



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Walsh's Anthophora *Anthophora walshii*

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: Walsh's Anthophora (*Anthophora walshii*) is a distinctive bee of moderate dimensions (14-16 mm in length and 5-6 mm wide), similar in size to a worker bumble bee. The head, thorax, and first segment of the abdomen are covered in long, pale yellow hair. The remainder of the abdomen is dark except for narrow, ivory-colored bands around the rear edge of the abdominal segments (the first four segments in the female, the first six in the male) (Mitchell 1962). The banded abdomen is unique, not found in any other eastern species of *Anthophora*. Males are distinguished from females by the extensive ivory markings on the front of the face and base of the antennae; the male also has longer antennae than the female. The foraging behavior of Walsh's Anthophora helps differentiate it in the field from other bees of similar size. Unlike both honey and bumble bees, which fly slowly and methodically between flowers while collecting pollen and nectar, the flight of Walsh's Anthophora is quick and direct; each flower is visited briefly (typically less than 3 seconds) before moving on to the next.

HABITAT: In Massachusetts, Walsh's Anthophora is found in open, disturbed coastal habitats on sandy soil



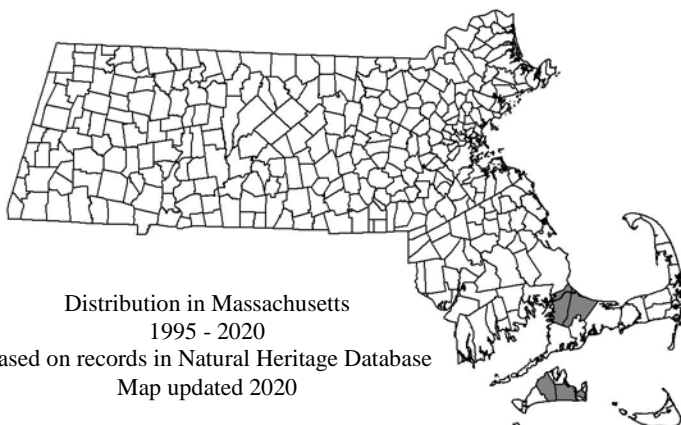
Anthophora walshii • MA: Barnstable Co., Bourne • 7 Jul 2017 • Photo by M.F. Veit

Adult Flight Period in Massachusetts

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

where Wild Yellow Indigo (*Baptisia tinctoria*) is relatively abundant. Habitats include managed grasslands, utility rights-of-way, and fire breaks.

LIFE HISTORY: In Massachusetts, Walsh's Anthophora has been collected or observed from early July through late September, with the majority of records between mid-July and mid-August. Like other *Anthophora* species, Walsh's Anthophora is a solitary (non-social) ground nester. Nesting has been documented in Massachusetts in sparsely vegetated, sandy soils in or near stands of Yellow Wild Indigo. Nest entrance holes are circular, 6-7 mm in diameter, and have a narrow fan of tailings extending about 4 cm from the opening. Nests occur both individually and in small aggregations of 3-7 (Veit 2019).



A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

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The life cycle of Walsh's Anthophora has not been studied in detail, but is likely similar to other species of *Anthophora*, as described by Danforth et al. (2019). *Anthophora* species overwinter as a pre-pupa; when the ground thaws and begins to warm in spring or early summer, pupation occurs. The adult bees emerge about two weeks later, typically synchronous with the flowering of host plants. Males search for females on flowers, often mating with multiple females. Each female, however, usually mates only once, then searches for appropriate nest sites. The female excavates a nest, with brood cells either arranged in a line along the main tunnel, or located at the tips of lateral branches. Each nest has up to ten cells, occasionally more. Nest depth varies, but can be as deep as 30 cm. Nest cells are lined with a waxy, waterproof substance produced by a gland at the tip of the female's abdomen. A female makes multiple foraging trips to provision each cell with a soupy mixture of nectar and pollen. After provisioning, a single egg is laid in each cell before it is sealed. After hatching, the larva feeds on the mixture of nectar and pollen, molting four times as it grows. About a month after hatching, the larva is a fully-grown pre-pupa, which remains dormant until the following spring or early summer.

GEOGRAPHIC RANGE: Walsh's Anthophora is primarily a species of the Great Plains and eastern slopes of the Rocky Mountains, ranging from Ohio north to Michigan, west to southern Saskatchewan and Montana, and south to Arizona and Texas (Ascher & Pickering 2016). Throughout its geographic range, Walsh's Anthophora has most often been collected while foraging on flowers of plants belonging to the pea family (Fabaceae), including Wild Indigo (*Baptisia* spp.), Sensitive Pea (*Chamaecrista* spp.), Wild Senna (*Senna* spp.), Bush Clover (*Lespedeza* spp.), and on various plants in the mint family (Lamiaceae) including Wood Mint (*Blepharis* spp.) and Germander (*Teucrium* spp.) (Hurd 1979). Current Massachusetts records represent a peripherally isolated population more than 600 miles east of the eastern edge of this species' primary range. In Massachusetts, Walsh's Anthophora has been found on Cape Cod, Martha's Vineyard, and Penikese Island; it has most often been observed foraging at Yellow Wild Indigo. Other host plants in Massachusetts include Orange Milkweed (*Asclepias tuberosa*) and goldenrod (*Solidago* spp.). Undocumented populations of this species may exist in southeastern Plymouth County, on outer Cape Cod, or on Nantucket.

STATUS AND THREATS: Walsh's Anthophora is threatened by habitat loss and fire suppression. Fire maintains open habitat, promotes growth of Yellow Wild Indigo, and provides nest sites by reducing organic matter at the soil surface. Other potential threats include introduced pathogens, aerial insecticide spraying, non-target herbiciding, excessive deer browse of larval host plants, and off-road vehicles.

Literature Cited

- Ascher, J.S., and J. Pickering. 2016. Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). http://www.discoverlife.org/mp/20q?guide=Apoidea_species.
- Danforth B.N., R.L. Minckley, and J.L. Neff. 2019. *The Solitary Bees: Biology, Evolution, Conservation*. Princeton University Press, Princeton, New Jersey. 488 pp.
- Hurd, P.D., Jr. 1979. Superfamily Apoidea, pp. 1741-2209 in: K.V. Krombein, P.D. Hurd Jr., D.R. Smith, and B.D. Burks (eds.). *Catalog of Hymenoptera in America North of Mexico*, Volume 2. Smithsonian Institution Press, Washington, D.C.
- Mitchell, T.B. 1962. *Bees of the Eastern United States*. North Carolina Agricultural Experiment Station Technical Bulletin No. 152, Raleigh, North Carolina. 557 pp.
- Veit, M.F. 2019. *2019 Camp Edwards Survey for Anthophora walshii (Hymenoptera: Anthophila)*. Unpublished report prepared for the Massachusetts National Guard Environmental and Readiness Center, Camp Edwards, Massachusetts.

Authored by M.F. Veit, January 2020

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