

Species Status Assessment

Common Name: Slender Resin Bee

Date: 3/14/2025

Scientific Name: *Megachile exilis* **Proposed By:** Katie Hietala-Henschell

Class: Insecta

Family: Megachilidae

Species Synopsis (a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):

Megachile exilis is known from the southwestern and eastern US (NatureServe 2021, Young et al. 2016). This species has two recognized subspecies, and some populations may be experiencing population declines in parts of its range (NatureServe 2021). In New York, it was not historically known to occur; however, recent efforts (2000 and later) confirmed *M. exilis* in New York City (White et al. 2022).

Threats facing *M. exilis* populations may include habitat loss from conversion of shrublands to agriculture, fire, logging and wood harvesting, invasive plants and pathogens, pesticides, and climate change (White et al. 2022). Additionally, *M. exilis* may have reduced reproductive capacity and limited dispersal abilities which may impact overall health and survival; however, they have been reported in urban areas and may be less impacted than other native bee species (NatureServe 2021). In the face of climate change and other threats, management and protection of suitable habitat will be essential to support this species.

I. Status

a. Current legal protected Status

i. **Federal:** Not listed **Candidate:** No

ii. **New York:** Not listed

b. Natural Heritage Program

i. **Global:** G5

ii. **New York:** S1 **Tracked by NYNHP?:** No

Other Ranks:

- NYS 2025 SGCN Status: High Priority Species of Greatest Conservation Need
- IUCN Red List: Not assessed (IUCN 2025)
- Northeast Regional SGCN: Not assessed (Northeast Fish and Wildlife Diversity 2025)

Status Discussion:

The conservation status for *M. exilis* was assessed after the Empire State Native Pollinator Survey efforts and this species was ranked as Critically Imperiled (S1) in New York. *M. exilis* occurs in less than 2% of New York state, based on the number of extant counties (1) (White et al. 2022).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			Choose an item.
Northeastern US	Yes	Unknown	Unknown			Choose an item.
New York	Yes	Declining	Declining	Pre-2000 vs 2000-2022	S1	No
Connecticut	Unknown	-	-		SNR	Choose an item.
Massachusetts	Unknown	-	-		SNR	Choose an item.
New Jersey	Yes	Unknown	Unknown		SNR	Choose an item.
Pennsylvania	Yes	Unknown	Unknown		SNR	Choose an item.
Vermont	Unknown	-	-			Choose an item.
Ontario	Unknown	-	-			Choose an item.
Quebec	Unknown	-	-			Choose an item.

Column options

Present?: Yes; No; Unknown; No data; (blank) or Choose an Item

Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item

SGCN?: Yes; No; Unknown; (blank) or Choose an item

References used in table: North America and State/Province Ranks (NatureServe 2021); Northeastern US (Northeast Fish and Wildlife Diversity 2025)

Monitoring in New York (*specify any monitoring activities or regular surveys that are conducted in New York*):

The Empire State Native Pollinator Survey was a multi-year pollinator survey effort conducted from 2017-2021. Leafcutter bees were included in the focal taxa targeted by this survey. The statewide effort resulted in up-to-date information on the occurrence of Megachilids across the state (White et al. 2022). However, no continued organized, regular monitoring or survey activities are directed toward this species.

Trends Discussion (*insert map of North American/regional distribution and status*):

M. exilis has a relatively wide distribution occurring primarily in the southern and eastern US. It appears to be experiencing declines in relative abundance in the northeast (Bartomeus et al. 2013). Of the states with conservation ranks, New York and Indiana, *M. exilis* has been assessed as Critically Imperiled and Vulnerable respectively. There are many data gaps to fill regarding this species range and conservation status. A bee survey in Maryland described *M. exilis* as uncommon, observing only a single specimen (Shapiro and Droege 2010). It was not previously known from New York prior to the ESNPS (White et al. 2022), although there are several observations of *M. exilis* in Newark, New Jersey (NatureServe 2021).

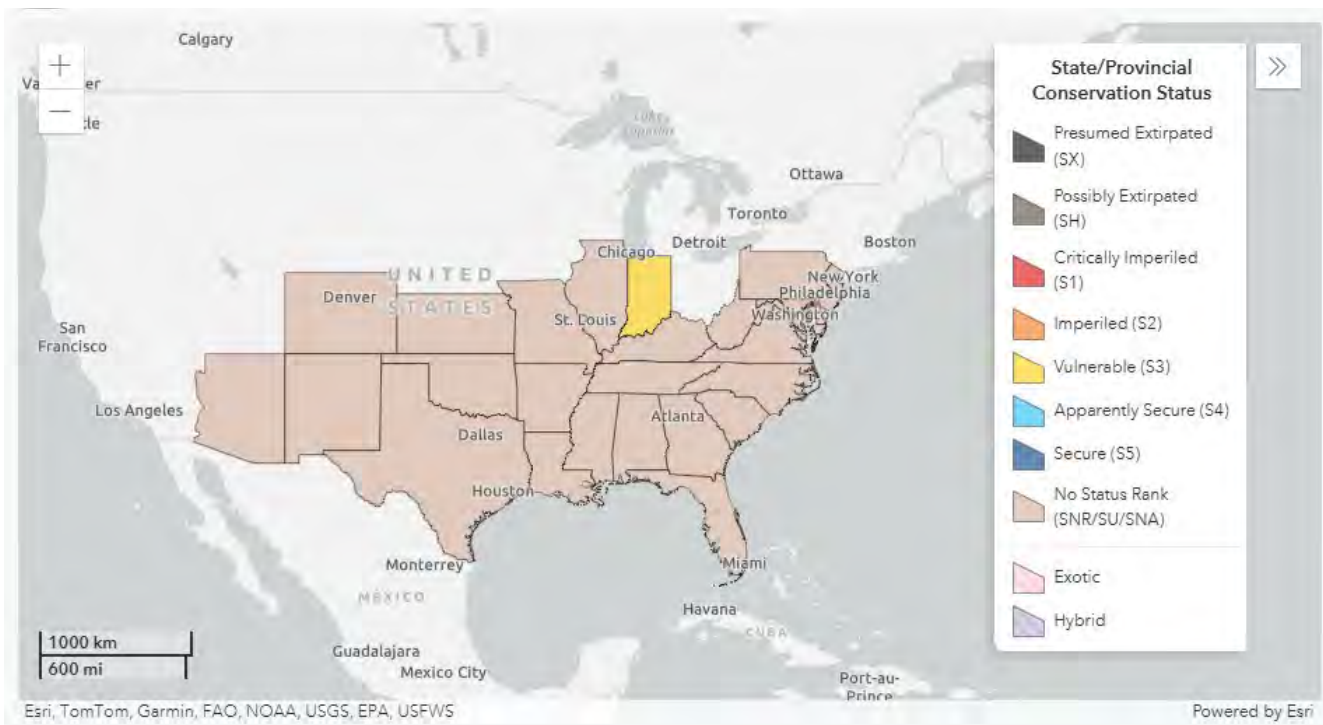


Figure 1. *Megachile exilis* distribution in North America (NatureServe 2021), the recent conservation status assessment of *M. exilis* is not yet reflected in this map.

III. New York Rarity (provide map, numbers, and percent of state occupied)

Megachile exilis has been assessed as Critically Imperiled in New York. It is known from just a single county (New York County) (White et al. 2022).

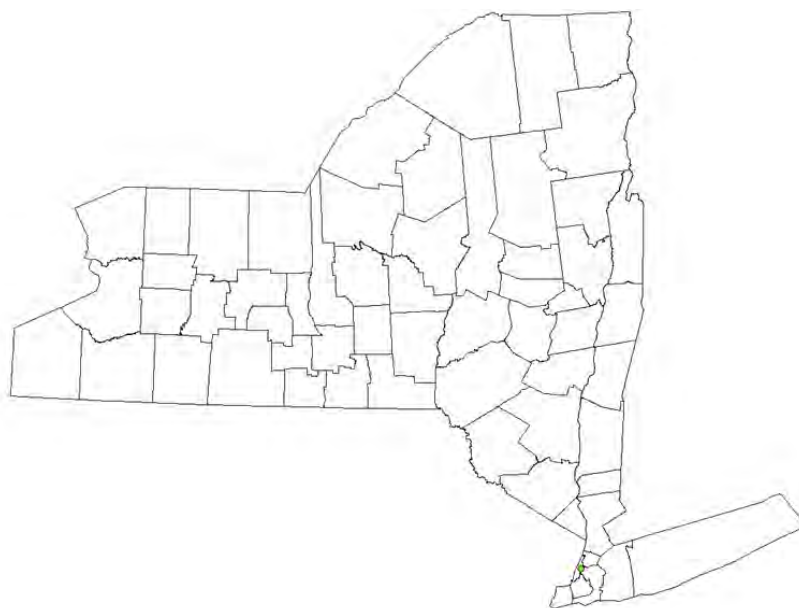


Figure 2. *Megachile exilis* observations in New York from 2000 to present depicted in green; no records from 1999 and earlier.

Years	# of Records	# of Counties	% of State
Pre-2000	0	0	0%
2000-2021	1	1	<2%

Table 1. Records of *Megachile exilis* in New York.

Details of historic and current occurrence:

Not previously known from New York, *M. exilis* was detected in less than 2% of the state. The Empire State Native Pollinator Survey effort (2017-2020), particularly partner data, detected *M. exilis* in New York County (White et al. 2022).

New York’s Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options

Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item

Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type (from NY crosswalk of NE Aquatic, Marine, or Terrestrial Habitat Classification Systems):

- a. Suburban/orchard, Urban/edificarian (NatureServe 2021)
- b. Open sandy habitat (Shapiro and Droege 2010)

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/Community Trend	Time frame of Decline/Increase
No	Choose an item.	Choose an item.	

Column options

Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item

Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

M. exilis is a cavity-nesting bee and will nest in pre-existing holes and tunnels created by wood-boring beetles or provided by pithy plants (Sharp and Eatman 2019). In New York, *M. exilis* was detected in a park in New York City (White et al. 2022). In general, *M. exilis* is considered a generalist. In parts of its range, it is associated with plants in the Fabaceae and Laminaceae families (Sharp and Eatman 2019). In Maryland it was found in open sandy habitat (Shapiro and Droege 2010).

V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Yes	No	No	Yes	Yes	Choose an item.

Column options

First 5 fields: Yes; No; Unknown; (blank) or Choose an item

Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion (*include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize*):

Bees in the Megachile genus are commonly referred to as leafcutter bees or resin bees. Megachilids are important pollinators and can utilize various nesting materials such as leaves and soil and will nest in logs, hollow stems, in the ground, and man-made boxes. Most species will form individual cells, with leaves that they cut, and provision them with pollen and nectar for their young (Killewald et al. 2019). Most females in this group have pollen-collecting hairs (scopae) on the underside of the abdomen. *M. exilis* is often associated with plants of the pea family. They are considered generalist pollinators and feed on a broad range of plants including asters, milkweeds, dogbane, heathers, calamint and salvias (Sharp and Eatman 2019).

Resin bees typically scrape and collect plant resin or sap from plants either instead of or in addition to leaf material to construct cells or seal nest entrances (Sharp and Eatman 2019). *M. exilis* is a solitary, cavity nesting bee. It is likely to utilize existing cavities in dead wood that were created by other insects, or pithy plant stems (Young et al. 2016, Sharp and Eatman 2019).

M. exilis is likely univoltine in northern parts of its range. It was documented on July 19th, 2019, in New York (White et al. 2022) and throughout the month of July in other parts of its range (Cockerell 1900). In Maryland, this species was seen in early October (Shapiro and Droege 2010). Solitary bees typically spend several weeks mating, building and provisioning nests, and laying eggs. Once the tunnel is full of provisioned cells, females will cap the end with a plug made up of plant resin, pebbles, mud, and masticated vegetation (Young et al. 2016).

VI. Threats (*from NY 2015 SWAP or newly described*):

Threats facing cavity nesting bees, like *M. exilis*, include habitat loss from conversion of shrublands to agriculture, fire, logging and wood harvesting, invasive plants and pathogens, pesticides, and climate change (White et al. 2022). Kammerer et al. (2020) found that warmer winters will result in fewer bees and solitary bees are more sensitive to drought conditions, which are predicted in the Northeast due to climate change. Specific threats to this species are unknown, however *M. exilis* may have reduced reproductive capacity and limited dispersal abilities which may impact overall health and survival (NatureServe 2021).

Threat Level 1	Threat Level 2	Threat Level 3	Scope	Severity	Irreversibility	Trend	Certainty
2. Agriculture & Aquaculture	2.1 Annual & Perennial Non-Timber Crops	(agricultural expansion/conversion of shrublands)	R	L	H	Choose an item.	Choose an item.
5. Biological Resource Use	5.3 Logging & Wood Harvesting	-	R	L	H	Choose an item.	Choose an item.
7. Natural System Modifications	7.1 Fire & Fire Suppression	7.1.1 Increase in the fire regime	R	L	H	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	8.1.2 Terrestrial plants	P	M	H	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.4 Pathogens	-	P	M	H	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides	R	L	H	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	(warmer winters result in fewer bees)	W	L	H	Choose an item.	Choose an item.
11. Climate Change	11.4 Changes in Precipitation & Hydrological Regimes	11.4.2 Droughts (solitary bees more sensitive to drought).	R	L	H	Choose an item.	Choose an item.

Table 2. Threats to *Megachile exilis*.

SCOPE: Spatial proportion of the distribution that is expected to be affected in the next 10 years (**narrow**= 1-10%; **restricted**=11-30%; **widespread**=31-70%; **pervasive**= 71-100%).

SEVERITY: The degree of population reduction in the next 10 years that can be reasonably expected from the threat given the current circumstances and trends (**low**=degrade/reduce population by 1-10%; **medium**=d/r population by 11-30%; **high**=d/r population by 30-70%; **very high**=d/r population by 71-100%).

IRREVERSIBILITY: The degree to which the effects can be reduced and the species restored (**low**=easily reversed, at a low cost, and/or within 0-5 years; **medium**=can be reversed with a reasonable commitment of resources and/or within 6-20 years; **high**=can technically be reversed, but not practicably affordable and/or it would take 21-100 years; **very high**=cannot be reversed and species not likely to be restore and/or it would take >100 years).

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _____ No: _____ Unknown:

If yes, describe mechanism and whether adequate to protect species/habitat:

Governor Kathy Hochul signed into law Legislation S.1856-A/A.7640, the Birds and Bees Protection Act. This law prohibits the use of certain neonicotinoid pesticide treated corn, soybean, or wheat seeds and neonicotinoid pesticides for outdoor ornamental plants and turfs. Reducing the amount of neonicotinoids used in the landscape in New York will likely benefit *M. exilis*.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Providing suitable nesting and foraging habitat are crucial for minimize threats facing *M. exilis*. Specific actions to conserve *M. exilis*, and other resin bees, include protecting nesting habitat (e.g., native plant materials), ensuring availability of leaves and petals, alternating management activities (e.g., fires and mowing) in nesting areas, providing abundant floral resources in the spring and early summer, avoiding pesticides, and avoiding the use of non-native pollinators in agriculture that could spread pathogens (Young et al. 2016). Establishing inventory and monitoring programs for native Megachile spp. will increase our understanding of current distributions and trends in population to inform conservation actions (Young et al. 2016).

Additional research clarifying taxonomic uncertainties is needed (NatureServe 2021).

Action Category	Action	Description
B.3 Outreach	B.3.1.4.0 Public outreach and information	Awareness & Communications

Action Category	Action	Description
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation planning	Resource/Habitat Protection
C.6 Design and Plan Conservation	C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands	Habitat/Natural process restoration
C.7 Legislative and Regulatory Framework or Tools	C.7.1.3.0 Create, amend, or influence regulation	
C.7 Legislative and Regulatory Framework or Tools	C.7.2.1.0 Create or amend policies	

Table 3. Recommended conservation actions for *Megachile exilis*

VII. References

- Bartomeus, I., J.S. Ascher, J. Gibbs, B.N. Danforth, D.L. Wagner, S.M. Hedtke, and R. Winfree. 2013. Historical changes in northeastern US bee pollinators related to shared ecological traits. PNAS. Available at: https://winfreelab.com/wp-content/uploads/2019/06/bartomeus2013_pnas.pdf
- Cockerell, T. D. A. 1900. The New Mexico Bees of the Genus *Megachile* and a New *Andrena*. Ca. Paper 296. https://digitalcommons.usu.edu/bee_lab_ca/296
- Kammerer, M., S.C. Goslee, M.R. Douglas, J.F. Tooker, and C.M. Grozinger. 2020. Wild bees as winners and losers: Relative impacts of landscape composition, quality, and climate. *Global Change Biology*. 27:1250-1265.
- Killewald, M.F., L.M. Rowe, K.K. Graham, T.J. Wood, and R. Isaacs. 2019. Use of nest and pollen resources by leafcutter bees, genus *Megachile* (Hymenoptera: Megachilidae) in Central Michigan. *The Great Lakes Entomologist*. Vol 52 (1). Available at: <https://scholar.valpo.edu/tgle/vol52/iss1/8>
- NatureServe. 2021. NatureServe Explorer: *Megachile exilis*. Authored by: S. Cannings. Available at: https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.882190/Megachile_exilis
- New York Natural Heritage Program. 2023a. Pollinator Record Compilation. Unpublished data. New York Natural Heritage Program, State University of New York College of Environmental Science and Forestry, Albany, New York.
- Shapiro, L. and S. Droege. 2010. Bees of the Cove Point liquefied natural gas site and vicinity, Calvert County, Maryland. Pp 1-25.
- White, Erin L., Matthew D. Schlesinger, and Timothy G. Howard. 2022. The Empire State Native Pollinator Survey (2017-2021). New York Natural Heritage Program. Albany, NY.
- Young, B. E., D. F. Schweitzer, G. A. Hammerson, N. A. Sears, M. F. Ormes, and A. O. Tomaino. 2016. Conservation and Management of North American Leafcutter Bees. NatureServe, Arlington, Virginia.

Version history

Originally prepared by: Katie Hietala-Henschell

Date prepared: 3/14/2025