

***Callophrys irus* (Godart), 1824**
Frosted Elfin
(Lycaenidae: Theclinae: Eumaeini)

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SUMMARY

The Frosted Elfin is widespread across the eastern half of the United States, but is rare or at best locally frequent in all areas. The Frosted Elfin holds the distinction of being the non-federally listed butterfly with the greatest number of state level listings, eleven in all. It is extirpated from Ontario, its only occurrence in Canada, and probably extirpated from Maine and Illinois. Its habitat is pine barren or oak savannah, places where wild lupine and wild indigo, its larval hostplants, grow. The major threats are loss of these areas to urban development or agriculture, poor vegetation management that results in declines in hostplant populations, and pesticide use.

The Frosted Elfin shares a hostplant and habitat with the federally listed Karner Blue. Where the distributions of these two butterflies overlap, the Elfin benefits from efforts to help the Karner Blue—although, ironically, the federally listed species is probably more abundant than the unlisted one.

CONSERVATION STATUS

Xerces Red List Status: Imperiled

Other Rankings:

Canada – Species at Risk Act:	Extirpated
Canada – provincial status:	ON: Endangered
Mexico	N/A
USA – Endangered Species Act:	None
USA – state status:	DE, MD, NH, OH: Endangered CT, MI, NJ, NY, WI: Threatened MA, RI: Species of Concern
NatureServe:	G3
IUCN Red List:	N/A

SPECIES PROFILE

DESCRIPTION

The Frosted Elfin is in the family Lycaenidae (gossamer-wing butterflies). It has a wingspan of 25 to 32 mm (1 to 1¼ inches).

The upperside of the wings are dark brown; males have a long, oval dark spot on the leading edge of the forewing. The underside of the wings are marked by an irregular postmedian line (fainter on the hindwing). On the hindwing this line separates the darker basal area from the paler submarginal area, which is frosted with white scales and has a black spot above the tail. There is one short tail on the hindwing.

TAXONOMIC STATUS

Callophrys irus (Godart), 1824 is the current name. It was previously assigned to the genus *Incisalia* Scudder, 1871.

There are three subspecies: *C. i. irus* (Godart), 1824; *C. i. arsace* (Boisduval & Le Conte), 1833; and *C. i. hadra* (Cook & Watson), 1909. It has been suggested that the latter of these, *hadra*, is a full species.

LIFE HISTORY

Frosted Elfins require open woods, forest edges, fields, and scrub in which their larval hostplants grow. Increasingly, it is confined to disturbed patches such as powerline rights of way and along railroads and not purely natural habitat. Recorded hostplants are all in the pea family (Fabaceae). Wild indigo (also called horseflyweed) (*Baptisia tinctoria*) and wild (sundial) lupine (*Lupinus perennis*) are most frequently used. The subspecies vary in their hostplant preferences. The larvae of *irus* feed on both indigo and lupine, but the larvae of *arsace* and *hadra* only feed on indigo. There are also occasional records of Frosted Elfins, feeding on blue false indigo (*B. australis*) and arrowhead rattlebox (*Crotalaria sagittalis*).

Eggs are laid singly on the hostplant; the lupine-feeding caterpillars eat both flowers and developing seedpods; indigo-feeding caterpillars eat leaves. As chrysalids, the two ecotypes also differ. Hibernation occurs in loose cocoons but lupine feeders pupae buried about half an inch below the soil surface and indigo feeders pupae in litter beneath the plant. There is a single adult flight period, the date of which varies with latitude, from March to April in the southern part of its range to May to June in the north.

DISTRIBUTION

The range extends throughout the eastern U.S. from western Maine to Florida and west to central Wisconsin and eastern Texas, but the butterfly is extremely local and usually scarce throughout this area, although it has a stronghold (albeit a precarious one) in southern New Jersey. It is probably extirpated from Maine and possibly Illinois, and no longer occurs in Canada (it was last seen in Ontario in 1988).

The three subspecies have regional distributions: *C. i. irus* occupies the northern part of this range, with clusters in northern Florida and eastern Maryland; *C. i. arsace* occurs from southern New England south to coastal areas of North and South Carolina; *C. i. hadra* is confined to east Texas and west Arkansas.

THREATS

The major threat to the Frosted Elfin is loss of habitat. The lupine hostplant is shared with the Karner Blue, a Federally Endangered butterfly in the U.S. and also extirpated from Ontario, and the principal reasons for the decline in the Frosted Elfin are the same as faced by that butterfly: destruction of barren and savannah habitat due to development, degradation of the vegetation due to succession, and fragmentation of habitat areas. (See Red List profile for more information on the Karner Blue.)

Fire management of these areas can impact the butterflies if done poorly. The lupine feeding butterflies are less susceptible to damage from fire because their larvae pupate in the soil.

In those areas where gypsy moth is considered a forest pest, because many Frosted Elfin habitats occupy forest edge locations, spraying of Btk poses a serious hazard to Frosted Elfin larvae.

CONSERVATION STATUS

Although the Frosted Elfin has a distribution that touches more than half of the states in the U.S., it is very rare or only locally distributed throughout this area. In eleven states it is protected under the individual state's threatened and endangered species statutes: four states rank it as Endangered, five as Threatened, and two as a Species of Concern. In Ontario, despite not being seen since 1988, it is Endangered under provincial legislation.

The subspecies *C. i. hadra* (Cook and Watson), 1909, found only in east Texas and west Arkansas, is particularly at risk.

Given the reliance of the Frosted Elfin on wild lupine for larval survival, it is also worth noting the status of this plant. *Lupinus perennis* is on the endangered and threatened species lists for several states in which Persius Duskywing is recorded: Maine, New Hampshire, Pennsylvania, and Vermont. New Hampshire includes both the lupine and the butterfly on their state lists.

CONSERVATION NEEDS

Populations are often small and local and generally need conservation attention. As with many butterflies, protection and management of their habitat to ensure the presence of hostplant populations is the primary need. Due to the successional nature of the habitat, appropriate vegetation management is important as poor actions such as overgrazing or badly timed proscribed fire may negatively impact the butterflies.

Where the Karner Blue also exists (from New York to Wisconsin), many habitat areas are receiving management or protection. Ironically, the federally listed Karner Blue may now be more abundant than the non-listed Frosted Elfin in this region.

Gypsy moth suppression programs must consider the impacts on Frosted Elfin populations.

RESEARCH NEEDS

Surveys for unidentified populations in all states where it is recorded would be useful and, in particular, surveys in those states and provinces from where it is extirpated should be done. Research into the impacts of habitat management, especially the use of fire, is a priority.

RESOURCES

CONTACTS

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DISTRIBUTION MAP (U.S. range)

(From: U.S. Geological Survey, Northern Prairies Wildlife Research Center.

<http://www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/usa/287.htm>; accessed 4/29/05.)

