# Species Status Assessment

**Class:** Insecta
**Family:** Petaluridae
**Scientific Name:** *Tachopteryx thoreyi*
**Common Name:** Gray petaltail

**Species synopsis**:

The gray petaltail (*Tachopteryx thoreyi*) is principally a southern species, with a range that extends from northern Florida west to eastern Texas and Oklahoma, and north to southern Illinois, southern Michigan, New York and southern New England (Dunkle 2000, Glotzhober and McShaffrey 2002). Overall, the statewide range for this species is quite broad, with nearly all records coming from counties across the southern portion of the state including the lower Hudson Valley, the southern Finger Lakes, and the Lake Erie portion of the Great Lakes drainage. There is a reliable site record from one location on the Tug Hill in 1990 that may represent a disjunct portion of the species range in New York, as well as unvouchered records from St. Lawrence county in 2007 and 2008. Despite this broad distribution in New York, *T. thoreyi* has very specialized habitat requirements leading to an especially localized distribution. It is known from just over a dozen sites in New York, with apparent population clusters in the Finger Lakes region and in Letchworth State Park. The general habitat of *T. thoreyi* is usually described as hillside seeps and fens located in areas of deciduous forest (Dunkle 2000, Nikula *et al.* 2003). In New York, all known populations are found at rocky gorges and glens, with groundwater-fed, hillside seepages feeding into small streams (White *et al.* 2010, New York Natural Heritage Program 2012).

## I. Status

### a. Current Legal Protected Status

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

ii. **New York** Special Concern; SGCN

### b. Natural Heritage Program Rank

i. **Global** G4

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

**Other Rank:**
IUCN Red List— Least concern

**Status Discussion:**

Several sites have been known for decades, indicating that the species is viable and presumably stable over the long-term. Suburban and other development has been taking place in the lower Hudson Valley portion of the species range for decades and it is possible that some sites, including two represented by historical records, have been lost (New York Natural Heritage Program 2011). Information on populations sizes and populations trends at specific sites is not available.

## II. Abundance and Distribution Trends

### a. North America

#### i. Abundance

**____ declining ____increasing ____stable __X__unknown**

#### ii. Distribution:

**____ declining ____increasing ____stable __X__unknown**

**Time frame considered:** 1988-2012

### b. Regional

#### i. Abundance

**____ declining ____increasing ____stable __X__unknown**

#### ii. Distribution:

**____ declining ____increasing __X__stable ____unknown**

**Regional Unit Considered:** Northeast

**Time Frame Considered:** 1988-2011

**c. Adjacent States and Provinces**

**CONNECTICUT** **Not Present** X **No data** _____

**QUEBEC** **Not Present** X **No data** _____

**VERMONT** **Not Present** X **No data** _____

**ONTARIO** **Not Present** X **No data** _____

**MASSACHUSETTS** **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? No

**NEW JERSEY** **Not Present** _____ **No data** X

**i. Abundance**

____ **declining** ____ **increasing** ____ **stable** X **unknown**

**ii. Distribution:**

____ **declining** ____ **increasing** X **stable** ____ **unknown**

**Time frame considered:** _____

**Listing Status:** Endangered SGCN? No

**PENNSYLVANIA** **Not Present** _____ **No data** ___X___

i. **Abundance**

____ **declining** ____**increasing** ____**stable** __X__**unknown**

ii. **Distribution:**

____ **declining** ____**increasing** __X__**stable** _____**unknown**

**Time frame considered:** _____

**Listing Status:** _____Not listed_____ SGCN? ___No____

**d. NEW YORK** **Not Present** _____ **No data** _____

i. **Abundance**

____ **declining** ____**increasing** _____**stable** __X_**unknown**

ii. **Distribution:**

__X__ **declining** ____**increasing** _____**stable** _____**unknown**

**Time frame considered:** ____2005-2009_____

**Moderate decline**

**Monitoring in New York.**

The New York State Dragonfly and Damselfly Survey (NYSDDS) was conducted from 2005-2009 but there are no organized, regular monitoring or survey activities directed toward this species or to sites where it has been documented.

**Trends Discussion:**

There is no information on population trends for *T. thoreyi* at known locations, although several sites have been known for decades, indicating that they are viable and presumably stable. There is also the possibility that some sites have been lost in recent years due to new suburban and other development in at least the rapidly growing lower Hudson Valley portion of the species range (New York Natural Heritage Program 2011).

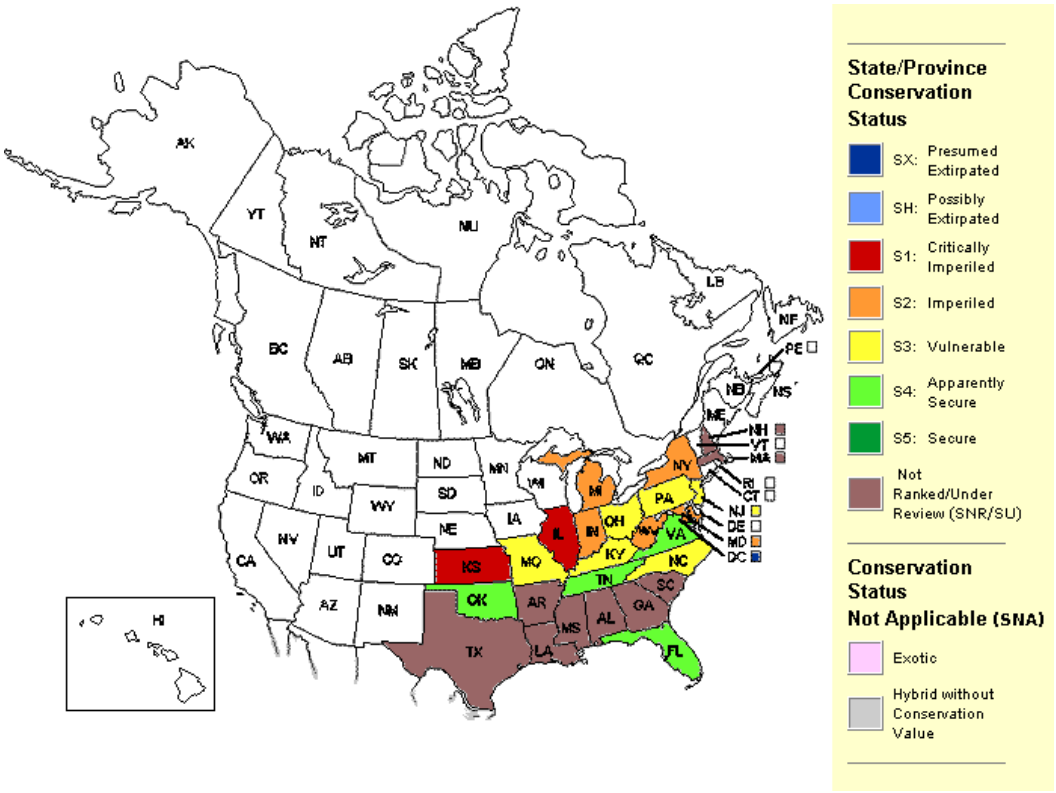


**Figure 1**. Conservation status of the gray petaltail in North America (NatureServe 2012).

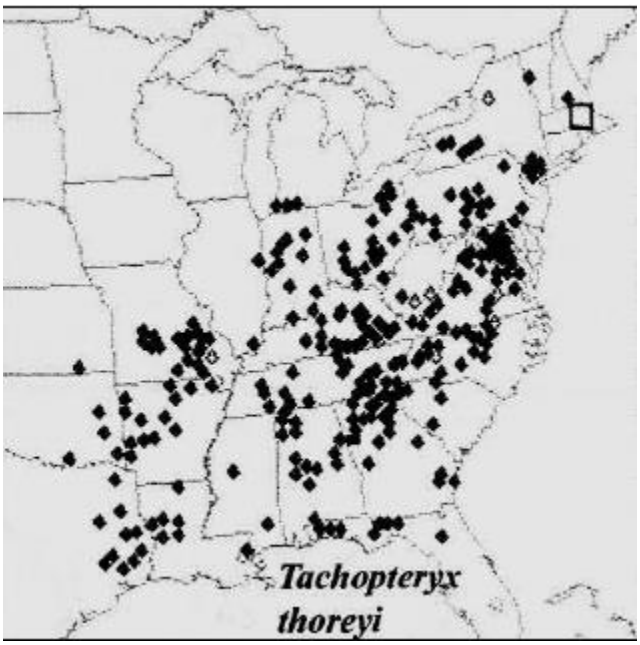


**Figure 2**. Distribution of the gray petaltail in the United States (Donnelly 2004).

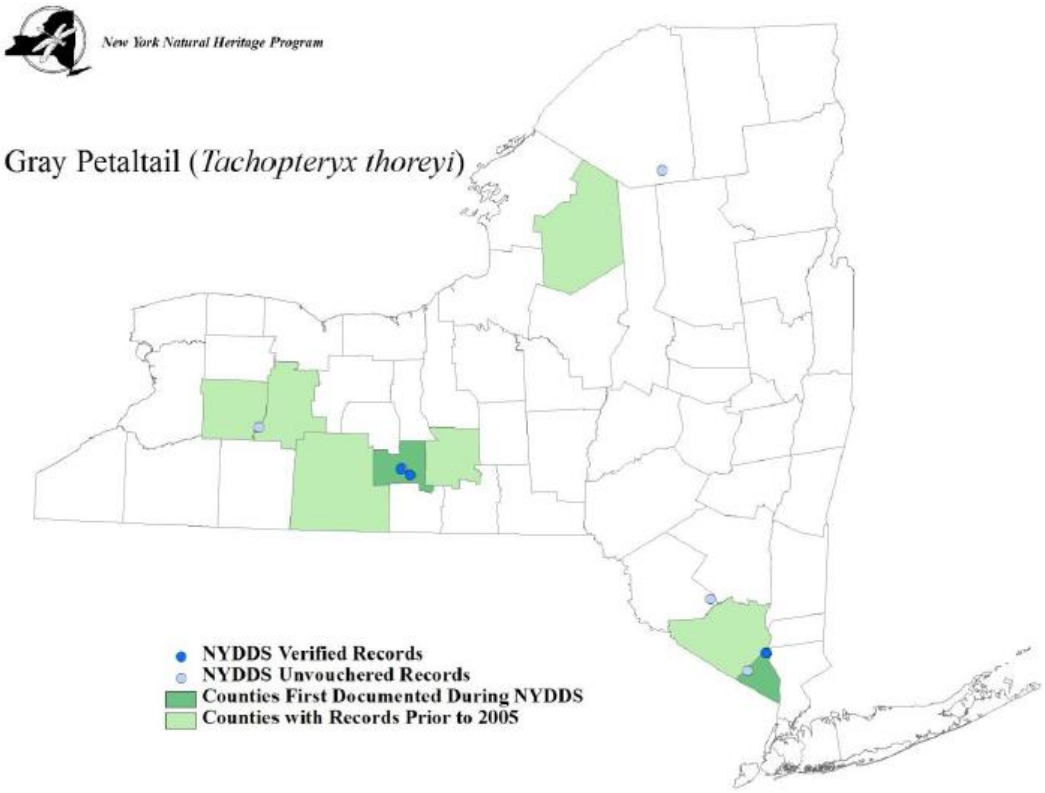


**Figure 3.** Occurrence records of the gray petaltail in New York (White *et al.* 2010).

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

| Historic | # of Animals | # of Locations | % of State |
|---|---|---|---|
| **prior to 1970** | _____ | 8 | _____ |
| **prior to 1980** | _____ | _____ | _____ |
| **prior to 1990** | _____ | _____ | _____ |

**Details of historic occurrence:**

The NYNHP Element Occurrence Database (2012) lists three historical occurrences for this species at West Point, Ramapo and Six Mile Creek in Ithaca, while Donnelly (1992) lists five others including, Coy Glen in Ithaca, McLean, Portage, Watkins Glen, and Ft. Montgomery, all but one of these initially reported by Needham (1928).

| Current | # of Animals | # of Locations | % of State |
|---|---|---|---|
| | _____ | 12-14 | _____ |

**Details of current occurrence:**

The statewide range for this species is quite broad, with records coming from counties across the southern portion of the state including the Lower Hudson Valley, the southern portion of the Finger Lakes and the Lake Erie portion of the Great Lakes drainage. Letchworth State Park and the Ithaca are locations with h multiple records some of which have been known since at least 1928. Overall there are as many as 11 well verified locations recorded since 1990 with two additional unverified site records from additional counties (St. Lawrence and Sullivan) reported during the NYDDS (White *et al.* 2010, New York Natural Heritage Program 2013) The fairly recent (1990) and reliable site record from one location on Tug Hill may represent a disjunct portion of the range for this primarily southern species (New York Natural Heritage Program 2012).

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

| **Distribution** (percent of NY where species occurs) | | **Abundance** (within NY distribution) | |
|---|---|---|---|
| _X_ | 0-5% | ___ | abundant |
| ____ | 6-10% | ___ | common |
| ____ | 11-25% | ___ | fairly common |
| ____ | 26-50% | ___ | uncommon |
| ____ | >50% | _X_ | rare |

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

_X__ 0-5%

____ 6-10%

____ 11-25%

____ 26-50%

____ >50%

**Classification of New York Range**

**____Core**

**_X_ Peripheral**

**____ Disjunct**

**Distance to nearest population:**

__~ 1,000 mi_____

**Rarity Discussion:**

As of 2013, there are 12 confirmed locations for this uncommon and local species. Several of the sites are in close proximity to one another and could be functioning as single metapopulations. While additional, undiscovered populations are expected, the specific nature of the species' habitat suggests that the number of sites may not be large (New York Natural Heritage Program 2011).

## I. Primary Habitat or Community Type:

1.Headwater Creek, Low Gradient, mud bottom

2. Headwater Creek, Low-Moderate Gradient, mud bottom

3. Headwater Creek, Low Gradient, sand and gravel bottom

4. Headwater Creek, Low-Moderate Gradient, sand and gravel bottom

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

**____ Declining ____Stable ____Increasing __X__Unknown**

**Time frame of decline/increase: _____**

**Habitat Specialist? __X__ Yes _____ No**

**Indicator Species? _____ Yes __X__ No**

**Habitat Discussion:**

The general habitat of the *T. thoreyi* is usually described as hillside seeps and fens located in areas of deciduous forest (Dunkle 2000, Nikula *et al.* 2003). In New York, all known populations are found at rocky gorges and glens, with groundwater fed, hillside seepages feeding into small streams (New York Natural Heritage Program 2011). Larvae inhabit the seepage areas. The adults perch vertically on tree trunks, stumps, or exposed branches in sunny spots within the seepage areas and adjacent woods, defending territories and searching for mating opportunities. At most New York sites, petaltails are often observed as they fly up and down the streams to forage (New York Natural Heritage Program 2011).

## II. New York Species Demographics and Life History

**_X_ Breeder in New York**

**_X_ Summer Resident**

**_X_ Winter Resident**

**____ Anadromous**

**____ Non-breeder in New York**

**____ Summer Resident**

**____Winter Resident**

**____ Catadromous**

**____ Migratory only**

**____ Unknown**

**Species Demographics and Life History Discussion:**

Donnelly (1999) shows previously recorded New York *T. thoreyi* dates from 7 June – 15 July. An examination of 37 records, including observations and museum specimens, in the database of the NYNHPprior to the NYDDS, shows 38% of the records from 1-15 June, 35% of the records from 16-30 June, 21% of the records from 1-15 July, and just 5% of the records from 16-30 July. The NYDDS records documented by photographs, or based on observations from sites also documented by photographs or in close proximity to other known sites, show a noticeably different percentage with 33% from 16-30 June and 66% from 1-15 July. The difference in the number of early June records based upon these two sources may reflect the timing of targeted search efforts for *T. thoreyi* at various New York State Parks from 1998-2004, as part of a multi-year Biodiversity Inventory Project (Evans and VanLuven 2005). Early June likely represents the beginning of the flight period in New York, a time when the petaltails may be most closely tied to the seep/spring habitat for mating, whereas late June and early July probably represents the peak of the flight period (White *et al.* 2010).

*T. thoreyi* is the only northeastern dragonfly species whose larvae may not be truly aquatic. The larvae live in the mud and vegetation of mucky, mossy, spring seeps which often contain very little standing water. Dunkle (1981) studied a population of *T. thoreyi* in Florida throughout the flight season of 1978 at a site similar in description to sites in New York, (*i.e.* hillside seeps in deciduous forest, although presence of a stream fed by the seeps is not mentioned). Adults were captured and individually marked. The minimum population based on individuals marked included 128 males and 46 females. If these numbers hold true for sites in New York, it would indicate that at least some populations may be larger than one would guess form a few initial surveys of short duration. Marked males moved distances from 0- 1.1 km. The average distance traveled by males between sightings was 0.28 km. One male, classified as mature when first marked, survived for at least 35 more days and was probably 7 weeks old when it was last seen.

## III. Threats:

Since seepage areas are the key larval habitat for this species, any activities that alter the quality or quantity of groundwater seepage in an occupied area would pose a threat to *T. thoreyi*. The most important likely negative impacts would come from changes in natural hydrology through the building of dams, increases in sediment load of the seepage (such as might occur should extensive logging take place in or adjacent to the seepage), changes in dissolved oxygen content, direct effects of pesticides, and chemical contamination by runoff or agricultural discharge (Novak 2006). Direct, intentional killing by people is a possible threat to this species. In at least one state park, petaltails squashed by park visitors have been observed. Petaltails are not wary and occasionally land on people whose first reaction is probably to swat the insect (New York Natural Heritage Program 2011).

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

**_____ No ____ Unknown**

**__X__ Yes**

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 (APA) has the authority to regulate smaller wetlands within the Adirondack Park. The APA could be important should the St. Lawrence County observation be confirmed.

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

Consideration should be given to providing information to the public at state parks where *T. thoreyi* occurs. The tame and harmless nature of the insects could be stressed in order to reduce the likelihood of the dragonflies being killed by startled hikers. For example, a photograph and brief information sheets could be provided at kiosks located near the entrances to trails during the late May-July flight period (New York Natural Heritage Program 2011). This action has already been completed at one or more State Parks in the Finger Lakes region. Conservation actions following IUCN taxonomy are categorized in the table.

| **Conservation Actions** | |
|---|---|
| **Action Category** | **Action** |
| Law and Policy | Policies and Regulations |
| Education and Awareness | Training |
| Education and Awareness | Awareness & Communications |

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for odonates of seeps and rivulets, and for gray petaltail in particular.

**Habitat monitoring:**

___ Support and encourage habitat monitoring efforts that would complete the baseline assessment of habitat quality and threats.

**Habitat research:**

___ Support and encourage research projects that will help define preferred habitat in order to guide future monitoring, restoration and habitat protection efforts.

**New regulation:**

___ Recommendations for official state endangered, threatened, and special concern listing are an anticipated result of the statewide inventory. The gray petaltail is currently listed as Special Concern. It is possible that a change in this species listing status may be warranted following additional surveys or that one of the other two species may be recommended for listing and officially adding these species to the list would constitute a concrete action.

**Population monitoring:**

___ Conduct surveys to obtain repeatable, relative abundance estimates for these species at known sites and newly discovered sites where access permission to conduct surveys is obtained (as indicated in the State Wildlife Grant Odonate Inventory Project).

**Statewide baseline survey:**

___ All of these species are known from fewer than 15 locations in the state, but new populations undoubtedly remain to be discovered. A currently approved, but not yet begun State Wildlife Grant Statewide Odonate Inventory Project will utilize volunteers, Natural Heritage Program and other staff to conduct surveys for these species at potential sites throughout the state.

## IV. References

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