



# Saving Birds Through Science

THE CENTER FOR CONSERVATION BIOLOGY

2012 Annual Report • William & Mary • Virginia Commonwealth University

# 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 the College of William and 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.



***Front Cover: A second-year bald eagle. Bald eagles are important indicators of aquatic health along major water bodies of North America. Photo by Bart Roberts.***

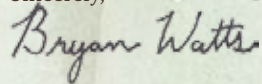


**T**HE CENTER FOR CONSERVATION BIOLOGY is more than a physical facility—we are a community formed around a simple belief. Our shared belief is that the existence and quality of human life throughout the planet is so dependent on the condition of the environment that safeguarding the environment is a priority for all humankind. We are a group of dedicated professional scientists, students, and citizens who focus energy, expertise, and experience on solving pressing environmental problems. We seek real-world solutions that work.

Our work has global impact. It drives the conservation community forward on a daily basis. Our research is used to create or improve environmental policy, to inform management decisions, to locate the highest priority lands for protection, and to educate us all about the least destructive path ahead. In 2012, The Center for Conservation Biology reached its 20th year and during that short span of time has completed more than 500 research projects and assembled more than 1,000 historic databases on birds of conservation concern. Molded and channeled by skilled hands into a useful form, this information continues to shape our world.

The year 2012 was full of opportunities and we have continued to dedicate our craft to the betterment of the natural world and our society. Become part of the solution. Contribute to our efforts to help birds and the environment we share.

Sincerely,



Bryan D. Watts

Mitchell A. Byrd Professor of Conservation Biology  
Director, Center for Conservation Biology




a message from the **Director**

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*The Ipswich sparrow reaches its highest winter density within the mid-Atlantic region and is confined to a coastal dune habitat. Because the form is specialized on this narrow ribbon of habitat, it is particularly vulnerable to beach development and the suppression of coastal dynamics.*

Photo by Bryan Watts



*Climbing into a raptor nest within  
the canopy can be such a sublime  
experience. Photo by Bryan Watts*



Progress with many of our most imperiled species is not measured within days, weeks or months but across decades or centuries. Recovery of these species requires an unflappable commitment against the storms of political, economic, and social change. The Center's commitment to more than 50 species that fall within this category is legendary.

# Legacy Projects



Bald Eagle Monitoring  
Red-cockaded Woodpecker Management  
Peregrine Falcon Management  
Crowned Eagle Research  
Shorebirds

*Right: Crowned eagle chick near Santa Rosa, Argentina. Photo by Bart Paxton*

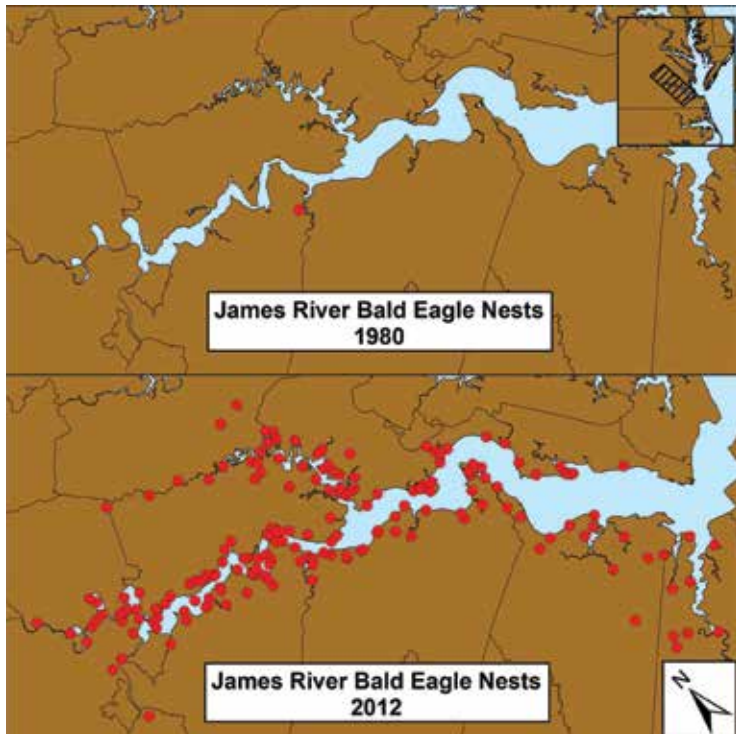


A high-angle photograph of a bald eagle perched on a nest made of dry sticks and twigs. The nest is situated within the branches of a large, mature pine tree. The pine needles are a vibrant green, and several small, brown pine cones are visible among the branches. The eagle, with its characteristic white head and neck and dark brown body, is facing away from the camera, looking down towards the nest. The background shows more of the pine tree's canopy and some distant, out-of-focus trees.

# Bald Eagle Monitoring

*Bald eagle incubating eggs on the Eastern Shore of Virginia. The Virginia population has been monitored by air for more than 50 years including over 25,000 nest checks. Photo by Bryan Watts.*





*Comparison of the breeding bald eagle population along the James River (1980 vs 2012) as revealed by the annual survey. The population has undergone a dramatic recovery in just 30 years.*



*Eight-week-old bald eagle chicks in nest along the James River. The eagle survey monitors both the number of breeding pairs and productivity. Photo by Bryan Watts*

## THE PROBLEM

The bald eagle population throughout the lower 48 states crashed and reached a low in the early 1970s leading to its classification as endangered on both federal and state lists of imperiled species. The primary causes of endangerment were low productivity related to DDT and similar chemicals, habitat loss, and human disturbance. Since the banning of DDT and legal protections, the population has experienced a dramatic recovery leading to the removal of the species from the federal list in 2007.

Despite the removal of bald eagles from the federal endangered species list, the species continues to be protected under the Bald and Golden Eagle Protection Act and information on its status and distribution is needed for regulatory protection. The Center for Conservation Biology has been committed to the conservation of this species for more than 40 years and has been the organization collecting and providing population data to agencies and the public.

## PRAGMATIC OBJECTIVES

The ultimate goal of monitoring and research efforts is the long-term conservation of bald eagles within North America. A supporting objective is to provide information needed by regulatory agencies and the public to enable responsible land-use decisions. Since 2009, The Center for Conservation Biology has provided survey results within an online Google mapping application. This application provides information to regulatory agencies and permit applicants needed to assess potential impacts of construction projects to eagles and allows the public to explore eagle distribution in Virginia.

## MOVING THE CONSERVATION NEEDLE IN 2012

The Center's online eagle nest locator has become central to the environmental review process. During 2012 the site was visited more than 40,000 times by regulatory agencies and the public. Access to survey information is changing business and benefiting eagles.



# Red-cockaded Woodpecker Management



*The reward for more than 30 years of conservation efforts, this red-cockaded woodpecker brood will carry on as the most endangered bird species in Virginia.*

*Photo by Bryan Watts.*



## THE PROBLEM

The Virginia population of red-cockaded woodpeckers is the northernmost throughout the species range and has been in eminent danger of extinction for more than 30 years. Classified as endangered on both the federal and state lists of imperiled species, this unusual woodpecker requires fire-maintained, old-growth pine forests that have been reduced to 1% of historic levels. Loss of their only habitat has been the primary cause of endangerment.

Protection of this species in Virginia reached a crisis in 2002 when only two breeding pairs and 14 individuals were known leading to a multi-pronged, multi-organization restoration effort. The Center for Conservation Biology's role in this effort has been direct population management.

## PRAGMATIC OBJECTIVES

Due to the lack of adequate old-growth forest in Virginia, the ultimate objective of the northern recovery unit (including Virginia and North Carolina) to support 100 breeding groups will likely require 50-100 years of appropriate forest management. An interim objective for the Piney Grove Preserve (the last remaining breeding site in Virginia) is to support 12-13 breeding groups.

## MOVING THE CONSERVATION NEEDLE IN 2012

Building on the success of the past five years, 2012 was a milestone year for red-cockaded woodpeckers in Virginia. The population included 10 breeding pairs that produced 26 fledglings and carried 53 individuals into the winter. All of these metrics of success are the highest in the state since the early 1980s and more than quadruple the low of 2002.



*Male red-cockaded woodpecker showing the red feathers for which the species is named.*  
Photo by Bryan Watts



*Mike Wilson inspects a red-cockaded woodpecker in the Piney Grove Preserve in Virginia.*  
Photo by Bryan Watts



*Entrance to a red-cockaded woodpecker nest cavity showing the surrounding resin flow that is a unique aspect of the species' ecology.* Photo by Bryan Watts



# Peregrine Falcon Management







*Adult male peregrine falcon within breeding territory on the Eastern Shore of Virginia.*  
Photo by Bart Paxton



*Brood of peregrine falcons on Watts Island in Virginia. Center biologists monitor productivity and band chicks produced by the Virginia population.*  
Photo by Bryan Watts

## THE PROBLEM

By the early 1960s the peregrine falcon population in eastern North America was extirpated, effectively eliminating the anatum race from the wild and elevating the species to endangered status on both federal and state lists. The primary cause of endangerment was low productivity due to DDT and similar chemicals. A heroic captive breeding and release program was initiated in the mid-1970s and the first Virginia breeding occurred in 1981.

Since re-establishment the population has experienced steady growth with 95% of breeding activity occurring on the Coastal Plain and little recovery within the historic mountain range. The Center for Conservation Biology has managed this species since 1978 and remains committed to restoring the historic mountain population. Since 1987 the Center has assisted with the release of more than 500 birds into the mountain range.

## PRAGMATIC OBJECTIVES

The objectives for peregrine falcon management in Virginia are to recover the historic population of 24 pairs and to contribute to a stable population within the southern Appalachians. An intermediate objective is to manage the “donor” population along the coast and to continue efforts to support mountain pairs.

## MOVING THE CONSERVATION NEEDLE IN 2012

Moving this imperiled population on the long path to recovery, Center staff monitored breeding sites across the Commonwealth, banded chicks produced, and worked with partners to release 10 more young in the mountains. Evidence continues to mount that the strategy of translocating chicks from donor pairs on the coast to release sites within the historic mountain range is beginning to show signs of success.

*Right: Young brood of peregrine falcons on the Eastern Shore of Virginia.*  
Photo by Libby Mojica



# Crowned Eagle Research

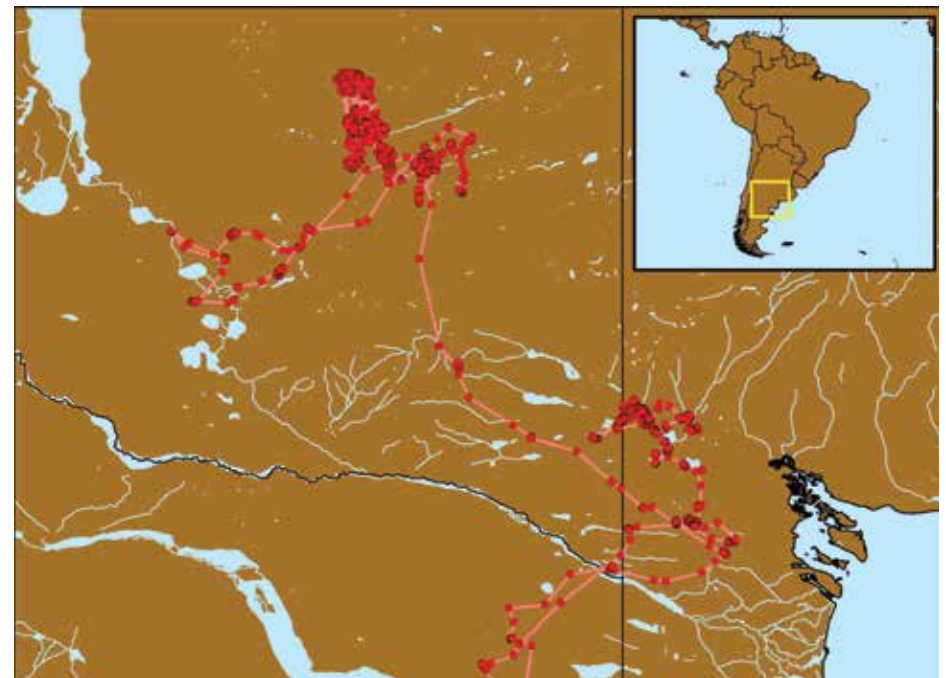


*Bryan Watts instructs Maxi Galmes on how to attach a satellite transmitter to the crowned eagle. Tracking young eagles is intended to fill gaps in our understanding of their ecology prior to breeding age. Photo by Bart Paxton*

## THE PROBLEM

The crowned eagle of southern South America is critically endangered with a declining global population estimated to be well below 1,000 individuals. Extremely little is known about crowned eagle population biology and basic ecology. The species has an extremely low reproductive rate producing one young each year (or possibly every other year), it feeds primarily on snakes and armadillos, and is associated with the declining calden forests. Suggested causes for endangerment include habitat loss and shooting.

Lack of information on the status, distribution and basic ecology of this species is a major impediment to the development of an effective conservation strategy. The role of The Center for Conservation Biology is to provide research assistance to fill critical information gaps.



*An early track map of a juvenile crowned solitary eagle showing dispersal from the natal territory.*



## PRAGMATIC OBJECTIVES

The ultimate goal of work with crowned eagles is to recover a sustainable population across its historic range. Information is currently inadequate to establish population objectives or to identify specific conservation actions. An intermediate goal is to determine current status and distribution and to complete our understanding of life history.

## MOVING THE CONSERVATION NEEDLE IN 2012

Virtually nothing is known about the juvenile life stage of crowned eagles. Center staff traveled to the La Pampa region of Argentina in 2012 to deploy five satellite transmitters on nestlings. Information from these birds is already revolutionizing what we know about their ecology during this critical period of the life cycle.



*Bryan Watts, Maxi Galmes, and Manu Grande take measurements, band and process a nestling crowned solitary eagle in La Pampa province of Argentina. Photo by Bart Paxton*



*Maxi Galmes measures a hairy armadillo, one of the common prey items of the crowned solitary eagle. Photo by Bryan Watts*



# Migrant Shorebirds

## THE PROBLEM

Shorebirds are declining on a global scale. Nearly 70% of the shorebird species using the Atlantic Flyway are experiencing population declines. Of note is that species that have experienced declines vary in terms of breeding range, winter range, and habitat requirements implying broad causal factors. Because shorebirds are one of the most migratory groups of animals known to science their conservation is complex. Success will require the informed collaboration of many countries and cultures.

The mid-Atlantic coastal region is a critical staging area for many shorebirds moving between tropical wintering grounds and Arctic breeding sites. For many, the region is the last site for refueling before flying nonstop to the Arctic and initiating breeding within inhospitable conditions. The availability of food resources within this region is critical to successful breeding. Due to its high use, the region also offers one of the best locations to monitor population status and trends.

## PRAGMATIC OBJECTIVES

The ultimate goal of work with shorebirds is to reverse declines and restore populations to historic levels. Collaborative research is ongoing to understand resource requirements and limiting factors across major flyways. An intermediate goal is to monitor populations within strategic locations to inform adaptive management efforts.

## MOVING THE CONSERVATION NEEDLE IN 2012

During the spring of 2012, the Center conducted aerial surveys along the coast from New Jersey through North Carolina counting, identifying and mapping more than 300,000 shorebirds. This continuing information stream represents the eyes and ears that enable many broader conservation efforts.



*Release of least sandpiper after banding on the lower Delmarva Peninsula.*  
Photo by Bart Paxton



*The mid-Atlantic region is critically important for several shorebird species because it represents the final refueling location before the birds fly to Arctic breeding sites. Mudflats like this one in Willis Wharf, Va., provide foraging habitat for these species.* Photo by Bryan Watts





*Red knot in breeding plumage. The rufa subspecies of the red knot has declined dramatically over the past 30 years and is a candidate species for federal listing. CCB has worked with this population for 20 years. Photo by Bryan Watts*

*Inset: Map of coastline surveyed by CCB for shorebirds during spring migration 2012.*





# Emerging Issues

Gulf Oil Spill

Avian Hazard Analysis

Sea-level Rise

Whimbrel Tracking



*Bald eagle with a CCB satellite transmitter near the Conowingo Dam on the Susquehanna River. Transmitters have been used to map eagle movements to inform hazard mitigation.*

Photo by Ted Ellis



**H**umans have become a prominent feature of the world's landscapes.

Habitat loss and fragmentation resulting from the rapid advance of the urban front is now the dominant cause of species endangerment throughout the world; human-related hazards such as buildings, towers, and oil spills have become major sources of mortality, the spread of contaminants have reduced productivity, and exploitation of resources has impacted the viability of many populations. CCB continues to conduct ground-breaking research designed to understand the intersection between the social and ecological sciences. Our objective is to find innovative ways of reducing human impacts on natural systems.



*Pine hummock killed by sea-level rise in the Chesapeake Bay. Creation of “ghost hummocks” has been one of the more visible signs of rising seas within the region. Photo by Bryan Watts*



# Gulf Oil Spill

## THE PROBLEM

The Deepwater Horizon oil spill began on April 20, 2010, and ultimately became the largest in U.S. history. Due to its location and timing the spill had the potential to impact millions of birds including a large portion of all North American species. Of particular concern were those species such as bald eagles and osprey that depend directly on the aquatic food chain. Because of the potential impact on wildlife resources, work was needed to be used in resource damage assessment as mandated by federal law.

In the months following the spill and at the request of the U.S. Fish and Wildlife Service, Dr. Watts led a national team of raptor biologists to develop a plan to investigate potential impacts to raptors. The ultimate plan included assessments of bald eagles and osprey. The Center for Conservation Biology executed the raptor assessment plan.

## PRAGMATIC OBJECTIVES

The objective of work within the Gulf was to collect information on the bald eagle and osprey populations that would be useful to the Natural Resource Trustees in assessing potential damage by the Deepwater Horizon spill.

## MOVING THE CONSERVATION NEEDLE IN 2012

In 2012 The Center for Conservation Biology concluded work on the Gulf project by completing final reports and transferring all data files to Natural Resource Trustees. Findings of this work continue to be confidential due to ongoing legal cases.



*Eagle nest trees in the bayous of Louisiana were spectacular with a heavy draping of Spanish moss. The moss both grew on the nest structure and was used as nest lining.*  
Photo by Bryan Watts



*Following the Deep Water Horizon oil spill, The Center for Conservation Biology monitored approximately 1,000 eagle nests along the immediate Gulf Coast.*





*Libby Mojica climbs to an osprey nest in the Gulf of Mexico. In addition to bald eagles, the CCB worked with nesting osprey to assess potential impacts. Photo by Fletcher Smith*

*Productivity for bald eagles within the Gulf of Mexico was measured across four states by flying aerial surveys and counting chicks in nests. Photo by Bart Paxton*





# Avian Hazard Analysis

## THE PROBLEM

As the infrastructure associated with modern society expands across the globe, man-made hazards such as electrical lines, wind turbines and towers represent a growing source of mortality for many bird species. One of the most effective strategies for reducing mortality is to place hazards away from “avian hotspots.” An impediment to implementing this strategy is our inability to identify areas of high bird use.

Following a spike in eagle mortality associated with the electrical infrastructure on Aberdeen Proving Ground in the upper Chesapeake Bay, the U.S. Department of Defense needed an approach to identify areas of high eagle use in order to prioritize lines for mitigation. Between 2007 and 2012 The Center for Conservation Biology has conducted a large-scale eagle tracking project to collect movement data for use in spatial modeling to identify eagle hotspots. The tracking project now containing more than 950,000 locations and growing has become the largest eagle movement dataset in the world.

## PRAGMATIC OBJECTIVES

The overriding objective of this project was to reduce avian mortality by developing an approach to mapping avian hotspots for use in mitigation of existing hazards or the placement of future hazards. The objective of the case study on Aberdeen Proving Ground was to provide land managers with a blueprint for cost-effective hazard mitigation.

## MOVING THE CONSERVATION NEEDLE IN 2012

A sophisticated movement model was used with tracking data to develop a composite “blueprint” for how eagles use the landscape within the upper Chesapeake Bay. Hotspots identified by the model were overlaid on a map of existing hazards to prioritize specific sites for mitigation. The approach developed was successful in identifying sites known to cause high mortality and shows great promise for future use in land planning to minimize avian mortality.

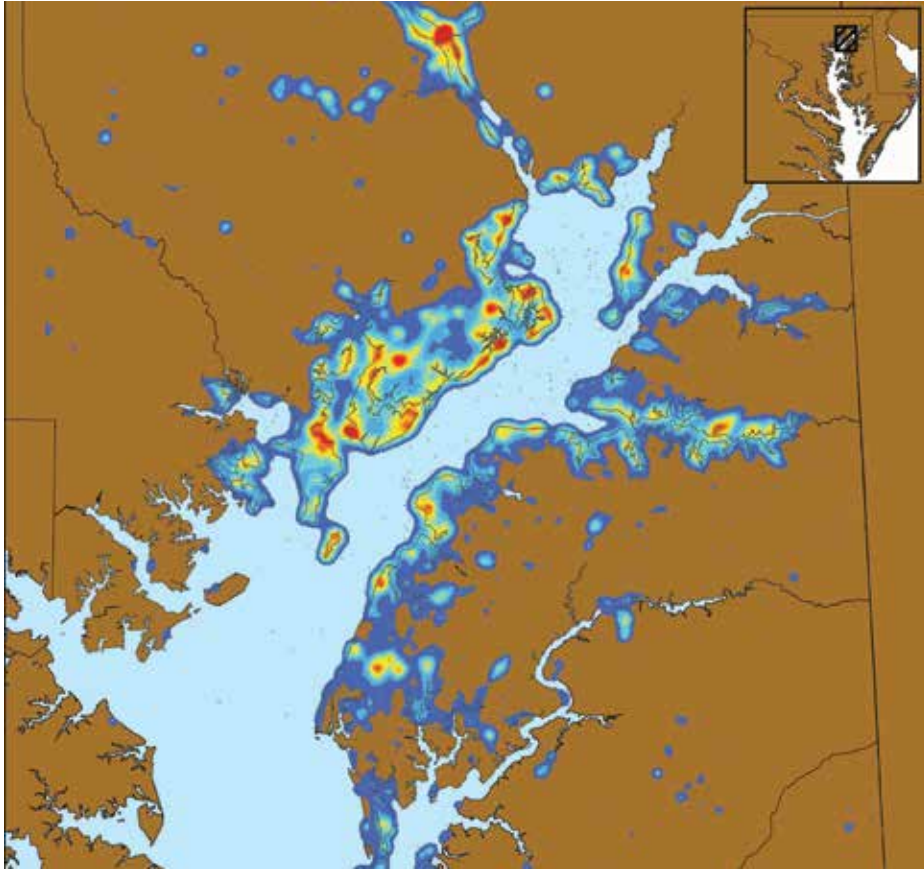


*Bart Paxton with an adult eagle captured on Aberdeen Proving Ground. Photo by Bart Roberts*



*Libby Mojica attaches a transmitter to a nestling eagle. Photo by Bryan Watts*





*The map illustrates the distribution of movement probabilities within the upper Chesapeake Bay. Red areas are consistent movement hotspots that are being used for mitigation planning.*



*Attaching GPS satellite transmitter to second-year bald eagle with a backpack harness. Photo by Craig Koppie*



*Male fourth-year eagle fitted with transmitter. A cross-section of birds was tracked to learn more about local and continental movements. Photo by Libby Mojica*



# Sea-level Rise

## THE PROBLEM

Projected changes in the level of the world's oceans will have profound consequences on the biological and social systems of the world. Such changes will create classes of winners and losers among near-shore species according to their affinities for habitats being altered. Because of their low position on the landscape, tidal marshes are one of the most vulnerable coastal habitats. Like a slow moving tsunami, sea-level rise will consume coastal wetlands and the species that depend on them.

The mid-Atlantic region supports significant populations of several species that depend on coastal marshes and is particularly vulnerable to rising seas. Modeling by The Center for Conservation Biology has shown that even modest levels of predicted sea-level rise will result in catastrophic declines in several of these species.

## PRAGMATIC OBJECTIVES

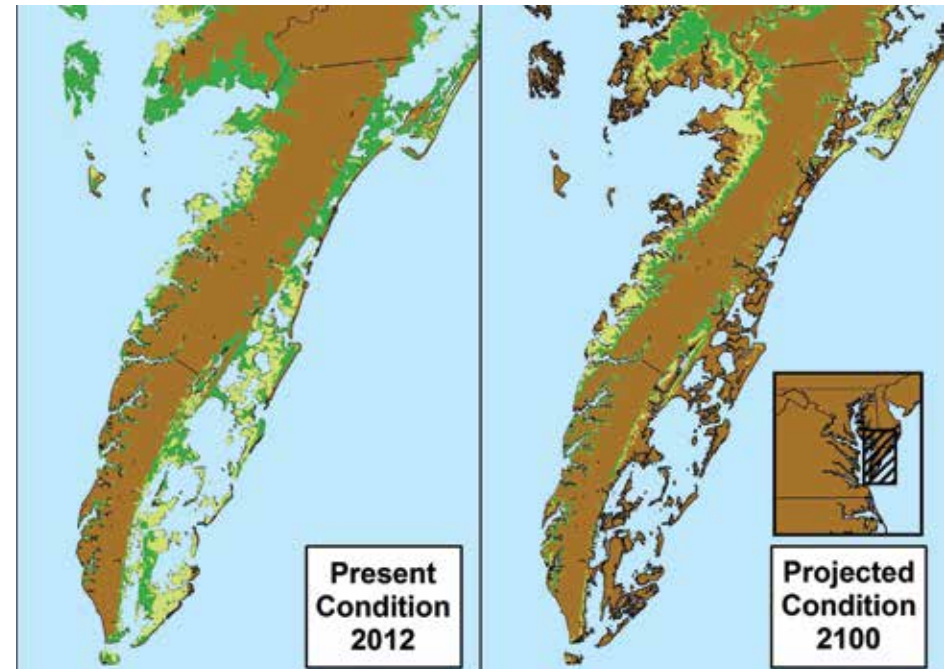
The broad objective of work with sea-level rise is to eliminate or reduce the impact of the phenomenon on natural populations. However, climate change and associated sea-level rise are being driven by global processes that require global cooperation and actions to curb. An intermediate objective is to better understand and communicate the consequences of sea-level rise on vulnerable species.

## MOVING THE CONSERVATION NEEDLE IN 2012

In 2012, the Center for Conservation Biology continued to monitor several species that depend on the thin ribbon of habitat along the coast that is so vulnerable to sea-level rise. In addition, the Center worked with regional media outlets and the BBC in a successful public campaign to communicate how sea-level rise is impacting the landscape around us.



*Fletcher Smith in marsh patch within the Chesapeake Bay. Salt marshes provide critical habitat for many bird species throughout the year. Photo by Bryan Watts*



*Results of spatial modeling work conducted by CCB that illustrates the loss and migration of salt marsh habitats that will result from expected rates of sea-level rise along the Delmarva Peninsula. Such changes will have catastrophic impacts on marsh birds.*





*Fletcher Smith measuring a salt marsh sparrow. CCB has been conducting dedicated fieldwork on the complex of salt-marsh dependent birds for more than 20 years and is in a position to understand the implications of sea-level rise. Photo by Bryan Watts*



*The Nelson's sparrow is one of the most vulnerable bird species along the Atlantic Coast to sea-level rise. The species depends on a thin ribbon of salt marsh habitat for breeding (Maine) and winter. Photo by Bryan Watts*



# Whimbrel Tracking

## THE PROBLEM

Achieving an understanding of full live-cycle ecology is the holy grail of conservation because it provides the information needed to identify life history bottlenecks and limiting factors that are causing population declines. Removal of such factors is the key to successfully releasing an imperiled population to recover. For most migratory species of conservation concern we remain in the very early stages of understanding resource requirements throughout the annual cycle and connectivity between critical areas.

Work by the Center for Conservation Biology has demonstrated that whimbrels using the Atlantic Flyway have declined by more than 50% over the past 15 years. However, our understanding of resource requirements, space use, and key factors contributing to declines has been very limited. Identifying migration pathways and locations used during the annual cycle by this species is a first step toward revealing possible causal factors.

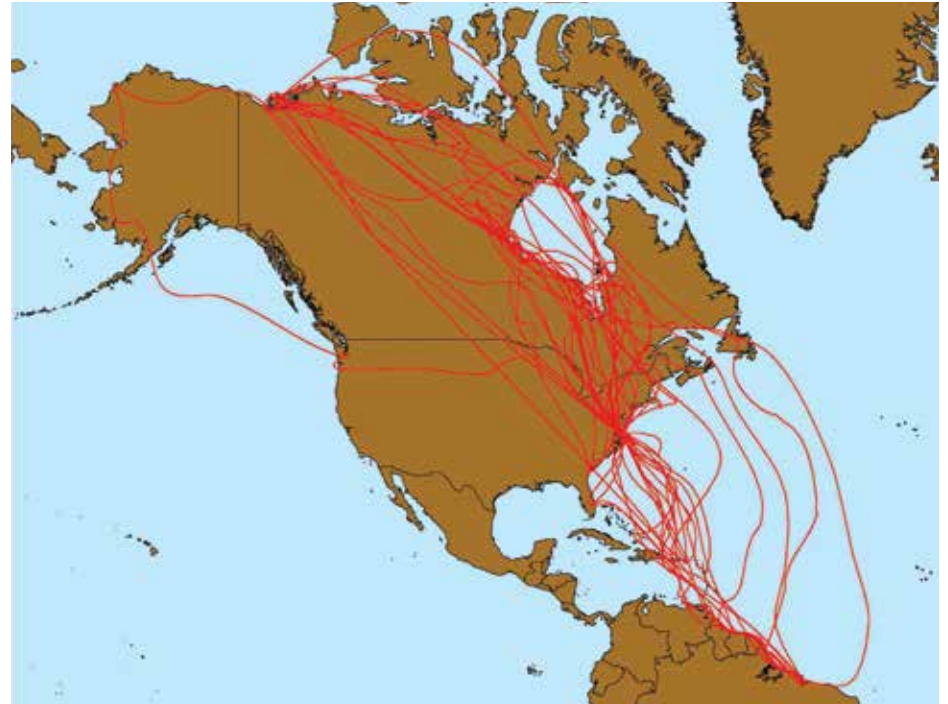
## PRAGMATIC OBJECTIVES

The overall objective in pursuing current information gaps in whimbrel ecology is to inform a broad-based conservation strategy that will stabilize the population and reverse declines. Our objectives in using state-of-the-art satellite transmitters is to expedite the discovery of migration pathways and locations of significance for the population, and by doing so, narrow the universe of possible factors contributing to declines.

## MOVING THE CONSERVATION NEEDLE IN 2012

The ongoing whimbrel tracking project has been an overwhelming success in accelerating the rate of discovery of movement pathways, mortality factors, and locations of significance. In 2012, migration pathways new to science have been discovered, unknown staging areas have been discovered and communication with local communities has provided new insights into possible limiting factors.

***Right: Mud fiddler on the Eastern Shore of Virginia. The abundance of this species is the underlying reason whimbrels stage along the mid-Atlantic coast.***  
Photo by Bart Paxton



***Map of whimbrel migration routes.***







*Inset photo (left to right): Jethro Runco, Fletcher Smith, and Shannon Ehlers in the field in Virginia preparing to trap migrant whimbrels for banding. Photo by Bart Paxton*

*Above: Whimbrel fitted with a solar-powered satellite transmitter using a leg-loop harness. The use of this attachment technique by CCB has revolutionized the tracking of this species and led to many new discoveries that continue to advance conservation. Photo by Bart Paxton*



# Citizens In Conservation



OspreyWatch  
Nightjar Network

*Ten-day-old chuck-wills-widow brood in nest. This species along with several other nightjars is the focus of a continent-wide monitoring program launched in 2007 by CCB.*

*Photo by Bart Paxton*



Concerned citizens are the hearts and hands of the conservation movement. The history of conservation as a cause and as a science emerged from real people who had a passion and concern for the future of our world. Even with the increasing sophistication of science as a profession there is no substitute for the many eyes of the public. Some of the most pressing questions that confront us today are so large in scope that the fieldwork needed to address them is simply not possible without citizen scientists. The Center for Conservation Biology is fortunate to have such an enthusiastic community of citizens who dedicate their time and talents for the sake of species in need.



*Just banded osprey brood on the James River. This species is the focus of a global network of citizen scientists launched in 2012 by CCB. Photo by Bryan Watts*





# OspreyWatch

*Seven-week-old osprey chick in the hand for banding. The Center is ramping up nestling banding within the lower Chesapeake Bay as part of a demographic study of the population. Photo by Bryan Watts*





*Osprey hatching within the lower Chesapeake Bay. The focus of OspreyWatch is to capture information on productivity on a large spatial scale. Photo by Bryan Watts.*



*OspreyWatch nests.*

## THE PROBLEM

Many aquatic ecosystems throughout the world are stressed by environmental contaminants, depletion of fish stocks and the uncertainties of global climate change. As the apex consumer in many aquatic systems osprey are sensitive to all of these risks and represent one of the most effective environmental indicators available on a global scale. Because most osprey populations breed in northern latitudes and winter in southern latitudes they also link the aquatic health of the hemispheres.

The Center for Conservation Biology has worked with osprey within the Chesapeake Bay since the early 1970s. However, a single research team is not capable of monitoring osprey on a global scale. Connection of the global community to this charismatic species makes it possible for eyes around the world to collectively monitor aquatic health through osprey.

## PRAGMATIC OBJECTIVES

The two primary objectives of OspreyWatch are to engage and connect the public from around the world in the ecology of a charismatic species and to record breeding information on a large enough spatial scale to be useful in monitoring aquatic health. By 2016 we will build a network of 2,000 observers to collect information on 5,000 osprey pairs.

## MOVING THE CONSERVATION NEEDLE IN 2012

In the spring of 2012 The Center for Conservation Biology launched an OspreyWatch website that allowed observers from throughout the world to register, map, and record nesting data on osprey nests. In its debut season the program was joined by more than 800 observers from five countries that recorded data on more than 1,600 osprey pairs.



*Adult, female osprey captured for banding along the James River. Few species are more recognizable to the public in coastal areas. Photo by Bryan Watts*







# Nightjar Network

## THE PROBLEM

Nightjars, or goatsuckers, are an unusual group of species that includes the familiar whip-poor-will but also the common nighthawk, Chuck-will's-widow and common poorwill. These species are primarily active during the night hours and their ecology is poorly understood. In recent decades there has been a growing concern within the conservation community that these species are experiencing rapid declines over much of their breeding ranges.

Unlike many North American bird species, we have very little information on the status and trends of nightjar populations. Such basic information is an essential element of any conservation assessment and provides the background both strategy development and measurement of progress.

## PRAGMATIC OBJECTIVES

Our objective in establishing the Nightjar Network has been to collect status information on a continental scale that would be useful in assessing regional to national trends and begin to unravel the underlying issues that may contribute to suspected declines. The network is a large number of standardized routes distributed across North America. The network is an all-volunteer endeavor and a secondary objective is to engage the public in a critical element of the conservation process.

## MOVING THE CONSERVATION NEEDLE IN 2012

In 2012, The Center for Conservation Biology launched an improved website that allows for easy online adoption of routes and data entry. Since 2007, 564 volunteers have recorded more than 12,200 nightjars across 36 states and two Canadian provinces. For the first time we are beginning to collect the information needed to assess trends.

*Opposite page: Chuck-will's-widow on nest. Nightjars are ground nesting species that use camouflage as nest defense.*  
Photo by Bart Paxton



*Southeastern pine stand maintained by frequent burning. This is the primary habitat of the Chuck-will's-widow. Photo by Bryan Watts*



*Chuck-will's-widows do not construct nests. Females lay eggs directly on the ground. Photo by Bart Paxton*



*Potential nightjar routes*



# Education & Outreach

Richmond Eagle Camera  
Students & Interns

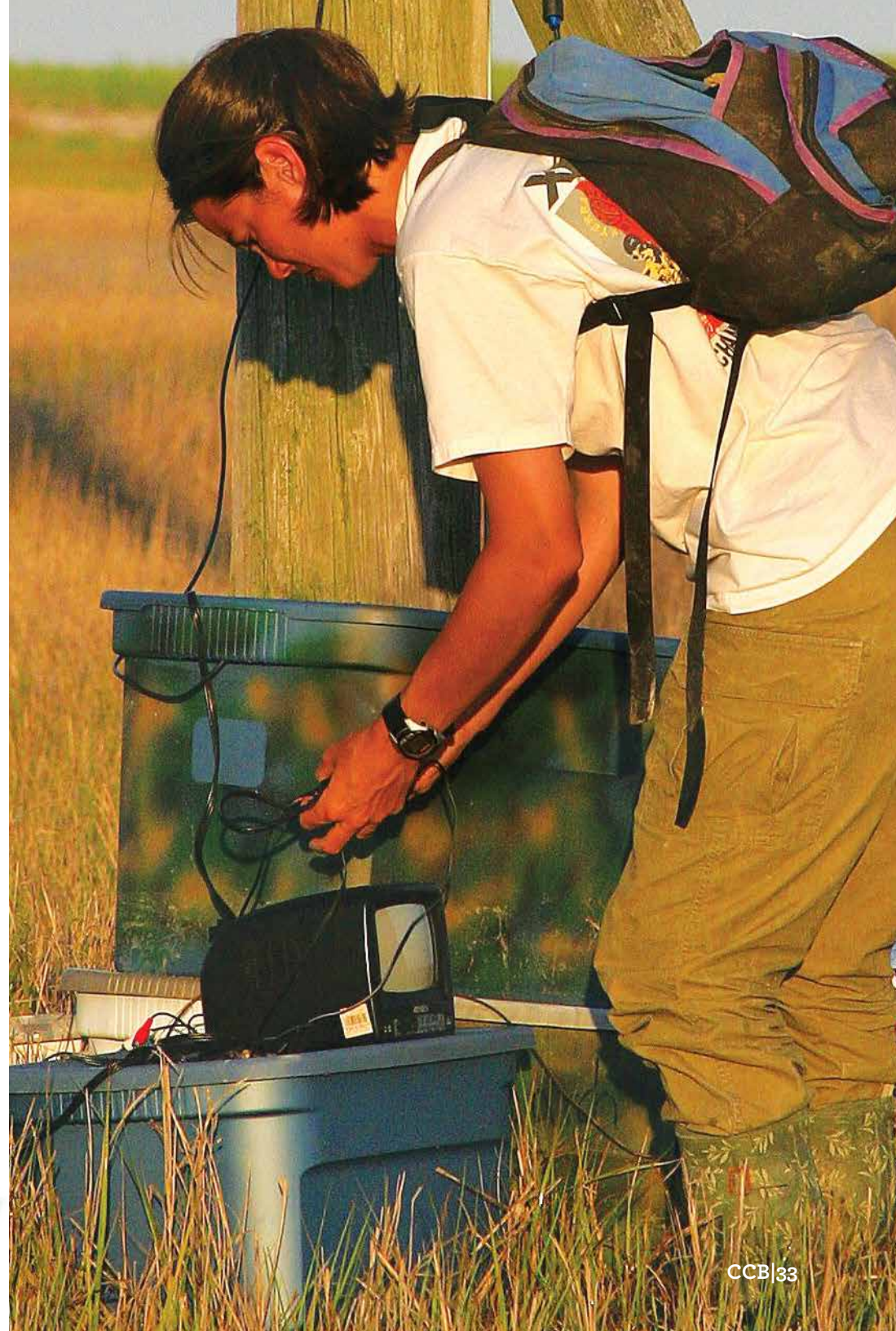




Progress in conservation is short-lived without a strong foundation in education. Education provides the opportunity for understanding and ultimately for the informed decision-making that leads to the wise use of limited resources. Education also provides the training necessary to cultivate the next generation of conservation scientists. The Center for Conservation Biology is dedicated to providing opportunities for students to learn more about current conservation problems and the strategies employed to develop practical solutions.

*Left: Tom Pelton records calls of whimbrels just as they rally in the evening to make their nonstop flight from Virginia to arctic breeding grounds. The recordings were used as part of a National Public Radio story. Photo by Bryan Watts.*

*Right: Elizabeth Long checks the status of a nest camera mounted in a peregrine falcon eyrie. Her graduate project focused on the diet of coastal-nesting peregrines. Photo by John DiGiorgio*





# Richmond Eagle Camera



## THE PROBLEM

Society in general and children in particular are more detached from the natural world than during any time in human history. The consequences of this detachment are profound. Today's society suffers from a lack of basic understanding of how important the environment is to our survival and quality of life. The deficit has deep implications for what our culture values and how our society functions. We are only inclined to protect the things we truly value.

One of the central challenges in combating the human-to-nature disconnect is to find ways of engaging people with the species around them. By observing other species on a regular basis people learn about their ecology and in so doing become more concerned about their welfare. Continued exposure and familiarity is one key to the social side of conservation.

## PRAGMATIC OBJECTIVES

Our clear objective in providing an online eagle camera in 2012 was to familiarize and educate the public about this dramatic species and in doing so engender a concern for its welfare. A secondary objective has been to engage the regional community of schools in using the resource to educate children about the environment around them.

## MOVING THE CONSERVATION NEEDLE IN 2012

During the spring of 2012 The Center for Conservation Biology was successful in building an online community around the Richmond eagle camera. The camera has more than 1.8 million views from 137 countries. Even more importantly, the camera was used as a foundation for instructional material by many schools within the region.

*Left: Brett Haskins plays along river's edge. Encouraging children to interact with the natural world is a critical part of conservation. The Richmond eagle camera project was intended to be a window for children to observe a nesting pair. Photo by Bryan Watts*

*Right: A bald eagle chick in nest. The eagle cam in Richmond allowed the public to view the intimate details and drama of nesting behavior online. Photo by Bryan Watts*







# Students & Interns



*Undergraduate student Jake McClain trapping overwintering American kestrels. Kestrels have declined dramatically in recent years. The marking program is designed to investigate site fidelity and survivorship.*  
Photo by Joseph McClain



## THE PROBLEM

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, undergraduate and graduate students need to 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.

There are few institutions in the county that provide a broader range of avian research opportunities for students than The Center for Conservation Biology. Since the establishment of the Center, staff members have involved hundreds of students, technicians, and interns in primary research designed to solve real conservation problems. These students have played an integral role in the success of many projects.

## PRAGMATIC OBJECTIVES

Our objective is to provide opportunities for students and interns to learn field techniques and practical problem solving in the field of avian conservation. Our long term objective is to more fully develop both domestic and international internship programs.

## MOVING THE CONSERVATION NEEDLE IN 2012

Each year the Center director is contacted by prospective conservation biologists from all over the world seeking opportunities to be directly involved in fieldwork. At present, we are unable to meet this growing demand for experience. During 2012 The Center for Conservation Biology provided opportunities for more than 20 students to be involved in hands-on fieldwork.



***Top right: Students from Virginia Commonwealth University make observations of foraging shorebirds in the upper Bay of Panama during a field course focused on bird conservation. Photo by Bryan Watts***

***Middle right: Students learn how to handle and band osprey along the James River. The Center for Conservation Biology offers a wide range of opportunities for students to learn field techniques. Photo by Bryan Watts***

***Bottom right: Graduate student Courtney Turrin handling an adult osprey along the James River. Courtney's graduate project focuses on the potential role of non-breeding adults on population regulation in bald eagles. Photo by Bryan Watts***





# CCB

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