe

An adult male American kestrel. This species has declined precipitously in northeastern North America in recent decades. Rhonda's research has shown that distribution is influenced by both patch quality and the composition of the surrounding landscape. This finding has important implications for habitat management. Photo by Reese Lukei

Left: Rhonda Sipe with American kestrel. Rhonda's research with kestrels in coastal Virginia has important implications for the management of this declining species throughout their winter and migratory range. Photo by Bryan Watts

Above: A nestling American kestrel just after banding. During Rhonda's work, CCB established a nest box program in an attempt to assist the declining population. Photo by Dana Bradshaw

Courtney Turrin

Courtney Turrin received her undergraduate degree in biology from Bucknell University. While an undergraduate she conducted work with diatoms and worked on the role of invasive crayfish on the decline of American eels in the Hudson River. Following undergraduate work she was an intern at Hawk Mountain Sanctuary and worked with dispersal in American Kestrels. Her broad background prepared her for work with nesting bald eagles.

WORK WITH CCB

Research Question

Bald eagles within the Chesapeake Bay have been recovering for 40 years and are now approaching saturation. As the population reaches capacity, breeding options for young birds are increasingly reduced setting off a class war that will ultimately bring the population into balance with available resources. This transition from population recovery to stability is a conservation milestone but the negative behavioral feedbacks that force the transition are poorly understood. Nothing was known about the behavioral mechanisms that slow population growth in bald eagles prior to Courtney's research.

Thesis Work

How do bald eagles respond to the rise in contests over territories and what are the consequences for brood rearing? Courtney investigated this question by selecting nests and making direct observations of territorial responses to intruders. Territorial adults responded aggressively to adult intruders particularly during the first two weeks after hatching. Male guarding behavior appears to be a key to the pair's defense strategy and male guarding rates have increased as the population has approached capacity. However, time invested in guarding comes at the expense of hunting activities required to provision broods. Such behavioral tradeoffs will, over time, increase population stability.

WORK BEYOND CCB

After leaving CCB, Courtney entered a Ph.D. program working with Steve Chang in the Psychology Department at Yale University. She is studying animal social behavior and how such behaviors are mediated by neuropeptide hormones like oxytocin. She is currently developing projects that will investigate social approach/avoidance behavior in rhesus macaques and human-directed social behavior in canines.

Right: Courtney Turrin with a young peregrine falcon on the Eastern Shore of Virginia. During her time working with CCB, Courtney was involved in many field projects.
Photo by Libby Mojica

"CCB gave me the opportunity to work on many different projects, to collect data in the field, to learn various spatial and statistical analyses, to write scientific papers, and to share the knowledge gained from these projects with the broader public. Working at The Center gave me the experience to shape my own research interests and encouraged me to develop skills that will be critical throughout my career as a scientist."
– Courtney Turrin

Above: Adult bald eagle incubates along the Potomac River. Intrusion by territory challengers is low during the incubation period but picks up dramatically after the eggs hatch. Guarding behavior is correspondingly low during this period and incubating adults rarely leave the nest to pursue intruders. Photo by Bryan Watts

Right: A four-year-old eagle in the Chesapeake Bay. Although intrusion into territories by younger birds does not illicit an aggressive response, intrusion by four-year old and older eagles results in an immediate response by guarding birds. Presumably, these birds are considered threats to young broods and to territory integrity. Photo by Libby Mojica

Northern saw-whet owl captured during migration on the lower Delmarva Peninsula. Dave started his research career with an honors project at CCB focused on saw-whet migration and is now considering coming back to that topic as a professor in Pennsylvania. Photo by John DiGiorgio.

David Whalen

Dave Whalen received his undergraduate degree in biology from William & Mary. While an undergraduate, Dave conducted honors research at CCB on the migration ecology of northern saw-whet owls and later worked on several conservation projects. His field experience and broad interest in ecological questions made him an ideal candidate to investigate winter sparrow communities.

WORK WITH CCB

Research Question

How complexes of closely related species coexist is one of the great questions of community ecology that has implications for patterns of species diversity. Winter sparrows represent ideal species complexes to investigate factors contributing to community structure. Most sparrows forage almost exclusively on herbaceous seeds during the winter months. How do species that eat the same food coexist within the same habitats? Variation in ability to access seeds under different conditions may restrict species according to performance. The availability of surface seeds varies through space depending on leaf litter and other factors. What role may ability to access buried seed play in habitat selection and community stability?

Thesis work

Do sparrow species differ in their ability to access buried seed and how may these differences influence foraging efficiency and habitat selection? Dave investigated these questions by using artificial seed trays and testing the ability of six species to extract seeds from varying soil depths. He demonstrated that species fell into three categories including strong scratchers, weak scratchers and non-scratchers and that scratching ability had a significant influence on energy budgets when surface seeds were limited. Variation in scratching ability promotes habitat selection and contributes to community structure. Understanding the underlying factors contributing to patterns of diversity is critical to species management.

WORK BEYOND CCB

After leaving CCB, Dave conducted his Ph.D. research at the University of New Mexico studying resource competition as a function of spatial scale among seed-eating ants, rodents and birds. He also researched community dynamics of lizards in a coastal desert ecosystem in Sonora, Mexico. Dave is currently a tenured biology professor at Montgomery County Community College in Blue Bell, PA. He teaches a wide variety of biology courses and supervises undergraduate students conducting field research.

"My experience as an undergraduate and graduate student researcher at The Center for Conservation Biology was the most formative time period in my career as a biologist. Working with CCB staff on widely varied and exciting conservation projects instilled in me an enduring passion for science education and ecological research."– Dave Whalen

Above: White-throated sparrow during winter. This species is common throughout eastern North America, depends on shrub cover and is adept at extracting buried seeds. Photo by Bryan Watts

Right: David Whalen measures a common barn owl. Photo by Bryan Watts

TECHNICIANS

The Center for Conservation Biology is a small place in a large world but our mission is grand. An important part of that mission is to provide the opportunity for young scientists to see and experience research.

Much of the field research conducted by CCB requires teams of biologists that are often deployed in remote locations. Interns and technicians represent critical components of these teams and we have been fortunate to have had several hundred dedicated interns and technicians working on projects over the years. They bring a curiosity and enthusiasm that is vital to the success of projects. Likewise, the experience of executing field research has left indelible marks on these young students and often shaped their career paths.

Jethro Runco (left) and Shannon Ehlers (right) band a whimbrel on the Eastern Shore of Virginia as part of an international tracking study. Technicians and interns work long hours in difficult conditions. Both their enthusiasm and professionalism are responsible for the success of many field projects.
Photo by Bart Paxton

Sarah Rosche counts fruit in an "exclusion bag" as part of a study focused on fruit availability for passerine migrants on the lower Delmarva Peninsula. Many of these intense and long studies could not be completed without the dedication of field technicians. Photo by Bart Paxton

Domestic Technicians

THE NEED

Each year, dozens of young conservation biologists from throughout North America contact The Center looking for opportunities to conduct field research. These young scientists are bright, full of energy and dedicated to making the world a better place for other species. They represent the future of the conservation enterprise. Some will move on to solve our most pressing environmental problems. Others will increase the environmental awareness of the broader public or teach new generations of aspiring scientists how to approach research questions of their own. With each passing year, the wave of interest grows and the need for hands on experience gets larger.

PROGRESS

The Center for Conservation Biology has involved hundreds of technicians and interns in research focused on solving real-world problems. However, during no year over the long history of The Center have we been able to accommodate even a small fraction of the demand for young scientists to get involved in primary research. This gap is one of our largest shortcomings. The Center needs a dedicated, endowed internship program to meet the demand to train developing scientists.

Dave Curtiss and Julie Kelso heading out along the Virginia coast to trap whimbrels. Working on intense field projects with CCB staff has shaped the career paths of many young scientists who have continued on in the conservation industry. Photo by Bryan Watts

Zak Poulton extracts a northern saw-whet owl from mist during fall migration study. Zak has worked with CCB on many field projects within the mid-Atlantic region.
Photo by Bart Paxton

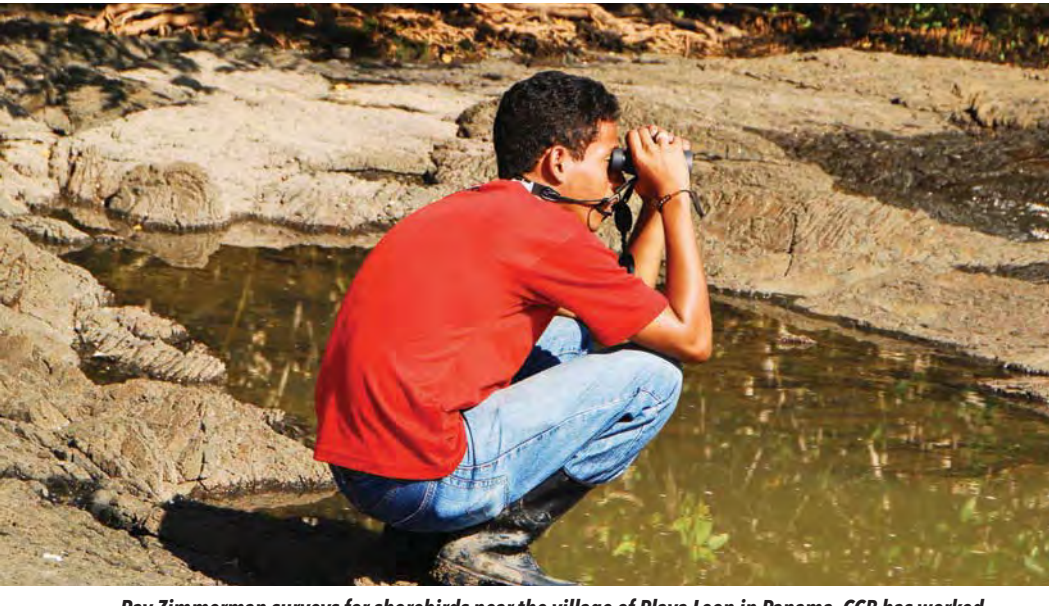
International Technicians

THE NEED

Although the availability of research opportunities for young scientists in North America is not where it should be, similar opportunities throughout many regions of the world are nonexistent. Because many of these areas support a disproportionate number of imperiled ecosystems the dearth of training opportunities for young scientists represents a global crisis. The crisis does not reflect any lack of interest but a lack of opportunity. For many communities across the planet, bright and energetic conservation biologists represent the sparks that carry the potential to change the future. Each year, The Center is contacted by more than 100 aspiring scientists from throughout the world searching for opportunities to learn basic research techniques so that they may apply them to local problems.

PROGRESS

Over many years, The Center has involved a relatively small number of international students or technicians in research within North America or worked alongside them within their own communities. Our lack of capacity to serve this critical need is one of the most heart breaking short comings of our long history. The Center needs a dedicated, endowed internship program to train young conservation biologists from strategically placed communities throughout the world.



Ray Zimmerman surveys for shorebirds near the village of Playa Leon in Panama. CCB has worked with numerous technicians with waterbirds in Panama. Photo by Bryan Watts

Avery Nagy-MacArthur holds a whimbrel trapped along the Acadian Peninsula in New Brunswick. Avery works with Diana Hamilton at Mount Allison University. CCB has worked with many students, technicians and volunteers from several countries. Photo by Bryan Watts

Maxi Galmes stands at the edge of a great calden forest in Argentina. The calden is the primary habitat for the crowned solitary eagle. Maxi has studied this critically endangered species for several years under the direction of Jose Sarasola. Photo by Bryan Watts

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