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RONALD H. DEMARIA
(1939-2004)

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MEMBER OF NEW YORK BAR +
MEMBER OF PENNSYLVANIA BAR •
MEMBER OF DISTRICT OF COLUMBIA ^
MEMBER OF CONNECTICUT BAR ∞
MEMBER OF VIRGINIA BAR •

November 3, 2011

**VIA HAND DELIVERY**

Lewin Weyl, Esq.
State of New Jersey
Department of Law and Public Safety
25 Market Street
PO Box 1112
Trenton, New Jersey 08625

**Re: CAFRA Individual Permit Application**
**DLUR No. 1500-04-0001.2 CAF090001**
**Block 505, Lots 14 & 15**
**Toms River Township, Ocean County**
**Block 44, Lots 2, 3, 4 & 5**
**Manchester Township, Ocean County**

Dear Mr. Weyl:

As you know, this office represents Walmart in reference to its interests in the above-entitled Coastal Area Facility Review Act ("CAFRA") and Freshwater Wetlands permit applications submitted by Jaylin Holdings, LLC ("Jaylin").

In accordance with our discussions related to the settlement agreement and in furtherance of the anticipated CAFRA Individual and Freshwater Wetlands GP6 permit issuance, enclosed please find the Vernal Habitat Mitigation Proposal prepared by EcolSciences, Inc. and the Wetland Mitigation Plan prepared by Bohler Engineering, P.C. By copy of this correspondence, we are forwarding copies of the report and plan to Jaylin's case manager, Eric Virostek, as well as David B. Fanz, of the Bureau of Coastal Regulation.

As discussed most recently, kindly review the report and plan and return comments, if any, within the next week so that we can finalize the settlement documents for inclusion in the next available DEP Bulletin.

If you have any questions or wish to speak with me, please do not hesitate to contact me. I look forward to your positive response.

Very truly yours,

**GENOVA, BURNS & GIANTOMASI**

WILLIAM F. HARRISON

JM:WFH/rmw
Enc.
c: Eric Virostek, Case Manager, Department of Environmental Protection
David B. Fanz, Manager, Bureau of Coastal Regulation
Matt Sitton, Real Estate Manager, Walmart (w/o enc.) (via e-mail only)
Dwayne Douglas Smith, Design Manager, Walmart (w/o enc.) (via e-mail only)
Rick Martin, Esq., Walmart Legal (w/o enc.) (via e-mail only)
Jay Grunin, Esq., Jaylin Holdings, LLC (w/o enc.) (via e-mail only)
Michael Moonan, P.E., Bohler Engineering (w/o enc.) (via e-mail only)
David Moskowitz, EcolSciences, Inc. (w/o enc.) (via e-mail only)

# VERNAL HABITAT MITIGATION PROPOSAL
# FOR
# BLOCK 505, LOTS 14 AND 15
# TOWNSHIP OF TOMS RIVER
# AND
# BLOCK 44, LOTS 2, 3, 4 (PART), AND 5
# TOWNSHIP OF MANCHESTER

## (ROUTE 37 & NORTHAMPTON BOULEVARD)

## OCEAN COUNTY, NEW JERSEY

Prepared for:

Jaylin Holdings, LLC
Dover Esplanade, Building 1
1027 Hooper Avenue
Toms River, New Jersey 08753
Attn: Jay Grunin, Esq.

Prepared by:

EcolSciences, Inc.
75 Fleetwood Drive, Suite 250
Rockaway, New Jersey 07866

November 2, 2011

## TABLE OF CONTENTS



## LIST OF ATTACHMENTS

## I. INTRODUCTION

The applicant Jaylin Holdings, LLC, of Toms River, New Jersey, is proposing to construct a Wal-Mart store on a 43-acre site known as Block 505, Lots 14 and 15 within the Township of Toms River and Block 44, Lots 2, 3, 4 (part) and 5 in the Township of Manchester, Ocean County, New Jersey (Attachment A - Figure 1). The site is bordered to the east by Northampton Boulevard and existing commercial development, to the north by State Route 37 and existing commercial development, to the northwest by existing commercial development, to the west by woodlands, and to the south and southwest by a former Central Railway of New Jersey railroad right-of-way. The site is currently undeveloped and is characterized predominantly by pitch pine and oak uplands. Forested wetlands dominated by pitch pine and red-maple also occur onsite in proximity to the railroad. The locations of freshwater wetlands on the site were verified by a Letter of Interpretation (LOI) issued by NJDEP on May 18, 2004, (File No. 1500-04-0001). The LOI has been extended until December 31, 2012 via the Permit Extension Act.

Numerous meetings have been held between the project team and representatives of the NJDEP to discuss the proposed project and the submission of a CAFRA Individual Permit and Statewide General Permit application. As currently proposed, a 0.47-acre portion of an isolated wetland will be filled to accommodate the development. The wetland has been identified by NJDEP as a vernal habitat. The proposed disturbance to this wetland meets the conditions for a Statewide General Permit No. 6. Thus, an application for the Statewide General Permit No. 6 has been submitted to NJDEP.

The permit approval will require the applicant to mitigate for the loss of wetlands and vernal habitats via the construction of a new vernal habitat that is at least two times the size of the permitted wetland fill. Accordingly, the applicant has proposed the on-site creation of a 1-acre vernal habitat as shown on the *Wetland Mitigation Plan* prepared by Bohler Engineering, P.C. and dated June 26, 2009 which was submitted to NJDEP with the permit application. The proposed wetland creation is at a ratio of 2.12:1 and exceeds the minimum 2:1 ratio required by NJDEP. The created wetland is proposed for construction within an upland area immediately west of the existing on-site isolated wetland. The goal of the mitigation project is to establish a seasonally inundated wetland within the surrounding forested and scrub-shrub setting. The created vernal habitat has been designed to provide conditions suitable for breeding and for the juvenile development of various vernal pool species known to occur on-site or locally. The plan has been accepted by NJDEP pending submission of the detailed plan (Revision 4 of the *Wetland Mitigation Plan,* dated November 2, 2011) accompanying this report.

Several aspects of the selected location will ensure the success of the mitigation. First, the location for the mitigation is in close proximity to the proposed impacts (approximately 300 feet). Numerous reptile and amphibian species are known or expected to occur on-site or in the immediate vicinity (see Section II below) and many are anticipated to utilize the mitigation site immediately upon its completion. Second, the mitigation site was selected based upon observations of suitably shallow groundwater. Test pits on the mitigation site in July of 2009 indicated a groundwater elevation from one to three feet below the existing ground surface, enabling the pool to be constructed without excessive excavations. This supply of accessible ground water is likely to be the single most important factor in the success of the constructed wetland as a vernal habitat. Finally, the mitigation wetland is positioned within a 20.9-acre portion of the site that is a proposed wildlife corridor that will be permanently preserved through a conservation easement. The corridor will provide on-site dispersal habitats for vernal species and provide a permanent link to other upland and wetland habitats located across the former railroad right-of-way southwest of the site.

This report has been prepared in accordance with guidelines outlined in NJDEP's *Vernal Habitat Wetland Mitigation Conditions*. The report establishes the goals of the proposed vernal habitat creation plan, including summarizing the functions and values of the vernal habitat that will be impacted by the proposed development. It also describes how the proposed creation of a new vernal habitat will result in equal ecological value to the area impacted. This report is intended to be used with Bohler Engineering's *Wetland Mitigation Plan* (last revised November 2, 2011) as well as the CAFRA and Freshwater Wetland Protection Act application documents and correspondence previously submitted to NJDEP and referenced under NJDEP File No. 1500-04-0001.2.

## II. EXISTING CONDITIONS

### A. Existing Vernal Habitat

The isolated forested wetland that will be disturbed during development is located in the southeastern portion of the site. It is approximately 950 feet long and up to 320 feet wide. The wetland is not part of a surface water tributary system. It is fed, in part by precipitation, but its primary hydrology appears to be derived from groundwater as evidenced by the permeable sands surrounding the wetland, the saturated soils that are present year-round and the shallow water table observed in the test pits made in the vicinity. In the majority of the wetland, open waters are generally absent, however during the wettest portion of the year (typically from late winter into spring), shallow ephemeral vernal pools of varying depth (up to approximately 1 foot) may be located in the lowest depressions. This wetland was inspected by the NJDEP and determined to be vernal habitat.

Although small portions of the wetland have an open canopy or only sparse shrubs, the majority of the wetland generally contains a closed canopy and dense tree and shrub cover. Dominant canopy species include red maple and pitch pine. Common shrub species include highbush blueberry, sweet pepperbush, dangleberry, and greenbrier. Due to the dense canopy coverage in the majority of the wetland, herbaceous species are limited and represented by sphagnum moss, various low sedges and scattered ferns. Leafy debris, pine needles, sticks, and a patchy mat of sphagnum moss characterize the bottom substrate.

B. Location of Proposed Mitigation

The proposed mitigation is located in the southwestern portion of the site and will occur immediately west of the existing isolated wetland. This area is characterized by a mixed forest containing shrubby openings surrounded by wooded areas with a closed canopy. Dominant canopy species include pitch pine, sassafras, post oak, and scrub oak. Common shrub species include black huckleberry, lowbush blueberry, dangleberry, sweet pepperbush, and inkberry. Herbaceous species are dominated by bracken fern and sparse grasses. Leafy debris, pine needles, sticks, and exposed sand characterize the substrate. Hydrology to the new wetland will be primarily provided by groundwater that is exposed by excavation of soils (primarily sands) up to three feet below the observed seasonal high ground water table, as well as overland runoff. The proposed location for the vernal pool construction project was selected only after obtaining data, in July of 2009, on the observed free water elevation from several on-site locations. Data was collected via test pits dug to observe the depth to water. On-site free water in the vicinity of the proposed vernal habitat construction was found within 1-3 feet of the surface, indicating a shallow and readily accessible source of hydrology.

C. Vernal Habitat Species

The LOI issued in 2004 by NJDEP identified the existing on-site wetlands as intermediate resource value, indicating that they are not critical habitat for any State-listed wildlife species. As a result of previous field studies, including a drift fence survey for the State-threatened pine snake, EcolSciences has documented numerous herptile species, including several common facultative vernal pool species, on the site. The observed vernal pool species include spring peepers (*Pseudacris crucifer*), Fowler's toad (*Bufo woodhousii Fowleri*), green frog (*Rana clamitans*), southern leopard frog (*Rana utricularia*), and common snapping turtle (*Chelydra serpentina*). Each of these species has been documented to use vernal pools for breeding or foraging and would thus be anticipated to quickly colonize the constructed vernal habitat. A number of additional vernal pool species have not yet been observed but are documented regionally and may one day be found to occur on the site. Included among those that potentially could colonize the vernal habitat if source populations are present are wood frog

(*Rana sylvatica*), northern gray treefrog (*Hyla versicolor*), marbled salamander (*Ambystoma opacum*), painted turtle (*Chrysemys picta*) and spotted turtle (*Clemmys guttata*). Finally, pine barrens treefrog (*Hyla andersonii*), a State-threatened species, is documented locally. Although it has not previously been observed on the site, the proposed vernal pool will likely be suitable for this species.

## III. VERNAL HABITAT MITIGATION

### A. Description of Proposed Mitigation

The plan is to create a 1-acre vernal habitat with a maximum pool depth of three feet by excavating below the observed seasonal high ground water table. Two to six feet of soil will be excavated across the area to achieve the desired bottom contours of the created vernal habitat. The area where the pool is proposed is mapped as Lakehurst sand and Mullica sandy loam. Because these sandy soils are permeable and because the pool will be excavated below the observed seasonal high water table, the pool will not need to be lined in order to retain suitable hydrology. The created pool is designed to fluctuate with the seasonal ground water level as natural vernal habitats at the site do. Due to its variety of depths, the proposed pool will meet the water depth and ponding requirements for breeding by vernal pool species during average and wet years. During extended dry periods or drought, the created pool may dry down, as would a natural pool, but it would be expected to retain water for longer periods than the surrounding wetlands due to its deeper residual pool (excavated to approximately 3 feet below seasonal high water table).

Following excavation of the site, topsoil and organic debris stockpiled during initial site clearing will be used as the top layer of the wetland surface. This is expected to serve as an initial seed bank containing seeds of sedges, rushes, or other plants located in the area. The topsoil will provide pores and voids that will resist compaction, provide a suitable substrate for aquatic plants and invertebrates to colonize, and provide nutrients for zooplankton, bacteria, and algae. Following construction, the adjacent forested and shrub landscape is expected to continue to supply leaf litter, pine needles, sticks, and other organic debris to the pool.

Select large woody debris (logs and stumps) stockpiled from initial site clearing will also be placed within and directly adjacent to the pool. This will provide substrate for egg laying and escape cover when the pool is filled and refugia during dry periods. Exposed upland soils upslope of the pool will be seeded with Ernst Seeds' Eastern Ecotype Native Grass Mix. Exposed soils along the edge of the pool will be seeded with Ernst Seeds' OBL-FACW Perennial Food & Cover Wetland Mix. The edge of the pool and temporarily disturbed portions of the transition area will also be planted with native trees and shrubs including red maple (*Acer*

*rubrum*), black gum (*Nyssa sylvatica*), sweetbay (*Magnolia virginiana*), American holly (*Ilex opaca*), inkberry (*Ilex glabra*), sweetspire (*Itea virginica*), bayberry (*myrica pensylvanica*), lowbush blueberry (*Vaccinium angustifolium*) and highbush blueberry (*Vaccinium corymbosum*) as shown on the *Wetland Mitigation Plan* (last revised November 2, 2011) prepared by Bohler Engineering.

B. Equal Functions and Ecological Values

The functions of the existing wetland and the proposed mitigation habitat include seasonal flood storage of overland runoff, breeding areas for vernal habitat species, seasonal open water source for on-site wildlife species, and breeding area for aquatic insects. The vernal habitat creation plan has been designed to replicate the functions and improve upon the ecological value of the existing habitat that will be disturbed as a result of the development proposal. The new vernal habitat will be twice as large as and immediately adjacent to the wetland containing the habitats being filled. As a result of designing a vernal habitat that is twice the size of the wetland that will be disturbed, seasonal flood storage of overland runoff will increase from current conditions. Similarly, as a result of its improved interface with groundwater and deeper residual pools, the created habitat will have surface hydrology for a longer duration than the wetland that will be disturbed. As such, the created wetland will provide improved vernal habitat functions and values compared to the wetland that will be disturbed. The created wetland will have greater resilience to drought and will be more likely to provide a stable aquatic habitat for the duration of vernal species' breeding and juvenile development. For similar reasons, the created vernal habitat will be a more reliable seasonal open water source for on-site and migratory wildlife species, including waterfowl, migratory songbirds, mammals, reptiles, amphibians, and aquatic insects, including those that may not be vernal species but that will opportunistically utilize wetland or open water habitats.

C. Monitoring and Measuring

The created pool will be monitored following construction to evaluate its use by vernal pool dependent and other wildlife species and to document that appropriate hydrology (surface ponding in March through July) has been achieved. Monitoring will also provide an opportunity to address any shortcomings or adverse outcomes, such as invasive plant species, vandalism, death of plantings, etc. as they arise. Field data on water levels, the performance of the plantings, and observations of wildlife, particularly vernal pool species, will be gathered and the site will be photographed. Monitoring will provide an opportunity to document the successful colonization of the pool by vernal pool species, allowing the pool to be certified as a vernal pool by the NJDEP using either the "obligate species method" or the "facultative species method" described in *Salamanders, Frogs, and Turtles, of New Jersey's Vernal Pools* (Kenny & Burne, 2002). Such certification will serve to confirm the primary function of the mitigation project.

## IV. CONSTRUCTION SCHEDULE

In order to create the new vernal habitat, critical timing and construction paths must be followed. Due to the complexity of the project, ongoing discussions with NJDEP biologists and Land Use staff, and the numerous mitigation requirements relating to vernal habitats, threatened species (northern pine snake) and off-site habitat enhancements, a complete construction sequence has not yet been developed. However, a construction schedule for each stage of the development and the required mitigation and enhancements will be provided to NJDEP in accordance with all permit conditions in advance of any work. Construction of the vernal habitat will occur and be completed prior to any impacts to the existing wetland habitat. As such, the following provides a general construction sequence for activities associated with the wetland impacts or mitigation:

- Issuance of CAFRA Individual Permit and Freshwater Wetlands Statewide General Permit No. 6. These permits authorize the development, including the filling of a 0.47-acre portion of the on-site isolated wetland.

- Silt fencing (as required by SCD) will be installed around the limits of disturbance associated with clearing and excavating of the mitigation site. Wire mesh pine snake barrier fencing will also be installed around the limits of disturbance if construction occurs during the active season for pine snake.

- The area will be screened for reptiles and amphibians by a qualified biologist prior to disturbance, regardless of season. Anything found will be removed from the area of disturbance and released to a suitable on-site location outside of the area of disturbance.

- Site clearing of vegetation from the footprint of the vernal habitat. Trees and shrubs will be removed to the minimum extent necessary to conduct the work. Woody debris will be stockpiled for later use in an area approved by NJDEP. Following seeding/mulching, some of this material will be spread or placed within and adjacent to the pool to provide places for egg laying and escape cover.

- Grading and excavation will achieve the desired configuration per the *Wetland Mitigation Plan* (last revised November 2, 2011) prepared by Bohler Engineering. Approximately 6 inches of topsoil and organic litter will be stockpiled in an area approved by NJDEP and will be used to contour the final surface of the vernal habitat.

- Select woody debris will be placed within and adjacent to the pool as shown on the *Wetland Mitigation Plan* (last revised November 2, 2011) prepared by Bohler Engineering.

- Exposed soils will be seeded with Ernst Seed Mixes as shown on the *Wetland Mitigation Plan* (last revised November 2, 2011) prepared by Bohler Engineering.

- The shallow portions of the pool and adjacent transition areas will be planted with native wetland/transition area trees, shrubs, and herbs as shown on the *Wetland Mitigation Plan* (last revised November 2, 2011) prepared by Bohler Engineering.

- As required by NJDEP, the constructed pool must be completed and available as breeding habitat prior to any disturbance of the existing vernal habitat. Following completion of the created vernal pool, construction within the existing on-site wetland may occur in accordance with the conditions of the Statewide General Permit No. 6.

## V. SUMMARY AND CONCLUSION

In summary, the applicant proposes to construct a 1-acre vernal habitat to mitigate for a 0.47-acre disturbance to an isolated wetland occurring as part of the development plan for the site. The created vernal habitat will meet all of the mitigation requirements of the CAFRA and the Freshwater Wetlands Protection Act Rules. It has been designed to provide breeding habitat for vernal pool species and to provide equal or greater functions and values than the wetland that will be impacted.

## REFERENCES


**Bohler Engineering. 2009.** Wetland Mitigation Plan, Sheet 1 of 1, June 26, 2009, Last revised November 2, 2011.

**Biebighauser, T. R. 2003.** A Guide to Creating Vernal Ponds. USDA Forest Service.

**Colburn, E.A. 2004.** Vernal Pools: Natural History and Conservation. The McDonald & Woodward Publishing Company, Blacksburg, Virginia.

**EcolSciences, Inc. 2006.** Northern Pine Snake Study Results, Block 505, Lots 14 & 15, Township of Dover, Block 44, Lots 2, 3, and Parts of 4 & 5, Township of Manchester Ocean County, New Jersey.

**Kenney, L.P. and M.R. Burne. 2002**. Salamanders, Frogs and Turtles of New Jersey's Vernal Pools.

**Gibbs, J.P., A.R. Breisch, P.K. Ducey, G. Johnson, J.L. Behler, and R.C. Bothner. 2007.** The Amphibians and Reptiles of New York State, Identification, Natural History, and Conservation. Oxford University Press, New York, New York.

**Mitchell, J.C., A.R. Breisch, and K.A. Buhlmann. 2006.** Habitat Management Guidelines for Amphibians and Reptiles of the Northeastern Untied States. Partners in Amphibians and Reptile Conservation, Technical Publication HMG-3, Montgomery, Alabama. 108 pp.

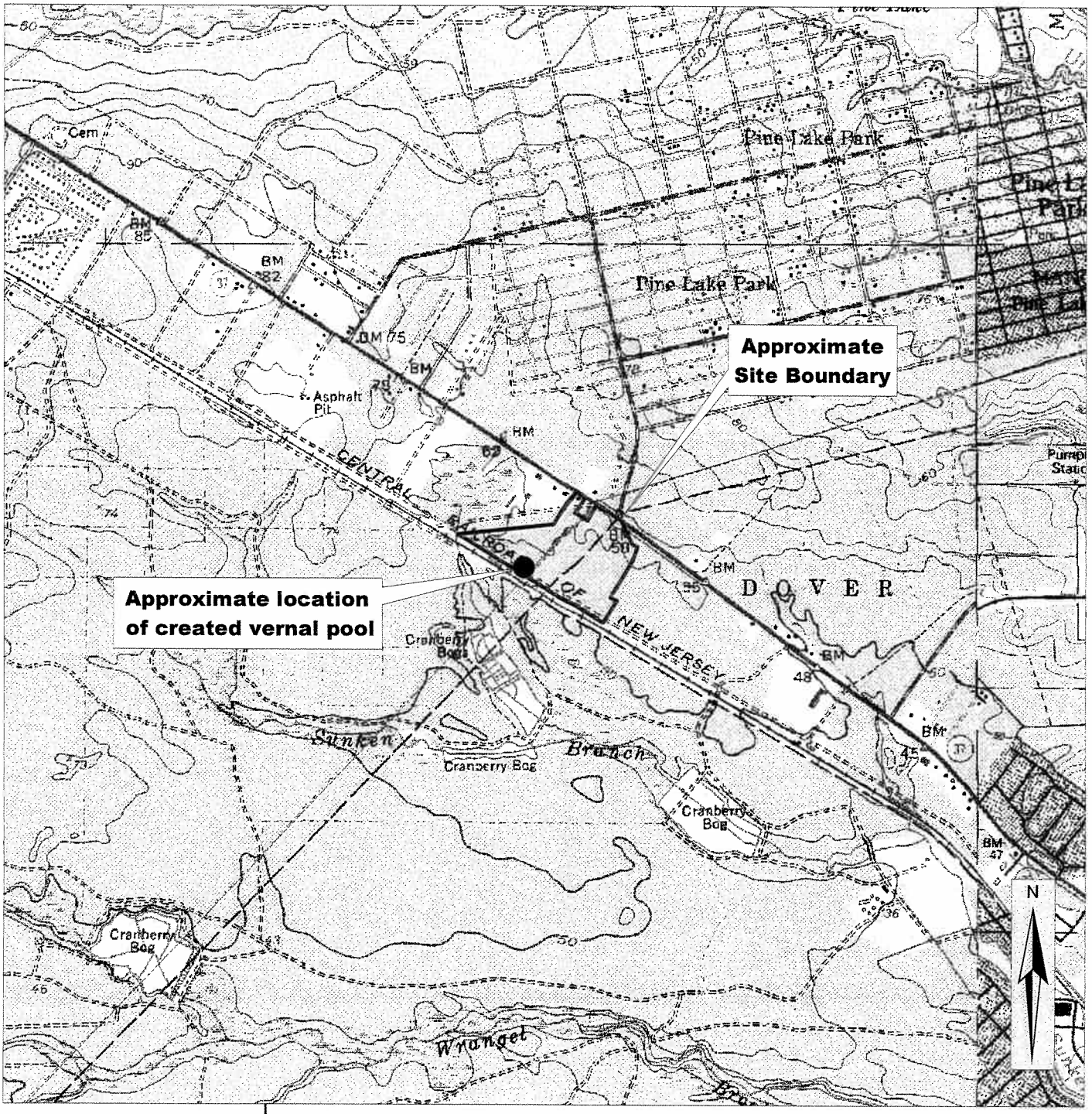
**Schwartz, V. and Golden. D. 2002.** Field Guide to Reptiles and Amphibians of New Jersey.

**United State Department of Agriculture, Soil Conservation Service. 1980.** Soil Survey of Ocean County, New Jersey.

# ATTACHMENT A

Figures

**EcolSciences, Inc.**
**Environmental Management & Regulatory Compliance**




SITE LOCATION

State Plane Coordinates (New Jersey NAD 83)
556,508' E; 420,839' N

## FIGURE 1: USGS SITE LOCATION

Block 44, Lots 2, 3, 4, 5 -Township of Manchester
Block 505, Lots 14 and 15 - Township of Toms River
Ocean County, New Jersey

Source: USGS Keswick Grove, NJ Quadrangle

**EcolSciences, Inc.**
Environmental Management & Regulatory Compliance

Date: 11/1/11

Scale 1:24,000

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# ATTACHMENT B

Annotated Photographs

**EcolSciences, Inc.**
**Environmental Management & Regulatory Compliance**

1

Photograph of the forested on-site isolated wetland in the vicinity of the proposed General Permit No. 6 activities.

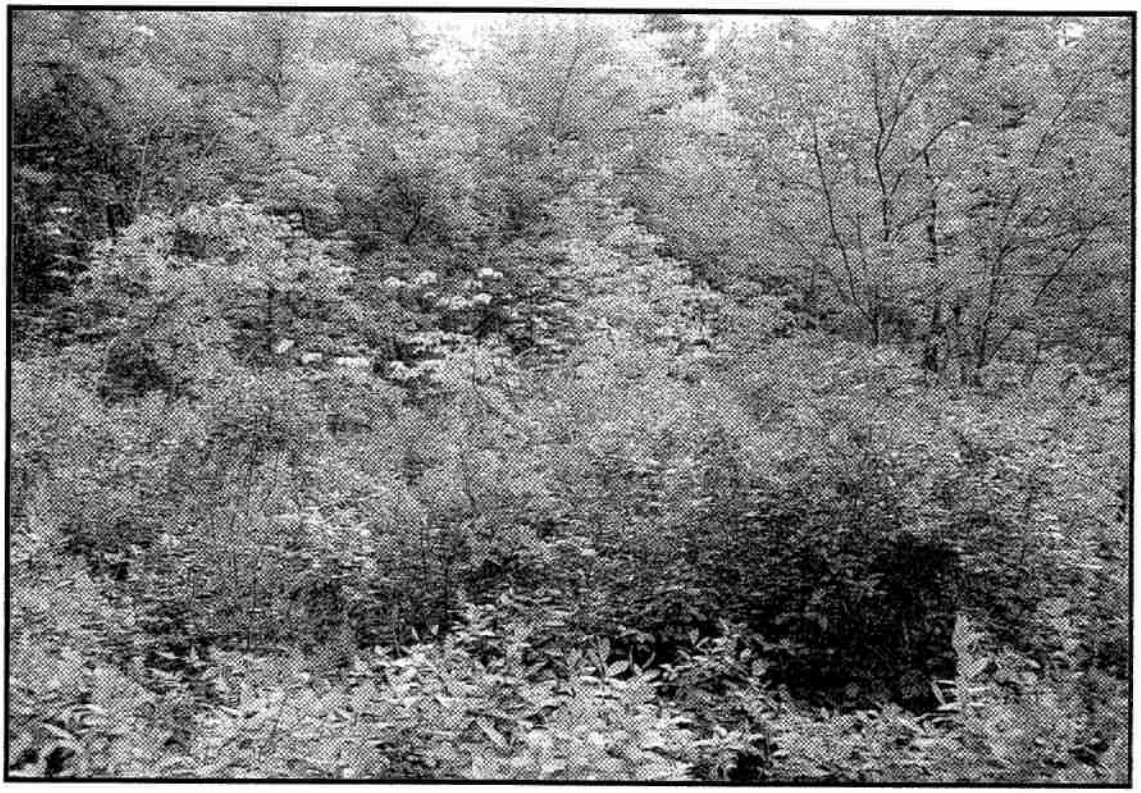
2

Photograph of a sphagnum depression within the on-site isolated wetland.

3

Photograph of the shrub-dominated western portion of the on-site isolated wetland.

4

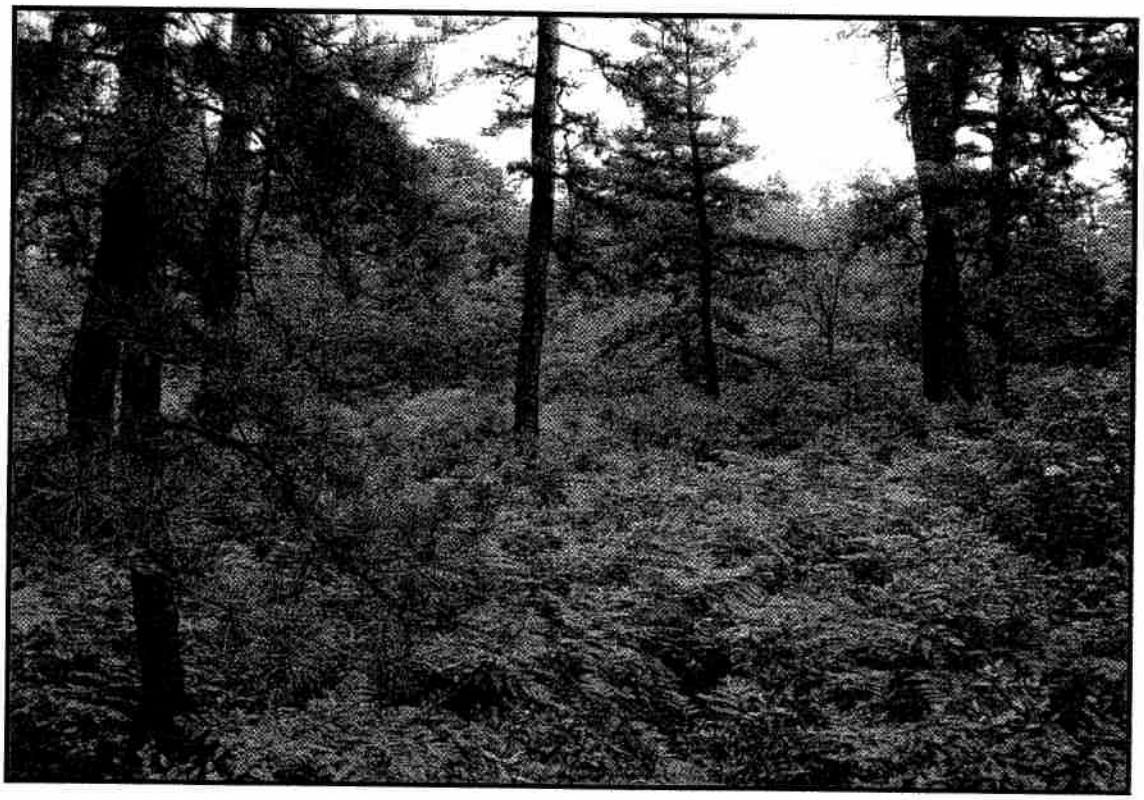


Photograph of the shrub-dominated western portion of the on-site isolated wetland as seen from the adjacent proposed vernal habitat mitigation area.

5

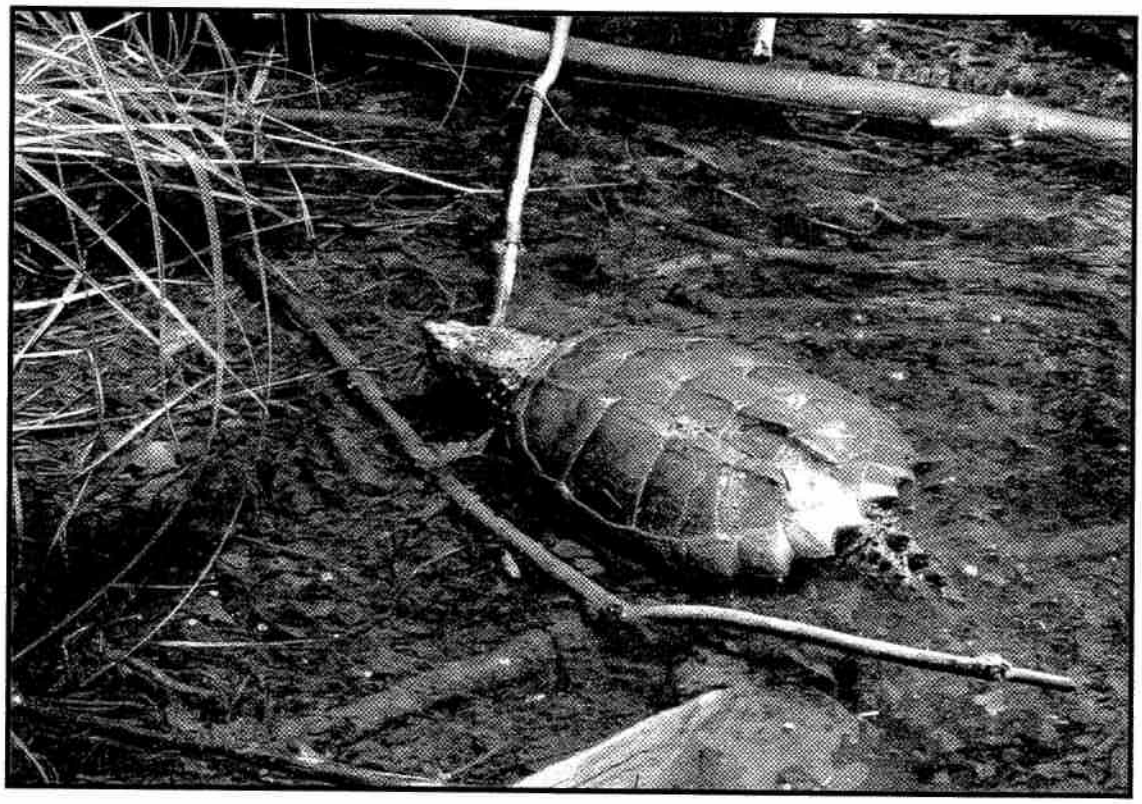
Photograph of the scrub/shrub uplands located within a portion of the proposed vernal habitat mitigation area.

6



Photograph of the upland pitch pine and scrub/shrub woodlands located within a portion of the proposed vernal habitat mitigation area.

7



Photograph of a common snapping turtle observed on the site.

8

Photograph of a southern leopard frog observed on the site.

9

Photograph of another on-site wetland located in the western portion of the site. The vernal habitat mitigation site is located between this wetland and the isolated wetland that will be disturbed for the development.

# ATTACHMENT C

Qualifications of Preparers

# ECOLSCIENCES, INC.
## CORPORATE HISTORY

EcolSciences, Inc., was founded in 1973 in response to the growing need for responsible environmental planning, as mandated by NEPA, The National Environmental Policy Act. EcolSciences specializes in performing environmental investigations relating to permit acquisition and regulatory compliance, demonstration of "due diligence", waste management, impact analysis, mitigation and remediation. EcolSciences' strength is a proficiency in current environmental and waste management laws, regulations, and policies, coupled with a practical problem-solving approach to analyzing the environmental consequences of projects.

During its thirty-three years, EcolSciences has successfully completed more than 10,000 studies for private, quasi-public and public clients. EcolSciences has represented many of the country's leading industries, corporations, developers, and financial institutions including AT&T, American Cyanamid Company, Lucent Technologies, Merck, Johnson & Johnson, Hartz Mountain Industries, Exxon, K. Hovnanian Companies, Roseland Property Company, Trammell Crow Company, Principal Real Estate Investors, PNC Bank, The Bank of New York, and JP Morgan Chase. Among the many utilities that EcolSciences has served are Jersey Central Power & Light, New Jersey Natural Gas Company, Verizon Wireless, Sprint, Elizabethtown Gas Company, Essex and Hudson County Improvement Authorities, Ocean County Utilities Authority, and numerous municipal utilities authorities. Representative government agency clients include the U.S. Environmental Protection Agency, New York City Economic Development Corporation, New York City Department of Design and Construction, and New York City Department of Sanitation.

EcolSciences' interdisciplinary staff of environmental engineers, geologists, biologists and scientists has extensive experience in a diversity of studies related to biological assessment and toxic and hazardous materials management. EcolSciences has performed environmental assessments and has acquired appropriate permits and approvals under a wide variety of federal, state, regional, and local jurisdictions. These include, but are not limited to: federal Section 404 and Section 10 authorizations; New York SEQRA and CEQR approvals; New Jersey CAFRA, Waterfront Development, and Freshwater Wetlands Protection Act permits (both general and individual); NJ Pinelands Commission certifications; Hackensack Meadowlands Development Commission (HMDC) approvals; and Delaware & Raritan Canal Commission

approvals. EcolSciences' senior staff is experienced in the delivery of expert testimony; senior staff of the firm have testified in public hearings, Administrative Law proceedings, and county, regional and municipal planning boards.

Since the promulgation of the New Jersey Environmental Cleanup Responsibility Act (ECRA) and its successor, the Industrial Site Recovery Act (ISRA), EcolSciences has been involved in the implementation of the entire ECRA/ISRA program for its industrial clients. More recently, as the demonstration of "due diligence" has become a lending industry standard, EcolSciences has completed numerous Phase I environmental audits per ASTM E1527-05 and AAI and follow-up Phase II studies to clarify the level of environmental risk and liability associated with past and current practices at a particular site or facility. These audits typically include such activities as hazardous materials inventories, building and site inspections, subsurface soil investigations, groundwater monitoring, tank testing, asbestos bulk sampling, development of remediation plans and supervision of cleanup activities. The firm and technical staff members are also certified by the NJDEP for the performance of underground storage tank installation, closure, and subsurface evaluation. All work is conducted under the supervision of a licensed professional engineer.

The biological staff of EcolSciences has conducted over 4,000 wetland delineations and environmental assessments throughout the eastern and central portions of the United States. Our staff is skilled in all technical aspects of wetland identification and delineation methodologies established by the ACOE, USFWS, EPA and SCS; the assessment of wetland functions and values using techniques such as HEP, WET, and IVA; the assessment of development-related wetland impacts, the acquisition of wetland permits, and the development and implementation of mitigation plans. Key members of our staff are certified as Professional Wetland Scientists and provisionally certified by the ACOE. Additionally, EcolSciences' biologists routinely perform specialized studies related to federally- and state-listed threatened and endangered plant and animal species, wildlife habitat surveys, and the assessment of development-related impacts. Three of EcolSciences' biologists are USFWS Qualified bog turtle surveyors and two are NJDEP Qualified Ornithologists.

EcolSciences is a multi-disciplinary firm that has the experience and capabilities to provide a full range of environmental services. Studies are conducted in a manner that emphasizes the balance of environmental, engineering and cost factors. This approach provides the information necessary for sound and practical project decisions.

# DAVID P. MOSKOWITZ

**EDUCATION:**

*B.A., 1984 - Environmental Studies*
*George Washington University, Washington, D.C.*

*M.S. 2000 - Environmental Policy Studies*
*New Jersey Institute of Technology, Newark, N.J.*

*Ph.D. Program – Entomology*
*Rutgers University, New Brunswick, N.J.*

**PROFESSIONAL AFFILIATIONS:**

*Society of Wetland Scientists*
*Association of Field Ornithologists*
*ASTM Environmental Committee (1998-2002)*
*Dragonfly Society of the Americas*

**PROFESSIONAL CERTIFICATIONS:**

*Professional Wetland Scientist - SWS*
*Certified Wetland Delineator - Corps of Engineers*
*USEPA Wetland Delineation - WTI*
*Qualified Ornithologist - NJDEP*
*Qualified Bog Turtle Surveyor - USFWS*

**OTHER:**

*Wetland Journal Technical Review Board (2000-2002)*
*SWS Certification Review Panel (1998-2001)*
*Poricy Park Board of Directors (1999-2002)*
*East Brunswick Environmental Commission*
*USFWS N.J. Breeding Bird Survey Coordinator (1995-1997)*
*Identification of Sedges and Rushes - Rutgers University*
*Field Identification of Raptors - University of Maine*
*Identification of Adult Dragonflies - University of Maine*
*Identification of Larval Dragonflies - University of Maine*
*Systematics & Conservation of Lepidoptera - University of Maine*
*Identification of Microlepidoptera – University of Maine*

**EXPERIENCE:**

Mr. Moskowitz is a Senior Vice President with EcolSciences, Inc. During the past 23 years, Mr. Moskowitz has conducted more than 4,000 environmental studies for a wide range of clients including government agencies, and the development, legal, engineering and financial professions. These studies have focused on wetland and wildlife issues including delineations, mitigation, field surveys and regulatory compliance as well as Phase I, Phase II and Brownfields Redevelopment. Mr. Moskowitz has also provided expert testimony before numerous municipal boards and the New Jersey Meadowlands Commission and has been qualified as an expert in Superior Court of New Jersey, New Jersey Office of Administrative Law, New Jersey Condemnation Commission, and the Morris County Board of Taxation. Mr. Moskowitz has published more than two-dozen technical and popular papers on wildlife, wetland, and threatened and endangered species related topics and has lectured widely on numerous environmental topics.

**Wetland Studies**
Directed and participated in more than 3,000 field studies in NJ, NY, PA, MD and CT evaluating all aspects of wetland ecology. Representative experience includes:

- The evaluation of more than 10,000 acres in the New Jersey Highlands.
- The evaluation of more than 7,500 acres in the complex red soils of the New Jersey Piedmont.
- The evaluation of nearly 3,000 acres on Staten Island, New York.

**Brownfields and Site Investigation Studies**
Principal in charge of numerous Phase I Environmental Assessments, historic pesticide investigations and remediatial activities, hazardous waste investigations and brownfields redevelopment projects.

**Wetland Mitigation Studies**
Numerous mitigation plans have been prepared to remedy regulatory violations of various State and Federal wetland laws, and to compensate for wetland losses resulting from permitted wetland fills. Two examples of the wide variety of studies include:

Preparation of mitigation plans and specifications for the remediation of wetlands and shorelines of the Freshkills Sanitary Landfill, Staten Island, New York.

Design and implementation of a 13-acre wetland restoration project in Morris County, New Jersey utilizing air conditioning condensation as a hydrologic supplement.

**Threatened and Endangered Species Studies**
Designed, directed and participated in numerous field studies for rare plant and animal species including Bog Turtle, Bald Eagle, Wood Turtle, Northern Pine Snake, Long-eared owl, Blue Spotted Salamander, Long Tailed Salamander, Pine Barrens Tree Frog, Great Blue Heron, Coopers Hawk, Grasshopper Sparrow, Savannah Sparrow, Upland Sandpiper, Barred Owl, Swamp Pink, Knieskern's Beaked Rush, Curly Grass Fern and Barrett's Sedge.

**Ornithological Studies**
Numerous studies conducted throughout the northeast designed to evaluate and census individual species, avian communities and habitats, to assess potential impacts upon the species and habitats associated with land development proposals, and to comply with State and Federal Wildlife regulations. Two examples of the wide variety of studies include:

Long-eared owl habitat evaluation, pellet analysis and management plan in Somerset County, New Jersey.

Two-year avian census, habitat evaluation and regulatory assessment for the proposed redevelopment of Flushing Airport in Queens, New York by the New York City Economic Development Corporation. Breeding, wintering and migratory utilization of the site was comprehensively evaluated and barn owl pellet analysis was conducted to augment small mammal population studies.

Bald eagle Assessments – Habitat assessments and field surveys for bald eagle have been conducted throughout New Jersey, New York, New Hampshire and Pennsylvania. These assessments have been part of due diligence investigations and site planning. In addition, the reviews have involved negotiations with regulatory personnel at both state and federal agencies and testimony before the New Jersey Office of Administrative law.

**Commercial/Residential/Industrial Studies**

More than 3,000 properties have been evaluated throughout NJ, NY, PA, and CT to assess potential environmental impacts from proposed development and to insure regulatory compliance with various Local, State and Federal environmental laws. Tasks have included wetland delineation, permit acquisition and mitigation planning.

**Corridor Studies**

Designed, directed and participated in ecological studies and regulatory assessments for more than 350 linear miles of road corridors, gas and electric transmission right of ways and sewer and water alignments. Studies have been performed for the New Jersey Turnpike Authority, New Jersey DOT, Jersey Central Power and Light, New Jersey Natural Gas, and numerous local governments.

**Special Environmental Studies**

A wide range of ecological studies have been conducted for various private clients, the USEPA and other government agencies. Representative studies include:

- Bird, mammal, dragonfly, damselfly, butterfly and floral surveys for the proposed Catskill/Delaware Water Treatment Facility in Weschester County, New York.

- Habitat assessments for Pine Barrens Tree Frog and River Otter in New Jersey.

- An avifaunal study of a 500-acre proposed incinerator ash landfill site in New York, conducted for a county agency, to evaluate FAA concerns about bird strike hazards to aircraft passing over the site, resulting in the preparation of a Bird Deterrent Plan.

- Biological studies of the impacts of Folcroft Landfill upon ecological communities of Tinicum National Environmental Center, Philadelphia, PA for the USEPA, Region III.

- Red-Headed Woodpecker evaluation of two central New Jersey properties.

**Publications/Articles**

Moskowitz, D.P., 1996. Swamp Pink: A Federally-Listed Threatened Species. Wetland Journal 8(3): 14-16.

Moskowitz, D., Auffenorde, T. and M. Kovacs, (1997). Vegetation and Surrounding LandscapeCharacteristics of Long-Eared Owl (*Asio otus*) Winter Roosts in Central New Jersey. Records of New Jersey Birds. (23)1 : 2-6.

Moskowitz, D.P., 1997. Wetland Restoration Using Non-Contact Cooling Water and Stormwater Runoff as a Supplemental Hydrologic Source. Wetland Journal 9(1): 17-20.

Moskowitz, D.P., 1997. Hine's Emerald Dragonfly (*Somatochlora hineana)*: The First FederallyEndangered Dragonfly. Wetland Journal (9)3: 12-14.

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Moskowitz, D.P., 1998. A Wetland Delineation Primer for the Professional Land Surveyor. Professional Surveyor Magazine. 18(1): 22-28.

Moskowitz, D.P. and D.M. Bell., 1998. Archilestes Grandis (Great Spreadwing) in Central New Jersey, with Notes on Water Quality. Bulletin of American Odonatology. 5(3): 49-54.

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Moskowitz, D.P., 2000. A Comparison of Field-Delineated Wetlands to the New Jersey Freshwater Wetland Maps. M.S. thesis - New Jersey Institute of Technology.

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Moskowitz, D., 2000. A New County Record for Archilestes Grandis in New York with Notes on Habitat and Water Quality. ARGIA 12(4): 7-8.

Moskowitz, D.P., 2000. Habitat Notes on a Winter Saw-whet Owl (*Aegolius acadicus*) Roost in Central New Jersey. Records of New Jersey Birds. 26(4): 138-139.

Moskowitz, D., 2000. Book Review: Dragonflies through Binoculars - A Field Guide to Dragonflies of North America. Wetland Journal 12(4): 41.

Poricy Park Citizens Committee. 2001. A Checklist and Guide to the Butterflies of Poricy Park. Pamphlet.

Moskowitz, D. P. 2001. First Record of the Queen Butterfly (*Danaus gilippus* Cramer) in New Jersey. News of the Lepidopterists' Society 43(3): 72, 74.

Moskowitz, D., J. Moskowitz, S. Moskowitz and H. Moskowitz. 2001. Notes on a large dragonfly and butterfly migration in New Jersey. Northeastern Naturalist 8(4): 483-490.

Moskowitz, D. P. 2002. An unusual interaction between a banded hairstreak butterfly (*Satyrium calanus*) Lycaenidae and a stink bug (*Banasa dimidiata*) Pentatomidae. Entomological News 113:(3) 183-186.

Moskowitz, D. P. 2002. Was there an invasion of the Queen butterfly (*Danaus gilippus* Cramer) in the northeastern United States in 2001? News of the Lepidoptersists' Society 44(2): 66-67.

Newgard, L. and D. Moskowitz. Bog turtle: It's small, secretive, rare, and it's in our hiking region Trailwalker 29(4): p. 5.

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Moskowitz, D. February 2007. The Spring Peeper – The Tiny Frog with the Loud Voice. NJ\NY Trailwalker.

Moskowitz, D. May 2007. Butterflies Along The Appalachian Trail. NJ\NY Trailwalker

Wikelski, M., et al. (submitted 4\1\2009 to PLOS BIO). Large-range Movements of Neotropical Orchid Bees Observed Via Radio Telemetry.

## SCOTT E. MCDONNELL

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**EDUCATION:**

*B.S. Ecology & Natural Resources, May 2007, with Honors*
*Rutgers University, New Brunswick, New Jersey*

*B.S. Environmental & Business Economics, May 1998*
*Rutgers University, New Brunswick, New Jersey*

*Environmental Geomatics Certificate, May 2007*
*Rutgers University, New Brunswick, New Jersey*

**AREAS OF EXPERTISE:**

*Threatened and Endangered Species Surveys*
*Wildlife Habitat Assessment*
*Wetland Delineation and Permitting*
*Geographic Information Systems*

**PROFESSIONAL CERTIFICATIONS:**

*USFWS Qualified Bog Turtle Surveyor, New Jersey and New York*

**CERTIFICATIONS:**

*Rutgers University Office of Continuing Professional Education*
*Wetland Delineation Certificate Series (2007)*

**EXPERIENCE:**

Mr. McDonnell is an Environmental Scientist with EcolSciences, Inc. He has conducted numerous environmental studies for a wide range of clients including government agencies, major utilities, development and legal professions, and private industry. His responsibilities include: the implementation and documentation of wildlife habitat assessments and species surveys, the delineation of wetlands based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, the preparation of applications for Letters of Interpretation, Transition Area Waivers, General Permits and Individual Permits in accordance with the New Jersey Freshwater Wetlands Protection Act, Flood Hazard Area Control Act, Coastal Area Facility Review Act, and Waterfront Development Law, and the use of Geographic Information Systems (GIS) in its capacity as an instrument of environmental analysis.

A summary of Mr. McDonnell's relevant experience includes:

- Phase I and II surveys and habitat evaluations for the Federally-threatened and State-endangered bog turtle (*Glyptemys muhlenbergii*) in Counties of Burlington, Camden, Gloucester, Hunterdon, Morris, Passaic, Salem, Sussex, and Warren, New Jersey.

- Habitat assessments and field surveys for the State-threatened northern pine snake (*Pituophis melanoleucus melanoleucus*) on proposed development properties in the Counties of Atlantic, Burlington, Cape May and Ocean, New Jersey. Studies employed drift fences, funnel traps, visual searches and radio telemetry equipment.

- Habitat assessments and field surveys for the State-threatened wood turtle (*Glyptemys insculpta*) on proposed development properties in central and northern New Jersey. Studies employed visual searches and radio telemetry equipment.

- Habitat assessments and field surveys for the State-endangered timber rattlesnake (*Crotalus horridus*) on proposed development properties in the Counties of Morris and Sussex, New Jersey and Orange, New York.

- Field surveys for the State-endangered red-shouldered hawk (*Buteo lineatus*) and northern goshawk (*Accipiter gentiles*), and the State-threatened red-headed woodpecker (*Melanerpes erythrocephalus*), barred owl (*Strix varia*) and Cooper's hawk (*Accipiter cooperii*) on proposed development properties in Counties of Atlantic, Burlington, Essex, Gloucester, Morris, Ocean and Sussex, New Jersey.

- Additional field surveys for the State-endangered blue-spotted salamander (*Ambystoma laterale*), southern gray treefrog (*Hyla chrysoscelis*), and State-threatened pine barrens treefrog (*Hyla andersonii*).

- Vernal habitat assessments and surveys in accordance with protocols developed by the NJDEP and the New York Department of Environmental Conservation (NYDEC). Pertinent information was gathered on hydrology, vegetation, observed reptile and amphibian species, and weather conditions.

- Surveys for numerous rare plants including the Federally-threatened and State-threatened small-whorled pogonia (*Isotria medeoloides*), the Federally-threatened and State-endangered swamp pink (*Helonias bullata*) and the NJ Pinelands Commission listed little ladies' tresses (*Spiranthes tuberosa*).

- Submitted new sighting records of barred owl, Cooper's hawk, red-shouldered hawk, bog turtle, wood turtle, northern copperhead, northern pine snake, timber rattlesnake, swamp pink, pawpaw (*Asimina triloba*) and wahoo (*Euonymus atropurpureus*) to the NJDEP Endangered & Nongame Species Program and the New Jersey Natural Heritage Program.