

ARE CHAIN-LINK FENCES BARRIERS TO BUTTERFLIES?

During the summers of 1982 and 1983, I regularly collected European cabbage butterflies, *Pieris rapae* Linnaeus from the Fenway Victory Gardens, Boston, Massachusetts, and Dunback Meadows, Lexington, Massachusetts. From 24 June to 18 August 1982, and 2 June to 1 August 1983, I observed 27 confrontations between free flying *P. rapae* and chain-link fences. On each occasion the butterfly flew within 5–10 cm of the fence, back and forth over a 1 to 1.5 meter area, and then added a vertical movement of equal distance. Three times *P. rapae* succeeded in flying over the fence. Once a male flew to the end of the fence and around it, and once a butterfly proceeded after a 2–3 second delay to pass through the fence after I tried unsuccessfully to capture it. On 21 occasions *P. rapae* changed their flight direction nearly 180° after confronting chain-link fences. On one occasion an alfalfa butterfly, *Colias eurytheme* Bdv. was observed to change direction approximately 90° after confronting a fence. A 90° change was also observed once for a *P. rapae* after physically striking a fence. The openings in a chain-link fence measure approximately 7 cm in height and width. The mean wing spread of *P. rapae* is only 3.8 cm. On several occasions I have seen individual *P. rapae* squeeze their folded wings through 1.3 cm wire screening of a flight cage in the laboratory; and in the field, I have observed individuals fly without hesitation through thin wire fences with openings of 12–15 cm. Even though chain-link fences have openings through which a *P. rapae* could physically pass without contact, the butterfly rarely does so. Perhaps *P. rapae* can not accurately judge the opening size; it may appear small and likely to damage wing tips; or perhaps the thick shiny wire on all sides of the butterfly may be distorted by the butterfly's visual system and perceived as a nearly solid barrier.

Chain-link fencing is used widely to keep would-be intruders out of areas or keep in desired objects. Mountain alpine areas are under increasing pressures from human visitors each summer. Some parks have posted personnel to keep visitors on established trails, others have begun to rope off areas. Chain-link fences have been proposed as a means to save badly trampled alpine areas.

The construction of chain-link fences and other obstacles may have a variety of effects on butterfly populations depending on the species involved and the habitat. Williams (1930. *The migration of Butterflies*, Oliver and Boyd, London. 473 pp.) states that *Belenois severina* and *Vanessa cardui* usually fly over obstacles with little or no lateral deviation from their line of flight. Feltwell (1982. *Large White Butterfly The Biology, Biochemistry, and Physiology of Pieris brassicae* (Linnaeus), Dr. W. Junk Publishers, The Hague, 535 pp.) reports that *P. brassicae* typically flies over obstacles rather than around them. However, *Andronymus neander* predominantly flies laterally with little or no vertical rise when confronted by an obstacle in its flight path (Williams, 1930. *ibid.*). Generally, alpine lepidoptera fly very low to the ground to avoid winds. If fences are encountered, movement may be hindered, adding an additional energetic pressure on mountain butterfly populations which are often already low in number. Therefore, there may be serious deleterious effects on alpine butterfly populations if chain-link fences are built in these areas.

These observations are limited in number and species involved. Perhaps a more quantified investigation is merited. Such an investigation should be concerned with the height and opening sizes of fences, with a look at a number of different species in various habitats to determine if the observations reported here can be generalized.

MARK K. WOURMS, *Department of Biology, Boston University, 2 Cummington Street, Boston, Massachusetts 02215.*