

## White Mountain Fritillary

*Boloria titania montinus*

Federal Listing	N/A
State Listing	E
Global Rank	
State Rank	S1
Regional Status	



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### Justification (Reason for Concern in NH)

White Mountain fritillary is limited to the 2,800 ac alpine zone of the White Mountain National Forest (WMNF). The natural communities used most frequently by White Mountain fritillary ranked S1 in New Hampshire. Climate change will likely alter alpine habitat structure, composition, phenology, and distribution, all of which directly impact White Mountain fritillary populations (Kimball and Weihrauch 2000, McFarland 2003, Lesica and McCune 2004). Habitat isolation further increases the species' vulnerability (Halloy and Mark 2003, McFarland 2003). Interdependent responses to climate change could disrupt ecological interactions throughout the alpine community, reducing the ability of sensitive species to endure other environmental stresses, such as acid deposition and increased UV-B radiation (McCarty 2001).

### Distribution

White Mountain fritillary is a subspecies endemic to the 2,800 ac alpine zone of the Presidential Range of the WMNF (McFarland 2003). Habitat suitability depends on the abundance of host plants, particularly Alpine goldenrod, as well as ground temperature, moisture, and winter snow cover (Anthony 1970, McFarland 2003). White Mountain fritillary populations tend to be locally abundant, the northernmost occurrence is from Mt. Madison and the southernmost is Mt. Pierce at an elevation range of 1,220 to 1,860 m, with the highest densities at Cragway Spring and Wamsutta Trail (McFarland 2003). The only historical record occurring outside the Presidential Range alpine zone was a specimen collected by D. J. Lennox on 27 August 1966 in Jefferson Notch at 900 m elevation and deposited in the University of New Hampshire collections (McFarland 2003).

### Habitat

The White Mountain fritillary, a subspecies of the Purple fritillary (*Boloria titania*), is endemic to the alpine zone of the Presidential Range of New Hampshire (McFarland 2003). White Mountain fritillary inhabits wet-mesic alpine communities above 1,220 to 1,860 m, specifically wet alpine meadows, alpine streamside communities, and snowbank communities (McFarland 2003). Wet-mesic alpine communities are typically sloped, have shallow organic soils, and are associated with late-melting snowbanks forming in lee positions of summits, ridges, outcrops, ravines, drainages, and at the alpine-treeline interface. Characteristic vegetation consists of *Geum peckii*, *Solidago cutleri*, *Spiraea septentrionalis*, *Scirpus cespitosus*, *Salix* spp., and *Vaccinium* spp. (Sperduto and Nichols 2004). The preferred habitat of White Mountain fritillary includes a ground cover composed of herbs and forbs, host and nectar sources, and proximity to water. No obligate larval host plants are known, although possible species include *Salix* spp., *Viola palustris*, *Viola adunca*, and *Vaccinium* spp. (McFarland 2003). Adults prefer *Solidago cutleri* but will also nectar on Aster species (McFarland 2003).

## Appendix A: Insects

### NH Wildlife Action Plan Habitats

- Alpine



**Distribution Map**

### Current Species and Habitat Condition in New Hampshire

The total abundance of White Mountain Fritillary in the alpine zone during the flight periods in 2012 and 2013 was estimated to be 1,764 (95% CI = 1,293 - 2,437) individuals (McFarland 2014). The White Mountain fritillary population is believed to be imperiled due to natural rarity (McFarland 2003) and susceptibility to climatic and atmospheric changes.

### Population Management Status

Surveys have been conducted but long-term monitoring has not been implemented. Little or no targeted management has been implemented to date.

### Regulatory Protection (for explanations, see Appendix I)

- Endangered Species Conservation Act (RSA 212-A)
- WMNF sensitive species

### Quality of Habitat

High quality alpine communities used by White Mountain fritillary occur in the Alpine Garden, Tuckerman Ravine, Oakes gulf, Great Gulf (Sperduto and Nichols 2004). Records of adult White Mountain fritillary are most often reported from Cragway Spring and Wamsutta Trail, each with high densities of *Solidago cutleri* (McFarland 2003). During recent surveys, the highest density of White Mountain Fritillary was observed in herbaceous snowbank plant communities, but this habitat is available only in a limited amount (<1%) (McFarland 2003, McFarland 2014). The heath-shrub rush community covers most of the area in the alpine zone occupied by the species and contained 78% of the White Mountain Fritillary population at any given time (McFarland 2014).

### Habitat Protection Status

Because White Mountain fritillary is protected under RSA 212, its habitat receives some special protection.

### Habitat Management Status

Little or no targeted management has been implemented to date. See also Alpine Habitat Profile.

## Appendix A: Insects

### Threats to this Species or Habitat in NH

*Threat rankings were calculated by groups of taxonomic or habitat experts using a multistep process (details in Chapter 4). Each threat was ranked for these factors: Spatial Extent, Severity, Immediacy, Certainty, and Reversibility (ability to address the threat). These combined scores produced one overall threat score. Only threats that received a "medium" or "high" score have accompanying text in this profile. Threats that have a low spatial extent, are unlikely to occur in the next ten years, or there is uncertainty in the data will be ranked lower due to these factors.*

#### Mortality of host plants, eggs and larvae from trampling due to recreation. (Threat Rank: Medium)

##### List of Lower Ranking Threats:

Habitat degradation from acid deposition  
Mortality from the collection of individuals from the wild  
Habitat impacts from roads (limited dispersal)  
Disturbance from phenology shifts of host plants and species  
Habitat conversion from changes or shifts in available habitat  
Habitat degradation from reduced habitat availability associated with climate change  
Habitat conversion due to development  
Habitat degradation from acid deposition  
Mortality from the collection of individuals from the wild  
Habitat impacts from roads (limited dispersal)  
Disturbance from phenology shifts of host plants and species  
Habitat conversion from changes or shifts in available habitat  
Habitat degradation from reduced habitat availability associated with climate change  
Habitat conversion due to development

### Actions to benefit this Species or Habitat in NH

#### Perform monitoring studies and captive rearing work to determine host plant(s) for the species.

**Primary Threat Addressed:** Disturbance from phenology shifts of host plants and species

**Specific Threat (IUCN Threat Levels):** Climate change & severe weather

##### Objective:

##### General Strategy:

Currently it is unknown what the primary host plant is for the species. More in depth work with the species to determine primary host plants that are supporting the populations in the White Mountains.

##### Political Location:

Coos County

##### Watershed Location:

## Appendix A: Insects

### Create signs informing the public of state law protecting the species.

**Primary Threat Addressed:** Mortality from the collection of individuals from the wild

**Specific Threat (IUCN Threat Levels):** Biological resource use

**Objective:**

**General Strategy:**

**Political Location:**

**Watershed Location:**

### Monitor the health of known populations; determine if captive propagation for augmentation or translocation is required.

**Objective:**

**General Strategy:**

Now that baseline population estimate has been determined for the species (McFarland 2014), a long-term monitoring strategy should be developed that can detect trend in species population over time. Determining population health and trend is especially important since the species appears to be dependent on snowbank communities and other wet areas, it is more likely to be impacted by climate change.

**Political Location:**

**Watershed Location:**

## References, Data Sources and Authors

### Data Sources

Published literature, NH Natural Heritage Database and consultation with experts. Sources of information include databases, expert review and consultation.

### Data Quality

The New Hampshire distribution of White Mountain fritillary is well documented. Abundance data are inadequate to allow rigorous population estimates.

### 2015 Authors:

Heidi Holman, NHFG

### 2005 Authors:

## Literature

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## ***Appendix A: Insects***

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