# Species Status Assessment

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|---|---|---|---|
| **Common Name:** | Patellar Oil-collecting Bee | **Date Updated:** | 2024-09-25 |
| **Scientific Name:** | *Macropis patellata* | **Updated By:** | Erin L. White |
| **Class:** | Insecta | | |
| **Family:** | Melittidae | | |

## Species Synopsis

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

*Macropis patellata* ranges from Vermont south to North Carolina as well as Minnesota and Nebraska in the U.S. (NatureServe 2024, Discover Life 2024).

The species was ranked an S1 as part of the ESNPS (White et al. 2022) based on rarity, trend, and threat information. It has been documented since 2000 in three counties in NY, while previously known from 7 counties historically and while always a rare specialist, it has likely recently declined in the state.

*Macropis* bees specialize on gathering oils from native loosestrife *(Lysimachia*) to line their nests and feed their offspring and nest in wetland habitats near these plants (Wilson and Carril 2016). Select food plants for *Macropis patellata* include *Lysimachia* L. (Fowler and Droege 2020).

## I. Status

### a. Current legal protected Status

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

**ii. New York:** Unprotected

### b. Natural Heritage Program

**i. Global:** GNR

**ii. New York:** S1 **Tracked by NYNHP?** On Active Tracking List

### Other Ranks:

-New York 2025 SGCN status: Species of Greatest Conservation Need
-COSEWIC: Not listed in Canada
-IUCN Red List: Not assessed by IUCN Red List
-Northeast Regional SGCN: RSGCN

### Status Discussion:

The species was ranked an S1 as part of the ESNPS (White et al. 2022) based on rarity, trend, and threat information. It has been documented since 2000 in three counties in NY, while previously known from 7 counties historically and while always a rare specialist, it has likely recently declined in the state.

## II. Abundance and Distribution Trends

| Region | Present? | Abundance | Distribution | Time Frame | Listing status or S-Rank | SGCN? |
|---|---|---|---|---|---|---|
| **North America** | Yes | Unknown | Unknown | Unknown | | |
| **Northeastern US** | Yes | Unknown | Unknown | Unknown | | RSGCN |
| **New York** | Yes | Unknown | Declining | Unknown | U, S1 | No |
| **Connecticut** | Historic | Unknown | Unknown | Unknown | SH | No |
| **Massachusetts** | Historic | Unknown | Unknown | Unknown | SH | Yes |
| **New Jersey** | No | - | - | - | | No |
| **Pennsylvania** | Historic | Unknown | Unknown | Unknown | SNR | No |
| **Vermont** | Yes | Unknown | Unknown | Unknown | S1 | No |
| **Ontario** | 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

### Monitoring in New York

*(specify any monitoring activities or regular surveys that are conducted in New York):*
The Empire State Native Pollinator Survey (ESNPS) was conducted from 2017-2021 and *Macropis* surveys conducted by a Cornell student Mark Buckner, but there are no organized, regular monitoring or survey activities directed toward this species or to sites where they have been documented. Some regular monitoring may occur at protected sites that Heritage staff revisit if they occur on state properties, as part of OPRHP or State Lands inventory work.

### Trends Discussion

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

The species is historically (1999 and earlier) known from seven counties in NY. It has been confirmed in three counties since 2000, suggesting a decline of at least 40% of it's former NY range.

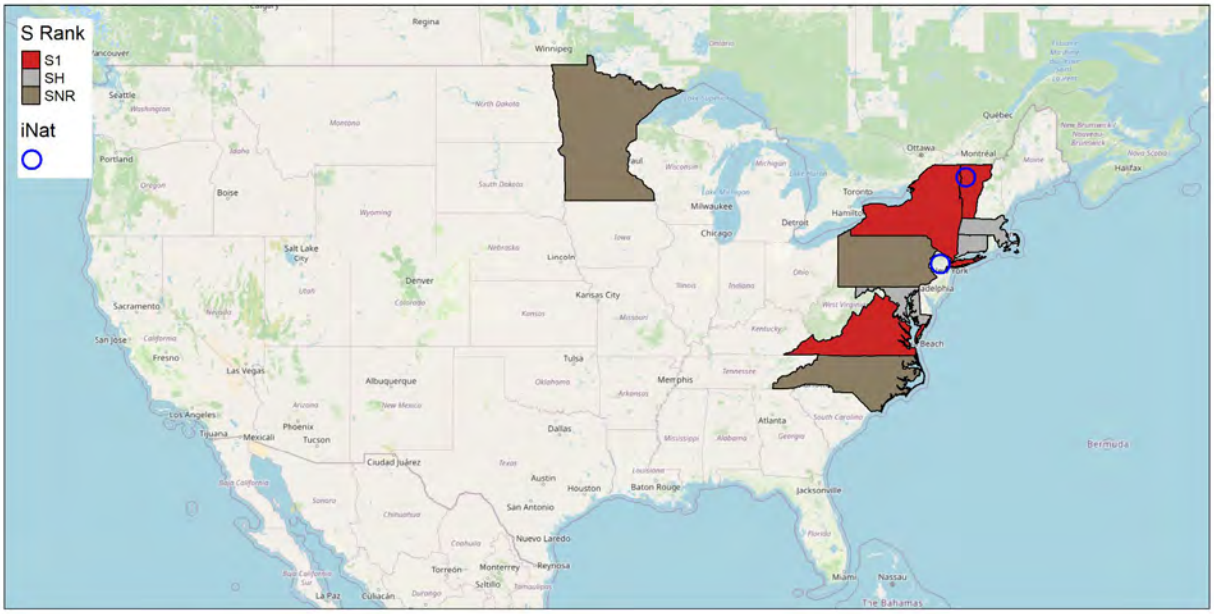


**Figure 1 1:** *Macropis patellata* North American distribution. Points show research-grade iNaturalist observations.

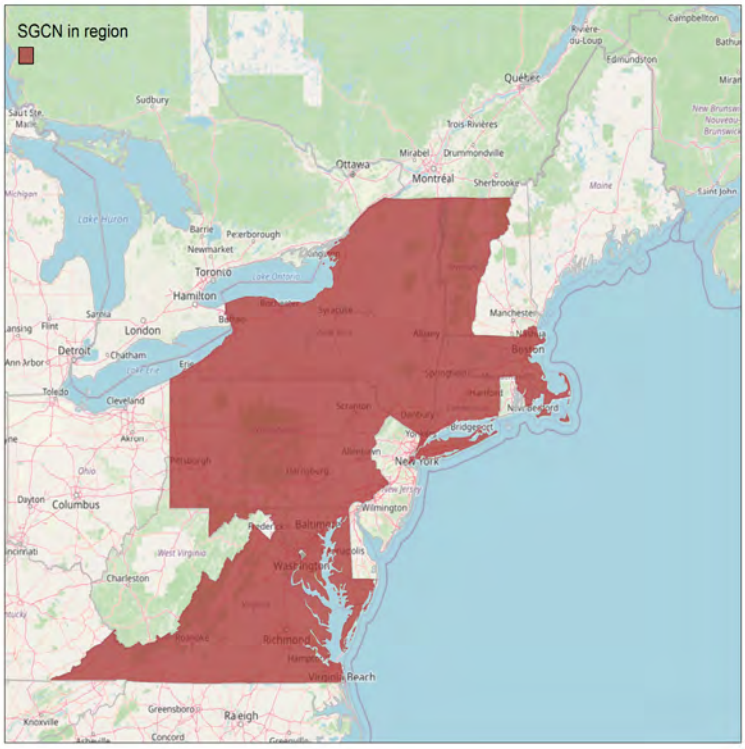


**Figure 2 2:** *Macropis patellata* regional distribution as reported at https://northeastwildlifediversity.org/rsgcn .

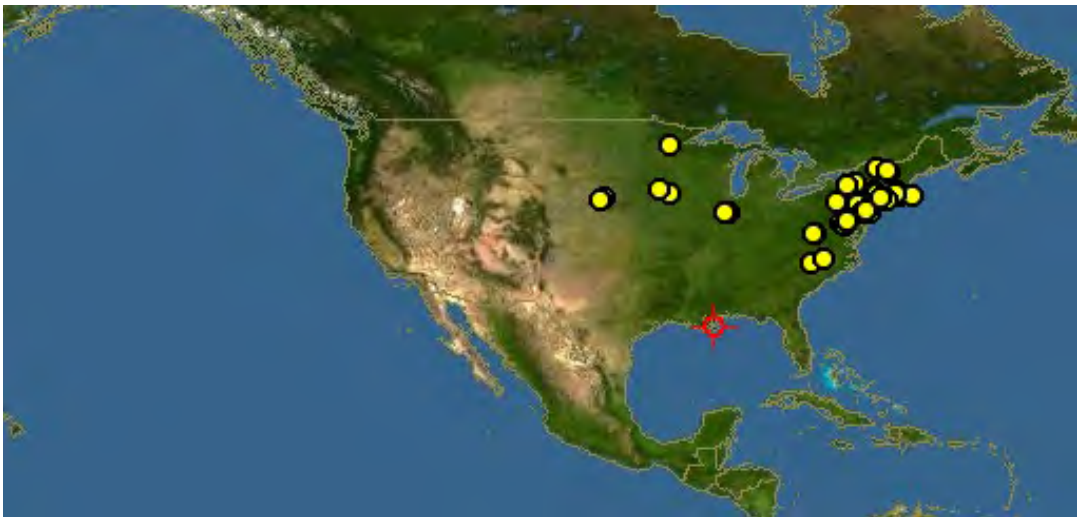

**Figure 3:** *Macropis patellata* distribution (DiscoverLife 2024).

## III. New York Rarity

*(provide map, numbers, and percent of state occupied)*

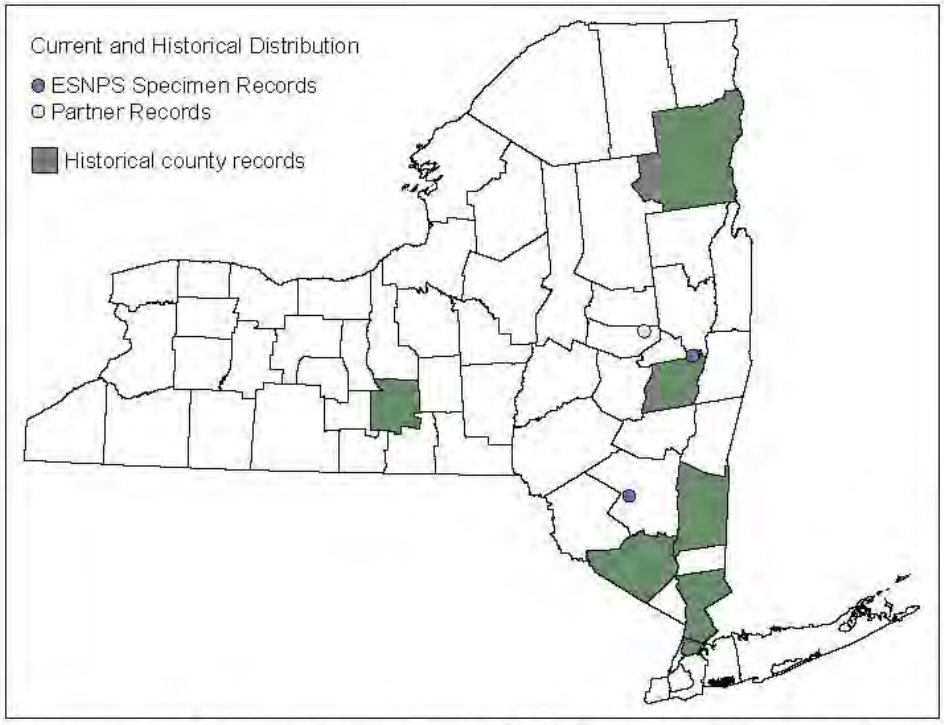


Figure 1: Observations from 2000 to present depicted as dots; those from 1999 and earlier as shaded counties.

**Figure 43:** NYS distribution for *Macropis patellata* based on ESNPS data.

| Years | Observations | # of Counties | % of counties in State |
|---|---|---|---|
| **Pre-2000** | 34 | 7 | 11.3 |
| **2000-2023** | 4 | 3 | 4.8 |

Table 1. Number of observations of *Macropis patellata* grouped by the dates known to be extant (repeat observations (element occurrences) include the years spanning first observation to last observation) and the number and percent of total of counties these observations fall within for New York State.

### Details of historic and current occurrence:

There are ESNPS records from Montgomery, Ulster, and Saratoga counties in recent years (Buckner 2022, White et al. 2022).

Historically, 1999 and earlier, the species is known from seven counties including Albany, Bronx, Dutchess, Essex, Orange, Westchester and Tompkins Counties.

| Percent of North American Range in NY | Classification of NY Range | Distance to core population, if not in NY |
|---|---|---|
| 1-25% | Peripheral | ~600 mi |

*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):*

Known occurrences are from (below), but could be expected at a variety of wetland habitats with native *Lysimachia*:

Open Acidic Peatland

Mixed Hardwood Swamp

### Habitat or Community Type Trend in New York

| Habitat Specialist? | Indicator Species? | Habitat/ Community Trend | Time frame of Decline/ Increase |
|---|---|---|---|
| Yes | Unknown | Unknown | Unknown |

*Column options*
**Habitat Specialist and Indicator Species:** Yes; No; Unkown; (blank) or Choose an item
**Habitat/Community Trend:** Declining; Stable; Increasing: Unkown; (blank) or Choose an item

### Habitat Discussion:

*Macropis* bees specialize on gathering oils from native loosestrife *(Lysimachia*) to line their nests and feed their offspring and nest in wetland habitats near these plants (Wilson and Carril 2016). Select food plants for *Macropis patellata* include *Lysimachia* L. (Fowler and Droege 2020).

## V. Species Demographics and Life History

| Breeder in NY? | Non-breeder in NY? | Migratory Only? | Summer Resident? | Winter Resident? | Anadromous/ Catadromous? |
|---|---|---|---|---|---|
| Yes | Yes | No | Yes | Yes | No |

*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):*

Recent observations in NY have occurred in July (White et al. 2022), but it has been documented from June to August throughout its range (Discover Life 2024).

## VI. Threats

Threats facing *Macropis patellata* and other ground-nesting bees include habitat loss and degradation, 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 as a result of climate change.

| 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. |
| 3. Energy Production & Mining | 3.2 Mining & Quarrying | - | 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 | 8.1 Invasive Non-Native Plants & Animals | 8.1.2 Terrestrial plants | 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 | 11.3 Changes in Temperature Regimes | 11.3.3 Gradual temperature change (warmer winters result in fewer bees) | Choose an item. | Choose an item. | Choose an item. | 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) | Choose an item. | Choose an item. | Choose an item. | Choose an item. | Choose an item. |

**Table 2.** Threats to *Macropis patellata.*

**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:
The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Adirondack Park Agency has the authority to regulate smaller wetlands within the Adirondack Park.

**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 bee populations from pathogen exposure would benefit this species. 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 bees and elimination of parasites from commercial populations has been suggested as ideal (Meeus et al. 2011, Schweitzer et al. 2012). Limiting exposure of Patellar Oil-collecting Bee to insecticides would also benefit them. Suggested actions include avoidance of application to flowers that 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 native bee populations (Schweitzer et al. 2012). Organic farming has also been suggested to benefit native bees. Ensuring habitat resources for foraging, nesting, and overwintering will also benefit *Macropis patellata*. 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 *Macropis patellata* include *Lysimachia* L. (Fowler and Droege 2020).

"In the northeast, there are just four species in the genus *Macropis*, three of which reside in New York, and all are loosestrife (*Lysimachia* spp.) pollen specialists. Management practices should protect intact wetlands and habitat. Most habitat restoration efforts benefit generalist bees; while creating pollinator habitat is beneficial, it is not advantageous to many specialist bees like *M. [patellata]* because pollen of other species is not nutritionally suitable for their offspring (Fowler 2016a, 2016b). Invasive species control in wetlands may be necessary to ensure suitable habitat for *M. [patellata]*. Additional planning and specific permits are likely needed to proceed with invasive species removal and management. Prioritizing the use of native plants and avoiding the use of introduced plants will benefit this species. Including native loosestrifes, like Fringed Loosestrife (*L. ciliata*), in wetland restoration plantings will provide forage for *M. [ patellata]* and other wetland specialists (Fowler 2016a, 2016b). Fringed Loosestrife seeds and transplants are commercially available (van Dyke etal. 2020). This herbaceous plant grows in shrublands, woods, and along streambanks throughout New York and blooms between June

through September (van Dyke et al. 2020). Including additional floral resources will also benefit *M. [patellata]* populations. Even though it is a pollen specialist, both males and females' nectar on a variety of plants. ..Potentially of highest importance when managing for *M. [patellata]* is to avoid land management that may reduce nesting habitat for this species. While plants in the *Lysimachia* genus appear to be stable and can adapt to altered environments, suitable nesting sites for *M. [patellata]* continue to be destroyed (Simpson and Neff 1983). Therefore, protecting against the reduction or removal of riparian habitats from erosion (e.g., recreational use) or compaction (e.g., development) will benefit this species (Buckner and Danforth 2022)." (New York Natural Heritage Program 2024).

| Action Category | Action | Description |
|---|---|---|
| A.1 Direct Habitat Management | A.1.0.0.0 Direct Habitat Management | Site/Area management |
| A.2 Direct Species Management | A.2.0.0.0 Direct Species Management | Invasive/problematic species control |
| B.3 Outreach | B.3.1.4.0 Public outreach and information | Awareness and communications |
| C.6 Design and Plan Conservation | C.6.0.0.0 Design and Plan Conservation | Site/area protection |
| C.6 Design and Plan Conservation | C.6.0.0.0 Design and Plan Conservation | 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.7.0.0.0 Legislative and regulatory framework or tools | Policies and regulations |
| C.9 Education and Training | C.9.0.0.0 Education and Training | Training |

**Table 3.** Recommended conservation actions for *Macropis patellata.*

## VII. References

**This SSA drew heavily from these resources:**

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