# ATTACHMENT 7 PRE-CONSTRUCTION SURVEY PROTOCOLS

#### Karner Blue Butterfly (*Lycaeides melissa samuelis*) Survey Protocols Within the State of New York

Prepared by: U.S. Fish and Wildlife Service (Service), New York Field Office New York State Department of Environmental Conservation (NYSDEC) May 2008

The following protocols were developed to determine whether a given site has the potential to support Federally- and State-listed endangered Karner blue butterflies and if so, to determine whether Karner blue butterflies are present at the site. These protocols do not replace methods for the annual monitoring of known occupied sites. These recommendations are based on our current understanding of Karner blue butterflies and their habitat. In addition, the State-listed threatened frosted elfin (*Callophrys irus*) butterfly is also found in the same habitat as Karner blue butterflies and these protocols can be used for that species as well. Note that on Long Island some frosted elfin populations feed on Baptisia rather than lupine. Therefore, surveys for frosted elfin on Long Island should include both lupine and Baptisia habitats. Please contact the NYSDEC for further information regarding the frosted elfin.

Karner blue butterflies have generally been observed to conduct localized movements of approximately  $\leq$ 200 meters (Service 2003). Therefore, the Service and NYSDEC define "occupied" habitat to include all lupine patches directly observed to be occupied by the butterflies, as well as all additional lupine (whether any of the butterflies were directly observed during surveys or not) within 200 meters of those patches. Therefore, all lupine within 200 meters of each other will be considered as one functioning patch. The definition of "occupied" habitat also may include suitable nectar plants (plants that provide nectar to small butterflies and that bloom during the first and/or second flight periods) and grassy areas (areas not regularly mowed during the growing season) that provide shelter for the butterflies within a lupine patch and extending 200 meters from the edge of a lupine patch. The NYSDEC and Service shall determine whether areas without lupine but containing nectar within 200 meters of occupied lupine are considered occupied.

There are four phases of the surveys:

- Conduct preliminary site assessment;
- Conduct lupine and nectar surveys;
- Monitor for butterfly presence; and
- Continue monitoring for relative butterfly abundance (optional but recommended).

We recommend site assessments be conducted for all project sites within and possibly outside portions of the Glacial Lake Albany Recovery Unit where Karner blue butterfly populations are known or likely to occur. This includes portions of Albany, Schenectady, Saratoga, and Warren Counties.

## Site Assessments

Preliminary site assessments are needed to identify potential butterfly habitat and shall be conducted before the first butterfly survey to identify which portions of a given site should be surveyed for wild lupine, nectar plants, and the butterflies. These assessments involve conducting a general field

survey of the site and broadly mapping site features including ecological communities, improved areas, and infrastructure. The map should indicate areas to be excluded and areas to be included as potential butterfly survey areas.

Lupine is generally found in more open areas, however, plants can continue to survive for periods of time in more closed-canopy situations. Therefore, all areas with well-drained, predominantly sandy or other well-drained soils, should be surveyed, except for those listed below.

Areas to exclude from future surveys include:

- Active row-cropped agricultural lands;
- Paved developed areas (buildings, roads, etc.);
- Other non-sandy or poorly drained soil areas;
- Areas regularly mowed during the growing season (lawns); and
- Areas with >50% canopy cover (only if there are no openings, trails, or paths through such areas).

Habitat may exist directly adjacent to, or outside the footprint of the above-listed areas, and should be surveyed for lupine, nectar, and the butterflies.

#### Lupine and Nectar Surveys

Surveys for wild lupine may be conducted prior to surveying for butterflies, in conjunction with the site assessment, to expedite butterfly surveys or you may chose to initially survey for both wild lupine and the butterflies at the same time. An individual who is knowledgeable in the identification of lupine should conduct the surveys. We provide the following guidance on when to survey for lupine:

• In places where lupine flowers early (sunny areas), survey from late May to mid-June. In places where lupine flowers rarely, or not at all (usually more shaded areas), surveys should be conducted from late May through mid-July.

While lupine is essential for butterfly larvae, adult butterflies rely on a variety of plants as nectar sources, especially during the second flight period as lupine plants senesce. Potential nectar plants will provide nectar to small butterflies and bloom during the first and/or second flight periods. Please refer to Appendix C of the Karner Blue Butterfly Recovery Plan (Service 2003) for a list of potential nectar sources.

To adequately assess the site, both wild lupine and nectar areas should be mapped as accurately as possible. In addition, descriptions of the lupine patches (*e.g.*, estimated size and number of lupine stems within a patch) should be provided. Provide a list of the observed nectar plants and include descriptions on the map (*e.g.*, where vigorous, dense clusters of plants were observed, where nectar plants were scattered throughout, etc.).

# Survey Methodology for Potential Karner Blue Butterfly Sites

The Karner blue butterfly has two broods and flight periods per year; the first flight normally begins in mid- to late May and ends in mid- to late June and the second flight normally begins in mid-July and ends in mid-August. However, the timing of the flight periods can vary by as much as 2-3 weeks from year to year and/or site to site due to weather and microclimatic influences. The length of the flight periods may also vary from year to year (generally 2-5 weeks). Since it cannot be known when the flight periods commence until field observers begin to report sightings of the butterflies, discussions with the Service/State are necessary prior to conducting surveys for either species to refine the survey window for any particular year.

Surveys shall be conducted by an individual knowledgeable in identification of the butterflies (see descriptions and photographs in the Recovery Plan for the Karner blue butterfly attached below). Identification photographs of butterflies can also be obtained from the State/Service.

Please note that scientific collector permits are required by the State for butterfly surveys. Please allow for adequate processing time to ensure that permits are in place prior to the first flight period.

## Determining Butterfly Presence: Intensive Search Method

- Survey all potential habitat areas for the butterflies. This includes all lupine patches as well as nectar and grassy areas that may provide adult food and/or shelter for butterflies.
  - All of the lupine, nectar, and nearby grass habitat should be carefully searched by slowly walking over it, gently prodding vegetation with a butterfly net or meter stick, and/or stopping frequently and scanning the area for movement. The search should criss-cross all of the potential habitat area until the surveyor can be confident that all potential habitats have been searched. If more than five individuals are found, a zigzag transect may be done in later surveys to establish relative butterfly abundance (see Zigzag Transect Methods below).
- To determine butterfly presence, conduct a minimum of 5 surveys per Karner blue butterfly flight period with a total of 10 surveys needed to establish baseline conditions for the Karner blue butterfly (weather permitting) (call the State to confirm the start and finish of flight periods at nearby locations). <u>Please Note</u>: At least 2 of the surveys should be conducted during the last two weeks of May to overlap with the frosted elfin flight period. The remaining 3 first flight surveys must occur in early June (as stated above, coordinate with Service/State regarding survey windows).
- Conduct all 5 first flight period surveys until both species of butterfly are observed (or all surveys complete).
- If neither species is observed during the first flight, continue with second flight surveys until Karner blue butterflies are observed (or all 5 second flight surveys are complete).

- We recommend conducting all 10 surveys, even if butterfly presence is documented during an earlier survey, to document the use of nectar areas and get the best possible peak count of butterflies within each flight period. This will assist the Service/State with determining an initial index count of butterflies within the site, which can be monitored over time to determine the effects of the proposed management actions.
- Visits should be spaced every 2-5 days.
- Conduct surveys during optimal time and weather conditions as listed below:
  - between 8:00 a.m. and 6:00 p.m.
  - when temperatures are 65-95°F
  - when temperatures are between 65-70°F, surveys should only be conducted under mostly sunny skies with calm to light wind
  - when temperatures are above 70°F, no restrictions on cloud cover
  - when eye-level winds are less than 20 mph
- Additional weather notes:
  - do not survey under drizzly or rainy conditions; however, surveys can continue through very light rain if the sun is shining and the temperature is 75°F or higher. <u>Please Note</u>: No more than 1 site visit per flight period should occur under these conditions.
  - delay surveying after heavy rain until the vegetation and the butterflies have had a chance to dry
  - if suboptimal weather conditions continue for extended periods, contact the Service/State for guidance.
- Time Keeping
  - Record the duration of each survey. For sites with more than one transect, record duration of each transect and provide a total time (and total butterflies) as a separate data sheet entry. Duration must be recorded to the second. Do not round off minutes! Record time of day in military time. Record the time of day you visit the site even if you use a stop watch to time the duration. If you are not using a stopwatch, record your start time and end times in military time and include the second (*e.g.*, 1417:00 1418:23). It helps to start at 00 seconds or 30 seconds to make it easier to subtract out later. Include duration of search even for zigzag and exhaustive searches.

## Determining Relative Butterfly Abundance at Occupied Sites: Zigzag Transects Method

- Establishing Transects
  - As reported in McCabe (1993), zigzag transects should be designed to cover each site. Transects should remain constant from day to day and for both broods. If monitoring longer term, transects should also remain constant from year to year so that data can be accurately compared through time. If the transect needs to be expanded (i.e., due to expansion of lupine population), it should be segmented so that data collected from the original transect can continue to be compared to that of previous years.
  - The distance between zigzags shall be sufficient to avoid counting an individual butterfly more than once. The distance between zigzags can be increased in areas where high butterfly densities would have resulted in many butterflies being counted more than once.
  - If the zigzag method is employed and surveys do not pick up butterflies regularly, abundance cannot be determined using this method (consult with State).
- Standard Methods
  - Observers walk at a comfortable pace gently swinging a butterfly net above the vegetation to stir the butterflies into motion. All butterflies seen, both at rest and in flight, are counted and their numbers recorded on a data sheet. Butterflies that fly into areas not yet walked are to be counted only if they fly no further than one zigzag ahead. Butterflies which fly farther than one zigzag ahead are left to be counted later in the walk-through (McCabe 1993). Butterflies that fly out of the census area are counted.
  - The sex of a butterfly should be recorded during the walk if it is obvious to the observer (*i.e.*, a butterfly sitting in the path of the observer with its wings open). However, sexing butterflies during the transect walk should be done judiciously so as not to change the length of time necessary to walk the site or introduce inaccuracies caused by losing track of counted butterflies. A separate walk-through should be conducted in order to determine the sex ratio of the butterflies.
  - After completing the transect walk and sex ratio determination, Karner blue butterfly nectar species should be noted and the number of butterflies observed to be nectaring recorded. Other plants in bloom and weather notes should also be recorded on the data sheet.
  - Follow weather and time protocols listed above.
  - Marked transects may be along a continuous line or in zigzags, as long as they cover the entire potential habitat on a site.
  - Keep eyes forward a short distance ahead but regularly glance toward your feet and about 10 feet ahead. This will help you to stay on the transect and avoid trampling too much lupine. Also sometimes the butterflies will not fly up as you step over them.

- Keep walking at a steady pace, about one heart beat per step. Avoid the tendency to slow down as you get into a lot of butterflies and speed up when there is not much lupine. If you wander off the transect route by more than a few feet, start over again. Do not try to slow down or speed up to keep your time exactly the same, but practice your pace to try to keep it steady enough that you are doing the transect within 10-15 seconds of the same duration each time.
- NOTE: CENSUS NUMBERS SHOULD NOT BE INTERPRETED AS THE ABSOLUTE NUMBER OF KARNER BLUE BUTTERFLIES IN A GIVEN SUB-POPULATION. RATHER, THEY REPRESENT AN INDEX FOR THE SIZE OF AN INDIVIDUAL SUB-POPULATION THAT CAN BE COMPARED FROM YEAR TO YEAR. ONLY IN INSTANCES WHERE THE SUB-POPULATION IS QUITE SMALL AND CONFINED TO A WELL-DEFINED AREA THAT CAN BE CENSUSED THOROUGHLY DO CENSUS NUMBERS APPROACH THE ABSOLUTE NUMBER OF KARNER BLUES IN A GIVEN SUB-POPULATION AT A GIVEN DAY.
- Zigzag surveys (for sites too small to effectively monitor with marked transects)
  - Monitors should strive to walk the same areas each time, but essentially should cover the entire habitat without counting butterflies twice. The zigzag surveys for unmarked transects should be done as described above for marked transects.

#### Similar Species

- Karner blue butterfly
  - There are two blue butterflies similar in appearance to Karner blue butterfly that may be present in Karner blue butterfly sites during both adult flights: the eastern tailed blue (*Everes comyntas*) and spring azure (*Celastrina ladon*). (See photographs provided below)
  - Eastern tailed males are blue on the upper side of the wings like male Karner blues, but have small orange dots at the bottom of the upper side of the hind wing. Female eastern tailed blues are similar to female Karner blues except that the orange on the upper side of the hind wing is limited to a few small dots instead of the row of orange crescents along the entire edge of the hindwing. In both sexes, the underside of the wings looks similar to Karner blues except the Karner blue has a row of orange crescents that line the entire edge of the hindwing and sometimes part of the forewing. Eastern tailed blues have only 2 or 3 small orange dots at the bottom of the hindwing. The Eastern tailed blue has small slender projections or "tails" at the bottom of the hindwing, but these may be difficult to see or broken off.
  - Both sexes of spring azures are blue on the upper side of the wings, but have a larger blue margin, especially the females. The underside of the wings has no orange dots or crescents. Spring azures are very likely to fly high up and fly off into tree canopies while Karner blues will do so very infrequently. This behavior is not enough to confirm identification, however.

- The wing markings are extremely difficult to see while the animals are in flight. At sites where Karner blue butterfly presence is not documented or where numbers are known to be very low, blue butterflies must be closely observed for field markings when perched or else captured in nets and seen through the net or placed in a clear jar for confirmation. An unknown blue butterfly should not be recorded as a Karner blue unless it is confirmed. However, a blue butterfly that was not identified should be noted in the field data sheet.
- Frosted elfin butterfly
  - Frosted elfins can easily be confused with both the Hoary elfin (*Incisalia polios*) and Henry's elfin (*I. henrici*). Frosted elfins are brown butterflies, 1" to 1-1/4" in size. They can be identified by a black spot above a short tail stump on the hindwing. They are named for the gray "frosting" on the hindwing.



Frosted elfin butterfly – ventral surface (www.google.com/images)







Male

Karner blue butterfly – dorsal view (K. Breisch)



Eastern tailed blue ventral surface (www.google/images)



Spring azure ventral surface (www.google/images)



Karner blue butterfly ventral view (K. Breisch)

References Cited:

- McCabe, T. 1993. Albany Pine Bush Project 1991-1992 entomological report. Report to The Nature Conservancy.
- U.S. Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly (*Lycaeides melissa samuelis*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. 273 pp.

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# **PRE-CONSTRUCTION SURVEYS**

# **T&E SURVEYS**

Detailed vegetative surveys and informal wildlife surveys, among other site investigations such as soil surveys, groundwater and surface water monitoring, and macoinvertebrate surveys, were conducted over the past 2-3 years within the proposed expansion and restoration areas. This analysis documented highly disturbed conditions in all areas. Additionally, no protected or other species of concern were identified over the many hours spent in the field by highly qualified biologists. As a result, the data and observations documented in the SEQR and permitting submittals presents a high level of certainty that no threatened, endangered or other species of concern will be impacted by the proposed expansion or the restoration activities. However, in order to address unforeseen circumstances and provide an even higher degree of certainty that no significant impacts will occur, surveys for threatened and endangered species, species of greatest conservation need, and special concern species will be conducted prior to the start of construction. Additionally, qualified ecologists, who will be overseeing construction activities, will continually monitor site conditions to address unforeseen encounters of protected species. To maximize the chance of detection, surveys will be conducted during periods of 'peak' activity for each species. Table 1 identifies species listed in the EIS and provides for peak detection periods. Surveyors will be proficient on field identification of all listed species.

Survey methods will consist of a combination of Point Counts and Wandering Transects. Prior to the survey, transect routes and point count locations will be identified as appropriate for each species.

In order to increase the efficiency of the survey efforts, surveys for more than one species can be conducted concurrently. For example, transects established for butterflies and dragonflies will occur within the same area as a bird survey point count. Additionally while one surveyor is conducting point counts the other may search cover objects for reptiles and amphibians. In order to obtain data during peak detection periods four surveys are proposed: late-May - early June, mid to late July, mid to late August and late September - early October.

#### Butterfly and Dragonfly Surveys

Modified transect counts using the Pollard Walk Method (1977) will be used to detect Karner blue butterfly and Pine Barrens buck moth. Each route will traverse a range of habitats deemed most representative of the majority of terrain at the site. Routes will also represent a variety of topographical and physical aspects of the Expansion and Restoration areas. Each surveyor will be assigned a transect width and is free to slowly wander at will in active search of productive habitats, nectar sites, within the assigned transect. Efforts will be made to record each individual only once.

Surveys will be conducted between 10 am and 5 pm. Optimal field conditions consist of temperatures between 55-64°F, cloud cover not exceeding 50% and no wind.

If identification of a species is difficult, a net may be used to capture the individual. Net dragonflies in flight by swinging at them from behind. Many species will fly a predictable route, so you can watch a while to see the pattern and then set up an ambush at a convenient spot, perhaps where you are partially hidden by a tree or shrub. When perched, approach them with very slow movements. Once in the net, remove the specimen by hand (they don't bite very hard). Hold with its wings held back together and use a hand lens for proper identification.

Equipment needed:

- Binoculars
- > GPS
- ➢ Butterfly net
- ➢ Hand lens
- Data Sheets
- ≻ Map
- ➢ Field guide
- ➢ Wind and temperature meter

#### Bird surveys

Bird surveys will be conducted using modified USGS Breeding Bird protocols. Survey locations will be identified within each habitat type. If possible suitable habitat for each point survey location will encompass  $12 \pm$ acres. Surveys will begin ½ hour before sunrise and be concluded no later than 2 hours after sunrise. Surveys will not be conducted during rain or periods of high wind (greater than 12 mph). Every point will be surveyed during the same day.

Once the observer arrives at the survey point wait 2 minutes before beginning the count. This enables the observer to prepare for the count and allows the birds to calm down and return to normal activity. Surveys will be conducted for a 5-minute period with all birds seen or heard within 100 meters (328 feet) will be recorded. This 3-minute period is divided into two periods; a 3- and a 2-minute period. The observer records the species and number of birds seen or heard during the first 3 minutes, then focus on the listed species only for the remaining 2 minutes.

Record all listed species as less than 25 meters, 25-100 meters or greater than 100 meters away from the survey point. Plot all listed species on a circle map with an abbreviation of the common name. If you observe a listed species before or after the 5-minute survey or between survey points, write it down and mark time and mark the approximate location on a field map.

Equipment needed:

- Binoculars
- > GPS
- > Stop watch
- $\succ$  Data sheets
- ≻ Map
- ➢ Field guide
- ➢ Wind and temperature meter

#### Reptile and Amphibian Surveys

Reptile and Amphibian surveys will be conducted in conjunction with any of the other surveys. Any potential cover objects will be recorded and searched. Visual encounters will also be recorded. Optimal survey times are generally between 60-80 or 85° F, partly sunny or cloudy skies, and little to no wind. Equipment needed:

- ➢ GPS
- ➢ Snake Hook
- ➢ Leather gloves
- ≻ Map
- ➢ Field guide

# Plants

While conducting the above surveys, observers will also conduct random searches for listed and nectar plants. If plants are found and are not in immediate danger of being destroyed, the exact location of the plant will be recorded and flagged in order to locate the plant during the dormant season for transplanting. If the timing is such that the plant will be destroyed by restoration or construction activities outside the preferred transplant season (fall & spring), ecologists will carefully dig up the plant and immediately relocate it to other appropriate areas within the restoration area using all proper precautions.

## Notification

If any species listed in Table 1 are found, notification will be made to the proper DEC official. Information to be provided includes location, habitat type, time of observation, number of individuals, and activity (breeding, foraging, resting). If an animal is found which has constrained mobility (e.g. turtles, snakes, amphibians or nesting birds) the appropriate agency will be notified, and it will be relocated to an acceptable area in the PBP. A GPS location will be obtained noting the exact location of the relocation. If species are highly mobile, a GPS location will be obtained and provided to DEC in an annual report. Areas within the PBP suitable for relocation of species will be determined prior to the conducting surveys.

# **VEGETATIVE SEED COLLECTION**

While moving between transect areas native vegetative species that may be available as a seed source or salvage will be identified, flagged and stage of seed development recorded. Special attention will be given to nectar species, many of which are easiest to identify when they are flowering.

Field collection forms and GIS will be used to document collection area location, along with other important details such as collection dates and the abundance, distribution and health of parent plants.

Collecting seeds at the correct time is crucial for propagation to be successful. Collect seeds only when they are mature. Mature seeds are usually dark in color, firm and dry. The flesh of pulpy fruits often become soft and changes from green or yellowish to reddish or blue-purple when ripe. Seeds are often mature a week or more before the fleshy fruits turn color and fall from the plant. Seeds that are green and moist are immature and generally will not germinate. Gather fruits from the ground only if they have recently dropped. Reject any seeds that have been on moist ground for some time.

# Grass

Grass seed will be harvested by stripping or shaking the seeds off of the stem, or by clipping the stem with scissors or small scythes just below the spikelet.

#### Forbes

Many pods or capsules dehisce when ripe and mature at staggered intervals. Once seeds begin to mature, the entire inflorescence will be cut and allowed to dry in a paper bag.

#### Shrubs

Shrub seeds will be picked or the shrub will be lightly beaten or shaken to encourage the seeds to drop. Seeds will be captured by laying a tarp underneath the shrub.

All seeds will be collected in paper bags and labeled appropriately with species and date of collection. Seeds from different species will be kept separate. Once seeds are collected they should be placed in a cooler to avoid overheating which will reduce viability of the seed.

Equipment needed:

- ➢ GPS
- ➢ Leather gloves
- $\blacktriangleright$  Drop cloths
- Pruning shears
- > Paper bags
- > Cooler

#### Seed Storage

As soon as possible after collection, mesh trays will be labeled with species and collection dates and the seeds will be spread out to dry. Following drying the seeds will be cleaned as thoroughly as possible using a combination of graded sieves and air current for removing the chaff. Seeds will then be placed in paper bags, labeled and stored in a refrigerator or in a dark cool (30°F) area.

# **VEGETATION TRANSLOCATION**

Translocation of trees and shrubs will occur when the specimen is dormant usually at the start and end of the growing season.

#### Removal

Two to three days before transplanting begins shrubs will be watered and trimmed. To remove the plant from its current location a circular trench should be dug about two-thirds that of the branch spread and as deep as possible in order to get as much of the tap root as possible.

While removing the plant do not disturb the root system. Wrap the entire root ball in burlap material and tie closed with the proper cording or string. Water the root ball to prevent it from drying out.

#### Planting

Dig a hole in the new location that is about twice as big as the root system. Mix compost into the hole. Place plant into the hole, the plant should be placed at the same soil elevation that it was removed from. Fill the hole with native soil and tamp down lightly. Water thoroughly and deeply. Keep moist for 3-4 weeks after planting

	Jan	Feb	March	April	May	June	July	Aug	Sept	t Oct	Nov	Dec
Barrens Dagger Moth												
Karner Blue Butterfly												
Frosted Elfin												
Brook Snaketail												
Common Sanddragon												
Forcipate Emerald												
Mocha Emerald												
Tiger Spiketail												
Eastern Hognose Snake												
Worm Snake												
Eastern Spadefoot toad												
Fowler's toad												
Jefferson Salamander												
Sharp-shinned hawk												
Cooper's hawk												
Woodcock												
Wood Thrush												
Blue-winged Warbler												
Golden-winged Warbler												
Black-throated blue												
Warbler												
Whip-poor-will												
Yellow-breasted chat												
Rufous-sided Towhee												
Indigo Bunting												

Table 1. Time period of greatest observation potential for listed animal species at Albany Landfill.