



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Mustard White *Pieris oleracea*

State Status: **Threatened**
Federal Status: **None**

DESCRIPTION: The Mustard White (*Pieris oleracea*) is a pierid butterfly with a wingspan of 32-50 mm (Layberry 1998). The wings are white, the underside of the hind wing with a small yellow spot at the humeral angle and gray to black scales outlining the wing veins in the spring brood. Outlining of the veins is faint, almost absent, in later broods. The wings are unmarked above except for a small amount of gray to black shading along the costa and at the apex of the forewing. The West Virginia White (*Pieris virginiensis*) flies in spring, but compared to the spring brood of the Mustard White, the outlining of the veins on the underside of the hind wing is lighter gray and more diffuse. A third congener in Massachusetts is the common and widespread Cabbage White (*Pieris rapae*); the upper side of the forewing of this species has two black dots and black apical shading.

HABITAT: In Massachusetts, the Mustard White inhabits openings in mesic forest, including riparian floodplains, margins of fens and marshes, and streambanks; as well as wet meadows, fields, and pastures.

LIFE HISTORY: In Massachusetts, the spring brood of the Mustard White flies from mid- to late April through the month of May. A second brood peaks in early July,

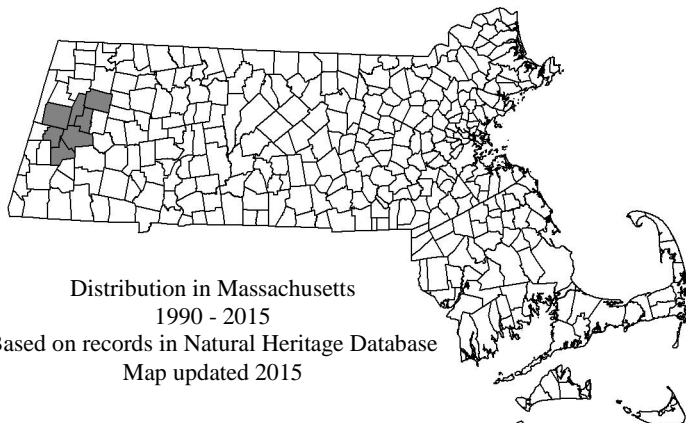


Pieris oleracea, spring form, ventral • MA: Berkshire Co., Lenox • 18 Apr 2002 • Photo by M.W. Nelson



Pieris oleracea, spring form, dorsal • MA: Berkshire Co., Lenox • 18 Apr 2002 • Photo by M.W. Nelson

Pieris oleracea, summer form, ventral • MA: Berkshire Co., Lenox • 12 Sep 2006 • Photo by B. Spencer



Distribution in Massachusetts
1990 - 2015

Based on records in Natural Heritage Database
Map updated 2015

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

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and a third brood flies in late August and early September. In some years the third brood is partial, in other years it is larger and some individuals likely represent a fourth brood. Adult butterflies imbibe nectar from their larval host plants, as well as a wide variety of other flowers. Larvae feed on two-leaved toothwort (*Cardamine diphylla*), cuckoo-flower (*Cardamine pratensis*), watercress (*Nasturtium*), and other mustard family plants (Brassicaceae). The chrysalis is attached to a plant stem just above the ground, and this stage overwinters.

GEOGRAPHIC RANGE: Massachusetts is at the southernmost extent of the Mustard White's range in the East. Its range extends north to Newfoundland and Labrador and west to British Columbia and the Northwest Territories (Opler 1999). The Mustard White is currently only known from seven towns in Massachusetts, all in central Berkshire County.

STATUS AND THREATS: In Massachusetts, the Mustard White butterfly has declined dramatically during the past 150 years. This decline is probably the cumulative result of several interacting factors (Keeler et al. 2006): the loss of intact woodland and wet meadow habitats and their associated flora of native crucifers (Chew 1981); introduction of the invasive garlic mustard (*Alliaria petiolata*) (Courant et al. 1994); and parasitism by the introduced braconid wasp, *Cotesia glomerata* (Benson et al. 2003). Female butterflies will lay eggs on garlic mustard, despite the fact that larval growth is typically slow, and survivorship poor, on this plant (Courant et al. 1994). There is some evidence, however, that the Mustard White may be adapting toward more effective use of garlic mustard as a larval host (Keeler & Chew 2008). In addition, the cuckoo-flower used by Massachusetts populations of the Mustard White is an introduced variety, but larval growth is fast, and survivorship high, on this plant (M.W. Nelson, unpublished data). *C. glomerata*, an introduced braconid parasitoid of the introduced Cabbage White butterfly, has been shown to not only parasitize caterpillars of the Mustard White, but even to prefer them over those of the Cabbage White (Van Driesche et al. 2003). However, *C. glomerata* has declined dramatically in Massachusetts in recent years (R. Van Driesche, pers. comm.). Other potential threats to the Mustard White in Massachusetts include hydrologic alteration (where riparian floodplain habitat and associated host plants are maintained by periodic flooding), river bank stabilization, introduced generalist parasitoids, aerial insecticide

Adult Flight Period in Massachusetts

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

spraying, non-target herbiciding, excessive browse of larval host plants by deer, and destruction of habitat and larval host plants by off-road vehicles.

Literature Cited

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Authored by M.W. Nelson, NHESP Invertebrate Zoologist, May 2015

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