Species Status Assessment

Class: Insecta
Family: Coccinellidae
Scientific Name: Adalia bipunctata
Common Name: Twospotted lady beetle

Species synopsis:

Adalia bipunctata is 4-5 mm long and ovoid-shaped. The head and thorax is black with yellow markings. Elytra are orange-red, typically with 1 black spot on each (Street 2001). However, there are variations that include: four to six spots, transverse markings, or a black background (Marshall 2000). Undersides are black to reddish-brown. Larvae are soft-bodied, black with yellow and white spots, and elongate (Street 2001).

This lady beetle can be found in a variety of habitats as long as aphids or other small, soft-bodied insects are present (Street 2001). The Lost Ladybug Project (Cornell University 2013) reported A. bipunctata in gardens, yards/backyards, and woods/trees (non-orchard) in New York.

A. bipunctata is the only Adalia species in North America and was once considered the second most common lady beetle. It is also found in Europe and remains common there. Surveys since the 1980s indicate a population decline for this species, as with several other native lady beetles (Harmon et al 2007 and The Lost Lady Bug Project 2013). Stephens and Losey (2003) stated that this species has rarely been collected in recent years.
I. Status

a. Current and Legal Protected Status

i. Federal __ unlisted __________________ Candidate? __ no __

ii. New York __ unlisted ____________________________

b. Natural Heritage Program Rank

i. Global ___ Not ranked _____________________________

ii. New York not ranked ________________ Tracked by NYNHP? ___ N (but planning on it) ___

Status Discussion:
New York Natural Heritage is planning on evaluating the status of this species which may lead to tracking.

II. Abundance and Distribution Trends

a. North America

i. Abundance

___x__ declining ___ increasing ___ stable ___ unknown

ii. Distribution:

___x__ declining ___ increasing ___ stable ___ unknown

Time frame considered: ____ 1980s-2013 ____________________________
b. Regional

i. Abundance

  ___ declining  ____ increasing  ____ stable  ___ unknown

ii. Distribution:

  ___ declining  ____ increasing  ____ stable  ___ unknown

Regional Unit Considered: ___ USFWS Region 5

Time Frame Considered: ____ 1980s-2013

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c. Adjacent States and Provinces

CONNECTICUT  Not Present  ____  No data ______

i. Abundance

  ____ declining  ____ increasing  ____ stable  ___ unknown

ii. Distribution:

  ____ declining  ____ increasing  ____ stable  ___ unknown

Time frame considered: ____ 1980s-2013

Listing Status: ___ not listed  ___________________  SGCN? ___ No ______

Declines first noted during the 1980s. The Lost Ladybug Project (Cornell University 2013): 0 of 119 were A. bipunctata.

MASSACHUSETTS  Not Present  ____  No data ______

i. Abundance

  ___ declining  ____ increasing  ____ stable  ___ unknown

ii. Distribution:

  ___ declining  ____ increasing  ____ stable  ___ unknown

Time frame considered: __ 1980s-2013

Listing Status: ___ not listed  ___________________  SGCN? ___ No ______

Declines first noted during the 1980s. The Lost Ladybug Project (2013): 9 of 471 (7 sites) were A. bipunctata.
NEW JERSEY Not Present _____ No data _____

i. Abundance
   _x_ declining ___ increasing ___ stable ___ unknown

ii. Distribution:
   _x_ declining ___ increasing ___ stable ___ unknown

Time frame considered: _1980s-2013______________________________
Listing Status: ___not listed________________________ SGCN? ___No____

Declines first noted during the 1980s. The Lost Ladybug Project (Cornell University 2013): 2 of 133 (1 site) were A. bipunctata.

ONTARIO Not Present _____ No data _____

i. Abundance
   _x_ declining ___ increasing ___ stable ___ unknown

ii. Distribution:
   _x_ declining ___ increasing ___ stable ___ unknown

Time frame considered: _1980s-2013______________________________
Listing Status: ___not listed________________________

Declines first noted during the 1980s. The Lost Ladybug Project (2013): 8 of 90 (6 sites) were A. bipunctata.

PENNSYLVANIA Not Present _____ No data _____

i. Abundance
   ___ declining ___ increasing ___ stable _x_ unknown

ii. Distribution:
   ___ declining ___ increasing ___ stable _x_ unknown

Time frame considered: _1980s-2013______________________________
Listing Status: ___not listed________________________ SGCN? ___no____
Declines first noted during the 1980s. The Lost Ladybug Project (Cornell University 2013): 0 of 407 were \( \text{A. bipunctata} \).

**QUEBEC**

<table>
<thead>
<tr>
<th>Not Present</th>
<th>No data</th>
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</thead>
<tbody>
<tr>
<td>___ declining</td>
<td></td>
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<tr>
<td>___ increasing</td>
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<tr>
<td>___ stable</td>
<td></td>
</tr>
<tr>
<td>x unknown</td>
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**Distribution:**

| ___ declining |
| ___ increasing  |
| ___ stable |
| x unknown |

Time frame considered: 1980s-2013

Listing Status: not listed

Declines first noted during the 1980s. The Lost Ladybug Project (2013): 0 of 172 were \( \text{A. bipunctata} \).

**VERMONT**

<table>
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<tr>
<td>___ declining</td>
<td></td>
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<tr>
<td>___ increasing</td>
<td></td>
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<tr>
<td>___ stable</td>
<td></td>
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<tr>
<td>x unknown</td>
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</table>

**Distribution:**

| ___ declining |
| ___ increasing  |
| ___ stable |
| x unknown |

Time frame considered: 1980s-2013

Listing Status: not listed

Declines first noted during the 1980s. The Lost Ladybug Project (Cornell University 2013): 0 of 172 were \( \text{A. bipunctata} \).
d. NEW YORK

No data ______

i. Abundance

_x__ declining  ____ increasing ____ stable  ____ unknown

ii. Distribution:

_x__ declining  ____ increasing ____ stable  ____ unknown

Time frame considered: __1980s-2013__________________________

Declines first noted during the 1980s. The Lost Ladybug Project (2013): 25 of 1639 (6 sites) were A. bipunctata.

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Monitoring in New York.

This species, as well as other lady beetles, are the target of a citizen science project known as The Lost Ladybug Project. Participants search for, photograph, and submit images and locations of ladybugs. I’m not aware of any regular surveys.

Trends Discussion:

A bipunctata was once found throughout a large portion of North America. Declines were noted during the 1980s. Harmon et al (2007) stated that the population is likely at or near the detection threshold. Decreases were noted after the arrival of Coccinella septempunctata and Harmonia axyridis.
A. bipunctata range map (Gordon 1985) prior to decline.

This was once a common species in New York. Currently, there are six known locations in the following counties: Erie, Monroe, and Kings.
New York State Range Map for Adalia bipunctata (twospotted lady beetle) 2000-2013 (The Lost Ladybug Project 2013)
III. New York Rarity, if known:

<table>
<thead>
<tr>
<th>Historic (select one)</th>
<th># of Animals</th>
<th># of Locations</th>
<th>% of State</th>
</tr>
</thead>
<tbody>
<tr>
<td>prior to 1970</td>
<td>__________</td>
<td>__________</td>
<td>__________</td>
</tr>
<tr>
<td>prior to 1980</td>
<td>__________</td>
<td>__________</td>
<td>__________</td>
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<tr>
<td>prior to 1990</td>
<td>__________</td>
<td>__________</td>
<td>__________</td>
</tr>
</tbody>
</table>

Details of historic occurrence:

<table>
<thead>
<tr>
<th>Current</th>
<th># of Animals</th>
<th># of Locations</th>
<th>% of State</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>__________</td>
<td>__________</td>
<td>&lt;1%</td>
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</table>

Details of current occurrence:

There are six known locations where approximately 25 individuals have been documented in Erie, Monroe, and Kings counties (Cornell University 2013).

New York's Contribution to Species North American Range:

<table>
<thead>
<tr>
<th>% of NA Range in New York</th>
<th>Classification of New York Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 (endemic)</td>
<td><em>x</em> Core</td>
</tr>
<tr>
<td>76-99</td>
<td><em>Peripheral</em></td>
</tr>
<tr>
<td>51-75</td>
<td><em>Disjunct</em></td>
</tr>
<tr>
<td>26-50</td>
<td>Distance to core population:</td>
</tr>
<tr>
<td><em>x</em> 1-25</td>
<td></td>
</tr>
</tbody>
</table>

Rarity Discussion:

Once a common species, A. bipunctata is now considered rare throughout the North American range. In New York, it is currently known from three counties. Despite a citizen science project that began in 2000 (Cornell University 2013), this species has only been found in two neighboring states and one Canadian province, all in low numbers.
IV. Primary Habitat or Community Type:

1. Urban/Suburban built
2. Agricultural
3. 

Habitat or Community Type Trend in New York:

- Declining  -x- Stable  - Increasing  - Unknown

Time frame of decline/increase: late 1800s-present

Habitat Specialist?  ____ Yes  -x- No

Indicator Species?  _x_ Yes  ____ No

(Stephens and Losey (2003) suggested lady beetles are a good indicator of ecological health because of their sensitivity to natural enemies and anthropogenic influences.)

Habitat Discussion:

A. bipunctata can be found in a variety of habitats as long as there are soft-bodied insects present, especially aphids. In New York, A. bipunctata have been found in gardens, yards/backyards, and woods/trees (non-orchard) in New York between 2000 and 2013 (Cornell University 2013). Agricultural land has been declining in New York since the 1880s. Between 1940 and 1997, there was a 57% decline in farmed land in New York (Harmon et al. 2007). This species is also known to use wooded habitats. “Stable” was selected above because one habitat type is decreasing (farmland) while the other is increasing (wooded areas).
V. New York Species Demographics and Life History

___x___ Breeder in New York
   ___ Summer Resident
   ___ Winter Resident
   ___ Anadromous

___x___ Non-breeder in New York
   ___ Summer Resident
   ___ Winter Resident
   ___ Catadromous

___ Migratory only
___ Unknown

A. bipunctata is a year-round resident.

Species Demographics and Life History Discussion:

A. bipunctata emerges in early to mid spring. It takes less than one month to mature and they live for one to two years (Martinez 2006).

Interspecies depredation and cannibalism have been documented. *Perilitus coccinellae*, a braconid wasp, parasitizes lady beetles (Martinez 2006). Microsporidia, a pathogen, has been documented and its impacts are under investigation (Martinez 2006, Cornell University 2013). Insecticides and transgenic crops are also a source of mortality (Martinez 2006).
VI. Threats:

1. While it is difficult to prove, it appears this species has been displaced by the nonnative lady beetles species.
2. A decline in farming (farm/open habitat loss) has decreased some of the available suitable habitat.
3. Pesticide use is a likely cause of mortality for this beneficial insect.

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

_____ No    _____ Unknown

__x__ Yes

The preservation of farm land via conservation easements would help preserve/conserve some suitable habitat.

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

<table>
<thead>
<tr>
<th>Conservation Actions</th>
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</thead>
<tbody>
<tr>
<td><strong>Action Category</strong></td>
</tr>
<tr>
<td>1 Species Management</td>
</tr>
<tr>
<td>2 Species Management</td>
</tr>
<tr>
<td>3 Livelihood, Economic &amp; Other Incentives</td>
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<tr>
<td>4 Add more lines if needed</td>
</tr>
</tbody>
</table>

Additional research is needed to determine specific habitat needs. Additional survey work is needed to determine the full range and population size in New York. Consider incentives that encourage sustainable farming or reduced pesticide use.
VII. References


Date last revised: January 22, 2014