

Karner Blue Butterfly Threats Summary Table
 Compiled by John Lerg (MI DNR) and Cathy Carnes (USFWS)

Sept. 2007

Threat	Threat Example	Cause of Threat	Monitoring	Prevention/Response
Direct Threats				7
<i>Habitat-focused</i>				
Habitat loss, alteration, fragmentation or destruction due to incompatible land use	Agriculture/residential/road development	Land use decisions	Long-term tracking	Safe Harbor permit, Land Owner Contact Programs, land protection (easements, or purchase), protective regulations, creation of dispersal corridors, adaptive management.
Habitat degradation due to incompatible recreational use	Horse trails, ORV activity	Recreational use	Long-term tracking, site-specific Evaluations	Protective regulations, proactive management , law enforcement,
Diseases/Pathogens	Powdery mildew or leaf rust on lupine	Naturally-occurring soil-borne fungi	Long-term tracking	Adaptive management.
Invasive plant competition	Pennsylvania sedge, spotted knapweed, buckthorn, black locust, American hazelnut, St. Johnswort	Competition for light and space	Site-specific evaluations, long-term tracking	Adaptive management, prescribed burns, herbicide applications, mowing.
Incompatible management practices	High fire frequency, mowing KBB habitat (nectar and lupine) during growing season	Management decision that do not consider KBBs	Site-specific evaluations	Implement conservation measures to minimize harm while conducting management activities (mowing, burning, herbicide use)
Insufficient adult and larval food plants	Lack of lupine and nectar plants	Insufficient seeding or natural regeneration	Site-specific	Plant lupine and at least 3 first flight and 3 second flight nectar plants.
<i>Butterfly-focused</i>				
Predation/Parasitism	Robber flies Sphecid wasps Asian ladybeetle (exotic species)	Predation on adults Parasitism of eggs Predation of larvae	Population-specific evaluations, short-term tracking	Habitat modifications to discourage vectors. Review introductions of exotic to avoid or minimize impacts to KBB. Maintaining a minimum isolation distance between agricultural crops known to harbor aphids and extant KBB populations to reduce impacts caused by Asian ladybeetles.
Bio-engineered crops.	Bt corn (incorporates a gene from a naturally occurring soil bacterium, <i>Bacillus thuringiensis</i> , into corn pollen that produces a protein that can kill Lepidoptera larvae if they ingest the pollen).	Management decision	Long term tracking, site-evaluation	Keep corn fields 100 m from KBB site – negligible amounts of Bt pollen expected at distances of 100 m or more from the field edge
Incompatible insecticide treatment	Use of Btk in occupied KBB sites	Gypsy moth infestation	Site-specific monitoring for KBBs	Treat insect infestations in ways that avoid or minimize impacts to the KBB, e.g., use pheromone flakes or Gypchek to treat gypsy moths.
Indirect Threats				
<i>Environment-focused</i>				
Ecological succession	Conversion of savanna to forest	Reduction of fire, loss of habitat disturbance	Long-term tracking	Prescribed fire, herbicides, mowing, adaptive management
Global Warming (changes in climate trend)	Possible conversion of savanna to prairie; fewer snow cover days, earlier senescence of lupine.	Warmer climate	Long-term tracking	Management on a larger and more diverse landscape with topographic heterogeneity (mediates larval mortality); location of some recovery populations in northern part of range.
Potential to introduce invasive species	Habitat conversion/degradation	Species introductions /spread	Long-term tracking	Reduced soil disturbance, more aggressive habitat management, clean mowers and other equipment of weed seeds prior to using on occupied sites.
Stochastic climate events	Spring and summer droughts, cold weather during the flight season, large scale wild fires.	Unusual or prolonged weather conditions.	Long-term tracking	Restoration of large, well buffered metapopulations.

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<i>Species-focused</i>				
Competition for food	Increases in lupine herbivores	Various insects such as blister beetles,, deer, elk, woodchuck, rabbit	Site-specific evaluations, long-term Monitoring	Habitat modifications to discourage vectors, competing population management e.g., trapping of rodents.
Ant reductions	Soil disturbance, habitat degradation	Inappropriate management	Long-term monitoring	Manage habitat to encourage more beneficial ant interactions