Karner Blue

Karner Blue butterfly

Photo credits: *Carly Voight*

Scientific Name *Plebejus melissa samuelis* (Nabokov, 1944)

Family Name Lycaenidae
Blues, Coppers, Hairstreaks, Elfins

Did you know?
This species would not persist without active management in New York. The Albany Pine Bush Preserve manages for this butterfly through prescribed fire and by planting and encouraging growth of wild blue lupine.

Summary

Protection Endangered in New York State, Endangered federally.

This level of state protection means: A native species in imminent danger of extirpation or extinction in New York (includes any species listed as federally Endangered by the United States). It is illegal to take, import, transport, possess, or sell an animal listed as Endangered, or its par

This level of federal protection means: Listed as Endangered in the United States by the US Department of Interior.

Rarity G5T2, S1

A global rarity rank of G5T2 means: Imperiled globally - The subspecies/variety is at high risk of extinction due to rarity or other factors; typically 20 or fewer populations or locations in the world, very few individuals, very restricted range, few remaining acres (or miles of stream), and/or steep declines. (The species as a whole is common globally.)
A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

Conservation Status in New York

Even though there are about 50 subpopulations occupied each year, these cluster into about four metapopulations, or recovery units. Of the 50 subpopulations, the vast majority have fewer than 100 butterflies present. This species does not persist well if the total July brood for the metapopulation is fewer than 1,000 adults. This Federally and State-listed species is completely management dependent in New York, and is the case in most or all of the remaining portion of the range.

Short-term Trends

There are over 10,000 individuals in July during at least some years at Saratoga Airport but only three other sites are believed to contain one or two thousand individuals in the summer brood most years, which is marginal for a viable population of this species. The majority of sites contain fewer than 100 adults. However, it should be noted that the estimates not based on mark-recapture (see Gall 1985) are very unlikely to be close to the actual population size. Since the Federal Listing, this species has apparently been fairly stable in New York, but some small subpopulations have declined or increased slightly. At some sites, the current population sizes are not known.

Long-term Trends

The Albany area population has declined by over 90% from what it apparently was in the 1970s and the population was probably even higher originally. The Tonawanda, Brooklyn, and Sullivan County populations are extinct, as are the Rome and Watertown populations, if they really existed. The Warren County populations are now small remnant colonies. The decline has probably been less at Saratoga.

Conservation and Management

Threats

The threats include habitat loss, degradation, and fragmentation, fire suppression, inappropriate management of lupine (Lupinus perennis), mosquito spraying and the use of other insecticides, and browsing of lupine by herbivores, primarily deer. There is also a concern that a reduction in winter snow pack and other changes, due to climate change, threaten this species. Such threats could be of particular concern in New York, which has a warmer climate and is farther south than most of the current range for this butterfly.

Conservation Strategies and Management Practices

All occupied sites should be managed to increase the amount of lupine (Lupinus perennis) and to connect nearby demes (subpopulations). Controlling herbivores such as deer and protecting occupied sites from spraying with insecticides is also a management need.

Research Needs

The severity of mosquito spraying to larvae and adults needs to be evaluated, since aerial adulticiding for mosquitoes is more prevalent in New York than most other northern states and sometimes involves large areas.

Habitat

Karner Blue butterflies can be found in extensive pine barrens, oak savannas or openings in oak woodlands, and unnatural openings such as airports and right-of-ways that contain lupine (Lupinus perennis), the sole larval food source. The original communities for some remnant populations in Saratoga and Warren Counties are unclear since there is little to suggest former pine barrens in these areas. Some recent populations have occurred in sandy old fields. The largest cluster of colonies was in the Albany-Schenectady County Pine Bush and parts of the region are still

occupied, although today the largest population may very well be at Saratoga Airport where it occurs mainly on the approach zones.

Associated Ecological Communities

Calcareous Pavement Barrens
A savanna community that occurs on nearly level outcrops of calcareous bedrock (limestone or dolomite). The community consists of a mosaic of shrub-savanna, grass-savanna, and rock outcrop vegetation.

Pine Barrens Vernal Pond
A seasonally fluctuating pond and its associated wetlands that typically occurs in pine barrens. The water is intermittent, usually a pond in the spring but sometimes losing water through the summer to become a mostly vegetated wetland at the end of the summer. These ponds and wetlands may be small.

Pitch Pine-oak Forest
A mixed forest that typically occurs on well-drained, sandy soils of glacial outwash plains or moraines; it also occurs on thin, rocky soils of ridgetops. The dominant trees are pitch pine mixed with one or more of the following oaks: scarlet oak, white oak, red oak, or black oak.

Pitch Pine-scrub Oak Barrens
A shrub-savanna community that occurs on well-drained, sandy soils that have developed on sand dunes, glacial till, and outwash plains.

Successional Northern Sandplain Grassland
A meadow community that occurs on open sandplains that have been cleared and plowed (for farming or development), and then abandoned. This community is usually dominated by low, dry turf of sedges and grasses less than 30 cm (12 inches) tall, and include patches of open sand and patches of soil covered with mosses and lichens.

Associated Species

Frosted Elfin (*Callophrys irus*)

Identification Comments

A small, sivery blue butterfly with orange crescents on the margins of the underside of the wings. The dorsal surface of the male is all violet-blue, as compared to the dorsal surface of the female, which is dull purplish-blue near the body and turning a dull brown away from the body. The dorsal surface of the lower wings also have orange crescents along their bottom edges.

Characteristics Most Useful for Identification

The combination of marginal orange spots on the underside of all wings and lack of tails on the hindwings is diagnostic. The males have no orange at all above. The females have some orange on the hindwing above and, unlike the Eastern Tailed-blue (Cupido (Everes) comyntas), always have some blue near the body on upper side of all wings. Both sexes are also larger than tailed blues. Azures and silvery blues have no orange on any surface.

Best Life Stage for Identifying This Species

The adult is the best life stage for identification. The larvae can be identified by an expert, but both Frosted Elfin (Callophrys irus) and Eastern Tailed-blue [Cupido (Everes) comyntas] larvae occur on lupine and are similar. The eggs can also be identified, but in part this involves context and experts.

Behavior

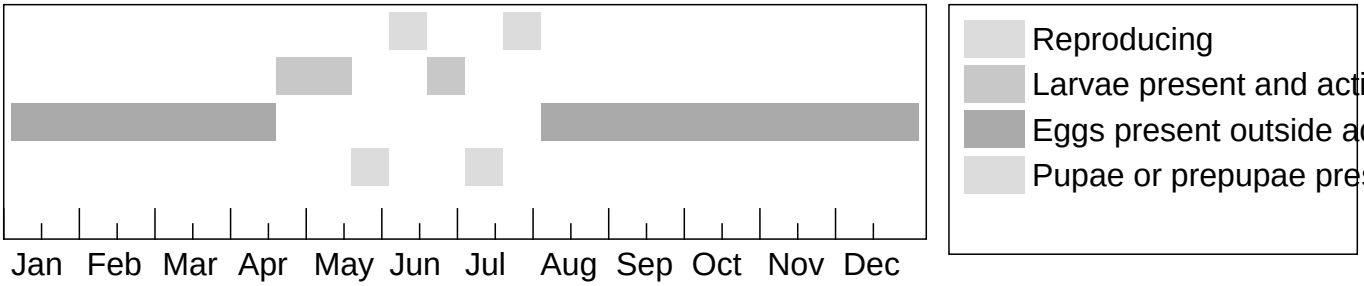
It is unlikely to be seen more than a few yards from patches of lupine (Lupinus perennis), although wandering individuals do occur up to a mile or more away from main breeding areas.

Diet

Larvae feed only on the native lupine (Lupinus perennis) in nature. The adults take nectar from many kinds of low growing flowers, native or otherwise.

The Best Time to See

The exact phenology varies from year to year and colony to colony. Those in the most open habitats tend to be about a week ahead of those in more wooded places. There are always two annual generations. The eggs overwinter and hatch, but not all at once, around the middle of April. The larvae mature mostly in late May and pupate. Adults emerge in late May to early June and are active for two to three weeks. The eggs from these adults hatch in a few days and the larvae are mostly mature in early July. Second brood adults fly for about three weeks and peak numbers usually occur for about a week in the second half of July. The eggs laid by these adults hatch the following spring.



The time of year you would expect to find Karner Blue in New York.

Similar Species

Eastern Tailed-Blue(Everes comyntas):

Spring Azure(Celastrina ladon):

Conservation Comments

Some experts suspect this will prove to be a full species and the number of species in this genus is not well understood. In New York, the Karner Blue is considered a subspecies of the Melissa Blue (Plebejus melissa) because no published works have revised the taxonomy to elevate this subspecies to species status.

Taxonomy

Kingdom Animalia
└─ **Phylum** Mandibulates (Mandibulata)
└─ **Class** Insects (Insecta)
└─ **Order** Butterflies, Skippers, and Moths (Lepidoptera)
└─ **Family** Lycaenidae (Blues, Coppers, Hairstreaks, Elfins)

Synonyms

Lycaeides melissa samuelis (Nabokov, 1944)

Additional Resources

Links

Google Images
http://images.google.com/images?q=LYCAEIDES+MELISSA+SAMUELIS

New York State Department of Environmental Conservation
http://www.dec.ny.gov/animals/7118.html

NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=LYCAEIDES+MELISSA+SAMUELIS

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New York Natural Heritage Program
625 Broadway, 5th Floor,
Albany, NY 12233-4757
Phone: (518) 402-8935
acris@nynhp.org

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