HA File No. NY2008.01

Study Plan for an Intensive Northern Cricket Frog Drift Fence Survey at Glenmere Lake, Orange County, New York

The two color phases of the northern cricket frog (*Acris crepitans*).

Submitted March 25, 2008

To

Alvin R. Breisch and Corbin Gosier
New York State Department of Environmental Conservation
Division of Fish, Wildlife and Marine Resources
625 Broadway, Albany, New York 12233

By

Robert Zappalorti Sr, Executive Director and Robert Zappalorti Jr, Staff Herpetologist

HERPETOLOGICAL ASSOCIATES, INC.
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INTRODUCTION

This Study Plan was written specifically for, and at the request of the Endangered Species Unit herpetologist, Alvin R. Breisch and the project manager, Corbin Gosier of the New York State Department of Environmental Conservation (NY DEC). On behalf of Orange County, Herpetological Associates, Inc. (hereafter HA), was asked to work as a subcontractor to the firm, Dvirka and Bartilucci Consulting Engineers (e.g., Thomas P. Fox, P.G., Dvirka and Bartilucci Consulting Engineers, 330 Crossways Park Drive, Woodbury, New York 11797-2015), on the above referenced project. HA will also work with Sheila M. McGroddy, P.E., President of Geovation Engineering, P.C., 468 Route 17A, P.O. Box 293, Florida, New York 10921, who's staff will help us with checking the frog hide boxes, frog traps, perimeter drift fences and record data.

Our responsibilities will include, but not be limited to evaluating the suitability of the old building foundations and concrete slabs which are adjacent to Glenmere Lake as northern cricket frog (*Acris crepitans*) habitat. It is possible that these nearby upland concrete structures may serve as overwintering habitat (hibernacula) for this New York State endangered species (NY DEC 1999; and Alvin R. Breisch, personal communication). In New York, northern cricket frogs are highly aquatic during the warmest months, but after the breeding season many adults migrate to adjacent upland habitat to forage (Conant and Collins 1991; Burkett 1984). In the fall season it is likely that some cricket frogs may also use protected upland sites to overwinter and prevent freezing (source: New York State Amphibian and Reptile Atlas Project). Some individual cricket frogs may also migrate to moving streams or spring seeps to hibernate (Zappalorti, personal observations).

OBJECTIVES AND SCOPE

Glenmere Lake contains one of the largest known populations of northern cricket frogs (*Acris crepitans*) in Orange County, New York. In order to protect these rare frogs, the NY DEC has requested that an intensive spring migration study be initiated on or about April 1, 2008, or as soon as possible before the cricket frogs emerge from hibernation. The objective of the investigation is to learn where the northern cricket frog population hibernates and what are their migration routes are back to Glenmere Lake. In reviewing both an aerial photograph and USGS topographic map of the Glenmere Lake study area there are several possible areas that could provide winter refugia for the cricket frogs (Labanick 1976; Gibbs et al 2007). These habitats include: old building foundations and concrete slabs, the nearby over flow stream, spring seeps, flooded wooded swales, vernal ponds and deep leaf pockets on the forest floor. As the frogs emerge from hibernation in April and May, they will migrate back to Glenmere Lake. It is HA's tasks to learn where the frogs are hibernating and from which direction they migrate towards their summer aquatic habitat.

Additionally, HA will conduct a cricket frog drift fence survey and test hide boxes with one opening funnel traps. HA will use 30 of our traps and 30 of the NY DEC's design to see which ones capture the most frogs. We will also review the potential direct and secondary impacts of the Environmental Remediation Project may have on the cricket frogs, make recommendations on any remedial measures, also check the overflow stream to the northwest of the lake to see if the frogs hibernate in it, and design and build artificial winter shelters for the frogs if this tasks becomes necessary.

HA's EXPERIENCE AND QUALIFICATIONS

HA has 30 years experience conducting various amphibian surveys in New York, New Jersey and Pennsylvania, some of which have been reviewed by the NY DEC. For instance, in the fall of 1999 HA conducted a similar northern cricket frog study entitled: "*Cricket Frog Surveys, Habitat Evaluations, and a Review of the Proposed Apple Greens East 9 Hole Golf Course, Lloyd Township, Ulster County, New York.*" During this study we observed a total of 603 cricket frogs between 24 September and 10 November 1999. The greatest frequency of encounters with cricket frogs was during random sampling efforts (578 frogs). HA has conducted other intensive amphibian surveys with the following endangered or threatened species: eastern tiger salamander (*Ambystoma tigrinum*), blue-spotted salamander (*Ambystoma laterale*), Jefferson salamander (*Ambystoma jeffersonii*), southern gray treefrog (*Hyla chrysoscelis*) and Pine Barrens treefrog (*Hyla andersonii*). Based upon our 30-years of biological expertise, sampling proficiency and experience we feel we are uniquely qualified to conduct endangered species surveys of the northern cricket frog.

Sample Drift Fence Survey Results

On a project in Stafford Township, New Jersey, HA conducted an intensive drift fence survey in April 16, 2007. Traps were checked along the drift fence once within every 48 hour time period throughout the active field season as dictated in a Northern Pine Snake Management and Conservation Plan. There were a total of 139 traps along approximately 13,000 feet of drift fence. However, on May 16, 2007, a forest fire destroyed a large portion of the perimeter drift fence along with 115 traps. As a result, drift fence surveys did not begin again until June 13, 2007. There were only 134 traps post fire. The traps were systematically closed on November 11, 2007, and will be reopened on April 15, 2008 for the entire field season. The purpose of the perimeter drift fence was to prevent animals, specifically pine snakes, from entering the construction site and to capture any snakes trying to leave the site. During the course of the season, 24 species of reptiles and amphibians, 9 species of mammals, and one species of bird were found captured in the drift fence traps. Some of the most common species captured included Hognose snake, northern black racer, Fowler's toad, red-backed salamander (*Plethodon cinereus*), and green frog (*Rana clamitans melanota*) Other amphibians captured in the traps include northern red salamander (*Pseudotriton r. ruber*), four-toed salamander (*Hemidactylium scutatum*), southern leopard frog (*Rana utricularia*), gray treefrog (*Hyla* sp.), and northern spring peeper (*Pseudacris c. crucifer*).

In 2007, five individual pine snakes were captured in the traps on six different occasions. Of the five, four were adults and one was a juvenile. Only one of the captured pine snakes was a new capture. This snake was captured on August 17, 2007. It was PIT tagged and fitted with an external transmitter to enable HA to radio-track it to a natural hibernaculum. White-footed mice (*Peromyscus leucopus*) were the most frequently captured mammal species and ovenbird (*Seiurus aurocapillus*) was the only bird species captured in a trap. Drift fence trapping on various projects by HA have caught numerous species of frogs including spring peeper, chorus frog, cricket frog, wood frog, leopard frog, green frog, bull frog, pickerel frog, American toad, Fowler's toad, spadefoot toad, red backed salamander, northern red salamander, four-toed salamander, marbled salamander and tiger salamander.

METHODS

Erecting Drift Fences

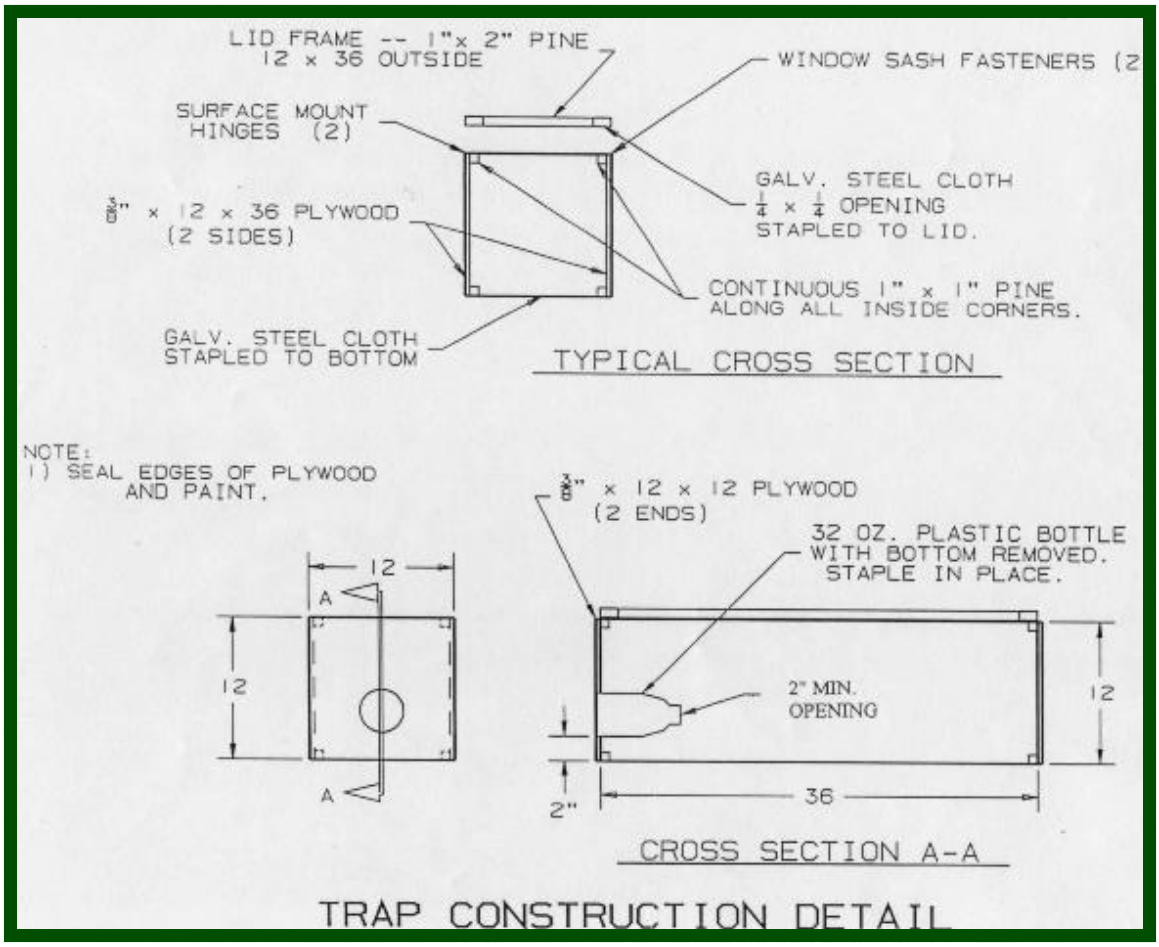
The use of drift fences has long been an acceptable way to monitor amphibians and reptiles (Campbell and Christman 1982; Enge 1997a and 1997b; Enge 1998). Under HA's supervision, Orange County's Maintenance Department will erect approximately 3,000 feet of nylon silt fences as depicted in NY DEC's **Figure 1**, in order to catch or observe migrating cricket frogs. Orange County's Maintenance Department will also supply a Ditch Witch to dig the 3,000 feet of trenches. The drift fences must be buried 4 to 8 inches below grade, then back-filled and tamped. It is likely that 50 extra wooden stakes will be needed to keep the fence at the proper angle. Other tools and materials will be needed such as staples, staple guns, shovels, rakes and laborers to install the fences. The top of the drift fence should be allowed to lean inward towards the hibernation sites, so that frogs are less likely to climb over the material and escape. These items will be provided by Orange County, Dvirka and Bartilucci Consulting Engineers and/or Geovation Engineering. HA will supervise all aspects of the drift fence installations and will help with its construction and hide box installation.

Hide Boxes and Frog Traps

The Orange County Maintenance Department carpenters will build the 30 plywood cricket frog hide boxes following the plans provided by the Division of Fish, Wildlife and Marine Resources (see NY DEC's **Figure 3-B**). The hide boxes will measure 24 inches long, 12 inches high, and 12 inches wide with one 8 inch ramp and one 6 inch ramp. A directional plywood arm will be placed on the hide box to guide the migrating frogs into the box. Each hide box will have a hinged lid on the top, to allow inspection of the interior for frogs, and a locking latch to prevent raccoons from opening the lid. A small low-sided plastic pan of water or large wet sponge will be placed inside to allow frogs to re-hydrate.

There will be a total of 30 hide boxes and 30 frog traps (60 total). The hide boxes will be placed along the inside edge of the nylon silt fences at approximately 40 to 50 feet apart, whereas the frog traps will be placed on the outside of the drift fences at ground level at approximately 40 to 50 feet apart. A small hole will be cut in the fence to allow the frogs to enter the traps. As frogs move overland they will be intercepted by the silt fence where they can be seen and counted, or they may seek shelter inside the 30 plywood hide boxes. Diagrams and construction details of HA's traps are provided below.

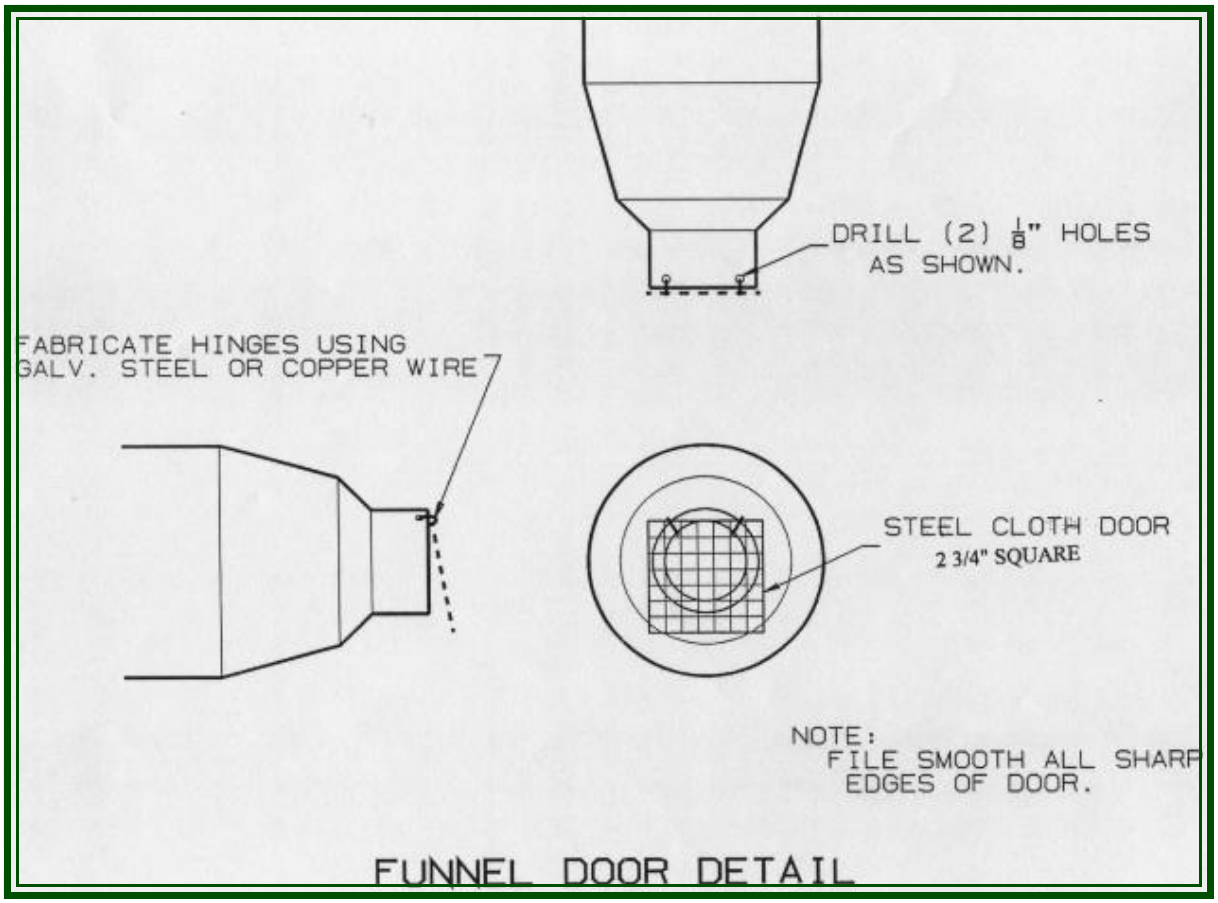
Northern cricket frogs feed upon small insects and other invertebrates. They have the amazing ability to jump 26times their own body length. Such long-distant jumping allows them to flee from predators. Photo by R.T. Zappalorti.



Monitoring Drift Fences

The drift fences, hide boxes and frog traps will be monitored from about April 1st (or as soon as the fence is operational) to June 1, 2008. As dictated by the NY DEC, the hide boxes and frog traps will be checked twice daily. Each box or trap will be opened and inspected between 0700 to 0900 hours in the A. M. Then again at the end of each workday between 1500 to 1700 hours in the P. M.. All frogs and other animals will be identified, counted and released on the lake side of the drift fence. Photos will be taken of frogs in the hide boxes and/or traps to document use and capture success.

It should be noted that we plan on checking the hide boxes and frog traps every day for the duration of the investigation. If, at any time, HA is unable to maintain this schedule, the traps would be removed or the openings will be covered to prevent frogs and other wildlife from being trapped. Data will be recorded for each individual organism captured and all cricket frogs will be promptly released on the lake side of the drift fence. A sample data sheet is provided below for review and approval. If it is determined that all frogs have completed their spring migration from hibernation sites and have entered Glenmere Lake, then the study will be terminated sooner, but only with the approval of the NY DEC herpetologist.



Monitoring Staff

Robert Zappalorti Sr. will supervise all aspects of this investigation. He will train the biologists from Geovation Engineering on site and be present the first few days of data collection. Both HA and Geovation Engineering will be responsible for monitoring the drift fences, 30 hide boxes and 30 frog traps. Robert Zappalorti Jr, and Ray Farrell will be HA's designated staff persons to check the hide boxes and frog traps. Ray is Robert Jr's backup if he cannot be on site to monitor the drift fences and hide boxes on his designated days. On alternative days, the following staff from Geovation Engineering will check the drift fences and hide boxes: Sheila McGroddy, P.E., Matthew Mordas, Robert Zimmer, P.E., P.G. One or more persons will be on the study site every other day, so someone will check and monitor the drift fences and look for cricket frogs twice a day (every day), throughout the two or three month study period. In keeping with the NY DEC's objectives we will attempt to identify where cricket frogs are migrating from and document their activities. One of the major tasks is to determine if the cricket frogs are preferentially using the abandoned buildings for hibernation purposes.

Schedule

The survey will take place during the spring when frogs are moving from upland hibernacula to Glenmere Lake. Therefore, HA requests that the NY DEC reviews and approves our study plan as soon as possible so we may erect the drift fences and start the investigation by April 1, 2008.

Cooperation and Coordination

HA will gladly coordinate our activities with the NY DEC, Division of Fish, Wildlife and Marine Resources, so your representatives can observe and inspect our survey methods and activities. We will also notify the NY DEC and/or DFWMR of any problems encountered during the survey and before deviating from this approved study plan. If it is determined that cricket frogs are indeed using the old foundations and concrete slabs as a hibernacula, then it may be necessary to design and build artificial overwintering sites to replace the important hibernacula that would be lost by the Glenmere Lake Environmental Remediation Project. This mitigation work and design would be done in conjunction with NY DEC herpetologist, Alvin R. Breisch and Corbin Gosier NY DEC's project manager.

HA will apply for an Endangered/Threatened Species Permit or License as soon as possible. Our license application is being submitted in conjunction with the submittal of this study plan, to ensure the license is approved in time for a spring (April 1, 2008) survey.

Recommendations

HA recommends that the overflow stream from Glenmere Lake is another possible habitat where cricket frogs could hibernate. To test this theory, routine random searches will be made along the stream edges and habitat that is situated between the lake and the stream on a daily basis. HA has provided a draft sample data sheet for the NY DEC's review and approval. Upon completion of this investigation and spring cricket frog survey, HA will submit our final report to the NY DEC. Based upon the results of our study we will make recommendations on IRM activities. Site clean-up should take place between June 16 and August 16, 2008, when the cricket frogs are breeding and utilizing the lake shore. Care must be taken by contractors not to impact the frogs during upland activities. Additional precautions will be required to avoid incidental take of individual frogs. For example, drift fence barriers can be placed on the lake shore, so that heavy equipment does not encroach upon the breeding habitat of the frogs. HA recommends that appropriate precautions be taken during the removal and clean-up of the old building foundations, thus eliminating the need for an additional license for incidental take of an endangered species.

If it is determined that building foundations, concrete slabs or other site debris have become important overwintering sites for northern cricket frogs, DFWMR may recommend the construction of artificial hibernacula concurrent with IRM activities. DFWMR would welcome further discussion regarding artificial hibernacula once the spring amphibian survey is complete.

Sample Data Sheet
Herpetological Associates, Inc. Data Sheet for Northern Cricket Frog Drift Fence Studies at Glenmere Lake

Date: _____ Time in AM: _____ Time in PM: _____

Relative Humidity: _____ Surface Temperature: _____ Air Temperature: _____

Soil Temperature: _____ Weather: _____

Drift Fence Sections	No. of Cricket Frogs Hopping Along the Drift Fence in AM	No. of Cricket Frogs Concealed in Hide Boxes or Frog Traps in the AM	No. of Cricket Frogs Hopping Along the Drift Fence in the PM	No. of Cricket Frogs Concealed in Hide Boxes or Frog Traps in the PM	Total Frogs Seen During the Day?
Fence One					
1 - A					
2 - B					
3 - C					
4 - D					
Fence Two					
1- A					
2 - B					
3 - C					
4 - D					
Totals:					

Record and take detailed notes on the number of cricket frogs seen along Glenmere Lake margins, the overflow stream, in the fields, in the woods, or in and around the old building foundations and concrete slabs. Note if any photos were taken and how many.

_____
_____
_____
_____
_____
_____
_____
_____

Observers: _____ Photos: _____

SUMMARY AND DISCUSSION

The purpose of this study is to determine to what extent the northern cricket frog population uses upland areas as overwintering sites. What part of the adjacent available habitat serves as important hibernacula? HA will attempt to answer this question with random habitat searching and an intensive drift fence study as suggested by and following the guidelines of the NY DEC. HA will collect data on frog movements by the use of hide boxes and frog traps positioned along drift fences. Overwintering in areas such as the old building foundations and concrete slabs, the nearby over flow stream, spring seeps, flooded wooded swales, vernal ponds and deep leaf pockets on the forest floor are typical of frogs that are not freeze tolerant (Lamoureux and Madison, 1999). The overwintering strategies of *A. crepitans* are presently poorly understood and this research project may clarify and define the hibernating habits and hibernating locations of this endangered species (Gibbs et al 2007).

HA looks forward to conducting this important northern cricket frog research project and working closely with Alvin R. Breisch and Corbin Gosier NY DEC's project manager. We welcome any suggestions or comments from NY DEC on how to improve upon our sampling methods and are ready willing and able to initiate this investigation.

Respectfully submitted

Robert Zappalorti, Sr.
and
Robert Zappalorti, Jr.

HERPETOLOGICAL ASSOCIATES, INC.

Northern Cricket Frog Bibliography and Literature Cited

Burkett, R. D. 1984. An ecological study of the cricket frog, *Acris crepitans. In* R. A. Seigel, L. E. Hunt, J. L. Knight, L. Malaret, and N. L. Zuschlag (eds.), Vertebrate Ecology and Systematics-A Tribute to Henry S. Fitch, pp. 89-103. Museum of Natural History, The University of Kansas, Lawrence.

Campbell, H.W. and S.P. Christman. 1982. Field techniques for herpetofaunal community analysis in herpetological communities. Ed. by Norman J. Scott, Jr., U.S. Dept. of the Interior, Fish and Wildlife Service. Wildlife Research Report No. 13, pp. 193-200.

Conant, R. and J. T. Collins. 1991. *A Field Guide to Reptiles and Amphibians of Eastern and Central North America.* Houghton Mifflin Company, Boston, Mass. 429 pp.

Enge, K. M. 1997a. A standardized protocol for drift fence surveys. Technical Report No. 14. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida. 68 pp.

Enge, K. M. 1997b. Use of silt fencing and funnel traps for drift fencing. Herpetological Rev. 28:30-31.

Enge, K. M. 1998a. Herpetofaunal drift-fence survey of steephead ravines in 2 river drainages. Proc. SE Assoc. Fish Wildlife Agencies 52:336-348.

Gibbs, J. P., A. R. Breisch, P. K. Ducey, G. Johnson, J. Behler, R. C. Bothner. 2007. The Amphibians and Reptiles of New York State. Oxford University Press. Pp 121-124.

Johnson, Bruce K. and James L. Christiansen. 1976. The Food and Food Habits of the Blanchard's Cricket Frog, *Acris crepitans blanchardi* (Amphibia, Anura, Hylidae), in Iowa. Journal of Herpetology 10(2):63-74.

Labanick, G. M. 1976. Prey availability, consumption and selection in the cricket frog, *Acris crepitans* (Amphibia, Anura, Hylidae). Journal of Herpetology 10(4):293-298.

Lamoureux, V. S. and D. M. Madison. 1999. Overwintering habitats of radio-implanted green frogs, *Rana clamitans*. Journal of Herpetology. 33(3):430-435.

Nevo, E., and R. R. Capranica. 1985. Evolutionary origin of ethological reproductive isolation in cricket frogs, *Acris. In* M.K. Hecht, B. Wallace, and G. T. Prance (eds.), Evolutionary Biology, Vol. 19, pp. 147-214. Plenum Press, New York.

Perrill, Stephen A. and Lisa C. Lower. 1994. Advertisement call discrimination by female cricket frogs *(Acris crepitans).* Journal of Herpetology 28(3):399-400.

Perrill, Stephen A. and M. Magier. 1988. Male mating behavior in *Acris crepitans.* Copeia 1988:245-248.

Perrill, Stephen A. and William J. Shepherd. 1989. Spatial Distribution and Male-Male Communication in the Northern Cricket Frog, *Acris crepitans blanchardi.* Journal of Herpetology 23(3):237-243.

Pyburn, W. F. 1958. Size and movements of a local population on cricket frogs *(Acris crepitans).* Texas J. Sci. 10:325-342.

Ryan, M. J., and W. Wilczynski. 1991. Evolution of intraspecific variation in the advertisement call of a cricket frog *(Acris crepitans,* Hylidae). Biol. J. Linnean Soc., 44:249-271.

Ryan M. J., S.A. Perrill, and W. Wilczynski. 1992. Auditory tuning and call frequency predict population-based mating preferences in the cricket frog, *Acris crepitans.* Amer. Natur. 139:1370-1383.

Smith, H.M., R. T. Zappalorti, A. R. Briesch, and D.L. McKinley. 1995. The Type Locality of the Frog *Acris crepitans.* Herpetological Review 26(t):14

Werner, Earl E., Gary A. Wellborn, and Mark A. McPeek. 1995. Diet composition in post metamorphic bullfrogs and green frogs: Implications for interspecific predation and competition. Journal of Herpetology 29(4):600-607.

Lamoureux, V. S. and D. M. Madison. 1999. Overwintering habitats of radio-implanted green frogs, Rana clamitans. Journal of Herpetology. 33(3):430-435.

Zappalorti, R. T. 1978-79. An updated progress report on the distribution and locality records of New Jersey's endangered and threatened reptiles and amphibians. For NJDEP, E&NSP, Vol. 10, Herpetological Associates, Inc., Parts 1, 2, 3, 4. pp. 198.

Zappalorti, R. T. and J. Bockowski. 1965. The northern cricket frog (*Acris crepitans*) on Staten Island, New York. Bulletin of the New York Herpetological Society. Vol 25.

Zappalorti, R. T. and D. Hulmes. 1980. A Preliminary Ecological Study of the Southern Gray Treefrog, *Hyla chrysoscelis*, Cope (Amphibia, Anura, Hylidae) in Southern New Jersey. Unpublished report submitted to the NJDEP. HA File No. 80.09, p. 25.

Zappalorti R. T. and E. W. Johnson. 1981. Proposed management plans for endangered and threatened amphibians and reptiles in New Jersey. Unpublished report submitted to the NJDEP, HA File No. 81.12, pp. 12-15.

Zappalorti, R. T. and E. W. Johnson. 1982. An Updated Progress Report on the Distribution and Locality Records of Endangered and Threatened Amphibians in New Jersey. Submitted to NJDEP, Endangered and Nongame Species Project. (Unpublished and classified information). Pp. 181.

Zappalorti, R. T. and S. A. Sykes. 1999. Northern Cricket Frog (*Acris crepitans*) Surveys, Habitat Evaluations, and a Review of the Proposed Apple Greens East 9 Hole Golf Course, Lloyd Township, Ulster County, New York. HA File No. 99.24. Submitted September 1, 1999, to Alec Diachishin and Associates, P.C., Consulting Engineers and Land Surveyors, Napanoch, New York 12458. By Herpetological Associates, Inc.

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April 2, 2008

Joshua P. Cook, Environmental Engineer I
Remedial Bureau C - Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7014

Re: Modifications, Additional Information and Amendments to the Northern Cricket Frog Study Plan to conduct a Drift Fence Study at the Glenmere Lake Environmental Remediation Project, Town of Chester, Orange County, New York - HA File No. NY2008.01

Dear Mr. Cook:

In response to your letter dated April 1, 2008, Herpetological Associates, Inc. (hereafter HA), provides herewith the modifications, additional information and amendments to our Study Plan that you requested. As you know, our firm was subcontracted by Dvirka and Bartilucci Consulting Engineers on behalf of the Orange County Department of Parks, Recreation and Conservation. Our responsibilities will include, but not be limited to evaluating the old foundations and concrete slabs on the Glenmere Lake upland habitat as overwintering sites (hibernacula) for northern cricket frogs (*Acris crepitans*), conduct a cricket frog drift fence survey, review the potential direct and secondary impacts of the Environmental Remediation Project on the cricket frog population.

Since most of the changes are related to data collection, Orange County and its consultants will begin to erect the drift fences as shown in NY DEC's **Figure I**. The nylon silt fence will be installed so it encircles potential areas where cricket frogs may be hibernating. We will place the fence in areas that avoid old structures, ground surface rock and large trees. We will seek to place the fence in areas with deep soil, so it can be back filled and buried at the proper soil depth (4 to 8 inches below existing grand). After the fences are erected, Dvirka and Bartilucci Consulting Engineers will record all coordinates via GPS. This information will include the locations of all the boxes, traps and fences.

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1. Once the fence is installed, a description and drawing will be provided that shows its location on the study site, and the number of stakes used to support it. We will also plot the position of the 30 hide boxes and 30 frog traps will be attached to the fence.

2. All hide boxes will be constructed from untreated plywood following the plans provided by the Division of Fish, Wildlife and Marine Resources (see NY DEC's **Figure 3-B**).

3. All hide boxes and frog traps will contain a water pan or wet sponge so cricket frogs have the opportunity to re-hydrate while in the structures.

4. All hide boxes and frog traps will be labeled and identified as follows: Scientific Study in Progress by Herpetological Associates, Inc. under an Endangered Species Permit issued by the New York State Department of Environmental Conservation. This is Hide Box Number 10. Please do not disturb or open the boxes as valuable data may be lost. For more information contact HA Staff at 732-833-8600. Thank You.

5. Routine checking of the fences will be made twice daily for the duration of the project. The fences will be walked first on the inside while the hide boxes are being checked, then the entire perimeter of the fences will be walked while checking the frog traps on the outside of the fences. Any frogs seen or captured will be recorded on the data sheet as to its closeness to the nearest numbered trap, and as to what side of the fence the frog was observed. After data is recorded, the frogs will be released away from the fences on the lake shore.

6. HA's data sheet has been modified as per NY DEC's request. A sample of our new data sheet is attached for your files.

HA's principal herpetologist will conduct an intensive two-day onsite training session with all persons responsible for monitoring the drift fences and collecting frog data. All personnel will be made aware of any site hazards and a safety procedures as needed. A weather station will also be established to record temperature and humidity at the study site. All personnel will be shown how to make thorough daily observations along the fences and how to safely capture cricket frogs. A plastic container with clean water will be one method of transporting the frogs to the lake shore after all pertinent data is recorded.

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HA looks forward to conducting this important northern cricket frog research project and working closely with Joshua Cook, Alvin Breisch and Corbin Gosier from NY DEC. We welcome any suggestions or comments from NY DEC on how to improve upon our sampling methods and are ready willing and able to initiate this investigation.

Respectfully submitted

HERPETOLOGICAL ASSOCIATES, INC.

Robert Zappalorti, Executive Director/CEO

Herpetological Associates, Inc. Data Sheet for Northern Cricket Frog
Drift Fence Studies at Glenmere Lake, Orange County, New York

Date: _____ Start Time in Morning (AM): _____ End Time in AM: _____

Start Time in Afternoon (PM): _____ Time Field Work Ended in PM: _____

Relative Humidity: _____ Surface Temperature: _____ Air Temperature: _____

Soil Temperature: _____ Weather Conditions: _____

Hide Box Numbers	No. of Frogs?	Hide Box Numbers	No. of Frogs?	Frog Trap Numbers	No. of Frogs?	Frog Trap Numbers	No. of Frogs?
Hide Box 1		Hide Box 16		Frog Trap 1		Frog Trap 16	
Hide Box 2		Hide Box 17		Frog Trap 2		Frog Trap 17	
Hide Box 3		Hide Box 18		Frog Trap 3		Frog Trap 18	
Hide Box 4		Hide Box 19		Frog Trap 4		Frog Trap 19	
Hide Box 5		Hide Box 20		Frog Trap 5		Frog Trap 20	
Hide Box 6		Hide Box 21		Frog Trap 6		Frog Trap 21	
Hide Box 7		Hide Box 22		Frog Trap 7		Frog Trap 22	
Hide Box 8		Hide Box 23		Frog Trap 8		Frog Trap 23	
Hide Box 9		Hide Box 24		Frog Trap 9		Frog Trap 24	
Hide Box 10		Hide Box 25		Frog Trap 10		Frog Trap 25	
Hide Box 11		Hide Box 26		Frog Trap 11		Frog Trap 26	
Hide Box 12		Hide Box 27		Frog Trap 12		Frog Trap 27	
Hide Box 13		Hide Box 28		Frog Trap 13		Frog Trap 28	
Hide Box 14		Hide Box 29		Frog Trap 14		Frog Trap 29	
Hide Box 15		Hide Box 30		Frog Trap 15		Frog Trap 30	
Notes - Frogs Seen Along the inside of Fence?							
Notes - Frogs Seen Along the Outside of Fence?							
Total Cricket Frogs Seen							

Write other notes of interest on back of data sheet. What other types of frogs, salamanders, or reptiles were seen?