## SUMMARY AND CONCLUSIONS

Herpetological Associates, Inc. (HA) was contracted by Geryville Materials, Inc. to conduct bog turtle (*Glyptemys muhlenbergii*) and redbelly turtle (*Pseudemys rubriventris*) habitat evaluations (Phase I) and presence/absence surveys (Phase II) at the Geryville Materials site in Lower Milford Township, Lehigh County, Pennsylvania (SIR# 21405, USFWS Project #2006-0390; **Appendix A**).

During the Phase I survey on April 6, 2006, HA found potential bog turtle habitat in three wetland areas (Wetlands D, J, and K) within the study site. Wetland D is a forested/shrub scrub with small emergent wetland areas along the banks of a Macoby Creek headwater branch. The most suitable bog turtle habitat associated with Wetland D is the off-site portion of the tributary located to the west of the subject property. Wetland J is an open-canopy tussock sedge wetland located along an unnamed tributary to Hosensack Creek near the southwestern edge of the study site. Wetland K is separated from Wetland J by West Hill Mill Road and consists of the emergent, scrub-shrub, and forested patches of wetland along the tributary. Suitable bog turtle habitat was also observed within a powerline ROW adjacent to the study site. The Phase I evaluation also documented potential redbelly turtle aquatic habitat in a man-made pond within Wetland L. Potential nesting habitat occurs on the banks of the pond, and in agricultural fields to the south and north of the pond.

Phase II bog turtle surveys were conducted at Wetland D on May17, May 29, June 3, and June 8, 2006. Both on-site and off-site portions of the wetland were included in each survey day, but permission was not granted to access the off-site portion of Wetland D on June 8, 2006. No bog turtles were found within Wetland D or within the off-site portion of the wetland during the surveys.

Phase II bog turtle surveys were conducted at Wetland J on April 20, April 27, May 2, and May 6, 2006. The surveys included suitable areas of Wetland K, but the primary emphasis was placed on the highly suitable habitat in Wetland J. One adult female bog turtle was found in Wetland J on May 6, 2006.

Phase II surveys for redbelly turtles and redbelly turtle nesting habitat were conducted at the man-made pond in Wetland L on June 3, June 8, June 16, and June 20, 2006. Snapping turtle and painted turtle nesting was observed on the banks of the pond and in the adjacent agricultural fields. All of the nests and egg fragments were smaller than is typical for redbelly turtle, and therefore redbelly turtle nesting was not confirmed. Surveys for basking or swimming redbelly turtles in the pond also failed to detect this species. Based on the results of the surveys, redbelly turtles do not occur within this pond.

## BOG TURTLE LIFE HISTORY

**Figure 32**. A bog turtle from Monroe County, Pennsylvania.

Description

The bog turtle is classified taxonomically into the class *Reptilia*, order *Testudines*, suborder *Thecophora*, family *Emydidae*, genus *Glyptemys* [*Clemmys*], and species *muhlenbergii* (Schoepff; **Figure 32**). Conant and Collins (1991) describe this turtle as small, attaining an average carapace length of 7.5-9 centimeters (3-3.5 inches), with a maximum recorded length of 11.4 centimeters (4.5 inches). The carapace is moderately domed, rather long, and slightly keeled (Carr, 1952). The scutes are often fairly deeply incised by the concentric rings of the laminae, although in older animals the shell is often worn smooth through years of burrowing in mud. In specimens which do not have iron oxide or other deposits on the shell, a light "sun-burst" pattern can be seen on each scute of an otherwise brown shell. The plastron is large, and dark brown or black in color with light markings either irregularly or symmetrically arranged. The limbs are typically brown with orange or reddish beneath, and there is a conspicuous orange head blotch behind the tympanum.

Status

Pennsylvania Status - Endangered
Federal Status - Threatened

Range

Disjunct populations exist throughout the range of the bog turtle, occurring in 4 distinct areas (Conant and Collins, 1991). These separate populations occur in central New York; western Pennsylvania; eastern New York south to southern New Jersey and west to central Pennsylvania; and southern Virginia, south through western North Carolina, into extreme northern Georgia.

Habitat and Life History

Although rarely found far from water, the bog turtle is not a strong swimmer and may drown quickly if forced to stay in deep water; generally bog turtles are found wallowing in soft mud or swimming in shallow (several inches) streams and puddles. This turtle is omnivorous, and may feed on a variety of insects, earthworms, slugs, or berries. Loss of habitat through the direct destruction of wetlands, fragmentation of range as a result of long-term geologic factors (Carr, 1952), and vegetative succession by wetland trees and invasive plants have all greatly impacted bog turtle populations.

Bog turtles generally do not move large distances and have relatively small home ranges. Not unlike other turtle species, males appear to have a larger home range than females (Lovich et al., 1992; Gibbons, 1986; Gibbons, et al., 1990; Morreale, et al., 1984). In Pennsylvania, Ernst (1977) reports mean home

range for males as 1.33 ha, and 1.26 ha for females. Chase, et al. (1989) is in agreement, but differences in mean home range between both sexes are larger and statistically significant for thread trailed specimens in Maryland: $\bar{x}$ = 0.176 ha for males, $\bar{x}$ = 0.066 ha and females. Distance traveled between locations of radiotracked bog turtles in North Carolina ranged 0-87 m ($\bar{x}$ = 24.3 m) for males and 0-62 m ($\bar{x}$ = 15.8 m) for females (Lovich, et al.,1992); rates of movements (distance/day) were also significantly larger for males. Movements and home range dimensions of bog turtles may be governed by the size of suitable habitat available to them.

Unlike most other chelonians, *G. muhlenbergii* do not travel to dry upland areas or the shore or beach of a pond to deposit their eggs. Instead, they select suitable slightly elevated nesting sites within their semi-aquatic marshy habitat (**Figure 33**). Probably because of the constant saturated soil conditions in such environments, eggs are not buried in deep nest chambers. Instead, they are deposited in a shallow depression on the surface of raised grassy tussocks and are slightly covered with available humus and vegetation (Zappalorti, 1976; Ernst et al., 1994). The elevated base of tussock-forming grasses and sedges is the preferred nesting site, but nests have also been found on moss covered stumps and *Sphagnum* clumps (Zappalorti, pers. obs. 1975-1989). Nesting areas typically have limited canopy closure, support low vegetation and provide ample solar exposure. The possibly unique nesting habits of *G. muhlenbergii* is believed to reduce high predation usually associated with upland egg-laying (Kiviat, 1978). In most chelonians and generally other K-selected vertebrates, the period of greatest vulnerability is during the early stages of life (Odum, 1984).

**Figure 33**. A bog turtle nest in a grassy hummock.

## REDBELLY TURTLE LIFE HISTORY

Identifying Characteristics

The redbelly turtle (*Pseudemys rubriventris*; Leconte, 1830; **Figure 34**) is a large basking turtle averaging 10-12 inches (254-305 mm) in carapace length when mature (Conant and Collins, 1991). Coloration and pattern are highly variable, but in general, the carapace is mahogany to black, with light chestnut to reddish vertical bars on the laminae. The name *rubriventris* is from the Latin words *rubidus* or reddish, and *venter* for belly, referring to the reddish plastron (Graham, 1991). The common name follows Collins and Tagart (2002).

**Figure 34**. A hatchling redbelly turtle.

Considerable sexual dimorphism exists in body size and scute proportions (Graham, 1991). Female redbelly turtles are larger and have a longer plastron, higher shell and wider bridges, and plastral scutes are relatively longer at the midline, except the femoral scute, which is slightly longer in males. Redbelly turtles, especially males, tend to become melanistic with age. Background color of the male plastron is pale pink overlaid with dark vermicular mottling; in females, it is coral red with grey figures narrowly bordering the plates (Graham, 1971b). The front of the upper jaw has a terminal notch flanked on each side by a distinct maxillary cusp. The presence of maxillary cusps distinguishes the redbelly group, which also includes the Florida redbelly turtle *(P. nelsoni)* and the Alabama redbelly turtle *(P. alabamensis)*.

Status

Pennsylvania Status - Threatened
Federal Status - None

Range

The redbelly turtle has a relatively continuous coastal plain distribution across seven mid-Atlantic states from eastern North Carolina to central New Jersey, and a disjunct population in southeastern Massachusetts (Ernst and Barbour, 1989). Waters (1962) suggests that the Massachusetts population may be a relic from a once continuous, prehistoric distribution across the eastern coastal United States. *P. rubriventris* could have expanded its range when the continental shelf was emergent during the post-Wisconsin glacial period, which became isolated as the shelf submerged with the retreat of the glaciers. South of New England, the northernmost redbelly population known occurs in Middlesex County, New Jersey. Redbelly turtles are also known historically from New York (Babcock, 1938; Carr, 1952), and an introduced population apparently became established in Charleston, Staten Island, New York, R. Zappalorti, in Litt. 1992).

Habitat and Life History

Although most of their time is spent in fresh water ponds, Pennsylvania redbelly turtles may also be found on land. In late spring and early summer, females select nesting sites in sandy soil, usually within 100 yards (90 m) of the pond. Females occasionally travel greater distances from the ponds in search of suitable nesting sites (J.D. Lazell, Conservation Agency, Conanicut Island, Rhode Island, in Litt. 1980). In each nest, an average of 12 eggs (range 5-17) are deposited (Zappalorti, personal observations; Haskell, 1993). Incubation takes 73-80 days at 25°C (Graham, 1971b). Hatchlings average about 1.25 inches (32 mm) in length (range 25.8-40.8 mm). Under certain conditions, hatchlings do not emerge from nests to enter ponds and instead overwinter in the nest chamber. Sexual maturity in redbelly turtles is probably reached at 15 years by females and sooner by males.

Redbelly turtles are usually active from late March to November. During the winter, they rest on the bottom of ponds under the ice, in a state of relative inactivity known as brumation. Current data gathered suggests that aquatic vegetation is the primary diet for all ages classes (Graham, 1969; 1981).

Factors Contributing to the Threatened Status in Pennsylvania

The Pennsylvania Fish and Boat Commission, with the advice of a team of herpetologists, generally considered the following factors that may adversely affect the redbelly turtle and its habitat: adverse modification of water quality, such as siltation from land clearing adjacent to ponds; pollution and eutrophication of ponds; pollution of groundwater or reduction in the levels of ponds from groundwater pumping; any draining or filling of wetlands adjacent to occupied ponds; and shoreline modification such as filling, dredging for beaches, dikes, real estate development or similar types of activity (Graham, 1984; U.S. Fish and Wildlife Service, 1994). Other factors include:

1. Predation of eggs by raccoons and striped skunks, whose population tend to increase with residential development and habitat fragmentation;

2. Predation on hatchlings and young turtles from introduced and natural predators, such as largemouth bass, herons, bullfrogs, etc.;

3. Loss of nesting and basking sites to development, recreation, and forest canopy closure;

4. Manipulation of aquatic vegetation, including herbicide use, which may impact quality and quantity of food resources;

5. Collection and harassment by humans;

6. Incidental mortality from highway traffic and shooting;

7. Isolation of populations resulting in inbreeding and genetic drift, which can reduce genetic variability and potentially decrease survivorship.

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**Zappalorti, R.T., M.P. McCort, M.E. Torocco, and D.W. Schneider.** 2001. Redbelly turtle (*Pseudemys rubriventris*), Coastal Plain leopard frog (*Rana utricularia*), and New Jersey chorus frog (*Pseudacris triseriata kalmi*) surveys at the Warner Northside Operations Project in Bucks County, Pennsylvania. Unpublished report submitted to Waste Management, Inc. HA File No. 2001.50.

# Appendix A

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
*(814) 359-5237 Fax: (814) 359-5175*



January 19, 2006

**IN REPLY REFER TO**
**SIR# 21405**

EARTHRES GROUP
JOHN ROSS
P.O. BOX 468
PIPERSVILLE, PA 18947

**RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species**
**PNDI Search No. 20051116011253**
**GERYVILLE MATERIALS, INC QUARRY**
**LOWER MILFORD Township, LEHIGH County, Pennsylvania**

Dear Mr. ROSS:

I have examined the project narrative and map accompanying your recent correspondence, which shows the location for the above-referenced project. Based on records maintained in the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files, the state endangered and federally listed threatened bog turtle (*Glyptemys muhlenbergii*) and the state threatened red-bellied turtle (*Pseudemys rubriventris*) are known from the vicinity of the project site.

The bog turtle is a small (up to a 4 inch carapace) semi-aquatic, omnivorous turtle that prefers open marshy wetlands associated with springs and groundwater, specific vegetative communities and mucky soils for burrowing. This species is restricted to the southcentral and southeast portions of Pennsylvania. However, due to the lack of pristine habitat found in its range from disturbance and plant successional processes, the bog turtle has, in some cases, become accustomed to disturbed, low quality wetland complexes often with semi-closed canopies. Bog turtles are also known to be transients in forested habitat that are associated with springs and small streams leading to more open marshes. They use these habitats as dispersal corridors to other wetlands. The bog turtle is threatened by habitat destruction, poor water quality and poaching.

Based on the proximity of your proposed project to known bog turtle habitat, there may also be suitable bog turtle habitat on the proposed project site. **Therefore, we request that a habitat suitability assessment (Phase 1 survey) for bog turtles be conducted by a qualified herpetologist.** A list of qualified surveyors is enclosed for your convenience. Bog turtle habitat surveys are to be conducted in accordance with the methods outlined in the enclosed "*Guidelines for Bog Turtle Surveys*."

Upon completion of the Phase 1 bog turtle survey, the qualified herpetologist is to send a report documenting the survey results to this office (Natural Diversity Section) for our review and comment. The report should include the following information: descriptions of the wetland vegetation, soils, and hydrology on the site; color photographs and maps of suitable habitat; and a list of all herpetofauna observed during the survey. If any bog turtles are observed during the survey, their location(s) should be mapped, and they should be photographed, aged, sexed, and measured. Following our review of the habitat survey, an additional life

survey to determine bog turtle presence (Phase 2) may be required. Due to the federal status of the bog turtle, future correspondence should also be directed to the Endangered Species Biologist of the U.S. Fish and Wildlife Service at their field office in State College, Pennsylvania.

The red-bellied turtle is one of Pennsylvania's largest native aquatic turtles. This turtle species is known to inhabit relatively large, deep streams, rivers, ponds, lakes, and marshes with permanent water and ample basking sites. Red-bellied turtles are restricted to the southcentral and southeastern regions of the Commonwealth. The existence of this turtle species is threatened by habitat destruction, poor water quality and competition with aggressive non-native turtle species that share its range and habitat (e.g. red-eared slider, *Trachemys scripta elegans*).

Based on the review of the project information and the proximity of the project to known element occurrences of the red-bellied turtle, potential habitat or nesting areas for the red-bellied turtle could be present within the proposed disturbance area. Therefore, additional evaluations are necessary to confirm whether or not the project site contains red-bellied turtle habitat and to determine the potential for adverse impacts to this species. We request completion of a biological survey to determine presence/absence of potential red-bellied turtle habitat and/or nesting habitat at the proposed project area.

The red-bellied turtle habitat/nesting habitat survey should include a search for habitat and nesting areas within 1000 feet of large, deep streams, rivers, ponds, lakes and wetlands with permanent water as well as the proposed project area. Note that the period from mid-May through July is the usual nesting time for the species. Although the red-bellied turtle nesting survey must include the aforementioned search areas at a minimum, additional areas should be surveyed at the discretion of the surveyor based upon field observations of likely habitat.

A qualified biologist, who possesses the necessary Scientific Collector's Permit issued by the Pennsylvania Fish and Boat Commission, must conduct this habitat/nesting habitat survey. A list of biologists recognized as qualified by the Pennsylvania Fish and Boat Commission to perform red-bellied turtle surveys is enclosed.

Following completion of the survey, a report of the qualified red-bellied turtle biologist's observations and conclusions must be submitted to this office for further review and consultation. At a minimum the report should include the following information:

- Dates and times (start and end, plus total elapsed) of all site visits
- Weather conditions (including starting and ending air temperatures)
- Search time spent per acre per visit
- A description of the survey methodology – including acreage searched, dates and hours per day of search effort
- An explanation of which waterways/wetlands/uplands or portions of waterways/wetlands/uplands were or were not surveyed and why
- Names and brief summary of the qualifications for all surveyors (leader and assistants)
- Presence or absence of red-bellied turtles
- Exact number and location (latitude/longitude coordinates) for all red-bellied turtles and nests observed
- A narrative description and color photographs (dated and keyed to a map) of where red-bellied turtles, habitat, or their nests were observed – i.e. waterway name, stream characterization (width, depth, channel substrate composition, presence/absence of pools and in-stream basking sites, type and abundance of aquatic vegetation), type of basking structure, stream/wetland/upland, vegetation type, acreage, and for nesting areas the type of soil and percent canopy cover

- A list of other reptile and amphibian species, and the number of each, observed on-site
- A site map with all herpetofauna sightings – including red-bellied turtles – annotated.

If the presence of red-bellied turtles, red-bellied turtle habitat and/or their nesting areas is confirmed within or near the project area, then additional consultation with this office (Natural Diversity Section) will be necessary.

Please note that the Pennsylvania Fish & Boat Commission conducts Species Impact Reviews only for reptiles, amphibians, fishes and aquatic invertebrates. Reviews concerning other natural resources should be directed to the appropriate agencies.

If you have any questions regarding this response, please contact this office at the above number and **refer to the SIR number at the top of this letter**. Thank you for your cooperation and attention to this matter of threatened and endangered species conservation and habitat protection.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/

Enclosures (3)

c: B. Dershem, USFWS
DEP, NE Region

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

January 9, 2006

John R. Ross
EarthRes Group, Inc.
P.O. Box 468
Pipersville, PA 18947

RE: USFWS Project # 2006-0390

Dear Mr. Ross:

This responds to your letter of November 17, 2005, requesting information about federally listed and proposed endangered and threatened species within the area affected by Gerryville Materials, Inc.'s proposed 628-acre quarry project, located in Lower Milford Township, Lehigh County, Pennsylvania. The following comments are provided pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, 16 U.S.C. 661 *et seq.*) and Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The 628-acre site is located within the range of five federally listed species, the threatened bald eagle (*Haliaeetus leucocephalus*), endangered Indiana bat (*Myotis sodalis*), threatened bog turtle (*Clemmys muhlenbergii*), endangered northeastern bulrush (*Scirpus ancistrochaetus*), and threatened small-whorled pogonia (*Isotria medeoloides*). Although none of these species is known to occur on the site, potential habitat for all of these species may occur. Future development on the site should be evaluated with respect to these species based on the information provided below.

Bald Eagle

Bald eagles typically occur in the vicinity of aquatic areas; they frequent lakes, reservoirs, large rivers (*e.g.*, Delaware River, Juniata River, Susquehanna River), and wetland systems. Their nests are usually built in large trees within two miles of these features. Because eagles are vulnerable to human disturbance, particularly during the nesting season, nests are often located in relatively remote forested areas.

The Fish and Wildlife Service proposed to remove the bald eagle from the federal *List of Endangered and Threatened Wildlife* on July 6, 1999 (*Federal Register*, Vol. 64, No. 128), but final action on that proposal has not been taken. The bald eagle, therefore, continues to be listed under the Endangered Species Act. Any changes in the regulatory status of the bald eagle can be monitored by accessing the Service's web site (www.fws.gov).

The bald eagle population in Pennsylvania has increased substantially from the three nest sites found in the State from 1963 through 1980. In 2002, 67 eagle nests were documented. Because bald eagles are continuing to recover and expand their breeding range in Pennsylvania, new eagle nests may be found in previously undocumented locations.

If project activities are proposed in or near potentially suitable bald eagle habitat, adverse effects to the species may occur. Prior to implementing such projects, a mid-winter, aerial survey should be conducted by a qualified biologist to determine whether or not bald eagle nests occur in or near the action area. The search should be focused on areas within two miles of lakes, reservoirs, rivers and large wetlands. Survey results should be submitted to the Service for review and concurrence.

Indiana Bat

Indiana bats hibernate in caves and mines during the winter months (November through March), and use a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, or living or dead trees with crevices or cavities. Female Indiana bats form nursery colonies under the exfoliating bark of dead or living trees, such as shagbark hickory, in upland or riparian areas. However, a variety of tree species such as black birch, red and white oak, and sugar maple are also used.

Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat. Due to the anticipated impacts of the project to forest habitat, a bat survey of the project area should be conducted between May 15 and August 15 by a qualified, Service-approved biologist (see enclosed list) using the enclosed *Indiana Bat Mist Netting Guidelines*. Survey results should be submitted to the Service for review and concurrence.

In addition, if any natural caves or abandoned mines occur within a project area, it is possible that Indiana bats or other bat species may be using them during hibernation or potentially as summer roost sites. If potential Indiana bat hibernacula (*i.e.*, caves or abandoned mines) occur within a project area, they should be surveyed by a qualified biologist. Prior to conducting any survey, however, the Pennsylvania Game Commission should be contacted to determine whether or not they have surveyed the cave/mine in the past. If adequate surveys have been conducted in the recent past, this may preclude the need to conduct additional surveys. Survey results should be submitted to the Service for review and concurrence.

Bog Turtle

Bog turtles inhabit shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy. Bog turtles usually occur in small, discrete populations occupying suitable wetland habitat dispersed along a watershed. The occupied "intermediate successional stage" wetland habitat is usually a mosaic of micro-habitats ranging from dry pockets, to areas that are saturated with water, to areas that are periodically flooded. Some wetlands occupied by bog turtles are located in agricultural areas and are subject to grazing by livestock.

If any wetlands occur within or adjacent to a project area, their potential suitability as bog turtle habitat should be assessed, as described under "*Bog Turtle Habitat Survey*" (Phase 1 survey) of the enclosed *Guidelines for Bog Turtle Surveys*. If any wetlands are identified as potential bog turtle habitat, efforts should be made to avoid any direct or indirect impacts to those wetlands. A known bog turtle site is located within the Hosensack Creek watershed, which is in proximity to the project area. Therefore, impacts to wetlands and streams should be specifically avoided in this area. If adverse effects to wetlands cannot be avoided, a more detailed and thorough survey would be necessary, as described under "*Bog Turtle Survey*" (Phase 2 survey) of the *Guidelines*. The Phase 2 survey should be conducted by a qualified biologist with bog turtle field survey experience (see enclosed list of qualified surveyors). Survey results should be submitted to the Service for review and concurrence. If project activities might adversely affect bog turtles, additional consultation with the Service would be required, pursuant to the Endangered Species Act.

Northeastern Bulrush

Potential habitat for this species could be affected if project implementation will directly or indirectly affect wetlands. The northeastern bulrush is typically found in ponds, wet depressions, shallow sinkholes, vernal pools, small emergent wetlands, or beaver-influenced wetlands. These wetlands are often located in forested areas and characterized by seasonally variable water levels.

We recommend that a qualified botanist with field experience in the identification of this species conduct a thorough survey of all potentially suitable wetland habitat within any proposed project areas to determine the presence of the northeastern bulrush before any permits are approved or earth-moving activities begin. Surveys for this species should be conducted between June 1 and September 30, when the flowering/fruiting culm is present. A survey report should be submitted to the Service for review and comment. A list of botanists skilled in the location and identification of the northeastern bulrush is available upon request.

Small-whorled Pogonia

The small-whorled pogonia typically occurs in upland sites in mixed-deciduous or mixed-deciduous/coniferous forests that are in second or third-growth stages. Characteristics common to most sites include sparse to moderate ground cover in the species' microhabitat, a relatively open understory canopy, and proximity to features (logging roads, streams, other features) that create long-persisting breaks in the forest canopy; too much shading could be a limiting factor. Soils at most sites are acidic and nutrient-poor, with moderately high soil moisture values. Various types of decaying vegetation are almost always found in the microhabitat of this species. Slope, aspect, and the position of the plants on the slope vary greatly throughout the range of the species. Individual plants rarely emerge consistently year after year; dormancy periods of up to four years have been documented.

We recommend that a qualified botanist with field experience in the identification of this species conduct a thorough survey of all potentially suitable habitat within proposed project areas before any permits are approved or earth-moving activities begin. Surveys for this species should be conducted between May 15 and July 31. Because this species is often confused with the common whorled pogonia (*Isotria verticillata*) and Indian cucumberoot (*Medeola virginiana*), the timing of the survey and use of a qualified surveyor are important. A list of qualified surveyors is available from the Service upon request. Survey reports should be submitted to the Service for review and comment.

Should any of the above species or potential habitat be found during any surveys, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects. A compilation of certain federal status species in Pennsylvania is enclosed for your information.

Aquatic Resources

Based on our office review of project information provided and map reconnaissance (*i.e.*, County Soils maps and/or National Wetland Inventory maps), wetlands may occur within the boundaries of the proposed project. Regardless of the presence or absence of federally listed species, work in wetlands requires permits from the Pennsylvania Department of Environmental Protection and/or the Army Corps of Engineers. We suggest you contact the DEP and the Corps for information about permit requirements. A list of the DEP and Corps offices, along with their areas of jurisdiction in Pennsylvania, is enclosed.

By copy of this letter, we are informing these agencies of the proposed project. Please be advised that the Service generally recommends that the Corps and DEP not grant permits to destroy streams or wetlands. For example, filling or relocating streams or wetlands to create buildable lots, or siting stormwater detention facilities in streams or wetlands should be avoided.

This response relates only to endangered or threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Therefore, we suggest contacting a qualified consultant to evaluate your site for potential wetland impacts.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

If you have any questions regarding these comments, please contact Jennifer Dombroskie of my staff at 814-234-4090.

Sincerely,

David Densmore
Supervisor

Enclosures