Species Status Assessment

Common Name: Lemon Cuckoo Bumble Bee **Date Updated:** 2/13/2025

Scientific Name: *Bombus citrinus* **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 citrinus (Lemon cuckoo bumble bee) belongs to the subgenus *Psithyrus*, and is an obligatory social parasite of *B. impatiens, B. bimaculatus, and B. vagans (*Williams *et al.* 2014*).* Threats to *B. citrinus*, and their hosts, include habitat loss, pesticides, and urbanization (Schweitzer *et al.* 2012) as well as pollution, invasive species, and roads (barriers to dispersal and habitat fragmentation). The threat impact for these factors was estimated to be high (White et al. 2022).

Bombus citrinus was considered S5 prior to the ESNPS but was updated to S2S3 after not being detected in areas where they were historically found (White *et al.* 2022). *B. citrinus* was historically present in 36 counties (1999 and earlier) and was recently detected in 26 counties (post-2000) in the state of New York. This data suggests a range reduction in New York; however, there was an increase in individual records which may indicate that existing populations may be stable and reflect the increased survey effort (New York Natural Heritage Program 2023a).

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). While it does not collect pollen, since host workers provision the nest, it has been observed visiting aster, *Cirsium, Eupatorium, Liatris, Pycnanthemum, Solidago,* and *Vernonia (*Williams *et al.* 2014*).*

I. Status

a. Current legal protected Status

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

ii. **New York:** Not listed (NY SWAP 2015)

b. Natural Heritage Program

i. **Global:** G4

ii. **New York:** S2 **Tracked by NYNHP?:** Yes

Other Ranks:

-IUCN Red List: Least Concern (Hatfield *et al.* 2015)
-Northeast Regional SGCN: Watchlist [Assessment Priority] (Northeast Fish and Wildlife Diversity 2025)
-New York 2025 SGCN status: Species of Greatest Conservation Need

Status Discussion:

The species was Secure (S5) until recent ESNPS survey efforts and conservation status re-ranking assessed this species as Imperiled (S2). The number of individual records increased;

however, the number of extant counties decreased from 36 to 26 (New York Natural Heritage Program 2023a). This species is considered rare, has a declining long-term trend, and threats to this species are high (White *et al.* 2022).

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Stable	Stable	1805-2001 vs 2002-2012	Not listed	
Northeastern US	Yes	Unknown	Unknown		Watchlist [Assessment Priority]	
New York	Yes	Unknown	Declining	Pre-2000 vs 2000-2022	S2S3	No
Connecticut	Yes	Declining	Declining		S2	No
Massachusetts	Yes	Unknown	Unknown		SU	
New Jersey	Yes	Unknown	Unknown		SNR	
Pennsylvania	Yes	Unknown	Unknown		SNR	Yes
Vermont	Yes	Declining	Declining		S2	Yes
Ontario	Yes	Declining	Declining		S3	Yes
Quebec	Yes	Stable	Unknown		SNR	

References used in table: North America (IUCN 2024, U.S. Fish and Wildlife Service 2024), Northeastern US (Northeast Fish and Wildlife Diversity 2025), State/Province Ranks (NatureServe 2025, 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 information on the occurrence of bumble bees 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):*

B. citrinus can be found in the northeastern U.S., the Midwest, and into southern Canada. A nationwide survey found that *B. citrinus* made up just 0.12% of bumble bees collected (Strange and Tripodi 2018). While it was assessed as having a stable population trend across its range (Hatfield et al. 2015); it appears to be declining in parts of its range (Dominey 2021, White et al. 2022). In Vermont, *B. citrinus* experienced a 65% decline in relative abundance (Richardson et al. 2018) and appears to be historic in Rhode Island were it was previously known (Northeast Fish and Wildlife Diversity 2025). A study assessing the population trend for northeastern bumble bees found that *B. citrinus* had insufficient records to assess relative abundance over time (Jacobson et al. 2018).

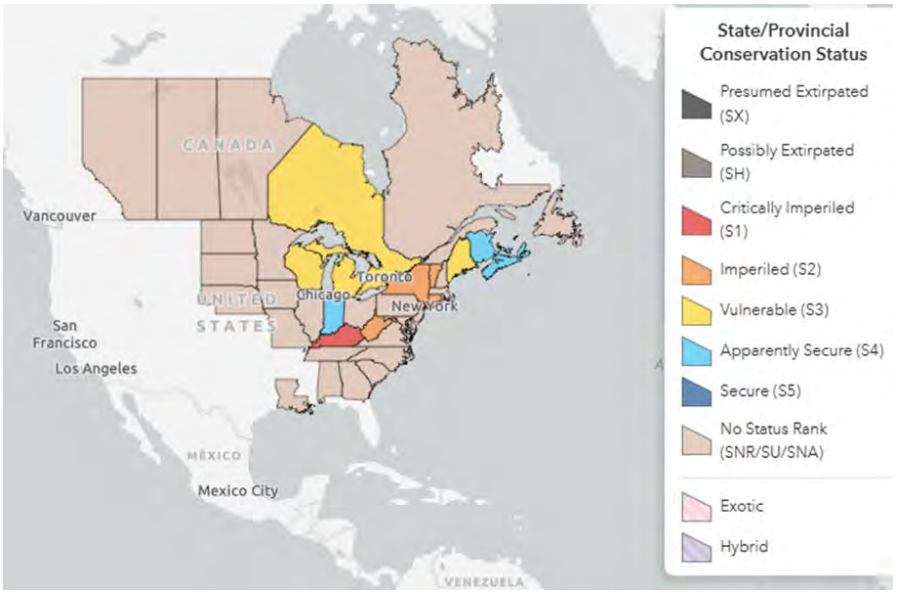

Figure 1. *Bombus citrinus* distribution and status
(Source: NatureServe 2025)

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

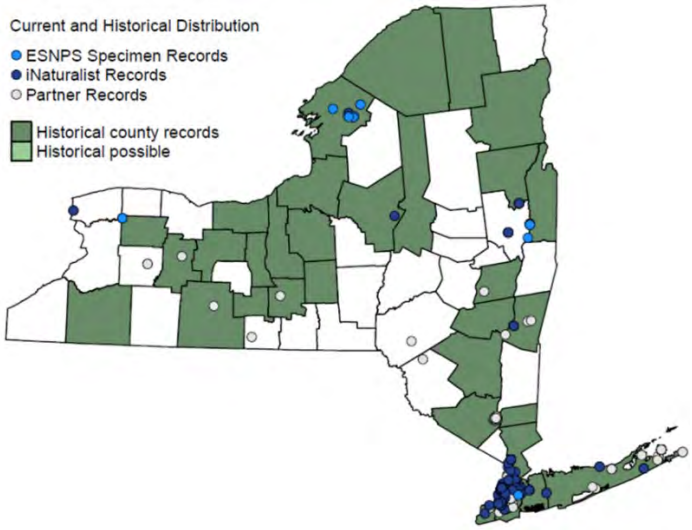

Figure 2. Records of *Bombus citrinus* in New York. Observations from 2000 to present depicted as dots; those from 1999 and earlier as shaded counties (Source: White *et al.* 2022).

Years	# of Records	# of Counties	% of State
Pre-2000	483	36	58%
2000-2021	1096	26	42%

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

Details of historic and current occurrence:

Bombus citrinus appears to have experienced a reduction its in range in New York. It was historically known from nearly 60% of the state across 36 counties. Recent survey efforts detected this species in 26 counties, just over 40% of the state (White *et al.* 2022, New York Natural Heritage 2023a). The increase in individual records is likely due to the increased survey effort and potentially stable population trends in persisting parts of its range.

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

The northeast is responsible for 25-50% of the range for *B. citrinus* (Northeast Fish and Wildlife Diversity 2025).

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

Various terrestrial communities including but not limited to meadows, fields, grasslands, pasturelands, gardens, and orchards that can support a diversity of wildflowers.

Habitat or Community Type Trend in New York

Declining: **Stable:** **Increasing:** **Unknown:** x

Time frame of decline/increase:

Habitat Specialist	**Yes:**	**No:** x
Indicator Species	**Yes:**	**No:** x
Pollinator	**Yes:** x	**No:**

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. Suitable habitat can occur in natural, agricultural, and urban areas and some species require forested habitat (Schweitzer *et al.* 2012).

Bombus citrinus is an obligatory social parasite in the subgenus *Psithyrus (*Williams *et al.* 2014*).* There are no workers, and the queens and males of this species do not collect pollen. However, they visit flowers for nectar and example food plants include aster, *Cirsium, Eupatorium, Liatris, Pycnanthemum, Solidago,* and *Vernonia* (Williams et al. 2014).

Managing for early successional habitats will likely benefit *B. citrinus*, and other *Bombus*. In Vermont, *B. citrinus* was strongly associated with grasslands and roads and negatively correlated with development and forest habitat (Richardson et al. 2018).

V. Species Demographic, and Life History:

Breeder in New York: x

Summer Resident: x

Winter Resident: x

Anadromous:_____

Non-Breeder in New York:_____

Summer Resident:_____

Winter Resident:_____

Catadromous:_____

Migratory Only:_____

Unknown:_____

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):*

Bombus citrinus is a cuckoo bumble bee, a specialized lineage of bumble bees (subgenus *Psithyrus*), that has lost the ability to collect pollen and to rear their brood. These bees enter the nests of other bumble bee species, will kill or subdue the queen of that colony, and forces (through aggression and pheromones) the workers to rear the offspring of the usurper. All of the resulting cuckoo bee offspring are reproductive and leave the colony to mate *B. citrinus* hosts include *B. impatiens, B. bimaculatus, and B. vagans* (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 fall between 0.15 to 0.62 miles; however, some species have been documented to forage as far as 1.86 miles (Jarau and Hrncir 2009).

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

This species is a social parasite of *B. impatiens, B. bimaculatus, and B. vagans* (Williams *et al.* 2014) all which belong to subgenera Pyrobombus. The host species are relatively stable in New York. Specific threats to *B. citrinus* include climate change, pollution, invasive species and pathogens, development, and agriculture (Northeast Fish and Wildlife Diversity 2025). The threat impact was estimated to be high to medium (New York Natural Heritage Program 2023b).

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	(habitat loss).	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	(introduced pathogens from manages bee populations in greenhouses)	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 citrinus*

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

Yes: x **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. citrinus.*

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

In states or provinces where the species still occurs, management of agricultural, urban, or natural areas should include attention to general habitat needs during various life stages, including adequate nest and overwintering sites as well as food sources from March-October in relatively close proximity without barriers to dispersal (Schweitzer *et al.* 2012). It is recommended to avoid application of insecticides on flowers used by bumble bees, and when chemicals must be used, to limit dosage and modify the application timing and method to affect them as little as possible. Minimizing contact between wild bumble bee populations and commercial bees can help protect the wild bees (Schweitzer *et al.* 2012).

Further inventory is needed within its native range to document any extant occurrences, if present, and define the current distribution of *B. citrinus*. In addition, research is required to understand the habitat requirements and threats to this species, and to create appropriate management guidelines for its persistence in known locations. Further research is needed on climate change effects and the effects of pesticides on bumble bees.

Action Category	Action	Description
B.3 Outreach	B.3.1.4.0 Public outreach and information	Awareness & Communications
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 2. Recommended conservation actions for *Bombus citrinus*.

VII. References

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VIII. Version history

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