

# NEW YORK COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT



2012

Annual Report

The New York Cooperative Fish and Wildlife Research Unit has embarked on a new era. Our staff is growing and research is expanding into new areas. We continue forming new relationships with our cooperators and planning research to address natural resource issues in New York State and beyond.

Front cover photo: Matt Adams (M.S. student) holding black bear cub.  
(Photo: Marty DeLong)

# New York Cooperative Fish and Wildlife Research Unit

2012 ANNUAL REPORT

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Cooperators:

U. S. Geological Survey  
Cornell University  
New York State Department of Environmental Conservation  
U. S. Fish and Wildlife Service  
Wildlife Management Institute

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## INTRODUCTION

The Cooperative Research Units (CRU) program was established in 1935 as a cooperative partnership between the Federal and State biological resource agencies and Land Grant universities to conduct research on managing wildlife populations and habitats, train wildlife managers, and disseminate information to management agencies. Seventy-five years later, the mission of the program remains unchanged. Now with 40 Units in 38 states, the CRU program employs over 100 scientists that conduct research on natural resource issues of importance to State and Federal agencies and other organizations, teach graduate-level courses at their host universities, and conduct workshops and short courses for their cooperators and other partners. Over the past five years, 595 Coop Unit students have graduated from their host institutions, and together with Unit scientists and postdocs, they have produced 1858 peer-reviewed publications and made 3804 presentations at scientific meetings (<http://www.coopunits.org/Headquarters/>, accessed on 1 May 2013).

The New York Cooperative Fish and Wildlife Research Unit was established in 1961 under the leadership of Dr. Daniel Thompson. Originally established as a separate wildlife unit, the fishery unit was added in 1963 and led by Dr. Alfred Eipper. In 1984, the units were combined and led through 2008 by Dr. Milo Richmond. Over its 50-year history, the New York Coop Unit has had five wildlife scientists and seven fishery scientists who have conducted research on a diversity of natural resource issues ranging most recently from assessing vertebrate biodiversity in New York State to evaluating immunocontraception of white-tailed deer to studying the ecology of Atlantic and shortnose sturgeon in the Hudson River.

Since 2008, the New York Coop Unit has undergone a complete change in personnel. Dr. William Fisher assumed the Unit Leader position in 2008 after serving nearly 18 years as Assistant Unit Leader-Fisheries for the Oklahoma Cooperative Fish and Wildlife Research Unit. In 2009, Dr. Angela Fuller became the new Assistant Unit Leader-Wildlife, coming to the New York Coop Unit from the University of Maine where she was a postdoc studying the effects of forest fragmentation on mammals. In 2011, Dr. Mitchell Eaton joined the New York Coop Unit as Assistant Unit Leader-Ecology. Mitch was previously a postdoc at the USGS Patuxent Wildlife Research Center where he worked on developing methods in and applying structured decision making and adaptive management to natural resource problems.

We look forward to embarking on new research directions in cooperation with our partners at Cornell University, the New York State Department of Environmental Conservation, U. S. Geological Survey, U. S. Fish and Wildlife Service, Wildlife Management Institute, and other organizations. We see a bright future for the re-formed New York Coop Unit.

*The Scientists and Staff of the  
New York Cooperative Fish and Wildlife Research Unit*

## PROGRAM STATEMENT

The New York Cooperative Fish and Wildlife Research Unit, one of 40 in a national Cooperative Research Units program, was established for the purpose of enhancing the management of this nation's natural resources. The mission of the program is to conduct research on natural resource questions, contribute to graduate education by engaging graduate students in research projects and teaching graduate-level courses, provide technical assistance and consultation on natural resource issues, and provide continuing education for natural resource professionals. The Unit is a partnership among the U.S. Geological Survey, the New York State Department of Environmental Conservation, Cornell University, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute. The mission of the Unit is to conduct and facilitate applied and basic research in fish and wildlife management among state and federal natural resource agencies, non-governmental organizations, and university faculty and staff on topics of mutual concern. The three Unit research scientists are aided by a highly motivated group of graduate students and research affiliates who conduct scientific research and understand the need for application and dissemination of research results. Particular attention is given to the natural resource problems and issues of the Northeastern states, with New York as the focal point, but we also work on national and international conservation issues. Our research focuses on how spatial and temporal variation in environmental and habitat characteristics influence habitat selection, movements, and population ecology of fish and wildlife. When appropriate, we promote the principles and use of structured decision making to guide management and research, and apply methods of adaptive management as a framework to reduce the pervasive uncertainties that complicate natural resource management and policy decisions.

Approved: September 18, 2012

## COOPERATORS AND PERSONNEL

### COORDINATING COMMITTEE

#### **United States Geological Survey**

MIKE TOME, Eastern Supervisor, Cooperative Research Units, Leetown Science Center, 11649 Leetown Road, Kearneysville, WV 25430

#### **New York State Department of Environmental Conservation**

PATTY RIEXINGER, Director, Division of Fish, Wildlife, and Marine Resources, 625 Broadway, Albany, NY 12233

#### **Cornell University**

MARIANNE KRASNY, Chair, Department of Natural Resources, Bruckner Hall, Cornell University, Ithaca, NY 14853

MAX PFEFFER, Senior Associate Dean, College of Agriculture and Life Sciences, Roberts Hall, Cornell University, Ithaca, NY 14853

#### **United States Fish and Wildlife Service**

RICHARD O. BENNETT, Regional Scientist, U.S. Fish and Wildlife Service, Northeast Regional Office, 300 Westgate Center Dr., Hadley, MA 01035

DAVID STILWELL, Field Supervisor, U.S. Fish and Wildlife Service, New York Field Office, 3817 Luker Rd., Cortland, NY 13045

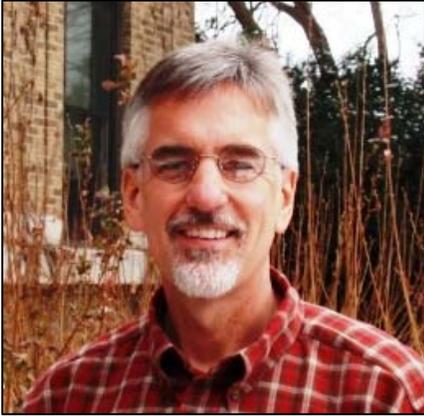
#### **Wildlife Management Institute**

SCOT WILLIAMSON, Northeast Regional Representative and Vice-President, Wildlife Management Institute, 69 Clinton Avenue, St. Johnsbury, VT 05819

## UNIT PERSONNEL

### Scientists

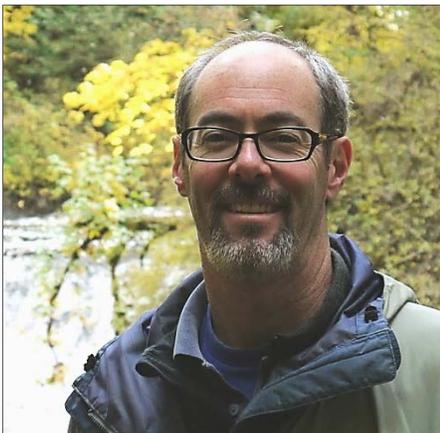
**WILLIAM L. FISHER**, Unit Leader-Fisheries, USGS, and Courtesy Associate Professor, Department of Natural Resources



**ANGELA K. FULLER**, Assistant Unit Leader-Wildlife, USGS, and Courtesy Assistant Professor, Department of Natural Resources



**MITCHELL J. EATON**, Assistant Unit Leader-Ecology, USGS, and Courtesy Assistant Professor, Department of Natural Resources



**Staff**



MELANIE MOSS , Administrative Assistant



KIMBERLEY CORWIN, Research Support Specialist

**Postdoctoral Research Associates**

JASON TAYLOR, Department of Natural Resources



KELLY ROBINSON, Department of Natural Resources



## COLLABORATORS

BARRY BALDIGO, U. S. Geological Survey, New York Water Science Center

GORDON BATCHELLER, New York State Department of Environmental Conservation

TOM BAUDANZA, New York City Department of Environmental Protection

DANIEL DECKER, Cornell University

ERIC L. DERLETH, Partners for Fish and Wildlife Program, U.S. Fish and Wildlife Service

MIKE FLAHERTY, New York State Department of Environmental Conservation

STEVEN FULLER, Wildlife Management Institute, North Atlantic LCC

JIM DALEY, New York State Department of Environmental Conservation

MATTHEW HARE, Cornell University

RANDY JACKSON, Cornell University

KATHRYN JAHN, U.S. Fish and Wildlife Service

DAVID KLEIN, The Nature Conservancy

FRED HENSEN, New York State Department of Environmental Conservation

PHIL HULBERT, New York State Department of Environmental Conservation

JEREMY HURST, New York State Department of Environmental Conservation

CLIFFORD KRAFT, Cornell University

Lisa Holst, New York State Department of Environmental Conservation

JEFF LOUKMAS, New York State Department of Environmental Conservation

SEAN MADDEN, New York State Department of Environmental Conservation

JOHN OZARD, New York State Department of Environmental Conservation

DANIEL ROSENBLATT, New York State Department of Environmental Conservation

J. ANDREW ROYLE, Patuxent Wildlife Research Center

MIKE SCHIAVONE, New York State Department of Environmental Conservation

TIM SMITH, NPS – Cape Cod National Seashore

BRYAN SWIFT, New York State Department of Environmental Conservation

ANTHONY TUR, U.S. Fish and Wildlife Service

MARK WOYTHAL, New York State Department of Environmental Conservation

## GRADUATE EDUCATION

### CURRENT STUDENTS

MATTHEW ADAMS, M. S., Natural Resources,  
Wildlife Conservation (Advisor: Fuller)



TYLER J. ROSS, M. S., Natural Resources, Fishery and  
Aquatic Science (Advisor: Fisher)



CHRIS NADEAU, M. S., Natural Resources,  
Conservation Biology/Quantitative Ecology  
(Advisor: Fuller)



CATHERINE SUN, M. S./Ph.D., Natural Resources,  
Conservation Biology/Quantitative Ecology  
(Advisor: Fuller)



ALEX ALEXIADES, Ph.D., Natural Resources, Fishery  
and Aquatic Science (Advisor: Fisher)



CHRISTIAN PERRY, Ph.D., Natural Resources, Fishery and Aquatic Science (Advisor: Fisher)



MAYA WELTMAN-FAHS, Ph.D., Natural Resources, Fishery and Aquatic Science (Advisor: Fisher)



## RECENT GRADUATES

Tyler Jeffery Ross. 2012.

## COURSES TAUGHT

Structured Decision Making for Natural Resource Management (January 23, 2012 - May 4, 2012; 2 hrs) – Fuller

Introduction and Application of Bayesian Methods for Inference in Ecology (August 22, 2012 – December 5, 2012; 2 hrs) – Eaton, Sullivan, Cooch

## UNDERGRADUATE STUDENT TECHNICIANS

Chris Boyce (SUNY ESF)

Jackie Chen (Cornell)

Collin Ferrell (Cornell)

Alex Koeberle (Cornell)

Evan McFee (SUNY ESF)

Shoshana Mitchell (Cornell)

Jeffrey Rossi (Cornell)

Ryan Wickens (Cornell)

Binta Wold (Cornell)

## RESEARCH – FISHERIES AND AQUATIC

### COMPLETED PROJECTS

#### **Use of Telemetry to Assess Potential Effects of Schoharie Reservoir Waters on Trout Populations in the Upper Esopus Creek**

**INVESTIGATORS:** Barry Baldigo, (USGS)  
William Fisher (NYCFWRU)  
Tom Baudanza (NYCDEP)  
Mike Flaherty (NYSDEC)  
Clifford Kraft (Cornell)

**STUDENTS:** Tyler J. Ross, M.S.  
Jackie Chen, Collin Ferrell, Alex Koeberle  
Student Technicians

**SPONSORS:** U. S. Geological Survey  
New York State Department of  
Environmental Conservation  
New York City Department of  
Environmental Protection  
Cornell University Cooperative Extension

**DURATION:** August 2009—October 2012



**T. J. ROSS TRACKING FISH IN ESOPUS CREEK**

The New York City (NYC) Watershed Protection Management Plan identified as a priority concern the potential adverse effects of turbid Schoharie Reservoir water discharged through the Shandaken Portal on trout populations in the upper Esopus Creek. We evaluated impacts of the releases on trout behavior, growth, survival, and use of thermal refuges in the upper Esopus Creek. We assessed differences in trout 1) movement and use of thermal refuges), 2) apparent survival, and 3) growth telemetry-tagged trout released upstream and downstream of the Shandaken Portal. Trout above, at and below the portal in upper Esopus Creek showed signs of stress in 2010 and 2011; however, fish immediately downstream from the portal lost less mass and were in better physiological condition than fish upstream or further downstream. These findings provide information for water management in Schoharie Reservoir to minimize turbidity and fisheries management to concentrate fish stocking immediately below the portal where cool water provides a thermal refuge for stocked fish.

## CURRENT PROJECTS

### Fate of Stocked Trout and an Evaluation of Trout Stocking in New York State

INVESTIGATORS: William Fisher (NYCFWRU)  
Pat Sullivan (Cornell)  
Fred Henson (NYSDEC)

STUDENT: Alex Alexiades, Ph.D.  
Ben Marcy-Quay, M.S.

SPONSORS: New York State Department of  
Environmental Conservation

STARTED: April 2011



**ALEX ALEXIADES WRESTLING WITH AN EEL  
WHILE SAMPLING FOR TROUT IN THE  
CARMANS RIVER, NY**

Each year hundreds of thousands of hatchery-reared trout are stocked into the state's streams and rivers according to statewide policies (Catch Rate Oriented Trout Stocking, or "CROTS"). Most stockings are designed to provide average angler catch rates of 0.5 fish per hour (or greater) for part of or all of a fishing season. Recent creel surveys indicate that in some circumstances the stocked trout are only briefly providing target catch rates, and survival within stocked reaches is lower than expected. Prior radio telemetry studies conducted in Catskill Mountain waters by regional NYSDEC staff indicated widespread movements of hatchery fish out of stocked reaches was not occurring, thus would not account for the apparent disappearance of stocked fish. Applied research to better document the fate of stocked trout, with an eventual goal of identifying important factors bearing on the fate of trout that are not caught and harvested by anglers, is needed to improve the effectiveness of this important and costly fishery management program.

In spring-summer 2011 and 2012, fish population estimates and angler surveys were conducted on eight streams around New York State, and analysis of those data is ongoing. Findings thus far have revealed that angler effort and harvest rates have decreased dramatically for many streams compared with previous estimates. Angler catch per unit of effort, however, has remained relatively consistent with historic estimates. Mortality rates for stocked trout in 2011 were found to be an order of magnitude higher than historic estimates in some cases, indicating a decline in stocked trout survival. During the fall 2012, habitat data were collected and mapped in the field to evaluate the carrying capacity portion of CROTS. Initial analyses of the 2012 data indicate patterns similar to 2011 although with some variation. Population estimates and creel surveys will continue through fall 2013.

## An Assessment of Black Bass Populations in New York State

INVESTIGATORS: William Fisher (NYCFWRU)  
Randy Jackson (Cornell)  
Jeff Loukmas (NYSDEC)

STUDENT: P. Christian Perry, Ph.D.

SPONSORS: New York State Department of  
Environmental Conservation

STARTED: April 2011



**CHRISTIAN PERRY STABILIZING THE  
TRAWLER AT THE CORNELL BIOLOGICAL  
FIELD STATION**

To properly manage largemouth bass and smallmouth bass (black bass) populations, in New York State, the New York State Department of Environmental Conservation, Bureau of Fisheries requires up to date knowledge of population parameters and fishery characteristics. However, it has been nearly 30 years since the last comprehensive statewide black bass investigation and building a foundation of new information is necessary for future management. For this study, we are consolidating data from various sources, including the Fisheries Statewide Database, Lake Erie and Lake Ontario, and Oneida Lake, to develop a baseline assessment of current conditions of the black bass populations. Appropriate population and fish community metrics (e.g., relative abundance, relative weights, length indices, etc.) are being determined for largemouth bass and smallmouth bass. Environmental characteristics, such as water chemistry and physical parameters are being incorporated into the assessment. Black bass population and lake environmental data are being compared among water body types, geographic areas, and over time. This assessment will provide information for the establishment of a comprehensive, long-term monitoring program aimed at documenting black bass population and fishery status in a variety of water body types throughout New York State.

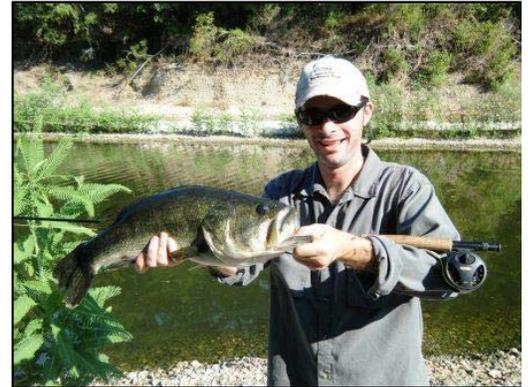
## Sustainable Flows for Rivers in the Great Lakes of New York and Pennsylvania

INVESTIGATORS: William Fisher (NYCFWRU)  
David Klein (TNC)  
Mark Woythal (NYSDEC)

STAFF: Jason M. Taylor, Postdoctoral Associate

SPONSORS: Northeast Regional Conservation  
Needs Grant  
The Nature Conservancy

STARTED: June 2011



**JASON TAYLOR WITH LARGEMOUTH BASS  
CAUGHT FLY FISHING**

This project is focused on developing information to inform river flow recommendations for Great Lake tributary streams within NY and PA. The Great Lakes Compact protects the waters of the basin from diversion, and also places obligations on the states for water management. Each state is committed to creating a management program for new or increased withdrawals and consumptive uses beyond current uses, which are the Compact baseline, within five years of the effective date of the Compact, December 2008. Such water management programs should prevent “significant individual or cumulative adverse impacts to the quantity or quality of the Waters and Water-Dependent Natural Resources” of the Basin from further water withdrawals or consumption. The goal of this project is to provide the NYSDEC with the scientific foundation to work with stakeholders in defining such standards and fulfilling one of the state’s major obligations under the Compact.

In 2012, we identified target fish species and their flow needs, as well as information on some freshwater mussel and macroinvertebrate species. This information was used to conceptual models of how their life histories interact with natural flow regimes to our initial literature review on flow targets. We developed a stream classification for the region that was used to stratify flow-ecology relationships and flow recommendations across similar stream types. This work combined with target flow needs information was used to drive the discussion for a June 2012 workshop of the technical working comprised up of biologists from federal and state agencies, and universities and TNC staff and focused on generating flow-ecology hypotheses. At the final flow recommendations workshop, held in December 2012, a synthesis was presented of the systematic literature review (causal-criteria analysis) designed to build support for flow ecology hypotheses generated by the technical working group in the June 2012 workshop. Overall, the workshop resulted in a large number of hypotheses, which support the need for protection of seasonal variation in low, average, and high flow components. This information was used by the technical working group to develop draft flow recommendations.

## Implications of Natural Gas Extraction on the Eastern Brook Trout

INVESTIGATORS: William Fisher (NYCFWRU)

STUDENT: Maya Weltman-Fahs, Ph.D.

SPONSORS: New York State Water  
Resources Institute

STARTED: April 2012



**MAYA WELTMAN-FAHS HOLDING EASTERN BROOK TROUT**

Natural gas extraction from the Marcellus Shale formation is underway in PA and WV and is expected to commence in NY in the future. Maya is investigating the environmental ramifications of drilling activities on stream ecosystems using eastern brook trout, a declining native salmonid in the northeastern US, as an indicator species. Maya and Coop Unit postdoc Jason Taylor co-authored a literature review article in the January 2013 issue of *Fisheries* examining the pathways of potential impact between hydraulic fracturing activities, including infrastructure development, the fracturing and wastewater disposal process, and brook trout juvenile and adult life stages.

Maya collected chemical, physical, biological, and hydrological data at her PA pilot study sites, which were highly forested watersheds with cold, headwater streams. The PA pilot study compares streams in a watershed across a range of gas shale drilling activities. Maya is currently analyzing these data to examine potential correlations between instream conditions, trout populations and the density of gas drilling. Water and macroinvertebrate samples were processed through the assistance of individuals in the Cornell Biological and Environmental Engineering and Entomology departments, respectively.

## RESEARCH – WILDLIFE AND TERESSTRIAL

### CURRENT PROJECTS

#### **Spatial Ecology and Movements of Black Bears in New York State**

INVESTIGATORS: Angela Fuller (NYCFWRU)  
Gordon Batcheller (NYSDEC)  
Jeremy Hurst (NYSDEC)

STUDENTS: Matthew Adams, M.S.  
Evan McFee, Shoshana Mitchell,  
Binta Wold, Student Technicians

SPONSOR: New York State Department of  
Environmental Conservation

STARTED: August 2010



**MATT ADAMS WITH A  
RADIOCOLLARED BLACK BEAR**

Within the last two decades, black bears in southern New York have continued to increase in abundance, which has caused an expansion of their range northward. This range expansion has resulted in increased utilization of areas with higher human densities, and landscapes with a greater proportion of agriculture. Landscapes with high proportions of developed areas and open agricultural lands have potential to increase home range size of bears and may influence the movement patterns of bears, given the lower overall habitat quality on the landscape. We are investigating how an anthropogenically-fragmented landscape influences the spatial ecology, movements, and habitat selection of black bears in New York. Data from GPS-collared bears will be used to determine how movements are defining home ranges in both the core and the recently expanded populations in the southern range, and how natural fragmentation (e.g., landcover type, human density, road density) influences movements of bears. Additionally, we will evaluate habitat selection and temporal variation in space use between bears in the core and in the expansion areas. This research will provide an understanding of how black bears move through landscapes to help in predicting where human-bear interactions may occur in the future. The project is scheduled for completion summer, 2013.

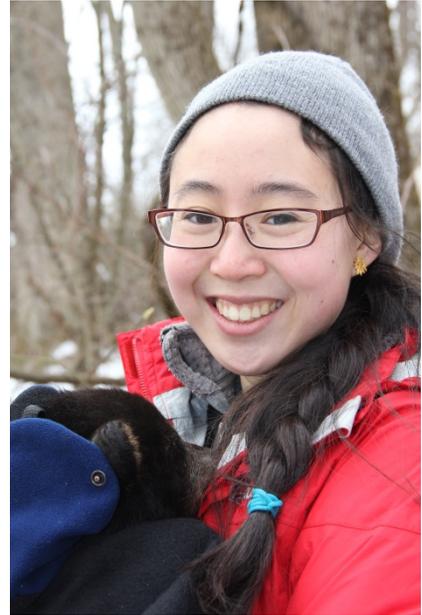
## Estimating Black Bear Density Using Genetic Approaches

INVESTIGATORS: Angela Fuller (NYCFWRU)  
Matthew Hare (Cornell)  
Gordon Batcheller (NYSDEC)  
Jeremy Hurst (NYSDEC)

STUDENTS: Catherine Sun, M.S.  
Chris Boyce, Jeffrey Rossi,  
Ryan Wickens, Student Technicians

SPONSORS: New York State Department of  
Environmental Conservation

STARTED: August 2010



**CAT SUN WITH BLACK BEAR CUB**

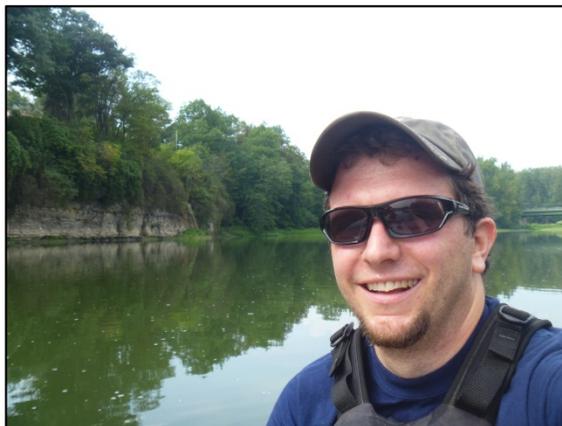
Recently, black bears in New York have expanded in range, merging into two large populations from three formerly distinct geographic populations (i.e., Adirondack, Catskills, Allegany populations). The Adirondack and Allegany ranges, now jointly referred to as the Southern black bear population, have been expanding into areas with agriculture and greater human densities. However, a rigorous density estimate of this expanding population does not exist. Characteristic low densities and extensive ranges of black bears make population estimates difficult. To estimate black bear density, we are conducting a non-invasive genetic mark-recapture study to collect black bear hair samples from barbed-wire snares. Individual bears are identified using 7 microsatellite markers. These data will inform a spatially explicit capture-recapture model to estimate population density of black bears. We will include a priori chosen covariates on detection probability and habitat covariates on population density at multiple spatial scales. This small-region study will be conducted in west-central New York, and will help direct future larger-scale designs. Additionally, the research will provide information on black bear populations that will assist the New York State Department of Environmental Conservation in developing effective management strategies. The project is scheduled for completion summer, 2013.

## **A Rapid Assessment Tool to Prioritize the Management of New York Species of Greatest Conservation Need in a Changing Climate**

INVESTIGATORS: Angela Fuller (NYCFWRU)  
Daniel Rosenblatt (NYSDEC)

STUDENT: Christopher Nadeau, M.S.

SPONSORS: New York State Department of  
Environmental Conservation



**CHRIS NADEAU, M.S. STUDENT**

STARTED: April 2011

The northeastern United States is expected to get approximately 10°F hotter, receive 30% more winter precipitation, experience stronger rain events, and experience annual late-summer droughts due to climate change. These climatic changes are expected to cause large-scale ecological change that could dramatically affect wildlife, especially those species already in danger of extinction from other factors (e.g., small population size, habitat degradation). It is logistically impossible for wildlife management agencies, tasked with managing numerous species, to conduct the studies necessary to accurately predict the persistence of each species in a changing climate. For this reason, rapid assessment tools are needed to determine which species and areas of the landscape should receive the most resources. Some rapid assessment tools already exist (e.g., Nature Serve's Climate Change Vulnerability Index), but these tools are not spatial and therefore cannot determine which parts of the landscape should receive increased attention. Moreover, these tools require information about each species (e.g., genetic diversity, dispersal ability, and climatic tolerances) that are often unavailable.

We are working with the New York State Department of Environmental Conservation (NYSDEC) to develop a rapid assessment tool to: 1) rank the relative vulnerability of Species of Greatest Conservation Need in New York, and 2) identify locations in New York and the Northeast that are most vulnerable to climate change. We will evaluate the vulnerability of species to climate change throughout the northeastern United States to determine how New York fits into the larger spatial context.

## Spatial Capture-Recapture Models for Carnivores

INVESTIGATORS: Angela Fuller (NYCFWRU)

J. Andrew Royle – USGS, Patuxent Wildlife Research Center

Sean Madden – New York State Department of Environmental Conservation

Kathryn Jahn – U.S. Fish and Wildlife Service



**BÉNÉDICTE MADON  
POSTDOCTORAL RESEARCH  
ASSOCIATE**

STAFF: Bénédicte Madon, Postdoctoral Research Associate

SPONSORS: U.S. Fish and Wildlife Service

New York State Department of Environmental Conservation

STARTED: June 2011

It is difficult to estimate abundance and density of carnivores due to their elusive nature, often low densities at landscape-scales, and the expense of methods that rely on capturing individuals. We are developing a model that incorporates multiple data sources to evaluate abundance and density of elusive carnivores using non-invasive survey methods. We are using a combination of hair collection methods and scats that are collected using scat detection dogs. To estimate the abundance and density, we are extending traditional spatial capture-recapture (SCR) models and using non-invasive genetic methods (scat and hair collection). In particular, for species known to use river and stream corridors, the Euclidian assumption for the distance from trap to activity center in traditional SCR models may not be appropriate. Therefore, we developed a non-Euclidian metric based on a shortest path approach using a cost function. The new methods that we are developing will be applicable to a wide array of elusive carnivore species and particularly those that have a tendency to travel along linear features (e.g., valley bottoms, roads, streams, transmission lines, ridges). We will conduct data during summer 2013 using scat detection dogs and hair snares.

## RESEARCH – ECOLOGY AND LANDSCAPES

### CURRENT PROJECTS

#### **Revision of the New York State Endangered Species and Species of Greatest Conservation Need Lists**

**INVESTIGATORS:** Angela Fuller (NYCFWRU)  
Mitch Eaton (NYCFWRU)  
  
William Fisher (NYCFWRU)  
John Ozard (NYSDEC)  
Dan Rosenblatt (NYSDEC)

**STAFF:** Kimberley Corwin, Research Support Specialist

**SPONSORS:** New York State Department of  
Environmental Conservation

**STARTED:** January 2010



**KIM CORWIN,  
RESEARCH SUPPORT  
SPECIALIST**

New York State's official list of endangered species was promulgated in 1971 and threatened species authorization was added in 1981. Over 10 years have passed since the last major review and revision of these lists around 1992. New information has been developed from the listing of Species of Greatest Conservation Need (SGCN) through the Comprehensive Wildlife Conservation Strategy. This project is providing supporting documentation for making recommendations on the status of species to enable the NYSDEC to amend the New York list of Endangered, Threatened, and Special Concern species with an emphasis on prioritizing and updating the New York SGCN list.

Species assessments are being written in the first phase of the project to update the state's list of SGCN. Kimberley Corwin, stationed at NYSDEC headquarters in Albany, has worked with NYSDEC and Coop Unit staff to carefully revise the species assessment form to include all elements that will be needed in the decision-making step of the project. The species assessments will provide a summary of the current status, distribution, threats, and population trend for each of the 537 SGCN currently included in the State Wildlife Action Plan. All assessments will be completed by July 2013, and following their review, a series of meetings will be held for each taxonomic group to discuss the information that has been assembled. A decision model will be used to place each species in an appropriate SGCN category. A similar model will use the information in the assessments to amend the state endangered species list.

**A structured decision making approach to white-tailed deer buck harvest management in New York State**

INVESTIGATORS: Angela Fuller (NYCFWRU)  
Jeremy Hurst (NYSDEC)  
Bryan Swift (NYSDEC)

STAFF: Kelly F. Robinson, Postdoctoral Associate

SPONSORS: U. S. Geological Survey

STARTED: March 2012



**KELLY ROBINSON,  
POSTDOCTORAL RESEARCH  
ASSOCIATE**

The 2012 Deer Management Plan for the New York State Department of Environmental Conservation (NYSDEC) states that the agency should “encourage various strategies to reduce harvest of young bucks in accordance with hunter desires.” Based on this directive, we have engaged the NSYDEC in using structured decision making (SDM) as a framework to guide their decision process. We are developing a decision framework that evaluates optimal management strategies for reducing harvest of yearling (1.5-year-old) bucks while considering both ecological and social objectives. We are using a Bayesian belief network model as a formal, quantitative framework that incorporates the output of our white-tailed deer population model, structural uncertainty in the system, and stakeholder values. This model will be used to evaluate seven harvest alternatives with the goal of achieving a management strategy that best achieves the multiple objectives. The results of this project will provide the NYSDEC with an optimal harvest decision and a framework for evaluation of harvest alternatives in the future.

## PUBLICATIONS AND PRESENTATIONS

### JOURNAL ARTICLES

- Conway, M., C. J. Conway, and C. P. Nadeau. 2012. Intraspecific variation in reproductive traits of burrowing owls. *Journal of Ethology* 30:395-402.
- Eaton, MJ. 2012. Monitoring trends in hunting returns and harvest sustainability: catch per unit effort (CPUE). In Clark, C.J. and J.R. Poulsen (eds). *Tropical Forest Conservation and Industry Partnership: an Experience from the Congo Basin*. Blackwell Publishing, Oxford, UK.
- Eaton, MJ. 2012. Crocodilia in Central African Forests: a long history of exploitation and the impacts of modern commercial logging. In Clark, C.J. and J.R. Poulsen (eds). *Tropical Forest Conservation and Industry Partnership: an Experience from the Congo Basin*. Blackwell Publishing, Oxford, UK.
- Laurance, W.F.,... M.J. Eaton, et al. 2012. Averting biodiversity collapse in tropical protected areas. *Nature*. 489:290-294. Doi: 10.1038/nature11318.
- Link, WA and MJ Eaton. 2012. On thinning of chains in MCMC. *Methods in Ecology and Evolution* 3(1):112-115
- Long, J.M., R.G. Hyler, and W.L. Fisher. 2012. Response by anglers to a differential harvest regulation on three black bass species at Skiatook Lake, Oklahoma. *Proceedings of the Oklahoma Academy of Science* 92:9-20.
- Nadeau, C. P., and C. J. Conway. 2012. A field evaluation of distance estimation error during wetland-dependent bird surveys. *Wildlife Research* 39:311-320.
- Robinson, K. F. and C. A. Jennings. 2012. Maximizing Age-0 Spot export form a South Carolina estuary: an evaluation of coastal impoundment management via structured decision making. *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* 4(1):156-172.

### TECHNICAL REPORTS

- Fisher, W. L., T. S. Seilheimer, and J. M. Taylor. 2012. Biological assessment of environmental flows for Oklahoma. U.S. Geological Survey, Open File Report 2012-1114. 43 p.
- Fuller, A.K., Royle, A.J., and Madon, B.M. 2012. Study plan investigation of mink abundance relative to polychlorinated biphenyl (PCB) contamination within the Hudson river drainage. Report to the Hudson River Natural Resource Trustees. 15 February, 2012. 74pp.
- Harrison, D., S. Olson, D. Mallet, J. Vashon, and A.K. Fuller. 2012. Relationships among commercial forest harvesting, snowshoe hares and Canada lynx in Maine. Pages 95-98 in B. E. Roth (Ed). *Cooperative Forestry Research Unit: 2011 Annual Report*. University of Maine, Orono, ME. 111 pp.
- Ross, T. J., and B. P. Baldigo, W. L. Fisher, and C. E. Kraft. 2012. Use of telemetry to assess potential effects of Schoharie reservoir waters on trout populations in the upper Esopus Creek. U. S. Geological Survey, Reston, VA. 212 pp.

## THESES AND DISSERTATIONS

Tyler Jeffery Ross. 2012. Effects of anthropogenic stream alteration on brown trout habitat, movement and physiology. M.S. student, Cornell University, Ithaca, NY. 119 pp.

## PRESENTATIONS AND SEMINARS

Adams, M. A., and A. K. Fuller. 2012. Black Bear Habitat Selection and Movements in New York: a Research Update, NYSDEC Big Game Team Meeting. September 26, 2012.

Adams, M.A., and Fuller, A. K. 2012. Home range models of animal space use. 68th Northeast Fish and Wildlife Conference, Charleston, WV. April 16, 2012.

Adams, M. C., and Fuller, A. K. 2012. Habitat and spatial ecology of black bears in New York. Department of Natural Resources, Cornell University, Graduate Student Association Symposium. 19 January, 2012.

Alexiades, A., W. L. Fisher, and P. Sullivan. 2012. Brown trout population dynamics and angling behavior in New York streams: evaluation of a stocking model. 142nd Annual Meeting of the American Fisheries Society, St. Paul, MN. 20 August 2012.

Alexiades, A., B. Fisher, and P. Sullivan. 2012. Brown trout population dynamics and angling behavior in New York streams. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.

Eaton, M.J., P.T. Hughes, J.E. Hines, and J.D. Nichols. 2012. Testing metapopulation concepts: effects of patch characteristics and neighborhood status on occupancy dynamics. Annual meeting of the Wildlife Society. Portland, OR, October 13-17, 2012.

Fisher, W. L. 2012. Cooperative Research Units: A collaborative fisheries research partnership between universities and agencies. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.

Fisher, W. L. 2012. Importance of strategic direction. Southern Division of the American Fisheries Society Leadership Workshop. Biloxi, MS.

Fisher, W. L. 2012. Importance of strategic direction. Western Division of the American Fisheries Society Leadership Workshop. Jackson, WY.

Fisher, W. L., M. J. Eaton, A. K. Fuller. 2012. "An Update on the Current Activities of the NY Cooperative Fish and Wildlife Research Unit." Presentation to the Office of Inspector General, U.S. Department of the Interior. Reynolds Game Farm, Ithaca, NY. 12 July, 2012

Fuller, A. K. 2012. Structured decision making for threatened and endangered species. Invited presentation, New York State Chapter of The Wildlife Society, Bronx Zoo, New York. 2 March, 2012

- Fuller, A. K. 2012. Core competencies and wildlife professionals in a changing world: Summary of symposium. The Wildlife Society Annual Conference, Portland, Oregon. 14 October, 2012.
- Fuller, A. K., and M. J. Eaton. 2012. Decision Model for Listing New York's List of Species of Greatest Conservation Need. New York State Department of Environmental Conservation, Division Management Team. Albany, NY. 30 November 2012.
- Koeberle, A., T. J. Ross, and B. Fisher. 2012. Growth of hatchery-reared and wildlife brown trout in the upper Esopus Creek, New York. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.
- McDonald, J. E., and A. K. Fuller. 2012. The role of professional societies in helping to fulfill core competencies needed by wildlife professionals. Invited presentation, The Wildlife Society Annual Conference. Portland, Oregon. 14 October 2012.
- Nadeau, C.P., and Fuller, A.K. 2012. Improving the future of climate change vulnerability assessments by reviewing the past. 68th Northeast Fish and Wildlife Conference, Charleston, WV. April 16, 2012.
- Perry P. C., and W. L. Fisher. 2012. Black Bass Project Update. DEC Bureau Meeting. Albany NY. 23-24 February, 2012.
- Perry, P.C., and W. L. Fisher. 2012. Black bass population characteristics in New York lakes: A statewide database analysis. Northeast Fish and Wildlife Conference, Charleston, West Virginia. April 15-17, 2012.
- Perry P. C., and W. L. Fisher. 2012. Black Bass Project Update. Black Bass Team Meeting. Bridgeport, NY. 30 May, 2012.
- Perry, P. C., and W. L. Fisher. 2012. Summarizing black bass relative abundance and proportional stock density from a New York statewide collection database. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.
- Perry, P. C., W. L. Fisher, and J. J. Loukmas. 2012. Grouping New York lakes by bass population metrics. 142nd Annual Meeting of the American Fisheries Society, St. Paul, MN. 20 August 2012.
- Sun, C. S., Fuller, A. K., Royle, J. A., and Hare, M. P. 2012. Using simulations to explore sampling schemes in mark-recapture studies. Department of Natural Resources, Cornell University, Graduate Student Association Symposium. 19 January, 2012.
- Sun, C.S., Fuller, A.K., Royle, J.A., and Hare, M.A. 2012. Using simulations to explore sampling schemes in spatial capture-recapture studies. 68th Northeast Fish and Wildlife Conference, Charleston, WV. April 16, 2012.
- Sun, C. S., and A. K. Fuller. 2012. Spatially Explicit Capture-Recapture Models for Black Bears: a Research Update, NYSDEC Big Game Team Meeting. September 26, 2012.

- Sun, C. S., A. K. Fuller, J. A. Royle, and M. P. Hare. 2012. Use of a spatially-explicit capture-recapture model for estimating population size of black bears in south-western New York. Invited presentation at The Wildlife Society Annual Conference, Portland, Oregon. 14 October, 2012.
- Taylor, J., and B. Fisher. 2012. Developing flow-ecology hypotheses in support of ecological-based flow recommendations for Lake Ontario and Erie drainages in New York. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.
- Taylor, J., T. Moberg, M. DePhilip, C. Apse, and W. L. Fisher. 2012. Integrating expert workshops and causal criteria analysis to develop general flow-ecology hypotheses for riverine fishes. 142nd Annual Meeting of the American Fisheries Society, St. Paul, MN. 20 August 2012.
- Weltman-Fahs, M., J. Taylor, and B. Fisher. 2012. Hydraulic fracturing and brook trout habitat restoration in the Marcellus Shale: Potential conflicts in an already controversial landscape. 2012 Annual Meeting of the New York Chapter of the American Fisheries Society. Lake Placid, NY.
- Weltman-Fahs, M., J. M. Taylor, and W. L. Fisher. 2012. Hydraulic fracturing and brook trout habitat in the Marcellus Shale region: potential impacts and research needs. 142nd Annual Meeting of the American Fisheries Society, St. Paul, MN. 20 August 2012.

## ACTIVITIES

### TECHNICAL ASSISTANCE

- Eaton, M.J. Led workshops with the USFWS and NPS-Cape Code National Seashore to develop an adaptive management framework for implementing estuarine restoration activities for the Herring River. Herring River Technical Committee. Plymouth, MA. April/June, 2012.
- Eaton, M. J., and A. K. Fuller. Co-hosted 2012 Adaptive Management Conference Series, sponsored by NYCFWRU, DNR, the Atkinson Center for a Sustainable Future, and the Institute for Computational Sustainability. Cornell University, Ithaca, NY. June 12-14, 2012.
- Fuller, A.K. Developed sampling design for an occupancy and density estimation study of fishers in the southern tier of New York for the New York State Department of Environmental Conservation. Winter, 2012.
- Fuller, A. K. and M. J. Eaton. Development of a categorization model for species of greatest conservation need for the New York State Department of Environmental Conservation. Fall, 2012.
- Fuller, A. K., D. R. Diefenbach, and M. J. Eaton. Led a Structured Decision Making workshop for setting fall hunting seasons for wild turkeys in New York and Pennsylvania. New York State Department of Environmental Conservation and Pennsylvania Game Commission. Ithaca, NY. 10-12 October 2012.
- Svedarsky, D., and A. K. Fuller. 2012. Core Competencies and Wildlife Professionals in a Changing World. Symposium Organizer. The Wildlife Society Annual Conference, Portland, Oregon. 14 October, 2012.

### TRAINING

- Eaton, M.J. 2012 Participated in Faculty Leadership Development Program. College of Agriculture and Life Sciences, Cornell University. Facilitated by Organizational and Development Services, Cornell. July 25-29, 2012.
- Fuller, A.K. Introduction to Structured Decision Making, 1-day workshop, U.S. Coast Guard, Washington, D.C. August 8, 2012.
- Fuller, A. K. and M. J. Eaton. Taught Introduction to Structured Decision Making, National Conservation Training Center, Shepherdstown, WV. August 27-31, 2012.

### SERVICE

#### **Mitch Eaton:**

Member, Biometrics Working Group, The Wildlife Society, October 2010 – Present

Appointed Member, New England Cottontail Research and Monitoring Working Group, October 2012 – Present

Member, IUCN Species Survival Commission (SSC) Crocodile Specialist Group, August 2011 - Present

**Bill Fisher:**

President, American Fisheries Society, September 2011 - August 2012

Past President, American Fisheries Society, August 2012 - Present

Faculty Advisor, Cornell Student Subunit, American Fisheries Society, March 2010 - Present

Member, Management Committee, American Fisheries Society, September 2007 - Present

Member, Governing Board, American Fisheries Society, August 2006 - Present

Member, New York Chapter, American Fisheries Society, January 2009 – Present

Member, Steering Committee, New York State Water Resources Institute, January 2011 - Present

Member, Advisory Committee, Cornell Biological Field Station, January 2009 - Present

**Angela Fuller:**

Appointed Member, The Wildlife Society Ad-hoc Certification Review Committee, November 2009 - Present

Appointed Member, Oversight Committee for the Cornell Center for Wildlife Conservation, September 2010 - Present

Co-chair, Student Activities Committee, 2013 Northeast Association of Fish and Wildlife Agencies, Northeast Fish and Wildlife Conference (May 2012-present)

Member, The Wildlife Society Leadership Institute Committee, December 2008 - Present

Member, College and University Education Working Group, The Wildlife Society, November 2008 - Present

Member, Biometrics Working Group, The Wildlife Society, November 2010 - Present

Member, Spatial Ecology and Telemetry Working Group, The Wildlife Society, November 2010 – Present

Appointed Member, Biodiversity Conservation Advisory Committee, New York State Department of Environmental Conservation (2011-present)

Appointed member, Excellence in Wildlife Education Award Committee, College and University Wildlife Education Working Group, The Wildlife Society (April 2012-present)

Appointed member, Nominating and Elections Committee, College and University Wildlife Education Working Group, The Wildlife Society (2012)

## HISTORY

### New York Cooperative Wildlife Research Unit (established 1961)

#### Unit Leaders

Daniel Q. Thompson, 1961-75  
Milo E. Richmond, 1975-77 (acting), 1977-1984

#### Assistant Unit Leaders

Milo E. Richmond, 1968-1975  
Richard A. Malecki, 1978-84

### New York Cooperative Fishery Research Unit (established 1963)

#### Unit Leaders

Alfred W. Eipper, 1963-75  
John G. Nickum, 1975-76 (acting), 1977-80  
Steven P. Gloss, 1980-84

#### Assistant Unit Leaders

Henry A. Regier, 1964-66  
Clarence A. Carlson, Jr., 1966-72  
John G. Nickum, 1973-75  
Steven P. Gloss, 1978-80

### New York Cooperative Fish and Wildlife Research Unit (combined 1984)

#### Unit Leaders

Milo E. Richmond, 1984-2008 (wildlife)  
William L. Fisher 2008-present (fisheries)

#### Assistant Unit Leaders

Steven P. Gloss, 1984-87 (fisheries)  
Richard A. Malecki, 1984-2008 (wildlife)  
Mark B. Bain, 1991-2003 (fisheries)  
Angela K. Fuller, 2009-present (wildlife)  
Mitchell J. Eaton, 2011-present (ecology)