

Species Status Assessment

Common Name: Yellow-banded bumble bee **Date Updated:** January 8, 2024

Scientific Name: *Bombus terricola* **Updated By:** Katie Hietala-Henschell

Class: Insecta

Family: Apidae

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

Bombus terricola (yellow-banded bumble bee) belongs to the subgenus (*Bombus*), which has been shown to be significantly more infected by the pathogen *Nosema bombi* than bumble bees of other subgenera (Cameron *et al.* 2011). Researchers believe this pathogen is largely responsible for the rapid (99-100%) decline of this species in most of the Northeast (Schweitzer and Sears 2013). There is evidence of sharp decline in the population both short-term and long-term (Colla and Packer 2008, Richardson 2013). In New York, abundance may have declined – over 2,700 historical (pre-2000) records compared to 361 recent observations – however, distribution across the state appears relatively stable but possibly shifting (New York Natural Heritage Program 2023a, White *et al.* 2022). They are distributed from Nova Scotia to Florida in eastern North America (Discover Life 2024), but many states and provinces have not yet assessed their conservation status (NatureServe 2023).

From White (2013): Bumble bees are generalist foragers and need nesting habitat in the spring, flowers for adult and larval nutrition throughout the spring and summer, and sites for queens to overwinter. Suitable habitat can occur in natural, agricultural, and urban areas and some species require forested habitat (Schweitzer *et al.* 2012). *B. terricola* is known to nest underground and feeds on willows, roses, honeysuckles, goldenrods, asters, *Vaccinium*, and *Rubus* (Colla *et al.* 2011).

I. Status

a. Current legal protected Status

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

ii. **New York:** Not listed

b. Natural Heritage Program

i. **Global:** G3G4

ii. **New York:** S3 **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Vulnerable (Hatfield *et al.* 2015)

-Northeast Regional SGCN: Yes (Northeast Fish and Wildlife Diversity 2023)

-New York 2025 SGCN status: Species of Greatest Conservation Need

Status Discussion:

While there is evidence from museum records that this species had a precipitous decline in New York (Richardson 2013, Yanega 2013), the species appears to have rebounded, as evidenced by a statewide survey 2017-2021. Various threats continue to face this species including habitat loss, insecticides, and urbanization (Schweitzer *et al.* 2012). Based on data from the Empire State Native Pollinator Survey, the current (2000 to 2021) and historical (1999 and earlier) distribution in

New York has remained relatively stable with 47 counties occupied historically and 45 counties currently extant (New York Natural Heritage Program 2023a).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Declining	1805-2001 vs 2002-2012	Not listed	
Northeastern US	Yes	Declining	Declining		RSGCN	Yes
New York	Yes	Declining	Stable	Pre-2000 vs 2000-2021	S3	Yes
Connecticut	Yes	Declining	Declining		S1	Yes
Massachusetts	Yes	Declining	Declining		S2	Yes
New Jersey	Yes	Unknown	Unknown		SNR	
Pennsylvania	Yes	Unknown	Unknown		SNR	
Vermont	Yes	Declining	Declining		S3	Yes
Ontario	Yes	Stable	Stable		S4	
Quebec	Yes	Unknown	Unknown		SNR	

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 (IUCN 2024, U.S. Fish and Wildlife Service 2024), Northeastern US (Northeast Fish and Wildlife Diversity 2023), State/Province Ranks (NatureServe 2023, NY SWAP 2015)

*Bumble bee species that have been ranked as Critically Imperiled (S1), Imperiled (S2), or Vulnerable (S3) by individual states have been interpreted as declining in abundance and distribution for this Species Status Assessment, unless additional data is available suggesting otherwise. Bumble bees are generalists and were typically widespread within their ranges and many species have experienced declines within their range. Most bumble bee species are not restricted to a specific rare habitat type or host, although some cuckoo bumble bees are reliant on an individual host species.

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. Bumble bees were included in the focal taxa targeted by this survey. The statewide effort resulted in up-to-date data on the occurrence of bumble bees across the state (White *et al.* 2022). However, no organized, regular monitoring or survey activities are directed toward this species.

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

In the East, *B. terricola* is present from Nova Scotia to Florida (Discover Life 2024). From the NYNHP *B. terricola* Conservation Guide (New York Natural Heritage Program 2023b): Short-term trends for the species are unknown. Based on data from the Empire State Native Pollinator Survey, the current (2000 to present) and historical (1999 and earlier) distribution in New York has remained relatively stable. While there has been a contraction from the lower latitudes of southern New York and Long Island, there has been expansion into other counties of New York not previously occupied (White *et al.* 2022).

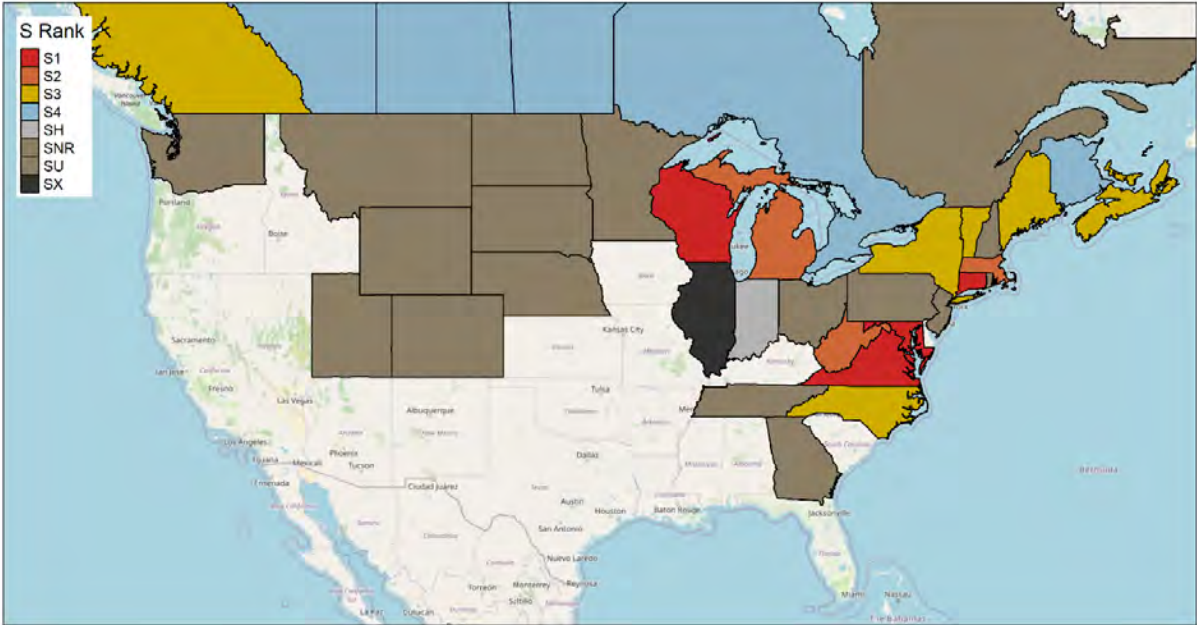


Figure 1. *Bombus terricola* distribution and status (Source: NatureServe 2023)

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

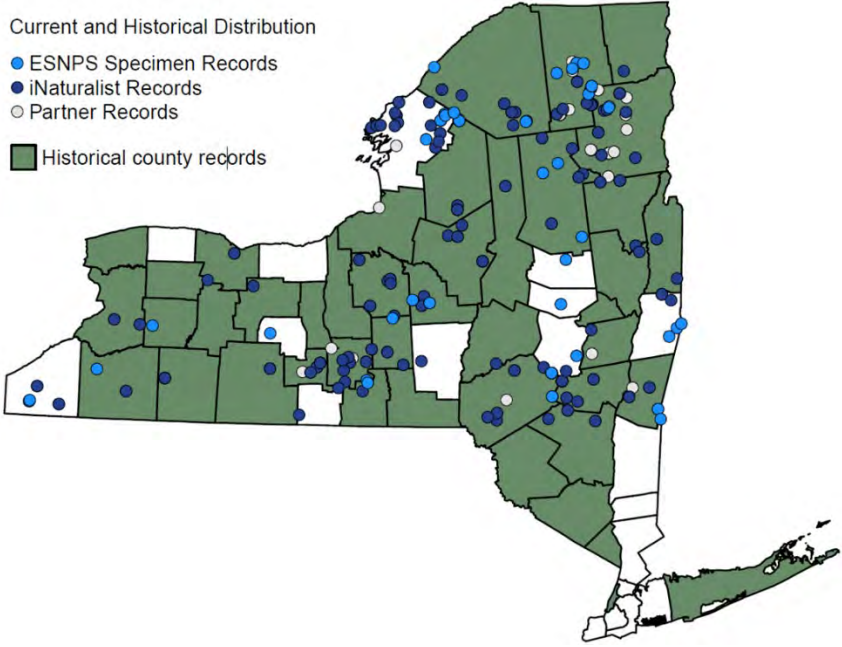


Figure 2. Records of *Bombus terricola* in New York. Observations from 2000 to present depicted as dots; those from 1999 and earlier as shaded counties (Source: White *et al.* 2022).

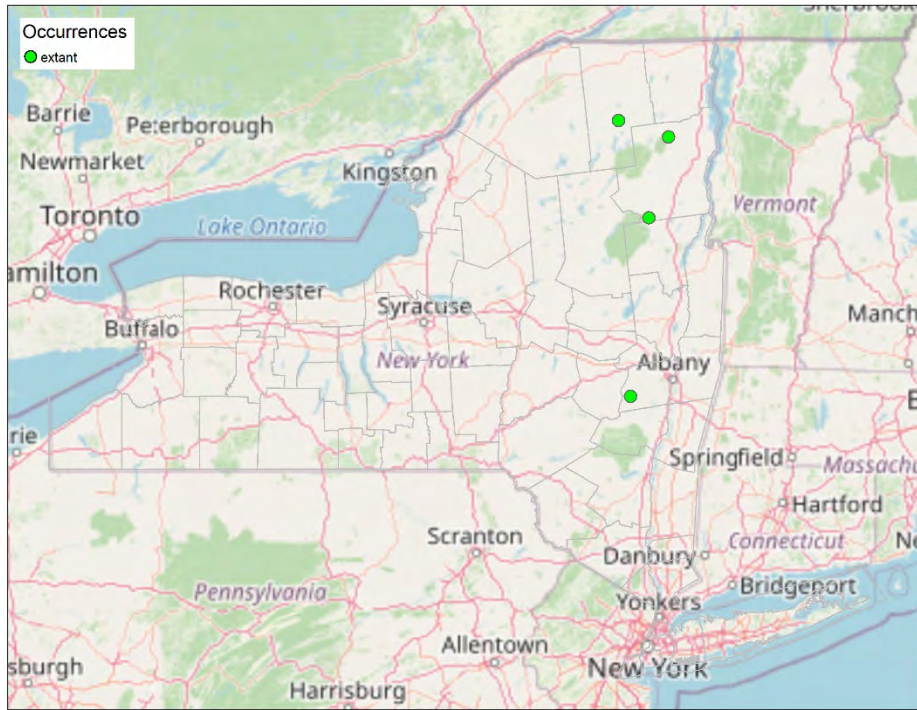


Figure 3. NYNHP element occurrence records for *Bombus terricola* in NY (Source: New York Natural Heritage Program 2023c).

Years	# of Records	# of Counties	% of State
Pre-2000	2718	47	76%
2000-2021	361	45	73%

Table 1. Records of *Bombus terricola* in New York.

Details of historic and current occurrence:

Bombus terricola has been confirmed in locations throughout most of the state of NY (year 2000 to present). It does appear to be absent from southern NY and Long Island in recent years, though historically (1999 and earlier) present there (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	Unknown

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):

Various terrestrial communities (both natural and otherwise) including but not limited to meadows, fields, grasslands, pasturelands, gardens, and orchards that can support a diversity of wildflowers with variable phenology throughout the warm seasons (White 2013).

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Pollinator Species?	Habitat/Community Trend	Time frame of Decline/Increase
No	No	Yes	Unknown	

Column options

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

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

Habitat Discussion:

Bumble bees are generalist foragers and need nesting habitat in the spring, flowers for adult and larval nutrition throughout the spring and summer, and sites for queens to overwinter. Bumble bees that are underground nesters such as this species often use abandoned rodent nests in south facing exposures. Foraging habitat should include flower abundance and species richness with overlapping blooms to ensure nectar availability throughout the growing season (Schweitzer *et al.* 2012). Suitable sites for bumble bees to overwinter may include rotting logs, mulch, or loose soil (Schweitzer *et al.* 2012). *Bombus terricola* is a short-tongued species and food plants include *Crocus*, *Eupatorium*, *Linaria*, *Melilotus*, *Monarda*, *Ribes*, *Rosa*, *Rubus*, *Spiraea*, *Taraxacum*, *Vaccinium*, and *Vicia*. It is a frequent nectar robber of long-corolla flowers (Williams *et al.* 2014).

V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/Catadromous?
Yes	-	-	Yes	Yes	-

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):

Bumble bees have annual colonies and are eusocial. In the spring, a queen will emerge from hibernation. She will forage on early floral resources and locate a suitable nest site. She will then lay her first clutch of eggs, from which worker bees will emerge a few weeks later. Workers typically live for about four weeks whereas queens live for about a year. Workers then take over the tasks of maintaining the colony and foraging for nectar and pollen to feed new generations. During mid to late summer, the queen will start laying eggs that will become new queens and

males. In the late summer and early fall, the new queens and males will disperse from the colony, mate, and only the new queens will overwinter and begin their own nest the following spring (Schweitzer *et al.* 2012). It nests underground; males patrol circuits in search of mates. It is a known host to the cuckoo bumble bee *B. bohemicus*, and a probable host to *B. suckleyi* and *B. insularis* (Williams *et al.* 2014).

The foraging range of a bumble bee varies by species, size of individual and colony, resource availability, and other factors. Studies have found that the flight range typically falls between 0.15 and 0.62 miles; however, some species have been documented to forage as far as 1.86 miles (Jarau and Hrnir 2009).

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

The primary threat to species in the subgenus *Bombus* leading to their global rapid, recent decline in the 1990s has been attributed to exotic pathogens. Cameron *et al.* (2011) showed a higher proportion of *B. terricola* individuals infected by the pathogen *Nosema bombi* than other bumble bees with stable global populations. While there is evidence from museum records that this species had a precipitous decline in New York (Richardson 2013), the species appears to have rebounded, as evidenced by a statewide survey 2017-2021. Various other threats continue to face this species including habitat loss, insecticides, and urbanization (Schweitzer *et al.* 2012).

Recent studies have started to identify the impacts of climate change. Increased temperatures had negative impacts on the majority of bumble bee species studied (Jackson *et al.* 2022). Climate change is also leading to shrinking and shifting of bumble bee ranges (Kerr *et al.* 2015) and can cause phenological mismatch between bumble bees and their floral resources (Pyke *et al.* 2015).

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
1. Residential and Commercial	1.1 Housing & Urban Areas	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
4. Transportation & Service Corridors	4.1 Roads & Railroads	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.4 Pathogens	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	9.3.3 Herbicides & pesticides	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Table 2. Threats to *Bombus terricola*.

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 *B. terricola*.

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

Any efforts to protect wild bumble bee populations from pathogen exposure would benefit *B. terricola*. Suggested actions would include using mesh to prevent escape of bees from commercial breeding greenhouses, proper disposal of commercial bees, sanitation in greenhouses, and development of molecular screening. Tight restrictions on importing bumble bees and elimination of parasites from commercial populations has been suggested as ideal (Meeus *et al.* 2011, Schweitzer *et al.* 2012).

Limiting exposure of *B. terricola* to insecticides would also benefit them. Suggested actions include avoidance of application to flowers that bumble bees are attracted to and application of solutions or soluble powders (rather than dusts or wettable powders) to the ground in calm wind and warmer temperatures during periods of dewless nights to minimize the impact to resident bumble bee populations (Schweitzer *et al.* 2012). Organic farming has also been suggested to benefit bumble bees.

Ensuring habitat resources for foraging, nesting, and overwintering will also benefit this species. These habitats should be within close proximity to each other and without road or railroads between them, which have been suggested as potential barriers to dispersal. Suggested actions for habitat management should include ensuring nectar availability throughout the spring and summer by improving flower abundance and species richness and species with overlapping blooms. Select food plants for *B. terricola* include willows, roses, honeysuckles, goldenrods, asters, *Vaccinium*, and *Rubus* (Colla *et al.* 2011). If mowing of fields occurs, summer is the best time and mower blades should be raised to avoid ground nests. Staggering cutting times in different field areas will ensure nectaring sources are always available. Increasing available nesting habitat may be accomplished by reducing tillage in fields, leaving unplowed strips vegetated, or even providing artificial nesting boxes. Managing for rodents and ground-nesting birds should also benefit bumble bees (Schweitzer *et al.* 2012).

Further research is needed to determine more information on habitat requirements, threats, climate change effects, and insecticide effects for *B. terricola*.

Action Category	Action	Description
B.3 Outreach	B.3.1.4.0 Public outreach and information	Awareness and communications
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation Planning	Resource and 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 *Bombus terricola*.

VII. References

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VIII. Version history

Originally prepared by: Erin White

Date prepared: 10/29/2013

First revision: Samantha Hoff

Revision date: 2/19/2014

Last updated: Katie Hietala-Henschell

Updated Date: 1/8/2024