

Oeneis alberta capulinensis (Capulin Volcano Alberta Arctic)



Steve Cary,

Taxonomy

- **Class:** INSECTA
- **Order:** LEPIDOPTERA
- **Family:** NYMPHALIDAE
- **Genus:** Oeneis
- **Scientific Name:** *Oeneis alberta capulinensis* F. Brown, 1970
- **Common Name:** Capulin Volcano Alberta Arctic
- **Synonyms:**
- **Taxonomic Name Source:** Pelham, J. P. 2008. A catalogue of the butterflies of the United States and Canada with a complete bibliography of the descriptive and systematic literature. The Journal of Research on the Lepidoptera. Volume 40. 658 pp. Revised 14 February, 2012.

Agency Status

- **NMDGF:**
- **Federal Status:**
- **BLM Sensitive:**
- **USFS:**
- **IUCN Red List:** [Not Evaluated](#)
- **Nature Serve Global:** [T2](#)
- **NHNM State:** S1
- **NM Endemic:** NO

Description

Ferris and Brown (1980) accurately described this species as “reminiscent of a pale, much grayed, miniature edition of *O. chryxus*.” **Comments.** Grassy, windswept mesas and volcanic peaks north and east of Raton (Co,Un) are home to subspecies *Oeneis alberta capulinensis* F. M. Brown 1970. This rather variable race (see the three images below) was discovered on Capulin Volcano (Un) in 1969 by well-known, highly respected and much-loved Rocky Mountain lepidopterist F. Martin Brown. The colony at the type locality is now thought to be extirpated.

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

Habitat and Ecology

The Capulin Mountain Arctic is found in the harsh windswept fescue mountain grasslands of mesa tops and isolated

summits within the Raton Mesa complex, and formerly including Capulin Volcano (Cary *et al.* 2004, NPS 2012). In Capulin the taxon was found at the crater rim on the highest elevation points possible (Cary *et al.* 2004). Currently the host plant for this taxon is not known however, the parent species uses Bunch Grasses (*Fescue*) and that is likely also the case for *O.a. capulinensis* as the butterfly seems to be associated with habitats which contain large amounts of fescue bunch grasses (Scott 1986, Parmenter *et al.* 2000, Cary *et al.* 2004). At present the necessary Fescue may still be present at Capulin Mountain however, only as isolated individuals which are collectively insufficient to support a population of this taxon (S. Cary Pers. Comm 2024). This butterfly seems to have one short flight from mid-May to early June (Brown 1970, Cary *et al.* 2004). This subspecies has been described as rarely flying unless it is kicked out of grass clumps which has made surveying for them challenging (Brown 1970, Cary *et al.* 2004). When this butterfly does fly its flight is described as erratic, rapid, and low to the ground, usually less than a foot above the grass (Brown 1970 Cary *et al.* 2004). Only males have been observed flying thus far while female butterflies have been seen crawling on the ground among grass clumps or crawling in and out of crevices in the volcanic cinders (Brown 1970, Cary *et al.* 2004, NPS 2014). Ultimately very little is known about this taxon's life history and additional knowledge is needed to properly conserve the Capulin Mountain Arctic.

Geographic Range:

According to our current knowledge, this butterfly is endemic to the Raton Mesa Complex, a very small area in northern New Mexico and southern Colorado. This subspecies was first discovered in 1969, at Capulin Volcano National Monument (Cary *et al.* 2004, NPS 2012, Cary and Toliver 2023). However, the subspecies is now thought to be extirpated at Capulin Volcano National Monument and as such the Raton Mesa Complex is the only known location for this subspecies (Cary *et al.* 2004, Cary and Toliver 2023). However, Capulin Mountain and Raton Mesa are both part of a series of isolated summits and broad mesas that make up the larger Raton Mesa Volcanic Field, a geologic feature which extends 100 miles from Raton, New Mexico east to Black Mesa Oklahoma, and 40 miles from Trinidad, Colorado to Gladstone, New Mexico. The entire geologic feature encompasses nearly 4,000 square miles, across which there are dozens of volcanic summits and broad mesas which have not been searched for the Capulin Mountain Arctic (Muehlberger *et al.* 2005, S. Cary pers. comm. 2024). As a result, additional surveys may reveal that this taxon's range is larger than currently thought.

Conservation Considerations:

There is one known prior conservation of this taxon which was done by NatureServe in 1998. In this assessment the Capulin Mountain Arctic was found to be globally imperiled with extinction (NatureServe 2023). However, this assessment is very out of date now, being run in 1998 and this was before the subspecies was extirpated at Capulin Volcano National Monument. This assessment also counted intermountain *Oeneis alberta oslari* as *O.a. capulinensis* (C. Nunes Pers. Comm 2024).

Cary *et al.* 2004 recommended regular systematic surveys to try to determine the full population number and extent of this subspecies and to try to learn its life history. We agree with this and see it as the most pressing conservation matter for this taxon. Determining if this taxon is in on any more mesas and the size of its population will be crucial to ensure the health of the subspecies. Determination of life history information is also needed to properly conserve this taxon currently Bartlett Mesa is the only place it has been seen in the last twenty years if this is truly the last locality for this butterfly then it is threatened with imminent extinction and immediate efforts are needed to try to conserve and restore habitat for this taxon. An important aspect of this habitat restoration and reintroduction will be determining the host plant of this butterfly. Currently Capulin Mountain does not have enough Fescue to sustain a population of this butterfly but with some restoration the Capulin Mountain Arctic may once again grace its namesake.

However, populations of butterflies on isolated peaks in New Mexico face a bleak future with climate change including peaks like Capulin Mountain. The high mesa tops such as Bartlett mesa though are quite extensive and there is still

hope that if conservation efforts are focused on these areas that enough habitat could be maintained or restored on these mesas to save the Capulin Mountain Arctic (S. Cary Pers. Comm 2024). As a result, this is where we recommend conservation efforts on this butterfly be targeted presently is within determination of this butterfly's range, population size, and with the maintenance and restoration of these high mesa tops.

However, more direct conservation measures may also be needed to ensure this subspecies's continued survival. This includes habitat management especially as it relates to fire and invasive species as either fire or invasive species could easily extirpate the remaining known population. If the situation continues to get more dire and we risk losing the only remaining known population in Raton then captive rearing, assisted migration, or hybridization may be necessary. Additionally, permit free collection should no longer be allowed in this taxon's range as with the current known population being on just a single mesa one large collection event similar to the one years ago where an individual took 200 specimens could result in the extinction of this butterfly (S. Cary Pers. Comm 2024).

Threats:

The Capulin Mountain Arctic butterfly faces many potential threats in its range. First off because of the population's small size, small natural or human impacts could threaten the existence of this subspecies (Cary *et al.* 2004). These could include loss of larval host plants due to development or replacement by invasive species (Cary *et al.* 2004). In many other places the parent species has been driven out of habitats due to overgrazing of cattle and non-native grasses (Cary *et al.* 2004, NatureServe 2023). This subspecies could also be highly affected by fire either by it or the lack of it. With such small population numbers in such small areas one fire controlled or wild could wipe out a large percentage of what's left of this subspecies and potentially cause its extinction (Cary *et al.* 2004). However, at the same time with no fire these grasslands may grow senescent or be succeeded which will also drive the taxon towards potential extinction (Cary *et al.* 2004). Because the current known population is so small and it's so restricted drought, and severe weather pose large challenges to the taxon as well including hailstorms and late snows which if during the flight period could kill off a large number of individuals (Cary *et al.* 2004). On top of all of this the subspecies is univoltine and being univoltine highly increases a butterfly's chances of extinction making them less adaptable and more prone to phenological mismatch (Forister *et al.* 2023).

Additionally, the population appears to have poor genetic health and be quite inbred based on the amount of recessive phenotypes observable in the population and its long-term isolation (Brown 1970, Cary *et al.* 2004). In a metapopulation like this it is not uncommon for events like weather or climate to extirpate small colonies, however, eventually they will be recolonized from another population (Cary *et al.* 2004). But with this taxon it does not seem like recolonization will be an option at many sites. This subspecies is a relict from a much colder time and climate warming has now driven the taxon as far up these mesas and volcanoes as it can get to replicate the colder temperatures it needs. On top of this, at some of the sites it is now gone from such as Capulin Volcano it would have to travel some distance across low elevations to get there making recolonization unlikely (Cary *et al.* 2004). As climate change continues and temperatures get warmer this subspecies is expected to be pushed to higher and higher altitudes however, at this point it can't increase in elevation anymore as it already exists towards the tops of the grassy Raton Mesas (Cary *et al.* 2004). It also has limited dispersal capability and so seems to be facing imminent extinction in New Mexico with climate change (Cary *et al.* 2004). Currently the climate projections for Capulin Volcano National Monument and the Raton Mesa complex show the landscaping getting much warmer and drier, a future that undoubtedly will be harsh on the Capulin Mountain Arctic (NPS 2012).

Population:

Since 1969 when the subspecies was first identified it has only been found six more times at Capulin Volcano National Monument with the last sighting there occurring in 1996 (NPS 2012). In 2003 and 2004 the National Park Service underwent formal surveys to try to determine the abundance and population of the subspecies and although none were found at the monument either year the taxon was found at other nearby mesas around Raton although in very low

numbers (Cary *et al.* 2004, NPS 2012). Additionally, this subspecies is phenotypically far more variable than any other studied population and this degree of variation seems to suggest a very small and isolated population where many recessive traits have begun to appear phenotypically (Brown 1970, Cary *et al.* 2004).

References:

- Muehlberger, W. R., Muehlberger, S. J. and L. Greer Price. 2005. High Plains of Northeastern New Mexico: A Guide to Geology and Culture. NM Bureau of Geology & Mineral Resources, Socorro, NM 19.
- [National Park Service \(NPS\).. 2012. Capulin Alberta Arctic Butterfly. National Parks Service. . <https://www.nps.gov/articles/capulin-alberta-arctic-butterfly.htm>](https://www.nps.gov/articles/capulin-alberta-arctic-butterfly.htm)
- [ITIS. 2021. Integrated Taxonomic Information System \(ITIS\). <https://www.itis.gov/>](https://www.itis.gov/)
- Parmenter, R.R., D.C. Lightfoot, and W. L. Gannon.. 2000. Capulin Volcano National Monument: listed and category species inventory. Report to US Department of the Interior National Park Service. .
- [GBIF.org . 2023. GBIF Occurrence Download . 2023. <https://doi.org/10.15468/dl.ab6aa2>](https://doi.org/10.15468/dl.ab6aa2)
- [Brown, F. M.. 1970. Oeneis alberta in New Mexico, a New Subspecies \(Lepidoptera: Satyridae\). . \[Journal of the New York Entomological Society 78: \\(134-138\\).\]\(http://www.jstor.org/stable/25006209\) <http://www.jstor.org/stable/25006209>](http://www.jstor.org/stable/25006209)
- [Cary, S. J., Johnson, K., & Pierce, L.. 2004. Alberta Arctic Butterfly Surveys in the Capulin Volcano National Monument Area 2003-2004 Final Report.. National Park Service. <http://www.npshistory.com/publications/cavo/butterfly-2004.pdf>](http://www.npshistory.com/publications/cavo/butterfly-2004.pdf)
- [Cary, S.J. and Toliver, M.E.. 2023. Butterflies of New Mexico. Pajarito Environmental Education Center \(PEEC\) . <https://peeccnature.org/butterflies-of-new-mexico/>](https://peeccnature.org/butterflies-of-new-mexico/)
- Forister, M.L., Grames, E.M., Halsch, C.A., Burls, K.J., Carroll, C.F., Bell, K.L., Jahner, J.P., Bradford, T., Zhang, J., Cong, Q., Grishin, N.V., Glassberg, K., Shapiro, A.M. and Riecke, T.V.. 2023. Assessing risk for butterflies in the context of climate change, demographic uncertainty, and heterogenous data sources. *Ecological Monographs* 93: (e1584).
- U.S. Fish and Wildlife Service (USFWS), Otero County, The Village of Cloudcroft, and U.S. Forest Service. 2004. Conservation Plan for the Sacramento Mountains Checkerspot Butterfly (*Euphydryas anicia cloudcrofti*). Albuquerque, NM : (80).
- Scott, J.A.. 1986. The Butterflies of North America, A Natural History and Field Guide. Stanford University Press, Stanford, California : (583).
- NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life.. Database .

More Information

