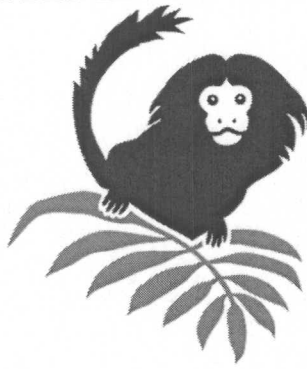


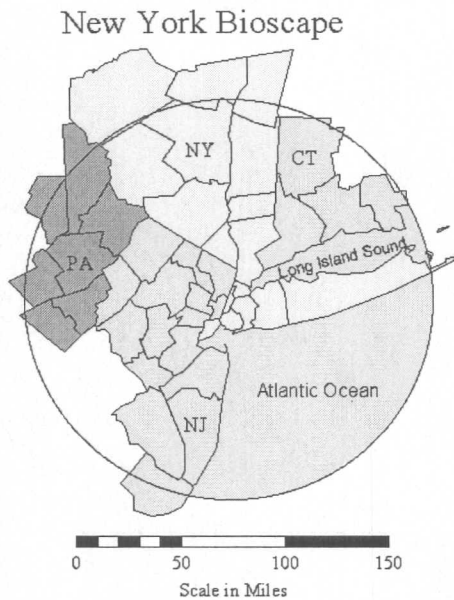
WILDLIFE TRUST



THE NEW YORK BIOSCAPE CONCEPT PAPER July 2002

Protecting Biodiversity and Health in Metropolitan NYC,
Connecticut, New Jersey, New York, and Pennsylvania

A brief description of the New York Bioscape Initiative



The *New York Bioscape* Initiative's mission is to conserve species and habitats in the New York City metropolitan region in partnership with scientists, health professionals, educators, and residents by protecting biodiversity and health in the presence of regional growth and urban development. Studies focus on the effects of environmental degradation and habitat fragmentation on the health of wildlife, ecosystems, and people. It is our belief that only through an improved understanding of the links between environmental, biological, and human processes will decision makers create policies that ensure the region's ecological health, and ultimately the quality of life that its citizens envision.

The *New York Bioscape Initiative* is designed by Wildlife Trust as a long-term, collaborative effort.

Wildlife Trust defines a "bioscape" as a human/natural landscape mosaic whose geographic area is defined by a common sphere of human influence, and it serves as a regional unit where conservationists integrate science and ecosystem management with other human activities that affect the landscape. Geographically, the *New York Bioscape* is described by drawing a 100-mile radius average from Manhattan; this is the familiar "Tri-State Region," stretched to include some natural areas that are especially relevant to metropolitan residents (e.g. the Catskills, Pocono Mountains, and New Jersey shore). The Bioscape's 28,000 square miles is a complex mosaic of human-use areas and natural lands and waters that supports 24 million people. It is surprisingly rich in biodiversity, and contains varied habitats, from marine waters to coastal plains to Appalachian highlands. It also is a part-time home to many nationally and internationally important migratory species. Yet, at the same time, the human dimension is extraordinary. The area covers parts of four states, 44 counties, and hundreds of communities – in fact, 8% of the United States population lives in the Bioscape.

The central issue of the *New York Bioscape Initiative* will be to understand how the health of wild species, ecosystems, and humans can be ensured in the context of regional growth and environmental degradation. Long-term goals will be realized through a series of interrelated projects and activities conducted by a team of Wildlife Trust staff and collaborators from other institutions. The projects will be organized around three themes: Conservation Medicine and Science, Environmental Education, and Professional Networking.

The principal outcome(s) expected in Year One and Two

The primary outcome expected in Year One and Two will be to launch a long-term, landscape-level, collaborative program aimed at ensuring the ecological health of the greater New York City metropolitan region. Conserving species and habitats in partnership with local scientists, health professionals, educators, and residents will be integral to the effort. Initial activities were selected to provide a balanced portfolio of start-up projects. The activities are interrelated, so that together they provide fundamental knowledge and depict how the health of wildlife, ecosystems, and humans are related – and that human choices do make a difference in the health of the region. Year One and Year Two outcomes are discussed below.

Conservation Medicine & Science. An organizing principle for the *New York Bioscape Initiative* is that health links all living things. Understanding how environmental degradation affects wildlife health and behavior will be the scientific entry point of our work. We have designed four projects for this theme.

1. Sentinel Species as Indicators of Bioscape Health. Studies of species health can serve as important early warning indicators for "ecosystem illness," and even human health concerns. Three initial activities for this project are:

- *Sea Turtle Health Assessment.* Drs. Alonso Aguirre, Steve Morreale, Scott Boomer and Kathryn McGonigle will evaluate the health status of threatened sea turtles visiting our local waters in Peconic Bay of eastern Long Island. The results will both benefit sea turtle recovery management and provide a window into the contaminants, pathogens, and other stressors present in Bioscape coastal waters. This project is supported in part by the National Marine Fisheries Service, and acknowledges the assistance of the Riverhead Foundation.
- *Common Terns as Bioindicators of Mercury Exposure.* Drs. Joanna Burger and Michael Gochfeld will lead a study of mercury exposure in the common tern. We suspect that airborne mercury is on the rise in the New York Bioscape because of energy deregulation policy changes that resulted in increased energy production in Midwest States. The impact that this mercury might be having on wildlife and humans is largely unstudied.
- *Raptor Health Assessment.* A raptor (hawks and eagles) health assessment is especially timely because we are concerned that as consumers at the higher end of the food chain, these predators could be accumulating dangerous levels of West Nile virus. Also, few analyses of toxic loads in hawks and eagles have been conducted in the area since the banning of DDT in the 1960's. (Anticipated start: Spring 2003)

2. Carnivores as "Landscape Health Detectives." Dr. Fred Koontz, assisted by Dr. William Schuster, Dr. William Lynn, and Columbia University Pre-doctoral Fellow Andres Gomez, will investigate carnivore spatial behavior, so that the study subjects themselves can provide us with insight (to act as "detectives") into how wild animals are responding to human-induced landscape modification. Our first effort will be with coyotes in suburban/rural Rockland and Orange Counties, New York. The work will contribute to finding solutions for the increasing human-wildlife conflict in the region (e.g., threat of rabies and coyote predation on family pets).

3. Assessment of Ecological Impacts of Invasive Animal Species. A first project will focus on assessing the impacts of mute swans on biodiversity in the Hudson River Estuary Corridor. Mute swans (*Cygnus olor*) were introduced into the eastern United States from England in the late 1800's. By 1999, swans in New York had increased to 2,429. As their numbers increase, mute swans are a growing concern for biodiversity managers. Suspected negative impacts include destruction of submerged aquatic vegetation, behavioral displacement of native waterbirds, and spread of pathogens that could threaten human and wildlife health. This project, led by Susan Elbin, will in Year One assess the potential ecological impacts of mute swans living in the Hudson River Estuary by: 1) quantifying summer and winter habitat, especially in relation to submerged aquatic vegetation; 2) reviewing and synthesizing what is known about mute swan ecology in the Hudson River Estuary Corridor and their demonstrated impacts in other regions of the Atlantic Flyway; and 3) producing a research action plan, in collaboration with regional experts, to investigate swan ecological impacts in the Estuary. In Year Two, the team will conduct three research activities: 1) study the effects that swan foraging has on submerged aquatic vegetation; 2) observe interspecific social interactions to

determine if swans are behaviorally disrupting other waterbirds; and 3) conduct a health assessment by capturing swans at several sites to perform a physical exam and collect blood, feces, and feathers for analysis. This project has been proposed as an element of the New York Department of Environmental Conservation's Hudson River Estuary Action Plan 2002/2003. (Anticipated start: April 2003)

4. New York Bioscape Ecosystem Health Assessment and Monitoring. While many organizations are working in the NYC metropolitan region on environmental issues, there have been few attempts at synthesis of data sets, and no Bioscape-wide analysis of ecological health. A long-term goal is to bring together environmental, biological, and human health databases to create benchmarks for evaluating regional ecological health. These benchmarks could allow local civic leaders, conservationists, and planners to monitor trends in health, and to measure success or failure of conservation policies. Our first activity will collect prerequisite habitat baseline information.

- *Identifying Ecological Land Units by Remote Sensing.* Mr. John Mickelson, a landscape ecologist at the Center for International Earth Science Information Network, based at Columbia University's Lamont-Doherty Earth Observatory will serve as project leader. A detailed, land cover/habitat digital map is needed as a baseline layer for many regional studies. Such a map would be prohibitively expensive if carried out using traditional methods of aerial photography. While there are affordable ecological maps routinely produced by remote sensing from orbiting satellites, these maps are not detailed enough for many ecological studies. With advances in remote sensing, however, we believe it is now possible to produce detailed habitat maps by combining seasonal images. This project is in collaboration with Columbia University's Center for Environmental Research and Conservation (CERC) and the Black Rock Forest Consortium.

Environmental Education. Wildlife Trust's work in conservation medicine and science is only meaningful if ultimately it leads to changes in human behavior and policy. We believe that the Program's focus on health will interest many citizens and attract notice and, as a result, provide motivation for change. For this reason, the Program includes education projects, aimed at making conceptual links between biodiversity and health, increasing awareness of regional efforts to conserve biodiversity, and strengthening landscape-level thinking among New York Bioscape citizens. We are currently focusing on three educational projects.

1. New York Bioscape Map & Guide – Adult Education. This project, in partnership with a national map producer, will develop, market, and sell an "educational outdoor map" for the New York Bioscape region. Messages about ecological health and outdoor natural areas will be featured. Target release date: April 2003.

2. "New York Bioscape Crossroads." - Adult Education. The Program's website (www.nybioscape.org) is designed as an information portal for adults interested in the region's ecological health and environmental conservation. The site will be organized around three bioscape dimensions: physical (air, water, soil, and

climate), biological, and human. Target launch date: Fall 2002.

3. The Wild Ones - Youth Education. Wildlife Trust's youth education program (www.thewildones.org) has received a grant for The Wild Ones Online Director Michael Wilkinson, a certified biology teacher, to produce a module, using the New York Bioscape as an example area. The module will be designed to encourage landscape-level thinking and to link the idea to ecological health.

Professional Networking. Within the New York Bioscape, there are hundreds of governmental and non-governmental organizations and professionals working on environmental health, biodiversity conservation, earth sciences, and urban planning. There are, however, few opportunities for professionals from different disciplines to communicate and learn together. We propose two start-up projects.

1. Conservation Medicine Interest Group. At an October 2001 symposium on "Conservation Medicine in the New York Bioscape," attended by local conservation scientists, it was recommended that Wildlife Trust administrate a conservation medicine interest group to strengthen the discipline within the New York City metropolitan area.

2. Saving Nature Together Workshops. We propose to sponsor a series of workshops that bring together local scientists, health professionals, civic leaders, and planners to share experience, identify needs, set priorities, and build collaborations. Example workshop topics include remote sensing products and regional measures of success.

Name and qualifications of key New York Bioscape personnel

Wildlife Trust Key Personnel

Dr. Fred Koontz, Deputy Director for North American Conservation and New York Bioscape Initiative Director. Dr. Koontz has many years experience directing community-based wildlife conservation programs around the world, and has expertise in managing teams for endangered species recovery, in providing professional training, conducting behavioral ecology research, and in communicating complex environmental issues to a broad array of constituencies. Dr. Koontz will devote 80% of his time on the *New York Bioscape Program*, providing overall leadership, as well as conducting research on carnivores and delivering public outreach. A 17-year resident of the region, Dr. Koontz lived for 10 years in Bronx County and for the last seven years in Garrison, Putnam County.

Susan Elbin, Senior Program Officer. Ms. Elbin holds a Master's degree in behavioral ecology, and has 15 years experience in environmental education and project management. Ms. Elbin will devote 50% of her time on the Bioscape Program; she will coordinate public education activities, conduct research on mute swans and migratory birds, and assist with Program administration.

Dr. Alonso Aguirre, Director for Conservation Medicine. Dr. Aguirre is one of the

founders of the new discipline of conservation medicine, and is an authority on the relationship between wildlife health and conservation, particularly in marine mammals and sea turtles. Before joining Wildlife Trust, Dr. Aguirre was a veterinarian for the National Marine Fisheries Service. He holds advanced degrees in veterinary medicine, wildlife management, and wildlife epidemiology. Dr. Aguirre will devote 20% of his time designing, implementing, and evaluating conservation medicine projects in the Bioscape.

Dr. Kathryn McGonigle, Conservation Medicine Intern. Dr. McGonigle is a graduate of Tufts University’s School of Veterinary Medicine and, in addition to her V.M.D., holds a Masters in Public Health from Harvard University. Dr. McGonigle is studying sea turtle health and epidemiology in the Bioscape.

To be hired, Conservation Medicine Scientist. We are currently interviewing for a veterinarian/scientist to join our team. Funding for the position has been secured, and we anticipate a hiring decision by early 2003. The person selected will devote 90% of their time conducting conservation medicine activities in the New York Bioscape.

Participating Wildlife Trust Staff (Biographies Available on Request)

Dr. Peter Daszak, Executive Director, Consortium for Conservation Medicine

Dr. Mary Pearl, Executive Director

Dr. James Powell, Director for Aquatic Conservation

Mr. Michael Wilkinson, Director/The Wild Ones Online

New York Bioscape Collaborators 2002/2003 (Biographies Available on Request)

Dr. Joanna Burger	Distinguished Professor of Biology, Division of Life Sciences, Nelson Biological Laboratories, Rutgers University, Piscataway, New Jersey
Dr. Michael Gochfeld	Professor, Department of Environmental & Community Medicine, University of Medicine and Dentistry of New Jersey – Robert Wood Johnson Medical School, Piscataway, New Jersey
John Mickelson	Land Information Specialist, Center for International Earth Science Information Network (CIESIN), Lamont Doherty Earth Observatory, Columbia University,

Palisades, New York

Dr. Stephen Morreale	Senior Research Associate, Department of Natural Resources, Cornell University, Ithaca, New York
Dr. Scott Boomer	Post Doctoral Scientist, Department of Natural Resources, Cornell University, Ithaca, New York
Dr. Cheryl Ryder	National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, Massachusetts
Dr. William Schuster	Executive Director, Black Rock Forest Consortium, Cornwall, New York
Dr. William Lynn	Associate for Ethics, Nature and Society, The Hastings Center, Garrison, New York

Acknowledgements

Wildlife Trust is grateful to many colleagues who have helped us formulate ideas and suggested projects for the New York Bioscape. Special thanks go to:

John Barclay, University of Connecticut
Brian Boom, Columbia University
David Burg, WildMetro/Wild Apple
Russell Burke, Hofstra University
Tim Clark, Yale University
Steve DeGloria, Cornell University
Robert DiGiovanni, The Riverhead Foundation for Marine Research and Preservation
Strachan Donnelley, The Hastings Center
Jim Else, Tufts University's School of Veterinary Medicine
Karen Frolich, Cornell University
James Gibbs, Syracuse University
Howard Ginsberg, USGS Patuxent Wildlife Research Center
Ted Kerpez, New York State Department of Environmental Conservation
Michael Klemens, Wildlife Conservation Society
Francesca Grifo, Columbia University
Tony Hiss, H2O Fund
William Karesh, Wildlife Conservation Society
Steve Keeling, Cornell Laboratory of Ornithology
George Kollias, Cornell University
Kathleen LoGiudice, Institute for Ecosystem Studies
Jonathan Patz, Johns Hopkins Bloomberg School of Public Health
Rob Pirani, Regional Plan Association

Ronald Rohrbaugh, Jr., Cornell Laboratory of Ornithology
William Shore, New York University
Sally Siddiqi, H2O Fund
Charles Smith, Cornell University
Nellie Tsipoura, Natural Resources Defense Council
Mark Walters, Harvard University
Richard Wyman, Edmund Niles Huyck Preserve

E-mail address for contact person at the organization

For additional information or questions concerning this effort, please contact Dr. Fred Koontz, Deputy Director for North American Conservation. Dr. Koontz's email address is koontz@wildlifetrust.org and his telephone is 845-365-8835.

Information about Wildlife Trust

Wildlife Trust (www.wildlifetrust.org) is a conservation science organization that conserves threatened wild species and their habitats in partnership with local scientists and educators around the world. With 30 years of international experience, Wildlife Trust has built a network of outstanding conservation leaders in 20 countries; created the field of conservation medicine; trained hundreds of scientists and civic leaders; and built a children's environmental stewardship network (www.thewildones.org) that is active in 30 countries. We couple innovation in science with exemplary professional training and mentoring of conservation scientists in developing countries. We do not engage in adversarial politics or advocacy for a single viewpoint. Our reputation also is built on our proven ability to develop positive, productive, and respectful relationships based on sharing scientific results with local communities. Our principal resources are our field-based project leaders, scientists and educators who excel at interdisciplinary conservation activities and communicate effectively with local people of diverse backgrounds.

Wildlife Trust's Approach. We believe that biodiversity, the variety of life on Earth, is critical to the health of people and the ecosystems that support life. We believe that well designed and focused research is the necessary precondition for effective strategies to protect species, ecosystems, and ecological health. When necessary, we develop entirely new approaches to the practice of biodiversity conservation. For example, in 1996, Wildlife Trust established a veterinary program that has helped define the new discipline of conservation medicine, a response to the growing threat of environmental degradation and disease on the survival of wild species and human communities alike. Along with our partners, Harvard Medical School's Center for Health and Global Environment, the USGS's National Wildlife Health Center, and Tufts University School of Veterinary Medicine, we are working to study and demonstrate the links between human, wildlife, and ecosystem health.

Headquartered in Palisades, New York, on the campus of Columbia University's Lamont-Doherty Earth Observatory, Wildlife Trust has worked for the past 30 years where we are most needed, in those parts of the developing world where rapidly growing human populations are placing wildlife species at risk, and where

professional capacity for conservation activity is limited. Now, we will put this valuable expertise to work in our own backyard, as we embark on a new series of projects in the USA in collaboration with others working toward safeguarding biodiversity and natural processes required to ensure human and ecological health.