A SERVICE OF THE Union County Board of Chosen Freeholders



IN PARTNERSHIP WITH KEAN UNIVERSITY, KEAN UNIVERSITY'S INSTITUTE OF URBAN ECOSYSTEM STUDIES, & PSE&G

Results and Findings For BIO-BLITZ 2009

A 24-hour intensive effort to measure biodiversity



Briant Park, Hidden Valley Park & Houdaille Quarry in Summit & Springfield, Union County, NJ

MARK YOUR CALENDARS! BIO-BLITZ 2010 * JUNE 11 & 12 , 2010 5:00 PM TO 5:00 PM Clark Reservoir & Esposito Park in Clark & Milton Lake Park in Rahway

BIO-BLITZ 2009

Why did we do it and what does it all mean?



Why?

On June 12 & 13, 2009, 10 teams of scientists and naturalists, totaling approximately 105 people, scattered along Union County's Briant Park, Hidden Valley Park & Houdaille Quarry in search of plant and animal life. The three parks, Briant Park (29.32 acres), Houdaille Quarry (69.68 acres), and Hidden Valley Park (74.03 acres) roughly total 173 acres of preserved open space for many species to thrive. Among these three parks there are ponds, wetlands, fields, woodlands, an old quarry, and a unique ridge habitat within Summit and Springfield. This fragmented greenway was initially planned as a connection between Union County's Watchung Reservation and Essex County's South Mountain Reservation by the Union County Park Commission under the advisement of the famous Olmsted Brothers Landscape Architecture Firm, which also designed New York City's Central Park. However, with the onset of the Great Depression and later construction of Interstate Route 78, the connection was never fully realized. But even still, the fragmented greenway provides valuable habitat and acts as a stopover and wildlife corridor for resident and migratory wildlife, enhancing the opportunity for bio-blitzers to discover and sight many different species of wildlife and plant life.

What?

A Bio-Blitz is a 24-hour intensive effort to measure the biodiversity (species richness) of a natural area. Bio-Blitzes are often conducted in urban parks and green spaces. As home to the fifth oldest county park system in the nation, Union County is proud of its ecologically diverse and historically rich parkland. In 2005, the County began a systematic survey of its parks through the annual Bio-Blitz. Bio-Blitz 2009 was held at Briant Park, Houdaille Quarry and Hidden Valley Park. Union County, in partnership with Kean University, the Institute of Urban Ecosystem Studies (IUES), & PSE&G, raised awareness of the diversity of life in this greenway and the importance of preserving and managing such places as essential wildlife habitat. Throughout the evening of June 12th and the following day, scientists, expert naturalists and amateurs raced to sample and identify as many plant and animal species as possible. A total of **652 species** were found and identified; **241** Plants; **69** Fungi;**11** Bryophytes; **258** Insects; **9** Aquatic Insects; **8** Reptiles & Amphibians; **6** Fish and **9** Mammals.

RESULTS

In all, 652 species of plants and animals were identified during the 24-hour event. Following is a breakdown of what each team found:



Plants: The plant team was led by *Dr. Daniela Shebitz*, Department of Biological Sciences, Kean University. The team consisted of 14 volunteers, including Kean University students and faculty, a professor from Columbia University, local high school teachers, a local librarian, and a botanist from Brooklyn Botanic Garden. A small group of volunteers went out on Friday evening to identify plants, and a larger group on Saturday. The group focused on two main areas: Houdaille Quarry and Briant Park. The total number of plant species identified was **241**. In Houdaille Quarry, 132 species of plants were identified. What was striking in this "mini-Grand Canyon" of New Jersey was the remarkable diversity of habitat types, and varying successional stages.

We found numerous wetland plants (but an extensive cover of common reed, or *Phragmites australis*) by the pond, beautiful fields with yellow star-grass (*Hypoxis hirsuta*) in bloom, pockets of blue ridge blueberry (*Vaccinium pallidum*), and forests lush with cinnamon fern (*Osmunda* cinnamomea) and interrupted fern (*Osmunda* claytoniana) in the understory. The forests had an overstory of many tree species including American beech (Fagus grandifolia), red maple (Acer rubrum) and 5 species of oak (Quercus spp.). In Briant Park, 193 species were identified. We focused on the wetland and forests surrounding the lake area in the Park, finding at least 6 species of sedges of the *Carex* genus and skunk cabbage (*Symplocarpus foetidus*). One of the most interesting findings for us at this site was a healthy population of American wintergreen (*Pyrola americana*). This species is often browsed by deer, so the fact that we found it throughout the understory suggests that the damage by deer to Briant Park may not as extensive as it is in other parks in Union County.



Macro-Fungi: The macro-fungi team, led by *Dorothy Smullen*, located and identified **60** species! There were 49 species of fungi found in 2009 in Briant Park and Houdaille Quarry. This was a good number of species and they were typical of June collections. The lichenized fungi (lichens) were an additional 11 species. This is the

highest number of macro fungi found at any Union County Bio-Blitzes. Two soil species that are not as common as others were found in the Ouarry; the Turban lichen, *Cladonia eziziformis*,

and the Wand lichen, *Cladonia rei*. It is important to have "untrampled" land for certain species. These collections, as in the past, were made by a few people. To learn more about fungi, consider joining the New Jersey Mycological Association next year and enjoy the fun of discovery.

Bryophyte: The bryophyte team led by *Dr. Norberto Mapoy* collected mosses by hand. They then used paper packets to determine substratum and



Members of the Fungi Team Photo by Dorothy Smullen

moss salient characteristics, such as habitat and if capsules are present or not. In total, this team identified **11** species. Some Genera of mosses collected are part of the genuses *Fissidens, Mnium, Bryum, Pogonatum, Leucobryum,* and *Thuidium*.



Members of Insect Team check lig traps, Photo by Gary Zelc

Insects: *Dr. Sylvio Codella* and his students at Kean University have been sampling *Hymenoptera* (wasps, ants, bees) in Union County's green spaces for about ten years, and they have documented the presence of hundreds of species in the process. They have participated in the BioBlitz since its start in 2005. This year, they focused their efforts in isolated conifer stands in the Hidden Valley Park area. They collected 129 species. The Codella Lab's

catch was especially rich in ichneumon wasps, a large and diverse family of parasitic wasps that prey on many forest pests. As is the case every

year, they also collected several hymenopteran species not previously recorded in the County. *Anthony Deczynski* collected an additional 129 species of beetles (*Coleoptera*), moths (*Lepidoptera*), grasshoppers (*Orthoptera*) and other groups. In total, the Insect Team collected **258** species. In general, insect diversity was greater in areas with high native plant diversity.





Aquatic Invertebrates: The Aquatic Invertebrates team, led by *Susan Marie Terra*, an AmeriCorps watershed ambassador from the New Jersey Department of Environmental Protection, consisted of three watershed ambassadors from different regions of New Jersey and six volunteers of which five were previously trained. The team collected **9** different species on Friday evening while sampling within Hidden Valley Park using kick seine nets. A biological assessment of this stream, done in March, yielded only 4 different species. The team was happy, therefore, to discover an increase in biodiversity when they sampled again at the "Blitz". Sampling resulted in organisms such as mayfly (*Heptageniidae* family), caddisfly (*Hydropsychidae* family), and cranefly larvae (*Tipulidae* family). Aquatic insects or macro-invertebrates are indicator species of water quality and categories include pollution intolerant, pollution sensitive, and pollution tolerant. A mayfly larvae is an example of pollution intolerant species and caddisfly larvae

along with cranefly larvae are pollution sensitive species. The remaining species were members of the tolerant category.

Amphibians and Reptiles: Team leaders *Cathy Eser* from the Staten Island Zoo and *Karen Inzillo* from Trailside Nature and Science Center were joined by other scientists and the general public as they collected some "herps" (reptiles and amphibians) specimens. On Friday night, the team set out to search Briant Park by boat and by land at. Meanwhile, Karen Inzillo, accompanied by a group of "frog sloggers", who dipped their nets into Briant Park Pond during a public *Frog Slog* program. Due to the depth of mud in the pond, it was very hard to catch the bullfrogs by hand or net, but they were spotted and heard calling. After the frog slog, the team walked around the park and caught some green frogs in a wet grassy area near the pond. Saturday morning, the team set out to survey Hidden Valley Park where they found green frogs, two-lined salamanders and spring peepers and then headed over to Houdaille Quarry. Most of the reptiles were found in the abandoned quarry. Harry Strano found a box turtle that had an old injury that appeared to have been hit by a car and healed many years



ago. Jason Fantuzzi from the Turtleback Zoo found the first of 4 garter snakes and, later in the day, a milk snake. We also found 2 additional box turtles. Many tadpoles and bullfrogs were found in the quarry pond. It was a great site to search and a memorable day for all of the scientists. In total, **8** different herpetofauna species were found during the Bio-Blitz.

Fish: *Shawn Crouse*, from the New Jersey Department of Environmental Protection, Division of Fish and Wildlife, and *Steve Jandoli* (NJDEP Green Acres Program) and their team sampled Briant Park Pond and the unnamed tributary that flows out of Briant Park Pond to the Rahway River using a variety of sampling methods, including electro-shocking (using mild electrical currents to temporarily stun the fish for easy capture and identification) and seining. Of the **6** species encountered, 3 are native to New Jersey waters (pumpkinseed, brown bullhead, and blacknose dace), while 3 species are non-native (green sunfish, common carp, and western mosquitofish). These common species are tolerant of environmental degradation and reflect the sediment filled conditions of the pond and the



high level of impervious cover in the watershed. The fish team also conducted a three-part riverside public presentation, consisting of an introduction to fisheries resources, a fish collection demonstration, including the use of a backpack electro-fishing unit and a 20 ft. seine, and a summary of fishes encountered and field identification.



Birds: The birding team lead by *Ed Zboyan* consisted of 15 birders who sighted and identified a total of **50** species of birds. Their survey methods included field observation by sight and sound (songs and calls) throughout Briant Park, Houdaille Quarry, and Hidden Valley Park. An experienced birder was on-hand at Bio-Blitz Central to update field count charts and staff the bird table display. A pair of double-crested cormorants at Briant Park Pond, although not an impossible sighting, was uncommon just a short distance from downtown Summit. Prior to the onset of Bio-Blitz, the birders visited the parks to become familiar with the area and saw some birds that were not seen during the Bio-Blitz. Likewise, they saw birds that they did not see prior to Bio-Blitz. Other birds sighted included Carolina wren, Eastern wood-pewee, indigo bunting, and spotted sandpiper, to name a few. It is assumed these birds are using Union County's Park System to their best advantage, moving from one park to another as the water, food, and habitat suit them in each park. Given the urban/

suburban nature of this year's Bio-Blitz site and the time of year (birds at this time have young and/or are sitting on eggs and don't want to attract attention), the team was delighted with their results. A greater number of birds would have been sighted if the Bio-Blitz had been held a month earlier when spring migration was in full swing.

Mammals: The mammals' team led by *Holly Jantz* used traps for small mammals baited with oatmeal and birdseed. They also observed larger mammals, looked for signs (tracks, scat, etc.), and used game cameras

during the 24-hour Bio-Blitz to determine mammal presence in the area. The ability to trap and capture pictures of mammals during this event helps to increase public knowledge of the wildlife that exists and the biodiversity of this urban area. All traps were set at dusk on Friday night and checked at dawn on Saturday along with the game cameras. Team members walked trails and roads looking for tracks, scat, and other sign of wildlife. The team's efforts resulted with no small animals being caught in the traps while capturing several photos of white-tailed deer on the game cameras. In addition, raccoons, opossums, eastern coyotes, and red fox were identified by tracks and scat. Eastern gray squirrels, eastern



cottontails, eastern chipmunks, and woodchucks were visually identified by the team. In total, 9 different species were identified by this team!

Environmental Modeling Bio-Blitz 2009



The Environmental Modeling Team was headed up by Dr. John Dobosiewicz.

The headwaters (1st order tributaries) of the Rahway River are located along the municipal boundary between Summit and Springfield. Commercial and residential land use near streams (see map) can have negative effects on water quality from runoff from impervious surfaces and storm water outfall pipes.

Longitude	Latitude	Bridge	Temperature	рН	Conductivity
(dd)	(dd)		(° C)	(std units)	(mS/cm)
-74.33696	40.71596	Morris Ave	16.9	6.99	0.625
-74.33807	40.71209	Orchard	17.72	7.42	0.837

The water quality measurements support the well documented connection between stream impairment and extensive land use. Despite the seemingly extensive natural habitat, there is significant Urban land use (Commercial and Residential) on the northern sream corridor with impervious surfaces and storm water outfall pipes. During a preliminary site visit in the winter, numerous dead frogs and black-nosed dace (fish) were found in the stream. Subsequently, conductivity was tested, over 1.4 mS/cm, an extremely high value that can likely be attributed to salt accumulated from the roadways following snow / ice storms. The acceptable level for conductivity to support a diverse ecosystem in a fresh water stream is 0.150-0.500 mS/cm (microsiemens/ centimeter) with streams across the nation reporting in the range of 0.050 – 1.50 mS/cm (<u>www.epa.gov/</u> <u>volunteer/stream/vms50.html</u>). Conductivity indicates the amount of dissolved substances in a stream and can be used as a non-specific surrogate for non-point source pollution and nutrient levels. The acceptable level for pH, to support a diverse ecosystem, in a fresh water stream is 6.5-8.0 (Standard Units) (<u>www.epa.gov/volunteer/</u> <u>stream/vms50.html</u>). The pH at the two sites was within the EPA criteria for a healthy stream.

PARTICIPATING ORGANIZATIONS Thank you to all of our partners & sponsors!

Union County Board of Chosen Freeholders Union County Department of Parks & Community Renewal Kean University & Kean University's Institute of Urban Ecosystem Studies PSE&G

Prize & food donations from Panera Bread, Wild Birds Unlimited, Starbucks, & Jenkinson's Aquarium



Bio-Blitz 2009 Committee:

Fungi: Macro: Dorothy Smullen & Marc Grobman, NJ Mycological Association Bryophytes: Norberto Mapoy, PhD, Kean University Plants: Daniela Shebitz, PhD, Kean University Aquatic Invertebrates: Susan Marie Terra, NJDEP/NJWAP Insects: Sylvio Codella, PhD, Kean University Amphibians and Reptiles: Cathy Eser, Staten Island Zoo Fish: Shawn Crouse, NJDEP/DFW Birds: Ed Zboyan & Frank Budney Mammals: Holly Jantz, Auburn University Environmental Monitoring: John Dobosiewicz, PhD, Kean University, Elizabeth River/Arthur Kill Watershed Association Chair: Betty Ann Kelly, Union Co. Parks & Community Renewal Education: Sylvia Weisbrot Publicity: Tom Plante, UC Office of Public Information Public Outreach: Karen Inzillo, TNSC-UCPCR Data: IUES: Janet Tuohy, Kean University

Cover photos by: (left to right): Plant Team member, Steve Glenn collects specimens (by Betty Ann Kelly); Briant Park Pond (by Ling-Huei Lin) and Fish Team Leader, Shawn Crouse (by Betty Ann Kelly)

Auburn University, Auburn, Alabama Brooklyn Botanic Garden Briant Park Olmsted Conservancy Colonia High School Fishing Club Elizabeth River/Arthur Kill Watershed Association Friends of Lenape Park Girl Scouts Heart of NJ NJ Conservation Foundation NJ Mycological Association NJDEP Fish & Wildlife NJDEP Watershed Ambassador Program Rahway River Association Seton Hall University Springfield Environmental Commission Summit Environmental Commission The Staten Island Zoo Trailside Nature & Science Center U.C. Model Airplane Club Union County Department of Parks & Community Renewal Division of Planning & Environmental Services 2325 South Avenue Scotch Plains, NJ 07076

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