

Karner Blue Butterflies and Necedah NWR

by Brian Czech

The Karner blue butterfly (*Lycaeides melissa samuelis*) has been endangered primarily by habitat loss, much of which has been due to urbanization and wildfire prevention (Andow et al. 1994). The lack of wildfires has resulted in plant community succession from old savannas and pine barrens (the natural habitat of the Karner blue) to communities dominated by woody vegetation. The range of the Karner blue is also limited by the distribution of wild lupine (*Lupinus perennis*), the only known food source for the Karner blue in its larval stage (U.S. Fish and Wildlife Service 2003).

Karner blue populations vary from a few individuals at some sites (especially in New York, New Hampshire, and Minnesota) to several thousand at larger sites in Michigan and Wisconsin. In recent years, the entire population is estimated between 80,000 and 120,000 adults.



Photo by Thomas A. Meyer

The Necedah National Wildlife Refuge in Wisconsin supports one of the largest populations. In 2002, the refuge contained about 1,200 acres (485 hectares) of Karner blue habitat. The population fluctuated between 6,000 and 31,000 from 1993 to 2002, according to Richard King, Necedah's wildlife biologist. The Necedah Wildlife Management Area is also administered by the

Necedah National Wildlife Refuge. It contains about 150 acres (60 ha) of Karner blue habitat and supports about 7,000 butterflies.

One of the goals identified in the Karner Blue Butterfly Recovery Plan is to establish a viable metapopulation of Karner blue butterflies on the Necedah Refuge. (A metapopulation consists of multiple subpopulations, some of which may "blink out" periodically but are restored via immigration from other subpopulations.) To achieve this goal, refuge personnel intend to restore approximately 4,000 acres (1,620 ha) of oak savanna within a 10 square-mile (26 square-kilometer) area. We estimate this acreage could support approximately 70,000 butterflies.

Tens of thousands of butterflies would seem to offer considerable genetic and demographic viability, but the small number of significant populations is worrisome. Outside the Necedah area, the only major Karner blue sites occur at Fort McCoy, Crex Meadows, and Fish Lake Wildlife Area (Wisconsin), Indiana Dunes National Lakeshore (Michigan), and the Saratoga Airport (New York). Other populations may occur on two state-managed game areas in Michigan.

The Fish and Wildlife Service has worked to increase carrying capacity on refuges and provide more geographical security for the Karner blue. The Great Bay National Wildlife Refuge includes a 28-acre (11-ha) easement near Concord, New Hampshire, that has unoccupied Karner blue habitat, according to Michael Amaral, Northeast Regional Senior Endangered Species Specialist with the Service in Concord. This parcel connects larger sites that have been inhabited by the species in recent years.

A new potential threat is the proliferation of field corn engineered with genes of *Bacillus thuringiensis* (Bt). "Bt corn" produces proteins that are toxic to lepidopteran species, which include the European corn borer, the most problematic corn pest in the Midwest. Several native lepidopterans, most notably Karner blue and monarch butterflies, may also be affected when their populations are adjacent to cornfields dusted with Bt corn pollen (Obrycki et al. 2001). Fortu-

nately, not many of the Karner blue populations are adjacent to cornfields at this time.

The trend of the Karner blue population during the 1990s was down, but Cathy Carnes (the Service's Karner Blue Butterfly Recovery Coordinator, Green Bay, Wisconsin) believes the management efforts of the Service and partners are improving the species' conservation and recovery potential in all seven states supporting the Karner blue. Three reintroductions (Ohio, New Hampshire, and Indiana) and one population augmentation (Minnesota) are underway. The Michigan Department of Natural Resources is developing a statewide habitat conservation plan for the Karner blue, and the Wisconsin statewide habitat conservation plan is in its fifth year of implementation by 36 partners.

Larry Wargowsky, Necedah Refuge Manager, notes that there are many side benefits of the prescribed burning program in addition to restoring oak savanna habitat for the endangered Karner blue. "Songbird and plant species diversity has greatly increased within the oak savanna restoration units. Rare plant species as well as conservation priority bird species have been identified."

Literature Cited

- Andow, D.A., R.J. Baker, and C.P. Lane, editors. 1994. Karner blue butterfly: a symbol of a vanishing landscape. Miscellaneous Publication Series, Minnesota Agricultural Experiment Station, University of Minnesota, St. Paul.
- Obrycki, J.J., J.E. Losey, O.R. Taylor, and L.C.H. Jesse. Transgenic insecticidal corn: beyond insecticidal toxicity to ecological complexity. *Bioscience* 51(5):353-361.
- 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.

Brian Czech is a conservation biologist with the National Wildlife Refuge System in the Service's Arlington, VA headquarters (703-358-2485; Brian_Czech@fws.gov).