

Species Status Assessment

Common Name: Black-and-gold bumble bee **Date Updated:** January 12, 2024

Scientific Name: *Bombus auricomus* **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 auricomus (black-and-gold bumble bee) belongs to the subgenus (Bombias), which are not experiencing higher susceptibility to the *Nosema bombi* pathogen like *Bombus* and *Thoracobomus* are, but may be experiencing other threats of habitat loss, pesticides, and urbanization (Schweitzer *et al.* 2012) as well as pollution and invasive species.

This species is only known from 18 counties in New York and appears to never have been common. New York is on the northern and eastern range margins for this species (Richardson 2013, Yanega 2013). They are distributed in many states and provinces across the United States and Canada, but many of these 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). *Bombus auricomus* is known to nest underground and feeds on clovers, bee balms, *Solanum*, *Hypericum*, and *Eupatorium* (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:** G5

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

Other Ranks:

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

-Northeast Regional SGCN: Not listed (Northeast Fish and Wildlife Diversity 2023)

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

Status Discussion:

Bombus auricomus appears to never have been common in New York. This species has been documented in 18 counties in New York State. There are an additional seven counties with historical records (1999 and earlier) (White *et al.* 2022). Threats include habitat loss, pesticides, and urbanization, pollution, and invasive species. This subgenus (Bombias) does not appear to be experiencing high susceptibility to the protozoan *N. bombi*, a pathogen attributed to playing a large role in the decline of *Bombus* and *Thoracobombus* subgenera.

II. Abundance and Distribution Trends

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Declining	Stable	1805-2001 vs 2002-2012	Not listed	
Northeastern US	Yes	Unknown	Unknown		Not listed	
New York	Yes	Stable	Stable	Pre-2000 vs 2000-2022	S2	Yes
Connecticut	Yes	Declining	Declining		S1	Yes
Massachusetts	No	-	-			
New Jersey	Yes	Unknown	Unknown		SNR	
Pennsylvania	Possibly extirpated	Declining	Declining		SH	Yes
Vermont	No	-	-			
Ontario	Yes	Stable	Stable		S4	No
Quebec	No	-	-			

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*):

Bombus auricomus appears to be a widespread species, occurring throughout eastern North America and as far west as the eastern Great Plains (NatureServe 2023). New York is on the northern and eastern range margins for this species (Richardson 2013, Yanega 2013).

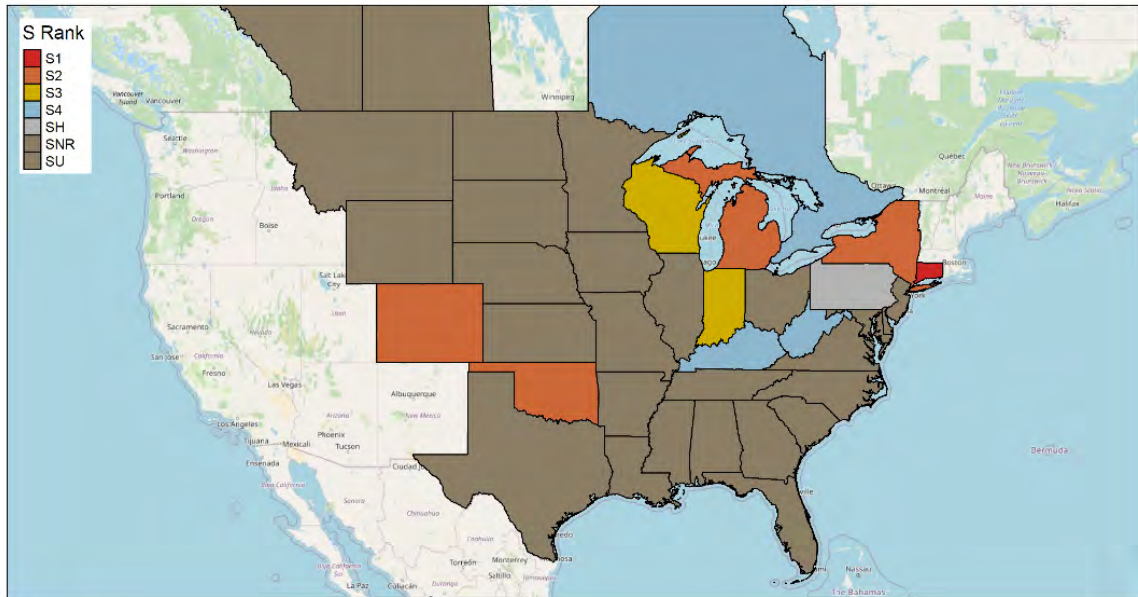


Figure 1. *Bombus auricomus* distribution and status (Source: NatureServe 2023)

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

From the NYNHP *B. auricomus* Conservation Guide (New York Natural Heritage Program 2023b): The short-term trends for this 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 appear to be seven counties no longer occupied that were historically, there are also several new county records in recent years (White *et al.* 2022). *Bombus auricomus* has been documented in 18 counties in New York State.

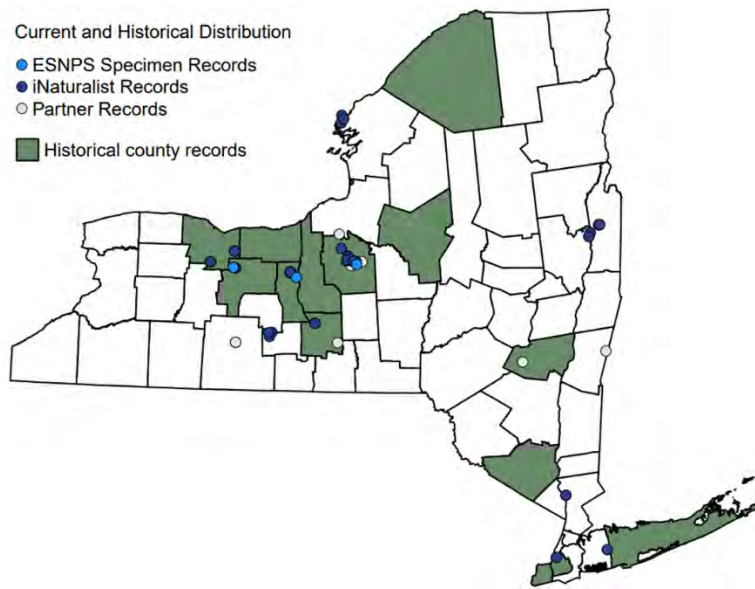


Figure 2. Records of *Bombus auricomus* in New York. Observations from 2000 to present depicted as dots; those from 1999 and earlier as shaded counties (Source: White *et al.* 2022).

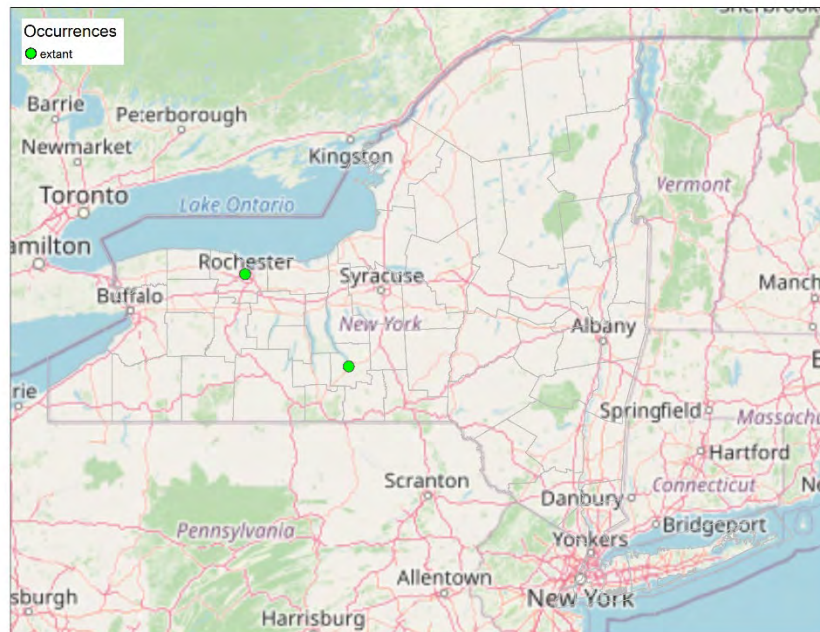


Figure 3. NYNHP element occurrence records for *Bombus auricomus* in New York (Source: New York Natural Heritage Program 2023c).

Years	# of Records	# of Counties	% of State
Pre-2000	61	14	23
2000-2021	97	18	29

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

Details of historic and current occurrence:

Bombus auricomus was only known from 14 counties prior to 2000. With increased survey efforts it has been documented in 18 counties in New York State. There are an additional seven counties with historical records (1999 and earlier) (White *et al.* 2022). The increase in the number of counties is likely a result of increased survey effort and does not likely reflect a range expansion.

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. This bumble bee nests underground (Colla *et al.* 2011). Such species often use abandoned rodent nests underground 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). Select food plants for *B. auricomus* include clovers, bee balms, *Solanum*, *Hypericum*, and *Eupatorium* (Colla *et al.* 2011). Suitable sites for bumble bees to overwinter may include rotting logs, mulch, or loose soil (Schweitzer *et al.* 2012). *Bombus auricomus* nests are small and above-ground, in open grassland and old field habitats (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 batch 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). The nests of *B. auricomus* are small and on the ground surface (Williams *et al.* 2011).

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 Hrnčir 2009).

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

A score of high to medium threat impact was calculated in NatureServe ranking calculator for this subgenus, which are not experiencing higher susceptibility to the *N. bombi* pathogen like *Bombus* and *Thoracobomus* are, but may be experiencing other threats of habitat loss and fragmentation, pesticides, and urbanization (Schweitzer *et al.* 2012) as well as pollution and invasive species. The score was estimated based on Schweitzer and Sears bumble bee ranking guidelines of May 1, 2013.

Additional research is needed to determine the impact of climate change and the introduction of non-native hymenoptera (Colla and Taylor-Pindar 2011, 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 auricomus*.

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. auricomus*.

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. auricomus*. 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).

Minimal to no exposure of *B. auricomus* 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.

Further research is needed to document extant occurrences in New York, and to define the current distribution of *B. auricomus*. 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 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

Action Category	Action	Description
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 auricomus*.

VII. References

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VIII. Version history

Originally prepared by: Erin White

Date prepared: 2/7/2013

Last updated: Katie Hietala-Henschell

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