

## Species Status Assessment

**Class:** Lepidoptera  
**Family:** Pieridae  
**Scientific Name:** *Pontia protodice*  
**Common Name:** Checkered white

### Species synopsis:

There is a spring (short-day) and summer (long-day) form of the checkered white (*Pontia protodice*), also called the southern cabbage butterfly. The spring form has strongly reduced black marks above and there is heavy green veining ventrally (Opler and Krizek 1984). Shapiro (1968) showed that the color variation is the result of larvae subjected to long nights of more than 14 hours in the spring (New York Natural Heritage Program 2012).

Checkered whites can be found from southern Canada south to northern Mexico. They are absent from the Pacific Northwest. In recent times, this species is also absent from New England where there is some question if it ever was a resident in the area. Occurrences are becoming more erratic east of the Appalachians (NatureServe 2012). Populations have been documented in Queens (New York Natural Heritage Program 2012). Populations do expand northward and then drop back seasonally when winter comes (expert meeting).

The species hadn't been reported since 1990 and populations appear to be declining. It is believed that the decline could be, at least in part, due to the introduction of the parasitoid wasp (*Cotesia glomerata*) to control cabbage white populations (New York Natural Heritage Program 2012).

The population expands northward and drops back seasonally when winter comes (NYSDEC SGCN Experts Meeting).

### I. Status

#### a. Current and Legal Protected Status

i. Federal None Candidate? No

ii. New York Special Concern; SGCN

#### b. Natural Heritage Program Rank

i. Global G4

ii. New York S1 Tracked by NYNHP? Yes

**Other Rank:**

None

**Status Discussion:**

The checkered white is has experienced drastic decline in the Middle Atlantic region and apparently as far south as the Carolinas and Georgia. The species no longer appears widely most years northeast of the Carolinas except for one persistent colony in northern New Jersey and around New York City. Decline seems sufficient to make a rank of "demonstrably secure" no longer accurate since it is not now predictable whether the decline will spread westward or not. For now, the species is apparently secure in the western United States (NatureServe 2012).

**II. Abundance and Distribution Trends**

**a. North America**

**i. Abundance**

declining  increasing  stable  unknown

**ii. Distribution:**

declining  increasing  stable  unknown

**Time frame considered:** \_\_\_\_\_

Moderate decline

**b. Regional**

**i. Abundance**

declining  increasing  stable  unknown

**ii. Distribution:**

declining  increasing  stable  unknown

**Regional Unit Considered:** \_\_\_\_\_ Northeast \_\_\_\_\_

**Time Frame Considered:** \_\_\_\_\_

Moderate decline

**c. Adjacent States and Provinces**

**CONNECTICUT**                      Not Present \_\_\_\_\_                      No data   X  

**i. Abundance**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

**ii. Distribution:**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Not listed \_\_\_\_\_                      SGCN?   Yes  

**NEW JERSEY**                      Not Present \_\_\_\_\_                      No data   X  

**i. Abundance**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

**ii. Distribution:**

\_\_\_\_\_ declining    \_\_\_\_\_ increasing                      \_\_\_\_\_ stable                        X   unknown

Time frame considered: \_\_\_\_\_

Listing Status: \_\_\_\_\_ Threatened \_\_\_\_\_                      SGCN?   Yes  

**ONTARIO**                      Not Present   X                        No data \_\_\_\_\_

**PENNSYLVANIA**                      Not Present   X                        No data \_\_\_\_\_

**QUEBEC**                      Not Present   X                        No data \_\_\_\_\_

**VERMONT**                      Not Present   X                        No data \_\_\_\_\_

**MASSACHUSETTS**                      Not Present   X                        No data \_\_\_\_\_

**d. NEW YORK**

No data \_\_\_\_\_

**i. Abundance**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

**ii. Distribution:**

X  declining \_\_\_ increasing \_\_\_ stable \_\_\_ unknown

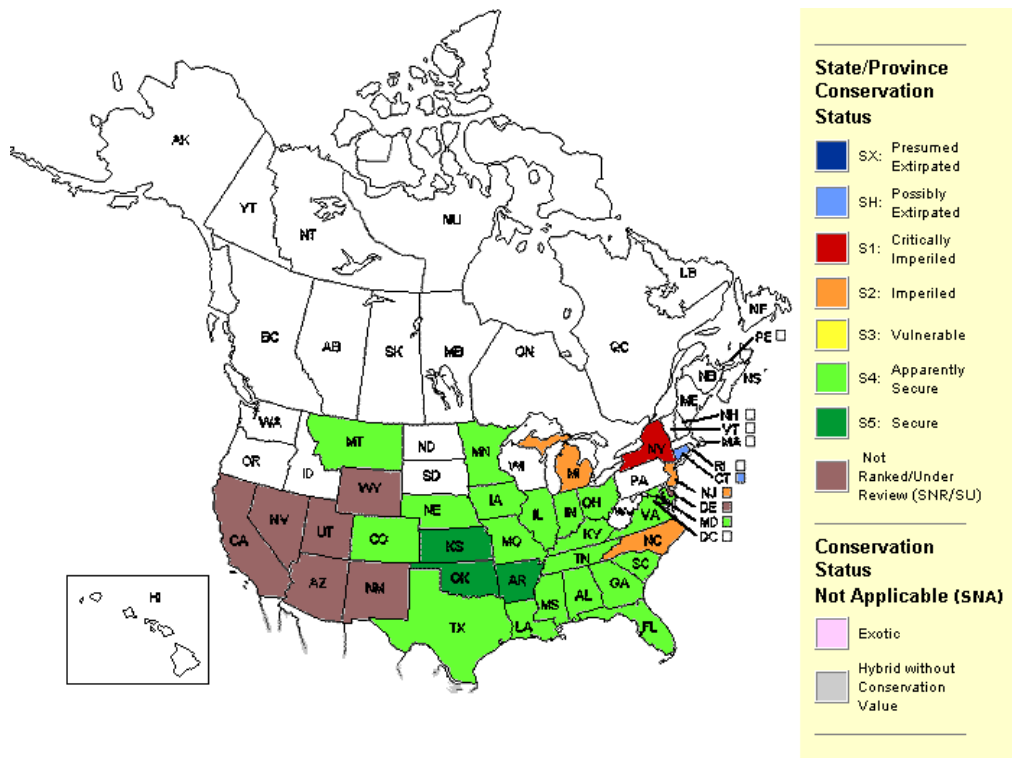
Time frame considered: \_\_\_\_\_

**Monitoring in New York.**

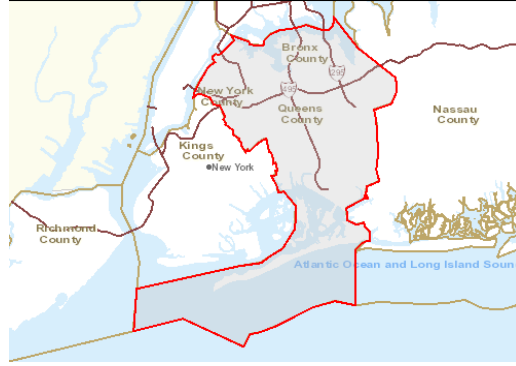
None

**Trends Discussion:**

Trend information for this species is unknown.



**Figure 1.** Conservation status of the checkered white in North America (NatureServe 2012).



**Figure 2.** Distribution of the checkered white in North America (New York Nature Explorer 2012).

**III. New York Rarity, if known:**

<b>Historic</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
<b>prior to 1970</b>	_____	_____	_____
<b>prior to 1980</b>	_____	_____	_____
<b>prior to 1990</b>	_____	_____	_____

**Details of historic occurrence:**

No record of historic occurrence in New York.

<b>Current</b>	<b><u># of Animals</u></b>	<b><u># of Locations</u></b>	<b><u>% of State</u></b>
	_____	<u>1</u>	_____

**Details of current occurrence:**

Queens – 1990

**New York’s Contribution to Species North American Range:**

**Distribution** (percent of NY where species occurs)

- X 0-5%
- \_\_\_\_\_ 6-10%
- \_\_\_\_\_ 11-25%
- \_\_\_\_\_ 26-50%
- \_\_\_\_\_ >50%

**Abundance** (within NY distribution)

- \_\_\_\_\_ abundant
- \_\_\_\_\_ common
- \_\_\_\_\_ fairly common
- \_\_\_\_\_ uncommon
- X rare

**NY's Contribution to North American range**

- 0-5%
- 6-10%
- 11-25%
- 26-50%
- >50%

**Classification of New York Range**

- Core
- Peripheral
- Disjunct

**Distance to core population:**

~1,000 miles

**IV. Primary Habitat or Community Type:**

1. Cultivated crops
2. Old field managed grasslands
3. Non-native shrublands
4. Powerlines
5. Urban and recreational grasslands

**Habitat or Community Type Trend in New York:**

Declining       Stable       Increasing       Unknown

Time frame of decline/increase: \_\_\_\_\_

Habitat Specialist?                                       Yes       No

Indicator Species?                                       Yes       No

**Habitat Discussion:**

In general, the checkered white can be found in a variety of disturbed habitats lacking heavy shade, such as vacant lots, railroad beds, roads, airports, fields, pastures, and grasslands that also contain their mustard and caper food plants (NatureServe 2012; Butterflies and Moths of North America 2012). In New York, the species has been found in sandy or gravelly disturbed areas with sparse vegetation (New York Natural Heritage Program 2012).

**V. New York Species Demographics and Life History**

- Breeder in New York**
- Summer Resident**
- Winter Resident**
- Anadromous**
- Non-breeder in New York**
- Summer Resident**
- Winter Resident**
- Catadromous**
- Migratory only**
- Unknown**

**Species Demographics and Life History Discussion:**

Adult checkered whites take nectar from a variety of flowers. Tooker et al. (2002) cited a study by C. Robertson in Illinois in which adult checkered whites were observed to feed on nectar from flowers of over 50 species of plants.

Although adults are sexually dimorphic in terms of dark pigmentation of the wings, both sexes recognize the opposite sex by differential UV reflectivity rather than by differences in the dark pigmentation (Rutowski 1981). When adult populations are dense, a female is typically mated during its first day of adult life and may mate more than once during its lifetime. Dense populations where there are numerous male/female interactions act as a signal for females to migrate to less densely populated areas (Shapiro 1970).



During mating, a male passes a spermatophore that represents about 7 to 8% of his body weight and requires about 24 hours to regenerate his potency while a female requires about five to seven days to deplete the contents of the spermatophore (Rutowski 1984). Males, because of their large investment, tend to select younger and larger females for mating (Rutowski 1982).

Females assess the egg load of host plants prior to oviposition. Eggs are often laid on the fruits of host plants but may also be laid on stems. Larvae prefer flowers or fruits but will also eat leaves of the host plants (Minno et al. 2005).

The hosts of checkered white larvae are herbs in the Mustard family (Brassicaceae). Preferred hosts are Virginia pepperweed (*Lepidium virginicum* L.) in the Southeast and prairie pepperweed (*Lepidium densiflorum* Schrad.) in the North, but they also eat the exotic shepherd's purse (*Capsella bursa-pastoris*) (Miller and Miller 1970).

White checkerspot has three flights, with a partial 4th in the South, from March-November. A short-day form appears in spring and fall. Chrysalids hibernate (Butterflies and Months of North America 2012).

## **VI. Threats:**

Checkered white populations may have declined because of the introduction of a parasitoid wasp, *Cotesia glomerata* that was released to control cabbage white populations. The wasp also attacks other pierine butterflies (Schweitzer et al. 2011). Development and railroad and road maintenance are also threats as this species has been found in areas with such pressure in New York (New York Natural Heritage Program 2012).

General threats known to affect Lepidoptera include habitat loss and degradation caused by development, habitat fragmentation, alteration of natural fire regimes, natural succession of habitat, land clearing, erosion, and sea level rise. Past use of chemical biocides to control gypsy moth and other pest insects continues to kill native Lepidoptera. Introduced parasitoid flies have been known to negatively affect native Lepidoptera. Other threats may include invasive species, light pollution affecting reproductive success, over grazing of host plants by wild deer populations, and off-road vehicle use (NYSDEC 2005).

The species has not been assessed at this time, but is has been identified by The New York Natural Heritage Program, the NYS Department of Environmental Conservation, and the Nature Conservancy as a second-priority species recommended for assessment of vulnerability to predicted climate change (Schlesinger *et al.* 2011).

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

**No**     **Unknown**  
 **Yes**

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

Since the white checkerspot often occurs along roadsides and railroads, maintenance in these areas should be done to reduce the impact to the species. Broadcast use of herbicides should be avoided and it has been recommended that herbicides be applied to specific target species (Schweitzer et al. 2011).

Conservation actions following IUCN taxonomy are categorized in the table.

<b>Conservation Actions</b>	
<b>Action Category</b>	<b>Action</b>
Law and Policy	Policies and Regulations
Education and Awareness	Training
Education and Awareness	Awareness & Communications
Land/Water Protection	Site/Area Protection
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Invasive/Problematic Species Control
Land/Water Protection	Site/Area Protection

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for other butterflies, and for the checkered white in particular.

**Fact sheet:**

Develop fact sheets and other outreach material to educate the public about species at risk Lepidoptera.

**Habitat management:**

Determine best management regimes for species in each locality.

**Habitat research:**

Determine precise habitat needs of all life stages.

Ascertain food plants.

Determine the relationship between food availability and species numbers.

**Invasive species control:**

- \_\_\_ Identify species which impact negatively on butterfly populations.
- \_\_\_ Determine the best control method for those exotic species with minimal repercussions for butterfly populations.

**Life history research:**

- \_\_\_ Investigate the metapopulation dynamics of those species which appear to have distinct populations.
- \_\_\_ Establish the duration of all life stages.
- \_\_\_ Taxonomic research for related species.

**Other action:**

- \_\_\_ Determine the actual sensitivity of species to chemical formulations, particularly diflubenzuron and other commonly used agricultural pesticides.
- \_\_\_ Determine the effect of *Bacillus thuringiensis kurstaki* (BTK) used in Gypsy moth sprayings on various species.

**Population monitoring:**

- \_\_\_ Inventory of species within historical range.

**Statewide baseline survey:**

- \_\_\_ Survey all species to more adequately define the list of species that need to be addressed.

**VII. References**

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