RAPP ROAD LANDFILL EASTERN EXPANSION : IMPACT ASSESSMENT REPORT
SPECIES LISTED AS ENDANGERED, THREATENED, SPECIAL CONCERN AND SGCN

Introduction and Executive Summary

The following is a compilation of data, summary materials, and conclusions generated from project information currently provided in the Supplemental Draft Environmental Impact Statement (SDEIS) and refinements to be included in the Final Environmental Impact Statement (FEIS). This document also summarizes responses to comments provided in the Supplemental Final Environmental Impact Statement (SFEIS). The City of Albany plans to expand their Rapp Road Landfill eastward into undeveloped and degraded/previously altered City-owned lands (Attachment 1, Figure 2-2). The proposed expansion includes a comprehensive habitat restoration plan that is intended to help re-link viable Pine Bush lands to the east and west of the landfill, mobile home park, and residential properties. The habitat restoration plan is massive in scale, offering the potential to reclaim 250 acres of land, including the landfill itself, with one of the major goals to expand Karner blue butterfly (*Lycaeides Melissa samuelis*) habitat. Figure 2-5 in Attachment 1 is a conceptual layout of the mitigation.

The Landfill Expansion Area and Facilities Relocation Area are located in the City of Albany and the restoration occurs next to the expansion area in the City of Albany, Village of Colonie, and the Town of Guilderland, Albany County, New York. The approximate center-point coordinates of the project are Lat. 42° 42’ 45.3”N; 73° 51’ 08.0”W (Attachment 1, Figure 1 - Project Location Map).

More then 1,500 person-hours have been invested into on-site quantitative investigations and qualitative inventories of vegetation, fauna, and evaluating the potential for restoration of existing disturbed lands. To inventory the current conditions and ecological communities of the impact areas, detailed quantitative vegetation investigations were undertaken along study transects (Refer to Attachment 2 - Albany Landfill Vegetation Data Summary) that bisected the primary representative areas within the Landfill Expansion Area, the Facilities Relocation Area and the Restoration Area that are collectively referred to as the Study Area. The entire communities were also further sampled using plot-less Timed Meandered Search techniques specifically used to evaluate the presence/absence of special status plant species. In addition, specific areas were further sampled for selected groups of species, such as macroinvertebrates in the ditched stream, wetland P4 and reference area locations.

The following methods were used to collect vegetative data. A system of approximately 100-meter line transects were established through representative areas as illustrated in Attachment 1. Along these transects, both herbaceous and woody vegetation was inventoried. Herbaceous species were identified in 1 square meter quadrats every 10 meters along the transects. Also, a Timed Meander Search was used to collect data on additional plant species observed for the first time in the vicinity of each transect and throughout the study area. When no new species were

encountered the search ended. Line intercept methodology was used to record the woody vegetation along the entire transect.

The cumulative list of species sampled in each community type is provided in Attachment 3. Representative photographs of the vegetative communities are located in Attachment 4.

The preferred alternative (Alternative # 3) (Refer to Attachment 1 – Figure 2-2) is to expand the landfill eastward into approximately 8 acres of undeveloped land that is composed of degraded/previously altered, predominantly forested communities. These communities have been significantly impacted by past agricultural activities that have ditched the stream and dewatered the wetlands with drain tiles. These communities have been described according to Edinger 2002. Please refer to Attachment 1, Figure 3.3-1 for the vegetative community locations. The landfill expansion will displace:

- approximately 5 acres of dewatered forested wetland (fits best into the red maple hardwood swamp Edinger community description – although it has very low species diversity and many invasives present) and the remaining 3 acres is composed of Appalachian oak-pine forest, what can best be described as successional old field (previously cleared areas), shallow emergent marsh (wet meadow), reed grass/purple loosestrife marsh (thickly vegetated with common reed), and a ditched perennial stream that has very low aquatic diversity and were found to not support fish or Odonates.

Relocation of the landfill operations facilities to the existing, developed residential parcels to the east will impact a residential property with mowed lawn and approximately 1.5 acres of Appalachian oak-pine forest, much of which is heavily dominated by black locust in the canopy and shrub layer and garlic mustard in the ground story.

Various resources were used to compile a list of rare species that the project evaluated to determine if they could be impacted by the proposed project. Each species documented habitat requirements were compared to the habitats present in the project impact (i.e. landfill expansion and restoration locations) areas. The list of endangered, threatened and special concern species as well as Species of Greatest Conservation Need (SGCN) is provided in Attachment 5.

The habitat measurements revealed that the Landfill Expansion Area, the Facilities Relocation Area and all of the areas proposed for restoration are degraded ecological communities, having been modified by past land uses such as farming, sand mining and development (Fox Run mobile home park). These activities have impacted drainage, soils and native vegetative communities and created disturbances that have favored invasive plant species to establish and in some locations, to predominate. Because no special status plants or animals, or critical habitats, or even suitable habitats were found during the ecological inventories, the conversion of the Expansion Area to landfill and the work necessary to restore, mitigate and enhance natural communities in the Restoration Area will not have any significant adverse short or long term impact on any rare, threatened or endangered species, because they presently do not occupy the land proposed for the expansion and restoration. We have also concluded that the long term benefit of the restoration will have a significant net positive benefit for many of these special status plants and animal species, such as the Karner Blue Butterfly.

Federally-listed Species

The United States Fish and Wildlife Service (USFWS) website was consulted for a list of federally-listed rare species that are known to occur or that have historic records within Albany County. Species listed include:

- Bald eagle (*Haliaeetus leucocephalus*) – Delisted
- Bog turtle (*Clemmys muhlenbergii*) (historic record) – Threatened
- Indiana bat (*Myotis sodalis*) (winter/summer) – Endangered
- Karner blue butterfly (*Lycaeides Melissa samuelis*) – Endangered
- Shortnose sturgeon (*Acipenser brevirostrum*) – Endangered

The USFWS list of extirpated species was also obtained. Species listed include:

- American burying beetle (*Nicrophorus americanus*) – Endangered
- Canada lynx (*Lynx canadensis*) – Threatened
- Eastern cougar (*Puma concolor cougar*) – Endangered
- Gray wolf (*Canis lupus*) – Endangered
- Northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) – Threatened
- Northeastern bulrush (*Scirpus ancistrochaetus*) – Endangered
- Swamp pink (*Helonias bullata*) – Threatened

We have compared the habitats of the study area to the known habitats of each species and have assessed the potential of the project to impact each species as follows:

- **Bald eagles** will not be impacted by the proposed project because their preferred nesting, wintering and foraging habitat does not occur within or near the project area. The project area occurs in a relatively developed area with considerable human/landfill activities and it does not occur near any large waterbodies that bald eagles would occupy on more than a possible transient basis. No nests are present. According to the NY Natural Heritage Program, bald eagles are typically found near large waterbodies that support healthy fish populations and tend to avoid areas with human activities. Their large nests are built in tall trees. Roost sites may be farther away from the food source. Feeding areas during the winter months usually have a high concentration of fish and waterfowl and open water[1].
- **Bog turtles** will not be impacted by the proposed project because suitable habitat for this species does not occur within or near the project area. This species prefers minerotrophic groundwater fed sedge meadows and marshes, typically referred to as rich fens. This is a rare community type not found in the Pine Bush. There have been no reported observations of bog turtles in the Pine Bush. Within the project Expansion Area, the wetlands present are primarily forested with some areas of cleared land along a powerline ROW that supports wetlands dominated by invasive species. None of the hydrology characteristic conducive to the forming of rich fens are present within the Expansion Area or the Restoration Area. The deep sands that comprise the Pine Bush tend to result in leaching of minerals and buffers such that more acidic to neutral conditions persist.

[1] New York Natural Heritage Program. 2009. Online Conservation Guide for *Haliaeetus leucecophalus*. Available from: http//www.acris.nynhp.org/guide.php?id=6811. Accessed March 18th, 2009.

This is documented in the soils report provided as Attachment 6. The soils map (Figure 3.1-4) is located in Attachment 1. The proposed restoration plan is intended to improve habitat for native Pine Bush species. Higher quality wetlands will be created along with upland communities supporting rare species. The stream within the Expansion Area will be re-routed around the landfill expansion so the corridor will be maintained (Attachment 1, Figure 2-5).

- The project will not impact **Indiana bats**. In a July 13, 2006 telephone conversation between USF&WS and CHA Inc. pertaining to this project, it was discussed that Indiana bat habitat does not occur in the Albany Pine Bush and the Pine Bush is greater than 5 miles from the local cave. Therefore, no impacts to the Indiana Bat are expected to occur.
- **Karner blue butterflies** will not be impacted by the proposed project because their habitat and host plants do not occur within the proposed Expansion Area (Attachment 1, Figures 2-3 and 3.3-1). This area is primarily forested. Additionally, no blue lupine (*Lupinus perennis*) plants were found in the restoration area, which is generally composed of degraded communities. Much of the restoration area located east of the mobile home park is forested or early successional forest/scrub shrub communities. The mobile home park itself is developed. The area immediately west of the mobile home park contains some open fields that have been disturbed by past grading and mining activities. The dry sands and past disturbance have left some patches of dry prairie that support native and non-native nectar species. These areas were thoroughly investigated and no blue lupine was identified (Attachments 2 and 3). Known locations of blue lupine that are currently unoccupied by Karner blue butterflies but may have been occupied in the past are illustrated on Figure 4 provided in Attachment 1. Because of the presence of some nectar species and conducive soil (dry sands) and covertype (open field) characteristics, pre-construction surveys are proposed during the appropriate timeframes and according to the protocol provided in Attachment 7. The protocol includes notification requirements should blue lupine plants or Karner blue butterflies be observed during the surveys. Therefore we feel that an impact to Karner blue butterfly is highly unlikely based on the absence of critical habitat and the proposed survey measures to ensure populations in other portions of the Pine Bush have not migrated within or near proposed grading areas. It is also important to note that the purpose of the restoration work is to establish higher quality pine barrens communities designed to expand the habitat of the Karner blue butterfly and other rare Pine Bush species. The landfill expansion will have no impact on Karner blue butterfly habitat. The site is forested. Conversely, upon closure and restoration, the landfill surface will be converted to a pine barrens community that will be highly conducive to the establishment of Karner blue butterfly habitat, consistent with the U.S. Fish and Wildlife Service recovery plan for the Karner blue butterfly. .
- **Shortnose sturgeon** will not be impacted by the proposed project. The stream of the site has very shallow water depths and does not support a fish population. The habitat of this species (Hudson River estuary[2]) does not occur within or near the impact areas. The proposed project does occur within the Patroon Creek watershed that is tributary to the Hudson River estuary. The proposed restoration efforts should improve downstream water quality significantly above current conditions.

[2] New York Natural Heritage Program. 2009. Online Conservation Guide for *Acipenser brevirostrum*. Available from: http://www.acris.nynhp.org/guide.php?id=7168. Accessed March 19th, 2009.

- It is unlikely that the **American burying beetle** will be impacted by the proposed project. The landfill attracts a great deal of scavengers such as gulls, crows, coyotes and rodents so it seems that competition for carrion in the vicinity of the landfill will be significant and more intense as you get closer to the existing landfill. The soils of the expansion area are either saturated mineral/sandy soils (Adrian muck) or loamy fine sands (Colonie loamy fine sand, Granby loamy fine sand & Stafford loamy fine sand) (Attachment 1, Figure 3.1-4). The USFWS Recovery Plan[3] for this species states *while it is clear that certain conditions are not suitable for carcass burial (e.g., very xeric, saturated, or loose sandy soils), it is probable that carrion availability in a given area is more important to the species' occurrence than vegetation or soils per se. Nevertheless, habitat parameters undoubtedly influence the prey base as well as the presence of competitors for limited carrion resources.*
- **Canada lynx** will not be impacted by the proposed project. The habitat and key prey species do not occur within or near the project area. The USFWS recovery outline states that *lynx occur in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare. These forests are generally described as boreal forests*[4].
- **Eastern cougar** will not be impacted by the proposed project because the geographic locale of the project area is too heavily developed and the NYSDEC states that cougar populations do not exist in New York State.
- **Gray wolf** will not be impacted by the proposed project because the project area locale is too heavily developed and the NYSDEC states that wolf populations do not exist in New York State.
- **Northeastern beach tiger beetle** will not be impacted by the proposed project because its habitat does not occur within the impact areas. The USFWS recovery plan states that *Cicindela dorsalis dorsalis has a coastal distribution along the Atlantic coast*[5].
- **Northeastern bulrush** should not be impacted by the proposed project because this species was not observed during the intensive vegetation inventories that were conducted (Attachment 3) and because the wetlands of the expansion area are forested with dense canopy cover and have been degraded and influenced by human activities (Attachment 2). The USFWS recovery plan states that *it has not been found in artificial or human-disturbed habitats, such as ditches, borrow pits, or natural ponds which have been altered by ditching, draining, or dredging. This species also seems to require ample sunlight; plants are usually absent from the highly shaded perimeter of woodland ponds*[6].
- The red maple hardwood swamp and its ditched stream of the proposed expansion area are similar to the habitats of **swamp pink** that are described by the USFWS[7]. However this species was not observed during the intensive vegetation surveys (Attachments 2 and 3). Therefore it is unlikely that it will be impacted by the proposed project.

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[3] U.S. Fish and Wildlife Service. 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.

[4] United States Fish and Wildlife Service Recovery Outline. Contiguous United States Distinct Population Segment of the Canada Lynx. September, 2005.

[5] U.S. Fish and Wildlife Service. 1994. Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis* Say) Recovery Plan. Hadley, Massachusetts. 60 pp.

[6] U.S. Fish and Wildlife Service. 1993. Northeastern Bulrush (*Scirpus ancistrochaetus*) Recovery Plan. Hadley, Massachusetts. 68 pp.

[7] U.S. Fish and Wildlife Service. 1991. Swamp pink (*Helonias bullata*) Recovery Plan. Newton Corner, Massachusetts. 56 pp.

State-listed Species

Various resources were used to identify state-listed species that have been documented or that could occur in the vicinity of the Study Area. These include the:

- New York State Department of Environmental Conservation (NYSDEC) Natural Heritage Program (NHP) response letter dated 7 April 2006.
- List of Species of Greatest Conservation Need (SGCN) from the NYSDEC Comprehensive Wildlife Conservation Strategy (CWCS) for New York State[8].
- Glacial Lake Albany SGCN list that was consolidated from the NYSDEC CWCS for New York State. This was used to identify SGCN that have been documented within the Preserve.
- Albany Pine Bush Management Plan[9].
- NYS Breeding Bird Atlas Blocks (5872B & 5972A)[10].
- NYS amphibian and Reptile Atlas Project[11].

The complete list of species was compiled (Refer to Attachment 5 - Cumulative List of Animals) and their habitats were compared to those of the project impact areas.

In this review, we have assumed that species that are habitat specialists, that rely heavily on specific habitat requirements and settings, will not be found unless their specific habitat requirements are met, and at an appropriate scale to support their populations. If the specific habitats do not occur in the project impact areas (i.e. mineraltropic fen or bog or pine barrens) we have concluded, along with corroborating data showing the species not to be present from on-site surveys for some of the species, that there is a very high probability that each of the special status species will not be impacted by the proposed project. Concern has been raised by Albany Pine Bush Preserve Commission staff that some species may be present from time to time in the proposed restoration areas due to the presence of remnant habitat and the documented presence of the following:

- eastern hognose snake (*Heterodon platirhinos*) in the Preserve lands west of the landfill and within the restoration area in the field located west of the mobile home park.
- eastern spadefoot toad in the vernal pool (Wetland VP) and surrounding sands in a location just northwest of the restoration zone, and
- spotted turtle in the vicinity of the P-4 mitigation wetland and pond and in the nearby bog that occurs to the west of the Restoration Area.

[8] Comprehensive Wildlife Conservation Strategy for New York State. 2006. New York State Department of Environmental Conservation, Albany, NY.
[9] Environmental Design & Research, P.C., M. Batcher, and Behan Planning Associates. 2002. *Albany Pine Bush Management Plan and Final Environmental Impact Statement.* Prepared for the Albany Pine Bush Commission, Latham, NY.
[10] *New York State Breeding Bird Atlas 1980-1985 & 2000-2004*. New York State Department of Environmental Conservation.
[11] *New York State Amphibian and Reptile Atlas Project 1990-1999*. New York State Department of Environmental Conservation.

Considerable on-ground quantitative analysis and qualitative surveys of existing vegetation and habitat conditions, hydrology settings, and some formalized surveys of faunal groups (eg., macroinvertebrates, breeding birds, etc) and informal surveys of these and others groups (eg., amphibians, reptiles, mammals, etc) were conducted during the intensive plant community investigations (see Attachments 2,3 and 8). These investigations resulted in the restoration design team drawing conclusions on the probability of special status species being found in any life-cycle stage within the proposed landfill expansion area, or proposed project restoration areas. For purposes of this review, the conclusions were drawn around the specific sub-areas in the table below, and in reference to all special status plant and animal species, using Karner Blue Butterfly, Buckmoth and their nectary or host plants; spadefoot toad, worm snake and hognose snake; spotted turtle; and woodcock and whipoorwill as representative surrogates for the total group of approximately 45 species.

The following table provides a review of the probability of special status plants or animals being present for any life cycle stage in the landfill expansion or restoration zones. Please see methods and the basis for this assessment and conclusions reached herein.

Area	**Conditions**	**Probability of Use by T/E species**	**Conclusion (s) Reached**
Landfill Expansion Areas			
Existing Landfill Overfill areas-	Brome, tall fescue, Phragmites monocultures	No records of use, no nectary plants, poor cover, poor habitat	Extremely low to not probable
Existing Dune Side Slope	Heavily eroding, shade suppressed ground story, virtually absent ground story vegetation layer and absence of coarse woody debris, and habitat structure.	No records, no nectary plants, poor cover, 100% closed canopy and dense shade and litter deposition.	Not probable
Red maple forested wetland	Dewatered landscape, heavy cover of invasive herbaceous and vines, and shrub layer in over 2/3's of area. Tree cover ~ 30 year old red maples, aspen and several other species. Minimum coarse woody debris, cavernous trees, bare ground, erosion rilling and mass wasting along drainage ditch, etc. Dense 100% canopy and shaded conditions.	No records, no nectary plants, weedy ground cover to absent ground story vegetation, dense shade.	Occasional use by migratory woodcock possible, use by other species extremely low to not probable.
Trailer Park Area			
Former Trailer Lots	Fallowed formal lawns, ornamental landscaping with interspersed	No records, minimum of nectary plants (except low quality, minimum flowering) and	Extremely low to not probable use by any of the species.

	building pads, sidewalks and driveways, roadways and parking areas. Remnant unmowed bluegrass and fescue, bromegrass monoculture lawns with interspersions of spruce, silver maple, ornamental crabs, and numerous other ornamental landscaping plants.	suppressed (growing in gravel and broken asphalt road bed) and occasional scattered plants of spotted Knapweed (Centuarea maculosa) in the roadway shoulders. No coarse woody debris and habitat cover, minimum moist soil areas, minimum plant and animal diversity.	
Former Trailer Park Open space in drainageways and Dune edges	Fallowed formal lawns, ornamental landscaping with interspersed building pads, sidewalks and driveways, roadways and parking areas. Remnant unmowed bluegrass and fescue, bromegrass monoculture lawns with interspersions of spruce, silver maple, ornamental crabs, and numerous other ornamental landscaping plants.	No records, minimum of nectary plants (except low quality, minimum flowering) and suppressed (growing in gravel and broken asphalt road bed) and occasional scattered plants of spotted Knapweed (Centuarea maculosa) in the roadway shoulders. No coarse woody debris and habitat cover, minimum moist soil areas, minimum plant and animal diversity. In one locations along the eastern property boundary of the former trailer park is a bisected dune. This area has some native switch grass, Draba sp, and a few plants of Prairie bush clover (Lespedeza capitata).	Extremely low to not probable use by any of the species in most of what appears to have been open space within the former trailer park. However, unlikely and of very low probability, in the small dry prairie vegetation growing along the bisected dune, it would be possible for a hognose snake and a few nectary plants to attract a Karner Blue butterfly if they were present nearby. However, the barrier effect of several tree lines, and the trailer park expanse currently represents a serious series of mobility impediments if KBB were even present in the western edge of the field just west of the trailer park.
Fallowed Field West of Trailer Park	This field contains a range of very highly degraded Phragmites dominated depressional areas and ditches growing tree rows of cottonwood and dense European buckthorn in the understory. Closest to the western edge of the Pine Bush preserve, along the trails bordering the Pine Bush preserve proper and along the east-west trail that bisects this fallowed field, there are small patches of remnant dry prairie. Other areas with fill are growing with the many of the same introduced grasses and weedy forbs present in the trailer park, in the former lots.	No records of KBB present, nor Buckmoth; may be one or an occasional audible or visual sighting of woodcock/whippoorwill (no written confirmation on records); no records on reptiles or amphibians. Nectar plants for KBB are present and include hairy vetch, knapweed, occasional bushclover, and several other native and non-native plant species. These are almost exclusively located near the old dune and margins of the trail systems nearest the PBP boundary. An occasional small patch of nectar plants are present south and north of the dune about 75% of the distance along the east-west trail as shown on the restoration plans.	Most of the fallowed field has low to extremely low probability of occurrence of most special status species. No buckmoths are likely because of the absence of suitable host plants; an absence of suitable coarse woody litter and habitat cover will restrict hog nose and worm snakes. There is no turtle habitat present as the ditches are shallow, seasonal, or baseflows are impeded by dense Phragmites.
Life Estate In-	Same as “Former Trailer	Same as “Former Trailer Lots”—	Same as “Former Trailer Lots”—

holding and trailer Consolidation Location	Lots"—see above	see above	see above
Main and Internal roadways	Asphaltic and gravel road bed	See habitat notes under road shoulder presence of Spotted Knapweed.	Not probable

Further documentation for State species is provided in the following:

Potential Impacts in the Expansion Area

Based on the site investigations (see Attachments 2, 3, 6, 8, and 9) we have determined that no globally rare Pine Bush vegetative communities occur within the Expansion Area and no rare species have been observed in the Expansion Area during our studies. The Expansion Area does not represent regional habitat of concern and is not similar to other rare communities known to provide habitat for rare plants and animals found in the Pine Bush Preserve.

Baseline investigations and quantitative vegetation analyses and mapping have concluded that all of the habitats present in the Expansion Area are overgrown and degraded ecological communities, having been modified by past land uses such as farming, mining, and development. All of these activities have impacted drainage, soils and native vegetative communities. What is present is ubiquitous and highly altered forest cover typical of many nearby disturbed landscapes. In addition, the wetlands that are present exhibit the highly altered vegetation characteristics of dewatered organic substrates and all potential expansion areas had a very high prevalence of invasive plants species, such as European buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Rhamnus* f*rangula*), tartarian honeysuckle (*Lonicera tartarica*) and garlic mustard (*Allaria petiolata*). European bittersweet (*Solanum dulcamara*) plants covered the ground in many locations, as did dense growths of tartarian honeysuckle, and other invasive plants.

The following provides an overview of representative rare species and addresses the likelihood of their utilization of the proposed landfill Expansion Area.

Invertebrates

- Barrens Dagger Moth (*Acronicta albarufa*) (oak woods)
- Karner Blue Butterfly (open dry prairie and oak barrens with lupine and other host plants)

No wild blue lupine plants occur within the proposed Expansion Area so host plants for the Karner blue butterfly and food sources for the frosted elfin (*Callophrys irus*) are not present. The barrens dagger moth is also unlikely to be present because of the lack of scrub oaks in this area.

No odonates were found during the macroinvertebrate investigation of the sandy bottomed ditched stream that flows through the proposed Expansion Area. This stream was historically manipulated for agricultural purposes. The macroinvertebrate survey showed the stream habitat to be degraded and could explain the absence of these non-tolerant odonate species. These species may return once the stream has been restored and exhibits better water quality.

Reptiles and Amphibians

- Eastern hognose snake (sandy soils in areas with toads)
- Worm snake (*Carphophis amoenus*) (loose damp soil in wooded areas or on edges, under surface cover or in rotten logs)
- Eastern spadefoot toad (*Scaphiopus holbrookii*) (sandy soils near vernal pools and vernal-like inundated areas)
- Fowler's Toad (*Bufo fowleri*) (sandy soils/open woodlands, meadows)
- Jefferson salamander (*Ambystoma jeffersonianum*) (vernal pools, vernal-like inundated portions of wetlands & upland forests)

There are no exposed open sandy areas known to harbor toads in the Expansion Area that would foster hognose snakes. Furthermore, there are no vernal pools present in the Expansion Area. This area has been highly dewatered with ditching and down-cutting of the ditched stream. Thus spadefoot toads and Jefferson salamanders are not likely to utilize this area and have not been observed here.

Fowler's toad would also be unlikely in the dense and overgrown wooded areas and this species has not been observed in the Expansion Area.

Worm snakes have not been documented in the Expansion Area and none were found during the intensive surveys that involved looking for animals under logs and leaf litter, etc.

Based on the many hundreds of hours invested in on-site quantitative investigations and many hundreds of additional person-hours spent in qualitative inventorying the expansion area, we have concluded that none of these species have been observed and no historic records that we are aware of exist. Both this and the inappropriateness of the habitats present for these species leads us to conclude that these species are not likely to be present in the Expansion Area.

Birds

We have broken the list of birds into categories of potential use of the Expansion Area as follows: A) No record but potentially present during migration and nesting season, B) No record and no potential of being present during nesting season.

A. No Records but Potentially Present During Migration or Nesting Season:

> Hawks, such as Cooper's (*Accipiter cooperii*) and sharp-shinned (*Accipiter striatus*), have been documented to nest in tree canopies of pine and larger stature deciduous trees (Apfelbaum and Seelbach 1983) and would also be very likely to forage or pass through the types of degraded forest communities found in the Expansion Area. However, because of the adjacent, much higher quality habitats present in the preserve, the small and disturbed forested areas in the expansion area would be very marginal habitat for these species, with the exception of occasional use for foraging and passage. As a result, no impact to these species is anticipated.

The dewatered nature of the wetlands and dense woody vegetation at the ground story, coupled with the absence of open shrubby wetlands would also suggest that the Expansion Area to be of marginal use for American woodcock (*Scolopax minor*) and wood thrush (*Hylocichla mustelina*). Therefore, no impact to these species is anticipated.

While none of these species were observed or heard specifically in the Expansion Area, the Cooper's hawk, woodcock and wood thrush were observed and heard in adjacent higher quality forested areas during fall migration season in 2006.

B. No Record and No Potential for Use During Nesting Season:

The Expansion Area does not provide known suitable habitat for any of the following species for nesting.

- Blue-winged warbler (*Vermivora pinus*) (power line corridors/successional forested edges)
- Black-throated blue warbler (*Dendroica caerulescens*) (mature deciduous and mixed woodlands with thick understory)
- Whip-poor-will (*Caprimulgus vociferus*) (deciduous and mixed forest adjacent to large clearings)
- Yellow-breasted chat (*Icteria virens*) (dense second-growth, riparian thickets, and brush)

While migratory birds of these and other species may occasionally use degraded forests, none of these species have been recorded using the Expansion Area.

Potential Impacts in the Facilities Area

No rare species have been observed in the Facilities Area during the site visits. Based on the site investigations we have determined that no globally rare Pine Bush vegetative communities occur within the Facilities Area (residential parcels located near the landfill entrance road and Rapp Road).

The natural habitats present in the Facilities Area include Appalachian oak-pine forest and mowed lawn community. The Appalachian oak-pine forests of this area are likely to support the same species listed as possibly occurring in the Appalachian oak-pine forests of the Expansion Area (i.e. a random occurrence of eastern hognose snake). The Facilities Area does not represent regional habitat of concern and is not similar to rare habitats found in the Pine Bush Preserve.

Potential Impacts in the Restoration Area

No rare species have been observed within the Restoration Area by the research and restoration team. This area consists primarily of the mobile home park and disturbed areas west of the mobile home park. The sandy soils of the "disturbed sands" area located west of the mobile home park provide scattered, remnant prairie and nectar species but overall provides poor habitat. As reported by APBPC staff, the Vernal Pool wetland and surrounding open sandy areas located west of the proposed restoration grading supports eastern spadefoot toad populations. Also according to APBPC undocumented reports, eastern hognose snakes have been observed within the same open field. Pre-construction surveys will be undertaken in all areas proposed for grading and restoration to either avoid or temporarily relocate the species. Avoidance is highly

probable. After restoration activities are complete, the new vernal pond with varying depths and surrounding restored pine barrens habitat will provide additional and improved habitat for these two species and many others.

In 2002, during construction monitoring activities associated with the P-4 mitigation, spotted turtles were documented in the vicinity of the mitigation wetland and pond. Also, according to the Commission, spotted turtles are known to occur in the nearby bog that occurs to the west of the Restoration Area. None of these areas are proposed for restoration activities that would involve grading. The proposed restoration elements in this area will provide additional habitat for spotted turtles and other reptiles and amphibians.

There is a known population of frosted elfin's approximately 80 yards southwest of the mitigation pond (Refer to Attachment 1, Figure 4), west of the study area. The occupied site is on a sand dune and is partially fenced in to protect the planted lupine from deer browse. It can be best classified as pitch pine scrub oak barrens containing numerous wild lupine plants both inside and outside of the fenced enclosure on the slope of the dune. The project will not impact this area.

3.3.2 SUMMARY OF POTENTIAL IMPACTS & MITIGATION

Poor habitat conditions in the landfill expansion and restoration zones, a lack of bonifide records of special status species-use and presence, and the virtual prevailing absence of appropriate habitat features, structure, vegetation communities, nectar plants, and the years of on-going disturbances (e.g. mowing of yards, fertilizer and irrigation uses) support the conclusions we have reached.

With the exception of a few very small isolated and fragmented areas that contain a few nectar plants, virtually all of the land included in the landfill expansion, facilities relocation, and restoration areas have an extremely low to not probable likelihood of supporting any and all life-cycle stages for the special status species found in the adjacent Pine Bush Preserve.

Lastly, little ecosystem restoration work in the Pine Bush Preserve has been invested in the land bordering the perimeter of the landfill or the mobile home park and associated old field, and the landfill expansion area, these bordering areas tend to be some of the most overgrown with woody vegetation and do not themselves appear to provide the appropriate habitats for most of the special status and species of concern. This acknowledged disinvestment zone, where especially even prescribed burning has not been conducted, has contributed to a declining habitat quality compared to what is required by most of the special status species of plants and animals, and host plants. Because of these observations, it has become clear that this zone, which has not received active management, has with very high probability and certainty directly contributed to a mobility barrier from other areas in the Pine Bush Preserve and an occupancy barrier for special status plants and animals, further reducing the probability of impact associated with restoration and landfill expansion.

The converse of these conclusions is that restoration of the field, mobile home park and existing and proposed expansion areas for the landfill, will significantly increase the habitat areas for

some of the special status plants and animals in general for the Pine Bush Preserve, and specifically in this location of the preserve. In addition, by expanding the valuable habitat in this area of the preserve, this alone will be justification for expanding the restoration efforts in the existing preserve by APBPC in areas mentioned above where the management has not occurred to date. This strategy and opportunity will increase the connectivity, potential mobility, and expansiveness of habitat suitable for many species, including many of the special status species in the Pine Bush Preserve. The net result of the restoration program is a significant positive gain in the acres of suitable high quality habitat.

In summary, the restoration plans for the landfill area and restoration areas are anticipated to have no measurable adverse impact on any listed species. In fact, the restoration plans and closure plans for the landfill surface are predicted to have a highly probable, very significant net positive benefit for the Pine Bush preserve, for its special status and more commonly found native plants and animals.