

# ANNUAL REPORT 2000



T H E C E N T E R F O R  
**conservation biology**

The College of William & Mary / Department of Biology

The Center for Conservation Biology is a non-profit organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Established in the fall of 1991, the Center has been a leader in conservation issues throughout the mid-Atlantic region. In just a few short years, staff and students have conducted more than 150 research projects that have addressed a diverse array of questions. Many of these projects have set the standard within specific disciplines and resulted in better ways of managing sensitive ecosystems.

### **Center Mission**

Our mission is the conservation of natural ecosystems within the mid-Atlantic region. We accomplish our mission by integrating the three complimentary disciplines (research, education, management) that we consider to be the "cornerstones" of effective conservation. We use birds to make progress toward conservation goals because we believe that they are ideally suited to bridge the gap between research and public education. Without this link, the public will not respond to important conservation issues and research findings have limited impact on the course of our environment.

**Research** – We conduct basic and applied research focused on the functioning of mid-Atlantic ecosystems. We strive to select projects that not only fill information needs but also serve as catalysts to increase public awareness and stimulate related work in the region.

**Education** – We educate students and the public about the conservation and significance of natural resources. We also distribute significant research findings and information to assist resource planners and promote informed, responsible decision-making.

**Management** – We initiate and develop comprehensive strategies for the conservation and preservation of mid-Atlantic resources and ecosystems. In addition, we assist local, state, and federal agencies in identifying the condition and distribution of coastal resources.

*Cover photos by Bryan Watts, Marian Watts, and Dana Bradshaw.*

Published by The Center for Conservation Biology. All rights reserved. No part of this publication may be reproduced in any form without the written permission of the publisher.



Bryan D. Watts, PhD  
*Director*

Mitchell A. Byrd, PhD  
*Director Emeritus*

Dana S. Bradshaw  
*Senior Biologist*

Barton J. Paxton  
*Biologist*

Marian Urbi Watts  
*Publications/Office Manager*

A. Catherine Markham  
*Research Assistant*

*Research Associates*

Reese Lukei, Jr.  
Shawn Padgett  
Bill Portlock  
Bill Williams

*Graduate Students*

Mike Wilson  
Rhonda Sipe  
Magill Webber

## Friends and Colleagues

This past year has been an exciting time in the development of the Center for Conservation Biology. Early in the year, we named our expanding research library in honor of Paul S. Baker. Paul is a true conservationist of the highest order and has worked with CCB since the early days. In June, we moved our offices to a new location with nearly twice the operating space. This move was a milestone in our organizational development and has already increased the productivity and efficiency of our staff. Throughout the year, we have reached out to numerous agencies, corporations, and organizations to form working partnerships. We are more confident than ever that these strategic alliances will provide the synergies needed to develop and implement real solutions. Over this same time, we have expanded our outreach program to more fully engage the public in problem solving. Finally, over the past year we conducted eighteen field projects covering a broad range of systems. Some of these projects represent our long-term commitment to sensitive species. Other projects represent new lines of investigation designed to answer pressing questions.



The upcoming year is teaming with new opportunities for CCB and the natural communities that we represent. At this writing, we have committed to twenty field projects scattered across five states. Discoveries made during these projects will change how we view and manage entire ecosystems. We will continue to strengthen our working relationship with strategic partners. In late spring we will launch our first significant website. This site will form the core of our information exchange program making our extensive catalog of data products available online. During the upcoming year we will begin the process of diversifying our funding base. In recent years, it has become increasingly clear that in order for CCB to provide the full range of research and educational services that we envision, we must interact with a broader pool of investors.

As always, we look forward to your ideas and participation.

Sincerely,

Bryan D. Watts, Director

# RESEARCH PROGRAMS



*Virginia Bald Eagles have a 27% annual relocation rate. Research by CCB is beginning to reveal the factors that contribute to this pattern. Nest tree mortality caused by lightning strikes (as seen above) is one contributing factor. Photo by David Wallin..*



*A new generation of Red-cockaded Woodpeckers were produced at the Piney Grove Preserve in 2000. Shown above is one of three broods. Photo by Bryan Watts.*

The past calendar year has been a very productive year for research. CCB documented record production for Bald Eagles and Peregrine Falcons, formed a partnership with The Nature Conservancy and government agencies to improve monitoring and management of Red-cockaded Woodpeckers, and initiated new research within key areas where information may have a positive impact. Several of the new projects are centered around different aspects of how to manage bird populations within human-dominated landscapes. Other work is focused on defining the role that the mid-Atlantic region plays in the life cycle of species of conservation concern. Below is a listing of projects initiated or completed during the 2000 calendar year. These are listed within our three core research programs including the Threatened and Endangered Species Program, the Coastal Diversity Program, and the Bird Migration Program.

## Threatened and Endangered Species Program

### Virginia Bald Eagles Have Record Production Year in 2000

Historically, the Bald Eagle was a common breeding species along major river systems, lakes and coastal areas throughout much of North America. The widespread use of persistent pesticides for crop management in the region resulted in dramatic declines over a 30-40 year period. By the late 1960's, most breeding populations had been decimated by eggshell thinning and associated low productivity. Concern for these populations prompted the elevation of the Bald Eagle to endangered status and led to a national effort to restore historic populations.

The 2000 breeding season represented the 24<sup>th</sup> year that CCB biologists have systematically surveyed the Bald Eagle population in coastal Virginia. From a population of only 33 territories in 1977, the population reached a survey record of 283 territories in 2000. The mild weather with few notable storms during the early part of the breeding season was ideal for nesting. The population produced a record 414 young.

### CCB Works with Red-cockaded Woodpeckers at Piney Grove

The Red-cockaded Woodpecker is in eminent danger of extinction within Virginia. Over the past 30 years, this species has declined from 23 known clans scattered across 5 counties to 3 active clans within a single county. In an attempt to reverse this trend, The Nature Conservancy has purchased just over 1,000 ha of old growth pineland that supports the core of the remaining population. This land has been designated as the Piney Grove Preserve. The primary mission of this new reserve is the restoration of the pine savannah habitat required by Red-cockaded Woodpeckers and other declining species. CCB has worked in partnership with The Nature Conservancy to monitor this fragile population.

During the 2000 breeding season, CCB monitored breeding activity within the Piney Grove population and worked to individually mark resident birds. All three woodpecker clans within Piney Grove produced young during the breeding season. Two clans raised 3 young to the nestling stage and the remaining clan fledged a single young. Estimated clutch initiation dates ranged from approximately 23 April to 28 May. A total of 20 different Red-cockaded Woodpeckers were identified during the 2000 breeding season. These birds included 13 different adults and 7 nestlings. Six of these birds disappeared over the course of the season including 3 adults and 3 nestlings. The known population included 13 individuals in April and 14 individuals in October. Additional monitoring and management work is planned for the 2001 breeding season.

## Virginia Peregrine Falcons Have Record Production

By the early 1960's, the Peregrine Falcon was believed to be extinct in the state of Virginia. Since the first successful breeding attempt in the early 1980's, the Virginia breeding population has continued a slow but steady increase.

The 2000 breeding season was a record production year for Peregrines in Virginia. Seventeen breeding pairs produced 29 young. Most pairs nested on artificial towers and in nest boxes fixed to bridges. Of continued concern is that hatching rate remains low. Despite record production, only 34 of 57 eggs hatched. Further work is needed to identify the underlying causes of the poor hatching rate.

## CCB Re-initiates Peregrine Falcon Hacking Program

As part of a national restoration effort, the College of William and Mary initiated a Peregrine hacking program for Virginia in 1978. The program involved the release of captive-reared Peregrines with the hope that these birds would re-colonize the historic breeding range. Release efforts were initially focused on the outer coastal fringe. In 1985, the program shifted focus to the mountains. Between 1978 and 1993, approximately 250 young falcons were released in Virginia. This release program provided the spark that has led to the recovery of the species in the region.

With the re-establishment of the breeding population in coastal Virginia, the opportunity now exists to use a portion of the annual production to bolster the population in other areas of the state. During the breeding season of 2000, 4 young falcons hatched on bridge structures were translocated to Shenandoah National Park and hacked. These young birds along with others in the future will provide the seed to repopulate the historic mountain breeding range.



*The Peregrine Falcon population continues its slow recovery with urban and bridge pairs leading the way. Photo by Craig Koppie.*



*Mitchell Byrd with young Peregrine Falcon in the mountains. Photo by Lynda Richardson.*

# RESEARCH PROGRAMS

## Coastal Diversity Program

### CCB Initiates Regional Habitat Assessment Program

In 1995, the national Partners-in-Flight (PIF) program initiated a comprehensive planning process. This process culminated in the development of a bird conservation plan for every physiographic region in North America. Ecoregion plans are intended to serve as “blueprints for action”, focusing available funding and manpower on identified research, management, and educational needs. A draft PIF conservation plan was completed for the Mid-Atlantic Coastal Plain Physiographic Region in the spring of 1999 (Watts 1999). Translating this conservation plan into meaningful conservation action will require the integration of region-based objectives with local recommendations.

Within the mid-Atlantic Coastal Plain, lands owned or controlled by government agencies and organizations within the PIF program are believed to control nearly 2 million acres of land within approximately 2000 parcels. Moving this patchwork of lands forward to achieve regional conservation goals will be a formidable task. In 2000, CCB initiated the first of a series of complimentary tasks designed to mobilize the collective partnership from conservation planning to conservation action. Tasks include 1) identification of parcels controlled by PIF partners, 2) identification of appropriate land managers, 3) assessment of partnership lands with respect to priority habitats, 4) conducting a collective assessment to determine status relative to regional conservation goals, and 5) development of parcel-specific recommendations. We refer to this two-pronged approach as scaling down region-based conservation goals to the management of land parcels while simultaneously scaling up local management actions to achieve regional goals.



*Research assistant Catherine Markham tracks Whip-poor-wills fitted with radio transmitters to learn more about the location of day roosts. Photo by Bart Paxton.*



*One of several Whip-poor-wills fitted with backpack transmitters. Understanding how this and other species utilize different landscape types is essential to developing sound management strategies. Photo by Bart Paxton.*

### Whip-poor-will Telemetry Study Gets Underway

The Whip-poor-will is a neotropical migrant that appears to be declining throughout many areas of eastern North America. Because their nocturnal habits are difficult to study, very little is known about their breeding ecology. Investigations conducted by the Center for Conservation Biology have documented a substantial breeding population within Weyerhaeuser's managed pine plantations in coastal North Carolina. A broad-scale study conducted in the summer of 1999 revealed that distribution is strongly influenced by the configuration of habitats within the landscape. Pine stands are more likely to support Whip-poor-wills if they are adjacent to open patches. This finding suggests that the spatial pattern of forest management is important to Whip-poor-wills at a landscape scale. However, specific information describing how birds are using these landscape types is not available. In order to investigate patterns of space use, 11 Whip-poor-wills were fitted with radio transmitters and tracked during the night hours throughout the breeding season of 2000. Analysis of movement patterns is continuing.

## CCB Conducts Ecological-Economic Assessment of Grassland Management Strategies within Colonial National Historical Park

In coastal Virginia, government agencies control nearly 1/3 of all open idle lands. These lands represent a significant opportunity to have a positive impact on declining species that require early successional habitats. The Colonial National Historical Park managed by the National Park Service contains 177 open patches. In 2000, CCB completed an analysis of these lands that examined the ecological-economic tradeoffs associated with a series of management scenarios. Results of a previous field study conducted by CCB, a landscape-scale simulation model, and maintenance costs provided by the park were used to evaluate possible management scenarios.

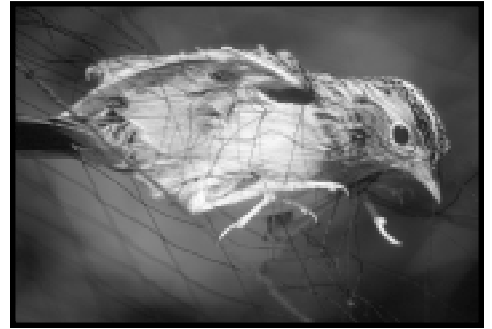
The analysis identified a management scenario that provided a balance between wildlife benefits and programmatic objectives. A shift from the current land management regime to the recommended management regime would provide a sustainable source of habitat capable of supporting an estimated 1,450 breeding pairs of open-habitat bird species. The recommended changes in management regime would require an estimated initial investment of \$70,835. However, due to savings in maintenance costs, the initial investment to convert lands would be recouped in 3 years. Over the course of 10 years, savings in management costs were estimated to exceed \$250,000.

## CCB Continues to Install Nest Boxes for Declining Barn Owl Population

In recent years the Common Barn Owl has suffered a substantial decline throughout much of North America. The Barn Owl was listed as a species of Special Concern throughout its range during the early 1980's. From 1976 to 1985 there were 111 known nest sites for Barn Owls in Virginia but only 43 of these sites supported active breeding pairs in 1986. A marsh box program for Barn Owls was initiated by CCB in 1997. The goal of the program is to install 60 nest boxes within extensive marshes in the hope that these boxes would be colonized and provide a source of dispersing juveniles to recolonize remaining up-lands. Work continues toward this initial goal.

## CCB Continues to Assist in Osprey Reintroduction Program

For the fifth consecutive breeding season, CCB has provided Osprey chicks to the Ohio Department of Natural Resources for release. Ohio is attempting to re-establish a viable breeding population in the post DDT era. Because the Chesapeake Bay population has now recovered to nearly 4,000 breeding pairs it is being used as a source of chicks for translocations. Each year, CCB collects 15 Osprey chicks that are 5-6 weeks old from rivers within the lower Chesapeake Bay. These chicks are flown to hack sites in Ohio during the same day.



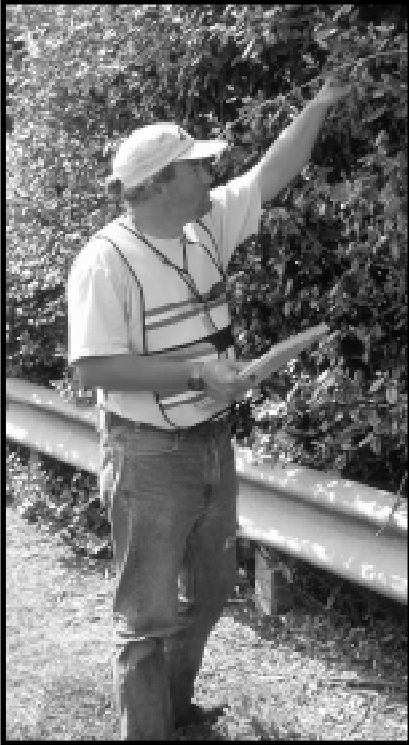
*The Grasshopper Sparrow is one of the primary species targeted in recommended shifts in open-habitat management strategy. Photo by Bryan Watts.*



*Reese Lukei approaches an Osprey nest on the North Landing River to collect chick for transport to Ohio's reintroduction program. Photo by Bryan Watts.*

# RESEARCH PROGRAMS

## CCB Investigates Roadway Hazards to Migratory Birds



*Bart Paxton examines the condition of elaeagnus fruit along one of the experimental roadway segments. Fruit abundance and condition appears to influence rates of bird mortality in high traffic areas. Photo by Bryan Watts.*

In the spring of 1999, representatives of the U.S. Fish and Wildlife Service collected 459 dead birds along discreet sections of highway near Richmond, Virginia. Roadway sections were adjacent to median plantings of thorny elaeagnus containing dense fruit crops. During the spring of 2000, the Center agreed to work with the Virginia Department of Transportation and the U.S. Fish and Wildlife Service to determine the extent to which this exotic shrub influences roadway mortality in migratory birds.

A controlled study revealed that the presence of ripe elaeagnus fruit had a significant influence on both the use of medians by birds and bird mortality. Roadway sections containing dense fruit crops accounted for more than 97% of bird mortality. The seasonal timing of median use and mortality was found to correspond to the peak availability of ripe fruit. These results have broad implications because thorny elaeagnus has been used throughout the southeastern United States as a highway median plant for more than 30 years. The Center is continuing to work with government agencies to design an appropriate remedy.

## CCB Continues Investigation of Hardwood Bird Community in Coastal North Carolina



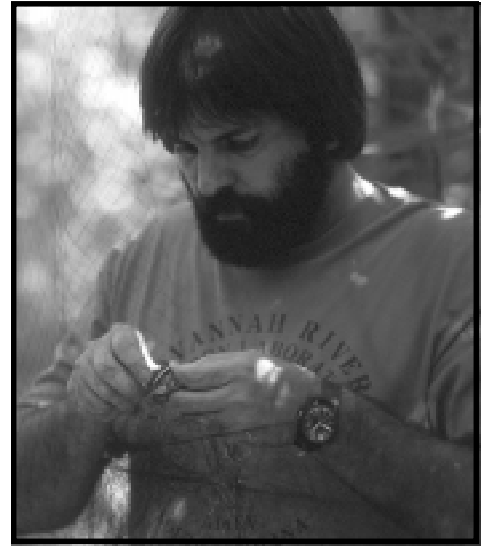
*Weyerhaeuser's Parker Tract is important to a diverse community of breeding birds. Photo by Dana Bradshaw.*

The natural forest areas of Weyerhaeuser Company's Parker Tract near Plymouth, NC represent the last remnants of the East Dismal Swamp and are recognized as some of the most biologically diverse lands within the South Atlantic Coastal Plain. In recognition of this increasingly rare ecosystem, the Weyerhaeuser Company and the Environmental Defense Fund formed a conservation partnership that included an initiative to maintain mature swamp forest capable of sustaining certain neotropical migratory songbirds. For the past two years the Center for Conservation Biology has served as a research partner conducting fieldwork to determine the requirements of bird species within the Parker Tract.

During the 2000 breeding season, the Center for Conservation Biology worked within all of the remaining hardwood stands of the Parker Tract. Thirty-four of 58 species supported by the hardwood forests were neotropical migrants. Of particular conservation interest were the populations of the Wayne" Black-throated-green Warbler and the Swainson's Warbler. The results of this ongoing study provide a foundation to examine the response of bird species to future forest management. A number of species showed significant responses to variation in habitat structures that may be subject to management control within a hardwood silvicultural system. Understory density was an important habitat feature for several species of conservation concern.

## CCB Completes Fourth Year of Participation in National MAPS Program

Monitoring Avian Productivity and Survivorship (MAPS) is a continent-wide program designed to estimate demographic parameters for passerines using constant-effort mist netting. The program focuses on long-term productivity patterns and rates of return to breeding territories. Initiated in 1989, the program now has 500 stations scattered across the United States and Canada. CCB has operated 3 MAPS stations in cooperation with U.S. Marine Corps, Quantico in northern Virginia since 1997. Two of the sites are within extensive hardwood forests with large populations of Wood Thrush, Ovenbird, Acadian Flycatchers, Hooded Warblers and Worm-eating Warblers. The remaining site contains a mixture of pine forest and a young clearcut. This site supports large populations of Yellow-breasted Chat, Indigo Bunting, White-eyed Vireo, and Common Yellowthroat.



*Bryan Watts removes Carolina Wren from mist net. Over the years, the MAPS project has recaptured many individuals between years. Photo by Marian Watts.*

## CCB Investigate Colonial Waterbirds on Smith Island, MD

Smith Island is one of the most pristine and productive locations within the Chesapeake Bay. A population of less than 1,000 people scattered among 3 small communities make their living from the abundant fish and crabs that live in the shallow waters surrounding the island. The extensive salt marshes that account for more than 95% of the island support tremendous bird populations. The sole Brown Pelican colony on the island was surveyed in 1993 by CCB and determined to have 53 pairs. A new survey in 2000 by CCB determined that the colony had grown to 920 pairs. A similar jump from 6 to 320 Double-crested Cormorant pairs occurred over this same time period.

During the summer of 2000, CCB spent 28 days observing the movement and foraging patterns of waterbirds on the southern end of Smith Island. This location has quickly become one of the most important locations for colonial waterbirds throughout the Chesapeake Bay.



*Brown Pelican chicks on Smith Island. In a short period of time, the Smith Island colony has become the largest in the Chesapeake Bay. Photo by Bryan Watts.*

## CCB Continues to Monitor Soaring Population of Double-crested Cormorants

In recent years the Double-crested Cormorant has been a controversial species throughout large regions of the United States. Population expansion in the post DDT era has placed this species in visible competition with fish farming operations, recreational anglers, and commercial fishermen. CCB has monitored the breeding population in coastal Virginia since 1985 when the state population was 8 breeding pairs located in a single colony. By 1990, the population has reached 134 pairs and by 1995 more than 400. Known nesting colonies of cormorants were once again surveyed during the breeding season of 2000. The Virginia population has now grown to more than 750 breeding pairs.

# RESEARCH PROGRAMS

## Bird Migration Program



*Marian Watts with two migrant Northern Parula Warblers. Several species were the focus of research on energetics of migration. Photo by Bryan Watts.*

### **CCB Launches Energetic Study Focused on Fall Migrants**

The mid-Atlantic Coastal Plain is an important migration area for many bird species. Most of the research focused on stop-over ecology within this region has been conducted within major migration bottleneck areas (e.g. Cape May Peninsula, Lower Delmarva Peninsula) within the outer coastal plain where birds become highly concentrated. Research conducted by CCB within these areas has investigated a number of ecological questions including geographic and landscape-scale patterns, patterns of habitat use, stop-over duration, foraging ecology, etc. Within these habitats, birds do not appear to be replenishing fat reserves suggesting that coastal bottleneck areas may be energy sinks for migrants. Additional research conducted by CCB has shown that foraging rates for selected migrant species are three times higher in deciduous forests compared to pine forests. These findings suggest that the hardwood-dominated forests of the inner coastal plain may be of superior quality for stopover habitats. Over the past 10 years, these forests have been lost at an alarming rate.

During the fall of 2000, CCB launched a study to compare the physical condition and foraging success of focal migrant species between the outer and inner coastal plain of Virginia. The location of the inner coastal plain site was U.S. Marine Corps Base, Quantico. The location of the outer coastal plain site was the lower Delmarva Peninsula. Fieldwork was conducted within both sites from mid-August through October. Analysis of time and energy budgets is ongoing. This study is scheduled to continue in the fall of 2001.



*Red-tailed Hawks are one of several species monitored during fall migration. Photo by Mitchell Byrd.*

### **CCB Completes 23<sup>rd</sup> Year of Fall Raptor Trapping**

For 23 years, a raptor banding station has been operated at Wise Point located at the southern tip of the Delmarva Peninsula. The purpose of this banding project is to help monitor populations of diurnal raptors that migrate along the Atlantic Coast and to learn more about their migration ecology. CCB research associate Reese Lukei, Jr. has operated the banding site for the past 12 years.

During the 2000 fall migration, the trap site was opened for 66 days between 7 September and 9 December. A total of 342 raptors were captured. This is the lowest number of raptors captured since Reese took over the station in 1989. The average number of captures over this period is 813. Results for individual species include 6 American Kestrels, 38 Merlin, 11 Peregrine Falcons, 121 Sharp-shinned Hawks, 111 Cooper's Hawks, 52 Red-tailed Hawks, 1 Red-shouldered Hawk, and 2 Northern Harriers.

### Study of Blackpoll Warbler Migration Ecology Completed

Each year in early May, the mid-Atlantic Coastal Plain hosts large numbers of Blackpoll Warblers on their way to northern breeding grounds. The timing of their arrival appears to coincide with the emergence of foliage and insects. However, the role that this region plays in the life cycle of this species has never been investigated. In the spring of 1999, Magill Weber initiated a graduate project to investigate the stopover ecology of this species in coastal Virginia. The study focused on geographic-scale patterns of migration and foraging ecology. Findings suggest that Blackpolls arrive and reach peak numbers on the outer coastal plain several days earlier than on the inner coastal plain. Blackpolls appear to forage in hardwood canopies along the forest edge. Birds spend the majority of their time foraging and energy intake appears to be two times higher than metabolic costs. This result suggests that coastal Virginia represents an energetic source for this species during spring migration.

### CCB Continues Study of Saw-whet Owl Migration Ecology

The Northern Saw-whet Owl breeds in southern Canada and the northern United States. During the late fall months this species migrates south to the mid-latitudes of North America. Because of its secretive habits, little is currently known about its migration ecology and winter distribution. Prior to 1994 very few records for this species existed south of Maryland. During the fall of 1994, CCB began a study of the migration of this species along the lower Delmarva Peninsula. This study has been the first to document large numbers of migrant Saw-whets south of Maryland. During the 7-year study, more than 2,000 owls have been banded and 75 foreign retraps and returns have been made.

Three trap stations were operated on the lower Delmarva Peninsula from 25 October through 15 December. One hundred owls were captured in 2000 compared to 700 in 1999. Information collected over several years is now beginning to reveal important aspects of this species migration ecology. Several more years of study may be needed to fully understand the irruptive nature of this species migration into the lower latitudes.



*The Northern Saw-whet Owl is the smallest forest owl in eastern North America. Since 1994, CCB has banded more than 2,000 of these birds during fall migration. Information collected is beginning to unravel the underlying factors that lead to the irruptive nature of their migration. Photo by Bryan Watts.*



*Dana Bradshaw removes Saw-whet from mist net. Photo by Lee Walker.*

# OUTREACH AND EDUCATION PROGRAMS

Progress in conservation is short-lived without a strong foundation in education. CCB is committed to a broad-based education and outreach program. Below is an overview of progress made in this program area during the year 2000.

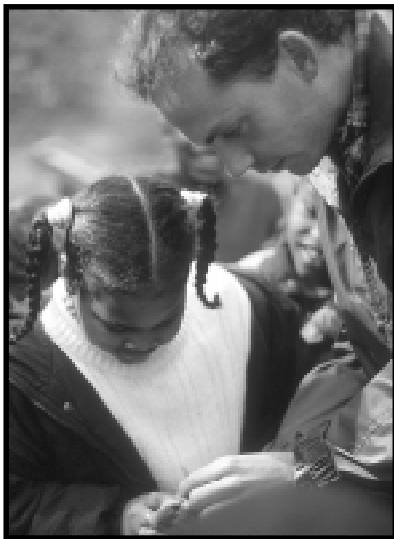


*Paul Baker and friends on Fisherman's Island.*

## **CCB Establishes Paul S. Baker Library**

CCB maintains an extensive library of materials used in daily research. Many of the resources housed in the library are rare and not available elsewhere in the region. The subject focus of these materials is avian ecology, distribution, and conservation. However, reference materials on many other topics are also available. Current library resources fall into several categories including books, government documents, scientific journals, reprints of research articles, topographic maps, aerial photographs, and slides.

CCB is honored to name our expanding research library for Paul Baker. Paul was a test pilot and aeronautical engineer in the early days of aviation, a world traveler, and is a true conservationist of the highest order. At an early age, Paul's love of flight and flying led to a natural fascination with birds. After retirement, Paul began to work with CCB to trap and monitor birds of prey during fall migration. He manned the trapping station on Fisherman's Island for many years. Throughout his life, Paul has been a tireless activist for the environment. Writing letters, attending meetings, making telephone calls to government agencies in support of environmental initiatives has become a way of life. Over the years, Paul assembled an extensive natural history library focused on birds of the world. His donation of this library to the Center for Conservation Biology in 1998 was one of several gifts that led to our expanding research library.



*Mike Wilson introduces young students to the mysteries of migration. Photo by Marian Watts.*

## **CCB Strengthens Outreach to the Community**

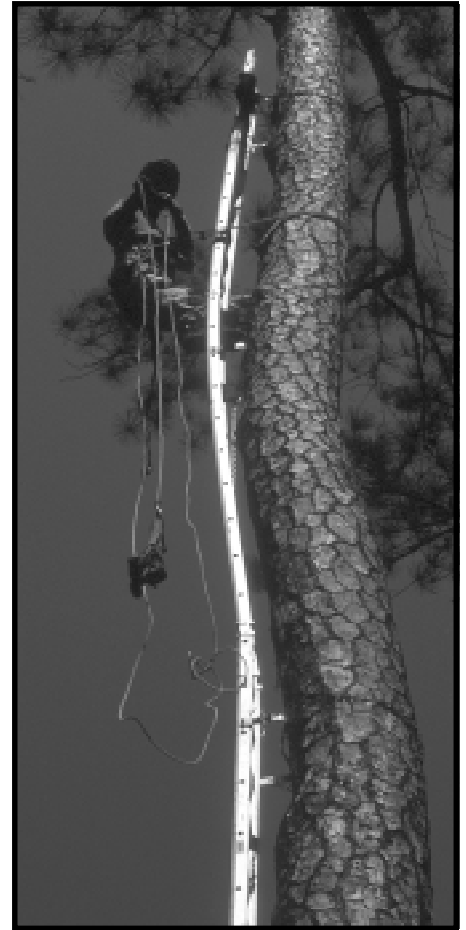
In recent years, CCB has initiated the development of a community outreach program. The purpose of this emerging program is to inform the general public about ongoing environmental problems while providing education about potential solutions and recent research findings. By interacting directly with the community we hope to advance the public debate and establish a forum for problem solving. During the past calendar year, CCB has participated in more than 89 newspaper articles, 7 magazine articles and 12 articles published via electronic media. In addition, CCB staff and/or associates have been featured in 8 television and 3 radio broadcasts. More than 18 presentations have been made to local, regional, and national audiences.

## CCB Continues Commitment to Information Exchange

Decisions that influence the future and health of sensitive populations and ecosystems are made on a daily basis. In order for land managers and planners to make the best use of our natural resources, it is important that they have direct access to recent research findings. CCB is committed to making research findings available as soon as possible. Below is a listing of publications produced by CCB during the year 2000.

### *Research Publications*

- Whalen, D. M. and B. D. Watts. 2000. Interspecific variation in extraction of buried seed within an assemblage of sparrows. *Oikos*. 88:574-584.
- Whalen, D. M., B. D. Watts, and D. W. Johnston. 2000. Diet of autumn migrating Northern Saw-whet Owls on the Eastern Shore of Virginia. *Journal of Raptor Research* 34:42-44.
- Watts, B. D. 2000. Migrant shorebirds: Role of the Delmarva Coastal Bays. Proc. Delmarva Coastal Bays Conf III: Tri-state approaches to preserving aquatic resources. Pp 36-38.
- Wilson, M. D. and B. D. Watts. 2000. Breeding bird communities in pine plantations on the Coastal Plain of North Carolina. *The Chat* 64:1-14.
- Mabey, S. E. and B. D. Watts. 2000. Conservation of landbird migrants: Addressing local policy. *Studies in Avian Biology* 20:99-108.
- Dunning, J. B., Jr., B. J. Danielson, B. D. Watts, J. Liu, and D. G. Krentz. 2000. Studying wildlife at local and landscape scales: Bachman's Sparrows at the Savannah River Site. *Studies in Avian Biology* 21:75-80.
- Erwin, R. M., M. K. Laubhan, J. E. Cornely, and D. S. Bradshaw. 2000. Managing wetlands for waterbirds: How managers can make a difference in improving habitat to support a North American Bird Conservation Plan. In: Bonney, R.; Pashley, D. N.; Cooper, R. J.; Niles, L. eds. *Strategies for bird conservation: The Partners in Flight planning process; Proceedings of the 3<sup>rd</sup> Partners in Flight Workshop; 1995 October 1-5; Cape May, NJ. Proceedings RMRS-P-16. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.*



*Precious Red-cockaded Woodpecker chicks extracted from the nest cavity at 7 days of age are carefully lowered to the ground for banding. Marking individuals with colored bands is the first step toward effective monitoring. Photo by Bryan Watts.*

# OUTREACH AND EDUCATION PROGRAMS

## *CCB Technical Report Series*

Lukei, R. F., Jr. and M. A. Byrd. 2000. Lower Delmarva Peninsula raptor migration study: Year 1999 report. Center for Conservation Biology Technical Report Series CCBTR-00-01. College of William and Mary, Williamsburg, VA. 10pp.

Paxton, B. J. and B. D. Watts. 2000. Autumn migration of the Northern Saw-whet Owl on the Lower Delmarva Peninsula 1994-1999. Center for Conservation Biology Technical Report Series: CCBTR-00-02. College of William and Mary, Williamsburg, VA. 8pp.

Paxton, B. J. and B. D. Watts. 2000. Investigation of grassland/shrubland migrants on the Lower Delmarva Peninsula. Center for Conservation Biology Technical Report Series: CCBTR-00-03. College of William and Mary, Williamsburg, VA. 23pp.

Wilson, M. D. and B. D. Watts. 2000. Breeding Bird Communities of the Parker Tract Hardwood Forest Swamps. Center for Conservation Biology Technical Report Series: CCBTR-00-04. College of William and Mary, Williamsburg, VA. 49pp.

Wilson, M. D. and B. D. Watts. 2000. The Chuck-will's-widow and the Whip-poor-will in a managed forest landscape: the effect of matrix habitats on distribution and abundance. Center for Conservation Biology Technical Report Series: CCBTR-00-05. College of William and Mary, Williamsburg, VA. 38pp.

Watts, B. D. 2000. Bachman's Sparrow management plan: Fort A. P. Hill, Virginia. Center for Conservation Biology Technical Report Series: CCBTR-00-06. College of William and Mary, Williamsburg, VA. 17pp.

Bradshaw, D.S. 2000. 1999 Status Information for Red-cockaded Woodpecker Groups on Lands Managed by Resource Management Service, Inc. in Southeastern Virginia. Center for Conservation Biology Technical Report Series: CCBTR-00-07. College of William and Mary, Williamsburg, VA. 13 pp.

Watts, B. D. 2000. An ecological-economic assessment of grassland management strategies within Colonial National Historical Park. Center for Conservation Biology Technical Report Series: CCBTR-00-08. College of William and Mary, Williamsburg, VA. 24pp.

Watts, B. D. and B. J. Paxton. 2000. The influence of thorny elaeagnus on automobile-induced bird mortality. Center for Conservation Biology Technical Report Series: CCBTR-00-09. College of William and Mary, Williamsburg, VA. 18 pp.



*The breeding population of Double-crested Cormorants has expanded dramatically throughout the mid-Atlantic region since the 1980's. This duck blind in Chincoteague Bay is one of the more unusual nesting substrates used by the growing population. Photo by Bryan Watts.*

# OUTREACH AND EDUCATION PROGRAMS

Watts, B. D. and D. S. Bradshaw. 2000. Investigation of Red-cockaded Woodpeckers in Virginia: Year 2000 report. Center for Conservation Biology Technical Report Series: CCBTR-00-10. College of William and Mary, Williamsburg, VA. 87 pp.

Wilson, M. D., B. D. Watts, and B. J. Paxton. 2000. Breeding bird communities of the Parker Tract hardwood forest swamps: Year 2000 report. Center for Conservation Biology Technical Report Series: CCBTR-00-11. College of William and Mary, Williamsburg, VA. 63pp.

Watts, B. D. 2000. A study of waterbirds in Shanks Creek: An investigation on Smith Island, MD. Center for Conservation Biology Technical Report Series: CCBTR-00-12. College of William and Mary, Williamsburg, VA. 28pp.

## *Outreach/Education Publications*

Watts, M. U. 2000. Community outreach programs: Media coverage and public presentations (1998-1999). Outreach and education report OER-01-00. Center for Conservation Biology, College of William and Mary, Williamsburg, VA. 180 pp.

Weber, M. E. 2000. Stopover ecology of the Blackpoll Warbler (*Dendroica striata*), during spring migration on the coastal plain of Virginia. M. A. Thesis. Department of Biology, College of William and Mary, Williamsburg, VA. 44 pp.

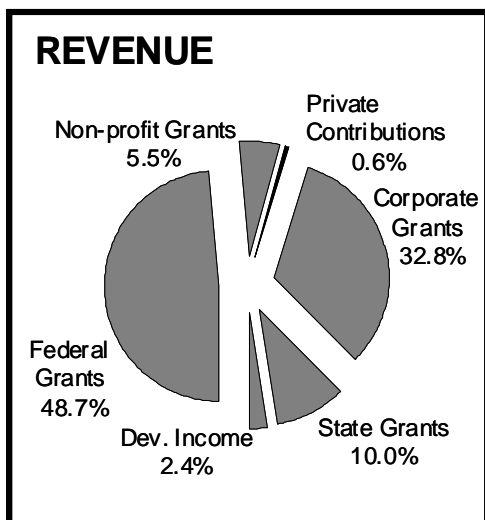


*Shawn Padgett (standing) and Richard Bartlett work on a Peregrine tower. Repair and management of nest boxes and towers requires a tremendous number of man hours each year. Photo by Bryan Watts.*

# SUPPORT

As in past years, most of the support received in 2000 was awarded by grant programs for the purpose of conducting research. CCB continues to provide high quality research products across a broad range of subject areas. Expertise in coordinating and conducting efficient field research continues to be one of the greatest assets of our programs.

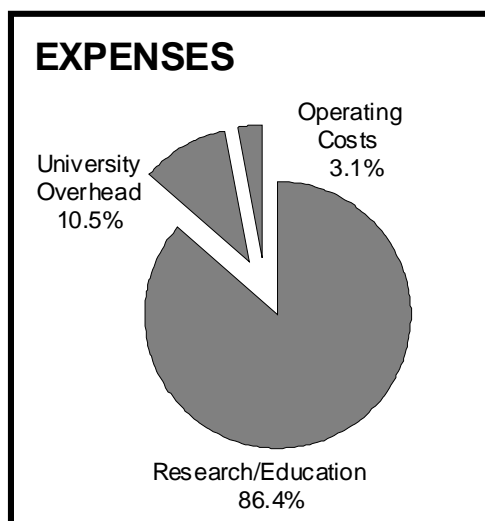
## Statements of Financial Position



Assets	12/31/99	12/31/00
Investments		
Faculty Endowment	247,600	258,600
Wildlife Art	4,978	4,978
Research Library	86,151	99,696
Office Equipment & Furniture	8,725	18,120
Less: Accum. Depreciation	4,194	7,912
	4,531	10,208
Deferred Revenue		
Grants	109,969	234,593
Development Funds	17,512	29,237
Education Funds	7,240	7,340
Net Assets	477,981	644,652

## Statement of Activities

For year ended 12/31/00



Category	Amount
Revenues	
Development Revenues	37,317
Grants and Contracts	344,445
Total Revenues	381,762
Expenses	
Research/Education Expenses	189,042
Operating Expenses	6,692
Administrative Fees (College)	23,075
Total Expenses	218,809
Net Change in Assets	166,671
Net assets beginning of year	477,981
Net assets end of year	644,652

## LIST OF ORGANIZATIONAL PARTNERS (2000)

**Government**

United States Department of Defense  
 Marine Corps Base Quantico  
 Fort A.P. Hill  
 Fort Monroe/TRADOC

United States Fish and Wildlife Service  
 Virginia Field Office  
 North Carolina Field Office  
 Eastern Shore of Virginia National Wildlife Refuge  
 Chincoteague National Wildlife Refuge  
 Presquile National Wildlife Refuge  
 Rappahannock River National Wildlife Refuge  
 Martin National Wildlife Refuge

National Park Service  
 Colonial National Historical Park  
 Shenandoah National Park

Army Corps of Engineers  
 Virginia Department of Environmental Quality  
 Virginia Department of Game and Inland Fisheries  
 Virginia Department of Transportation  
 Virginia Transportation Research Council  
 Virginia Museum of Natural History  
 Virginia State Parks  
 Kiptopeke State Park  
 Caledon Natural Area

Ohio Department of Natural Resources

**Corporate**

Weyerhaeuser Company  
 Dominion Virginia Power  
 Hancock Timber Resource Group  
 A&N Electric Cooperative  
 Aluminum Company of America  
 Resource Management Services, Inc.  
 J. Carter and Associates  
 Hunton & Williams

**Non-Profit**

The Nature Conservancy (Virginia Chapter)  
 Virginia Society of Ornithology  
 James River Association  
 Virginia Coastal Wildlife Observatory  
 Cape Henry Audubon Society  
 Richmond Audubon Society  
 Center for Conservation Technology  
 Raptor Society of Metropolitan Washington



*Shrublands such as this field above represent one potential endpoint of open-habitat management. Landscape-scale simulations such as those conducted by CCB for the National Park Service allow management strategies to be customized to specific landscapes. This approach allows managers to get the most wildlife benefit from the landscape they control. Photo by Bryan Watts.*

# ACKNOWLEDGMENTS



*Fruit of Elaeagnus pungens. This exotic shrub from Asia sets fruit in mid spring when migrant birds are moving north toward the breeding grounds. The large, sweet fruit are attractive to many frugivores. Research by CCB suggests that plantings near high traffic areas are hazardous to migrants. Photo by Bart Paxton.*

The Center for Conservation Biology is fortunate to have many friends and colleagues throughout the community who contribute to our programs in many ways. We would like to express our thanks to the many individuals who provided invaluable assistance to CCB during the year 2000. Among others, these included Captain Fuzzo, Carlton Adams, Irvin Ailes, Bob Anderson, George Armistead, Rex Badgett, Paul Baker, Bill Barber, Wendy Bley, Bill Bolin, Don Bolling, Dee Bowan, Sharon Broadwater, Lois Byrd, Bob Carpenter, Rudy Cashwell, David Cerusale, Jennifer Ciminelli, Bob Cole, Linda Cole, Walter Conrad, Gwynn Crichton, Dan Cristol, Doug Davis, Pam Denmon, Randy Dettmers, Kate DiPasquale, Judy Dunscomb, Steve Eades, Chris Eberly, Greg Edmonds, Mike Erwin, Geoffrey Feiss, Ray Fernald, Michael Fitch, Amber Foster, Lee Foster, LeRoy Friesen, Dave Froggatt, John Fulton, Greg Garman, Mary Geil, Chris Graham, Emily Grey, Sabrina Grossman, Rolf Gubler, Niels Hayden, Kirk Havens, Tim Hayes, Blake Henke, Shelly Hitchings, Joe Hughes, Chuck Hunter, Sonya Hylton, Patti Jackson, Dan Hurt, Kendell Jenkins, Brian Johnson, Jim Kenyon, Craig Koppie, Mike Lipford, Jane Lopez, Mike Ludwick, Melinda Lukei, Larry Lynch, Sharryl Lyndberg, Heather Mansfield, Wayne Marion, Karen Mayne, Joe McCauley, Julie McClafferty, Laura McKay, Tony Melchiors, Andrew Milliken, Mike Mitchell, Irene Morris, Bob Noffsinger, Kevin O'Kane, David Pashley, Don Patterson, Renee Peace, Cheryl Pope, John Porter, Chuck Rafkind, Sue Rice, Lisa Richman, Mark Roberts, Ken Rosenberg, Eileen Rowan, Amy Ruth, Lisa Sausville, William Sbrega, John Schroer, Don Schwab, Gloria Sciole, Bill Seegar, Laura Sherman, Joel Sickert, Aileen Smith, Rex Springston, Tim Stamps, Dawn Storr, Brian Sullivan, Dave Summers, Glenn Therres, Barry Truitt, Sherri Tribble, Joe Urbi, Brian van Eerden, Cathy Viverette, Keith Watson, Don West, Jenny West, Dave Whalen, Lydia Whitaker, David Whitehurst, Bonnie Willard, Larry Wiseman, Anne Womack, Andy Zadnik.