

# Return of a Native

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**Karner blue butterfly caterpillar**  
Photo by Ann B. Swengel

The Karner blue butterfly (*Lycaeides melissa samuelis*) has suffered catastrophic population declines in the past 100 years, disappearing from almost 99 percent of its historical range. It is now extirpated in Illinois, Massachusetts, Pennsylvania, and Ontario. The Fish and Wildlife Service (FWS) listed the Karner blue as endangered in 1992. This living jewel is a signature species of the oak savanna ecosystem, an endangered habitat characterized by meadows of prairie plants dispersed among stands of widely spaced oaks.

Oak savanna in Ohio is limited to a small region of northwestern Ohio known as “the Oak Openings.” This region has special relevance to the State of Ohio because it contains more endangered species than any other part of the State. Certain agricultural practices, fire suppression activities, and drainage projects have severely modified this area, allowing encroachment on open areas by trees and exotic plants. These habitat changes extirpated many rare and unique taxa, including the Karner blue butterfly, which requires oak savanna habitat with extensive patches of wild lupine (*Lupinus perennis*). The Karner blue was last seen in Ohio in 1988 within the Oak Openings region.

Since 1992, in a partnership with the Ohio Department of Natural Resources (ODNR) and the Michigan Department of Natural Resources (MDNR), the FWS, Toledo Zoological Gardens (TZG), and The Nature Conservancy (TNC) have been preparing for a reintroduction of the Karner blue to the Oak Openings of Lucas County, Ohio. This long-term effort began with propagation of more than 5,000 wild lupine, the host plant for Karner blue larvae. At the same

time, TNC began extensive habitat restoration efforts that cleared woody vegetation and exotic plants from Kitty Todd Preserve, allowing stands of wild lupine to regenerate. By 1995, restoration of the oak savanna at Kitty Todd had proceeded to the point that a release of the butterfly was feasible. Our partnership then made a detailed study of microhabitat requirements at the Allegan State Game Area in Michigan to ensure that habitat in the Kitty Todd Preserve could support populations of the Karner blue. Statistical analysis of these data indicated that target release areas on the Kitty Todd Preserve did not differ significantly from the localities in the Allegan State Game Area that supported large flights of the Karner blue, at least in terms of microhabitat environments and densities of lupine and nectar plants.

We elected to use breeding and release rather than translocation as a strategy for reintroduction of the Karner blue, as we believed that we could release many more butterflies on the preserve after breeding them in a zoo. The Melissa blue butterfly (*Lycaeides melissa melissa*) was selected as a model species to perfect breeding

techniques, and it successfully bred and overwintered at the TZG with no apparent problems. In May and June 1998, adult female Karner blues were collected by MDNR, ODNR, and TZG staff from the Allegan State Game Area for breeding. From these individuals, 592 eggs were produced in the zoo's butterfly breeding facility, resulting in 341 adults.

We transported potted lupine plants containing larvae and pupae (protected with netting) to the Kitty Todd Preserve in late June 1998. A total of 164 adults metamorphosed from this group and were released from June 29 through July 14, 1998. The release coincided with the peak flowering of New Jersey tea (*Ceanothus americanus*) on the preserve, and the newly released butterflies were seen feeding in the extensive stands of this important nectar plant. We observed the first eggs laid in the wild on July 21, 1998, and in May 1999 wild-bred Karner blues were flying again at the Kitty Todd Preserve. We

collected additional Karner blues in May and June of this year, and we'll continue through 2002 to bolster the numbers and genetic diversity of the reintroduced population.

The dedication to restore the Karner blue to Ohio is shared by an active coalition of conservation partners. With luck, additional habitat management, and the additional releases planned over the next 5 years, it is our hope that the Karner blue butterfly will again become a permanent resident of Ohio's Oak Openings.

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*Photo by Joel Trick*

