# Appendix A: Correspondence

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

June 4, 2002

Mr. Michael Nowicki
Biologist
Ecological Solutions, LLC
1248 Southford Road
Southbury, CT 06488

Dear Mr. Nowicki:

This responds to your letters of May 7, 2002, requesting information on the presence of endangered or threatened species in the vicinity of the residential subdivisions proposed at the following locations:

1. Stoneridge Residential Subdivision on Route 52 near Route 27 in the Town of East Fishkill, Dutchess County, New York.

2. Summit Woods Residential Subdivision on Route 52 near Interstate 84 in the Town of East Fishkill, Dutchess County, New York.

The bog turtle (*Clemmys muhlenbergii*) is known to occur in the vicinity of both the proposed Stoneridge and Summit Woods Residential Subdivisions. This species is listed as threatened by the U.S. Fish and Wildlife Service (Service). The Service recommends, therefore, that an evaluation be completed of any existing habitat that would be disturbed by the projects, and its potential to support the bog turtle. Bog turtles prefer open canopy wetlands with soft saturated soils such as fens or sedge meadows fed by seeps and springs of cold groundwater that has been in contact with calcium rich bedrock or soils. In New York, bog turtles are very often found in or near rivulets having deep mucky substrate, but where above-surface water depths are very shallow - usually only a few inches deep at most. Plant species commonly associated with bog turtle habitats include tamarack (*Larix laricina*), cinquefoil (*Potentilla* spp.), alders (*Alnus* sp.), willows (*Salix* sp.), sedges (*Carex* sp.), sphagnum moss (*Sphagnum* sp.), jewelweed (*Impatiens capensis*), rice cut-grass (*Leersia oryzoides*), tearthumb (*Polygonum sagittatum*), arrow arum (*Peltandra virginica*), red maple (*Acer rubrum*), skunk cabbage (*Symplocarpus foetidus*), rushes (*Juncus* sp.), and bulrushes (*Scirpus* sp.). If the evaluation indicates that the sites have the potential to support the bog turtle, the sites should be surveyed by a qualified person to determine the presence or absence of this species.

The project's environmental documents should identify any direct, indirect, and cumulative impacts on the bog turtle and its habitat, and include appropriate measures, if necessary, to protect this species and its habitat. This information should be forwarded to this office and it will be used to evaluate potential impacts on either the bog turtle or its habitat, and to determine

the need for further consultation pursuant to Section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Except for the bog turtle and occasional transient individuals, no other Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the respective project impact areas. In addition, no habitat in the respective project impact areas is currently designated or proposed "critical habitat" in accordance with the provisions of the Endangered Species Act. Should project plans change, or if additional information on listed or proposed species or critical habitat becomes available, this determination may be reconsidered. A compilation of Federally listed and proposed endangered and threatened species in New York is enclosed for your information.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

The Blanding's turtle (*Emydoidea blandingii*) is found in the vicinity of the proposed Stoneridge Residential Subdivision. The Blanding's turtle is considered a species of concern (formerly known as Category 2 Candidate species) by the Service and its status is being monitored throughout much of its range. Species of concern do not receive substantive or procedural protection under the Endangered Species Act; however, the Service does encourage Federal agencies and other appropriate parties to consider these species in the project planning process.

Potential habitat for this species consists of wetland areas with water depths from 1 to 5 feet vegetated with aquatic emergents and aquatic shrubs. Generally, wet or flooded woods (forested wetland), wet meadows, and/or deep water wetlands do not provide suitable habitat for this species. The wetlands at the site may contain excellent habitat for this species. An evaluation of any existing habitat and its ability to support the Blanding's turtle should be completed. If the evaluation indicates that the site has the potential to support the Blanding's turtle or its habitat, the site should be surveyed by a qualified person to determine the presence or absence of this species. The project's environmental documents should include an evaluation of the potential direct, indirect, and cumulative effects of the proposed activities on this species, and include appropriate measures, as necessary, to protect this species and its habitat. When specific detailed project plans are available for the project area, the plans and the results of the evaluation and potential surveys should be provided to this office for our review and comment.

The bog turtle is listed as an endangered species and the Blanding's turtle as a threatened species by the State of New York. The results of the evaluations discussed above and any plans for surveys, their timing, and the results should be coordinated with both this office and with the New York State Department of Environmental Conservation (State). The State contact for the bog and Blanding's turtles is also Mr. Peter Nye, Endangered Species Unit, 625 Broadway, Albany, NY 12233 (telephone: [518] 402-8859).

For additional information on fish and wildlife resources or State-listed species, we suggest you contact the appropriate New York State Department of Environmental Conservation regional office(s) as shown on the enclosed map, and:

New York State Department of Environmental Conservation
New York Natural Heritage Program Information Services
625 Broadway
Albany, NY 12233
(518) 402-8935

Since wetlands may be present, you are advised that National Wetlands Inventory (NWI) maps may or may not be available for the project areas. However, while the NWI maps are reasonably accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems
302 Rice Hall
Cornell University
Ithaca, NY 14853
(607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting the appropriate Corps office(s) as shown on the enclosed map.

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely,

Mark W. Clough

Acting For

David A. Stilwell
Field Supervisor

Enclosures

cc: NYSDEC, New Paltz, NY (Environmental Permits)
NYSDEC, Albany, NY (Natural Heritage Program)
NYSDEC, Albany, NY (Endangered Species Unit, Attn: P. Nye)
COE, New York, NY

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, NY 13045

November 30, 2004

Mr. Mark A. Day
M.A. Day Engineering, PC
942 Route 376, Suite 218
Wappingers Falls, NY 12590

Dear Mr. Day:

This letter is in regards to the proposed 325.22-acre Summit Woods Residential Subdivision on Route 52 near Interstate 84 in the Town of East Fishkill, Dutchess County, New York. We understand that the proposed project includes 175 lots for single-family homes with 177 acres to be protected as open space. We also understand that the applicant has applied for several permits from the New York State Department of Environmental Conservation (NYSDEC) and that a Federal agency, the U.S. Army Corps of Engineers (USACE), is involved through authorizations under Section 404 of the Clean Water Act. Please be aware that Federal agencies have responsibilities under Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to consult with the U.S. Fish and Wildlife Service (Service) regarding projects that may affect Federally-listed or proposed species. Thus, further coordination and consultation between the USACE and Service will be needed as required at 50 CFR § 402. Further information regarding listed species is below.

The Service initially provided comments on this project in our June 4, 2002, letter to Mr. Michael Nowicki of Ecological Solutions, LLC. In that letter, we stated that there was potential for the Federally-listed threatened bog turtle (*Clemmys muhlenbergii*) and the New York State-listed Blanding's turtle (*Emydoidea blandingii*) to occur within the project area and that an evaluation of the habitat characteristics for both species should occur. We also stated that if the evaluation indicated that the site had potential to support either species, that the site should be surveyed by a qualified person to determine whether the species were present. Finally, we stated that the project's environmental documents should identify potential impacts to the species and that information should be forwarded back to our office for further review to determine whether additional coordination or consultation was necessary. Since writing that letter, we have gathered additional information on the potential presence of Federally-listed species within the proposed project area and offer the following comments for your consideration.

NATURAL RESOURCES STUDY

We would like to note that the Service was never contacted regarding the proposed project after our June 4, 2002, letter was sent to Mr. Nowicki, and so we were unsure of the status of the proposed project until we noticed that it was referred to in the cumulative effects section of an environmental impact statement (reviewed in September 2004) for another proposed project in the Town of East Fishkill. On September 29, 2004, Ms. Robyn Niver, of this office, contacted

Mr. Nowicki to determine the status of the Summit Woods project, as we had obtained new information regarding the potential presence of the Federally-listed endangered Indiana bat (*Myotis sodalis*) within the proposed project area. Mr. Nowicki stated that he had completed the biological assessment work for the project and offered to participate in a site visit with the Service.

Mr. Nowicki also stated that the site was now a known bog turtle site based on survey work done in 2004. Ms. Niver also contacted you on September 29, 2004, and requested additional information on the proposed project and discussed the potential for a site visit. On October 6, 2004, Mr. Nowicki, Ms. Niver, and Mr. Alan Hicks, of the NYSDEC, conducted the site visit, primarily to determine whether there was any potential suitable Indiana bat habitat within the site. The following comments are separated by species for your convenience.

Indiana bat

The Indiana bat is known to winter in six counties in New York State. While we have learned a great deal about the wintering population with standardized biennial counts organized by the NYSDEC Endangered Species Unit, we are continuing to study Indiana bat migratory patterns and summer habitat use within the state. Previous research has documented Indiana bat movements of up to 330 miles between hibernacula and summer habitats (Kurta and Murray 2002). However, that study, as well as the majority of research on Indiana bats, took place in the Midwest.

In the Northeast, multiple State and Federal agencies are investigating Indiana bat movements and the most recent studies of bats from hibernacula in Essex and Ulster Counties, New York, provide additional information. In the spring of 2002 through 2004, the NYSDEC successfully tracked female Indiana bats from their hibernacula in Essex and Ulster Counties to their spring roosts, distances up to 30 miles. From the Ulster County study, multiple roosts were located on both sides of the Hudson River near the City of Poughkeepsie and in the Towns of Beekman, East Fishkill, and La Grange, Dutchess County, and in the Towns of Crawford, Wallkill, Hamptonburgh, and New Windsor, Orange County. The closest observed roost trees were less than 2 miles from the proposed site and the Ulster County hibernacula are approximately 27 miles from the proposed site. Based on the proximity of the proposed project site to both the hibernacula and known spring roost locations, the Indiana bat has a high likelihood of using the proposed project site if suitable habitat is present.

This species is typically associated with cave habitats for hibernacula and trees with exfoliating bark for roosting. Suitable potential summer roosting/maternity habitat is characterized by trees (dead, dying, or alive) or snags, greater than or equal to 5 inches diameter breast height, that have characteristics typical of roost sites for Indiana bats, having exfoliating or defoliating bark, or containing cracks, crevices, or holes that could potentially be used by Indiana bats as a roost.

Streams, associated floodplain forests, and impounded water bodies (ponds, wetlands, reservoirs, etc.) provide preferred foraging habitat for pregnant and lactating Indiana bats, some of which may fly up to 1.5 miles from upland roosts. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.*, old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (U.S. Fish and Wildlife Service 1999).

During the October 6, 2004, site visit, we determined that the majority of potential Indiana bat habitat occurred within the proposed open space area and that additional habitat occurred along the existing drive. Further coordination is necessary to ensure that we fully understand the proposed project and to determine whether we will have any recommendations to avoid or minimize adverse impacts to the Indiana bat (*e.g.*, conducting tree felling activities in the fall through early spring while Indiana bats are in their hibernacula).

Bog turtle

As mentioned above, Mr. Nowicki informed the Service that the proposed project was a newly confirmed bog turtle site during a September 29, 2004, telephone conversation. Through conversations with the New York Natural Heritage Program, we understand that bog turtles were confirmed within the NYSDEC wetland HJ-49 in May of 2004. We understand that the Draft Final Environmental Impact Statement (Draft FEIS) was completed in April 2004, therefore, the information on confirmed bog turtle presence was not available for consideration in the project's environmental documents. However, Mr. Nowicki's July 8, 2002, Flora and Fauna Report for this project stated that, "the field investigation conducted from March/June 2002 by Ecological Solutions biologists revealed evidence of potential Bog Turtle habitat in the existing NYSDEC regulated wetland on the site... However, no evidence of the presence of threatened or endangered species was found during the attempts to identify specific habitat types" (Nowicki 2002). Based on the discovery of potentially suitable habitat, it would have been prudent for you or Mr. Nowicki to contact the Service to determine the need for surveys for the bog turtle (Phase II surveys). The Bog Turtle Recovery Plan (U.S. Fish and Wildlife Service 2001) provides guidelines for bog turtle surveys and we have enclosed a copy of the guidelines for your convenience. We do not consider habitat surveys adequate to actually find bog turtles. Furthermore, the identification of potential bog turtle habitat was never mentioned in the Draft Environmental Impact Statement (DEIS). Section 3.6.1 stated that, "the ability of the site to support endangered, threatened or special concern status species was also evaluated. The surveys were conducted during the months of March, April, and June 2002." It further stated that, "specific surveys for Blanding's Turtle (Emydoidea blandinghii) habitat yielded no sign of suitable habitat for species on the building portion of the site" (M.A. Day 2003). We could find no mention of the bog turtle throughout the report. There appears to be disconnect among our June 2002 letter, Mr. Nowicki's July 2002 Report, and the DEIS, Draft FEIS, and ultimate project planning. We may have been able to resolve this issue at an earlier phase of project planning and review had we been involved at an earlier date.

As stated above, bog turtles were confirmed within the NYSDEC wetland HJ-49 in May of 2004. While the sighting did not occur within the proposed project boundaries (surveys were being conducted for a separate project), the bog turtle was located within the contiguous wetland and therefore, the entire wetland is considered to be an occupied bog turtle site. Due to the presence of the bog turtle, additional coordination among you or the applicant, the USACE, the NYSDEC, and the Service is necessary to fully evaluate the potential impacts (direct and indirect) of the proposed development on bog turtles. For example, we are concerned about direct impacts to the wetland from the proposed water treatment plant outfall and utility lines crossings. There are also potential future impacts associated with maintenance of the utility lines and outfall.

We are also concerned about multiple potential indirect effects associated with the proposed project. The proposed development currently includes portions of the wetland and/or the 100-foot buffer of the wetland within individual lots. Due to the proximity of the lots to the wetland, adverse effects to bog turtle and their habitat could result. These adverse effects could



10/14/2004

include the introduction of contaminated surface water runoff into the wetland; introduction of yard and other waste materials into the wetland; introduction of people, pets, and recreational vehicles into the wetland; and death/injury of bog turtles that wander onto lawns and roads. Generally, the larger the upland buffer, the lower the risk of these potential adverse affects. The Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan (U.S. Fish and Wildlife Service 2001) (Appendix A - Bog Turtle Conservation Zones) includes recommendations for minimum buffers for various activities. You can find this document at http://nyfo.fws.gov/es/btconszone.pdf; we have enclosed a copy for your convenience.

In addition, multiple stormwater retention basins are currently proposed within the boundaries of the wetland and/or the 100-foot buffer of the wetland. Ideally, these basins would be designed to infiltrate flow back into the ground to feed the wetlands. If the basins clog, this will prevent infiltration resulting in evaporation of most of the water, and concentrating any contaminants (*e.g.*, anti-freeze, salt, oils). These concentrated contaminants would likely be washed out with high flows directly into the wetland. We would recommend relocating the stormwater retention basin locations to exclude all portions of the wetland, as well as the 100-foot buffer, at a minimum. However, additional measures may be necessary to avoid impacts to the bog turtle and/or its habitat.

In summary, we have concerns about both direct and indirect effects to the bog turtle and its habitat associated with the proposed project. We have provided examples of some potential adverse effects that should be addressed, however, there may be additional effects to consider. In addition, further coordination is necessary to ensure that potential impacts to Indiana bats are addressed. Finally, because it appears the project will involve a request for authorization of project impacts to waters of the U.S., including wetlands, through the Clean Water Act Section 404 permit program, additional coordination and consultation related to the potential effects of this project on listed species will need to take place. By copy of this letter, we will inform the USACE of the technical assistance we have provided thus far.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the ESA. This response does not preclude additional Service comments under other legislation.

The Indiana bat and bog turtle are listed as endangered by the State of New York. Further coordination is necessary with both this office and with the NYSDEC. The NYSDEC contact for the Endangered Species Program is Mr. Peter Nye, Endangered Species Unit, 625 Broadway, Albany, NY 12233 (telephone: [518] 402-8859).

We also have a comment on the existing wetland mapping for the proposed project. It appears that NYSDEC wetland PQ-17 is not mapped on the proposed project maps. The Hudsonia Map (Figure 3.6.1-1) in the DEIS and National Wetlands Inventory maps also depict wetland habitat in that section of the proposed project area. We recommend reviewing this further as multiple lots are currently proposed within the potential boundaries of wetland PQ-17.

Thank you for your time. We look forward to discussing this matter further. If you would like to set up a meeting or need additional information please contact Robyn Niver at (607) 753-9334.

Sincerely,

David A. Stilwell
Field Supervisor

References:

Kurta, A., and S.W. Murray. 2002. Philopatry and migration of banded Indiana bats (*Myotis sodalis*) and effects of radio transmitters. Journal of Mammalogy 83(2):585-589.

M.A. Day Engineering. November 18, 2003. Summit Woods Residential Subdivision Draft Environmental Impact Statement. M.A. Day Engineering, Wappingers Falls, NY.

Nowicki, M. July 8, 2002. Natural Resources Survey Summit Woods Subdivision, Route 52, Town of East Fishkill, New York. Ecological Solutions, LLC, Southbury, CT.

U.S. Fish and Wildlife Service. 1999. Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. Fort Snelling, MN: U.S. Department of the Interior, Fish and Wildlife Service, Region 3. 53 p.

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan. Hadley, Massachusetts. 103 pp.

Enclosures

cc: Town of East Fishkill, NY (Attn: P. Twomey)
NYSDEC, New Paltz, NY (Attn: S. Joule/M. Clancy)
NYSDEC, Albany, NY (Endangered Species; Attn: P. Nye/A. Breisch/A. Hicks)
NYSDEC, Albany, NY (Natural Heritage; Attn: J. Jaycox)
COE, New York, NY
NYFO, Project & BR Files
Niver File
ES:NYFO:RNiver:ram:mvd



MEET

**New York State Department of Environmental Conservation**
**Division of Fish, Wildlife & Marine Resources**
**New York Natural Heritage Program**
625 Broadway, 5th floor, Albany, New York 12233-4757
**Phone:** (518) 402-8935 • **FAX:** (518) 402-8925
**Website:** www.dec.state.ny.

Erin M. Crotty
Commissioner

November 14, 2005

Michael Rubbo
Chazen engineering
21 Fox Street
Poughkeepsie, NY 12601

Dear Mr. Rubbo:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed 325 acre Summit Woods Subdivision, site as indicated on the map you provided, located in the Town of East fishkill, Dutchess County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information

Sincerely,
Betty Ketcham jr
Betty A. Ketcham, Information Services
NY Natural Heritage Program

cc: Reg. 3, Wildlife Mgr.
Peter Nye, Endangered Species Unit, 5th flr, Albany

# Natural Heritage Report on Rare Species

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor,
Albany, NY 12233-4757
(518) 402-8935

~This report contains **SENSITIVE** information that may not be released to the public without permission from the NY Natural Heritage Program.
Refer to the User's Guide for explanations of codes, ranks and fields.
Ve do not provide maps for species most vulnerable to disturbance.

**REPTILES**

***Clemmys muhlenbergii***

| | | | | | |
|---|---|---|---|---|---|
| **Bog Turtle** | **NY Legal Status:** | Endangered | **NYS Rank:** | Imperiled | Office Use 11055 |
| | **Federal Listing:** | Threatened | **Global Rank:** | Vulnerable | |
| | **County:** | Dutchess | | | ESU |
| | **Town:** | East Fishkill | | | |
| | **Location:** | Documented within 1 mile of project site. Animals can move 1 mile or more from documented locations. For information, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Clemmys muhlenbergii***

| | | | | | |
|---|---|---|---|---|---|
| **Bog Turtle** | **NY Legal Status:** | Endangered | **NYS Rank:** | Imperiled | Office Use 11359 |
| | **Federal Listing:** | Threatened | **Global Rank:** | Vulnerable | |
| | **County:** | Dutchess | | | ESU |
| | **Town:** | Beekman, East Fishkill | | | |
| | **Location:** | Documented within 1 mile of project site. Animals can move 1 mile or more from documented locations. For information, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

***Clemmys muhlenbergii***

| | | | | | |
|---|---|---|---|---|---|
| **Bog Turtle** | **NY Legal Status:** | Endangered | **NYS Rank:** | Imperiled | Office Use 11564 |
| | **Federal Listing:** | Threatened | **Global Rank:** | Vulnerable | |
| | **County:** | Dutchess | | | ESU |
| | **Town:** | East Fishkill | | | |
| | **Location:** | Documented within 1 mile of project site. Animals can move 1 mile or more from documented locations. For information, please contact the NYS DEC Regional Wildlife Manager or NYS DEC Endangered Species Unit at 518-402-8859. | | | |

3 Records Processed

# Appendix B: Hudsonia Blanding's Turtle Assessment and Survey

Hudsonia
a nonprofit institute

Main Office (Field Station): (845) 758-7053
Fax: (845) 758-7033

Rhinebeck Office: (845) 876-7200
Fax: (845) 876-7220

PO Box 5000, Annandale, NY 12504-5000
www.hudsonia.org

# Blanding's Turtle Habitat Assessment and Survey, Tucker Tract Development Site, Town of East Fishkill, Dutchess County, New York

by Erik Kiviat, Ph.D.

Hudsonia Ltd.

P.O. Box 5000, Annandale NY 12504-5000

Report to J. Tesauro Ecological Consulting

6 July 2004

## Introduction

At the request of J. Tesauro Ecological Consulting, Hudsonia conducted a habitat assessment and survey for Blanding's turtle at the "Tucker tract" site in the Town of East Fishkill, Dutchess County, New York. The Tucker tract, shown on the Maser Consulting aerial photographic map dated 15 August 2001, is part of Tucker's Homestead Farms and is proposed for a residential subdivision. The site is located south of the junction of Route 52 and Route 216 near Stormville, and covers ca. 156 hectares (ca. 385 acres); it is shown on the Hopewell Junction, N.Y. and Poughquag, N.Y., 7.5 minute U.S. Geological Survey topographic map quadrangles. There are approximately 65 hectares (160 acres) of wetlands on the site, comprising state-regulated wetland HJ-49 and associated areas. Records of Blanding's turtle within 4 kilometers (about 2.5 miles) of the site, with intervening areas of potential habitat, indicated the need to address this threatened species in environmental planning for the proposed project.

Hudsonia's role in planning for the the Tucker tract is to conduct scientific studies to address the issue of the Blanding's turtle. In addition, Hudsonia was asked to provide information on any other noteworthy species or habitats observed at the site during the course of the Blanding's turtle studies (we did not, however, conduct a comprehensive habitat assessment or biological survey). Hudsonia does not support or oppose land use projects; rather we provide scientific information, analyses, and recommendations for use by parties involved in environmental planning and environmental management.

## The Blanding's Turtle in Dutchess County

Blanding's turtle *(Emydoidea blandingii)* is listed as Threatened in New York. Blanding's turtle populations in Dutchess County generally occupy primary habitat comprising deep, shrubby, groundwater-fed, organic-bottom, wetland pools in or near an upland matrix of glacial outwash, most often Hoosic gravelly loam soil (see Kiviat 1993, 1997, Kiviat et al. 2000, 2004, Kiviat and Stevens 2001, Munger and Kiviat 2001). These pools are used for springtime foraging and basking habitat, overwintering, and other activities. During the nesting season, summer, drought periods, and occasionally other times, the adult turtles may range 1000 meters (about 3300 feet) or farther from the primary habitat to lay eggs, forage, and find permanent water. Egg laying typically takes place in sparsely vegetated gravelly, sandy, or rocky soil. "Vernal" pools (intermittent woodland pools, *sensu* Kiviat and Stevens 2001), tree-dominated swamps, springfed natural or artificial ponds, and other wetlands and waterbodies, depending on water depths, temperatures, and other factors, are used for foraging, rehydration during the nesting migration, and drought refuge. Some of these wetlands and ponds may be as small as 10-20 meters in diameter. Juveniles use shallower (sometimes smaller) wetland habitats. I consider areas within 1000 meters of potential primary habitat as a Blanding's turtle "area of concern" where land use planning should take into account the potential for Blanding's turtle activity (Kiviat 1997, Stevens and Broadbent 2002). Potential primary habitat is the "kettle shrub pool" or similar habitat type (Kiviat and Stevens 2001, Stevens and Broadbent 2002, Hartwig 2004).

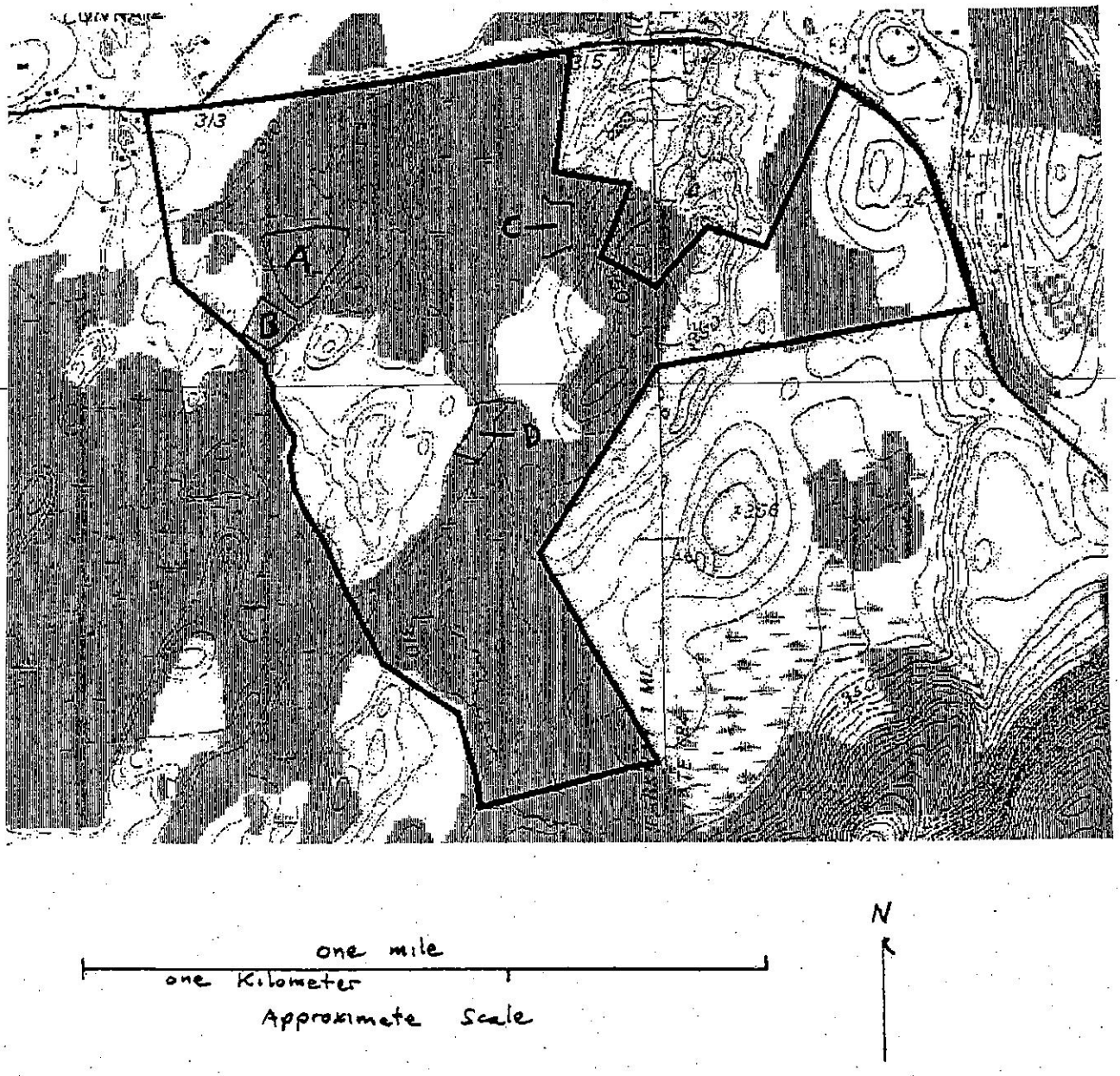


Figure 1. Map of the Tucker tract showing the four areas of potential Blanding's turtle habitat A, B, C, and D where trapping was conducted. Base map from the U.S. Geological Survey Hopewell Junction and Poughquag 7.5 minute quadrangles, amended by Jason Tesauro to show habitat areas.

## Habitat Assessment

### Methods of the Habitat Assessment

In conducting a habitat assessment for the Blanding's turtle I focus on "primary" wetland habitat, especially those areas with suitable water depths, little or no surface water flow, sparse or no tree canopy, substantial component of tall shrubs (especially buttonbush), presence of trees around the margins of the wetland or pool, and sandy or gravelly soil nearby (e.g., within 1000 meters). Hudsonia's habitat assessment of the Tucker tract comprised analysis of maps, field reconnaissance, and discussions of the site with Jason Tesauro. On 24 March 2004, I reconnoitered the site with Jason, focusing on wetlands likely to have 25+ cm deep standing water at that season. I also studied maps and aerial photographs of areas surrounding the site, including the Hudsonia habitat map of the Town of East Fishkill (Stevens and Broadbent 2002), and I drove or walked several of the public roads near the site and walked the railroad north of the site. Gretchen Stevens provided information from Hudsonia's town mapping study. Attention to the surrounding area was necessary because of the high mobility and spatially extensive habitat use typical of Dutchess County Blanding's turtles.

### Results of the Habitat Assessment

In general, wetland HJ-49 onsite consisted of extensive wooded swamp. Tree species composition varied somewhat, and there were openings dominated by shrubs or herbs. Water depths varied as well, with the majority of areas either too shallow for adult Blanding's turtles (i.e., less than about 25 cm deep water at spring high water) or flowing.

I identified four areas (A, B, C, and D; Figure 1) that had the most potential for adult or large juvenile Blanding's turtles:

A. In the northwestern portion of the site, east and north of the main dirt road entering the site from the junction of Routes 52 and 216.

This area had abundant red ash (*Fraxinus pennsylvanica*) and buttonbush (*Cephalanthus occidentalis*). Also present were: red maple (*Acer rubrum*; uncommon to common), elm (*Ulmus*; rare?), highbush blueberry (*Vaccinium corymbosum*; common), winterberry (*Ilex verticillata*; uncommon?), swamp rose (*Rosa palustris*; rare), tussock sedge (*Carex strica*; common and large), arrow arum (*Peltandra virginica*; locally abundant), reed canary grass (*Phalaris arundinacea*; uncommon to locally common), purple loosestrife (*Lythrum salicaria*; rare); climbing hempweed (*Mikania scandens*; common on shrubs), yellow water-lily (*Nuphar*; rare, in deeper water), water-parsnip (*Sium suave*; uncommon), big burreed (*Sparganium eurycarpum*), yellow water crowfoot (*Ranunculus flabellaris*), spiny coontail (*Ceratophyllum echinatum*), and pondweed (*Potamogeton pusillus* var. *tenuissimus*). The ash canopy was open with a lot of dead and live trees in the 7-30+ cm dbh range and perhaps 25% canopy cover. There were some big woody hummocks (root crowns of certain trees or shrubs) and downlogs. Water depth was about

25-40+ cm deep at the 24 March visit. This area was the most suitable Blanding's turtle habitat on the site.

B. Near A but on the south side of the main dirt road where a pool is visible close to the road.

This area was dominated by a mixture of herbs and shrubs with lakeside sedge (*Carex lacustris*) and reed canary grass in the shallow areas, some burreed (*Sparganium* sp.), and woody plants including alder (*Alnus*), silky dogwood (*Cornus amomum*), and red maple.

C. In the north-central portion of the site, in the northeastern portion of the main wooded swamp north of an old dirt road crossing the swamp on fill.

Red maple (common), red ash (common), swamp white oak (rare?), winterberry (common), highbush blueberry (uncommon?), swamp rose (rare), tussock sedge (common), skunk-cabbage (*Symplocarpus foetidus*; locally common), reed canary grass (rare), purple loosestrife (uncommon to rare). Tree canopy cover was about 65-70%, shrub cover perhaps 25-40%. Trees were ca. 6-35 cm dbh but mostly small. The water was ca. 20-40 cm deep on 24 March.

D. Abandoned beaver pond on a tributary of the main swamp in the central portion of the site.

There was a small excavated pool with a culvert under the dirt road draining into the main portion of the wooded swamp. Near the dirt road (upstream side) there was a semi-open area about 10 meters wide from the road to an extensive common reed (*Phragmites australis*) stand. The open area had water smartweed (*Polygonum amphibium*), cattail (*Typha latifolia* or *Typha* X *glauca*), reed canary grass, and yellow water-lily. To the south was a big area of flooded (on 24 May) sedge (*Carex ?granularis*) with red ash and purple loosestrife on the deeper, centripetal side.

Wetlands of the Tucker tract are suitable for "secondary" use by Blanding's turtle adults in summer, during nesting migration, and probably in early spring before leaf-out, whenever water depths are ca. 25 cm or deeper. There may also be areas that are suitable for juvenile Blanding's turtles which are typically associated with shallow water than are adults. Habitat area A has potential to be primary habitat for adults.

Hudsonia's habitat map of the Town of East Fishkill (Stevens and Broadbent 2002) shows kettle shrub pools north of the Tucker tract. In addition there is a circumneutral bog lake north of the site. These pools and lake are potential primary Blanding's turtle habitat. Kettle shrub pools are the most important primary habitat of Dutchess County Blanding's turtles (Kiviat and Stevens 2001). Blanding's turtles are known to extensively use a circumneutral bog lake in the Town of Clinton, Dutchess County (Hudsonia, unpublished data). The 1000-meter Blanding's turtle areas of concern around these three pools north of the site encompass substantial portions of the northern portion of the site, including at least part of onsite habitat A. The potential primary habitats north of the site appear quite suitable for Blanding's turtle, thus the secondary habitats onsite are likely to be used by Blanding's turtles as well. Furthermore, Blanding's turtles that

may be supported by the kettle shrub pools offsite could be nesting onsite. There are extensive Hoosic soils in the vicinity (on the northern end of the site and north of the site), which increases the likelihood that Blanding's turtles are present. Onsite nesting habitats could include sparsely vegetated areas with friable soils (not just Hoosic materials) on agricultural fields, old fields, rock outcrops, road verges, physically disturbed soils, and similar locations.

I consider it likely that Blanding's turtles reside in primary habitat north of the site, and possibly elsewhere in the general area of the site. Blanding's turtles in primary wetland habitat within 1000 or so meters of the site may move onto the site seasonally to use the onsite swamps or to nest. Habitat area A has potential as primary habitat for adults. Blanding's turtles farther from the site may occasionally pass through the site during dispersal to new home ranges or during unusual environmental conditions. If beavers flood the habitat areas A, B, C, or D identified in this report, higher quality habitat may eventually be created for Blanding's turtle onsite. Hoosic gravelly loam soils (HsA and HsB) occur on the northwestern corner of the site just south of Route 52, and are extensive north of Route 52. Hoosic soils are typically associated with portions of the uplands in Blanding's turtle habitat complexes in Dutchess County, and are probably the soil most often used for nesting.

## Turtle Survey

### Methods of the Turtle Survey

Hudsonia uses a standardized survey method for Blanding's turtle. The procedure, which we have used in Dutchess County at a number of sites during the past ca. 17 years, comprises live-trapping and visual observation. A minimum of 25 traps is set for at least 5 nights (i.e. five 24-hour periods) in a complex of wetlands. Water depths must be ca. 25-45 cm to set traps, although sometimes the substrate can be scooped out if water is shallower. This survey procedure, according to our results at a site where we have studied Blanding's turtles continuously since 1996, has about a 95% chance of detecting at least one adult Blanding's turtle in a wetland complex. However, we do not necessarily detect the species in every individual wetland that Blanding's turtles may use at some time during a year because the turtles are very mobile and may not be present or enter traps in a particular wetland during the survey period. If primary habitat occurs outside (but within ca. 1000 meters of) the trapping area, the trapping survey will not necessarily capture Blanding's turtles because those turtles may stay in the non-trapped area during the survey.

At the Tucker tract, we set 25 baited hoop traps continuously for five 24-hour periods, yielding a total of 125 trap-days of effort. Traps were commercial hoop nets with 2.5 foot diameter hoops and 1 inch square mesh staked in 25+ cm deep still water. Traps were checked daily and a small amount of fresh bait added each day. Suitable wetland habitat was scanned with binoculars during the trapping operations. Suitable stations for setting traps were located on 24 March and 24 May 2004, traps were set on 24 May, and traps were removed on 29 May 2004. Traps were set by Tanessa Hartwig, John Sullivan, Jason Tesauro, and me. Traps were checked by Sullivan

and Hartwig, and pulled on the last day of the survey by Hartwig, Sullivan, and Tesauro. All four of us conducted visual searching for Blanding's turtles.

Traps were set in habitat area A (12 traps), area B (3 traps), area C (6 traps), and area D (4 traps). Figure 1 shows the habitat areas where traps were set. These were the only wetland locations where depths of still water were adequate to set traps during the survey.

In a Blanding's turtle survey, we try to set traps offsite (as well as onsite) if there is suitable habitat near the site. During the studies of the Tucker tract (and previously the Moore site, see Kiviat 2002) we were effectively denied permission to trap on property north of the Tucker tract where we had identified potential primary wetland habitat.

The weather during the Tucker tract trapping survey was:

24 May. Warm, cloudy, breaks of sun, then heavy rains
25 May. Sunny to partly cloudy, warm
26 May. Sunny, warm
27 May. Mostly cloudy, cool morning, warmer afternoon
28 May. Intense thunderstorm in morning, afternoon overcast and cool
29 May. Mostly sunny, warm

The standard survey procedure, in combination with the habitat assessment of the site and surrounding area, provides information that Hudsonia uses to determine the level of concern about Blanding's turtle use of a site. This allows recommendations about reducing or mitigating impacts of land use change on the Blanding's turtle and its habitats.

**Turtle Survey Results and Discussion**

We found no Blanding's turtles at the Tucker tract despite standard trapping coverage and moderate weather. Bycatch (other species) in the turtle traps was as follows:

| Date (May 2004) | Snapping turtle | Painted turtle |
|---|---|---|
| 25 | 1 | 3 |
| 26 | 0 | 0 |
| 27 | 0 | 0 |
| 28 | 0 | 0 |
| 29 | 4 | 0 |
| Totals | 5 | 3 |

Bycatch of snapping turtle (*Chelydra serpentina*) and painted turtle (*Chrysemys picta*) was low, as would be expected in wooded swamp habitat. Observations of species other than turtles are presented below (Other Findings).

Mostly high quality potential Blanding's turtle habitat exists at several locations around the periphery of the Branton Woods Golf Club north of the site, including two areas on the southern edge of the golf course just north of the railroad, an area at the north end of the golf course, and an area on the east side of Stormville Road. These habitats are approximately 400, 500, > 1000, and 700 m from the Tucker tract. The closest area is within 1000 m of Blanding's turtle habitat area A (1000 meters is a distance commonly travelled between wetlands or between a wetland and a nesting area). Route 52, a heavily-travelled and fairly high-speed two-lane highway, separates the offsite (northern) habitats from the onsite habitats; Blanding's turtles would be able to cross Route 52 but would be subject to an unknown degree of mortality from vehicles. Hudsonia previously conducted a habitat assessment and trapping survey for Blanding's turtle on the Moore development site adjoining the Golf Club on the north, also with negative results for Blanding's turtle (Kiviat 2002). Wetland pool habitat at the Tucker tract appears somewhat better than at Moore, with deeper water and more pool-like conditions. I did not assess areas south of the Tucker tract site for potential habitat.

The nearest known (to me) Blanding's turtle site is about 4 km (2.5 miles) from the Tucker tract. This distance exceeds documented seasonal movements of Blanding's turtles in Dutchess County. Seasonal movements of this magnitude have been reported elsewhere (e.g., Joyal et al. 2001; see Hartwig 2004 for summary), and dispersal movements of this magnitude have been observed in Dutchess (Kiviat, personal observation). (Dispersal constitutes essentially one-way shifts from one habitat complex to another.)

## Other Findings

During the habitat assessment and turtle survey, we observed a variety of wildlife onsite. Reptiles and amphibians found were wood frog and northern water snake (in addition to painted turtle and snapping turtle). Birds found were green heron, mallard, wood duck, red-tailed hawk, wild turkey, ring-necked pheasant, rock pigeon, mourning dove, eastern screech-owl, red-bellied woodpecker, hairy woodpecker, great crested flycatcher, eastern wood-pewee, crow (probably American crow), black-capped chickadee, brown creeper, brown thrasher, American robin, wood thrush, veery, yellow-throated vireo, common yellowthroat, yellow warbler, scarlet tanager, Baltimore (northern) oriole, red-winged blackbird (including an active nest with four eggs), northern cardinal, rose-breasted grosbeak, tree sparrow, song sparrow, and white-throated sparrow. An adult and two young eastern screech-owls were seen at habitat area C on 24 May. Mammals found were muskrat, beaver (old sign), and white-tailed deer.

I found three rare plants on the site. Spiny coontail (*Ceratophyllum echinatum*) is ranked as S3 on a scale from S1 (rarest plants in the state) to S5 (common plants) by the New York Natural Heritage Program, and is classified as Threatened under Environmental Conservation Law. Spiny coontain was present in Blanding's turtle habitat area A in the small pools between hummocks.

Small-flowered agrimony or swamp agrimony (*Agrimonia parviflora*) is ranked S3 by the Heritage Program. There were hundreds of tufts of small-flowered agrimony in the corner of a

wet field just south of Blanding's turtle habitat area D. This area appears to be part of the wetland to its north but is not flagged as wetland.

Drooping bulrush (*Scirpus pendulus*) is regionally-rare in the Hudson Valley (Kiviat and Stevens 2001). I saw at least several stems along the trail or road in the north end of the field between Blanding's turtle habitat areas C and D. This wet field area may also be undelineated wetland.

All three of these rare plant species are associated with calcareous (limy) wetlands in the Hudson Valley, and indicate the likelihood of finding other rare plant species associated with calcareous wetlands.

On the Tucker tract, certain habitats have the potential to support the following additional rare or vulnerable species:

Spotted turtle and wood turtle are listed as Special Concern in New York, and potential habitat exists onsite. Wood turtle could occur in the streams and less likely in swamp pools; spotted turtle could occur wherever there is standing water. Spotted turtle and wood turtle rarely enter traps set for Blanding's turtle, thus the trapping results do not indicate the status of these species. Box turtle, also Special Concern, could occur on the uplands and seasonally in the wetlands.

In the swamps and adjoining forests and wet meadows of the site there is potential habitat for: blue-spotted salamander *(Ambystoma laterale)* (Special Concern), spotted salamander *(Ambystoma maculatum)* (vulnerable), four-toed salamander *(Hemidactylium scutatum)* (regionally-rare?), ribbon snake (*Thamnophis sauritus*), wood duck (*Aix sponsa*) (vulnerable), red-shouldered hawk *(Buteo lineatus)* (Special Concern), American woodcock *(Scolopax minor)* (declining), cerulean warbler *(Dendroica cerulea)* (scarce and vulnerable), swamp cottonwood *(Populus heterophylla)* (S2 Threatened), and Gray's sedge *(Carex grayi)* (scarce?).

Despite the modest size of most trees, dead trees and dead branches in these swamps and on adjoining uplands provide potential habitats (nest sites, cavities, loose bark, decaying wood, etc.) for snag-using animals including various wood-boring insects (status unknown), gray treefrog *(Hyla versicolor)*, black rat snake *(Elaphe obsoleta)* (scarce?), great blue heron *(Ardea herodias)* (breeding colonies regionally-rare), wood duck, American kestrel *(Falco sparverius)* (declining), red-headed woodpecker *(Melanerpes erythrocephalus)* (regionally-rare), tree swallow *(Tachycineta bicolor)*, eastern bluebird (*Sialia sialis*), northern waterthrush (*Seiurus noveboracensis*), and several species of bats.

It is my understanding that the Endangered Species Unit of the New York State Department of Environmental Conservation in spring 2004 radio-tracked Indiana bats (*Myotis sodalis*), a federally-listed Endangered species, from an overwintering site in Rosendale (Ulster County) to summer habitat on or near the Tucker tract (Al Hicks in presentation at the Northeast Natural History Conference, May 2004, *fide* John Sullivan).

Additional information on habitats and rare species of the region is in Hudsonia's *Biodiversity Assessment Manual for the Hudson River Estuary Corridor* (Kiviat and Stevens 2001).

## Recommendations

The Tucker tract either does not support resident adult Blanding's turtles or supports a very small number. The four habitat areas shown on Figure 1 are suitable for use as secondary habitats, e.g. for seasonal foraging and for rehydration during nesting migrations. These areas may also be suitable for juvenile Blanding's turtles which use shallower habitats than adults. There are potential primary habitat units just north of the site, however, and Blanding's turtles are likely to range onto the Tucker tract to nest or to use secondary wetland habitats. Changes to onsite wetlands, e.g. due to beaver activity or accidental blocking of drainage from human activities, could raise water levels and make wetlands more attractive to adult Blanding's turtles. A small increase in water level in habitat area A, for example, could create high quality primary habitat for Blanding's turtle. Also, any pond construction onsite could create drought refuge habitat that might attract Blanding's turtles.

The likelihood of secondary or future use of wetlands onsite by Blanding's turtle, as well as the likelihood of nesting onsite, indicate the need for development design to reduce potential impacts on turtles. I recommend the following measures during site preparation, construction, and occupancy.

Protect wetland habitats onsite from filling, dumping, drainage, incursion of equipment, siltation, polluted runoff, and altered hydrology.

Maintain buffer zones of natural soil and vegetation around onsite wetlands, including unregulated wetlands.

Keep vehicle speeds low on internal subdivision roads by means of posted speed limits, wildlife crossing signs, and speed bumps, as appropriate.

Design storm drain gratings such that turtles (including hatchlings of carapace length 2.5 cm [1 inch]) cannot fall in, or design catch basins and storm sewers such that animals that fall through gratings can easily escape from culverts and catch basins.

Either houses should not have window wells, or window wells should be made inaccessible to turtles by means of permanent screens (that turtles as small as 2.5 cm carapace length cannot pass through) or lips at least 25 cm (10 inches) high (that adult Blanding's turtles of carapace length up to 25 cm cannot climb over).

In-ground swimming pools should have fencing or barriers that keep turtles of any size out of the pools. Fencing should exclude turtles as small as 2.5 cm carapace length; barriers should be at least 25 cm (10 inches) high to exclude turtles up to 25 cm carapace length.

Any excavations (soil test pits, foundation holes, utility ditches, etc.) should be backfilled immediately or outfitted with gently-sloping (e.g 30° or less) earthen or wooden ramps to allow animals to climb out.

Workers and residents should be educated to look for turtles under cars or construction equipment before operating or driving. Blanding's turtles often rest beneath vehicles, especially during the nesting season. Blanding's turtles may rest beneath parked cars in driveways, enter open garages, hide beneath wood piles or brush piles, or rest concealed or partly concealed in leaf litter, beneath shrubs, or next to logs.

Educational materials on Blanding's turtle should be provided to workers and residents. Suitable materials include the color-illustrated booklet "Blanding's turtle" (Munger and Kiviat 2001) and the article "Tale of two turtles" (Kiviat 1993). These are available from Hudsonia.

When improvements are scheduled for Route 52 in the vicinity of the site, the possible need for a turtle tunnel should be assessed. Highway agencies have suggested a willingness to construct such tunnels, where justified, in connection with other necessary work.

There are areas of wet meadow onsite that appear to be connected to wetland HJ-49. These wet meadows (including areas between and around habitat areas C and D) may be undelineated, state or federal jurisdictional, portions of HJ-49 and they should be checked by an independent wetland scientist. Although these wet meadow areas are not Blanding's turtle habitat *per se* (except possibly for hatchlings), wet meadows are part of the buffer zone that protects deeper wetlands as habitat for Blanding's turtle and other biota. The wet meadows onsite, furthermore, are calcareous (limy) and are suitable habitat for rare plants. I found small-flowered agrimony and drooping bulrush in these areas, and other, rarer plants could also be present.

## References Cited


Hartwig, T.S. 2004. Habitat selection of Blanding's turtle (*Emydoidea blandingii*): a range-wide review and microhabitat study. M.S. thesis, Bard College, Annandale, New York.

Joyal, L.A., M. McCollough, & M.L. Hunter, Jr. 2001. Landscape ecology approaches to wetland species conservation: A case study of two turtle species in southern Maine. Conservation Biology 15(6):1755-1762.

Kiviat, E. 1993. A tale of two turtles; Conservation of the Blanding's turtle and bog turtle. News from Hudsonia 9(3):1-6.

Kiviat, E. 1997. Blanding's turtle habitat requirements and implications for conservation in Dutchess County, New York. P. 377-382 in J. Van Abbema, ed. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - an International Conference. New York Turtle and Tortoise Society and Wildlife Conservation Society Turtle Recovery Program.

Kiviat, E. 2002. Blanding's turtle habitat assessment and survey, Moore site, Town of East Fishkill, Dutchess County, New York. Report to Stearns & Wheler LLP. Hudsonia Ltd., Annandale, New York. 9 p.

Kiviat, E. & G. Stevens. 2001. Biodiversity assessment manual for the Hudson River estuary corridor. New York State Department of Environmental Conservation, New Paltz, New York. 508 p.

Kiviat, E., G. Stevens, R. Brauman, S. Hoeger, P.J. Petokas & G.G. Hollands. 2000. Restoration of wetland and upland habitat for Blanding's turtle. Chelonian Conservation and Biology 3(4):650-657.

Kiviat, E., G. Stevens, K.L. Munger, L.T. Heady, S. Hoeger, P.J. Petokas & R. Brauman. 2004. Blanding's turtle response to wetland and upland habitat construction. P. 93-99 in C. Swarth, W. Roosenberg & E. Kiviat, eds. Conservation and Ecology of Turtles of the Mid-Atlantic Region; A Symposium. Bibliomania!, Salt Lake City, Utah.

Munger, K. & E. Kiviat. 2001. Blanding's turtle. New York State Office of Parks, Recreation and Historic Preservation, Albany. 8 p.

Stevens, G. & E. Broadbent. 2002. Significant habitats of the Town of East Fishkill, Dutchess County, New York. Report to the Marilyn Milton Simpson Charitable Trusts and the Town of East Fishkill. Hudsonia Ltd., Annandale, New York. 56 p. + 4 colored map sheets 33 x 35 inches at 1:10000 scale.

# Appendix C:

# 100 Foot Buffer Recommendations

Copy FYI

CONSERVATION ADVISORY BOARD
160 CHARLES COLMAN BLVD.
TOWN OF PAWLING
Pawling, New York 12564-1192

April 7, 2005

RECEIVED
APR 11 2005
VILLAGE
~~TOWN~~ OF PAWLING
PLANNING BOARD

Mr. Michael Grogan, Chair
Planning Board, Village of Pawling
9 Memorial Avenue
Pawling, NY 12564

RE: Umscheid Property

Dear Mr. Grogan and Members of the Board:

The Umscheid Property is an exceptionally beautiful site in the Village. It is also a critical part of the Great Swamp (DP-22), one of New York States largest wetlands, consisting of about 6,770 acres, officially recognized as an "Important Bird Area"; "Priority Wetland" by USFWS; "Significant Natural Area" Dutchess County Environmental Management Council; "Class I Wetland" NYS DEC, among others.

The center of the Village, in regards to The Great Swamp, is the drainage divide. The northern part, (pertaining to the Umscheid Site) flows north via the Swamp River, destined to join the Housatonic River. Because the divide area is narrow, the connection here is critical to maintain the corridor of life in the swamp. As the Village builds out, the recognition of this critical factor is essential for the survival of the otter, mink and other rare mammals and the various turtles, salamanders and amphibians that inhabit these unusual calcareous wetlands.

Billy Umscheid graciously granted permission for Dr. Michaels Klemens, Director of the Metropolitan Conservation Alliance (and a respected herpetologist) to visit these wetlands, and for subsequent visits by his staff. The Conservation Advisory Board (CAB) will share that information with you. It has assisted greatly with this review, and gives us a head start.

We submit the following comments on the conceptual plan, dated 1/20/05:

1. The Swamp (DP-22) was recognized as a "Critical Environmental Area" (CEA), in 1988 by the Putnam County Legislature, and in 1991 by the Dutchess County Legislature. Consequently a coordinated review is required. Your engineering consultant can guide you through that process. The most important function of a CEA designation is that it requires that the agency in charge of the project, "takes a hard look" at the potential impacts of the proposed project on the resource that the CEA is intended to protect, the swamp, in this case.

2. The wetland boundaries must be accurately delineated by qualified professional(s). The CAB will check out these boundaries after a larger map is available. Our impression at this point (examining the small map) is that the delineation seems to be more or less consistent with our records.

3. A copy of Dr. Klemens report is enclosed. You can read that his evaluation states that this is a "quite pristine" basin fen, and that indicator vegetation and spring fed hydrology may be potential bog turtle habitat. He identified a possible small fen at the base of the hill.

In regards to this "fen", Mike Clancy, Conservation Biologist, with NYS DEC, performed a wetland delineation in that area (for The Pathway), and also confirmed that he saw the fen, and it should be protected during Pathway construction. The hydrology (water flow) to this fen maybe preserved by adjusting the lot line configuration on Proposed Lot 1. The developer's consultant, "Ecological Solutions" should identify the exact location of this small fen, and map its water source to confirm what should be done to maintain the hydrology, which is the critical issue.

Bog turtles may be present. An investigation should be undertaken in May, or the most productive time to conduct this. In previous field visits, no bog turtles were found, but the spotted turtle, a "Special concern" species was present. In any event, in a conversation with Dr. Klemens, on April 4, 2005, he said that if the wetland and the 100 buffer zone were maintained and preserved, both these species could survive.

4. The upland island is being preserved evidently. That is good, for islands in any body of water are important ecological features.

5. The barn on the property is historic. It is the oldest surviving barn in the Village. Julia Umscheid, years ago, expressed her wish that some community use for the structure could be found. Would it be possible to sever the barn from the house site, and rehabilitate this building for use as a community club house?

6. According to Norm Benson, Town of Pawling Environmental Director, the new stormwater management standards for the entire Town/Village are MS4. (The same more stringent standards as the NYC DEP's for the NYC watershed). Toll Brothers may not be aware of this.

The CAB requests an explanation of how the 2 manmade ponds would be impacted by the location of the SWMs, in the adjacent areas.

7. The proposal to provide housing for active seniors is very attractive. As taxpayers, we like the fiscal impacts of this proposal, and we recognize the need for attractive and suitable housing for mature adults in Pawling. However, the concept depicts two story housing, and sooner or later, seniors will not be able to climb stairs. Can some other design be substituted, such as joining some of the buildings, designing one level, living units and installing an elevator?

Anotherconsideration is that while we have a shortage of senior housing in Pawling, Putnam County is becoming flooded with such housing already constructed or proposed. We fear that in case the Umscheid development does not compete successfully in the marketplace, that Toll Brothers, or their replacement, will return to the Planning Board with a proposal that will impact our schools. This is what the Town Planning Board contended with in the case of the Deerfield Ponds development. That approved plan was for townhouses. Deerfield is now filling several school buses.

8. The wetlands, buffers and other important open space should be protected with a conservation easement, according to Dr. Klemens. These lands are far too sensitive to be maintained by a HOA or the future owner(s) of the Umscheid house.

The Umscheid Concept has every prospect of being a model development, given attention to detail to mitigate the potential impacts on the environment. The CAB looks forward to providing additional comments and information, as the Planning Board's review progresses.

Please let us know if you have questions regarding this letter, and we thank you for this opportunity to comment. You may call our secretary, Sibyll Gilbert with questions, at 855-3266.

Very truly yours,

F. Lenny Turner,
Chairman

Encl: one
Cc: Toll Brothers

Michael W. Klemens, LLC
68 Purchase Street, 3rd Floor, Suite 2
Rye, NY 10580

May 17, 2004

Mr. Joe Millstein
BCM Development Corporation
576 Valley Road, No. 301
Wayne, NJ 07470

Dear Mr. Millstein:

This is a follow-up memorandum to my earlier report of May 16, 2002. That report is appended to this current report as my following discussion and recommendations will draw both upon the findings of my May 16th, 2002 report, as well as comments provided by Hickory Creek Consulting dated 23 March 2004.

As per my recommendation, the Applicant is proposing to develop this site in a manner that is consistent with the potential of bog turtles, *Clemmys muhlenbergii*, occurring in the wetlands on the subject property. Two areas of potential bog turtle habitat were found on site. These are indicated as meadow wetlands and shrub wetlands on the Habitat Map in wetland sections A and C. Bog turtles using these open areas would also use the adjacent sections of red maple swamp.

In order to comply with the recommendations of the Bog Turtle (*Clemmys muhlenbergii*) Northern Population Recovery Plan (2001) (which I authored under contract to the US Fish and Wildlife Service) the Applicant must avoid direct and indirect impacts to the bog turtle habitat. The current site plan that is being proposed by the Applicant is the result of an iterative process between the Applicant's consultant team and myself, to create a development plan that meets both the substance and spirit of the goals set out in the Recovery Plan as follows:

1. There is a 100 foot strictly protected area surrounding all the wetlands (except in a small area of wetland crossing—see No. 2). This protected zone will be part of a conservation easement that will be held by an appropriate conservation organization (e.g., Orange County Land Trust) and be managed by once-yearly mowing in November to keep it as a meadow. The easement area will be demarcated by a system of stone cairns (for visual demarcation) and metal buried metal stakes with disc tops flush to the ground for more precise verification of the limits of the easement for monitoring purposes.

2. The central wetland corridor will be crossed by a bridge constructed out of three 20-foot wide concrete spans. The entire wetland corridor (the stream and the

vegetated riparian zone) will be crossed by this 60-foot span. Natural light penetration below the bridge will be accomplished by the bridge being at least six feet above grade, and the provisioning of 3x3 foot grates in the roadway. This will allow light to penetrate laterally under the bridge, as well as from above through the grates. This light spillage is essential to encourage turtles and other wildlife to use the underpass. This design was used in the adjacent development at Warwick Grove. Restoration of the stream corridor will occur in the vicinity of the current farm road crossing.

3. There is no indication that this type of stream crossing would be required over the farm ditch due west of this proposed riparian crossing. That ditch is lined with stone and gravel, its substrate unsuitable to support bog turtle use, therefore a crossing of the type described under No. 2 is not required. This was discussed with DEC on 12 May 2004 and they concurred with my assessment of the ditch not serving as bog turtle habitat, and therefore not requiring the type of stream crossing described in No.2.

4. Apart from the 100-foot strictly protected area, the Recovery Plan discusses a secondary zone of impact evaluation, from 100-300 feet from the bog turtle wetland and even beyond 300 feet if necessary. Of critical concern in this secondary zone are impacts that could affect groundwater quantity and quality—i.e., anything that could affect the groundwater fed wetlands that the bog turtle depends upon. Groundwater quantity could be affected by the construction of wells that could lower the groundwater table and flow. I specifically asked Thomas Cusack of Leggette, Brashears, and Graham, Inc. to address this issue, specifically whether in his professional opinion there was a connection between the surficial groundwater fed wetlands on the site, and the bedrock aquifer from which the water will be drawn from. Mr. Cusack's letter to me dated 14 May 2004 is appended to this report, and has satisfied me that the creation of wells on the site will not affect the water quantity and flow into the bog turtle wetlands.

5. Another area of potential impact could be from septic systems that could alter the water quality entering the wetlands by the addition of nitrogen, phosphorous, and other pollutants. At my request, the septic system inputs to the wetland were analyzed and reported on by Mr. Cusack (letter to David Higgins dated 14 May 2004 appended to my report). The distance of separation of the septic system from the wetlands, which is facilitated by the Eljen septic in drain system (see Lanc and Tully design specifications) will ensure that the septic run off will not affect the bog turtle wetlands, as the septic systems are located farther than 100 feet from the wetlands, in soils that have excellent penetration and percolation capacity. Based on the reports of these professionals, I find that the water quality and quantity issues from well and septic systems have bee adequately addressed.

6. Stormwater management is a critical component of a development adjacent to critical wildlife habitat. To accomplish these goals I suggest the following measures. All stormwater basins and swales should be sloped 4:1 to allow wildlife to move through them without impediment. In areas where it would be detrimental to allow wildlife to traverse (such as into the roadway) steeper slopes would be preferred to exclude animals from hazardous areas. All riprap should be small-sized rounded river stone, as opposed to jagged angular riprap that traps small animals. Roof leaders should infiltrate back into the ground via french drains, dry wells, or rain gardens. Storm water should be conveyed via grassy swales, the sides of the swales sloped 4:1.

   No hydrodynamic separators should be used on the site. Long term detention, specifically the creation of stormwater ponds should be substituted by rapid infiltration via vegetated depressions and the use of leaky berms. Though recommended, it is my understanding that these measures may not be acceptable to the New York State Department of Environmental Conservation and may not be implemented in final design.

7. Blue spotted salamanders were documented on site in the vernal pools 2, 3, 4, 5 shown on the Habitat Map. These are cryptic vernal pools (*sensu* Calhoun and Klemens, 2002: Conserving Pool Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States) that are imbedded within a red-maple swamp system. These special concern species will be protected by following the vernal pool protection guidelines outlined in Calhoun and Klemens (2002), specifically that no development will occur within the first 100 feet of habitat surrounding the pool (the vernal pool envelope) and development area in the critical upland habitat zone (100-750 feet) surrounding the pool will be limited to no more than 25% and will follow the development design guidelines established by Calhoun and Klemens . A copy of Calhoun and Klemens (2002) is appended to this report.

8. A complete list of amphibians, reptiles, breeding birds, and some other noteworthy plants and animals recorded during my investigation of the BCM property are appended to this report.

If I can provide any further assistance or guidance for this project, please do not hesitate to contact me.

Sincerely,

Michael W. Klemens, PhD

Michael W. Klemens, LLC
9 Charlotte Street
Rye, New York 10580

May 16, 2002

Mr. Joe Millstein
BCM Development Corporation
576 Valley Road, #301
Wayne, NJ 07470

Dear Mr. Millstein:

At your request, I conducted a field investigation on 11 May 2002 of a 174-acre parcel consisting of a mixture of wetlands, forest, and agricultural land located in the town of Warwick, New York. The site is part of the Wawayanda Creek drainage, and lies E of Homestead Village, N of Ketchum Road and N of Pumpkin Hill Road. Bog turtles are known from the Wawayanda Creek drainage, and have been found just to the west of this site in Homestead Village. The focus of my investigation was to conduct a Phase 1 Bog Turtle Habitat Assessment as described in Appendix B, pp. B2-B3, Bog Turtle (*Clemmys muhlenbergii*) Northern Population, Recovery Plan. 2001. USFWS Hadley, Massachusetts. Thirty person-hours were spent on the site on May 11th to conduct this investigation. The work was conducted by me, assisted by two field technicians. We all worked from 9 AM to 7 PM.

A Phase 1 assessment focus on the presence of bog turtle habitat, not the documentation of bog turtle activity. If a Phase 1 assessment is negative, no further work need be done to accommodate this Federally-threatened species. If the Phase 1 assessment is positive (i.e, there are areas on the site that are potential bog turtle habitat), there are two ways that this can be dealt with in terms of site development. A Phase 2 assessment can be conducted to determine the actual presence (i.e., activity) of bog turtles in those wetlands (or portions of wetlands) considered to be potential bog turtle habitat as determined during by the Phase 1 assessment. Details of the Phase 2 assessment are contained in Appendix B of the Recovery Plan, but in brief, Phase 2 requires searches of the habitat to be conducted four times, separated by a proscribed number of days, under optimal weather conditions, and within a narrow annual activity window, with an intensity of person/hour search effort determined per acre of wetland. If these standards are all met, and after four searches bog turtles have not been found, the site is considered to not be an inactive bog turtle habitat.

Because of the expense and effort required to conduct Phase 2 assessments, it is often preferable for a developer to assume that those wetlands indicated in the Phase 1 assessment as bog turtle habitat be considered active bog turtle habitat, and the development be designed in a manner so as not to adversely impact this habitat. Apart from 100 foot wetland setbacks, which are generally sufficient for this species, special attention must be given to stream crossings; ground water withdrawals (wells) and discharges (septic) as well as management of stormwater. It is critical to maintain clean, steady flows of water into bog turtle habitat, and to allow turtles to move through stream corridors from wetland to wetland.

As the wetlands on site were not extensively flagged, and I had no plans for the division of the site into house lots, I cannot make any specific design recommendations in this report.

My comments are based upon an ortho-photographic map with wetlands delineated and topographic contours prepared by Lanc and Tully, dated 26 November 2001. For the purposes of this letter report I am dividing the wetlands on site into three areas:

A: This wetland extends eastward from the boundary of the Homestead Village site in a northerly direction where is bordered by active alfalfa fields which narrow down to constrict the wetland.

B: Passing through this constriction (in a southeasterly direction) one enters a second wetland area which is in the northeastern section of the property, bordered on the east by another field that is quite steeply graded.

C: On the south side of the steep hills lies a wetland and several stream corridors, these corridors extend southward to Ketchum Road and to NYS Highway 17-A and the wetland borders Pumpkin Hill Road.

Section A:

This is a wooded swamp wetland, mostly closed canopy, with several vernal pools on its north-western edge. A large population of blue-spotted salamanders (*Ambystoma laterale*) use this section of the wetland. Blue-spotted salamanders were also found in the section of this wetland below an oak-tulip forested slope that bulges into the northwestern side of this wetland. The blue-spotted salamander is listed as a New York State "Special Concern Species". Other associated species included the redback salamander (*Plethodon cinereus*), four-toed salamander (*Hemidactylium scutatum*) and the wood frog (*Rana sylvatica*). At the southwestern end of this wetland section is an area of open tussock sedge, skunk cabbage, reed canary grass, some cattails. The area appears to be drying out, and this may be a results of the adjacent development at Homestead Village. The substrate becomes increasingly mucky moving uphill to Ketchum Road, and there are rivulets and springs in the area of the open wetland closest to Ketchum Road. There is approximately 10 acres or more of suitable bog turtle habitat there, however its overall quality is low. This portion of the site is quite close to (and connected to) the wetland at Homestead Village where a bog turtle was found several years ago. There were some numbered flags in the rivulet area, specifically 2,4, 8, 10, 11, and 12. A garter snake (*Thamnophis sirtalis*) was observed. Although the habitat is mostly of poor quality (ditched, drying, and lacking vegetational diversity) because of the open canopy, presence of rivulets, the deep mucky areas associated with the rivulets, and its connection to a known bog turtle site, I recommend that the entire open portion of the wetland qualifies for a Phase 2 assessment.

Section B:

This area is wooded swamp, dissected by a network of small streams. It is not bog turtle habitat. The wooded slopes adjoining this wetland to the east are very young, and show evidence of disturbance. Species observed included redback salamander (*Plethodon cinereus*), four-toed salamander (*Hemidactylium scutatum*), red-spotted newt (*Notophthalmus viridescens*) and green frog (*Rana clamitans*).

Section C:

This area is primarily open canopy wet grassland, grading into a large, open canopy skunk cabbage wetland, reminiscent of bog turtle sites farther south in Pennsylvania and Maryland. The Wallkill Valley is transitional in its bog turtle habitat types between the harsh fen New England habitats found on the east side of the Hudson River, and the more generalized open canopy wetlands that characterize bog turtle habitat in the non-glaciated portions of its range. The presence of extensive groundwater fed seepage areas, clear cold water, open canopy, and deep muck make this area the prime bog turtle habitat on the site. I recommend that entire wetland of Section C qualifies for a Phase 2 assessment, including the narrow stream corridors that extend southwest and south from this open wet grassland to Ketchum Road and NYS Highway 17-A. Some wetland flags that were included in this area are: 29, 30, 31,48, 49, 50, 51, 52, 62, 64, 67. The area is in total at least 20 acres.

In conclusion, given the extensive amount of bog turtle habitat on site, I would recommend that rather than going through the expense of conducting a Phase 2 survey, which almost certainly would require eight days of field work x three-four individuals, that the site be developed in a manner that presumes bog turtle presence in those areas I have identified as qualifying for Phase 2 assessment. The Recovery Plan contains a great deal of detail concerning the protection of bog turtle habitat. Some critical issues to bear in mind are the importance of the 100 foot buffer around bog turtle habitats, the need to ensure habitat connectivity through spanning, as opposed to cut/fill/and culverts for stream crossings, the need to maintain ground water hydrology and purity which requires a hard look at wells and septic systems and, innovative methods to treat stormwater before discharging into these wetlands. The placement of curbs, catch basins, and hydrodynamic separators are also problematic in and near areas where turtles may move overland between wetlands.

If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

Michael W. Klemens, PhD

cc: Robert Torgersen
Ted Kerpez, DEC-Region 3

# Appendix D:

# Jason Tesauro Ecological Consulting Bog Turtle Report

**Surveys for the Bog Turtle (*Glyptemys muhlenbergii*) at the Tucker Tract, East Fishkill, New York**

Final Report submitted by:

J. TESAURO ECOLOGICAL CONSULTING
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Blairstown, NJ 07825
(908) 362-6995
jasontesauro@yahoo.com

To:

Howard Rippetoe
Sharbell Development Corp.
One Washington Boulevard
Suite 9
Robbinsville, NJ 08691

July 8, 2004

## 1.0 Introduction

In April 2004 J. Tesauro Ecological Consulting (JTEC) was hired by the Sharbell Development Corporation to perform a trapping survey for the New York state-endangered Blanding's turtle (*Emydoidea blandingii*) and a Phase II survey for the federally threatened bog turtle, [*Glyptemys (=Clemmys) muhlenbergii*], on the Tucker tract located in East Fishkill, New York. Suitable habitat for both species of turtle had been previously identified onsite by Maser Consulting while conducting a wetland delineation. Hudsonia Ltd. performed all aspects of the Blanding's turtle work under a sub-contractual agreement with JTEC. The findings of the Blanding's turtle surveyed are contained in a separate report. The bog turtle portion of the survey was performed exclusively by JTEC. JTEC field-verified Maser's bog turtle habitat assessment and discovered additional habitat, which together totaled approximately 10 acres of emergent and scrub/shrub wetland. This report provides information on the Phase II bog turtle survey results of these wetlands.

### 1.1 Background Information on the Bog Turtle

The bog turtle is a semi-aquatic freshwater turtle that prefers open, shallow wetlands with soft soils that are saturated by perennial groundwater discharge. Vegetation varies throughout the bog turtle's range, however in the northern part of its range (NJ, NY, CT, MA) the bog turtle exhibits a strong preference for calcareous (limestone) fens. These palm-sized, elusive turtles spend much of their lives hidden in the soft soils or concealed under vegetation, which provides them with refuge and aids in thermoregulation. Bog turtles are one of the few turtles that remain within its core wetland habitat to nest, typically selecting hummock-forming vegetation on which to deposit their eggs. They are omnivorous and can live over 50 years. The U.S. Fish and Wildlife Service listed the bog turtle in 1997 as threatened because of loss of habitat (Ernst et al. 1994).

### 1.2 Description of Bog Turtle Habitat on the Tucker Tract

The 385-acre Tucker tract (Figure 1) contains approximately 160 acres of wetland (Figure 2). The majority of the wetland onsite is comprised by bottomland hardwood swamp, which runs through the center of the property along a tributary of Fishkill Creek. Green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*) and American elm (*Ulmus americana*) are the dominant hardwoods in the swamp. Small patches (0.5 to 5 acres) of scrub-shrub wetland, featuring buttonbush (*Cephalanthus occidentalis*) and spicebush (*Lindera benzoin*) are sparsely distributed within the northern portion of the swamp. These scrub-shrub wetland areas were the focus of Hudsonia's Blanding's turtle trapping survey.

Emergent wetlands containing bog turtle habitat (Figure 3) are primarily restricted to the southern half of the site along a northerly flowing tributary that flows through main swamp. Beavers have heavily influenced the emergent wetlands onsite in recent and historic times, as evidenced by browsed stumps dating from 2 to 20+ years. The portion of the emergent wetlands more recently occupied by beavers (wetland EW-A) is dominated by lake sedge (*Carex lacustris*), common reed (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*). Water levels in this portion vary from 1.5 meters to 5 centimeters. Soils are a mixture of organic and mineral material. Groundwater seepage is present along the wetland's transition area. Two calcicolous plant species, shrubby cinquefoil (*Pentaphylloides floribunda*) and grass-of-parnassus (*Parnassia glauca*), which are often excellent indicators of bog turtle habitat, are present near the seeps. South of EW-A along the southern tip of the property is the second substantial area of emergent wetland (wetland EW-B) that had been occupied by

beavers several years ago. The plant community at EW-B consists of a mosaic of limestone fen indicators including shrubby cinquefoil, gooseberry (*Ribes hirtellum*), alder-leaved buckthorn (*Rhamnus alnfolia*), swamp goldenrod (*Solidago uliginosa*), eastern red cedar (*Juniperus virginiana*), and more typical non-fen indicators, e.g., narrow-leaved cattail (*Typha angustifolia*), lake sedge (*Carex lacustris*), tussock sedge (*Carex stricta*), common reed, poison sumac (*Rhus vernix*), alders (*Alnus* spp.), and red maple. Soils in EW-B are organic and groundwater seeps and springs are numerous. Other than rivulets, very little standing water is present in EW-B; most of the water is contained within or located below the organic substrate creating mucky conditions excellent for bog turtles. The total approximate area of wetland EW-A and EW-B is 10 acres.

## 2.0 Methods

Bog turtle surveys were conducted on 5/1, 5/10, 5/15, 5/22, 5/23, 6/1 and 6/4. All surveys were performed between 800-1700hrs under non-inclement conditions with air temperatures between 65-85 degrees Fahrenheit. Turtle searching methods consisted of the principal investigator (Jason Tesauro) accompanied by assistant bog turtle field personnel walking slowly through open fen and shrubby/wooded transitional areas in straight-line transects, probing mucky pools and rivulets for submerged turtles with a wooden stick, lifting up dense vegetation for concealed turtles, and visually searching hummocks for basking turtles. All spring-generated rivulets were thoroughly inspected, for bog turtles exhibit a strong proclivity for using these linear waterways as travel corridors through their habitats. This effort often involved sifting through the mucky water by hand for burrowed turtles. In addition to searching for turtles, low, open hummocky areas that resembled nesting areas were searched for remains of hatched eggs as well as fresh nests. All sites were surveyed at least four times at a rate of twelve search man-hours per acre of suitable bog turtle habitat.

Wetlands on the Tucker tract are part of vast system of interconnected wetlands that lie within a contiguous block of rural land bordered by Route 52 to the north and west, I-84 to the south and the Taconic Parkway to the west (Figure 4). Using aerial photographs, two large areas of emergent wetland were identified within this system on land parcels immediately adjacent to the Tucker tract. In order to make the most prudent and accurate assessment of whether a particular site is important for bog turtles it is necessary to determine habitat suitability for associated wetlands that are within a bog turtle's dispersal capabilities (i.e. ~ 1 mile). While bog turtles are generally a colonial species that perform most of their life histories in one discrete wetland, individuals have been documented moving 850 meters between habitat patches in large wetland systems similar to the study area (Eckler et al 1990; Tesauro 2004). Offsite wetlands adjacent were briefly surveyed for bog turtle habitat suitability on 5/15. Bog turtle habitat suitability was based upon the presence of the following habitat parameters: 1) soft, saturated organic mineral soil; 2) hydrologic regime derived from perennial groundwater discharge; 3) floristic community represented by a predominance of native herbaceous vegetation including, sedges, rushes, grasses, forbs and mosses; 4) open tree canopy allowing no less than 50% direct sunlight exposure to the herbaceous understory.

## 3.0 Results

Despite the presence of excellent habitat on the site, the 7-day survey yielded no bog turtles or sign of their presence (Table 1). Other turtle species encountered during the Phase II survey were common snapping turtle (*Chelydra serpentina*) and eastern painted turtle (*Chrysemys p. pitca*). During the offsite bog turtle habitat inspection an adult female bog turtle was found in a 5-acre calcareous fen located on the Bailey property on 5/15 (Figure 4). The

location of her capture was approximately 670 meters southwest of the southern tip of the Tucker tract. A second area (ca. 3 acres) of highly suitable bog turtle habitat was found on the Van Dam property located approximately 300 meters east of the site (Figure 4). The habitat at this location is a mosaic of tussock sedge marsh and calcareous fen. A juvenile spotted turtle (*Clemmys guttata*) and an eastern box turtle (*Terrapene carolina*) were observed.

## 4.0 Discussion and Recommendations

JTEC is confident that a breeding population of bog turtles does not occur on the Tucker tract. The relatively small size of the habitat made it easy for JTEC's biological survey team to cover the site thoroughly. Moreover, the habitat features several open areas of low-growing vegetation and well-defined rivulets, which can significantly increase the chances of finding a bog turtle.

Of the two emergent wetland patches surveyed in the study, EW-B contains the better bog turtle habitat. This patch of habitat is also located at the extreme southern limit of the property and will likely be far enough outside of the footprint of any development activities to sustain impacts. EW-A, which is immediately adjacent to the developable uplands on site may have also have been highly suitable in the past, but beaver flooding and possibly damming from the collapsed culvert at the downstream road crossing appears to have changed the hydrology and plant community drastically. There is an old barbed wire cattle fence running along the southern end of the habitat indicating that the area was much more open and had low water levels in the past. Today, however, much of the wetland is ponded and choked with invasive grasses; bog turtles could only exist along the narrow fringe of the flooded wetland. It is possible for this area to be restored for bog turtles by improving the drainage and controlling the invasive plants.

While bog turtle presence was not confirmed on the site, the presence of the bog turtle population* on the adjacent Bailey property and highly suitable but unconfirmed habitat on the Van Dam property elevate the importance of protecting the bog turtle habitats onsite from adverse effects (wetland filling, sediment runoff from adjacent construction, hydrological impacts, stormwater discharge, etc.). Given the history of beaver activity in this wetland system and the ephemeral ecological nature of bog turtle habitat, it is possible that bog turtles may eventually disperse to the wetlands on site as the wetland changes in community composition (i.e. due to succession, beaver occupation). Furthermore, while it may not be a common occurrence, it is possible for the bog turtles from the Bailey tract to travel to the site's wetlands on a seasonal basis following the mixed emergent/scrub shrub wetland corridor that connect the two areas of habitat.

*Three adults turtles have been found to date on the Bailey site by Dr. J. Utter of SUNY-Purchase

## 5.0 Citations

Eckler, J. T., A. R. Breisch and J. T. Behler. 1990. Radio Telemetry Techniques Applied to the Bog Turtle. In Ecosystem Management: Rare Species and Significant Habitats. New York State Museum Bulletin 471

Ernst, C.H., R.W. Barbour and J.E. Lovich. 1994. Turtles of the United States and Canada. Smithsonian Institution Press, Washington. 578 pp.

U.S. Fish and Wildlife Service. 2001. Bog Turtle (Clemmys muhlenbergii), Northern Population Recovery Plan. Hadley, Massachusetts. 103 pp.

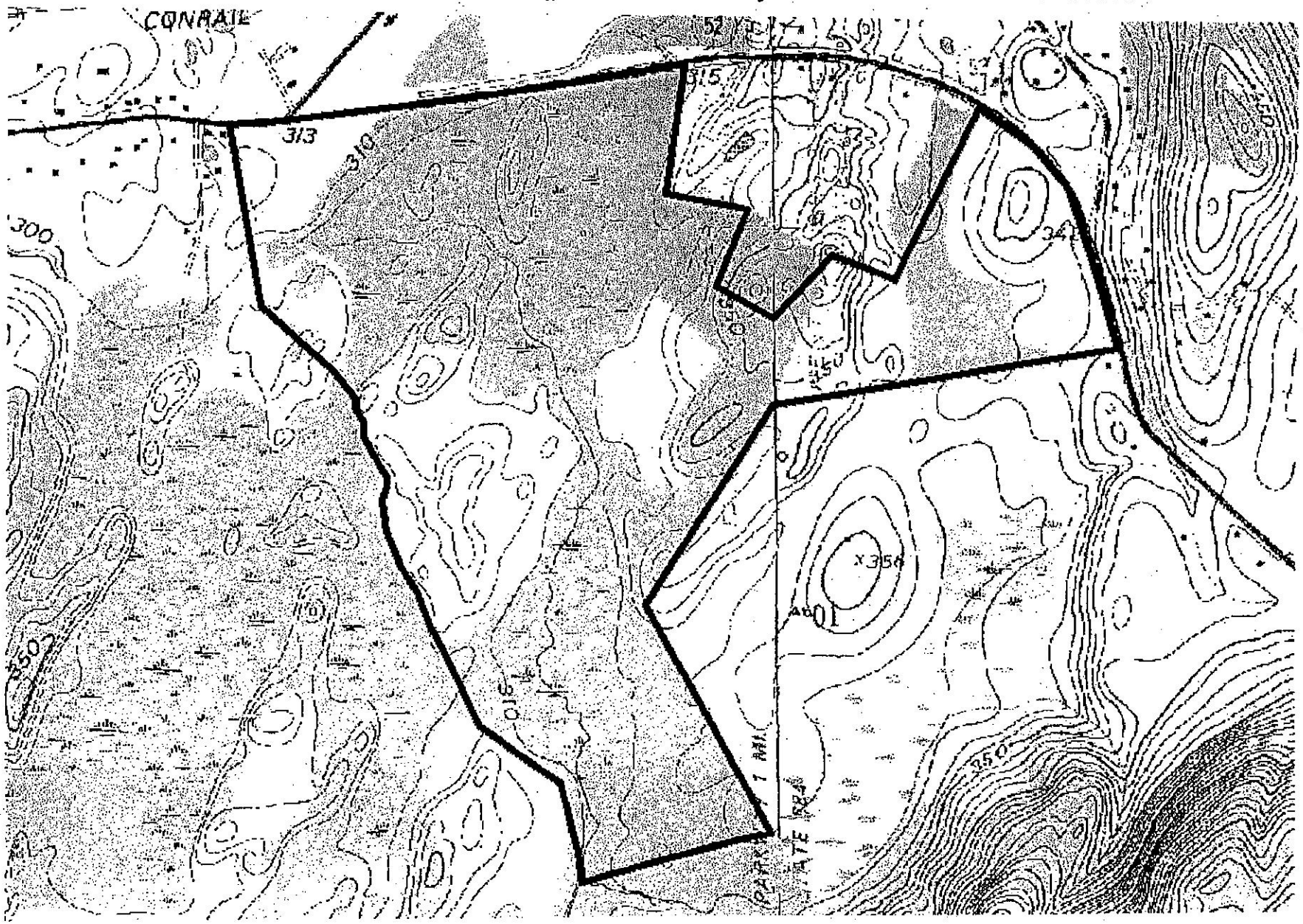
Tesauro, J. 2004. Bog turtle movements in floodplain habitats of southwestern New Jersey. Unpublished report submitted by the New Jersey Division of Fish and Wildlife to the U.S. Fish and Wildlife Service, 927 N. Main Street, Pleasantville, NJ 08232. 6pp.

# Tables and Figures

TABLE 1. Bog Turtle Survey Data Summary

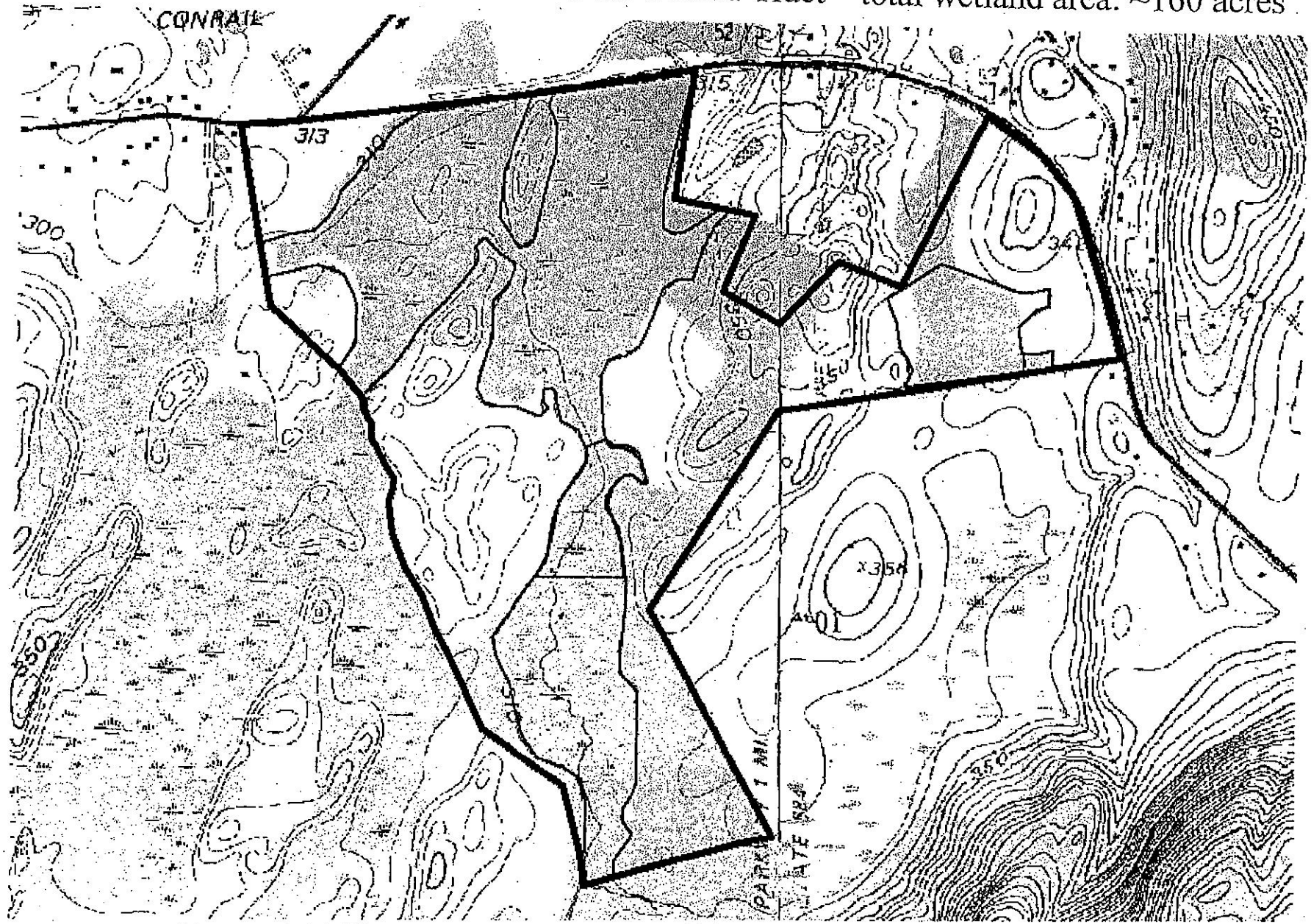
| SITE | DATE | SEARCH TIME | WEATHER CONDITIONS | # SEARCHERS | # MAN-HOURS | HERPS OBSERVED |
|---|---|---|---|---|---|---|
| Sharbell (EW-A & EW-B) | 5/1/2004 | 930-1530 | mostly sunny; ~80F | 3 | 18 | american toad, green frog, eastern painted turtle, snapping turtle |
| Sharbell (EW-A & EW-B) | 5/10/2004 | 1000-1600 | mostly cloudy; 75-80F | 4 | 24 | american toad, green frog, pickerel frog, ribbon snake, northern water snake, northern gray tree frog |
| Sharbell (EW-A & EW-B) | 5/15/2004 | 900-1400 | sunny; 80-85F | 3 | 15 | green frog, eastern painted turtle, northern water snake, eastern garter snake |
| Bailey (offsite) | 5/15/2003 | 1430-1530 | sunny; 75F | 3 | 3 | **bog turtle**, green frog, northern water snake, pickerel frog |
| Van Dam (offsite) | 5/15/2004 | 1545-1630 | sunny; 85F | 3 | 2.25 | eastern box turtle, spotted turtle, pickerel frog, green frog, ribbon snake, gray treefrog, northern spring peeper |
| Sharbell (EW-A & EW-B) | 5/22/2004 | 1000-1600 | sunny; 80F | 3 | 18 | green frog, pickerel frog, snapping turtle, eastern painted turtle |
| Sharbell (EW-A & EW-B) | 5/23/2004 | 930-1600 | partly sunny; 75-80F | 3 | 19.5 | green frog, pickerel frog, eastern painted turtle, northern water snake |
| Sharbell (EW-A & EW-B) | 6/1/2004 | 900-1500 | partly sunny; 65-70F | 2 | 12 | eastern box turtle, green frog, pickerel frog, northern water snake |
| Sharbell (EW-A & EW-B) | 6/4/2004 | 830-1530 | sunny; 70-75F | 2 | 14 | wood frog, green frog, black racer, snapping turtle |
| | | | | **TOTAL MAN HOURS:** | **125.75** | |

Figure 1. Tucker Tract parcel boundary – total lot size: 385 acres



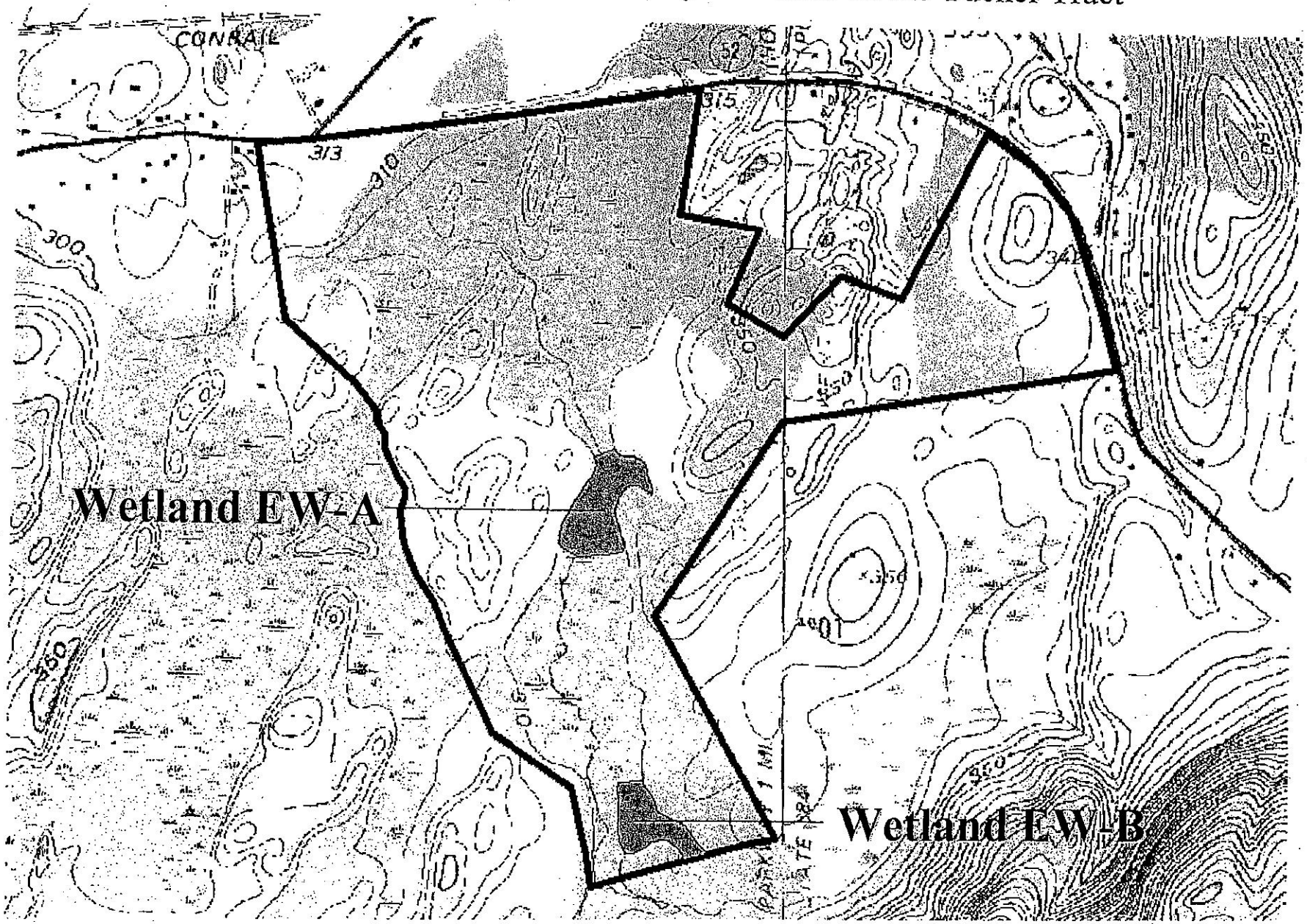

Town of East Fishkill, NY - USGS Hopewell Junction and Poughquag quadrangles

Figure 2. Field delineated wetlands on the Tucker Tract – total wetland area: ~160 acres



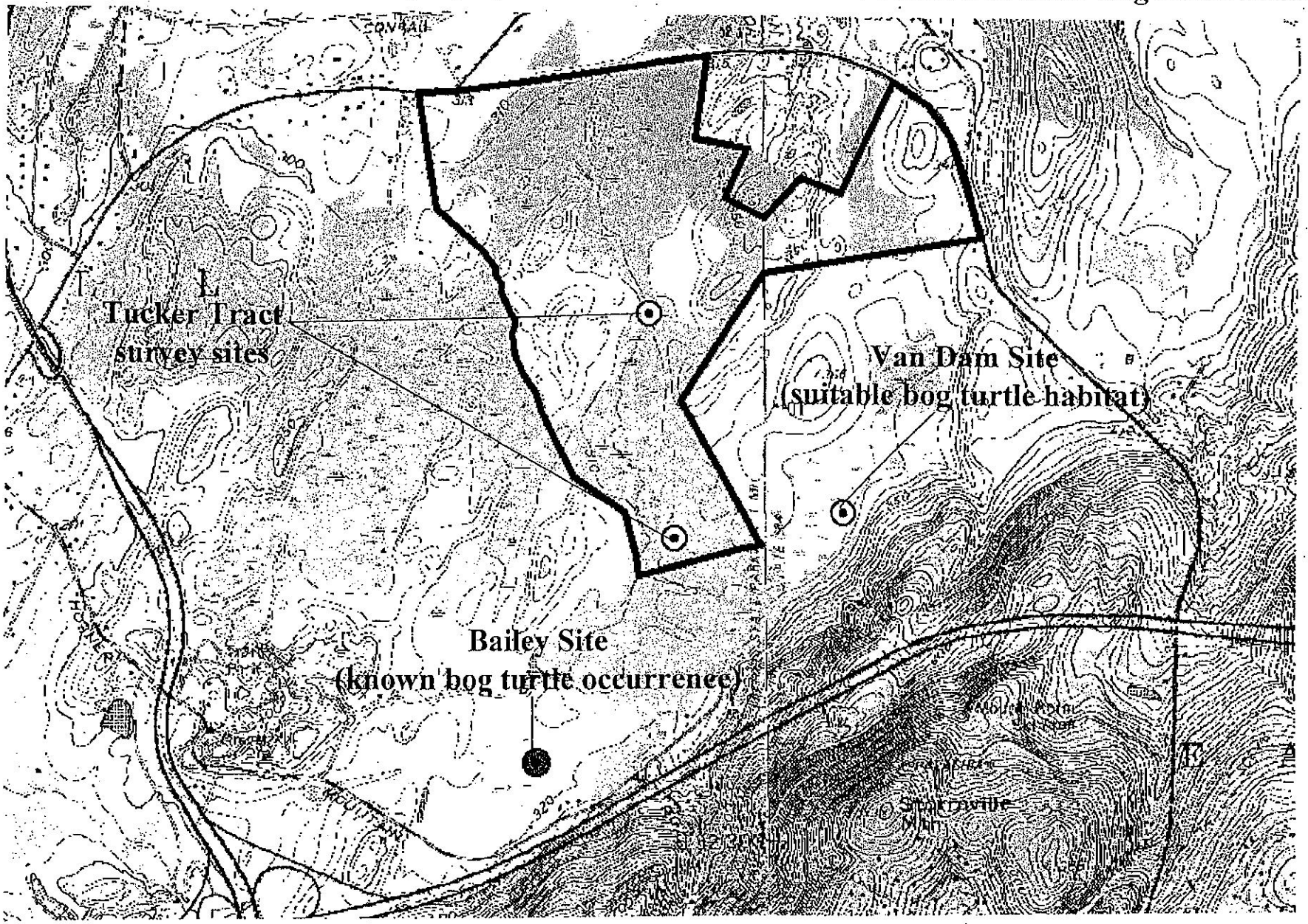

Town of East Fishkill, NY - USGS Hopewell Junction and Poughquag quadrangles

Figure 3. General bog turtle survey locations on the Tucker Tract




Town of East Fishkill, NY - USGS Hopewell Junction and Poughquag quadrangles

**Figure 4. Map demonstrating geographic context of Tucker tract relative to other bog turtle habitats**




Town of East Fishkill, NY - USGS Hopewell Junction and Poughquag quadrangles

# Appendix E:
# Hydrogeologic Investigation

**LEGGETTE, BRASHEARS & GRAHAM, INC.**

PROFESSIONAL GROUND-WATER AND
ENVIRONMENTAL ENGINEERING SERVICES

126 MONROE TURNPIKE
TRUMBULL, CT 06611
203-452-3100
FAX 203-452-3111
www.lbgweb.com

December 21, 2005

Mr. Michael Rubbo
The Chazen Companies
263 Route 17 K
Newburgh, NY 12550

RE: ABD Fishkill, L.L.C.
Summit Woods Residential Community
Town East Fishkill, New York

Dear Mr. Rubbo:

As requested during our recent telephone conversation, I have reviewed the potential of the proposed well supply sources on the above-referenced project to impact the adjacent wetland. To date, Wells 1 and 3 have been drilled. The proposed wells (1 and 3) on the Summit Woods parcel are completed in the bedrock aquifer and located about 125 feet from the wetland. The average water demands of the proposed water-supply system is estimated to be about 63 gpm or about 90,500 gpd.

Wells completed in the deeper bedrock aquifer typically are not hydraulically-connected to adjacent wetlands. The geologic logs for Wells 1 and 3 indicate a moderately thick overburden material overlying the bedrock of about 30 feet; consisting of dense clay material. The clay material would act as a confining layer between the saturated wetland features and the deep bedrock aquifer and prevent any direct hydraulic connection between these features. This was confirmed during the 72-hour pumping test event of Wells 1 and 3 in November 2002. The water-level data and the hydrographs for the piezometers (PZ-1 and PZ-2) installed in the onsite wetland indicated no direct hydraulic connection with the bedrock aquifer during the testing event. In addition, a comparison of the temperature and specific conductance values for the wetland and Wells 1 and 3 during the pump testing event also indicate no direct recharge from the adjacent wetland under pumping conditions of the bedrock aquifer. The well/piezometer locations are shown on figure 5. The support data are included in the DEIS and LBG report dated January 2003. The data strongly indicate the surface bodies and wetland features on the Summit Wood property will not exhibit any significant effects from ground-water withdrawals from the deep bedrock wells.

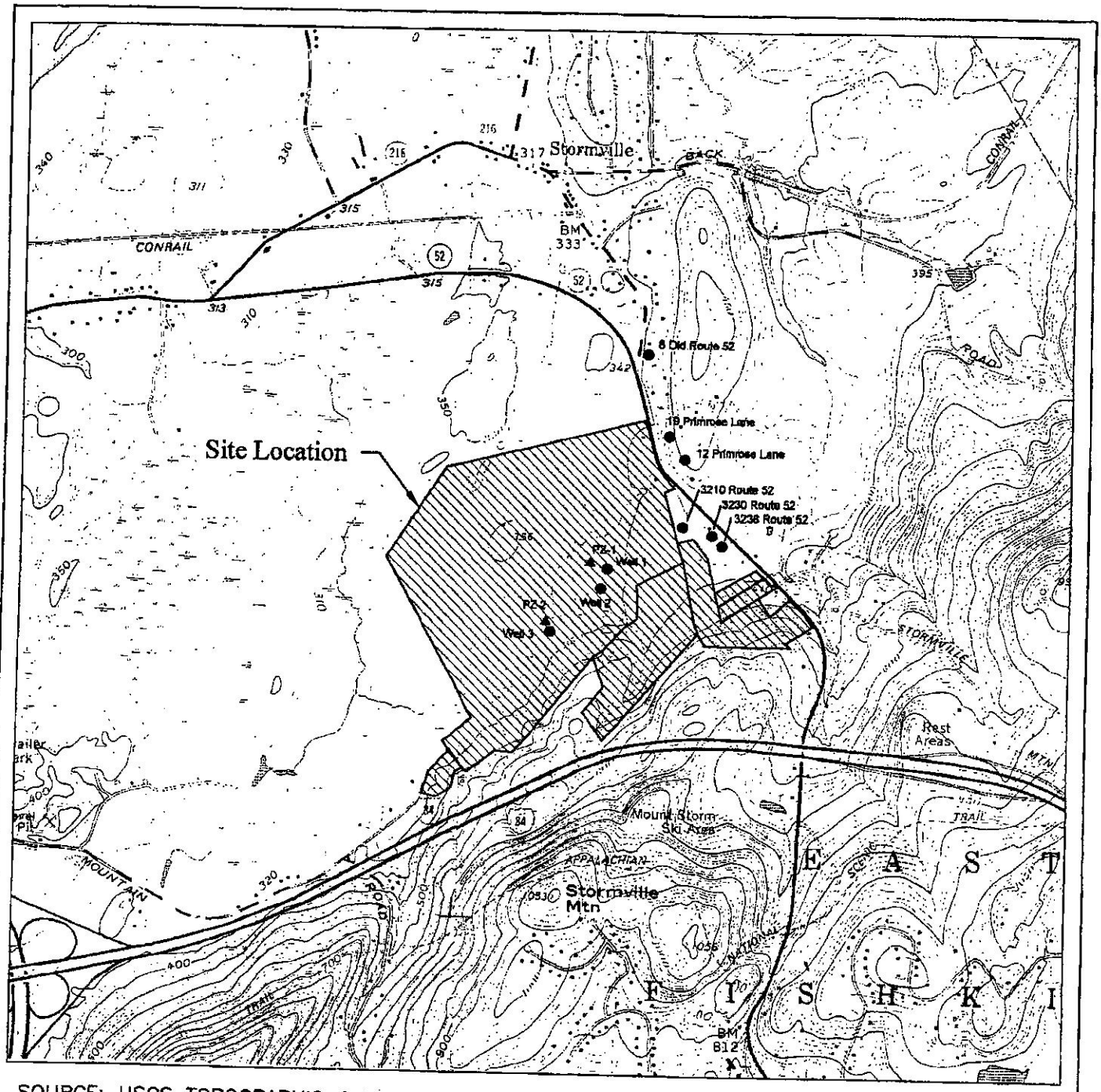
The wetland feature on the Summit Woods property discharges water from streams which flow off the site along the southwestern property boundary. The distinct wetland environment bisects the site and flanks a hillside on the northwest portion of the property and Storm Mountain to the southwest. The wetland feature receives recharge from precipitation; surface-water runoff and inflow from streams; and base flow from the upland areas which flank both sides of the wetland. The more significant recharge feature would be surface water/base flow from Storm Mountain. Surface-water features are exhibited in the wetland area where the elevation is the lowest on the site and where underlying soils have low permeability and poor drainage features. The surface water and saturated soils in the wetland is considered a perched surface water feature in the watershed which is not hydraulically-connected to the deeper water-bearing fractures in the bedrock aquifer. This has been confirmed during a significant number of pumping tests conducted in similar hydrogeologic settings in Dutchess County. LBG strongly believes the ground-water withdrawal from the deep bedrock aquifer will have no discernible impact on the wetland features. Thank you for your time and consideration on this matter.

Very truly yours,

LEGGETTE, BRASHEARS & GRAHAM, INC.

Thomas P. Cusack, CPG
Senior Associate


TPC:etn
Enclosures
H:\Summit Woods\well supply source.doc




SOURCE: USGS TOPOGRAPHIC QUADRANGLES POUGHQUAG, NEW YORK (PHOTOREVISED 1981) AND HOPEWELL JUNCTION, NEW YORK (PHOTOREVISED 1981).

N


QUADRANGLE LOCATION

0 2000

SCALE IN FEET

# ABD FISHKILL L.L.C.
# SUMMIT WOODS
# EAST FISHKILL, NEW YORK

## SITE LOCATION MAP SHOWING MONITORING LOCATIONS

| DATE | REVISED |
|---|---|
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| DRAWN: | TLC | CHECKED: | TPC | DATE: | 12/9/02 | FIGURE: | 5 |
|---|---|---|---|---|---|---|---|

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# Appendix F:
# 100 and 300 ft Buffer Zones