

## Pieris marginalis sibilanca (Sierra Blanca Margined White)

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Steve Cary,

### Taxonomy

- **Class:** INSECTA
- **Order:** LEPIDOPTERA
- **Family:** PIERIDAE
- **Genus:** Pieris
- **Scientific Name:** *Pieris marginalis sibilanca* Grishin, 2022
- **Common Name:** Sierra Blanca Margined White
- **Synonyms:**
- **Taxonomic Name Source:** Zhang, J., Q. Cong, J. Shen, L. Song, R. J. Gott, P. Boyer, C. S. Guppy, S. Kohler, G. Lamas, P. A. Opler, and N. V. Grishin. 2022. Taxonomic discoveries enabled by genomic analysis of butterflies. *The Taxonomic Report of the International Lepidoptera Survey* 10(7):1-60.

### Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [TNR](#)
- **NHNM State:** S1
- **NM Endemic:** YES

### Description

Margined Whites resemble European Cabbage Whites, being white above with a dark forewing apex. Undersides, however, are creamy white with gray scaling on hindwing veins. Females may have dark scales on upperside hindwing veins as well. Scaling of VHW veins tends to be heavier in spring individuals and lighter in summer individuals. The old name, 'Veined' White, seems more appropriate than 'Margined' White. **Comments.** This butterfly is placed by some taxonomists with Old World *Pieris napi* (Linneaus). Most workers now consider New World populations to comprise multiple species, none of which is *Pieris napi*. North-central New Mexico has Rocky Mountains subspecies *Pieris marginalis mcdunnoughii* W. Barnes & McDunnough 1916. Populations in the Mogollon Mountains (Ca) are *Pieris marginalis mogollon* Burdick 1942. Populations in the Sacramento Mountains (Li,Ot) are the newly described *Pieris marginalis sibilanca* Grishin 2022.

Description courtesy of Steven J. Cary, [Butterflies of New Mexico](#), 2024

## Habitat and Ecology

No specific habitats and ecology information is available for this subspecies however, it is likely similar to that of its parent species. The parent species is a higher elevation butterfly in New Mexico where it flies generally above 2286 meters (7,500 feet) in moist woods, and meadows especially alongside riparian corridors such as streams (Opler and Wright 1999, Cary and Toliver 2024). As meadow habitat and moist woods with riparian elements are both available although decreasing in the Sacramento Mountains complex we assume this is the habitat for this subspecies as well. The specific host plants for this subspecies are also unknown however, the parent species utilizes a variety of native mustards (*Brassicaceae*) including Watercresses (*Nasturtium*), Rockcresses (*Boechea*), and Toothworts (*Cardamine*) (Scott 1986, Opler and Wright 1999, Cary and Toliver 2024).

Flight dates for this taxa have not been reported; however, GBIF.org records stretch from April 9th to July 28th (GBIF.org 2024). For the parent species extreme flight dates in New Mexico are April 9th to September 12th (Cary and Toliver 2024). During flight adults are often seen flying near the ground in sunny openings and often visit damp sand and nectar, especially nectar of their host plants (Opler and Wright 1999, Cary and Toliver 2024).

## Geographic Range:

The Sierra Blanca Margined White is endemic to the Sierra Blanca and Sacramento Mountains of southeastern New Mexico (Grishin 2022, Cary and Toliver 2024). Thus far, this butterfly has not been found in the Capitan Mountains, just to the north (GBIF.org 2024). The parent species is a high elevation montane species in New Mexico, generally being found between 2,290 and 3,350 m (7,500 and 11,000 ft). This seems to also be the case for this subspecies (Cary and Toliver 2024).

## Conservation Considerations:

There are no conservation actions in place for this species. Steps should be taken to conserve all known populations and to try to seek out additional extant populations. Habitat restoration in order to increase the patch size and make populations more resilient to environmental stressors will also be crucial in order to ensure the survival of this taxon. Research is needed on the population size and trend, as well as the life history and ecology. Research on ant associations. genetic research. More research on what conservation actions may best benefit this butterfly and how best to restore its habitat and promote its resilience will also be crucial.

## Threats:

More research is needed on the threats to this newly described butterfly however, with only four observations since 2000 this may be one of the rarest Sacramento Mountain endemics. As a mountaintop endemic at the southern extreme of its range, climate change is the primary threat to this taxa (Holland 2010). Many butterflies respond to climate change by moving to higher elevations or latitudes however, this is not an option for this taxa where there are no higher elevation habitats to shift to and as a result just a small amount of warming could push this taxa into thin air driving it to extinction (Forister *et al.* 2010, Holland 2010, RÅdder *et al.* 2021). As such the likelihood that this butterfly survives until 2100 is very poor as the western United States is expected to continue to get hotter and drier over the next century (Cook *et al.* 2009, Holland 2010, Cook *et al.* 2015, Williams *et al.* 2022). Phenological mismatch with the host plant or nectar sources is also a potential consequence of climate warming however, as this butterfly may use a wide variety of host plants like its parent this may not be a major threat (Singer and Parmesan 2010, Patterson *et al.* 2019).

Other credible threats to this subspecies include catastrophic wildfire and fire suppression (Holland 2010). Fire suppression has been a key component of forest management in the Sacramento Mountains since the early 1900s which has resulted in dense conifer growth and increased fuel loads (Kaufmann *et al.* 1998). At least nine large fires have burned over 34,000 acres of land in the Sacramento Mountains in the last 50 years (Kaufmann *et al.* 1998). These fires could easily knock out this species' host plant causing mass mortality, in adults, larvae, or eggs and easily extirpating the remaining colonies (Holland 2010). Additionally, pesticide use has also likely adversely impacted this subspecies across its known range (Holland 2010). In 1983 and 1984 during June and July when this taxa is active and overlapping with its flight period carbaryl pesticides were sprayed using aerial application over 240,900 acres of the Sacramento Mountains at elevations between 1828 and 3353 meters (6,000 and 11,000 feet), to control an outbreak of Western Spruce Budworm (*Choristoneura freemani*) (Bennett and Linnea 1985). Most of the inhabited areas and waterways were instead sprayed with *Bacillus thuringiensis* (*Bt*). In another example, in 2007, the Village of Cloudcroft again sprayed *Bt var. kurstaki*, which targets lepidopterans, to control a Janet Fir Looper (*Nepytia janetae*) outbreak (Holland 2007).

This subspecies is also potentially threatened by inbreeding depression due to the extreme isolation of this taxa from other Margined Whites. Inbreeding depression can result in these isolated populations when slightly deleterious alleles accumulate in small populations, reducing the likelihood of population persistence (Hedrick 1994, Lynch *et al.* 1995). The accumulation of deleterious alleles and reduction in heterozygosity have been shown to reduce survival rates at several important life stages in butterflies, including those that have an effect on population stability and persistence, even after just one generation of mating between full-siblings (Saccheri *et al.* 1998, Nieminen *et al.* 2001). Nieminen *et al.* (2001) also suggests that inbreeding depression may pose an even greater problem in populations currently experiencing rapid habitat fragmentation but with minimal inbreeding in the past. A reduction in fitness resulting from the loss of genetic diversity significantly increases the risk of extinction when populations are subject to environmental stress. Saccheri *et al.* (1998) found that microclimatic conditions combined with inbreeding caused the extinction of a checkerspot population in Finland, while Singer and Ehrlich (1979) found a combination of drought, fragmented habitat, and low dispersal rates contributed to the extinction of several butterfly populations in California.

## Population:

The population size and trend are not known for this subspecies. Determination of population size and monitoring of population trends is necessary to ensure the population is stable. Especially as several widespread, relatively common species of butterfly are in decline across the American west (Forister *et al.* 2021).

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## More Information

