Species Status Assessment

Class: Insecta
Family: Coenagrionidae
Scientific Name: *Enallagma recurvatum*
Common Name: Pine barrens bluet

Species synopsis:

The pine barrens bluet (*Enallagma recurvatum*) is a regional endemic species known only from New Jersey, New York, Rhode Island, Massachusetts, New Hampshire, and southern Maine (Abbott 2007, Massachusetts NHESP 2008). The species primarily inhabits acidic, coastal plain ponds with sandy substrate and emergent vegetation such as *Juncus militarus* (Bayonet rush) along the shoreline (Massachusetts NHESP 2003, Nikula *et al.* 2003, Lam 2004). In addition to the landscape typical of their habitat, in New York, some sites have a floating bog mat or a boggy edge in at least one area of the pond (New York Natural Heritage Program 2010).

In New York, *E. recurvatum* is known from 11 coastal plain ponds in Suffolk County on Long Island (New York Natural Heritage Program 2010). Locations were investigated as part of a special New York State Dragonfly and Damselfly Survey (NYSDDS) effort. All but one site were visited during the NYSDDS years, and two ponds visited during this time lacked any observations since 1990 (New York Natural Heritage Program 2010).

I. Status

a. Current and Legal Protected Status

i. **Federal** ____Not listed_____ **Candidate?** __No___

ii. **New York** ___Threatened; SGCN_____

b. Natural Heritage Program Rank

i. **Global** _____G3_____

ii. **New York** _____S1_____ **Tracked by NYNHP?** __Yes___

Other Rank:
IUCN Red List— Vulnerable

Status Discussion:

White *et al.* (2010) calculated a revised draft S-rank of S3 from S2.

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: ___Last assessment US 1985; Canada 2012 _____

b. Regional

i. Abundance

____ declining ____increasing ____stable __X__ unknown

ii. Distribution:

____ declining ____increasing __X__ stable ____ unknown

Regional Unit Considered: _____Northeast_____

Time Frame Considered: ____Last assessment 1985 _____

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? ___No_____

MASSACHUSETTS **Not Present _____** **No data _____**

i. Abundance

____ declining ____increasing ____stable __X__ unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Time frame considered: _____
Listing Status: _____Threatened_____ SGCN? ___Yes_____

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

i. Abundance

____ declining ____increasing ____stable __X__ unknown

ii. Distribution:

____ declining ____increasing ____stable __X__ unknown

Time frame considered: _____
Listing Status: _____Not listed_____ 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 _____**

d. NEW YORK **No data _____**

i. Abundance

____ declining ____increasing ____stable __X__ unknown

ii. Distribution:

____ declining ____increasing __X__ stable _____ unknown

Time frame considered: ____2005-2009_____

Monitoring in New York.

The New York State Dragonfly and Damselfly Survey (NYSDDS) was conducted from 2005-2009.

Trends Discussion:

Population estimates have been made in recent years as part of a special effort during the New York Dragonfly and Damselfly Survey (White *et al.* 2010). Of the eleven sites where *E. recurvatum* is known to currently occur, four sites are estimated to have excellent viability. Some sites are in close proximity to each other, and the eleven sites may be grouped into four pond complexes. In two of the complexes 100–999 individuals were estimated in at least four of the ponds since 2005. Recent information on the species prior to 2005 is very limited, with records going back to 1988 or 1990 at a few sites (New York Natural Heritage Program 2011). New locations in recent years are likely due to increased survey effort rather than a population increase or expansion and may serve as baseline information to look at future trends. Long-term trends are unclear at this time.

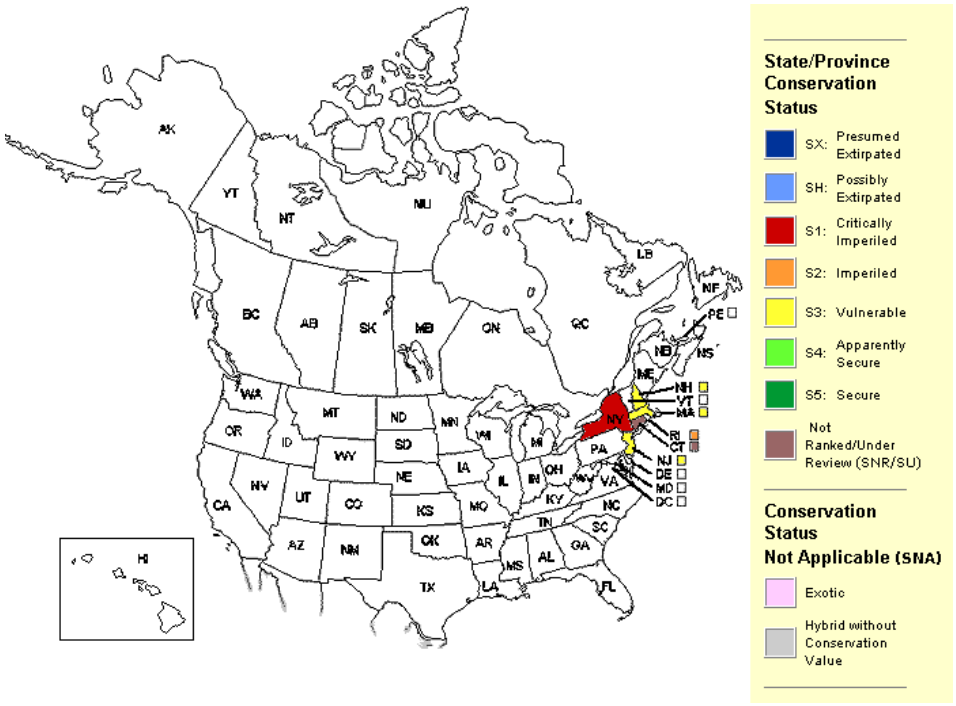

Figure 1. Conservation status of the Pine Barrens bluet in North America (NatureServe 2012).

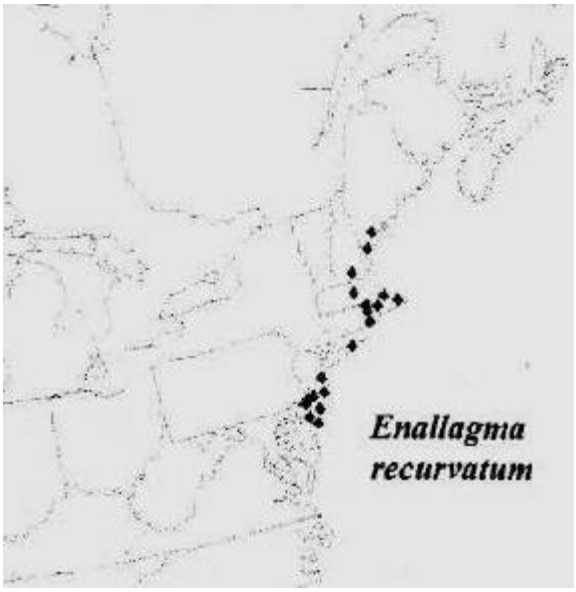

Figure 2. Distribution of the Pine Barrens bluet in the United States (Donnelly 2004).

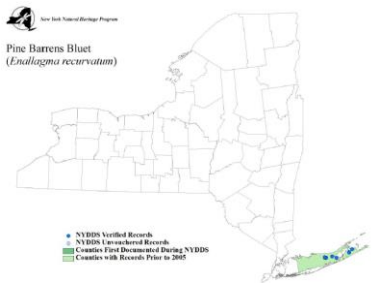

Figure 3. Occurrence records of the Pine Barrens bluet in New York (White *et al.* 2010).

III. New York Rarity, if known:

Historic	# of Animals	# of Locations	% of State
prior to 1970	_____	___1____	_____
prior to 1980	_____	_____	_____
prior to 1990	_____	Unknown #	_____

Details of historic occurrence:

Observations since 1988 have been noted at Suffolk County sites and the species had been observed at three additional historical locations, one of which dates back to 1910 (New York Natural Heritage Program 2011).

Current	# of Animals	# of Locations	% of State
	_____	___6____	_____

Details of current occurrence:

From The New York Dragonfly and Damselfly Survey 2005-2009. Number of occurrences obtained from map by White *et al.* 2010.

New York's Contribution to Species North American Range:

Distribution (percent of NY where species occurs)

_X__ 0-5%

____ 6-10%

____ 11-25%

Abundance (within NY distribution)

___ abundant

___ common

_X_ fairly common

_____ 26-50%

_____ >50%

___ uncommon

___ rare

NY's Contribution to North American range

_____ 0-5%

_X__ 6-10%

_____ 11-25%

_____ 26-50%

_____ >50%

Classification of New York Range

_X*_ Core

____ Peripheral

____ Disjunct

Distance to core population:

__N/A____

* *E. recurvatum* has a very small range restricted to scattered locations in the Northeastern U.S. It has only been found in New York, Maine, Massachusetts, and New Jersey

Rarity Discussion:

In New York, *E. recurvatum* has been confirmed in eleven coastal plain ponds in Suffolk County (New York Natural Heritage Program 2011). In addition to a restricted range, there are a number of threats to these locations. New locations in recent years are likely due to increased survey effort rather than a population increase or expansion.

IV. Primary Habitat or Community Type:

1. Estuarine, brackish marsh, coastal plain pond
2. Alustrine, peatlands, bog/fen

Habitat or Community Type Trend in New York:

__X__ Declining ____Stable ____ Increasing ____Unknown

Time frame of decline/increase: _____

Habitat Specialist? __X__ Yes _____ No

Indicator Species? _____ Yes __X___ No

Habitat Discussion:

E. recurvatum does not require, or even often occur in, very pristine natural habitats, but it has a narrow range of tolerances.

V. 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:

The flight season of *E. recurvatum* is generally restricted to the month of June, with adults rarely seen after that. Little has been published about the life stages of *E. recurvatum* specifically, but it is likely very similar to other better-studied species in the genus (NatureServe 2012).

E. recurvatum has a one-year life cycle. Eggs are laid in the summer and hatch by early fall. The nymphs undergo several molts through winter and spring before emergence, usually during the last week in May. Adult activity is almost exclusively limited to feeding and reproduction and like other smaller damselflies, *E. recurvatum* has a short adult lifespan of approximately 3-4 weeks (Massachusetts NHESP 2008).

VI. Threats:

Any activity which might lead to water contamination or the alteration of natural hydrology could impact *E. recurvatum* populations (NYS DEC 2005). Such threats might include roadway and agricultural run-off, ditching and filling, eutrophication and nutrient loading from fertilizers, herbicides, and septic systems, changes in dissolved oxygen content, and development (NYS DEC 2005). Groundwater withdrawal is a potential threat in lentic habitats on Long Island, as are invasive plant species such as *Phragmites* encroaching on pond shores which crowd out native emergent rushes and floating plants that are required for successful reproduction. The white water lily, which *E. recurvatum* depends on for oviposition, is an example of a native plant being replaced by invasives (New York Natural Heritage Program 2011). The introduction of grass carp is also a threat to coastal plain ponds on Long Island. A potential threat to *E. recurvatum* may be the impact of Canada goose (*Branta canadensis*) browse on native vegetation as they may decrease oviposition sites on *Juncus* or increase egg mortality through overgrazing (New York Natural Heritage Program 2011).

Kalkman *et al.* (2008) indicated that both emergence rates and/or species ranges may shift for odonate species as a result of climate change. However, the pine barrens bluet was classified as "not vulnerable/presumed stable" (PS) to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program. Available evidence does not suggest that abundance and/or range extent within the geographical area assessed with change (increase/decrease) substantially by 2050. Actual range boundaries may change (Schlesinger et al. 2011).

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

__X___ No ____ Unknown

_____ Yes

The pine barrens bluet is listed as a threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres in size under Article 24 of the NYS Conservation Law. The Tidal Wetlands Act protects all tidal wetland habitats and adjacent areas under Article 25 of the NYS Conservation Law.

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 reduce roadway and agricultural run-off, eutrophication, development of upland borders to ponds and resulting increased groundwater withdrawal, invasive plant and animal species, trampling of vegetation from recreation, and ditching and filling activities should be considered when managing for this species (NYS DEC 2005, White *et al.* 2010). Maintenance or restoration of native shoreline vegetation and surrounding upland habitat will benefit the pine barrens bluet, as females require native emergent vegetation for successful reproduction and spend much of their time in upland habitats away from the breeding pond (Gibbons et al. 2002, White et al. 2010). Many of the known sites on Long Island are located within or on preserves or protected lands, but threats might be present on adjacent lands. The Massachusetts NHESP (2003a) suggests that maintaining habitat in the upland areas surrounding breeding ponds is essential to conservation of the species, as newly emerged adults use these areas for maturing, roosting, and feeding.

Further monitoring is needed to define the extent of populations of *E. recurvatum* in New York. In addition, research is required to understand the habitat requirements and threats to this species. In particular, the impact of Canada geese at some of the locations in Suffolk County should be assessed to determine if bird browse decreases oviposition sites or increases egg mortality by overgrazing native rushes (White *et al.* 2010). A recovery plan for the species should be developed and appropriate management guidelines should be adopted for its persistence in known locations (NYS DEC 2005).

Conservation actions following ICUN taxonomy are categorized in the table.

Conservation Actions	
Action Category	**Action**
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 Management	Habitat and Natural Process Restoration

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for odonates of coastal lakes and ponds, and for little bluet in particular.

Educational signs:

___ Educate the public not to introduce fish into historically fishless coastal plain ponds or new species of fish into coastal plain ponds where the species did not historically occur.

Habitat management:

___ Reduce or eliminate detrimental ATV use in and around coastal plain ponds supporting state threatened damselflies.

___ Where possible, remove introduced fish or other aquatic animals that may be detrimental to odonate populations through excessive predation on larvae.

___ Where possible, remove invasive, non-native plants from ponds and adjacent uplands that may significantly impact larval and adult odonate survival and reproduction.

Habitat monitoring:

___ Identify existing and potential locations of public water supply wells and ensure that present and future water withdrawals will not alter the normal range of variation of ground and pond water elevation.

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

___ Identify existing and potential sources of invasive species (including fish).

___ Compile existing baseline data on habitat quality and threats. Include pond water quality (pH, conductivity, nutrients, toxins), pond hydrographs (fluctuations in water level with time), presence of fish, presence of characteristic native plants and invasive species, history of ATV use, history of pesticide spraying for mosquito control, extent of upland habitat around each pond.

Habitat research:

___ Support and encourage research that would increase knowledge of the impact of poorly known threats to odonates (e.g. water quality degradation, atmospheric deposition, invasive species, pesticide spraying).

___ Support and encourage research projects that will help define preferred habitat in order to guide future monitoring, restoration and habitat protection efforts. Include both pond and adjacent upland habitats.

Habitat restoration:

___ Wherever possible, fill in non-natural , deep water-retaining holes in coastal plain ponds.

___ Identify existing and potential sources of nutrients, toxins, and other chemicals originating from human activities and reduce/eliminate/prevent these where possible.

Modify regulation:

___ Ensure that aerial pesticide spraying does not occur over or in close proximity to ponds and adjacent uplands that support these state listed damselflies during the period of adult emergence and flight.

___ Modify regulations to provide expanded protection for uplands adjacent to coastal plain ponds that support state threatened damselflies.

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:

___ Conduct surveys for these species at potential sites throughout the state (expected range for these species is Long Island and Lower New England ecoregion, possibly Westchester County only). These species are known from fewer than 10 locations in the state, but new populations probably remain to be discovered for all of the species. 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 these surveys.

VII. References

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