

**Species Listing PROPOSAL Form:**  
**Listing Endangered, Threatened, and Special Concern Species in Massachusetts**

Scientific name: *Satyrrium favonius*Current Listed Status (if any): Special ConcernCommon name: Oak Hairstreak**Proposed Action:** Add the species, with the status of: \_\_\_\_\_

Change the scientific name to: \_\_\_\_\_

 Remove the species

Change the common name to: \_\_\_\_\_

 Change the species' status to: \_\_\_\_\_

(Please justify proposed name change.)

**Proponent's Name and Address:**

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Proponent's Signature:



Date Submitted: June 2, 2014

Please submit to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 100 Hartwell Street, Suite 230, West Boylston, MA 01583

**Justification**

Justify the proposed change in legal status of the species by addressing each of the criteria below, as listed in the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00), and provide literature citations or other documentation wherever possible. Expand onto additional pages as needed but make sure you address all of the questions below. The burden of proof is on the proponent for a listing, delisting, or status change.

**(1) Taxonomic status.** Is the species a valid taxonomic entity? Please cite scientific literature.

Yes, *Satyrrium favonius* was first described by J.E. Smith in 1797, as *Papilio favonius* (Pelham 2008), and its species status continues to be recognized in recent works including Pelham (2008), NABA (2012), Opler et al. (2014), and Warren et al. (2014).

**(2) Recentness of records.** How recently has the species been conclusively documented within Massachusetts?

The most recent record of *Satyrrium favonius* in the NHESP database is from 29 June 2012, observed by M. Faherty. The most recent record of *Satyrrium favonius* in Massachusetts is from 2 July 2013, observed by G. Kessler (Fairbrother 2014).

**(3) Native species status.** Is the species indigenous to Massachusetts?

Yes; the type locality of *Satyrrium favonius* is Georgia, U.S.A. (Pelham 2008).

**(4) Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts?

Yes, currently there are 20 known element occurrences (local populations) of *Satyrrium favonius* in Massachusetts (NHESP database).

**(5) Federal Endangered Species Act status.** Is the species listed under the federal Endangered Species Act? If so, what is its federal status (Endangered or Threatened)?

No, *Satyrrium favonius* is not listed under the federal Endangered Species Act.

**(6) Rarity and geographic distribution.**

(a) Does the species have a small number of occurrences (populations) and/or small size of populations in the state? Are there potentially undocumented occurrences in the state, and if so, is it possible to estimate the potential number of undocumented occurrences?

*Satyrrium favonius* is listed as a Special Concern species in Massachusetts; there are 20 current (observed within the past 25 years) element occurrences (local populations) in the NHESP database. Figure 1 (attached) shows the distribution, by town, of the 20 current element occurrences of *Satyrrium favonius* in the NHESP database; 18 towns are represented. For the 20 current populations of *Satyrrium favonius*, there is a total of 4,918 acres of mapped habitat, of which a total of 2,507 acres (51%) is on protected open space.

*Satyrrium favonius* has seven historic (not observed within the past 25 years) element occurrences (local populations) in the NHESP database. *Satyrrium favonius* may no longer occur at some of the seven historic sites; however, some sites have not been surveyed during the past 25 years, and this species may very well persist at some of its historic sites. Figure 2 (attached) shows the distribution, by town, of all 27 element occurrences of *Satyrrium favonius* in the NHESP database; 22 towns are represented.

From 1992 to 2013, the Massachusetts Butterfly Club (MBC) database includes records of *Satyrrium favonius* from 38 towns: Amherst, Braintree, Burlington, Canton, Carver, Concord, East Longmeadow, Easton, Edgartown, Falmouth, Foxborough, Gloucester, Great Barrington, Hingham, Holliston, Hopedale, Mansfield, Medford, Milford, Montague, Natick, Newbury, North Andover, Northampton, Oak Bluffs, Rowley, Sharon, Sherborn, Springfield, Tisbury, Upton, Uxbridge, Wellesley, Wellfleet, West Tisbury, Woburn, Worcester, and Wrentham (Stichter 2014). Therefore, the MBC database includes records of *Satyrrium favonius* that have not been reported to NHESP; most of those unreported records are from the Connecticut River Valley, the northeastern part of the state, and Martha's Vineyard.

In summary, the known distribution of *Satyrrium favonius* in Massachusetts includes most of the state east of Worcester (with the exception of Nantucket), the Connecticut River Valley, and the southern Berkshires. Within this range, *Satyrrium favonius* inhabits oak woodland, typically on xeric and open rocky uplands, as well as on sandplain barrens; adult butterflies nectar at flowers in or near such habitat. Larvae feed on oaks (*Quercus* spp.). Unlike many species on the Massachusetts List of Endangered, Threatened, and Special Concern Species, *Satyrrium favonius* is not restricted to natural habitats; the butterfly may be found in a variety of anthropogenic settings, including old fields and vacant lots, powerline or pipeline cuts, abandoned gravel pits and landfills, plant nurseries, and suburban yards (NHESP database, D.L. Wagner pers. comm.). There is an enormous amount of oak woodland and anthropogenic habitat with oaks within this species' range in Massachusetts, and it is probably more common than records in the NHESP and MBC databases indicate. The reason for this is that adult butterflies spend most of their time in the tree canopy, descending only to nectar at flowers (NatureServe 2014), making observation difficult. Likewise, larvae feed in the spring on catkins and new foliage of oaks, presumably with most larvae too high in the canopy for observation.

(b) What is the extent of the species' entire geographic range, and where within this range are Massachusetts populations (center or edge of range, or peripherally isolated)? Is the species a state or regional endemic?

Massachusetts populations of *Satyrrium favonius* are at the northeastern edge of a large geographic range, which extends from Massachusetts south to Florida, and west to the Colorado and New Mexico (Opler et al. 2014).

**(7) Trends.**

(c) Is the species decreasing (or increasing) in state distribution, number of occurrences, and/or population size? What is the reproductive status of populations? Is reproductive capacity naturally low? Has any long-term trend in these factors been documented?

*Satyrrium favonius* “does not appear to be declining and apparently expanded its range in the Northeast in the 1970s and 1980s” (NatureServe 2014). From the late 1990s to date, *Satyrrium favonius* has been observed with greater frequency and in greater numbers, and appears to have expanded its range within Massachusetts (Stichter 2014). It is unclear, however, whether this is due to a true increasing trend for this species in the state, or simply better documentation of its distribution and abundance due to the increasing number of butterfly watchers over the past two decades. Given that *Satyrrium favonius* is a southern butterfly at the northern extent of its geographic range in Massachusetts, it is possible that a warming climate has contributed to an increase in its distribution and abundance in the state.

**(8) Threats and vulnerability.**

(d) What factors are driving a decreasing trend, or threatening reproductive status in the state? Please identify and describe any of the following threats, if present: habitat loss or degradation; predators, parasites, or competitors; species-targeted taking of individual organisms or disruption of breeding activity.

Potential threats to *Satyrrium favonius* in Massachusetts include: (1) habitat loss to development; (2) clearcut timber harvest; (3) introduced generalist parasitoids; and (4) aerial insecticide spraying. Habitat loss is less of a threat to *Satyrrium favonius* than many other species, as this butterfly may persist in a variety of anthropogenic settings, including suburban yards. Clearcut timber harvest is a potential threat to a local population of *Satyrrium favonius* in prime oak woodland habitat. However, most timber harvest in Massachusetts consists of tree thinning or other types of selective cutting, and clearcutting is relatively rare and generally does not occur at a large scale. With regard to introduced generalist parasitoids, currently none are known that are a serious threat to lycaenid butterflies such as *Satyrrium favonius*. The most notorious offender, *Compsilura concinnata*, occurs in greatest numbers in late summer and early autumn, and therefore most seriously impacts species with larvae that mature late in the season. The larval stage of *Satyrrium favonius* occurs in the spring. Aerial insecticide spraying is a potential threat to *Satyrrium favonius*; however, most such spraying (e.g., mosquito spraying to reduce the risk of Eastern Equine Encephalitis) occurs in late summer and early autumn. In late summer and autumn *Satyrrium favonius* is in the egg stage, which unlike active stages (larva and adult), is not thought to be affected by low-volume aerial insecticide spraying.

(e) Does the species have highly specialized habitat, resource needs, or other ecological requirements? Is dispersal ability poor?

In Massachusetts, *Satyrrium favonius* inhabits xeric and open oak woodland and barrens on rocky uplands and sandplains; adult butterflies nectar at flowers in or near such habitat, including old fields and vacant lots, powerline or pipeline cuts, abandoned gravel pits and landfills, plant nurseries, and suburban yards. Larvae feed in the spring on catkins and new foliage of oaks (*Quercus* spp.); the particular oak species used in Massachusetts have not been documented. As a flying insect, *Satyrrium favonius* disperses readily.

**Conservation goals.**

What specific conservation goals should be met in order to change the conservation status or to remove the species from the state list? Please address goals for any or all of the following:

(a) State distribution, number of occurrences (populations), population levels, and/or reproductive rates  
*Satyrrium favonius* is widely distributed in Massachusetts. The number of element occurrences (local populations) is not especially large; however, the behavior of this species makes it difficult to observe, and it is probably more common than records in the NHESP and MBC databases indicate.

## (b) Amount of protected habitat and/or number of protected occurrences

For the 20 current (observed within the past 25 years) element occurrences (local populations) of *Satyrrium favonius* in the NHESP database, there is a total of 4,918 acres of mapped habitat, of which a total of 2,507 acres (51%) is on protected open space.

## (c) Management of protected habitat and/or occurrences

Populations of *Satyrrium favonius* and their habitat are not management-dependent.

*Satyrrium favonius* is currently listed as a Special Concern species in Massachusetts. However, with regard to the listing criteria of rarity, trend, and threat (NHESP 2008), Special Concern status is not warranted, and *Satyrrium favonius* should be removed from the Massachusetts List of Endangered, Threatened, and Special Concern Species. The reasons for this are discussed above under (6) Rarity and geographic distribution; (7) Trends; and (8) Threats and vulnerability.

Subsequent to removal from the Massachusetts List of Endangered, Threatened, and Special Concern Species, *Satyrrium favonius* should continue to be monitored by the NHESP, the MBC, and others. When and if such monitoring indicates the development of a decreasing trend, either in state distribution or number of element occurrences (local populations), or the emergence of novel threats, then *Satyrrium favonius* should be reevaluated for potential return to Special Concern status.

**Literature cited, additional documentation, and comments.**

Fairbrother, M. 2014. 2013 season summary and records. *Massachusetts Butterflies* 42: 10-25.

NABA. 2012. *Checklist of North American butterflies occurring north of Mexico*. North American Butterfly Association, Morristown, New Jersey. <http://www.naba.org/pubs/enames2.html>.

NatureServe. 2014. *NatureServe Explorer: An online encyclopedia of life* [web application]. Version 7.1. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>.

NHESP. 2008. *Listing Endangered species in Massachusetts: the basis, criteria, and procedure for listing Endangered, Threatened, and Special Concern species*. Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, Westborough, Massachusetts. 29 pp.

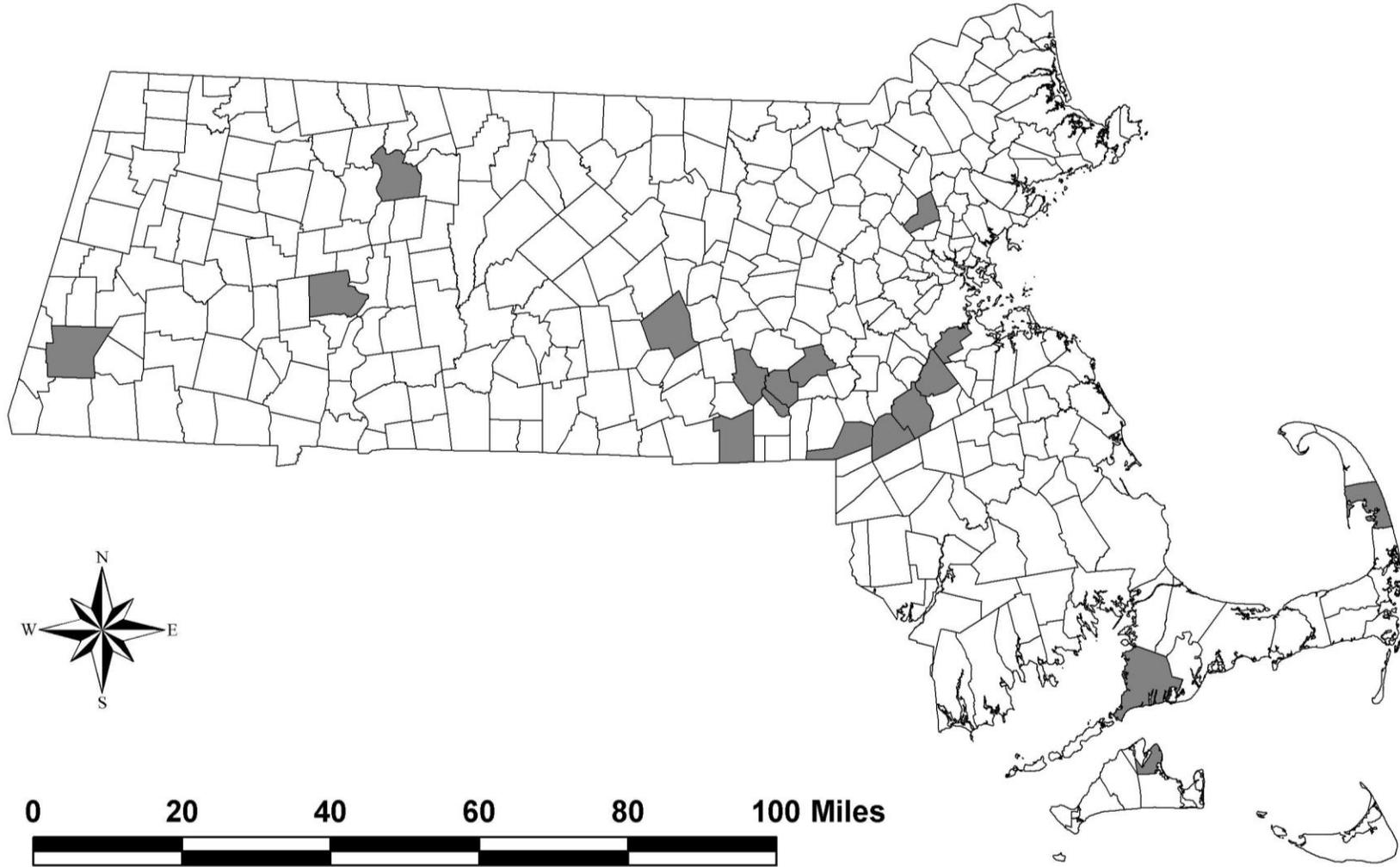
Opler, P.A., K. Lotts, and T. Naberhaus (coordinators). 2014. *Butterflies and moths of North America*. <http://www.butterfliesandmoths.org>.

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* 40: 1-658.

Stichter, S. 2014. *The butterflies of Massachusetts*. <http://www.butterfliesofmassachusetts.net>.

Warren, A.D., K.J. Davis, E.M. Strangeland, J.P. Pelham, and N.V. Grishin. 2014. *Butterflies of America*. Illustrated lists of American butterflies. Butterflies of America Foundation, Dallas, Texas. <http://www.butterfliesofamerica.com>.

**Figure 1.** Distribution, by town, of the 20 current (1989-2013) element occurrences of *Satyrium favonius* in Massachusetts (NHESP database). A total of 18 towns are represented: Canton, Falmouth, Foxborough, Great Barrington, Holliston, Hopedale, Milford, Milton, Montague, Northampton, Oak Bluffs, Sharon, Upton, Uxbridge, Wellfleet, Woburn, Worcester, and Wrentham.



**Figure 2.** Distribution, by town, of all 27 element occurrences of *Satyrium favonius* in Massachusetts (NHESP database). A total of 22 towns are represented: Barnstable, Canton, Douglas, Falmouth, Foxborough, Great Barrington, Holliston, Hopedale, Medford, Milford, Milton, Montague, Northampton, Oak Bluffs, Sharon, Sherborn, Upton, Uxbridge, Wellfleet, Woburn, Worcester, and Wrentham.

