



**18th Annual Conference on the Adirondacks
May 18th and 19th, 2011, Lake Placid, NY**

Research Abstracts, Poster Presentations, and Session Outlines

Concurrent Session 1.4 - Connecting Finnish and Adirondack Communities: Science Museums Facilitating Awareness & Action on Climate Change and Energy - The Wild Center and Heureka/The Finnish Science Center:

THE WILD CENTER (U.S.) – HEUREKA (FINLAND) PROJECT

PARTICIPANTS

Stephanie Ratcliffe, Executive Director, The Wild Center, Moderator

Paula Havaste - Dr. Paula Havaste is the Project Development Manager of Heureka and is experienced in working with media, science centres, and science communication.

Johanna Kirkinen - Dr. Johanna Kirkinen works as an Energy and Climate Change Lead in Sitra's Energy Programme. Her expertise is climate change mitigation and energy efficiency. She is responsible for carrying out and leading projects financed by Energy Programme, obtaining and studying information around the themes of Energy Programme - energy efficiency in built environment, energy-wise citizens and Cleantech business, as well as being active communicator. Before joining Sitra in 2009 she worked for four years at VTT Technical Research Centre of Finland, where she studied climate change mitigation and evaluated greenhouse gas emissions.

Sanna Koskinen - Dr. Sanna Koskinen works as a Participation coordinator at the Helsinki City Youth Department. She is leading a project whose aim is to develop various permanent practices for all offices of the city of Helsinki that enable children's and young people's participation in planning and designing their own spaces and places.

Her doctoral thesis from the last year was “Children and young people as environmental citizens – the environmental education perspective to participation”. Her expertise is environmental education, environmental citizenship, children’s and young people’s participation and community planning. She has been doing various jobs in the field of environmental education and also been active within The Association for Environmental Education in Finland which coordinates the Eco-Schools program in Finland.

Kirsi Verkka - Kirsi Verkka is working as an education consultant in the Basic education division of the department of education in Helsinki. There are 106 comprehensive schools in Helsinki, including schools for children with learning and other disabilities. Kirsi Verkka is responsible for coordinating and developing pedagogics and good practices in the fields of sustainable education. Her work tasks also extend to planning of the in-service training for teachers in these fields. Kirsi has a master’s degree from the University of Helsinki in education, biology and geography and has more than 15 years of experience working as a teacher at primary and secondary level schools. She has been actively developing the Finnish Eco-School program and the Environmental certification system for schools. Her long experience of inservice teacher training has further resulted in the publication of various teaching materials

Concurrent Session 2.4 - Assessing emerging threats and impacts of invasive species:

Description:

This session will include presentations that describe emerging invasive species threats to terrestrial or aquatic systems and a presentation that describes methods for assessing the health of aquatic plant communities and how they are impacted by invasive species or management. Each speaker will deliver 20 minute presentations with an additional 3-5 minutes for Q & A.

Moderator:

Hilary Smith, Director, Adirondack Park Invasive Plant Program

Bio:

Hilary Smith directs the Adirondack Park Invasive Plant Program, a partnership program hosted by the Adirondack Chapter of The Nature Conservancy. Since 2002, Hilary has specialized in regional invasive species planning, monitoring, management, and education. She also serves on the New York Invasive Species Advisory Committee as the representative of the eight Partnerships for Regional Invasive Species Management (PRISMs) in New York State. Prior professional experience includes both research and environmental education in locations from Long Island Sound to Puget Sound. Hilary received her undergraduate degree in Biology from Hamilton College and her Master's in Biodiversity, Conservation, and Policy from the State University of New York at Albany.

Speakers, affiliations, presentation titles:

1. **Mark C. Whitmore**, Forest Entomologist, Department of Natural Resources, Cornell University

Emerald ash borer and hemlock woolly adelgid. What's in store for the Adirondack Park

2. **Christopher T. Martine**, Ph.D., Associate Professor, Department of Biological Sciences and Curator, SUNY Plattsburgh Herbarium

Three "new" plant invaders in the Adirondack region: European frogbit, Wall lettuce, and Crested late summer mint: how to identify them and what we know of them so far

3. **Scott A. Kishbaugh**, Chief, Lake Monitoring and Assessment Section Bureau of Water Assessment and Management, NYS Department of Environmental Conservation

Floral Quality Indices: A Botanist's Barometer or a Plant Manager's Planimeter?

FQI: A botanists barometer or a plant managers planimeter?

Scott Kishbaugh, NYSDEC Division of Water, 625 Broadway, Albany, NY 12233

The floristic quality index (FQI) is a simple tool devised to evaluate the quality of a plant community. The key component of the FQI is the coefficient of conservatism (C value) assigned by botanists to "represent an estimated probability that a species is likely to occur in a landscape relatively unaltered from what is believed to be a pre-settlement condition." These C values (and calculated FQI) were intended to evaluate the historical significance of plants and a means for assessing the "heritage" of a plant community.

However, with some modifications, these tools can also be used to evaluate changes in plant communities in response to the introduction of invasive species or active management, or evaluate the recreational, aesthetic, and habitat value of these communities, particularly when coupled with plant survey data collected by lake managers and shorefront residents. This presentation will guide the audience through the FQI process and propose several mechanisms for adapting the process to the plant managers toolbox, using examples from New York state and Adirondack region lakes.

Concurrent Session 3.2 - Birds of the Northern Forest:

Projected Effects of Climate Change on High Elevation Forests of Northern NY

Joan Collins, NYS Ornithological Association & Northern NY Audubon

At the end of 2010, the carbon dioxide (CO₂) level in the atmosphere reached 390 parts per million (PPM). By the end of the 21st century, the U.S. EPA projects atmospheric CO₂ levels will be 535 PPM and possibly as high as 983 PPM. The amount of CO₂ in the atmosphere is directly related to the temperature on Earth. 2010 was one of the three hottest years on record, within the hottest decade. The average northeastern summer temperature is expected to increase from 2.8 to 5.9 degrees Celsius by the end of the century. There are ongoing and projected effects on breeding, migrating, and wintering birds in northern NY from such an unprecedented and rapid change in climate. National Audubon has documented a significant northward movement in nearly 60% of the species tallied in the North American Christmas Bird Count data over the past 40 years. *The Second Atlas of Breeding Birds in New York State* (2008) documents the significant change in bird distribution that has occurred since publication of *The Atlas of Breeding Birds in New York State* (1988), with some of these changes attributed to climate change. While many species are able to expand their breeding ranges northward, species that breed exclusively at high elevations are at particular risk from climate change. High elevation spruce-fir habitat, used by Bicknell's Thrush, is predicted to completely disappear by 2100 (Lambert JD, McFarland KP, 2004). The projected effects of climate change on high elevation habitat in northern NY will be reviewed.

Mountain Birdwatch: High-Elevation Citizen Science in the Adirondacks

Scarl, Judith C.^{1*}, Julie A. Hart^{2,3}, Randy Dettmers⁴, and J. Daniel Lambert¹.

Mountain Birdwatch is a citizen science initiative designed to monitor population trends of sensitive bird species in montane forests of the northeastern U.S, including the Adirondack and Catskill mountains of New York State. For the past decade, approximately 150 trained citizen scientists have annually conducted point counts in the high-elevation regions of NY, VT, NH, and ME, focusing on five species: Bicknell's Thrush (*Catharus bicknelli*), Blackpoll Warbler (*Dendroica striata*), Swainson's Thrush (*Catharus ustulatus*), White-throated Sparrow (*Zonotrichia albicollis*), and Winter Wren (*Troglodytes troglodytes*). Using data collected at 18 sites in the Adirondacks from 2001-2009, we conducted a nine-year trend analysis of observed abundance of each of the five target species. Bicknell's Thrush, Swainson's Thrush, and White-throated Sparrow demonstrated significant increases in abundance in the Adirondacks within this time scale, while Blackpoll Warbler showed a significant decrease in abundance, and Winter Wren populations demonstrated no significant change. Currently, the Mountain Birdwatch project is transitioning to a randomly-selected distribution of routes and a new survey protocol which includes extensive habitat sampling. These revisions are designed to better map the abundance and distribution of high-elevation birds across time and space while relating population status and trend information to environmental variables that may affect the target species.

1. Vermont Center for Ecostudies
2. Program in Ecology and Zoology, University of Wyoming
3. Physiology Department, University of Wyoming
4. Division of Migratory Birds, U.S. Fish and Wildlife Service

Status and Distribution of Lowland Boreal Birds in the Adirondack Park

Michale Glennon, Wildlife Conservation Society, Adirondack Program, NY

The Adirondack Park is a large, intact breeding ground for numerous migratory bird species, several of which are declining throughout their range. A unique component of the Adirondack avifauna is the birds inhabiting the boreal peatlands of the park. Climate change is now widely recognized as the pre-eminent threat to biodiversity in the 21st century. At the southern range extent for this ecosystem type and many of its avian inhabitants, the Park is a valuable location from which to monitor changes in bird populations from a warming climate. The Wildlife Conservation Society (WCS), a global conservation organization which protects wildlife and habitat through careful science, has been studying the distribution and abundance of birds in lowland boreal habitats of the Adirondacks in order to inform long-term conservation planning for these species. Our work offers the first comprehensive assessment of the status and trends in occupancy for a suite of target species throughout the Park and has resulted in several key findings. Among the migratory species on our target list, the Lincoln's Sparrow, Yellow-bellied Flycatcher, Yellow Palm Warbler, and Olive-sided Flycatcher have the highest predicted rates of occupancy of lowland boreal habitats, while Cape May, Tennessee, and Bay-breasted Warblers appear to have much lower occupancy rates in the Park. Among those species for which adequate data were obtained to calculate trends, only Lincoln Sparrow has demonstrated a pattern of increasing occupancy over the course of 2007–2010, while Yellow Palm Warbler has remained relatively stable within the last 3 years, and Yellow-bellied and Olive-sided Flycatchers are demonstrating patterns of decline. Though declining occupancy rates are modest, they are cause for concern for species already rare in the region, and made more troubling by observed declines in occupancy of other, nonmigratory species in the same habitats (i.e., Black-backed Woodpecker, Boreal Chickadee, and Rusty Blackbird). Analysis of the influence of local- and landscape-scale habitat covariates on boreal bird occupancy indicated that wetland size and context were most important in determining boreal bird occupancy, raising important implications for metapopulation dynamics as well as potential conservation strategies.

Concurrent Session 3.4:

David A. Patrick¹, Nicholas Boudreau¹, Zachary Bozic¹, Geoffrey S. Carpenter¹, David M. Langdon¹, Spencer R. LeMay¹, Shaun M. Martin¹, Reid M. Mourse¹, Sarah L. Prince¹, and Kelli M. Quinn¹.

Changes in aquatic communities resulting from interactions between climate change and invasive aquatic plants in the Adirondack Park, New York

Invasive species of plants and animals represent one of the principal threats to aquatic ecosystems. Climate change may impede or promote the competitive advantage and spread of these invasive species. We evaluated the relationships between increases in water temperature; growth, survival and invasive potential of invasive aquatic plants; and resulting changes in ecosystems structure. Our focal plant species were Eurasian water milfoil, *Myriophyllum spicatum*, an invasive species in the United States, and northern water milfoil, *M. sibiricum*, a native species with similar life history traits. Experiments were conducted in artificial mesocosms (1000-gallon cattle tanks), with water heaters used to simulate climate change. We monitored growth, survival, and invasive potential of the two milfoil species. We also documented the abundance of zooplankton and algal biofilm. Our results showed that temperature did not directly affect milfoil, with the invasive species, *M. spicatum*, demonstrating higher growth, survival, and invasive potential when compared to the native milfoil species, *M. sibiricum*. Temperature did directly affect algae growth with more algae at higher temperatures. Zooplankton density was affected by both milfoil species and temperature: Zooplankton in mesocosms with the *M. spicatum* did not increase with temperature whereas zooplankton in mesocosms with *M. sibiricum* increased rapidly with higher temperatures. We conclude that climate change is unlikely to influence competitive dominance of the invasive species, *M. spicatum*. When considering the aquatic community in general, however, our results indicate that invasive species and climate change may act synergistically with the potential to alter ecosystem structure and function.

Celia A. Evans¹, Kimberly M. Forrest², Daniel L. Kelting³, Lindsey E. Steblen²

Fragment viability and rootlet formation in Eurasian watermilfoil after desiccation

Eurasian watermilfoil often invades aquatic ecosystems in North America via fragment transport from infested lakes to uninfested water bodies by watercraft and boat trailers. While fragments transported on watercraft and trailers are likely introduced to new water bodies in various stages of desiccation, surprisingly little is known about the desiccation tolerance and subsequent viability of Eurasian watermilfoil. We conducted *in-situ* and laboratory experiments, during the growing season in 2010 to examine 1) the rate at which Eurasian watermilfoil desiccates, 2) the likelihood of new growth and rootlet formation in control fragments and fragments that had been desiccated for 3, 6, 18, 24 and 48 hours, and, 3) time until new growth and rootlet formation in the different treatment groups. We found that desiccation over time fit a Michaelis-Menten type function on which 87% and 96% desiccation occurred after just 3 and 6 hours respectively and 100% desiccation of milfoil strands occurred at approximately 13 hours under laboratory conditions. Based on a logistic regression model, desiccation significantly reduced the likelihood of fragment viability from 98% in control fragments to 2% in fragments that were completely (100%) desiccated in the laboratory experiment. Desiccation also increased the time until new growth and rootlet formation. In control treatments, 20% of Eurasian watermilfoil nodes produced new growth (via lateral bud growth) after 5 weeks and 90% of those produced rootlets. We learned that while desiccation significantly reduced viability, a small proportion of fragments that were 100% dried were still viable and able to form rootlets.

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Progress toward Clean Cloud Water at Whiteface Mountain New York

James E. Dukett^{1*}, Nenad Aleksic², Nathan Houck¹, Philip Snyder¹, Paul Casson¹, Michael Cantwell¹

Fossil fuel combustion is the primary source of anthropogenic acidity in cloud water. Since 1994 there is a measurable decrease in hydrogen, sulfate, and nitrate ion concentrations in cloud water collected at Whiteface Mountain. In this paper we assess these changes from the point of view of progress towards clean air conditions.

The cleanest clouds crossing Whiteface Mountain, those with the lowest total ion concentrations, are found to have pH values in the range 5.0-5.25. Furthermore, there is a linear relationship between pH, sulfate and nitrate ion concentrations in cloud water. With this in mind, we define clean cloud water values of sulfate, nitrate and hydrogen as mean concentrations observed in cloud water samples with pH in the range 5.0-5.25.

We then compare mean annual values to clean air values to determine annual clean air ratios (CAR). In 1994, CAR for SO_4^{2-} , NO_3^- and H^+ were respectively 26.9, 13.1 and 29.9 times above the clean air value. In 2009, the SO_4^{2-} , NO_3^- and H^+ corresponding CAR were 4.2, 2.7, and 4.8 times above the clean air value. In other words, comparison of the 1994 and 2009 results suggest reductions in anthropogenic concentrations of SO_4^{2-} , NO_3^- and H^+ , by 84%, 79% and 84% respectively.

To verify our approach, we have calculated corresponding changes in the aerosol SO_4^{2-} ratio, with clean air concentrations equal to the natural background aerosol SO_4^{2-} value used for the Regional Haze Rule. These results compared favorably to our SO_4^{2-} CAR.

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Arseneau¹*, Kristina M. A., Cummings¹, Cassandra, Fenton¹, Ayla, Cumming¹, Brian F.

Studying the influence of environmental stressors on Adirondack lakes: a paleolimnological approach

Freshwater lakes are becoming increasingly impacted by multiple environmental stressors (i.e. acid deposition, eutrophication, climate warming, etc.). Unfortunately, understanding the impact of these stressors can be difficult due to a lack of long-term monitoring data. Paleolimnology can help overcome this difficulty. Paleolimnology is a rapidly developing field in which researchers reconstruct lake histories using the fossils of aquatic organisms preserved in lake sediments. By understanding the present day ecology of aquatic organisms (i.e. their pH/temperature ranges), we can use changes in their fossil assemblages to infer how aquatic environments have changed over time. Recent paleolimnological research in the Adirondacks has identified shifts in algal/zooplankton groups that may be related to environmental stressors such as climate warming and calcium depletion. However, most of this research has focused on lakes impacted by multiple stressors (i.e. acidification, watershed development, etc.). Ideally, to identify the influence of a particular stressor (i.e. climate warming), researchers need to examine a range of *minimally* impacted lakes. This presentation will introduce a new paleolimnological study that is being undertaken by the PEARL lab at Queen's University. Using the ALSC's online ALS pond database, we have identified approximately 50 'reference' lakes that show little exposure to acidification, eutrophication, salinization, or fish stocking. A minimum of 30 of these lakes will be used in a regional paleolimnological study. The goals of this project include identifying if Adirondack lakes are undergoing widespread shifts in algal/zooplankton groups, and identifying if these changes are related to recent climate warming (or other stressors).

¹Paleoecological Environmental Assessment and Research Laboratory (PEARL), Department of Biology, Queen's University

Concurrent Session 3.5:

Ruzow Holland, Ann Hope. ¹

Participatory Planning For A Promised Land: Citizen-Led, Comprehensive Land Use Planning In New York's Adirondack Park

The Adirondack Park is internationally recognized for its biological diversity, is the largest protected area within the Northern Appalachian/Acadian Eco-Region and the contiguous United States. Ecologists, residents of the Park, and others are concerned about rapid land use change occurring within the borders of the Park. Almost half of the six million acres encompassed by the Park boundary is privately-owned, where 80% of land use decisions fall within the jurisdiction of local governments. The comprehensive planning process of one such local government, the Town of Willsboro, was the focus of a Participatory Action Research (PAR), single case study. Using a PAR, mixed methods approach, community-led comprehensive planning integrated natural science, technology and citizen participation. I evaluated the role of PAR in helping to transform conventional land use planning practice into a more democratic, environmentally conscious, and durable civic responsibility. Findings of the research indicate that planning capacity increases when citizens increase their scientific and ecological literacy. Applying ecologically-based comprehensive planning utilizing a PAR framework improved citizen's confidence in land use decision-making and also expanded science literacy. PAR holds great promise as a methodological framework to bring together ecologically-focused natural science with citizen-led collaborative land use planning. Local land use planning decisions have important cumulative impacts on protected area land development at the local and regional scale. A comprehensive plan can reflect an emergent process, where the primacy of community self-determination and consensus-building yields recognition of the link between, and sanctity of, nature, home, and homeland.

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Patinelli-Dubay, Marianne.^{1*}

Transgressing the Blue Line: Toward an Inclusive Narrative of Adirondack Wilderness.

Motivation connects awareness with agency thus avoiding the habitual slide into William James' sentimentalist fallacy, where sympathy becomes stalled in "an ephemeral state of felt concern that provokes no concrete action" (Voparil). In order to understand this transition from sympathy to action in the context of environmental conservation, I will attempt to reconcile James' fallacy by locating motivation within John Dewey's notion of consummatory experience using Ralph Waldo Emerson's poem *The Adirondacs* as a practical illustration. In fact, the Emersonian persona is a deeply ingrained representation of Adirondack wilderness, and its qualities are often summoned to further the conservation agenda. However successful this narrative is, it is nevertheless an exclusive and limiting paradigm that excludes individuals and communities who don't see themselves as part of Emerson's wilderness. If the motivation to conserve and protect Adirondack open space is activated through consummatory experience, then this sense of being compelled to act can be stimulated more broadly *only* if we push past the contemporary "master perspective" (Plumwood) that excludes other cultural narratives in its myopic adherence to the Emersonian vision of wilderness. We can begin enlarging the conservation community by re-integrating our prevailing Adirondack wilderness narrative with the stories and resistance of Black Americans, thereby resettling what Molefi Kete Asante calls *borrowed space*. I will use contemporary poetic illustrations of the Black American consummatory/wilderness experience as a corollary to Emerson's representation of the Adirondack wilderness experience.

¹ PO Box 96, North Hudson, NY 12855

Values in the Wind: A Hedonic Analysis of Wind Power Facilities

Martin D Heintzelman² and Carrie M. Tuttle^{3*}

The 6.1 million acre Adirondack Park was established in 1892 by the State of New York to protect valuable natural resources. The park is the largest of its sort and has been severely impacted by acid deposition and methyl mercury pollution. New York State and the Adirondack region has much to gain from transitioning away from fossil-based sources of energy and toward renewable sources like wind. Some of the largest wind farms are located just outside the Adirondack Park in the counties of Clinton, Franklin, and Lewis – which make up our study area. This paper uses data from more than 10,000 property transactions over 9 years to explore the effects of new wind facilities on property values. We use a repeat-sales hedonic analysis framework to control for omitted variables and endogeneity biases. The study finds that nearby wind facilities significantly reduce property values. Decreasing distance from the nearest turbine to 1 mile results in a decline in price of between 7.73% and 14.87%. From a policy perspective, these results indicate that there remains a need to compensate local homeowners and communities for allowing development within their borders. The study does not say anything about the societal benefits from wind power. In fact, if wind power is being used to displace fossil-based electricity generation it may still be that the environmental benefits of such a trade exceed the costs.

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Concurrent Session 4.2:

Maintaining Connectivity: Wildlife Habitat Linkage Designs for the Split Rock Wildway Planning Area, Essex County, NY

Author: Rose **Graves**, M.S. Student, University of Vermont Ecological Planning Program

Major Advisor(s): Dr. Deane Wang and Dr. Therese M. Donovan, University of Vermont

Habitat connectivity is an important factor to consider in conservation planning, particularly for wide-ranging and mobile species. The protection of habitat corridors or linkages that allow species live and move through is a useful conservation strategy for maintaining biodiversity and reducing the effects of habitat fragmentation. Spatial models have been widely used to predict the “best” locations for these conservation corridors. I used an expert-based habitat suitability model and least-cost modeling to predict the habitat corridor locations for three focal species: black bear (*Ursus americanus*), bobcat (*Lynx rufus*), and fisher (*Martes pennanti*). These species corridors were merged to create an overall linkage design connecting Jay and Giant Wilderness Areas to Split Rock Wild Forest in the Adirondack Park.

I also evaluated the uncertainty of the model outputs and proposed linkage design due to subjectivity in expert-based parameters, as well as provided comparisons to two alternatives: an ad hoc habitat linkage design and a habitat linkage design based on a predictive occurrence model developed using empirical data from Vermont. These comparisons provide stakeholders and conservation planners with increased confidence in the proposed habitat linkage as well as offering alternative corridors. The proposed habitat linkage provides an opportunity for conservation planners to protect the existing connectivity between Lake Champlain and the high peaks of the Adirondacks.

Brook trout (*Salvelinus fontinalis*) habitat assessment and dispersal patterns in True Brook, NY:

Justin Ecret, SUNY Plattsburgh

Minimal research involving Adirondack brook trout habitat and movement patterns within headwater streams has been conducted, leaving managers with an information gap regarding the specific habitat conditions necessary for sustainable brook trout populations in Adirondack streams and rivers. By means of electrofishing, we examined size-class specific microhabitat requirements and reach scale movement patterns for brook trout (*Salvelinus fontinalis*) populations within two northern Adirondack streams. An additional goal of this research was to assess the effects of road crossings on fish habitat selection and seasonal movement patterns. Water depth, water velocity, and substrate size requirements were observed to be similar among two brook trout size classes (size class1 [SC1] represents brook trout less than 14.5cm and size class2 [SC2] represents brook trout greater than 15.5cm). Both size classes exhibited selection patterns within deeper-slower moving pool habitats; however, older brook trout were found to be associated with smaller sized substrates within one of our study sites. These habitat selection patterns were also supported by determining and comparing stream hydrologic conditions, including stream depth and Froude number. A total of 788 brook trout were tagged throughout a four month period and consisted of both sedentary and highly mobile individuals. Brook trout movement patterns varied between size classes as well as between seasons. Younger trout exhibited increased movement during the spring while older trout were found to be more mobile and move more frequently during early fall. Lastly, we examined the proportion of brook trout moving upstream/downstream and found a greater frequency of younger brook trout moving upstream during late summer. The primary goal of this study was to provide sufficient knowledge of the adequate conditions that allow for a strong and sustainable fish habitat; thereby, allowing for future assessment protocols for road crossings on Adirondack brook trout populations.

Concurrent Session 4.4:

Lee, Elizabeth^{1*}, Amsel, Sheri², Thomas-Train, David³

Utilization of Outdoor Learning to meet NYS Science Curriculum Standards

Factors affecting the ability of educators and administrators to utilize outdoor learning experiences that complement science curricula were studied in Nov and Dec. 2010. Through a 10 question on-line survey 208 respondents provided information about their knowledge of and access to programs currently provided. The target population of educators who were solicited for response were teachers in elementary grades and middle and high school science teachers however other individuals responded by request of an administrator. Educators ranked their ability to use outdoor resources on their school grounds as well as their ability to take advantage of resources at locations within 50 miles or beyond 50 miles from their schools. Educators also ranked the barriers to enhancing their science teaching through outdoor programming and listed the three science topics they would most like to see addressed in an outdoor program. Teachers also noted whether or not they addressed conservation or other environmental issues in their classrooms and if so, how frequently. Results of the survey revealed a variety of barriers as well as a significant range of access to and desire to increase use of science-based outdoor education experiences available in the Adirondack region. Over 70% of respondents responded that they would be “very likely” to allocate time to outdoor studies if a trained naturalist could come to their school. When asked to rank the obstacles to enhancing science curricula through outdoor programming most respondents ranked “funding” as the most difficult to overcome.

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2. Artist, Illustrator, Founder and Director of Exploring Nature Education Resource, Brainard’s Forge Road, Elizabethtown, NY 12932
3. Certified NYS teacher, Editor of ADK Eastern Region Guidebook, Executive Director of Adirondack Fire Tower Association, P.O. Box 401, Keene Valley, NY

Occurrence of Skipper Butterfly Species in the Northern Adirondacks

Mihuc, Janet R., Paul Smith's College

During the summers of 2008-2010, roadside and trail surveys of skippers were conducted within the four northernmost counties that are part of Adirondack Park. Data gathered from each location included number of individuals by species, diversity of host and nectaring plants and GPS coordinates. Survey data was used to produce GIS maps for each skipper species and to address potential habitat and elevational preferences. Findings were compared to historical occurrence data published for the northern New York and southern Quebec region. Of the 23 skipper species known to occur in this area, 17 were found during the study. The species not found during this study were considered rare or uncommon based on historical occurrence data, with one exception. The Columbine Duskywing (*Erynnis lucilius*), whose larvae feed on Wild Columbine (*Aquilegia canadensis*), was not found during this study but was considered frequent based on historical occurrence data. Other skipper species were seen more or less commonly compared to historical occurrence data. Several species of grass skippers were common along roadsides and could be candidates for citizen science monitoring. All data from this study is destined to be incorporated into the Adirondack All-Taxa Biodiversity Inventory database.

POSTER PRESENTATIONS:

Nathan L. Houck, Adirondack Lake Survey Corp.

Roy, Karen M.¹, Nathan Houck^{2*}, Pamela Hyde², Michael Cantwell², Jeffery Brown²

The ALTM: A Compendium of Research, Chemistry And Research Information.

The Adirondack Lakes Survey Corporation (ALSC) and the New York State Department of Environmental Conservation (NYSDEC) have compiled a compendium of site descriptions, recent lake chemistry and selected research information of the fifty-two Adirondack Long Term Monitoring (ALTM) waters sampled since 1982. This compilation is distributed free to the public on CDROM and via the web at www.adirondacklakessurvey.org in Adobe PDF format. For each of the fifty-two lakes sampled, concise descriptions of the geomorphology, recent chemistry, results of historical and recent aquatic biota and fish surveys, intensive studies and research programs, and watershed and land/cover use overviews are provided in an easy-to-use desk reference format. The work is organized by watershed and supplemented with maps and tables that complete the overview for each ALTM water. This work was designed to offer the public, researchers and policy makers an easy reference to the current research and chemistry at the diverse sites represented by the ALTM across the Adirondack Park.

¹New York State Department of Environmental Conservation, Ray Brook NY.

²The Adirondack Lakes Survey Corporation, Ray Brook NY.

Brian Kain, Paul Smith's College

Kain¹, Brian and Jorie Favreau²

Monitoring Scraping Behavior of White-Tailed Deer (*Odocoileus virginianus*) in the Adirondack Mountains

¹Baccalaureate Student, Fisheries and Wildlife Sciences in the School of Forestry at Paul Smith's College. Anticipated Graduation May 2011

²Faculty Advisor and Primary Contact, Fisheries and Wildlife Science Program, Paul Smith's College, Paul Smiths NY 12970

Despite the ubiquity of white-tailed deer in New York State, they remain a mysterious animal. Many of their behaviors, such as scraping behavior are still not well understood. This study uses motion activated video cameras to monitor scraping behaviors at two sites over two consecutive years on a free ranging population of white tailed deer in the northern Adirondacks. Scraping behaviors are usually associated with the rut in white-tailed deer, and were defined as: (1) paw ground, (2) urination, (3) rub or lick overhead branch, (4) smell overhead branch, and (5) smell ground. Each of these behaviors was recorded as an individual event during each camera event, and scrapes were not considered used unless one of the first three behaviors was observed. A total of 11 juvenile bucks, and 7 adult bucks were identified individually during this study. Does and fawns were not identified as individuals. Bucks accounted for 57 camera events, does accounted for 42 camera events, and fawns accounted for 14 camera events. This study attempts to answer the following questions. Do adult bucks (≥ 2.5 yrs) interact with scrapes more often and/or for a longer duration at each visit than do juvenile bucks (< 2.5)? Do whitetail bucks and does interact at scrapes? What are the behaviors and age class of white-tailed deer associated with scrapes? When do deer visit scrapes, seasonally as well as daily (24 hr.)? The main goals of this study are to document what behaviors are exhibited at scrapes, as well as to compare results from other studies done, such as those on captive deer.

The results suggest that adult bucks (44 visits) visit and use scrapes more often than juvenile bucks (28 visits) and that adult bucks are present for a longer duration (average 33 seconds) during each visit than are juvenile bucks (average 24 seconds). At each site the largest buck visited scrapes more often, and for a longer duration during each visit than did any other deer during each year. There was no evidence of whitetail bucks and does interacting at scrape sites. Almost all of the scraping behavior was done by bucks (92%). For all behaviors recorded adult bucks performed each behavior more often than juvenile bucks. Adult bucks performed all rut behaviors in sequence during one camera event 44% of the time. Juvenile bucks were not ever recorded performing all rut behaviors in sequence during one camera event. Most scrape sites were used during the early morning (0201-0600, 28%), morning (0601-1000, 25%), and the evening (1801-2200, 36%). Few interactions were recorded during the afternoon or during the night. The majority of scraping behavior occurred during the month of November (54%), followed by October (17%), then August and May (10% each).

The use of scrapes during the summer months has not been considered during other studies, and suggests that scrapes can serve as a form of communication year round and not just during breeding season. Scrape use by adult bucks compared to juvenile bucks and does was much higher in this study than studies done on captive deer herds. This could suggest a skewed sex ratio or some other factor present in captive deer that can lead to a depression of scraping behavior by adult bucks.

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Saving the Croghan Dam: A Site Development Strategy for Revitalizing Hydro Infrastructure

Faculty sponsor: **Dr. Amanda Lavigne**

As finding cleaner, domestic energy sources becomes more important, some argue we need look no further than the 1000+ small overflow dams sitting at the heart of towns and villages throughout the Adirondack region. This study encompasses an analysis of potential development strategies and scenarios for small overflow dams, using the Croghan Dam, in Croghan, NY as a case study. After a period of initial research, it was determined that finding funding to simply rebuild these dams was not a likely scenario in the near term due to limited federal/state initiatives devoted to rebuilding hydro infrastructure. Therefore, a more holistic approach was adopted, refocusing attention on a more broadly-defined development strategy, highlighting the economic potential of the entire dam “site”. This more broadly defined “site strategy” deemphasizes the actual dam reconstruction and focuses on facilitating development of industrial/commercial businesses and/or university research and development test-beds, wherein dam reconstruction offers the unique opportunity to incorporate “free”, “green” power and electricity generated into all business development models. Three probable site development scenarios are the focus of this study: 1. New Business Development; 2. Alternative Energy Storage Technology Research and Development; 3. Value-Added Development to Support Existing Local Agricultural Businesses. The results highlight the social, economic, and environmental benefits that could be seen locally and regionally if this broader approach/perspective were adopted with respect to the revitalization of small overflow dam infrastructure in upstate NY.

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Recent Evidence of Biological Recovery from Acidification in the Adirondacks (NY, USA): Building a Regional Paleolimnological Perspective

The Adirondack region of New York (USA) has been significantly impacted by acid deposition. Since the implementation of the 1990 Clean Air Act Amendments, the area has shown improvements in water chemistry. However, little work has been done to assess biological recovery in the region. Assessing biological recovery is often difficult due to a lack of long-term monitoring data but paleolimnology can overcome this difficulty. Paleolimnological studies reconstruct the environmental histories of lakes using the physical, chemical, or biological characteristics of lake sediments. The goal of this investigation was to identify if biological recovery has followed chemical recovery in three acid-impacted Adirondack lakes, using paleolimnological techniques. Changes in the lakes' chrysophyte and cladoceran fossil assemblages were analyzed from ca. 1760-present in ²¹⁰Pb dated sediment cores. Multivariate statistics were applied to compare changes in fossil species composition with measured changes in chemical and climatic variables. Recent (post-ca. 1995) declines in chrysophyte species with low pH optima suggest that biological recovery from acidification is occurring in the study lakes. However, recent (post-ca. 1970) increases in colonial chrysophyte taxa suggest that the species assemblages are not returning to their pre-disturbance state, likely due to an influence of climate warming. The cladocera remain unresponsive to increasing pH and several local/regional factors may be preventing their recovery (i.e. predation, calcium depletion, climate warming, etc.). This study provides evidence that biological recovery is underway in the Adirondacks but that recovered assemblages are unlikely to return to their pre-disturbance state due to other environmental factors.

Lawrence, Gregory W., Adirondack Information Trust

Adirondack Park Grey Literature : Preserving the Record

Grey literature is a dynamic, open forum of public and private information. Government agencies, non-profit organizations, resident associations, scholars and private citizens publish an enormous amount of grey literature about the Adirondack Park. These publications provide a management record for the Park and illustrate competing visions for economics, policy and science. Long term access to this information is at risk. Libraries no longer actively acquire and preserve Adirondack Park grey literature, especially publications that are created and distributed electronically. An overview of at-risk publications is presented along with a detailed assessment of library holdings for an Adirondack Park agency.