

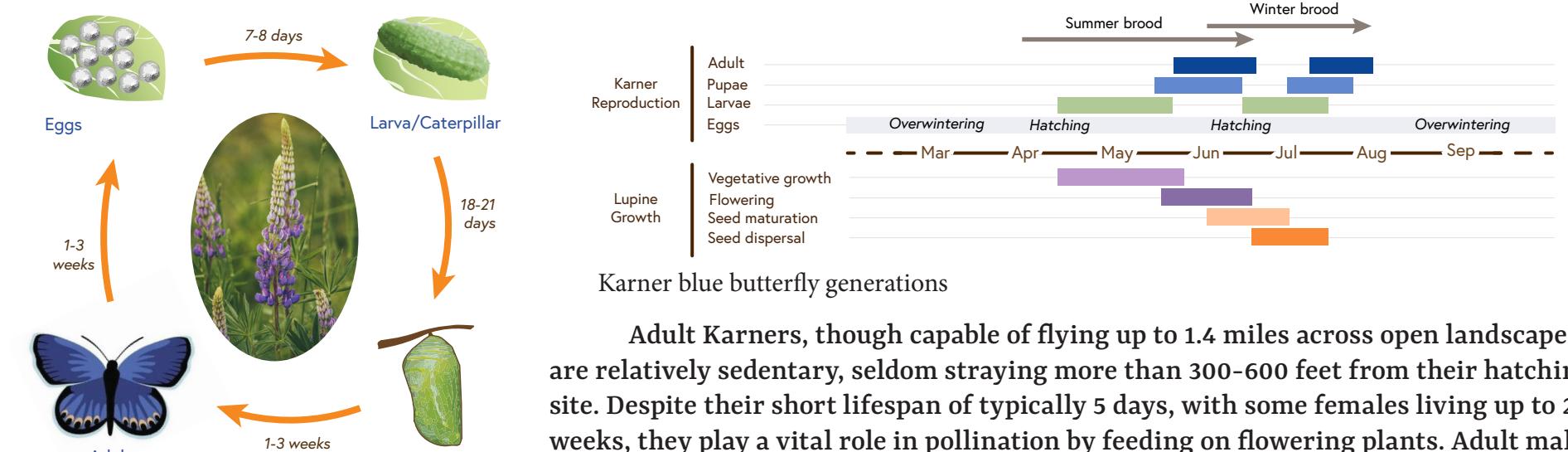
# KARNER BLUE BUTTERFLY

## Wisconsin's Endangered Beauty



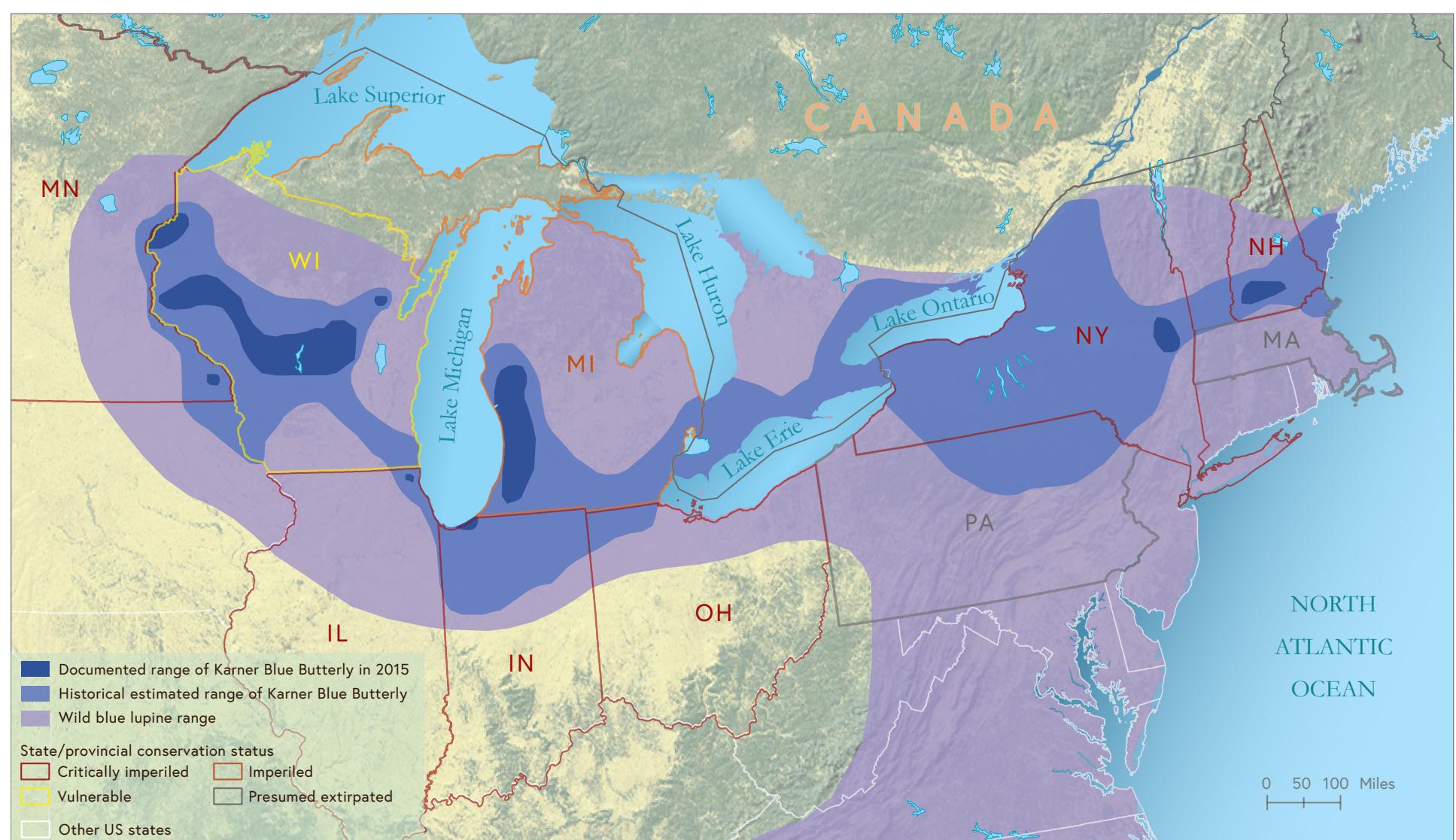
Karner blue butterfly (*Lycaeides melissa samuelis*) is a diminutive species typically with a wingspan of around one inch. They are signified by striking violet-blue wings bordered by black margins and adorned with white fringes in males, while females feature grayish brown color with violet-blue center with marginal orange crescents along the hind wings. The underside of both sexes is gray with a continuous band of orange crescents along the edges, interspersed with black spots encircled by white.

The species undergoes two annual broods of offspring - spring and summer. Larvae emerge in April from overwintered eggs that exclusively feed on wild blue Lupine (*Lupinus perennis*). Therefore, their reproductive success is profoundly reliant on the abundance of Lupine plants. Following pupation at the end of May or early June, adult butterflies emerge from their cocoon-like chrysalis, mate and lay eggs in June on Lupine plants. Their eggs hatch in a week and the caterpillars feed for about three weeks. The second brood emerges from mid-July to early August and their eggs overwinter to hatch again in April.



Wild blue Lupine (center) and the life cycle of Karner blue butterfly

Adult Karners, though capable of flying up to 1.4 miles across open landscapes, are relatively sedentary, seldom straying more than 300-600 feet from their hatching site. Despite their short lifespan of typically 5 days, with some females living up to 2 weeks, they play a vital role in pollination by feeding on flowering plants. Adult males also drink from moist sand. Karners have a unique symbiotic relationship with ants, which attend to their larvae, collecting a sugary secretion in exchange for protection from predators and parasites.



Karner Blue Butterfly and wild blue Lupine range

The Karner blue was identified only in 1944 in Karner, NY. They once soared through the upper midwest's oak savannas and pine barrens ecosystems from western Wisconsin eastward to the Atlantic seaboard. However, its range has seen drastic declines in the 1970s and 1980s and dwindled to scattered pockets in New York, Michigan, Ohio and, notably, Wisconsin, where it remains most prevalent. Although typically found in rural areas and flat grassy ecosystems, Karners' existence is intimately entwined with the well-drained sandy landscapes in the central and northwest Wisconsin where the perennial wild blue Lupines thrive.

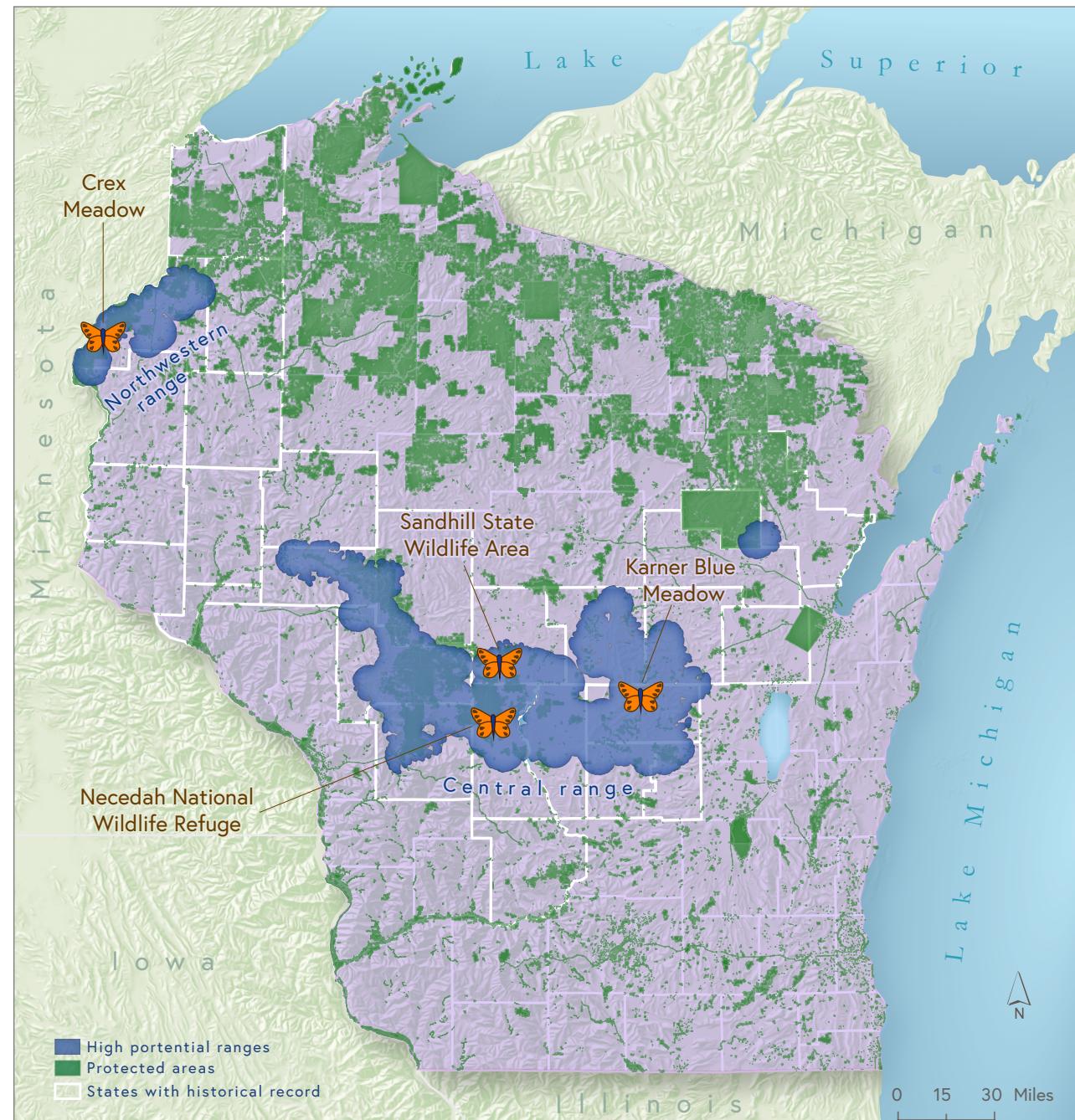
Federally listed as endangered since 1992 by the United States Fish and Wildlife Service (USFWS), their decline is primarily attributed to habitat loss, fire suppression and grazing. They are extremely sensitive to temperature and precipitation changes. Other rare species like frosted elfin, phlox moth, persius dusky wing, prairie fameflower, and the western slender glass lizard often co-occur with Karners, emphasizing the need for conservation efforts.

In Wisconsin's natural history, Karner blue, often confused as the Melissa Blue, holds a unique place. While it wasn't recognized in the 1970 book Butterflies of Wisconsin, records of the Northern Blue may have actually referred to this species. Over time, however, the decline of the Karner blue in Wisconsin has become unmistakable, primarily due to loss of suitable habitat with Lupine, caused by land clearing for urbanization and agriculture, fire suppression, and off-road vehicle use ultimately contributing to its endangered status.

Efforts to conserve ecosystems through prescribed burns, mowing, and habitat restoration is crucial for maintaining stable Karner habitats. The Wisconsin Department of Natural Resources (DNR) took a pioneering step in 1994 initiating the first statewide Habitat Conservation Plan streamlining recovery efforts across landowners and agencies. In collaboration with over 50 partners, this ambitious plan has protected more than 792,000 acres of critical habitat, establishing Wisconsin as a primary stronghold for the species. Notable sites like the Karner Blue Meadow in Waushara County are managed specifically for the benefit of this delicate butterfly, serving as sanctuaries in a landscape increasingly fragmented by human activity. Similar efforts exist in sites like Sandhill Wildlife Area, Necedah National Wildlife Refuge, Crex Meadows among others.

The Karner blue Recovery Program in Wisconsin comprises five units - Morainal Sands (MS), Escarpment & Sandstone Plateau (ESP), West Central Driftless (WCD), Glacial Lakes (GL) and Superior Outwash (SO). They employ population and occupancy surveys to monitor the species' health and population dynamics. In 2023, population surveys, using distance sampling, estimated a total population of 10,460 individuals across 229 acres, representing a decrease compared to previous years. Occupancy surveys, using less intensive methods, indicate Karners' presence in 78% of surveyed sites. Despite low estimates, colonization and extinction rates remain favorable, suggesting is persisting within its Wisconsin habitats. However, lack of repeated sampling and biased site selection, highlight the need for more robust monitoring.

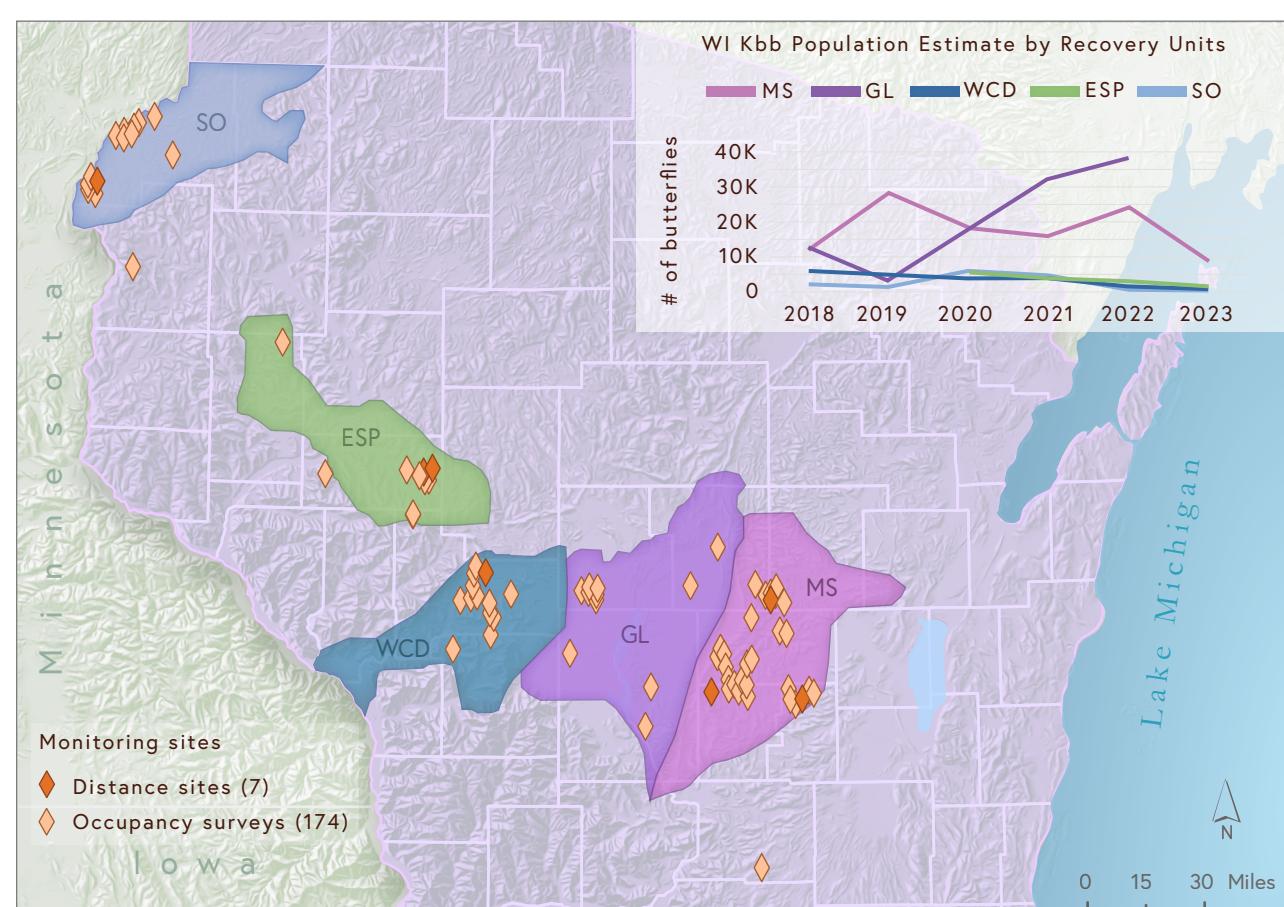
The Karner blue butterfly has become a flagship species for restoration initiatives across Wisconsin. While landowners can play a critical role in creating suitable habitats on their properties, individuals can support conservation efforts through advocacy, volunteering in and making donations to like DNR, Nature Conservancy, Southern Wisconsin Bird Alliances and other nature preserve sites to fuel the resilience of Wisconsin's natural heritage.



High potential ranges and major habitats of Kbb in comparison with protected areas in Wisconsin



Images from some of the major habitats of Karner Blue Butterfly in Wisconsin (from left to right) - a Wild Blue Lupine plant from the Karner Blue Meadow (State Natural Areas of Wisconsin), a Karner on a prairie flower at the Sandhill Wildlife Refuge (State Journal), Wild Lupine at Crex Meadows, Grantsburg and a Karner on Bird's-foot Trefoil; Necedah National Wildlife Refuge (The Photonaturalist).



Recovery units and monitoring sites of Wisconsin DNR, 2023