# NY Coop News

**NEWSLETTER OF THE NEW YORK COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT**

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The aim of this newsletter is to provide a regular report on the activities of the New York Cooperative Fish and Wildlife Research Unit. The mission of the Unit is to conduct applied research on natural resource issues, participate in graduate education, and provide technical assistance and training for natural resource professionals. The Unit is a cooperative effort of the U. S. Geological Survey, New York State Department of Environmental Conservation, Cornell University, U. S. Fish and Wildlife Service, and the Wildlife Management Institute. For more information about the Unit call us at 607-255-2839 or visit our website: http://www.coopunits.org/New_York/

## Environmental Flows: Conserving the Natural Flow Regime of Rivers

Water management goals in the new millennium have broadened from traditional societal goals of water supply, flood control, channel maintenance, power production and commerce to include maintenance and enhancement of natural aquatic communities and ecosystem services. This has resulted in a paradigm shift from the simple question of "How much water can be taken from streams and lakes for human use?" to the more complex question of "How much water needs to be left in streams and lakes to sustain critical water-dependent natural resources?" This shift was articulated by USFWS and USGS scientists and managers in a 2004 workshop report on future challenges.

Evaluation of water use and development projects now requires consideration of effects at multiple scales, the whole hydrograph and not simply minimum flows, the dynamic river channel rather than the static channel, the linkage between surface and ground water, and ecological communities rather than single species.

Assessment of environmental flows (traditionally referred to as instream flows) in the Northeast is needed to aid environmental planners, policy makers and the public in water use and conservation planning. An initial step in assessing environmental flows is characterizing and classifying streams and rivers based on their flow regimes. There are currently over 200 methods for evaluating environmental flows, which range from those that determine "minimum" flows to those that mimic the "natural flow regime." Most scientists and managers are now in general agreement that a regulated river needs to mimic the five components of the natural flow regime, including the magnitude, timing, frequency, duration, and rate of change and predictability of flow events, plus the sequence of these conditions. These more complex methods go beyond developing simple hydrological "rules of thumb" to more comprehensive environmental flow assessment.

Esopus Creek, NY photo by T. J. Ross

The NY Coop Unit is embarking on a study in collaboration with The Nature Conservancy and the New York State Department of Environmental Conservation to provide scientific information that will inform environmental flow recommendations for streams in the state. The project will initially focus on Great Lakes tributaries, with the eventual goal of expanding to other areas of the state.—WLF

## Meet the Staff: Melinda Von Gordon - Admin. Asst.

Melinda joined the NY Coop Unit staff in 2008 after working several years for Cornell Business Services, and before that with a local auto dealership. She has brought a wealth of financial experience to managing the Unit's finances and other administrative matters. In 2009, Melinda spent a week at the Coop Research Units headquarters learning Federal administrative procedures and has mastered those systems.

Melinda is a native of central New York and resides in Trumansburg with her husband John and four children, Dillon, Emily, Mason, and baby Landon.

Melinda is leaving the Unit to become the Associate Administrative Manager for the Cornell Department of Natural Resources. We are happy that Melinda received this promotion and is staying in the department, but sad that she is leaving the Unit; we will miss her cheery personality.

# Projects

## Trout Population Response to Water Diversion in Esopus Creek – T. J. Ross, M.S. Student

During fall 2010, T.J. Ross analyzed data collected during summer 2010 and re-analyzed data from summer 2009. Data analysis included: physical habitat, trout telemetry locations, and trout physiological condition.

T.J. also developed a research proposal for a cooperative study with Dr. Bill Fisher (USGS, NY Coop Unit), Dr. Cliff Kraft (Cornell, DNR), Dan Josephson (Cornell, Adirondack Field Station) and Dale Honeyfield (USGS, Wellsboro Lab). The study, which is scheduled to begin in January 2011, will develop bioelectrical impedance analysis models for field application, as well as assess the effect of fasting on rainbow, brown and brook trout fatty acid content.

Bill and T.J. worked with Cornell undergraduate and summer technician, Jackie Chen, who is completing an independent study project to analyze telemetry data from 2009 and 2010.

T.J. presented preliminary results from his research at the New York Watershed and Technical Conference held at Westpoint, NY, in September 2010, and at the Catskill Environmental Monitoring and Research Conference in Highmount, NY in November 2010.

T.J. is currently working to finalize his study design for the summer 2011 field season.

This project is funded by the U. S. Geological Survey with support from the New York State Department of Environmental Conservation, the New York City Department of Environmental Protection, Cornell Cooperative Extension, and a fellowship to T. J. from the Woodrow Wilson Foundation.

T. J. Ross collecting GPS locations in Esopus Creek

## Improving Trout Stocking Models for New York State Streams – Ed Camp, Ph.D. Student

Stocking trout in New York streams provides recreational opportunities that are highly valued by anglers; however, there is recent concern by New York State Department of Environmental Conservation (NYSDEC) professionals that some trout stockings fail and stocked fish are never caught by anglers. We are working cooperatively with NYSDEC to assess the fate of stocked trout, and to estimate stocked trout natural mortality and fishing mortality, as well as angling effort and catch rates on stocked trout. This information is used in NYSDEC's model for estimating the number of trout to stock in streams.

In fall 2010, we worked to define project objectives, began formulating a study design, and gathered information to develop our sampling approach. Our objective for this first year is to estimate current values of key rates for the stocked trout fishery. To this end, we are determining the number and location of study sites. We are using historical data to help understand the mean and variance of the data, which will help in guiding site selection and making comparisons among stream types.

We will continue to develop our study and sampling design during winter 2011. NYSDEC regional biologists are helping us identify and select streams most amenable to this study and providing further historical data.

Ed is working on the project in collaboration with Bill Fisher, NY Coop Unit; Pat Sullivan, Department of Natural Resources, Cornell University; and Jim Daley NYSDEC. This project is funded by NYSDEC.

Ed Camp, Ph.D. student

# Projects

## Spatial Ecology and Movements of Black Bears in New York State – Matt Adams, M.S. Student

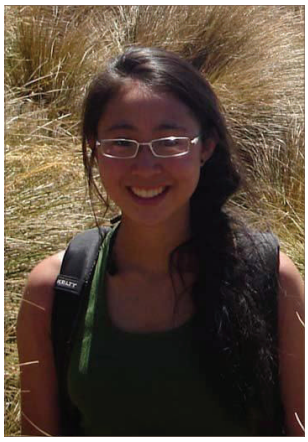
Matt Adams, M. S. Student

Black bears in southern New York have been increasing in abundance, which has caused an expansion of their range. As bears move northward, they are increasingly utilizing areas with higher human densities and landscapes with a greater proportion of agriculture. It is unknown how an anthropogenically modified landscape influences the spatial ecology 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 expanding front of the population (i.e., fringe) in the southern range. Additionally, we will evaluate habitat selection and temporal variation in space use between bears in the core and in the fringe.

Matt has been reviewing pertinent literature, gaining experience working with and handling black bears, and becoming certified in the chemical immobilization of animals. During the spring semester, Matt will write a research proposal and prepare for the upcoming field season.

Matt is advised by Dr. Angela Fuller. The project is funded by the New York State Department of Environmental Conservation.

## Estimating Black Bear Density Using Genetic Approaches– Cat Sun, M.S. Student



Cat Sun, M.S. Student

In recent years, black bears in New York have been expanding their range and encroaching on agricultural and more densely human-populated areas. However, a rigorous density estimate of this expanding population does not exist. Estimating population size for black bears is especially important because they are a long-lived species with low reproductive rates, which make them susceptible to overharvest. To estimate black bear density, we will conduct a non-invasive genetic mark-recapture study to collect black bear hair samples from barbed-wire snares. Individual bears will be indentified using a suite of variable, mitochondrial genetic markers. These data will inform a spatially-explicit model to estimate population density of black bears. Additionally, this study will analyze landscape genetics, potentially identifying landscape features facilitating and/or inhibiting black bear gene flow. This small-region study will be conducted in west-central New York, and will help direct future larger-scale designs.

During the spring semester, work will include drafting a research proposal, determining sampling design, and acquiring field and lab materials.

Cat is working on this project with Dr. Angela Fuller, NY Coop Unit and Dr. Matt Hare, Cornell University, DNR. This project is being funded by the New York State Department of Environmental Conservation.

# Projects

## Biological Assessment of Environmental Flows for Oklahoma – Titus Seilheimer, former Postdoc

Using a stream classification based on eco-hydrological characteristics, we are identifying how altered flow regimes affect aquatic ecosystems, particularly fish assemblages. We are using publicly available streamflow information from USGS stream gages with existing fish collection records from University, State, and Federal sources to identify how flow alteration is linked to altered biotic communities.

During fall 2010, we completed the preparation of the fish assemblage database for each gauged stream site. Species were characterized based on functional groups (e.g. habitat preferences, feeding strategies) to minimize the regional differences in species occurrences. Data were analyzed in groups of sites based on the degree of hydrologic alteration (e.g. reference, low, moderate, high), reference/altered, and geographic location (i.e. east, west).

These analyses showed that reference sites had significantly fewer lentic (i.e. lake) species than all levels of altered sites. The fish assemblages at the reference sites could be characterized as containing stream specialists that were intolerant to water quality and habitat alteration, and preferred faster flowing water. The altered sites had species with more general habitat preferences, were tolerant of water quality and habitat alteration, and preferred slower currents. Ordination of the sites also showed differences in the fish assemblages and functional groups between reference and altered sites, and between geographical areas. Work on the data analysis is ongoing.

This project is funded by the U. S. Geological Survey through the Science Support Partnership program in cooperation with the U. S. Fish and Wildlife Service, Ecological Services in Tulsa, Oklahoma.

Titus Seilheimer surveying stream habitat in an Oklahoma stream

## Biomonitoring of Lower Trophic Levels in Lake Ontario – Lars Rudstam, Professor, and Kristen Holeck, M.S. student

Lake Ontario is undergoing ecological change that is affecting the food web structure and therefore the ability of the lake to support different fish species, including native species such as lake trout, Atlantic salmon, deep water and shallow water coregonids, slimy sculpin, deepwater sculpin and lake sturgeon. This study will analyze zooplankton, chlorophyll, and phosphorus samples collected as part of the New York State Department of Environmental Conservation, U. S. Geological Survey, U. S. Fish and Wildlife Service and Cornell University's biomonitoring program for lower trophic levels in Lake Ontario. The study will also provide an in-depth analysis of the status of Lake Ontario in 2010, including an analysis of time trends using data collected through this program since 1995. This collaborative program collects the most comprehensive data on lower trophic levels in Lake Ontario at this time.

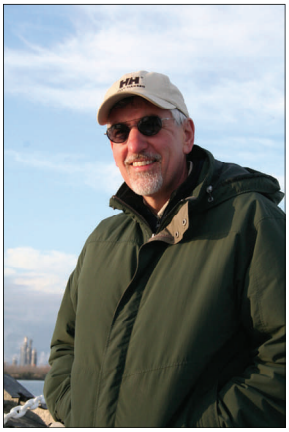
This study involves collaborations on data analysis between two countries and among numerous agencies. Cornell University and the Cornell Biological Field Station (CBFS) staff at Shackelton Point on Oneida Lake, NY are uniquely positioned to carry out this project.

Investigators on this project include Lars Rudstam and Kristen Holeck, Cornell CBFS; Bill Fisher, NY Coop Unit, and Pat Sullivan, Cornell, DNR. Funding for this project is being provided by the USFWS, Lower Great Lakes Fish and Wildlife Conservation Office.

Undergraduate intern at CBFS holding sturgeon.

# Activities

## Publications



Unit Leader, Bill Fisher

**Bill Fisher:**

Dauwalter, D. C., W. L. Fisher, and F. J. Rahel. 2010. Warmwater streams. Chapter 20 in M. Quist and W. Hubert, editors. Inland Fisheries Management in North America, 3rd edition. American Fisheries Society, Bethesda, Maryland.

Seilheimer, T. S., and W. L. Fisher. 2010. Habitat use by fishes in groundwater-dependent streams of southern Oklahoma. American Midland Naturalist 164:201-216.

Splinter, D. K., D. C. Dauwalter, R. A. Marston, and W. L. Fisher. 2010. Ecoregions and stream morphology in eastern Oklahoma. Geomorphology 122:117-128.

Splinter, D. K., D. C. Dauwalter, R. A. Marston, and W. L. Fisher. 2011. Watershed morphology of highland and moutain ecoregions in eastern Oklahoma. The Professional Geographer 63:1 -13.

**Angela Fuller:**

Fuller, A. K., and D. J. Harrison. 2010. Foraging paths reveal scale-dependent habitat decisions by Canada lynx. Journal of Mammalogy 91: 1269-1279.

## Presentations

**Bill Fisher:**

Ross, T. J., B. Fisher, B. Baldigo, T. Baudanza, and M. Flaherty. Effects of altered hydrologic, turbidity and thermal regimes on rainbow and brown trout populations in the upper Esopus Creek. Catskill Environmental Monitoring and Research Conference, Belleayre Mountain, Highmount, NY. 17 November 2010.

Seilheimer, T. S., R. A. Esralew, W. L. Fisher, and D. J. Turton. Classification of Oklahoma streams using the hydroecological integrity assessment process. 140th Annual Meeting of the American Fisheries Society, Pittsburgh, PA. 14 September 2010.

Assistant Unit Leader, Angela Fuller

**Angela Fuller:**

Fuller, A. K., D. J. Harrison, and W. B. Krohn. A Wildlife Habitat-Based Modeling Approach to Forest Landscape Planning. Paper presented at The Wildlife Society 17th Annual Conference, Snowbird, Utah. October 5, 2010.

Fuller, A. K. Structured Decision Making in Natural Resource Management: Forest Productivity and Biodiversity Conservation in Managed Landscapes. Invited Seminar in Environmental Studies Seminar Series, Alfred University, Alfred, New York. October 22, 2010.

Fuller, A. K., D. J. Harrison, and W. B. Krohn. Managing The Nature Conservancy's Working Forest Landscape Given Multiple Biodiversity and Fiber Objectives: Final Contract Presentation to The Nature Conservancy. Brunswick, Maine. November 9, 2010.

Fuller, A. K., D. J. Harrison, and W. B. Krohn. A Structured Decision Making Approach for Use in Forest Landscape Planning. Presented at Managing Working Forest Landscapes for Multiple Biodiversity and Fiber Objectives: A Workshop for Landowners, Land Managers, and Biologists. University of Maine, Orono, Maine. November 10, 2010.

Fuller, A.K., D. J. Harrison, and W. B. Krohn. Planning for Multiple Biodiversity and Forest Objectives on The Nature Conservancy Lands in Northern Maine: Final Results, Application to Other Landowners, and Where Do We Go From Here. Presented at Managing Working Forest Landscapes for Multiple Biodiversity and Fiber Objectives: a Workshop for Landowners, Land Managers, and Biologists. University of Maine, Orono, Maine. November 10, 2010.

Fuller, A. K. Applications of Structured Decision Making and Adaptive Management in Invasive Species Management. Invited talk, New York Invasive Species Research Institute, presented at the Cornell Cooperative Extension Invasive Species In-Service. November 17, 2010.

# Activities

## Technical Assistance

**Bill Fisher:**
Panel Member, Cornell University, Department of Ecology and Evolutionary Biology, Graduate Student Job Opportunities Panel, December 6, 2010

**Angela Fuller:**
Led opening discussion for the Wildlife Society Leadership Institute, Snowbird, Utah. October 1, 2010.

Managing Working Forest Landscapes for Multiple Biodiversity and Fiber Objectives: A workshop for landowners, land managers, researchers, and biologists. Orono, Maine. November 10, 2010.

## Meetings and Training

**Bill Fisher:**
Participated in Trout Team meeting of New York State Department of Environmental Conservation. December 7, 2010, Cortland, NY.

Participated in Statewide (Fisheries) Database Committee meeting, New York Department of Environmental Conservation. December 9, 2010, Cortland, NY.

**Angela Fuller:**
Structured Decision Making Workshop. September 13-17, 2010. National Conservation Training Center, Shepherdstown, WV.

Black Bear Management Team Meeting, September 29-30, 2010. Ithaca, NY.

The Wildlife Society Conference, October 1-7, 2010, Snowbird, Utah.

**Coop students T.J. Ross, Ed Camp, and Matt Adams after a successful goose hunt**

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# Upcoming

**New Projects.**—Unit scientists will be initiating several new projects in 2011. Angela Fuller and Bill Fisher will co-lead a study to review the status of New York's endangered, threatened and special concern species. Angela will lead a project that uses a structured decision making approach to evaluate actions that the NYSDEC can implement for species of species of greatest conservation need that are vulnerable to climate change impacts. Bill is seeking a PhD student to head up a project to assess black bass populations in NY lakes, and a Postdoc to lead a study to assess environmental flows in Great Lakes tributaries in NYS.

**Technical Assistance.—**We are striving to increase technical assistance service to our cooperators. To this end, we are planning a workshop on the use of structured decision making (SDM) for solving complex natural resource problems. This worshop will be held in March, 2011 and will be offered to technical and administrative staff at the New York State Department of Environmetal Conservation. Angela and Bill will provide an introduction to SDM, and Mike Conroy, formerly with the Georgia Cooperative Fish and Wildlife Research Unit, will lead a two-and-a-half day session on a natural resource problem.

**New Assistant Leader, Ecology.—**We are continuing our search for a new Assistant Unit Leader, Ecology. The search conducted in 2010 did not result in a hire, so the position was re-advertised in November, 2010. We anticipate interviewing candidates in spring 2011, and hiring the second Assistant Leader, which will make our Unit fully staffed.

**Staff changes.—**Melinda Von Gordon, Administrative Assistant for the NY Coop Unit (see Meet the Staff on page 1), will be leaving in January but staying in the Department of Natural Resources at Cornell. She is being replaced by former Unit Administrative Assistant, Ellen Harris. We welcome Ellen back to the Unit and wish Melinda the best in her new position.