Appendix A5:

Comprehensive Wildlife Conservation Strategy Species Group Reports for Insects

Revised DRAFT

Prepared by New York State Department of Environmental Conservation staff in cooperation with Cazenovia College and the Riverhead Foundation for Marine Research in support of the Comprehensive Wildlife Conservation Strategy prepared for New York as required by the United States Fish and Wildlife Service's State Wildlife Grants Program

27-Sep-05

Taxa Group: Insect
Species Group: American burying beetle

Threats:
The causes of the decline for this federally Endangered beetle are unclear. Habitat fragmentation was the prevailing theory at the time of federal listing in 1989 and is still thought to be a primary factor in the species decline (Raithel 1991). Outright loss and alteration of habitat and a reduction in larval food resources (carcasses) are related and also thought to be involved. Disease or pesticides have also been mentioned as possible causes in the decline although a dramatic disappearance of this insect took place over wide areas before the widespread use of DDT. Today, the American burying beetle seems to be largely restricted to areas that are not heavily disturbed by human influence so further development and habitat alteration are considered current threats.

Trends:
The American burying beetle has been recorded historically from at least 150 counties in 35 states and three Canadian provinces extending from southern Maine west across the Great Lakes states to South Dakota, and south to Texas and Florida. At the time of federal listing it was known from just two locations; a small, but apparently stable population on Block Island off the coast of Rhode Island and a lower density, but more widespread population in eastern Oklahoma. East of the Appalachians records indicate that the species declined in a generally north to south direction, and the decline was well underway, if not complete by the early 1920s. West of the Appalachians, the decline occurred later. In the Midwest, the decline appears to have proceeded from the center of the range outward (Univ. Nebraska 2004). While it is now known to occur in Nebraska, South Dakota, Kansas, and Arkansas, as well as Oklahoma, these locations are rediscoveries or discoveries within the known historical range, and do not indicate an increasing trend. Reintroduction efforts have taken place in Massachusetts and Ohio.

SEQR - No Action Alternative:
With no action it is difficult to envision a scenario under which the American burying beetle would re-occupy New York State given the distance to the nearest known, extant site (Block Island to eastern point of Long Island is approximately15 miles over the ocean). It is remotely possible that a population of burying beetles remains on Gardiner's Island or at some other site in New York State, but even were this to be true any such site could be lost to natural or other causes without our knowledge, should surveys not be undertaken to search for the species.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
American burying beetle (Nicrophorus americanus)	E		SH	G2G3	E	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
American burying beetle (Nicrophorus americanus)	Lower Hudson - Long Island Bays Lake Erie SW Lake Ontario	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
American burying beetle (Nicrophorus americanus)	North Atlantic Coast Great Lakes	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
American burying beetle (Nicrophorus americanus)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	southern deciduous
	all	Terrestrial	open upland	grasslands

Goal and Objectives for American burying beetle

Goal: Assess the need for surveys for American burying beetle at specific localities in New York, conduct needed surveys to determine presence/absence, and assess the potential for a reintroduction effort for New York.

Objective 1 : Determine the presence/absence of American burying beetle at selected sites in New York.

Measure: *Survey results for selected sites.*

Objective 2 : Evaluate the Massachusetts and Ohio reintroduction efforts with respect to the potential to for a reintroduction effort for New York. This should be undertaken in conjunction with USFWS Recovery team should suitable reintroduction sites be identified.

Measure: *Reports on MA and Ohio reintroductions obtained, reviewed, and discussed with USFWS Recovery team.*

Objective 3 : Identify specific sites in New York that may warrant surveys for American burying beetle based on the likely presence of substantial populations of suitable sized carcasses, relative lack of human disturbance, and grassland or woodland habitat.

Measure: *Map of potential survey sites.*

Recommended Actions

Habitat research:

* Identify sites that may warrant surveys for American burying beetle based on likely availability of appropriate size carcasses, and relatively undisturbed habitat of grasslands or woodlands (probably mainly oak or oak/pine).

Other management plan:

* Incorporate findings into USFWS Recovery Plan and planning efforts.

Statewide baseline survey:

* In addition to Gardiner's Island, sites to be surveyed (if any) could be expected to occur within the vicinity of known, recorded New York locations for the species, but need not be restricted to those areas as the species overall range suggest it could possibly have occurred throughout the state. Surveys are called for in the USFWS Recovery Plan.

References

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Taxa Group: Insect

Species Group: Barrens buck moth

Threats:

Loss of habitat via direct destruction from construction and other human activity, invasive species, and natural succession due to fire suppression. Also spraying for mosquitoes and gypsy moth of both chemical and Bt control agents. Possibly impact from introduced parasites meant to control other Lepidopteran pest species. Light pollution from human development is an increasing concern for moths, but it is not clear what effect it might have on diurnal species like the buckmoth.

Trends:

Monitoring is sporadic for this species. Some populations where management is taking place (e.g. Albany Pine Bush Preserve) may be stable or increasing, while it is likely most populations are either stable or declining. More surveys are needed to determine actual population status.

SEQR - No Action Alternative:

Without any action it is likely that a few populations may continue to survive in refuge areas but will disappear from the majority of their range. Populations will become isolated and precarious without management.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Barrens buck moth (Hemileuca maia maia)						Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Barrens buck moth (Hemileuca maia maia)	Upper Hudson	Upper Hudson	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Barrens buck moth (Hemileuca maia maia)	Northern Appalachian/Boreal Forest	North Atlantic Coast	Unknown
	North Atlantic Coast	Northern Appalachian/Boreal Forest	Stable
	Lower New England Piedmont	Lower New England Piedmont	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Barrens buck moth (Hemileuca maia maia)				
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	southern deciduous

Goal and Objectives for Barrens buck moth

Goal: Maintain viable populations of barrens buck moth throughout its historic range in New York State.

Objective 1 : Identify entities that will be responsible for long-term management and protection of buckmoth habitat.

Measure: *Entities are identified and funded to accomplish all actions necessary to maintain viable populations of the buckmoth throughout its range for the foreseeable future.*

Objective 2 : Preserve and manage locations for barrens buckmoths to maintain viable populations across its range in New York.

Measure: *Actions to protect and manage populations sites long-term are in place in sufficient locations across the species range to ensure its viability in New York.*

Objective 3 : Understand differences if any between inland barrens and coastal barrens populations

Measure: *Genetic/life history research determines whether there are more than one species or subspecies and whether the two population groups have different status and/or needs.*

Objective 4 : Understand habitat parameters necessary for viable populations of buckmoths.

Measure: *Life history and habitat research determine what aspects of habitat are necessary for good populations of buckmoths and what fluctuations in populations numbers are normal for the species.*

Objective 5 : Understand the status and distribution of all barrens buckmoth populations in New York

Measure: *Surveys and population monitoring programs determine where populations are located and whether they are stable, increasing or decreasing.*

Recommended Actions

Curriculum development:

* Develop and disseminate curricula to educate the public about management of "fire communities" and the protection and conservation needs of barrens buckmoth and other pine-barrens species.

Easement acquisition:

* Where appropriate, state or local municipalities or NGOs acquire easements to protect and manage buckmoth habitat.

Fact sheet:

* Update the barrens buckmoth fact sheet on paper and on webpage

Habitat management:

* Manage habitat via burning, cutting, mowing or other methods to stimulate scrub oak production in appropriate areas.

Habitat monitoring:

* Develop standardized protocols for measuring and evaluating the quality of barrens buckmoth habitat.
* Monitor habitat to determine suitability for buckmoth.

Habitat research:

* Conduct research to determine optimal habitat parameters for buckmoth.

Other action:

* Evaluate threats to barrens buckmoth and rank according to severity at all sites in New York.
* Work with researchers to determine if the Long Island populations are different from inland populations. If so, develop appropriate management and protection strategies to ensure long-term viability of both groups
* Work with researchers and experts on barrens buckmoth to define parameters of "viable" barrens buckmoth populations.
* Develop an outreach program to encourage local municipalities to include conservation of buckmoth habitat during local planning and project review

Population monitoring:

* Develop standardized survey protocol for barrens buckmoth.

Recommended Actions

* Survey populations to understand population status, trends and distribution

Private fee acquisition:

* Encourage private NGOs to acquire land to protect and manage buckmoth habitat.

State fee acquisition:

* State acquire land to protect and manage buckmoth habitat.

State land unit management plan:

* Incorporate buck moth management into appropriate state land area management plans

References

Hick, A. H. 1985. Review of the status of the buckmoth (Hemileuca maia) in New York State and recommendation for its listing as a species of special concern. 20 December 1985. Report on file in Endangered Species Unit, NYS DEC, 625 Broadway, Albany, NY 12233. January 1992.

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Taxa Group: Insect
Species Group: Beach tiger beetles

Threats:
The extirpation of Cicindela dorsalis dorsalis from much of its former range has been attributed primarily to the destruction and disturbance of natural beach habitats from shoreline development, beach stabilization efforts, and high recreational use, all of which affect the larval stage. Oil slicks, use of pesticides for mosquito control, increased vehicular beach traffic, and natural phenomena such as winter beach erosion, flood tides, and hurricanes may also have contributed to the species decline (USFWS 1993a). Threats identified at a recent Recovery Team meeting for Cicindela dorsalis dorsalis include groins, bulkheads, shoreline hardening, human use, sand backfill/deposition, pesticides, spills, storms, sea level rise, invasive species, erosion, and disruption of sand sources (USFWS 2004). Some of these same factors threaten the Chesapeake Bay populations of Cicindela puritana, while Connecticut River populations of this species have probably been lost due to the construction of dams, urbanization and bank stabilization, pollution, excessive recreational use (including off-road vehicle use), and invasion of woody plants (USFWS 1993b).

Trends:
These federally listed species have declined throughout major portions of their range. Cicindela dorsalis dorsalis is thought to be extirpated from New York State. The historical presence of Cicindela puritana in New York is based on three location records in a Cornell University Master's thesis (Gordon 1939), and a New York State list published in 1926 (Leonard). One of the records appears to be a case of mistaken identification, one of the records appears to be a case of mistaken location (taken in CT rather than NY), while the third record is indefinite in location, listed only as "NY" (Novak 1997). It is possible this species never actually occurred in NY.

SEQR - No Action Alternative:
Cicindela dorsalis dorsalis is likely extirpated from NY, while Cicindela puritana is almost certainly extirpated if it did ever occur in the state. With no action we will remain uncertain as to whether either species is still extant in the state and there will be no efforts to restore Cicindela dorsalis dorsalis to a significant portion (Long Island, NY) of its former range. If either is still present in the state (one privately owned offshore island with very restricted access could possibly support Cicindela dorsalis dorsalis) they could persist at this or other existing sites as long as the habitat is protected and the population size is large enough to weather natural population fluctuation. There are no nearby populations of either species so neither species is likely to re-colonize NY sites without assistance.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Puritan tiger beetle (Cicindela puritana)	T		SNA	G1G2	U	Resident
Northeastern beach tiger beetle (Cicindela dorsalis	T		SX	G4T2	T	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Northeastern beach tiger beetle (Cicindela dorsalis dorsa	Lower Hudson - Long Island Bays	Unknown	Unknown
Puritan tiger beetle (Cicindela puritana)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Northeastern beach tiger beetle (Cicindela dorsalis dorsali	North Atlantic Coast	Unknown	Unknown
Puritan tiger beetle (Cicindela puritana)	Unknown	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Northeastern beach tiger beetle (Cicindela dorsalis dorsalis)	all	Terrestrial	coastal	beach/shoreline
Puritan tiger beetle (Cicindela puritana)	all	Terrestrial	coastal	beach/shoreline

Goal and Objectives for Beach tiger beetles

Goal: Complete a final status assessment for Cicindela dorsalis dorsalis and Cicindela puritana for NY and assess the potential for restoration of Cicindela dorsalis dorsalis in NY.

Objective 1 : Evaluate the potential for the restoration of the federally listed Cicindela dorsalis dorsalis on Long island.

Measure: *Data regarding the extent of beach not accessible to vehicle and heavy foot traffic, beach width/ length measurements, qualitative population data for Cicindela hirticollis at a selected number of beaches on Long Island. Coordinate with Recovery Team.*

Objective 2 : Research the third published record for Cicindela puritana for New York in order to determine if the species can be confirmed as having occurred historically in the state.

Measure: *Survey of museums for NY specimens. Review of old literature that may shed light on the published record in Leonard (1926).*

Objective 3 : Through targeted surveys at a selected number of beaches on Long Island, more definitively answer whether this species is extirpated from New York.

Measure: *Number of beaches surveyed with presence/absence for Cicindela dorsalis dorsalis.*

Recommended Actions

Habitat research:

* Beaches on Long Island where Cicindela dorsalis dorsalis formerly occurred or could occur should be examined to determine if any support large populations of an associated species (Cicindela hirticollis) or have other factors (such as a long stretch of beach where vehicle and heavy foot traffic is restricted) suggesting that they may be capable of supporting a population of Cicindela dorsalis. Coordinate with Cicindela dorsalis dorsalis Recovery Team.

Other management plan:

* Information from surveys should be provided to the USFWS recovery teams for Cicindela dorsalis dorsalis and Cicindela puritana.

Relocation/reintroduction:

* An assessment as to the feasibility of a New York reintroduction site for Cicindela dorsalis dorsalis should be given consideration in conjunction with USFWS Cicindela dorsalis dorsalis Recovery Team planning. Introductions took place in New Jersey in 1994, 1995, and 1997 and the beetles were still present as of 2003 (USFWS 2004).

Statewide baseline survey:

* Status surveys should be conducted to definitively determine if Cicindela dorsalis dorsalis is extirpated from the state. Surveys should also seek to determine if C. puritana may be present in the state. In at least one case, access to private lands will be essential.
* Compile a complete list of all beaches searched for Cicindela dorsalis dorsalis in recent years as part of NY Natural Heritage Program surveys of NYS Parks, or other surveys.

References

Leonard, M. D. 1926. A list of the insects of New York. Cornell University Agr. Exp. Sta. Memoir No. 101.

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U. S. Fish and Wildlife Service. 1993. Puritan Tiger Beetle (Cicindela puritana G. Horn) Recovery Plan. Agency Draft. Hadley, MA. 43 pp.

U. S. Fish and Wildlife Service. 1993a. Northeastern Beach Tiger Beetle (Cicindela dorsalis dorsalis Say) Recovery Plan. Hadley, MA. 50 pp.

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Taxa Group: Insect

Species Group: Bog buck moth

Threats:

Changes in water levels in fens where populations are located. Natural succession of fens to woody swamp. Encroachment of invasive species such as purple loosestrife and phragmites and glossy buckthorn. Development in the watersheds of the drainages supplying water to the fens which change water patterns and send pollution into the wetlands. Any spraying for mosquitoes, gypsy moths or other pests may be a threat if done near the populations. There may be other threats which are not yet understood which more research on the species and its habitat may explain. For instance, we do not know the reason for declines in some of the populations in Deer Creek Marsh WMA or Rainbow Shores, and we do not understand the effect of parasitism on population levels.

Trends:

Some trend data are available but for the most part long-term population data have not been accumulated to well understand the population dynamics of the species. More research into this is necessary. Current annual censuses have shown short-term declines in some of the populations sites but short term increases have occurred in others. We have no information about the Selkirk fen population due to no access for 15 years or so. Now that the state owns the site, it will be possible to begin a dataset on this population.

SEQR - No Action Alternative:

With no action, the populations of this species will likely be affected negatively by changes in the wetland systems they depend on and by other factors we will not have an understanding of. It is likely they will die out in the foreseeable future.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Bog buckmoth (Hemileuca sp.)						Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Bog buckmoth (Hemileuca sp.)	SE Lake Ontario	SE Lake Ontario	Decreasing

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Bog buckmoth (Hemileuca sp.)	Great Lakes	Great Lakes	Decreasing

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Bog buckmoth (Hemileuca sp.)				
	all	Palustrine	peatlands	bog/fen

Goal and Objectives for Bog buck moth

Goal: Maintain viable populations of bog buck moths in New York into the foreseeable future.

Objective 1 : Evaluate potential to introduce the species to other fens in New York. If evaluation is positive, conduct introduction and monitoring of success.

Measure: *Parameters of bog buckmoth success are researched and applied to other potential population sites. Introduced populations are monitored and determined to be viable long term.*

Objective 2 : Maintain current populations at viable levels to ensure that self-sustaining populations persist long-term.

Measure: *Monitoring and management programs are in place to detect and reverse downward trends not related to natural fluctuations. Management actions address and reverse downward trends*

Objective 3 : Understand population status and dynamics of bog buckmoths at all current locations in New York.

Measure: *Monitoring and research programs are in place to provide data sufficient to understand how populations behave at individual sites and what roles climate, hydrology, food availability, and parasites play on population levels.*

Recommended Actions

Fact sheet:

* Develop a fact sheet for the bog buckmoth for paper distribution and for the website.

Habitat management:

* Take appropriate action to remove invasive species or control, deter, or repair damage from human activities

Habitat monitoring:

* Identify development and other human impacts on the population sites and whether they are negatively affecting the populations
* Identify invasive species contamination of all population sites and whether it is negatively impacting populations.

Recommended Actions

Habitat restoration:

* With understanding of habitat requirements and threats, identify methods to maintain and improve habitat and if possible expand the species to other wetlands.

Life history research:

* Conduct research on effects of egg/larvae parasitism on population dynamics at all sites.
* Determine viability parameters for bog buckmoth populations
* Conduct research to better understand pupation habitat, immigration and emigration from population sites, and long term population dynamics.

Other action:

* Contact experts in Ontario Canada regarding the status of the sites previously known from that province.
* Pursue final naming of the species (subspecies) by experts supposedly working on this.

Other management plan:

* Develop a management/recovery plan for the bog buckmoth that includes all current knowledge of the species and its habitat and recommendations for actions to recover the species to the extent that it can be down-listed or de-listed.

Population monitoring:

* Continue monitoring of all populations. Increase effectiveness of monitoring techniques.

State land unit management plan:

* Incorporate bog buckmoth management into management and work plans for NYS DEC lands where it occurs.

References

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Taxa Group: Insect

Species Group: Karner blue butterfly

Threats:

Loss of habitat and habitat fragmentation from development, forest succession, ATV use, invasive species, dumping and inappropriate mowing and other physical disturbance of the habitat. Physical destruction of butterflies themselves from mowing, crushing, etc. or spraying of pesticides. Decline of lupine from unknown factors (speculation about acidification from rain).

Trends:

Seriously declining at almost all sites. Only one seems to be stable, but all sites are vulnerable to human impacts and poor weather.

SEQR - No Action Alternative:

Without protection and active management to improve and increase habitat this species will become extirpated from New York.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Karner blue (Lycaeides melissa samuelis)	E		S1	G5T2	E	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Karner blue (Lycaeides melissa samuelis)	Upper Hudson Delaware SE Lake Ontario SW Lake Ontario Lower Hudson - Long Island Bays NE Lake Ontario - St. Lawrence	Upper Hudson	Decreasing

Species Distribution - Ecoregion

Species	Historical	Current	Stability

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Karner blue (Lycaeides melissa samuelis)	Lower New England Piedmont Great Lakes High Allegheny Plateau North Atlantic Coast St. Lawrence-Lake Champlain Valley	Lower New England Piedmont	Decreasing

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Karner blue (Lycaeides melissa samuelis)				
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	open upland	grasslands

Goal and Objectives for Karner blue butterfly

Goal: Restore and maintain at least 5 viable Karner blue metapopulations in New York.

Objective 1 : Assure Adequate funding for long-term protection and management of each metapopulation.

Measure: *Protection/management/monitoring needs for each metapopulation are included in state work plans, unit management plans, organization budgets, etc. that are used to secure funding.*

Objective 2 : Continue legal protection of all occupied sites.

Measure: *All claims of damage and/or disturbance to the species and its habitat are pursued by law enforcement with the result that the damage is corrected and fines or other mitigation are required of the perpetrators.*

Objective 3 : Continue protection of all Karner blue sites by review and comment on development projects that might impact populations and habitat.

Measure: *All development projects with potential to impact Karner blue are reviewed and, where necessary, protection or mitigation is achieved via cooperation from municipalities and developers or via permit conditions.*

Objective 4 : Develop and implement a monitoring protocol to estimate Karner blue populations and detect downward trends in the most effective and economical method.

Measure: *Karner blue monitoring at all metapopulations is sufficient to detect downward trends and estimate population levels.*

Objective 5 : Ensure long-term viability of metapopulations with protection/management entities dedicated to long-term maintenance of the metapopulations even after delisting.

Measure: *Each metapopulation has a long-term protection/management entity designated for it.*

Objective 6 : Establish viable metapopulations besides those targeted in the recovery and potential recovery units where opportunities arise in order to keep the numbers of metapopulations and the extent of the range of the species in New York above minimum levels.

Measure: *New metapopulations are established where possible, increasing connectivity among metapopulations and increasing the total number of Karner blues in the state.*

Objective 7 : Explore the feasibility of developing a statewide Habitat Conservation Plan for the Karner blue in New York State

Measure: *New York works with USFWS in evaluating the scope of a Habitat Conservation Plan, costs, funding, staff time expenditure, and benefits to the species, the State and to landowners.*

Objective 8 : Identify entities to be responsible for long-term management and protection of each Karner blue metapopulation.

Measure: *Each metapopulation has a management/protection entity identified and imbued with the responsibility to keep the metapopulation viable. Entity has access to funding necessary to conduct necessary actions and authority/permission to conduct the actions.*

Objective 9 : Improve connectivity among Karner blue sites within all recovery and potential recovery units.

Measure: *All Karner blue metapopulations have at least "good" connectivity according to habitat viability rating system in Karner blue butterfly state recovery plan.*

Objective 10 : Incorporate needs of the Karner blue into the New York State Landowner Incentive Program

Measure: *Landowner Incentive Program projects are developed and funded to benefit the Karner blue butterfly.*

Objective 11 : Increase and improve habitat at all Karner blue sites where management access exists.

Measure: *All managed Karner blue sites are at least "good" according to habitat viability rating system described in draft Karner blue butterfly state recovery plan.*

Objective 12 : Increase the number of Karner blue sites receiving appropriate management and protection.

Measure: *Outreach to owners of Karner blue habitat results in all or most sites receiving appropriate management and protection.*

Objective 13 : Keep habitat and monitoring activities current as knowledge of the Karner blue.

Measure: *Recovery plans, monitoring and habitat management plans are kept flexible and updated to adapt new management techniques to New York metapopulations.*

Objective 14 : Maintain an adequate land base for at least 5 viable Karner blue metapopulations in New York.

Measure: *All 4 recovery units in Glacial Lake Albany and at least 1 in either the Rome Sandplains or Western NY recovery units have metapopulations occupying areas rated "good" according to the habitat viability rating system in the Kb state recovery plan*

Objective 15 : Maintain Karner blue numbers in metapopulations at viable levels.

Measure: *All Karner blue metapopulations have at least "good" butterfly numbers according to habitat viability rating system in Karner blue butterfly state recovery plan.*

Objective 16 : Obtain funding from federal, state and private programs to benefit the Karner blue.

Measure: *Existing and new funding programs help provide funding for Karner blue management, monitoring and outreach for DEC and for recovery partners.*

Recommended Actions

Captive breeding:

* Continue to send Karner blue eggs or larvae to New Hampshire captive breeding facility and receive eggs or larvae in return to be returned to the donor sites or new areas of habitat.

Easement acquisition:

* Acquire easements where appropriate to create habitat and buffer from human development in all Karner blue recovery units according to the draft state Karner blue recovery plan.

Educational signs:

* Construct educational signs for Karner blue population sites on state land and private land to educate the public on protection of the site and values of habitat.

Fact sheet:

* Update the Karner blue fact sheet.

Recommended Actions

Habitat management:

* Manage population sites to increase and improve habitat for existing populations
* Manage new areas to create new habitat and create dispersal corridors between population sites and to buffer areas against human encroachment.

Habitat monitoring:

* Implement habitat viability monitoring protocol (to be developed under SWG grant).

Invasive species control:

* As part of habitat management, control invasive species such as spotted knapweed, aspen, black locust, garlic mustard, and other species detrimental to Karner blue habitat.

Life history research:

* Research aspects of Karner blue life history that are poorly understood including dispersal dynamics, especially the best configuration of corridors, ability to successfully nectar from lupine, etc.

Other action:

* Develop an outreach effort to municipalities to increase the effectiveness of project review in terms of protection and enhancement of Karner blue sites and to further the overall recovery strategies for the species.
* Use state funding programs to benefit Karner blue management, monitoring and outreach by partners in Karner blue recovery.
* Develop and implement incidental take policy for endangered species take permit so that opportunities to gain more from mitigation that would be lost can be taken advantage of from developers and enrollees of the Safe Harbor Program.
* Work with USFWS and TNC in developing a Safe Harbor program in New York State for the Karner blue butterfly.
* If evaluation of cost/benefits is positive, work with USFWS in developing a Habitat Conservation Plan for the Karner blue butterfly in New York State.
* Identify long-term protection/management entities that will sustain Karner blue metapopulations before and after delisting.
* Apply for funding from all available federal, state, and private funding programs appropriate to the Karner blue for acquisition, outreach, management and monitoring.
* Develop a network of volunteers to "adopt" sites for management and/or assist in monitoring activities
* Develop and implement an outreach program to Karner blue site landowners to increase protection and management of those sites.
* Protect existing Karner blue sites and potential habitat areas through review of development projects.
* Contact all landowners with Karner blue sites on their property and alert them to the presence and legal protection of the site.

Recommended Actions

* Enroll partners in Karner blue management via the Landowner incentive program

Other management plan:

* As a member of the recovery team, participate with US Fish and Wildlife Service in revisions to the federal recovery plan for the Karner blue.

Population monitoring:

* Continue to monitor all known Karner blue sites where access is allowed. Pursue access where it is presently denied.

Relocation/reintroduction:

* Where natural colonization will not suffice, reintroduce Karner blue to new habitat areas made in recovery units.

State fee acquisition:

* Acquire land to create habitat and buffer from human development in all Karner blue recovery units according to the draft state Karner blue recovery plan.

State land unit management plan:

* Develop management plans for state land where Karner blue habitat exists and where we want to create and expand it.

Statewide management plan:

* Complete the state recovery plan for the Karner blue.
* Incorporate Karner blue needs into UMPs and other land management plans in the recovery and potential recovery units.

References

Department of Environmental Conservation. 1998. Draft Karner Blue Butterfly New York State Recovery Plan. Draft 4/98 Working Draft.

US Fish and Wildlife Service. 2003. Final Recovery Plan for the Karner Blue Butterfly (Lycaeides melissa samuelis). US Fish and Wildlife Service, Fort Snelling, Minnesota. 273 pp.

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Taxa Group: Insect
Species Group: Odonates of bogs/fens/ponds

Threats:
Little published information is available citing specific cases of negative impacts to bog/fen odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. Examples include peat mining, ditching, filling, eutrophication and changes in dissolved oxygen content, direct effects of pesticides (e.g. for mosquito control or from agricultural runoff), and increases in the sediment load of the wetland (such as might result should logging occur down to the wetland edge). Natural succession could also threaten some sites as shallow pools fill in with vegetation over time.

Trends:
Many of these species have only been collected or observed a few times in New York State so there is virtually no information on population trends. One species, Williamsonia lintneri, is likely extirpated from the one area where it was discovered and from the state as a whole as well. Williamsonia fletcheri appears to have been extirpated from the lone site for it in the High Allegany Plateau.

SEQR - No Action Alternative:
Without the indicated actions, the status of these species will remain uncertain and at least some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. There are a large number of protected bog/fen habitats in the Adirondack Park and elsewhere in New York State, but some of these species may or do occur outside of the Adirondacks where these habitats are more likely to come under threat. In addition, some of the species are known from, and may occur in, a small number of sites putting the species at risk of extirpation from various factors.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Southern sprite (Nehalennia integricollis)			S1	G5	U SC	Resident
Subarctic bluet (Coenagrion interrogatum)			S1S3	G5	U	Resident
Black meadowhawk (Sympetrum danae)			S2S3	G5	U	Resident
Yellow-sided skimmer (Libellula flavida)			S1	G5	U	Resident
Ringed boghaunter (Williamsonia lintneri)			SH	G3	U	Resident
Ebony boghaunter (Williamsonia fletcheri)			S1	G3G4	U	Resident
Incurvate emerald (Somatochlora incurvata)			S1	G4	U	Resident
Forcipate emerald (Somatochlora forcipata)			S1	G5	U	Resident
Taper-tailed darner (Gomphaeschna antilope)			S1	G4	U	Resident
Subarctic darner (Aeshna subarctica)			S1?	G5	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Subarctic darner (Aeshna subarctica)	Susquehanna Upper Hudson	Susquehanna	Unknown
Taper-tailed darner (Gomphaeschna antilope)	Unknown	Upper Hudson	Unknown
Forcipate emerald (Somatochlora forcipata)	Unknown	NE Lake Ontario - St. Lawrence Upper Hudson	Unknown
Incurvate emerald (Somatochlora incurvata)	Unknown	NE Lake Ontario - St. Lawrence Upper Hudson	Unknown
Ebony boghaunter (Williamsonia fletcheri)	Susquehanna	NE Lake Ontario - St. Lawrence Upper Hudson	Unknown
Ringed boghaunter (Williamsonia lintneri)	Upper Hudson	Unknown	Unknown
Yellow-sided skimmer (Libellula flavida)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Black meadowhawk (Sympetrum danae)	SW Lake Ontario Upper Hudson	Upper Hudson	Unknown
Subarctic bluet (Coenagrion interrogatum)	Unknown	NE Lake Ontario - St. Lawrence	Unknown
Southern sprite (Nehalennia integricollis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Subarctic darner (Aeshna subarctica)	High Allegheny Plateau Northern Appalachian/Boreal Forest	High Allegheny Plateau	Unknown
Taper-tailed darner (Gomphaeschna antilope)	Unknown	High Allegheny Plateau	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Forcipate emerald (Somatochlora forcipata)	Unknown	Northern Appalachian/Boreal Forest	Unknown
Incurvate emerald (Somatochlora incurvata)	Unknown	Northern Appalachian/Boreal Forest	Unknown
Ebony boghaunter (Williamsonia fletcheri)	High Allegheny Plateau	Northern Appalachian/Boreal Forest St. Lawrence-Lake Champlain Valley	Unknown
Ringed boghaunter (Williamsonia lintneri)	Lower New England Piedmont	Unknown	Unknown
Yellow-sided skimmer (Libellula flavida)	North Atlantic Coast Lower New England Piedmont	North Atlantic Coast	Unknown
Black meadowhawk (Sympetrum danae)	Great Lakes Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown
Subarctic bluet (Coenagrion interrogatum)	Unknown	Northern Appalachian/Boreal Forest	Unknown
Southern sprite (Nehalennia integricollis)	North Atlantic Coast	North Atlantic Coast	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Subarctic darner (Aeshna subarctica)				
	all	Palustrine	peatlands	bog/fen
Taper-tailed darner (Gomphaeschna antilope)				
	all	Palustrine	mineral soil wetland	mixed deciduous/coniferous
	all	Palustrine	peatlands	bog/fen
Forcipate emerald (Somatochlora forcipata)				

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Forcipate emerald (Somatochlora forcipata)				
	all	Palustrine	peatlands	bog/fen
Incurvate emerald (Somatochlora incurvata)				
	all	Palustrine	peatlands	bog/fen
Ebony boghaunter (Williamsonia fletcheri)				
	all	Palustrine	peatlands	bog/fen
Ringed boghaunter (Williamsonia lintneri)				
	all	Palustrine	peatlands	bog/fen
Yellow-sided skimmer (Libellula flavida)				
	all	Palustrine	peatlands	bog/fen
Black meadowhawk (Sympetrum danae)				
	all	Palustrine	mineral soil wetland	emergent marsh
	all	Palustrine	peatlands	bog/fen
Subarctic bluet (Coenagrion interrogatum)				
	all	Palustrine	peatlands	bog/fen
Southern sprite (Nehalennia integricollis)				
	all	Palustrine	peatlands	bog/fen

Goal and Objectives for Odonates of bogs/fens/ponds

Goal: Maintain a sufficient number of self-sustaining populations of these dragonflies and damselflies, at sites with protected habitat, to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species.

Measure: *Number of studies.*

Objective 2 : Maintain existing populations, and if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of these species at known, extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations that can be identified and accessed, and by conducting surveys to at least 25 bogs/fens in each basin and each ecoregion north of Long Island.

Measure: *Number of bogs/fens surveyed.*

Objective 5 : Obtain baseline distribution data by conducting surveys of all known historic locations that can be identified and accessed, and by conducting surveys to at least 5 bogs/fens in the North Atlantic Coast ecoregion.

Measure: *Number of bogs/fens surveyed.*

Objective 6 : Protect, manage, restore, monitor habitats occupied by these species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species at the site.*

Recommended Actions

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. It is expected that at least a few species will be recommended for listing and officially adding these species to the list would constitute a specific 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).

Recommended Actions

Statewide baseline survey:

* Most of these species are known from fewer than 10 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.

References

Glotzhober, R. C. and D. McShaffrey. 2002. The dragonflies and damselflies of Ohio. Bulletin of the Ohio Biological Survey, 14(2): 1-364.

Dunkle, S. W. 2000. Dragonflies through binoculars: A field guide to dragonflies of North America. Oxford Uni. Press. NY, NY. 266 pp.

Nikula, B, J. L. Loose, and M. R. Burne. 2003. A field guide to the dragonflies and damselflies of Massachusetts. MA Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 196 pp.

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Donnelly, T. W. 1992. The Odonata of New York. Bulletin of American Odonatology 1(1):1-27.

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Taxa Group: Insect

Species Group: Odonates of brackish marshes/lakes/ponds

Threats:

Little published information is available citing specific cases of negative impacts to brackish marsh odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. Examples include ditching, filling, eutrophication and changes in dissolved oxygen content, direct effects of pesticides (e.g. for mosquito control or from agricultural runoff), and other chemical contamination from runoff or discharge of agricultural, industrial or urban effluent.

Trends:

Both of these species have been collected or observed at fewer than 10 sites in New York State and there is virtually no information on population trends.

SEQR - No Action Alternative:

Without the indicated actions, the status of these species will remain uncertain and at least some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. There are many brackish marshes, lakes and ponds from the lower Hudson valley out to the eastern end of Long Island and many of these are on protected lands such as state or National Parks. Clarification of whether the species are widespread and abundant in these sites is needed before one could offer a better evaluation of what no action could lead t to.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Rambur's forktail (Ischnura ramburii)			S2	G5	U	Resident
Needham's skimmer (Libellula needhami)			S2S3	G5	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Needham's skimmer (Libellula needhami)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Rambur's forktail (Ischnura ramburii)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Needham's skimmer (Libellula needhami)	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast	North Atlantic Coast	Unknown
Rambur's forktail (Ischnura ramburii)	North Atlantic Coast	North Atlantic Coast	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Needham's skimmer (Libellula needhami)				
	all	Estuarine	intertidal	emergent marsh
	all	Palustrine	mineral soil wetland	emergent marsh
Rambur's forktail (Ischnura ramburii)				
	all	Estuarine	intertidal	emergent marsh
	all	Palustrine	mineral soil wetland	emergent marsh

Goal and Objectives for Odonates of brackish marshes/lakes/ponds

Goal: Maintain a sufficient number of self-sustaining populations of these dragonflies and damselflies, at sites with protected habitat, to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species.

Measure:

Objective 2 : Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of these species at known, extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations that can be identified and accessed, and by conducting surveys to at least 10 brackish marshes, ponds, and lakes in the Lower New England/Northern Piedmont ecoregion.

Measure: *Number of brackish marshes, ponds, and lakes surveyed.*

Objective 5 : Obtain baseline distribution data by conducting surveys of all known historic locations that can be identified and accessed, and by conducting surveys to at least 20 brackish marshes, ponds, and lakes in the North Atlantic Coast ecoregion.

Measure: *Number of brackish marshes, ponds, and lakes surveyed.*

Objective 6 : Protect, manage, restore, and monitor sites occupied by these species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

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. It is expected that either one or both of these species could be recommended for listing and officially adding these species to the list would constitute a specific 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:

* Both of these species are known from fewer than 10 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 (where brackish habitats occur - LNE and NAC ecoregions).

References

Dunkle, S. W. 2000. Dragonflies through binoculars: A field guide to dragonflies of North America. Oxford Uni. Press. NY, NY. 266 pp.

Nikula, B, J. L. Loose, and M. R. Burne. 2003. A field guide to the dragonflies and damselflies of Massachusetts. MA Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 196 pp.

Donnelly, T. W. 1999. The dragonflies and damselflies of New York. Prepared for the 1999 International Congress of Odonatology and 1st Worldwide Dragonfly Association. Colgate University, Hamilton, NY. 39 pp.

Donnelly, T. W. 1992. The Odonata of New York. Bulletin of American Odonatology 1(1):1-27.

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Taxa Group: Insect

Species Group: Odonates of coastal plain lakes/ponds

Threats:

Little published information is available citing specific cases of negative impacts to coastal plain pond odonates, but any activities which degrade the sensitive hydrology or water quality of these habitats would threaten populations of these odonates. Examples include ditching, filling, eutrophication and changes in dissolved oxygen content, direct effects of pesticides (e.g. for mosquito control or from agricultural runoff), and other chemical contamination from runoff or discharge of agricultural, industrial or urban effluent. Introduction of fish may be a threat as some of these species are thought to be restricted to, or reach their highest population levels in fishless ponds. Historically, coastal plain ponds dried out completely during occasional severe droughts, which prevented fish from establishing themselves in these ponds. Today, many ponds in the Central Pine Barrens never go completely dry due to deep holes dug at the edge of nearly all coastal plain ponds, and several species of fish introduced by the public are permanent pond residents. Off road vehicle use of pond shores and groundwater withdrawal have been noted as specific problems in New England and New York. At the present time, only a few public water supply wells are currently located near existing coastal plain ponds on Long Island so groundwater withdrawal may not be a major threat to existing ponds. Future new supply water wells could pose a threat, if located near the ponds. While groundwater sources are protected for the majority of ponds within the Central Pine Barrens Core Preserve, they are not protected for ponds in the Compatible Growth Area.

Trends:

Enallagma recurvatum has been found at nine sites on Long Island, while Enallagma pictum has been found at three sites, and Enallagma minusculum at just two sites. There is virtually no information on population trends at any of these sites. Although none of these species are absolutely restricted to coastal plain ponds in Rhode Island and Massachusetts they are predominantly coastal plain pond species (Brown pers. comm.) and all NY sites for E. pictum and E. recurvatum are coastal plain ponds. A fourth species, Enallagma laterale, co-occurs with the other three species on Long Island, but is even less restricted to coastal plain ponds and in NY has been found at several ponds in the Hudson Highlands so this species has been placed in the lakes/ponds habitat grouping.

SEQR - No Action Alternative:

Many of the known sites on Long Island are found on lands that are protected from further development such as state or county lands in the Central Pine Barrens and Long Pond Greenbelt. Groundwater sources are protected for many, but not all ponds so no action could result in the loss of damselfly populations at these unprotected ponds. Some sites are on private lands where the water quality may be at risk and populations could be lost from these sites as well. No action could also result in the loss of sites that have not yet been documented for these species. The loss of any existing populations could lead to the need for a change in listing status to Endangered or to a higher likelihood of eventual extirpation from the state.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Scarlet bluet (Enallagma pictum)			S1	G3	T	Resident
Little bluet (Enallagma minusculum)			S1	G3G4	T	Resident
Pine barrens bluet (Enallagma recurvatum)			S1S2	G3	T	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Pine barrens bluet (Enallagma recurvatum)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Little bluet (Enallagma minusculum)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Scarlet bluet (Enallagma pictum)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Pine barrens bluet (Enallagma recurvatum)	North Atlantic Coast	North Atlantic Coast	Unknown
Little bluet (Enallagma minusculum)	North Atlantic Coast	North Atlantic Coast	Unknown
Scarlet bluet (Enallagma pictum)	North Atlantic Coast	North Atlantic Coast	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Pine barrens bluet (Enallagma recurvatum)	all	Lacustrine	coastal plain	sand/gravel bottom
Little bluet (Enallagma minusculum)	all	Lacustrine	coastal plain	sand/gravel bottom
Scarlet bluet (Enallagma pictum)	all	Lacustrine	coastal plain	sand/gravel bottom

Goal and Objectives for Odonates of coastal plain lakes/ponds

Goal: Maintain a sufficient number of self-sustaining populations of these damselflies, at sites with protected habitat, to ensure the long term perpetuation of the species within their historic range in New York State.

Objective 1 : Increase our understanding of the ecology of these damselflies including habitat preferences and threats to the species.

Measure: *Number of studies completed.*

Objective 2 : Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these damselflies in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of the three threatened species at known extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance (compared to one another and to other sites in the species range such as MA and RI).*

Objective 4 : Obtain baseline distribution data by conducting surveys of at least 20 coastal plain ponds on Long Island (North Atlantic Coast ecoregion) where the three threatened species have not been documented.

Measure: *Number of coastal plain ponds surveyed.*

Objective 5 : Protect, manage, restore, and monitor coastal plain pond habitats occupied by these species.

Measure: *Number of ponds for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long term viability of the ponds.*

Recommended Actions

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.

Recommended Actions

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.

References

Central Pine Barrens Joint Planning and Policy Commission, Protected Lands Council. 2003. Ecological Principles for Management and Stewardship for tl Long Island Central Pine Barrens. Pages 21-28 (Freshwater Wetlands Section).

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Originator

Name: Paul Novak (28)
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Street: 625 Broadway
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Taxa Group: Insect

Species Group: Odonates of high elevation lakes

Threats:

No published information is available citing specific cases of negative impacts to this species or other lake dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. Examples include eutrophication and changes in dissolved oxygen content, direct effects of pesticides, increases in the sediment load of the lake (such as might result should logging occur down to the lake edge), chemical contamination by runoff of agricultural or other discharge, acidification of lakes by airborne industrial emissions, and possibly increased predation of larvae due to stocking of fish.

Trends:

This species have been collected just two times in New York State, both records are very old, and there is no information on population trends or whether the species is still present at those two sites.

SEQR - No Action Alternative:

Without the above actions, the status of this species will remain uncertain, and if still extant in the state, it could be in jeopardy of significant declines or extirpation form the state over the long-term. While the two records for this species are from protected state lands the species is not known to be extant at either and both locations could be sensitive to airborne emissions leading to increased acidification.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Ringed emerald (Somatochlora albicincta)			SH	G5	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Ringed emerald (Somatochlora albicincta)	Upper Hudson	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Ringed emerald (Somatochlora albicincta)	Northern Appalachian/Boreal Forest	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Ringed emerald (Somatochlora albicincta)				
	all	Lacustrine	cold water shallow	mud bottom
	all	Lacustrine	cold water shallow	sand/gravel bottom
	all	Palustrine	peatlands	bog/fen

Goal and Objectives for Odonates of high elevation lakes

Goal: Maintain a sufficient number of self-sustaining populations of this species at sites with protected habitat to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of this species including habitat preferences and threats to the species.

Measure: *Number of studies.*

Objective 2 : Maintain existing populations and, if needed and possible, establish or restore additional populations to ensure the long-term persistence of this species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of this species at any extant sites that are identified as a result of baseline distribution surveys.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys for Somatochlora albicincta at 2 historical locations and at least 10 other high elevation lakes/ponds in the Northern Appalachian Forest ecoregion.

Measure: *Number of lakes/ponds surveyed.*

Objective 5 : Obtain baseline distribution data by conducting surveys for Somatochlora cingulata to at least 5 lakes/ponds in the Catskills (High Allegany Plateau ecoregion). The lone historical record from that ecoregion is not from breeding habitat.

Measure: *Number of lakes/ponds surveyed.*

Objective 6 : Protect, manage, restore, and monitor sites occupied by this species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

Habitat research:

* Support and encourage habitat monitoring efforts that would complete the baseline assessment of habitat quality and threats.
* 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. It is possible that this species will be recommended for listing and officially adding the species to the list would constitute a specific action.

Population monitoring:

* Conduct surveys to obtain repeatable, relative abundance estimates for this species at any extant known sites where access permission to conduct surveys is obtained (as indicated in the State Wildlife Grant Odonate Inventory Project).

Statewide baseline survey:

* This species is known from just two locations in the state, and may no longer occur at those sites, but new populations may 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 this species at potential sites throughout the state.

References

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Taxa Group: Insect
Species Group: Odonates of lakes/ponds

Threats:
Little published information is available citing specific cases of negative impacts to these three species or other lake dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. Examples include eutrophication and changes in dissolved oxygen content, direct effects of pesticides, increases in the sediment load of the lake (such as might result should logging occur down to the lake edge), chemical contamination by runoff of agricultural or other discharge, acidification of lakes by airborne industrial emissions. Groundwater withdrawal is also a likely threat at pond/lake sites on Long Island.

Trends:
All five of these species have been collected or observed at fewer than 15 locations in New York State and there is virtually no information on population trends. Tetragoneuria semiaquea, Enallagma laterale, and Anax longipes may also be associated with coastal plain ponds, but were left in this grouping as they are not restricted to coastal plain ponds.

SEQR - No Action Alternative:
Without the indicated actions, the status of these species will remain uncertain and at least some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. There are many lakes and ponds across the state within the likely range of Aeshna mutata and Anax longipes including many on protected lands such as state or parks, state forests, or wildlife management areas. Several sites for Enallagma laterale are on protected lands. Clarification of whether the species are widespread and abundant in these protected sites is needed before one could evaluate the impact of no action. There are far fewer lakes and ponds on Long Island and some of these may be threatened by groundwater withdrawal or other detrimental actions so no action is more likely to have the potential to lead to extirpation of Tetragoneuria semiaquea.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
New England bluet (Enallagma laterale)			S2	G3	U	Resident
Lake emerald (Somatochlora cingulata)			S1	G5	U	Resident
Mantled baskettail (Tetragoneuria semiaquea)			SH	G4	U	Resident
Comet darner (Anax longipes)			S2	G5	U	Resident
Spatterdock darner (Aeshna mutata)			S2	G3G4	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Spatterdock darner (Aeshna mutata)	Susquehanna	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Susquehanna	Unknown
		Upper Hudson	Unknown
Comet darner (Anax longipes)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
	Susquehanna	Susquehanna	Unknown
		Upper Hudson	Unknown
Mantled baskettail (Tetragoneuria semiaquea)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Lake emerald (Somatochlora cingulata)	Upper Hudson	NE Lake Ontario - St. Lawrence	Unknown
		Upper Hudson	Unknown
New England bluet (Enallagma laterale)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
		Upper Hudson	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Spatterdock darner (Aeshna mutata)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
		Great Lakes	Unknown
Comet darner (Anax longipes)	Great Lakes	Great Lakes	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast	North Atlantic Coast	Unknown
Mantled baskettail (Tetragoneuria semiaquea)	North Atlantic Coast	North Atlantic Coast	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Lake emerald (Somatochlora cingulata)	High Allegheny Plateau	Northern Appalachian/Boreal Forest	Unknown
New England bluet (Enallagma laterale)	North Atlantic Coast	Lower New England Piedmont	Unknown
		North Atlantic Coast	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Spatterdock darner (Aeshna mutata)				
	all	Lacustrine	cold water shallow	mud bottom
	all	Lacustrine	warm water shallow	mud bottom
Comet darner (Anax longipes)				
	all	Lacustrine	coastal plain	mud bottom
	all	Lacustrine	coastal plain	sand/gravel bottom
	all	Lacustrine	warm water shallow	mud bottom
	all	Lacustrine	warm water shallow	sand/gravel bottom
Mantled baskettail (Tetragoneuria semiaquea)				
	all	Lacustrine	coastal plain	sand/gravel bottom
	all	Lacustrine	warm water shallow	sand/gravel bottom
Lake emerald (Somatochlora cingulata)				
	all	Lacustrine	cold water deep	mud bottom
	all	Lacustrine	cold water deep	sand/gravel bottom
	all	Lacustrine	cold water shallow	mud bottom
	all	Lacustrine	cold water shallow	sand/gravel bottom
New England bluet (Enallagma laterale)				
	all	Lacustrine	coastal plain	sand/gravel bottom
	all	Palustrine	mineral soil wetland	pond/lake shore

Goal and Objectives for Odonates of lakes/ponds

Goal: Maintain a sufficient number of self-sustaining populations of these dragonflies and damselflies, at sites with protected habitat, to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species.

Measure: *Number of studies.*

Objective 2 : Obtain baseline distribution data by conducting surveys in the vicinity of the known historic record (Slide Mountain) for Somatochlora cingulata in the Lower New England ecoregion.

Measure: *Number of lakes/ponds surveyed.*

Objective 3 : Obtain baseline distribution data by conducting surveys in the vicinity of the two recent records for Somatochlora cingulata (records may not be from the breeding habitat) and at least 10 other lakes in the Northern Appalachian ecoregion.

Measure: *Number of lakes/ponds surveyed.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations for Aeshna mutata and Anax longipes that can be identified and accessed in the High Allegany, Lower New England, and Great Lakes ecoregions.

Measure:

Objective 5 : Obtain baseline distribution data by conducting surveys of all known historic locations for Aetna mutate, Amax loonies, and Enflame lateral that can be identified and accessed in the High Allegheny, Lower New England, and Great Lakes ecoregions.

Measure: *Number of lakes/ponds surveyed.*

Objective 6 : Obtain baseline distribution data by conducting surveys of all known historic locations in the North Atlantic Coastal Plain ecoregion for Anax longipes, Tetragoneuria semiaquea and Enallagma laterale that can be identified and accessed .

Measure: *Number of lakes/ponds surveyed.*

Objective 7 : Obtain baseline distribution data by conducting surveys of at least 25 other locations for Aeshna mutata, Anax longipes, and Enallagma laterale in the High Allegany, Lower New England, and Great Lakes ecoregions.

Measure: *Number of lakes/ponds surveyed.*

Objective 8 : Protect, manage, restore, and monitor sites occupied by these species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

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.

Life history research:

* In some locations, Anax longipes is thought to be either episodic or migratory with many of the sight records being from locations that do not support actual populations where the larvae over winter. However, it is clearly resident in at least one location in Albany County where over-wintering larvae have been documented. Surveys for this species need to take this situation into account and incorporate larval sampling. This will add to our knowledge of the life history of this species.

New regulation:

* Recommendations for official state endangered, threatened, and special concern listing are an anticipated result of the statewide inventory. It is expected that one or more of these species may be recommended for listing and officially adding these species to the list would constitute a specific 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 five 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.

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Taxa Group: Insect
Species Group: Odonates of rivers/streams

Threats:
Little published information is available citing specific cases of negative impacts to the various species of river dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. The most important likely negative impacts would come from changes in the natural hydrology such as the building of dams, increases in the sediment load of the river (such as might result should logging occur down to the river edge), changes in dissolved oxygen content, direct effects of pesticides, and chemical contamination by runoff of agricultural or other discharge.

Trends:
Most of these species are known from fewer than 10 locations in New York State and there is virtually no information on population trends. Although several species have been found in a number of previously undocumented locations these new finds almost certainly reflect a new interest in looking for these species rather than a population increase or range expansion. At least two species, Calopteryx dimidiata and Calopteryx angustipennis are quite possibly extirpated from the state.

SEQR - No Action Alternative:
Without the indicated actions, the status of these species will remain uncertain and at least some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. While there are many rivers and stream located throughout the state a large number of these have been impacted by the construction of dams, increased sedimentation, channelization, and other impacts and few if any are well protected from various threats over long reaches. Some of these species probably have quite restricted distributions within the state and some may be restricted to rivers and streams in specific size ranges (e.g. large rivers). Clarification of species distributions are needed before one could evaluate the likely result of no action.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Pygmy snaketail (Ophiogomphus howei)			S1	G3	U SC	Resident
Septima's clubtail (Gomphus septima)			S1	G2	U SC	Resident
Cobra clubtail (Gomphus vastus)			SH	G5	U	Resident
Skillet clubtail (Gomphus ventricosus)			SH	G3	U	Resident
Rapids clubtail (Gomphus quadricolor)			S1S2	G3G4	U	Resident
Spine-crowned clubtail (Gomphus abbreviatus)			S2S3	G3G4	U	Resident
Green-faced clubtail (Gomphus viridifrons)			S1	G3	U	Resident
Extra-striped snaketail (Ophiogomphus anomalus)			S1	G3	U SC	Resident
Midland clubtail (Gomphus fraternus)			S1S3	G5	U	Resident
Boreal snaketail (Ophiogomphus colubrinus)			S1	G5	U	Resident

Arrow clubtail (Stylurus spiniceps)	S3	G5	U	Resident
Common sanddragon (Progomphus obscurus)	S1	G5	U SC	Resident
Appalachian jewelwing (Calopteryx angustipennis)	SH	G4	U	Unknown
Sparkling jewelwing (Calopteryx dimidiata)	SH	G5	U	Resident
American rubyspot (Hetaerina americana)	S2S3	G5	U	Resident
Blue-tipped dancer (Argia tibialis)	S1	G5	U	Resident
Riverine clubtail (Stylurus amnicola)	SH	G4	U	Resident
Elusive clubtail (Stylurus notatus)	SH	G3	U	Resident
Russet-tipped clubtail (Stylurus plagiatus)	S1	G5	U	Resident
Brook snaketail (Ophiogomphus aspersus)	S2	G3G4	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Midland clubtail (Gomphus fraternus)	Lake Erie	SE Lake Ontario	Unknown
	SE Lake Ontario	Upper Hudson	Unknown
		SW Lake Ontario	Unknown
Septima's clubtail (Gomphus septima)		Delaware	Unknown
		Upper Hudson	Unknown
Cobra clubtail (Gomphus vastus)	Susquehanna	Susquehanna	Unknown
	Upper Hudson	Susquehanna	Unknown
Skillet clubtail (Gomphus ventricosus)	NE Lake Ontario - St. Lawrence	Unknown	Unknown
	Upper Hudson		
Rapids clubtail (Gomphus quadricolor)	SE Lake Ontario	Delaware	Unknown
	Susquehanna	Lake Champlain	Unknown
	Upper Hudson	NE Lake Ontario - St. Lawrence	Unknown
		SE Lake Ontario	Unknown
		Susquehanna	Unknown
		Upper Hudson	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Spine-crowned clubtail (Gomphus abbreviatus)	Delaware	Delaware	Unknown
	SE Lake Ontario	Lower Hudson - Long Island Bays	Unknown
	Lower Hudson - Long Island Bays	Susquehanna	Unknown
	Susquehanna		
Green-faced clubtail (Gomphus viridifrons)	Delaware	Delaware	Unknown
Extra-striped snaketail (Ophiogomphus anomalus)	Delaware	Delaware	Unknown
		NE Lake Ontario - St. Lawrence	Unknown
		Upper Hudson	Unknown
Brook snaketail (Ophiogomphus aspersus)	Delaware	Delaware	Unknown
	Lower Hudson - Long Island Bays	Lake Champlain	Unknown
	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Unknown
	Upper Hudson	Upper Hudson	Unknown
Boreal snaketail (Ophiogomphus colubrinus)	Unknown	Lake Champlain	Unknown
Pygmy snaketail (Ophiogomphus howei)	Susquehanna	Upper Hudson	Unknown
Common sanddragon (Progomphus obscurus)	Lower Hudson - Long Island Bays	Upper Hudson	Unknown
Appalachian jewelwing (Calopteryx angustipennis)	Lower Hudson - Long Island Bays	Unknown	Unknown
Sparkling jewelwing (Calopteryx dimidiata)	Lower Hudson - Long Island Bays	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
American rubyspot (Hetaerina americana)	Allegheny	Allegheny	Unknown
	Lake Champlain	Delaware	Unknown
	Lake Erie	Lake Champlain	Unknown
	SE Lake Ontario	Lake Erie	Unknown
	Susquehanna	SE Lake Ontario	Unknown
	Upper Hudson	Susquehanna	Unknown
		SW Lake Ontario	Unknown
		Upper Hudson	Unknown
Blue-tipped dancer (Argia tibialis)	Upper Hudson	Lake Erie	Unknown
		SE Lake Ontario	Unknown
		SW Lake Ontario	Unknown
		Upper Hudson	Unknown
Riverine clubtail (Stylurus amnicola)	Upper Hudson	Unknown	Unknown
Elusive clubtail (Stylurus notatus)	Lake Champlain	Unknown	Unknown
	SE Lake Ontario		
	SW Lake Ontario		
Russet-tipped clubtail (Stylurus plagiatus)	Lake Champlain	Upper Hudson	Unknown
	Lower Hudson - Long Island Bays		
	Upper Hudson		
Arrow clubtail (Stylurus spiniceps)	SE Lake Ontario	Delaware	Unknown
	Susquehanna	Lake Champlain	Unknown
	Upper Hudson	NE Lake Ontario - St. Lawrence	Unknown
		Susquehanna	Unknown
		SW Lake Ontario	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Midland clubtail (Gomphus fraternus)	Great Lakes	Great Lakes	Unknown
		Lower New England Piedmont	Unknown
Septima's clubtail (Gomphus septima)		High Allegheny Plateau	Unknown
Cobra clubtail (Gomphus vastus)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
Skillet clubtail (Gomphus ventricosus)	Lower New England Piedmont	Unknown	Unknown
	Northern Appalachian/Boreal Forest		
Rapids clubtail (Gomphus quadricolor)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Great Lakes	Great Lakes	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
		St. Lawrence-Lake Champlain Valley	Unknown
Spine-crowned clubtail (Gomphus abbreviatus)	Great Lakes	Lower New England Piedmont	Unknown
	Lower New England Piedmont	High Allegheny Plateau	Unknown
	High Allegheny Plateau		
Green-faced clubtail (Gomphus viridifrons)	High Allegheny Plateau	High Allegheny Plateau	Unknown
Extra-striped snaketail (Ophiogomphus anomalus)	High Allegheny Plateau	High Allegheny Plateau	Unknown
		Northern Appalachian/Boreal Forest	Unknown
		St. Lawrence-Lake Champlain Valley	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Brook snaketail (Ophiogomphus aspersus)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Northern Appalachian/Boreal Forest	Lower New England Piedmont	Unknown
	North Atlantic Coast	Northern Appalachian/Boreal Forest	Unknown
		St. Lawrence-Lake Champlain Valley	Unknown
Boreal snaketail (Ophiogomphus colubrinus)	Unknown	Northern Appalachian/Boreal Forest	Unknown
Pygmy snaketail (Ophiogomphus howei)	High Allegheny Plateau	Northern Appalachian/Boreal Forest	Unknown
Common sanddragon (Progomphus obscurus)	North Atlantic Coast	Northern Appalachian/Boreal Forest	Unknown
Appalachian jewelwing (Calopteryx angustipennis)	Lower New England Piedmont	Unknown	Unknown
Sparkling jewelwing (Calopteryx dimidiata)	Lower New England Piedmont	Unknown	Unknown
American rubyspot (Hetaerina americana)	Great Lakes	Great Lakes	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	St. Lawrence-Lake Champlain Valley	Northern Appalachian/Boreal Forest	Unknown
		St. Lawrence-Lake Champlain Valley	Unknown
		Western Allegheny Plateau	Unknown
Blue-tipped dancer (Argia tibialis)	Lower New England Piedmont	Great Lakes	Unknown
		High Allegheny Plateau	Unknown
		Lower New England Piedmont	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Riverine clubtail (Stylurus amnicola)	Lower New England Piedmont	Unknown	Unknown
Elusive clubtail (Stylurus notatus)	Great Lakes	Unknown	Unknown
	St. Lawrence-Lake Champlain Valley		
Russet-tipped clubtail (Stylurus plagiatus)	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast		
	Northern Appalachian/Boreal Forest		
Arrow clubtail (Stylurus spiniceps)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Great Lakes	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
		St. Lawrence-Lake Champlain Valley	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Midland clubtail (Gomphus fraternus)				
	all	Lacustrine	warm water shallow	mud bottom
	all	Lacustrine	warm water shallow	sand/gravel bottom
	all	Riverine	warmwater stream	mud bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Septima's clubtail (Gomphus septima)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Cobra clubtail (Gomphus vastus)				
	all	Riverine	warmwater stream	mud bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Skillet clubtail (Gomphus ventricosus)				
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	sand/gravel bottom

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Skillet clubtail (Gomphus ventricosus)				
	all	Riverine	warmwater stream	mud bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Rapids clubtail (Gomphus quadricolor)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Spine-crowned clubtail (Gomphus abbreviatus)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Green-faced clubtail (Gomphus viridifrons)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Extra-striped snaketail (Ophiogomphus anomalus)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Brook snaketail (Ophiogomphus aspersus)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Boreal snaketail (Ophiogomphus colubrinus)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Pygmy snaketail (Ophiogomphus howei)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Common sanddragon (Progomphus obscurus)				
	all	Lacustrine	coastal plain	sand/gravel bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Appalachian jewelwing (Calopteryx angustipennis)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Sparkling jewelwing (Calopteryx dimidiata)				
	all	Riverine	coldwater stream	sand/gravel bottom
	all	Riverine	warmwater stream	sand/gravel bottom
American rubyspot (Hetaerina americana)				
	all	Riverine	coldwater stream	rocky bottom

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
American rubyspot (Hetaerina americana)				
	all	Riverine	coldwater stream	sand/gravel bottom
	all	Riverine	warmwater stream	rocky bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Blue-tipped dancer (Argia tibialis)				
	all	Riverine	warmwater stream	mud bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Riverine clubtail (Stylurus amnicola)				
	all	Riverine	deepwater river	sand/gravel bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Elusive clubtail (Stylurus notatus)				
	all	Riverine	deepwater river	sand/gravel bottom
	all	Riverine	warmwater stream	sand/gravel bottom
Russet-tipped clubtail (Stylurus plagiatus)				
		Riverine	warmwater stream	mud bottom
		Riverine	warmwater stream	sand/gravel bottom
	all	Riverine	deepwater river	mud bottom
	all	Riverine	deepwater river	sand/gravel bottom
Arrow clubtail (Stylurus spiniceps)				
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	sand/gravel bottom
	all	Riverine	warmwater stream	mud bottom
	all	Riverine	warmwater stream	sand/gravel bottom

Goal and Objectives for Odonates of rivers/streams

Goal: Maintain a sufficient number of self-sustaining populations of these dragonflies and damselflies, at sites with protected habitat, to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species

Measure: *Number of studies.*

Objective 2 : maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of these species at known extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations that can be identified and accessed, and by conducting surveys to at least 20 rivers and streams in each basin.

Measure: *Number of rivers/streams surveyed.*

Objective 5 : Protect, manage, restore, and monitor sites occupied by these species

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

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. It is expected that at least a few species will be recommended for listing and officially adding these species to the list would constitute a concrete action. Four of the species are currently listed as Special Concern, but it is possible a change in their listing status may be warranted following additional surveys.

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).

Recommended Actions

Statewide baseline survey:

* Most of these species are known from fewer than 10 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.

References

Glotzhober, R. C. and D. McShaffrey. 2002. The dragonflies and damselflies of Ohio. Bulletin of the Ohio Biological Survey, 14(2): 1-364.

Dunkle, S. W. 2000. Dragonflies through binoculars: A field guide to dragonflies of North America. Oxford Uni. Press. NY, NY. 266 pp.

Nikula, B, J. L. Loose, and M. R. Burne. 2003. A field guide to the dragonflies and damselflies of Massachusetts. MA Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 196 pp.

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Donnelly, T. W. 1992. The Odonata of New York. Bulletin of American Odonatology 1(1):1-27.

Originator

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Taxa Group: Insect

Species Group: Odonates of seeps/rivulets

Threats:

Since seepage areas are key areas for these species for oviposition, any activities that alter the groundwater seepages in an area would be a threat to these species. Little published information is available citing specific cases of negative impacts to the various species of stream and seepage dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. The most important likely negative impacts would come from changes in the natural hydrology such as the building of dams, increases in the sediment load of the seepage or associated stream (such as might result should logging occur down to the stream edge), changes in dissolved oxygen content, direct effects of pesticides, and chemical contamination by runoff of agricultural or other discharge.

Trends:

Three of these species are known from fewer than 10 locations in New York State while the fourth (Cordulegaster obliqua), is known from fewer than 15 locations, and there is virtually no information on population trends for any of the species. Although three of the species have been found in a number of previously undocumented locations in recent years, these new finds almost certainly reflect a new interest in looking for these species rather than a population increase or range expansion, and the fourth species (Argia bipunctulata) has not been documented in the state since the early 1900s.

SEQR - No Action Alternative:

Without the indicated actions, the status of these species will remain uncertain and at least some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. While seepage areas feeding into small streams are located throughout the state the actual status of these species is unclear. Cordulegaster erronea and Argia bipunctulata appear to have, or are expected to have, very restricted ranges within the state and all four species are quite habitat specific. Clarification of species distributions are needed before one could evaluate the consequences of no action.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Seepage dancer (Argia bipunctulata)			SH	G4	U	Resident
Arrowhead spiketail (Cordulegaster obliqua)			S2S3	G4	U	Resident
Tiger spiketail (Cordulegaster erronea)			S1	G4	U	Resident
Gray petaltail (Tachopteryx thoreyi)			S2	G4	U SC	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Gray petaltail (Tachopteryx thoreyi)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
	SW Lake Ontario	SW Lake Ontario	Unknown
	Upper Hudson		
	NE Lake Ontario - St. Lawrence		
Tiger spiketail (Cordulegaster erronea)	Lake Champlain	Lower Hudson - Long Island Bays	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
		Upper Hudson	Unknown
Arrowhead spiketail (Cordulegaster obliqua)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
	Susquehanna	SE Lake Ontario	Unknown
		SW Lake Ontario	Unknown
		Susquehanna	Unknown
Seepage dancer (Argia bipunctulata)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Gray petaltail (Tachopteryx thoreyi)	Great Lakes	Great Lakes	Unknown
	Northern Appalachian/Boreal Forest	Lower New England Piedmont	Unknown
	Lower New England Piedmont		
Tiger spiketail (Cordulegaster erronea)	Northern Appalachian/Boreal Forest	Lower New England Piedmont	Unknown
	Great Lakes	Great Lakes	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Arrowhead spiketail (Cordulegaster obliqua)	High Allegheny Plateau	Great Lakes	Unknown
	Lower New England Piedmont	High Allegheny Plateau	Unknown
	North Atlantic Coast	Lower New England Piedmont	Unknown
Seepage dancer (Argia bipunctulata)	Unknown	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Gray petaltail (Tachopteryx thoreyi)				
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Tiger spiketail (Cordulegaster erronea)				
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Arrowhead spiketail (Cordulegaster obliqua)				
	all	Riverine	coldwater stream	mud bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Seepage dancer (Argia bipunctulata)				
	all	Palustrine	mineral soil wetland	pond/lake shore
	all	Palustrine	peatlands	bog/fen

Goal and Objectives for Odonates of seeps/rivulets

Goal: Maintain a sufficient number of self-sustaining populations of these dragonflies, at sites with protected habitat, to ensure the long term perpetuation of the species in New York State.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species.

Measure:

Objective 2 : Maintain existing populations and, if needed and possible, establish or restore additional populations to ensure long-term persistence of these species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of these species at known extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations that have not been reconfirmed and can be identified and accessed.

Measure: *Number of seepage areas surveyed.*

Objective 5 : Obtain baseline distribution data by conducting surveys of at least 10 seepage areas in the North Atlantic Coast ecoregion for Argia bipunctulata (this species has been found in nearby NJ).

Measure: *Number of seepage areas surveyed.*

Objective 6 : Obtain baseline distribution data by conducting surveys of at least 20 seepage areas with associated streams in each ecoregion with recent records for the three species that have recent records (Lower New England, Great Lakes, High Allegany).

Measure: *Number of seepage areas surveyed.*

Objective 7 : Protect, manage, restore, and monitor sites occupied by these species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

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.

Recommended Actions

New regulation:

* Recommendations for official state endangered, threatened, and special concern listing are an anticipated result of the statewide inventory. The gray petaltail, tachopteryx thoreyi 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.

References

Glotzhober, R. C. and D. McShaffrey. 2002. The dragonflies and damselflies of Ohio. Bulletin of the Ohio Biological Survey, 14(2): 1-364.

Dunkle, S. W. 2000. Dragonflies through binoculars: A field guide to dragonflies of North America. Oxford Uni. Press. NY, NY. 266 pp.

Nikula, B, J. L. Loose, and M. R. Burne. 2003. A field guide to the dragonflies and damselflies of Massachusetts. MA Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 196 pp.

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Donnelly, T. W. 1992. The Odonata of New York. Bulletin of American Odonatology 1(1):1-27.

Originator

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Taxa Group: Insect

Species Group: Odonates of small forest streams

Threats:

Little published information is available citing specific cases of negative impacts to the various species of stream dwelling odonates, but any activities which degrade the sensitive hydrology of these habitats would threaten populations of these species. The most important likely negative impacts would come from changes in the natural hydrology such as the building of dams, increases in the sediment load of the river (such as might result should logging occur down to the lake edge), changes in dissolved oxygen content, direct effects of pesticides, and chemical contamination by runoff of agricultural or other discharge.

Trends:

All three of these species are known from fewer than 10 locations in New York State and there is virtually no information on population trends for any of the species. Although all three species have been found in a few previously undocumented locations in recent years, these new finds almost certainly reflect a new interest in looking for these species rather than a population increase or range expansion.

SEQR - No Action Alternative:

Without the indicated actions, the status of these species will remain uncertain and one or more some species would probably be in jeopardy of significant population declines and possibly extirpation from the state over the long-term. While there are a great many small forest streams located throughout the state a large number of these have been impacted by the construction of dams, increased sedimentation, channelization, and other impacts. At least two of these species probably have quite restricted distributions within the state and therefore may not be found in a large number of locations. Clarification of species distributions are needed before one could evaluate the consequences of no action.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Ocellated emerald (Somatochlora minor)			S2S3	G5	U	Resident
Mocha emerald (Somatochlora linearis)			S2S3	G5	U	Resident
Sable clubtail (Gomphus rogersi)			S1	G4	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Sable clubtail (Gomphus rogersi)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Mocha emerald (Somatochlora linearis)	SE Lake Ontario	Upper Hudson	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Allegheny		
	Lake Erie		
Ocellated emerald (Somatochlora minor)	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Unknown
		Upper Hudson	Unknown
		SE Lake Ontario	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Sable clubtail (Gomphus rogersi)	Lower New England Piedmont	Lower New England Piedmont	Unknown
Mocha emerald (Somatochlora linearis)	Great Lakes	Lower New England Piedmont	Unknown
	High Allegheny Plateau		
	North Atlantic Coast		
Ocellated emerald (Somatochlora minor)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Sable clubtail (Gomphus rogersi)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Mocha emerald (Somatochlora linearis)				
	all	Riverine	coldwater stream	rocky bottom
	all	Riverine	coldwater stream	sand/gravel bottom
Ocellated emerald (Somatochlora minor)				
	all	Riverine	coldwater stream	sand/gravel bottom

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Ocellated emerald (Somatochlora minor)				

Goal and Objectives for Odonates of small forest streams

Goal: Document the current distribution of the small forest stream odonates in New York State and determine which species warrant official state listing and more specific conservation actions.

Objective 1 : Increase our understanding of the ecology of these species including habitat preferences and threats to the species.

Measure: *Number of studies.*

Objective 2 : Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these species in New York State.

Measure: *Number of maintained/established populations.*

Objective 3 : Obtain baseline data on the relative abundance of these species at known extant sites where access permission can be obtained.

Measure: *Estimates of relative abundance.*

Objective 4 : Obtain baseline distribution data by conducting surveys of all known historic locations that have not been reconfirmed and can be identified and accessed.

Measure: *Number of streams surveyed.*

Objective 5 : Obtain baseline distribution data by conducting surveys of at least 20 small forest streams in each basin with recent or historical records for the species.

Measure: *Number of streams surveyed.*

Objective 6 : Protect, manage, restore, and monitor sites occupied by these species.

Measure: *Number of sites for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long-term viability of the species.*

Recommended Actions

Recommended Actions

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. It is expected that one or more of these species will be recommended for listing and officially adding these species to the list would constitute a specific 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 three of these species are known from fewer than 10 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.

References

Glotzhober, R. C. and D. McShaffrey. 2002. The dragonflies and damselflies of Ohio. Bulletin of the Ohio Biological Survey, 14(2): 1-364.

Dunkle, S. W. 2000. Dragonflies through binoculars: A field guide to dragonflies of North America. Oxford Uni. Press. NY, NY. 266 pp.

Nikula, B, J. L. Loose, and M. R. Burne. 2003. A field guide to the dragonflies and damselflies of Massachusetts. MA Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 196 pp.

Donnelly, T. W. 1999. The dragonflies and damselflies of New York. Prepared for the 1999 International Congress of Odonatology and 1st Worldwide Dragonfly Association. Colgate University, Hamilton, NY. 39 pp.

Donnelly, T. W. 1992. The Odonata of New York. Bulletin of American Odonatology 1(1):1-27.

Originator

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Phone: (518) 402-8953
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Taxa Group: Insect
Species Group: Other butterflies

Threats:
Habitat loss and degradation caused by land development, the use of chemical controls (diflubenzuron and in agriculture) and fire (ill-conceived burns or suppressing natural fires) are the major threats to butterfly populations.

Competition is another threat, as is the case with Erynnis martialis and deer for the food plant Ceanothus americanus.

Succession, the increasing number of exotic species and Gypsy moth sprayings also pose threats. Pyrgus wyandot is especially threatened by Gypsy moth sprayings.

For some species it is unclear what is causing the decline in numbers (Pontia protodice).

Trends:
There is a general consensus that most species are on the decline. Many of these species have not been documented recently so there is little information on actual numbers, but it is believed that Phyciodes batesii batesii is probably extirpated from most locations in New York. Some species are experiencing recent, rapid decline while the decline among others has been more gradual.

SEQR - No Action Alternative:
Severe decline and possible extirpation of most or all species.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Bog elfin (Callophrys lanoraieensis)			S1	G3G4	U	Resident
Persius duskywing (Erynnis persius persius)			SH	G5T2T3	E	Resident
Southern grizzled skipper (Pyrgus wyandot)			SH	G2	E	Resident
Arogos skipper (Atrytone arogos arogos)			SH	G3G4T1T2	E	Resident
Brazilian skipper (Calpodes ethlius)			SH	G5	U	Migratory
Olympia marble (Euchloe olympia)			S1	G4G5	U SC	Resident
Hessel's hairstreak (Callophrys hesseli)			S1	G3G4	E	Resident
Mottled duskywing (Erynnis martialis)			S1S2	G3G4	U SC	Resident
Henry's elfin (Callophrys henrici)			S2S3	G5	U SC	Resident
Jutta arctic (Oeneis jutta)			S1	G5	U	Resident
Northern oak hairstreak (Fixsenia favonius ontario			S1S3	G4T4	U	Resident
Silvery blue (Glaucopsyche lygdamus lygdamus)			SH	G5T4	U	Resident

Northern metalmark (Calephelis borealis)	SH	G3G4	U	Resident
Regal fritillary (Speyeria idalia)	SH	G3	E	Resident
Gorgone checkerspot (Chlosyne gorgone)	S1	G5	U	Resident
Checkered white (Pontia protodice)	SNA	G4	U SC	Resident
Tawny crescent (Phyciodes batesii batesii)	SH	G4T1	U SC	Resident
Frosted elfin (Callophrys irus)	S1S3	G3	T	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Mottled duskywing (Erynnis martialis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
	Upper Hudson	Upper Hudson	Decreasing
	SE Lake Ontario	Delaware	Decreasing
	Lake Erie	NE Lake Ontario - St. Lawrence	Decreasing
	Susquehanna	SE Lake Ontario	Decreasing
	NE Lake Ontario - St. Lawrence	Lake Champlain	Decreasing
	Lake Champlain	SW Lake Ontario	Decreasing
	SW Lake Ontario	Lake Erie	Decreasing
	Delaware	Susquehanna	Decreasing
Persius duskywing (Erynnis persius persius)	Upper Hudson	Lake Champlain	Unknown
	Lower Hudson - Long Island Bays	Upper Hudson	Unknown
	Lake Champlain	Delaware	Unknown
	Delaware	Susquehanna	Unknown
	Susquehanna	SE Lake Ontario	Unknown
	SE Lake Ontario	SW Lake Ontario	Unknown
	SW Lake Ontario	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Southern grizzled skipper (Pyrgus wyandot)	Delaware	Lake Erie	Unknown
	Lake Erie	Lower Hudson - Long Island Bays	Unknown
	Susquehanna	SE Lake Ontario	Unknown
	SE Lake Ontario	Susquehanna	Unknown
	Lower Hudson - Long Island Bays		
Arogos skipper (Atrytone arogos arogos)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
Brazilian skipper (Calpodes ethlius)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
Olympia marble (Euchloe olympia)	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Decreasing
Hessel's hairstreak (Callophrys hesseli)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
Frosted elfin (Callophrys irus)	Upper Hudson	Lower Hudson - Long Island Bays	Decreasing
	Lower Hudson - Long Island Bays	Upper Hudson	Decreasing
	Delaware	Delaware	Decreasing
	Susquehanna	Susquehanna	Decreasing
	SE Lake Ontario	SE Lake Ontario	Decreasing
Henry's elfin (Callophrys henrici)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
	Delaware	Delaware	Unknown
	Susquehanna	Susquehanna	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
Bog elfin (Callophrys lanoraieensis)	SE Lake Ontario	SE Lake Ontario	Decreasing

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Northern oak hairstreak (Fixsenia favonius ontario)	Upper Hudson	Lower Hudson - Long Island Bays	Stable
	Lower Hudson - Long Island Bays	SE Lake Ontario	Stable
	SE Lake Ontario	Upper Hudson	Stable
Silvery blue (Glaucopsyche lygdamus lygdamus)	Upper Hudson	Upper Hudson	Decreasing
	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Decreasing
	Susquehanna	Susquehanna	Decreasing
	SE Lake Ontario	SE Lake Ontario	Decreasing
	Lake Champlain	Lake Champlain	Decreasing
Northern metalmark (Calephelis borealis)	Lower Hudson - Long Island Bays	Upper Hudson	Decreasing
	Upper Hudson		
Regal fritillary (Speyeria idalia)	Susquehanna	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Delaware	Unknown
	Lower Hudson - Long Island Bays	Upper Hudson	Unknown
	Delaware	Susquehanna	Unknown
	Allegheny		
Gorgone checkerspot (Chlosyne gorgone)	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Decreasing
Checkered white (Pontia protodice)	Lake Erie	Lake Erie	Decreasing
	Upper Hudson	Upper Hudson	Decreasing
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
	SE Lake Ontario	SW Lake Ontario	Decreasing
	SW Lake Ontario	SE Lake Ontario	Decreasing

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Tawny crescent (Phyciodes batesii batesii)	Lake Champlain	Lake Champlain	Decreasing
	SE Lake Ontario	Upper Hudson	Decreasing
	Upper Hudson	Delaware	Decreasing
	Delaware	Susquehanna	Decreasing
	Susquehanna	SE Lake Ontario	Decreasing
	Allegheny	Allegheny	Decreasing
Jutta arctic (Oeneis jutta)	Lake Champlain	Lake Champlain	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Mottled duskywing (Erynnis martialis)	North Atlantic Coast	Great Lakes	Decreasing
	Great Lakes	Northern Appalachian/Boreal Forest	Decreasing
	Lower New England Piedmont	St. Lawrence-Lake Champlain Valley	Decreasing
	High Allegheny Plateau	High Allegheny Plateau	Decreasing
	St. Lawrence-Lake Champlain Valley	Lower New England Piedmont	Decreasing
	Northern Appalachian/Boreal Forest	North Atlantic Coast	Decreasing
Persius duskywing (Erynnis persius persius)	North Atlantic Coast	Northern Appalachian/Boreal Forest	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Great Lakes	Great Lakes	Unknown
	Northern Appalachian/Boreal Forest	North Atlantic Coast	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Southern grizzled skipper (Pyrgus wyandot)	High Allegheny Plateau	Great Lakes	Unknown
	Great Lakes	North Atlantic Coast	Unknown
	North Atlantic Coast	High Allegheny Plateau	Unknown
Arogos skipper (Atrytone arogos arogos)	North Atlantic Coast	North Atlantic Coast	Decreasing
Brazilian skipper (Calpodes ethlius)	North Atlantic Coast	North Atlantic Coast	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
Olympia marble (Euchloe olympia)	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Decreasing
Hessel's hairstreak (Callophrys hesseli)	North Atlantic Coast	North Atlantic Coast	Decreasing
Frosted elfin (Callophrys irus)	Lower New England Piedmont	Great Lakes	Decreasing
	Great Lakes	High Allegheny Plateau	Decreasing
	High Allegheny Plateau	Lower New England Piedmont	Decreasing
	North Atlantic Coast	North Atlantic Coast	Decreasing
Henry's elfin (Callophrys henrici)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast	North Atlantic Coast	Unknown
	Great Lakes	Great Lakes	Unknown
Bog elfin (Callophrys lanoraieensis)	Great Lakes	Great Lakes	Decreasing
Northern oak hairstreak (Fixsenia favonius ontario)	Great Lakes	Great Lakes	Stable
	North Atlantic Coast	Lower New England Piedmont	Stable
	Lower New England Piedmont	North Atlantic Coast	Stable

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Silvery blue (Glaucopsyche lygdamus lygdamus)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Decreasing
	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Decreasing
	Great Lakes	Great Lakes	Decreasing
	High Allegheny Plateau	High Allegheny Plateau	Decreasing
	Lower New England Piedmont	Lower New England Piedmont	Decreasing
Northern metalmark (Calephelis borealis)	North Atlantic Coast	Lower New England Piedmont	Decreasing
	Lower New England Piedmont		
Regal fritillary (Speyeria idalia)	Western Allegheny Plateau	North Atlantic Coast	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
	North Atlantic Coast	Western Allegheny Plateau	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
Gorgone checkerspot (Chlosyne gorgone)	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Decreasing
	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Decreasing
Checkered white (Pontia protodice)	Great Lakes	Great Lakes	Decreasing
	Lower New England Piedmont	Lower New England Piedmont	Decreasing
	North Atlantic Coast	North Atlantic Coast	Decreasing
Tawny crescent (Phyciodes batesii batesii)	Northern Appalachian/Boreal Forest	High Allegheny Plateau	Decreasing
	Lower New England Piedmont	Lower New England Piedmont	Decreasing
	Great Lakes	Great Lakes	Decreasing
	High Allegheny Plateau	Northern Appalachian/Boreal Forest	Decreasing

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Jutta arctic (Oeneis jutta)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Mottled duskywing (Erynnis martialis)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	open upland	grasslands
Persius duskywing (Erynnis persius persius)				
	all	Palustrine	mineral soil wetland	shrub swamp
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
Southern grizzled skipper (Pyrgus wyandot)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	forested	southern deciduous
	all	Terrestrial	open upland	cliffs & open talus
	all	Terrestrial	open upland	grasslands
Arogos skipper (Atrytone arogos arogos)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	coastal	cultural
	all	Terrestrial	coastal	other
Brazilian skipper (Calpodes ethlius)				
	all	Terrestrial	barrens/woodlands	cultural
Olympia marble (Euchloe olympia)				
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	open upland	dunes
	all	Terrestrial	open upland	grasslands
Hessel's hairstreak (Callophrys hesseli)				
		Palustrine	mineral soil wetland	pond/lake shore
	all	Palustrine	mineral soil wetland	deciduous forested
	all	Palustrine	peatlands	bog/fen

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Frosted elfin (Callophrys irus)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	barrens/woodlands	southern deciduous
Henry's elfin (Callophrys henrici)				
	all	Palustrine	mineral soil wetland	deciduous forested
	all	Palustrine	mineral soil wetland	shrub swamp
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	southern deciduous
Bog elfin (Callophrys lanoraieensis)				
	all	Palustrine	peatlands	bog/fen
Northern oak hairstreak (Fixsenia favonius ontario)				
	all	Terrestrial	barrens/woodlands	southern deciduous
Silvery blue (Glaucopsyche lygdamus lygdamus)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	northern deciduous
	all	Terrestrial	forested	southern deciduous
Northern metalmark (Calephelis borealis)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	southern deciduous
Regal fritillary (Speyeria idalia)				
	all	Palustrine	mineral soil wetland	deciduous forested
	all	Palustrine	mineral soil wetland	emergent marsh
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	open upland	grasslands

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Gorgone checkerspot (Chlosyne gorgone)				
	all	Terrestrial	barrens/woodlands	northern coniferous
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	open upland	cultural
Checkered white (Pontia protodice)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	open upland	grasslands
Tawny crescent (Phyciodes batesii batesii)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	open upland	grasslands
Jutta arctic (Oeneis jutta)				
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	alpine/mountain	other
	all	Terrestrial	barrens/woodlands	northern coniferous

Goal and Objectives for Other butterflies

Goal: Maintain healthy populations of listed butterflies in New York State in their historic ranges

Objective 1 : Determine status of listed species through surveys and assessment of population levels.

Measure: *Number of surveys and assessments*

Objective 2 : Determine the best management techniques for the particular habitat needs of each species

Measure: *Number of species for which habitat management is determined*

Objective 3 : Determine threats to butterfly species, rate by level of risk to species, and develop management and protection plans to address the threats

Measure: *Number of species for which management and protection plans are completed*

Objective 4 : Document the current distribution of listed butterfly species and determine actual conservation status

Measure: *Number of species for which surveys have been conducted and status evaluated*

Objective 5 : Evaluate the status of species habitat quantity and quality including host plants, shelter areas, predators, parasites and other components.

Measure: *Completeness of habitat evaluation*

Recommended Actions

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

Recommended Actions

Statewide baseline survey:

* Survey all species to more adequately define the list of species that need to be addressed.

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Taxa Group: Insect
Species Group: Other moths

Threats:
The threats to moth populations have not been well documented, but habitat loss and degradation caused by land development, habitat fragmentation, natural succession of shrubland, woodland and barrens habitats, land clearing, coastal erosion and sea level rise, and the use of chemical biocides (traditional pesticides and growth regulators) are likely major threats to moth populations in varied habitats. Another likely but poorly known threat is the continued impact of biological agents introduced beginning in 1906 for control of gypsy moth and other pests. The introduced parasitoid fly Compsilura concinnata may be the cause of reported declines of silk moth populations in New England, and may impact other native Lepidoptera (Boettner et al. 2000). Although widespread spraying doesn't occur today, chemical biocides (traditional pesticides and growth regulators), and to a lesser extent Bacillus thuringiensis var. kurstaki (= BTK) applied locally continue to kill native lepidoptera (Schweitzer 2004). Extirpation of native species may occur if these biocides are applied to the entirety of localized, isolated habitats. Other possible threats to moths and their habitats are invasive plants, animals and pathogens, and the effect of night time lighting on reproductive success.

Trends:
Many of these species have only been documented a few times and trend data is largely unavailable. Some species, such as Abagrotis nefascia benjamini have declined in numbers.

SEQR - No Action Alternative:
Rapid extirpation of a large number of species and possible extinction of one or more endemic moths.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A noctuid moth (Chytonix ruperti)			S1			Unknown
Dot-lined white (Artace cribraria)			SH			Unknown
Bay underwing (Catocala badia)			S2S4			Resident
The consort underwing (Catocala consors sorsconi)			SH			Resident
Quiet or sweet underwing (Catocala dulciola)			SH			Resident
Jersey jair underwing (Catocala jair ssp 2)			S1S2			Unknown
Precious underwing (Catocala pretiosa pretiosa)			SH			Unknown
An underwing moth (Catocala sp 3)			SH			Unknown
Broad-lined catopyrrha (Erastria coloraria)			S2S3			Unknown
A moth (Lepipolys perscripta)			SH	G4	U	Resident
A noctuid moth (Chaetaglaea cerata)			S1S2			Unknown
A noctuid moth (Apamea inordinata)			SH			Unknown

A noctuid moth (Chytonix sensilis)	S1S3			Unknown
Melsheimer's sack bearer (Cicinnus melsheimeri)	SH			Unknown
Regal moth (Citheronia regalis)	S1	G4		Unknown
Pine devil (Citheronia sepulcralis)	S1			Unknown
A hand-maid moth (Datana ranaeceps)	S1S3			Unknown
Imperial moth (Eacles imperialis pini)	S?			Unknown
The little beggar (Eubaphe meridiana)	SH			Unknown
A geometrid moth (Euchlaena madusaria)	SH			Unknown
Brown-bordered geometer (Eumacaria latiferrugat	S2S4			Unknown
Bird dropping moth (Cerma cora)	S1S3			Unknown
Coastal heathland cutworm (Abagrotis nefascia be	S1S3	G4T3	U	Resident
Hairy artesta (Trichoclea artesta)	S1S3	G5	U	Resident
Maroonwing (Sideridis maryx)	S2S3	G4	U	Resident
Gray woodgrain (Morrisonia mucens)	S1S3	G4G5	U	Unknown
A noctuid moth (Orthodes obscura)	S1?	G4	U	Resident
A noctuid moth (Agrotis obliqua)	S1	GNR	U	Resident
A noctuid moth (Eucoptocnemis fimbriaris)	S1	G4	U	Resident
A noctuid moth (Euxoa pleuritica)	S2S3	G4	U	Resident
A noctuid moth (Euxoa lidia thanatologia)	SH	G5T5	U	Unknown
A noctuid moth (Richia acclivis)	S2S3	G4G5	U	Resident
Toothed apharetra (Apharetra dentata)	S2S3			Unknown
A noctuid moth (Abagrotis barnesi)	S1	G5	U	Resident
A noctuid moth (Apamea mixta)	SH			Unknown
Golden aster flower moth (Schinia tuberculum)	S2	G4	U	Resident
A noctuid moth (Schinia bifascia)	SH	G4	U	Resident
A noctuid moth (Hydraecia stramentosa)	S1S3	G4	U	Resident
A notodontid moth (Heterocampa varia)	S1S2	G3		Unknown
Herodias underwing (Catocala herodias gerhardi)				Unknown
Jair underwing (Catocala jair)				Unknown
Barrens dagger moth (Acronicta albarufa)	SH			Resident
A noctuid moth (Amphipoea erepta ryensis)	S1			Unknown
Blueberry gray (Glena cognataria)	S1S3			Unknown

A noctuid moth (Anomogyna rhaetica)				Resident
A geometrid moth (Semiothisa denticulata)	S1			Unknown
A noctuid moth (Fagitana littera)	S2S3			Unknown
A borer moth (Papaipema marginidens)	SH			Unknown
Maritime sunflower borer moth (Papaipema mariti	SH			Unknown
Culvers root borer (Papaipema sciata)	SH			Unknown
Ostrich fern borer moth (Papaipema sp 2)	S1?			Unknown
Chain fern borer moth (Papaipema stenocelis)	S1?			Unknown
Stinging rose caterpillar moth (Parasa indetermina	SH			Unknown
A noctuid moth (Phoberia orthosioides)	S2S3			Unknown
A noctuid moth (Psaphida thaxteriana)	SH			Unknown
Dark stoneroot borer moth (Papaipema duplicata)	S?			Resident
A geometrid moth (Semiothisa banksianae)	S1			Unknown
Seaside golden borer moth (Papaipema duovata)	SH	G4		Unknown
Variable sallow (Sericaglaea signata)	SH			Unknown
Gordian sphinx (Sphinx gordius)	S1S3	G4		Unknown
Chestnut clearwing moth (Synanthedon castaneae)	SH	G4		Unknown
A noctuid moth (Synedoida adumbrata)	S1S2			Unknown
Black-bordered lemon moth (Thioptera nigrofimbr	SH	G5		Unknown
Dimorphic gray (Tornos scolopacinarius)	SH	G4		Unknown
Acadian swordgrass moth (Xylena thoracica)	S1S2			Unknown
A noctuid moth (Zale largera)	S1	G4		Unknown
Pine barrens zanclognatha (Zanclognatha martha)	S1S2	G4		Unknown
Pink sallow (Psectraglaea carnosa)	S2			Resident
Black fungus moth (Metalectra tantillus)	SH			Unknown
Trichoclea artesta (Hairy artesta)	S1S3	G5		Unknown
Phyllira tiger moth (Grammia phyllira)	SH			Unknown
Coastal barrens buckmoth (Hemileuca maia ssp 5)	S2	T2	SC	Unknown
Buchholz's gray (Hypomecis buchholzaria)	SH			Unknown
Barrens itame (Itame sp 1)	S1			Resident
A looper moth (Lambdina canitiaria)	SH			Unknown
Lemmer's noctuid moth (Lithophane lemmeri)	SR	G3		Unknown

A noctuid moth (Lithophane lepida lepida)	S1	T3	E	Unknown
Pale green pinion moth (Lithophane viridipallens)	SH			Unknown
Heracleum stem borer moth (Papaipema harrisii)	SH	G4		Unknown
Doll's merolonche (Merolonche dolli)	SH	G3		Unknown
A noctuid moth (Fishia enthea)	SH			Unknown
Barrens metarranthis moth (Metarranthis apiciaria	SH			Resident
A slug moth (Monoleuca semifascia)	S1	G4		Unknown
A geometrid moth (Nemoria bifilata)	SH	G4		Unknown
A tussock moth (Orgyia detrita)	SH	G3		Unknown
A noctuid moth (Paectes abrostolella)	S1	G4		Unknown
A borer moth (Papaipema aerata)	SH			Unknown
Yellow stoneroot borer (Papaipema astuta)	SH	G3		Resident
Aweme borer moth (Papaipema aweme)	SH			Resident
Golden borer moth (Papaipema cerina)	SH	G4		Unknown
Woolly gray (Lycia ypsilon)	SH	G4		Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A moth (Lepipolys perscripta)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Hairy artesta (Trichoclea artesta)	SE Lake Ontario NE Lake Ontario - St. Lawrence	Unknown	Unknown
Maroonwing (Sideridis maryx)	NE Lake Ontario - St. Lawrence Lake Champlain	Lake Champlain	Stable
Gray woodgrain (Morrisonia mucens)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
A noctuid moth (Orthodes obscura)	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Stable
A noctuid moth (Agrotis obliqua)	Lake Champlain	Lake Champlain	Stable
A noctuid moth (Eucoptocnemis fimbriaris)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A noctuid moth (Euxoa pleuritica)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
	SW Lake Ontario	SW Lake Ontario	Decreasing
A noctuid moth (Euxoa lidia thanatologia)	Unknown	Unknown	Unknown
A noctuid moth (Richia acclivis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
A noctuid moth (Anomogyna rhaetica)	Lake Champlain	Lake Champlain	Unknown
A noctuid moth (Abagrotis barnesi)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
Coastal heathland cutworm (Abagrotis nefascia benjami	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Golden aster flower moth (Schinia tuberculum)	Upper Hudson	Upper Hudson	Unknown
A noctuid moth (Schinia bifascia)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
A noctuid moth (Hydraecia stramentosa)	SE Lake Ontario	SE Lake Ontario	Unknown
A notodontid moth (Heterocampa varia)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Herodias underwing (Catocala herodias gerhardi)	Unknown	Lower Hudson - Long Island Bays	Unknown
Jair underwing (Catocala jair)	Lower Hudson - Long Island Bays	Unknown	Unknown
Barrens dagger moth (Acronicta albarufa)	Upper Hudson	Unknown	Unknown
	Lower Hudson - Long Island Bays		
A noctuid moth (Amphipoea erepta ryensis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A noctuid moth (Apamea inordinata)	Upper Hudson	Upper Hudson	Unknown
A noctuid moth (Apamea mixta)	Unknown	Unknown	Unknown
Toothed apharetra (Apharetra dentata)	Lower Hudson - Long Island Bays	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Dot-lined white (Artace cribraria)	Unknown	Unknown	Unknown
Bay underwing (Catocala badia)	Upper Hudson Lake Champlain Lower Hudson - Long Island Bays	Unknown	Decreasing
The consort underwing (Catocala consors sorsconi)	Lower Hudson - Long Island Bays	Unknown	Unknown
Quiet or sweet underwing (Catocala dulciola)	Unknown	Unknown	Unknown
Jersey jair underwing (Catocala jair ssp 2)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Precious underwing (Catocala pretiosa pretiosa)	Upper Hudson	Unknown	Unknown
An underwing moth (Catocala sp 3)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Broad-lined catopyrrha (Erastria coloraria)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Bird dropping moth (Cerma cora)	Upper Hudson	Unknown	Unknown
A noctuid moth (Chaetaglaea cerata)	Upper Hudson Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A noctuid moth (Chytonix ruperti)	Unknown	Unknown	Unknown
A noctuid moth (Chytonix sensilis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Melsheimer's sack bearer (Cicinnus melsheimeri)	Upper Hudson Lower Hudson - Long Island Bays SW Lake Ontario Susquehanna Delaware	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Regal moth (Citheronia regalis)	Lower Hudson - Long Island Bays	Unknown	Unknown
Pine devil (Citheronia sepulcralis)	Upper Hudson	Upper Hudson	Unknown
A hand-maid moth (Datana ranaeceps)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
Imperial moth (Eacles imperialis pini)	SE Lake Ontario	SE Lake Ontario	Unknown
The little beggar (Eubaphe meridiana)	Unknown	Unknown	Unknown
A geometrid moth (Euchlaena madusaria)	Unknown	Unknown	Unknown
Brown-bordered geometer (Eumacaria latiferrugata)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A noctuid moth (Fagitana littera)	Unknown	Unknown	Unknown
A noctuid moth (Fishia enthea)	Unknown	Unknown	Unknown
Blueberry gray (Glena cognataria)	Unknown	Unknown	Unknown
Phyllira tiger moth (Grammia phyllira)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Coastal barrens buckmoth (Hemileuca maia ssp 5)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
Buchholz's gray (Hypomecis buchholzaria)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Barrens itame (Itame sp 1)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A looper moth (Lambdina canitiaria)	Susquehanna	Unknown	Unknown
Lemmer's noctuid moth (Lithophane lemmeri)	Unknown	Unknown	Unknown
A noctuid moth (Lithophane lepida lepida)	Unknown	Lake Champlain	Unknown
Pale green pinion moth (Lithophane viridipallens)	Lower Hudson - Long Island Bays	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Woolly gray (Lycia ypsilon)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Doll's merolonche (Merolonche dolli)	Lower Hudson - Long Island Bays	Unknown	Unknown
Black fungus moth (Metalectra tantillus)	Unknown	Unknown	Unknown
Barrens metarranthis moth (Metarranthis apiciaria)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Decreasing
A slug moth (Monoleuca semifascia)	Unknown	Unknown	
A geometrid moth (Nemoria bifilata)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A tussock moth (Orgyia detrita)	Lower Hudson - Long Island Bays	Unknown	Unknown
A noctuid moth (Paectes abrostolella)	Unknown	Unknown	Unknown
A borer moth (Papaipema aerata)	Lake Erie SW Lake Ontario NE Lake Ontario - St. Lawrence SE Lake Ontario	Unknown	Unknown
Yellow stoneroot borer (Papaipema astuta)	Lower Hudson - Long Island Bays	Unknown	Unknown
Aweme borer moth (Papaipema aweme)	SE Lake Ontario	Unknown	Unknown
Golden borer moth (Papaipema cerina)	Unknown	Unknown	Unknown
Seaside golden borer moth (Papaipema duovata)	Unknown	Unknown	Decreasing
Dark stoneroot borer moth (Papaipema duplicata)	Unknown	Unknown	Unknown
Heracleum stem borer moth (Papaipema harrisii)	Unknown	Unknown	Unknown
A borer moth (Papaipema marginidens)	Unknown	Unknown	Unknown
Maritime sunflower borer moth (Papaipema maritima)	Unknown	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Culvers root borer (Papaipema sciata)	Lake Erie	Unknown	Unknown
	Lower Hudson - Long Island Bays		
Ostrich fern borer moth (Papaipema sp 2)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Susquehanna	Susquehanna	Unknown
Chain fern borer moth (Papaipema stenocelis)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Stinging rose caterpillar moth (Parasa indetermina)	Unknown	Unknown	Unknown
A noctuid moth (Phoberia orthosioides)	Upper Hudson	Upper Hudson	Unknown
	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
A noctuid moth (Psaphida thaxteriana)	Unknown	Unknown	Unknown
Pink sallow (Psectraglaea carnosa)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson		
A geometrid moth (Semiothisa banksianae)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
A geometrid moth (Semiothisa denticulata)	Unknown	Unknown	Unknown
Variable sallow (Sericaglaea signata)	Unknown	Unknown	Unknown
Gordian sphinx (Sphinx gordius)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Upper Hudson	Unknown
Chestnut clearwing moth (Synanthedon castaneae)	Unknown	Unknown	Unknown
A noctuid moth (Synedoida adumbrata)	Unknown	Unknown	Unknown
Black-bordered lemon moth (Thioptera nigrofimbria)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Dimorphic gray (Tornos scolopacinarius)	Lower Hudson - Long Island Bays	Lower Hudson - Long Island Bays	Unknown
Acadian swordgrass moth (Xylena thoracica)	Lower Hudson - Long Island Bays	Upper Hudson	Unknown
		Lower Hudson - Long Island Bays	Unknown
	Upper Hudson	Lake Champlain	Unknown
A noctuid moth (Zale largera)	Unknown	Unknown	Unknown
Pine barrens zanclognatha (Zanclognatha martha)	Upper Hudson	Upper Hudson	Unknown
Trichoclea artesta (Hairy artesta)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A moth (Lepipolys perscripta)	North Atlantic Coast	North Atlantic Coast	Unknown
Hairy artesta (Trichoclea artesta)	Great Lakes	Unknown	Unknown
	St. Lawrence-Lake Champlain Valley		
Maroonwing (Sideridis maryx)	Northern Appalachian/Boreal Forest	St. Lawrence-Lake Champlain Valley	Stable
	St. Lawrence-Lake Champlain Valley	Northern Appalachian/Boreal Forest	Stable
Gray woodgrain (Morrisonia mucens)	North Atlantic Coast	North Atlantic Coast	Decreasing
A noctuid moth (Orthodes obscura)	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Stable
A noctuid moth (Agrotis obliqua)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Stable
	St. Lawrence-Lake Champlain Valley	St. Lawrence-Lake Champlain Valley	Stable

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A noctuid moth (Eucoptocnemis fimbriaris)	North Atlantic Coast	North Atlantic Coast	Decreasing
A noctuid moth (Euxoa pleuritica)	North Atlantic Coast	North Atlantic Coast	Decreasing
	Great Lakes	Great Lakes	Decreasing
A noctuid moth (Euxoa lidia thanatologia)	Unknown	Unknown	Unknown
A noctuid moth (Richia acclivis)	North Atlantic Coast	North Atlantic Coast	Decreasing
A noctuid moth (Anomogyna rhaetica)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown
A noctuid moth (Abagrotis barnesi)	North Atlantic Coast	North Atlantic Coast	Decreasing
Coastal heathland cutworm (Abagrotis nefascia benjamini	North Atlantic Coast	North Atlantic Coast	Unknown
Golden aster flower moth (Schinia tuberculum)	Lower New England Piedmont	Lower New England Piedmont	Unknown
A noctuid moth (Schinia bifascia)	North Atlantic Coast	North Atlantic Coast	Decreasing
A noctuid moth (Hydraecia stramentosa)	Great Lakes	Great Lakes	Unknown
A notodontid moth (Heterocampa varia)	North Atlantic Coast	North Atlantic Coast	Unknown
Herodias underwing (Catocala herodias gerhardi)	Unknown	North Atlantic Coast	Unknown
Jair underwing (Catocala jair)	North Atlantic Coast	Unknown	Unknown
Barrens dagger moth (Acronicta albarufa)	Lower New England Piedmont	Unknown	Unknown
	North Atlantic Coast		

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A noctuid moth (Amphipoea erepta ryensis)	North Atlantic Coast	North Atlantic Coast	Unknown
A noctuid moth (Apamea inordinata)	Lower New England Piedmont	Lower New England Piedmont	Unknown
A noctuid moth (Apamea mixta)	Unknown	Unknown	Unknown
Toothed apharetra (Apharetra dentata)	North Atlantic Coast	Unknown	Unknown
Dot-lined white (Artace cribraria)	Unknown	Unknown	Unknown
Bay underwing (Catocala badia)	Northern Appalachian/Boreal Forest North Atlantic Coast	Unknown	Decreasing
The consort underwing (Catocala consors sorsconi)	North Atlantic Coast	Unknown	Unknown
Quiet or sweet underwing (Catocala dulciola)	Unknown	Unknown	Unknown
Jersey jair underwing (Catocala jair ssp 2)	North Atlantic Coast	North Atlantic Coast	Unknown
Precious underwing (Catocala pretiosa pretiosa)	Lower New England Piedmont	Unknown	Unknown
An underwing moth (Catocala sp 3)	North Atlantic Coast	North Atlantic Coast	Unknown
Broad-lined catopyrrha (Erastria coloraria)	North Atlantic Coast	North Atlantic Coast	Unknown
Bird dropping moth (Cerma cora)	Lower New England Piedmont	Unknown	Unknown
A noctuid moth (Chaetaglaea cerata)	Lower New England Piedmont Great Lakes	North Atlantic Coast	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A noctuid moth (Chytonix ruperti)	Unknown	Unknown	Unknown
A noctuid moth (Chytonix sensilis)	North Atlantic Coast	North Atlantic Coast	Unknown
Melsheimer's sack bearer (Cicinnus melsheimeri)	Western Allegheny Plateau High Allegheny Plateau Lower New England Piedmont North Atlantic Coast	Unknown	Unknown
Regal moth (Citheronia regalis)	Unknown	Unknown	Unknown
Pine devil (Citheronia sepulcralis)	Lower New England Piedmont High Allegheny Plateau	High Allegheny Plateau Lower New England Piedmont	Unknown Unknown
A hand-maid moth (Datana ranaeceps)	North Atlantic Coast	North Atlantic Coast	Decreasing
Imperial moth (Eacles imperialis pini)	Great Lakes	Great Lakes	Unknown
The little beggar (Eubaphe meridiana)	Unknown	Unknown	Unknown
A geometrid moth (Euchlaena madusaria)	Unknown	Unknown	Unknown
Brown-bordered geometer (Eumacaria latiferrugata)	North Atlantic Coast	North Atlantic Coast	Unknown
A noctuid moth (Fagitana littera)	Unknown	Unknown	Unknown
A noctuid moth (Fishia enthea)	Unknown	Unknown	Unknown
Blueberry gray (Glena cognataria)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Phyllira tiger moth (Grammia phyllira)	North Atlantic Coast	North Atlantic Coast	Unknown
Coastal barrens buckmoth (Hemileuca maia ssp 5)	North Atlantic Coast	North Atlantic Coast	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
Buchholz's gray (Hypomecis buchholzaria)	North Atlantic Coast	North Atlantic Coast	Unknown
Barrens itame (Itame sp 1)	North Atlantic Coast	North Atlantic Coast	Unknown
A looper moth (Lambdina canitiaria)	High Allegheny Plateau	Unknown	Unknown
Lemmer's noctuid moth (Lithophane lemmeri)	Unknown	Unknown	Unknown
A noctuid moth (Lithophane lepida lepida)	Unknown	Unknown	Unknown
Pale green pinion moth (Lithophane viridipallens)	North Atlantic Coast	Unknown	Unknown
Woolly gray (Lycia ypsilon)	North Atlantic Coast	North Atlantic Coast	Unknown
Doll's merolonche (Merolonche dolli)	North Atlantic Coast	Unknown	Unknown
Black fungus moth (Metalectra tantillus)	Unknown	Unknown	Unknown
Barrens metarranthis moth (Metarranthis apiciaria)	North Atlantic Coast	North Atlantic Coast	Decreasing
A slug moth (Monoleuca semifascia)	Unknown	Unknown	Unknown
A geometrid moth (Nemoria bifilata)	North Atlantic Coast	North Atlantic Coast	Unknown
A tussock moth (Orgyia detrita)	North Atlantic Coast	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A noctuid moth (Paectes abrostolella)	Unknown	Unknown	Unknown
A borer moth (Papaipema aerata)	Great Lakes	Unknown	Unknown
	St. Lawrence-Lake Champlain Valley		
Yellow stoneroot borer (Papaipema astuta)	North Atlantic Coast	Unknown	Unknown
Aweme borer moth (Papaipema aweme)	Great Lakes	Unknown	Unknown
Golden borer moth (Papaipema cerina)	Unknown	Unknown	Unknown
Seaside golden borer moth (Papaipema duovata)	Unknown	Unknown	Unknown
Dark stoneroot borer moth (Papaipema duplicata)	Unknown	Unknown	Unknown
Heracleum stem borer moth (Papaipema harrisii)	Unknown	Unknown	Unknown
A borer moth (Papaipema marginidens)	Unknown	Unknown	Unknown
Maritime sunflower borer moth (Papaipema maritima)	Unknown	Unknown	Unknown
Culvers root borer (Papaipema sciata)	Great Lakes	Unknown	Unknown
	Lower New England Piedmont		
Ostrich fern borer moth (Papaipema sp 2)	Lower New England Piedmont	Lower New England Piedmont	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
Chain fern borer moth (Papaipema stenocelis)	North Atlantic Coast	North Atlantic Coast	Unknown
Stinging rose caterpillar moth (Parasa indetermina)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A noctuid moth (Phoberia orthosioides)	Lower New England Piedmont	North Atlantic Coast	Unknown
	North Atlantic Coast	Lower New England Piedmont	Unknown
A noctuid moth (Psaphida thaxteriana)	Unknown	Unknown	Unknown
Pink sallow (Psectraglaea carnosa)	North Atlantic Coast	North Atlantic Coast	Unknown
	Lower New England Piedmont		
A geometrid moth (Semiothisa banksianae)	North Atlantic Coast	North Atlantic Coast	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
A geometrid moth (Semiothisa denticulata)	Unknown	Unknown	Unknown
Variable sallow (Sericaglaea signata)	Unknown	Unknown	Unknown
Gordian sphinx (Sphinx gordius)	North Atlantic Coast	North Atlantic Coast	Unknown
	Lower New England Piedmont	Lower New England Piedmont	Unknown
Chestnut clearwing moth (Synanthedon castaneae)	Unknown	Unknown	Unknown
A noctuid moth (Synedoida adumbrata)	Unknown	Unknown	Unknown
Black-bordered lemon moth (Thioptera nigrofimbria)	North Atlantic Coast	North Atlantic Coast	Unknown
Dimorphic gray (Tornos scolopacinarius)	North Atlantic Coast	North Atlantic Coast	Unknown
Acadian swordgrass moth (Xylena thoracica)	North Atlantic Coast	Lower New England Piedmont	Unknown
	Lower New England Piedmont	North Atlantic Coast	Unknown
A noctuid moth (Zale largera)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Pine barrens zanclognatha (Zanclognatha martha)	Lower New England Piedmont	Lower New England Piedmont	Unknown
Trichoclea artesta (Hairy artesta)	Unknown	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A moth (Lepipolys perscripta)				
	all	Terrestrial	coastal	cultural
Hairy artesta (Trichoclea artesta)				
	all	Terrestrial	barrens/woodlands	shrublands
Maroonwing (Sideridis maryx)				
	all	Terrestrial	barrens/woodlands	shrublands
Gray woodgrain (Morrisonia mucens)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
A noctuid moth (Orthodes obscura)				
	all	Terrestrial	barrens/woodlands	shrublands
A noctuid moth (Agrotis obliqua)				
	all	Terrestrial	forested	northern coniferous
A noctuid moth (Eucoptocnemis fimbriaris)				
	all	Terrestrial	barrens/woodlands	southern deciduous
A noctuid moth (Euxoa pleuritica)				
	all	Terrestrial	coastal	dunes
A noctuid moth (Euxoa lidia thanatologia)				
	all	Unknown		
A noctuid moth (Richia acclivis)				
	all	Terrestrial	barrens/woodlands	shrublands
A noctuid moth (Anomogyna rhaetica)				
	all	Terrestrial	alpine/mountain	cliffs & open talus
	all	Terrestrial	alpine/mountain	northern coniferous
A noctuid moth (Abagrotis barnesi)				

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A noctuid moth (Abagrotis barnesi)				
	all	Terrestrial	barrens/woodlands	shrublands
Coastal heathland cutworm (Abagrotis nefascia benjamini)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	coastal	dunes
Golden aster flower moth (Schinia tuberculum)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
A noctuid moth (Schinia bifascia)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	maritime	other
A noctuid moth (Hydraecia stramentosa)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	open upland	heathlands
A notodontid moth (Heterocampa varia)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	shrublands
	Hibernating/Overwintering	Unknown		
Herodias underwing (Catocala herodias gerhardi)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	open upland	cliffs & open talus
Jair underwing (Catocala jair)				
	all	Terrestrial	barrens/woodlands	shrublands
Barrens dagger moth (Acronicta albarufa)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
A noctuid moth (Amphipoea erepta ryensis)				
	all	Palustrine	mineral soil wetland	other
A noctuid moth (Apamea inordinata)				

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A noctuid moth (Apamea inordinata)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	open upland	grasslands
A noctuid moth (Apamea mixta)				
	all	Palustrine	peatlands	bog/fen
Toothed apharetra (Apharetra dentata)				
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	unknown
Dot-lined white (Artace cribraria)				
	all	Terrestrial	unknown	unknown
Bay underwing (Catocala badia)				
	all	Terrestrial	coastal	other
	all	Terrestrial	forested	unknown
The consort underwing (Catocala consors sorsconi)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
Quiet or sweet underwing (Catocala dulciola)				
	all	Terrestrial	barrens/woodlands	other
	all	Terrestrial	forested	other
Jersey jair underwing (Catocala jair ssp 2)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
Precious underwing (Catocala pretiosa pretiosa)				
	all	Palustrine	mineral soil wetland	mixed deciduous/coniferous
	all	Palustrine	mineral soil wetland	shrub swamp
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	forested	unknown
An underwing moth (Catocala sp 3)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
Broad-lined catopyrrha (Erastria coloraria)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	open upland	cliffs & open talus
Bird dropping moth (Cerma cora)				
	all	Palustrine	mineral soil wetland	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Bird dropping moth (Cerma cora)				
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	southern coniferous
A noctuid moth (Chaetaglaea cerata)				
	all	Terrestrial	barrens/woodlands	northern deciduous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	forested	mixed deciduous/coniferous
A noctuid moth (Chytonix ruperti)				
	all	Terrestrial	barrens/woodlands	other
	all	Terrestrial	barrens/woodlands	shrublands
A noctuid moth (Chytonix sensilis)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
Melsheimer's sack bearer (Cicinnus melsheimeri)				
	all	Terrestrial	barrens/woodlands	shrublands
Regal moth (Citheronia regalis)				
	all	Terrestrial	unknown	unknown
Pine devil (Citheronia sepulcralis)				
	all	Terrestrial	coastal	other
A hand-maid moth (Datana ranaeceps)				
	all	Terrestrial	barrens/woodlands	other
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	other
Imperial moth (Eacles imperialis pini)				
	all	Terrestrial	barrens/woodlands	northern coniferous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern coniferous
The little beggar (Eubaphe meridiana)				
	all	Unknown		
A geometrid moth (Euchlaena madusaria)				
	all	Terrestrial	barrens/woodlands	unknown
	all	Terrestrial	forested	unknown
Brown-bordered geometer (Eumacaria latiferrugata)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	open upland	heathlands

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A noctuid moth (Fagitana littera)				
	all	Palustrine	mineral soil wetland	emergent marsh
	all	Palustrine	peatlands	bog/fen
A noctuid moth (Fishia enthea)				
	all	Unknown		
Blueberry gray (Glena cognataria)				
	all	Unknown		
Phyllira tiger moth (Grammia phyllira)				
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	unknown
Coastal barrens buckmoth (Hemileuca maia ssp 5)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	barrens/woodlands	southern coniferous
	Hibernating/Overwintering	Subterranean	natural	unknown
Buchholz's gray (Hypomecis buchholzaria)				
	all	Terrestrial	barrens/woodlands	unknown
Barrens itame (Itame sp 1)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	southern coniferous
	Hibernating/Overwintering	Unknown		
A looper moth (Lambdina canitiaria)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
Lemmer's noctuid moth (Lithophane lemmeri)				
	all	Unknown		
A noctuid moth (Lithophane lepida lepida)				
	all	Terrestrial	barrens/woodlands	unknown
Pale green pinion moth (Lithophane viridipallens)				
	Feeding	Terrestrial	barrens/woodlands	shrublands
	Hibernating/Overwintering	Subterranean	natural	unknown
	Nursery/Juvenile	Palustrine	peatlands	bog/fen
Woolly gray (Lycia ypsilon)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Woolly gray (Lycia ypsilon)				
	all	Terrestrial	barrens/woodlands	shrublands
Doll's merolonche (Merolonche dolli)				
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	southern coniferous
Black fungus moth (Metalectra tantillus)				
	all	Unknown		
Barrens metarranthis moth (Metarranthis apiciaria)				
	Breeding	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	Breeding	Terrestrial	forested	unknown
A slug moth (Monoleuca semifascia)				
	all	Terrestrial	barrens/woodlands	shrublands
A geometrid moth (Nemoria bifilata)				
	all	Terrestrial	barrens/woodlands	shrublands
A tussock moth (Orgyia detrita)				
	all	Palustrine	mineral soil wetland	mixed deciduous/coniferous
	all	Terrestrial	forested	mixed deciduous/coniferous
A noctuid moth (Paectes abrostolella)				
	all	Unknown		
A borer moth (Papaipema aerata)				
	all	Palustrine	unknown	unknown
	all	Terrestrial	unknown	unknown
Yellow stoneroot borer (Papaipema astuta)				
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	northern deciduous
Aweme borer moth (Papaipema aweme)				
	all	Terrestrial	open upland	dunes
	Hibernating/Overwintering	Unknown		
Golden borer moth (Papaipema cerina)				
	all	Unknown		
Seaside golden borer moth (Papaipema duovata)				
	all	Palustrine	mineral soil wetland	other

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Dark stoneroot borer moth (Papaipema duplicata)				
	all	Terrestrial	barrens/woodlands	southern deciduous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
	Hibernating/Overwintering	Unknown		
Heracleum stem borer moth (Papaipema harrisii)				
	all	Unknown		
A borer moth (Papaipema marginidens)				
	all	Unknown		
Maritime sunflower borer moth (Papaipema maritima)				
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	open upland	grasslands
Culvers root borer (Papaipema sciata)				
	all	Palustrine	mineral soil wetland	emergent marsh
	all	Terrestrial	barrens/woodlands	cultural
	all	Terrestrial	barrens/woodlands	unknown
	all	Terrestrial	forested	unknown
	all	Terrestrial	open upland	grasslands
Ostrich fern borer moth (Papaipema sp 2)				
	all	Palustrine	mineral soil wetland	mixed deciduous/coniferous
	all	Terrestrial	forested	mixed deciduous/coniferous
	all	Terrestrial	forested	northern deciduous
Chain fern borer moth (Papaipema stenocelis)				
	all	Terrestrial	unknown	unknown
Stinging rose caterpillar moth (Parasa indetermina)				
	all	Unknown		
A noctuid moth (Phoberia orthosioides)				
	all	Terrestrial	barrens/woodlands	shrublands
A noctuid moth (Psaphida thaxteriana)				
	all	Terrestrial	barrens/woodlands	unknown
	all	Terrestrial	forested	unknown
Pink sallow (Psectraglaea carnosa)				
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	Hibernating/Overwintering	Terrestrial	barrens/woodlands	other

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Pink sallow (Psectraglaea carnosa)				
A geometrid moth (Semiothisa banksianae)				
	all	Terrestrial	barrens/woodlands	shrublands
A geometrid moth (Semiothisa denticulata)				
	all	Terrestrial	barrens/woodlands	shrublands
Variable sallow (Sericaglaea signata)				
	all	Terrestrial	barrens/woodlands	unknown
	all	Terrestrial	forested	unknown
Gordian sphinx (Sphinx gordius)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
	all	Terrestrial	barrens/woodlands	shrublands
	all	Terrestrial	open upland	heathlands
Chestnut clearwing moth (Synanthedon castaneae)				
	all	Terrestrial	unknown	unknown
A noctuid moth (Synedoida adumbrata)				
	all	Unknown		
Black-bordered lemon moth (Thioptera nigrofimbria)				
	all	Unknown		
Dimorphic gray (Tornos scolopacinarius)				
	all	Terrestrial	unknown	unknown
Acadian swordgrass moth (Xylena thoracica)				
	all	Palustrine	peatlands	bog/fen
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
A noctuid moth (Zale largera)				
	all	Unknown		
Pine barrens zanclognatha (Zanclognatha martha)				
	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous
Trichoclea artesta (Hairy artesta)				
	all	Unknown		

Goal and Objectives for Other moths

Goal: Maintain viable moth populations and sufficient good quality habitats to support moth species throughout their historic ranges in New York State.

Objective 1 : Determine actual conservation status

Measure: *Number of feasible habitats; Magnitude of threats*

Objective 2 : Determine the current distribution of moths

Measure: *Number of surveys conducted*

Objective 3 : Determine threats to moth species and ways to address them.

Measure: *research conducted on threats and threat reduction*

Objective 4 : Evaluate need for and feasibility of expanding moth populations numerically and spatially

Measure: *Number of populations on appropriate habitat*

Objective 5 : Maintain existing populations

Measure: *Annual surveys*

Recommended Actions

Easement acquisition:

* where appropriate, acquire easements to promote moth protection and conservation

Fact sheet:

* create fact sheets covering moths

Habitat management:

* - Determine best management regime for moth species, including fire and other forms of management

Habitat monitoring:

* Develop standardized measures of habitat parameters for each species of listed moth
* - Investigate threats to food and host plants
  - Monitor land development projects

Recommended Actions

Habitat research:

* Examine role of light pollution as threat to moths
* - Determine host/ food plant

Life history research:

* - Investigate the metapopulation dynamics of those species which warrant it
* examine role of introduced parasites and predators in threats to moths

Other action:

* Develop standard definition of what is needed for "viable" populations of moths
* research the role of pesticide use in threats to moths

Population monitoring:

* - Inventory of species within historical range
* Develop standardized survey protocols for moths

Private fee acquisition:

* where appropriate, encourage/assist private entities to acquire land for moth protection and conservation

State fee acquisition:

* where appropriate, acquire land essential to moth protection and conservation

State land unit management plan:

* incorporate needs of moths into state land management plans

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Taxa Group: Insect

Species Group: Pine barrens tiger beetles

Threats:

Suburban and other development, and natural succession of open pine barrens habitats due to fire suppression are probably the major threats to these species. Excessive use of sandy areas and sunny woods trails by ATV's are also a likely problem. The latter threat is probably especially true for Cicindela abdominalis and the consentanea subspecies of Cicindela patruela that are restricted to Long Island.

Trends:

Unknown for sure, though all three species have almost certainly declined. Only the nominate form of Cicindela patruela as been observed in recent years (and that in 2004). Cicindela abdominalis and Cicindela patruela consentanea were likely restricted to Long Island pine barrens habitats that have been greatly reduced in acreage and both of these could well be extirpated from the state. The nominate form of Cicindela patruela had also not been observed in the state for decades until 2004 when it was observed at Sams Point in the Shawangunks.

SEQR - No Action Alternative:

Without the indicated actions the status of these species will remain uncertain at best and in jeopardy of further decline or extirpation from the state. Extirpation from the state, seems especially likely, if it has not already occurred, for Cicindela abdomonalis and Cicindela patruela consentanea as these species are, or were, undoubtedly restricted to Long Island where large amounts of formerly suitable habitat have been lost. The nominate form of Cicindela patruela which was historically found elsewhere in the state, was found on a protected site in 2004 in the Shawangunks in 2004, but the species may still be limited to a small number of sites and failure to identify sites for this species could lead to significant population declines.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A tiger beetle (Cicindela abdominalis)			SH	G5	U	Resident
A tiger beetle (Cicindela unipunctata)			SH	G4	U	Resident
A tiger beetle (Cicindela patruela)			SH	G3T2T3	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A tiger beetle (Cicindela patruela)	Lower Hudson - Long Island Bays Lake Champlain Upper Hudson SW Lake Ontario SE Lake Ontario	Upper Hudson	Decreasing
A tiger beetle (Cicindela unipunctata)	Lower Hudson - Long Island Bays Lake Champlain NE Lake Ontario - St. Lawrence	Unknown	Decreasing
A tiger beetle (Cicindela abdominalis)	Lower Hudson - Long Island Bays	Unknown	Decreasing

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A tiger beetle (Cicindela patruela)	North Atlantic Coast St. Lawrence-Lake Champlain Valley Great Lakes	Lower New England Piedmont	Decreasing
A tiger beetle (Cicindela unipunctata)	North Atlantic Coast Northern Appalachian/Boreal Forest	Unknown	Decreasing
A tiger beetle (Cicindela abdominalis)	North Atlantic Coast	Unknown	Decreasing

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A tiger beetle (Cicindela patruela)	all	Terrestrial	barrens/woodlands	mixed deciduous/coniferous

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A tiger beetle (Cicindela patruela)				
	all	Terrestrial	barrens/woodlands	southern deciduous
A tiger beetle (Cicindela unipunctata)				
	all	Terrestrial	barrens/woodlands	southern coniferous
	all	Terrestrial	forested	northern deciduous
A tiger beetle (Cicindela abdominalis)				
	all	Terrestrial	barrens/woodlands	southern coniferous

Goal and Objectives for Pine barrens tiger beetles

Goal: Maintain a sufficient number of self-sustaining populations of these species throughout their historic range in New York to ensure that the species are not extirpated from the state.

Objective 1 : Determine the distribution and population status of these species in New York State.

Measure: *Number of sites surveyed to determine presence of the species and population size.*

Objective 2 : Increase our understanding of the ecology of these beetles including habitat preferences and threats to the species.

Measure: *Number of studies completed.*

Objective 3 : Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these damselflies in New York State.

Measure: *Number of maintained/established populations.*

Objective 4 : Protect, manage, restore, and monitor barrens or other habitats occupied by these species.

Measure: *Number of barrens or other habitats for which threats are adequately abated and are under protection/management/monitoring directed toward ensuring the long term viability of the species.*

Recommended Actions

Habitat management:

* Reduce or eliminate detrimental ATV use in barrens habitats that support, or may support, these species.

Recommended Actions

Habitat research:

* Support and encourage research that would increase knowledge of threats facing these species of tiger beetles.
* 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, or special concern listing are an anticipated result of the State Wildlife Grant Tiger Beetle Inventory. It is expected that one or more of the species will be recommended for listing and officially adding these species to the list would constitute a concrete action.

Population monitoring:

* Conduct repeatable surveys for these species at a selected number of sites in order to monitor populations trends over time.

Statewide baseline survey:

* Conduct surveys for these species at potential sites throughout the state (expected range for two species is Long Island only. These species are known from fewer than 10 locations in the state, but new populations probably remain to be discovered for at least two of the species. A currently approved, but not yet begun State Wildlife Grant Tiger Beetle Inventory Project will utilize Natural Heritage Program staff and other biologists to conduct these surveys.

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Gordon, W. M. 1939. The Cicindelidae of New York With Reference to their Ecology. M. S. Thesis. Cornell University, Ithaca, NY. 136 pp.

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Taxa Group: Insect
Species Group: Riparian tiger beetles

Threats:
Alteration of natural flooding regimes, primarily due to construction of dams, is probably the primary threat to both species (Novak 1999, Knisley and Shultz 1997). Dams will inundate cobble bar habitat upstream of the dam while the natural flooding regime is altered downstream of the dam. When natural flooding regimes are altered cobble bars become overgrown with dense herbaceous and shrub vegetation becoming unsuitable for the beetles. Gravel mining of cobble bars, an activity regulated by NYSDEC but for which permits are given, is also a major threat. There are a number of existing permits on both the Genesee River (Taft 2002) and Cattaraugus Creek that have the potential to negatively impact populations of Cicindela marginipennis. Off road vehicle use of cobble bars can destroy larval habitat and has been noted as a threat both in the literature and during on site surveys in western New York. Intensive collecting by private collectors has been noted as a threat to some species of tiger beetle and is a potential threat primarily to Cicindela marginipennis.

Trends:
It is difficult to assess population trends for either species as historical data gives little sense of population sizes and as new locations for both species probably represent populations that were always present, but had not yet been documented. The strong indication that the Delaware River population of Cicindela marginipennis is extirpated would suggest a downward trend for this species at least.

SEQR - No Action Alternative:
Without the indicated actions, the status of these species will remain uncertain and both species could be in jeopardy of population declines or, over the long-term, extirpation from the state. Population declines would be expected to occur should gravel mining of cobble bar habitat and ATV use of cobble bar habitat continue and/or if additional dams, and channelization projects take place on rivers and creeks that support these species. Cicindela marginipennis, if truly present on just two rivers in the state, could especially face extirpation if gravel mining and other threats are widespread on the two rivers.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A tiger beetle (Cicindela ancocisconensis)			S1	G3	U	Resident
Cobblestone tiger beetle (Cicindela marginipennis)			S1	G2G3	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Cobblestone tiger beetle (Cicindela marginipennis)	Delaware	Lake Erie	Unknown
	Lake Erie	SW Lake Ontario	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A tiger beetle (Cicindela ancocisconensis)	Delaware	Delaware	Unknown
	Lake Erie	Lake Champlain	Unknown
		Lake Erie	Unknown
		SW Lake Ontario	Unknown
		Upper Hudson	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Cobblestone tiger beetle (Cicindela marginipennis)	Great Lakes	Great Lakes	Unknown
	High Allegheny Plateau	High Allegheny Plateau	Unknown
A tiger beetle (Cicindela ancocisconensis)	High Allegheny Plateau	Great Lakes	Unknown
	Great Lakes	High Allegheny Plateau	Unknown
		Northern Appalachian/Boreal Forest	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Cobblestone tiger beetle (Cicindela marginipennis)	all	Terrestrial	open upland	sand/gravel bar
A tiger beetle (Cicindela ancocisconensis)	all	Terrestrial	open upland	sand/gravel bar

Goal and Objectives for Riparian tiger beetles

Goal: Document the current distribution of these two rare riparian tiger beetles in New York State, and maintain a sufficient number of self-sustaining populations to ensure the long-term perpetuation of the species within New York State.

Objective 1 : Document the full extent of the occurrence of Cicindela marginipennis on the Genesee River and Cattaraugus Creek.

Measure: *Occupied cobble bars surveyed and mapped in the NY Natural Heritage Program database and Master Habitat Databank and available for regional and central office permit review and conservation planning.*

Objective 2 : Increase our understanding of the ecology of these species including adult and larval habitat characteristics and adult dispersal.

Measure: *Data on distances moved by adult beetles, data describing adult and larval habitat.*

Objective 3 : Maintain existing populations and, if needed and possible, establish or restore additional populations, to ensure the long-term persistence of these tiger beetles in New York State.

Measure: *Number of maintained/established populations.*

Objective 4 : Obtain baseline distribution data by conducting surveys of cobble/gravel bar habitat on rivers/ streams in each ecoregion or watershed in the state where potential habitat can be identified (potential habitat may not be present on LI).

Measure: *Number of rivers/streams surveyed.*

Objective 5 : Protect, manage, restore existing or potentially suitable habitat for these species.

Measure: *Number of rivers/streams with cobble bars maintained by natural stream flooding regimes and protected from detrimental gravel mining and off road vehicle activities.*

Recommended Actions

Habitat management:

* Reduce or eliminate detrimental ATV use on cobble bars where these species occur or could occur if such activity was lacking or reduced .

Habitat monitoring:

* Compile baseline data on existing threats to these species including existing gravel mine permits, exiting areas of high ATV use, existing hydrological flow alterations.

Habitat research:

* Larval habitat for Cicindela marginipennis should be determined by excavation of a limited number of larval burrows and adult beetle dispersal should be identified through a mark-recapture effort . Vegetation density, cobble size, and sand/cobble interspersion are habitat characteristics that probably need to be determined for both species as well as common species that co-occur with them.

Recommended Actions

* Support and encourage research that would increase knowledge of the impact of poorly known threats to these species (e.g. invasion by aggressive, non-native plants such as Polygonum cuspidatum and Lythrum salicaria, in riparian areas; development in riparian areas).

Habitat restoration:

* Determine if there are streams/rivers with existing dams where restoration of more natural flow regimes could result in restoration of suitable habitat for these species.
* Determine if there is a means of restoring suitable (as in not overgrown) cobble bar habitat on the Delaware River where Cicindela marginipennis appears to have been extirpated.

New regulation:

* Recommendations for official state endangered, threatened, or special concern listing are an anticipated result of the statewide inventory. It is expected that one or both species will be recommended for listing and officially adding these species to the list would constitute a specific action.

Population monitoring:

* Conduct surveys to obtain repeatable, transect count, baseline population assessments at occupied sites where the species occur.

Statewide baseline survey:

* Conduct surveys for these species at potential sites throughout the state. Cicindela marginipennis is known from just two rivers in the state while Cicindela ancocisconensis is currently known from less than 10 streams/rivers. A currently approved, but not yet begun State Wildlife Grant Tiger Beetle Project will utilize Natural Heritage Program staff and other biologists to conduct surveys for these species at potential sites throughout the state.

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Taxa Group: Insect

Species Group: Stoneflies/Mayflies of lentic waters

Threats:

Siphlonurus barbaroides is vulnerable to any activity which affects water quality. Increased silt loading, loss of vegetation, water-level fluctuation and pollution are some of the more imminent threats.

Trends:

The current status of Siphlonurus barbaroides cannot be determined since there is little recent documentation of the species.

SEQR - No Action Alternative:

Without further surveys to determine the status of the species there is the possibility that the species could be lost from the state.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A mayfly (Siphlonurus barbaroides)			SNR	G3	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A mayfly (Siphlonurus barbaroides)	SE Lake Ontario	SE Lake Ontario	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A mayfly (Siphlonurus barbaroides)	High Allegheny Plateau	Great Lakes	Unknown
	Great Lakes	High Allegheny Plateau	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A mayfly (Siphlonurus barbaroides)				
	all	Lacustrine	cold water shallow	SAV

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A mayfly (Siphlonurus barbaroides)				
	all	Riverine	unknown	unknown

Goal and Objectives for Stoneflies/Mayflies of lentic waters

Goal: Document the current distribution of Siphlonurus barbaroides and ensure its perpetuation in its historic locations.

Objective 1 : Determine the presence of Siphlonurus barbaroides in its historical range.

Measure: *Number of surveys conducted.*

Objective 2 : Maintain existing populations of Siphlonurus barbaroides.

Measure: *Number of sites earmarked for protection within the historical range of the species.*

Recommended Actions

Habitat management:

* Control the timing and intensity of activity in the riparian zone of historical waters.

Habitat research:

* Determine the critical habitat of the species.

Population monitoring:

* Survey sites outside the historical range of the species that may contain potential habitats.
* Survey potential sites in the historical range of the species.

References

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Taxa Group: Insect

Species Group: Stoneflies/Mayflies of lotic waters

Threats:

These species would be vulnerable to any activity which affects water quality. Increased silt loading, loss of vegetation, water-level fluctuation and pollution are some of the more imminent threats.

Trends:

The current status of many of the species remain undetermined since there is little recent documentation on population sizes for these species.

SEQR - No Action Alternative:

Without further surveys to determine the status of these species there is the possibility that they could be lost from the state.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A mayfly (Epeorus frisoni)			SNR	G1Q	U	Resident
A mayfly (Ameletus tertius)			SNR	G3	U	Resident
A mayfly (Ameletus tarteri)			SNR	G1	U	Resident
A mayfly (Siphlonurus barbarus)			SNR	G1	U	Resident
A mayfly (Baetis rusticans)			SNR	G2	U	Resident
A mayfly (Eurylophella bicoloroides)			SNR	G3	U	Resident
A mayfly (Heptagenia culacantha)			SNR	G3	U	Resident
A mayfly (Heptagenia julia)			SNR	G4	U	Resident
A mayfly (Brachycercus maculatus)			SNR	G3Q	U	Resident
A mayfly (Rhithrogena uhari)			SNR	G3	U	Resident
A stonefly (Pteronarcys comstocki)			SNR	G3	U	Resident
A mayfly (Epeorus punctatus)			SNR	G3	U	Resident
A mayfly (Epeorus suffusus)			SNR	G1Q	U	Resident
A mayfly (Nixe rusticalis)			SNR	G2	U	Resident
A mayfly (Procloeon mendax)			SNR	G2	U	Resident
A mayfly (Procloeon ozburni)			SNR	G2	U	Resident
A stonefly (Allocapnia illinoensis)			SNR	G3	U	Unknown

A stonefly (Alloperla vostocki)	SNR	G3	U	Resident
A stonefly (Utaperla gaspesiana)	SNR	G3	U	Unknown
A mayfly (Rhithrogena anomala)	SNR	G2	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A mayfly (Brachycercus maculatus)	Upper Hudson	Upper Hudson	Unknown
A mayfly (Ameletus tertius)	Susquehanna	Susquehanna	Unknown
A mayfly (Ameletus tarteri)	Susquehanna	Susquehanna	Unknown
A mayfly (Siphlonurus barbarus)	Upper Hudson	Unknown	Unknown
A mayfly (Baetis rusticans)	NE Lake Ontario - St. Lawrence	Unknown	Unknown
A mayfly (Eurylophella bicoloroides)	Delaware	Delaware	Unknown
	Upper Hudson	Upper Hudson	Unknown
	SE Lake Ontario	SE Lake Ontario	Unknown
A mayfly (Heptagenia culacantha)	Lake Champlain	Lake Champlain	Unknown
	Upper Hudson	Upper Hudson	Unknown
	Delaware	Delaware	Unknown
	Susquehanna	Susquehanna	Unknown
A mayfly (Heptagenia julia)	SE Lake Ontario	Unknown	Unknown
A mayfly (Rhithrogena anomala)	Lake Champlain	SE Lake Ontario	Unknown
	NE Lake Ontario - St. Lawrence		
	SE Lake Ontario		
A mayfly (Rhithrogena uhari)	Unknown	Lake Champlain	Unknown
A mayfly (Epeorus frisoni)	Unknown	Unknown	Unknown
A mayfly (Epeorus punctatus)	Lake Erie	Unknown	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A mayfly (Epeorus suffusus)	Upper Hudson SE Lake Ontario	Upper Hudson	Unknown
A mayfly (Nixe rusticalis)	SE Lake Ontario	Unknown	Unknown
A mayfly (Procloeon mendax)	NE Lake Ontario - St. Lawrence Lake Champlain	Unknown	Unknown
A mayfly (Procloeon ozburni)	SE Lake Ontario	Unknown	Unknown
A stonefly (Allocapnia illinoensis)	Unknown	Unknown	Unknown
A stonefly (Alloperla vostocki)			
A stonefly (Utaperla gaspesiana)	Unknown	Unknown	Unknown
A stonefly (Pteronarcys comstocki)	SE Lake Ontario	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A mayfly (Brachycercus maculatus)	Lower New England Piedmont Northern Appalachian/Boreal Forest	Lower New England Piedmont Northern Appalachian/Boreal Forest	Unknown Unknown
A mayfly (Ameletus tertius)	High Allegheny Plateau	High Allegheny Plateau	Unknown
A mayfly (Ameletus tarteri)	High Allegheny Plateau	High Allegheny Plateau	Unknown
A mayfly (Siphlonurus barbarus)	High Allegheny Plateau	Unknown	Unknown
A mayfly (Baetis rusticans)	St. Lawrence-Lake Champlain Valley	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A mayfly (Eurylophella bicoloroides)	High Allegheny Plateau	High Allegheny Plateau	Unknown
	Great Lakes	Great Lakes	Unknown
A mayfly (Heptagenia culacantha)	High Allegheny Plateau	Great Lakes	Unknown
	Great Lakes	High Allegheny Plateau	Unknown
A mayfly (Heptagenia julia)	Great Lakes	Unknown	Unknown
A mayfly (Rhithrogena anomala)	St. Lawrence-Lake Champlain Valley	Great Lakes	Unknown
	Great Lakes		
A mayfly (Rhithrogena uhari)	Unknown	Northern Appalachian/Boreal Forest	Unknown
A mayfly (Epeorus frisoni)	Unknown	Unknown	Unknown
A mayfly (Epeorus punctatus)	Great Lakes	Unknown	Unknown
A mayfly (Epeorus suffusus)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown
	Great Lakes		
A mayfly (Nixe rusticalis)	Great Lakes	Unknown	Unknown
A mayfly (Procloeon mendax)	Northern Appalachian/Boreal Forest	Unknown	Unknown
A mayfly (Procloeon ozburni)	Great Lakes	Unknown	Unknown
A stonefly (Allocapnia illinoensis)	Unknown	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A stonefly (Alloperla vostocki)			
A stonefly (Utaperla gaspesiana)	Unknown	Unknown	Unknown
A stonefly (Pteronarcys comstocki)	Great Lakes	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A mayfly (Brachycercus maculatus)				
	all	Lacustrine	unknown	unknown
	all	Riverine	unknown	unknown
A mayfly (Ameletus tertius)				
	all	Lacustrine	unknown	unknown
	all	Riverine	coldwater stream	SAV
A mayfly (Ameletus tarteri)				
	Nursery/Juvenile	Riverine	coldwater stream	unknown
A mayfly (Siphlonurus barbarus)				
	all	Lacustrine	cold water shallow	unknown
	all	Riverine	coldwater stream	unknown
A mayfly (Baetis rusticans)				
	all	Riverine	coldwater stream	unknown
	Nursery/Juvenile	Riverine	coldwater stream	SAV
	Nursery/Juvenile	Riverine	coldwater stream	structure
A mayfly (Eurylophella bicoloroides)				
	all	Riverine	unknown	unknown
A mayfly (Heptagenia culacantha)				
	Nursery/Juvenile	Riverine	coldwater stream	structure
A mayfly (Heptagenia julia)				
	all	Riverine	unknown	unknown
A mayfly (Rhithrogena anomala)				
	all	Lacustrine	unknown	unknown
	all	Riverine	unknown	unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A mayfly (Rhithrogena anomala)				
A mayfly (Rhithrogena uhari)				
	all	Lacustrine	cold water shallow	unknown
	Nursery/Juvenile	Riverine	coldwater stream	mud bottom
A mayfly (Epeorus frisoni)				
	all	Lacustrine	unknown	unknown
	all	Riverine	unknown	unknown
A mayfly (Epeorus punctatus)				
	all	Lacustrine	unknown	unknown
	all	Riverine	unknown	unknown
A mayfly (Epeorus suffusus)				
	all	Riverine	unknown	unknown
A mayfly (Nixe rusticalis)				
	all	Riverine	coldwater stream	sand/gravel bottom
	Nursery/Juvenile	Riverine	coldwater stream	mud bottom
A mayfly (Procloeon mendax)				
	all	Lacustrine	cold water shallow	unknown
	Nursery/Juvenile	Riverine	coldwater stream	sand/gravel bottom
A mayfly (Procloeon ozburni)				
	all	Lacustrine	cold water shallow	unknown
	Nursery/Juvenile	Riverine	coldwater stream	SAV
A stonefly (Allocapnia illinoensis)				
	all	Riverine	unknown	unknown
A stonefly (Alloperla vostocki)				
	all	Riverine	coldwater stream	unknown
A stonefly (Utaperla gaspesiana)				
	all	Riverine	unknown	unknown
A stonefly (Pteronarcys comstocki)				
	all	Riverine	coldwater stream	unknown

Goal and Objectives for Stoneflies/Mayflies of lotic waters

Goal: Document the current distribution of these mayflies and stoneflies and ensure their perpetuation in their historic locations.

Objective 1 : Determine the presence of these species in their historical ranges.

Measure: *Number of surveys conducted.*

Objective 2 : Maintain existing populations of these mayflies and stoneflies.

Measure: *Number of sites chosen for protection.*

Recommended Actions

Habitat management:

* Monitor activity in the riparian zone and actual waters where these mayflies and stoneflies are found (or will potentially be found).

Habitat research:

* Determine the critical habitat for these species.

Population monitoring:

* Survey sites within the historical ranges of these species.

References

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Jacobus, Luke and W.P. McCafferty. 2001. The Mayfly Fauna of New York State (Insecta: Ephemeroptera). Journal of The New York Entomological Society. 109(1): 47-80.

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Taxa Group: Insect

Species Group: Stoneflies/Mayflies of uncertain habitat

Threats:
These species would be vulnerable to any activity which affects water quality. Increased silt loading, loss of vegetation, water-level fluctuation and pollution are some of the more imminent threats.

Trends:
The current status of many of the species remain undetermined since there is little recent documentation on population sizes for these species.

SEQR - No Action Alternative:
Without further surveys to determine the status of these species there is the possibility that they could be lost from the state.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
A mayfly (Procloeon vicinum)			S?	G2	U	Resident
A stonefly (Alloperla voinae)			SNR	G3	U	Unknown
A mayfly (Dannella provonshai)			SNR	G2	U	Resident
A mayfly (Plauditus gloveri)			SNR	G2	U	Resident
A mayfly (Procloeon vicinum)			SNR	G2	U	Resident
A mayfly (Procloeon simile)			SNR	G2	U	Resident
A mayfly (Leucrocuta thetis)			SNR	G3	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A mayfly (Leucrocuta thetis)	Susquehanna	Unknown	Unknown
A mayfly (Procloeon simile)	Upper Hudson	SE Lake Ontario	Unknown
	NE Lake Ontario - St. Lawrence		
	Lower Hudson - Long Island Bays		
A mayfly (Procloeon vicinum)	NE Lake Ontario - St. Lawrence	NE Lake Ontario - St. Lawrence	Unknown

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
A mayfly (Plauditus gloveri)	SW Lake Ontario	SW Lake Ontario	Unknown
A mayfly (Dannella provonshai)	SE Lake Ontario	SE Lake Ontario	Unknown
A stonefly (Alloperla voinae)	Unknown	Unknown	Unknown
A mayfly (Procloeon vicinum)	NE Lake Ontario - St. Lawrence	Unknown	

Species Distribution - Ecoregion

Species	Historical	Current	Stability
A mayfly (Leucrocuta thetis)	High Allegheny Plateau	Unknown	Unknown
A mayfly (Procloeon simile)	Lower New England Piedmont St. Lawrence-Lake Champlain Valley North Atlantic Coast	Great Lakes	Unknown
A mayfly (Procloeon vicinum)	Northern Appalachian/Boreal Forest	Northern Appalachian/Boreal Forest	Unknown
A mayfly (Plauditus gloveri)	Great Lakes	Great Lakes	Unknown
A mayfly (Dannella provonshai)	Great Lakes	Great Lakes	Unknown
A stonefly (Alloperla voinae)	Unknown	Unknown	Unknown
A mayfly (Procloeon vicinum)	Northern Appalachian/Boreal Forest	Unknown	

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat

A mayfly (Leucrocuta thetis)

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
A mayfly (Leucrocuta thetis)				
	all	Riverine	unknown	unknown
A mayfly (Procloeon simile)				
	all	Lacustrine	cold water shallow	unknown
	all	Riverine	coldwater stream	unknown
A mayfly (Procloeon vicinum)				
	all	Lacustrine	cold water shallow	unknown
	all	Riverine	unknown	unknown
A mayfly (Plauditus gloveri)				
	all	Riverine	unknown	unknown
A mayfly (Dannella provonshai)				
	all	Lacustrine	unknown	unknown
	all	Riverine	unknown	unknown
A stonefly (Alloperla voinae)				
	all	Riverine	unknown	unknown
A mayfly (Procloeon vicinum)				

Goal and Objectives for Stoneflies/Mayflies of uncertain habitat

Goal: Document the current distribution of these mayflies and stoneflies and ensure their perpetuation in their historical waters.

Objective 1 : Determine the presence of the species in their historical ranges.

Measure: *Number of surveys conducted.*

Objective 2 : Maintain existing populations of these mayfly and stonefly species.

Measure: *Number of sites selected for protection.*

Recommended Actions

Recommended Actions

Habitat management:

* Control the activity level and intensity in and around historic waters where these species are known to have habitats.

Habitat research:

* Determine the critical habitat for these species.

Population monitoring:

* Survey potential sites in the historical range of the species.

References

The James Needham Ephemeroptera Slide Collection (Cornell University) http://entomology.cornell.edu/CUIC/Info/Needham/. Accessed August 27th 200

Jacobus, Luke and W.P. McCafferty. 2001. The Mayfly Fauna of New York State (Insecta: Ephemeroptera). Journal of The New York Entomological Society. 109(1): 47-80.

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Taxa Group: Insect

Species Group: Sylvan hygrotus diving beetle

Threats:

Threats to this aquatic beetle are unknown given the few locations ever recorded for the species and the scant information on the species and its life history. As an aquatic species it can be assumed that changes in water quality and hydrology could have a negative impact on the species where it occurs.

Trends:

The species has only been collected a few times and there is no information on population trends although the type location (and the only confirmed New York location) recorded only as a "pond in the woods; Peekskill, NY", may no longer exist.

SEQR - No Action Alternative:

Without the indicated actions, the status of this species will remain uncertain at best and could be in jeopardy of significant population declines and/or extirpation from the state over the long-term.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Sylvan hygrotus diving beetle (Hygrotus sylvanus)			SH	G1	U	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Sylvan hygrotus diving beetle (Hygrotus sylvanus)	Lower Hudson - Long Island Bays	Unknown	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Sylvan hygrotus diving beetle (Hygrotus sylvanus)	Lower New England Piedmont	Unknown	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat

Sylvan hygrotus diving beetle (Hygrotus sylvanus)

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Sylvan hygrotus diving beetle (Hygrotus sylvanus)				
	all	Lacustrine	warm water shallow	unknown
	all	Palustrine	mineral soil wetland	unknown

Goal and Objectives for Sylvan hygrotus diving beetle

Goal: Determine the status of Sylvan Hygrotus diving beetle in New York State and maintain a sufficient number of self-sustaining populations to ensure the long-term perpetuation of the species in New York State.

Objective 1 : Conduct surveys of small ponds in the Dryden area to see if the species is still present in this area (assuming the Ringwood specimen was identified correctly).

Measure: *Number of ponds surveyed*

Objective 2 : Conduct surveys of small ponds in the Peekskill area to see if the species is still present in this area.

Measure: *Number of ponds surveyed*

Objective 3 : Confirm the identification of the specimen in the Cornell collection from Ringwood Preserve, Dryden, NY.

Measure: *Report from an entomologist that is considered an expert with dytiscids indicating whether the Ringwood specimen is or is not Hygrotus sylvanus.*

Objective 4 : Identify habitat characteristics of any specific, known sites for this species in order to model and predict other sites that warrant surveys for this species.

Measure: *Known locations for the species mapped in GIS.*

Objective 5 : Increase our understanding of the ecology of this species including habitat preferences and threats to the species.

Measure: *Search of literature for existing previous studies, number of studies undertaken at any new sites that are found.*

Recommended Actions

Recommended Actions

Habitat research:

* Known locations for the species in other states should be mapped and used with GIS in an attempt to model and predict other sites that warrant survey for this species.

Life history research:

* Should the species be re-located in the Peekskill area and/or confirmed to be present in in the Dryden area, research on the life history aspects of the species should be undertaken. This research should include characterization of the occupied habitat which would feed into additional baseline surveys of similar habitats expanding outward from known occupied locations.

Statewide baseline survey:

* The type locality for this species is Peekskill, NY where the species was "taken in a pond in the woods no longer existent". While the pond for the type specimens may no longer occur it is reasonable to believe that other ponds in the vicinity of Peekskill could still support the species and these ponds should be surveyed where access permission can be obtained. In addition, there is a specimen in the Cornell University Insect Collection that is labeled as this species. The specimen is from Ringwood Preserve, Dryden, NY, 1982. The accuracy of the specimen identification should be confirmed and if the specimen is indeed this species then this location should be re-surveyed and additional, similar wetlands in the vicinity of Dryden should also be surveyed.

References

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Anderson, R. D.1976. A revision of the Nearctic species of Hygrotus groups II and III (Coleoptera: Dytiscidae). Ann of Entom. Soc. Amer. 69:577-584.

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Taxa Group: Insect
Species Group: Tomah mayfly

Threats:
Because most of its life is spent as an aquatic nymph, mayflies are threatened by activities which degrade water quality including the introduction of pollutants into the water and chemical application for pesticide control. This species is also vulnerable activities which alter the seasonal discharge patterns of rivers . The construction of dams and alteration of the floodplains by dredging or filling are especially detrimental (Gibbs 1993). Alteration of the riparian habitat, principally forests, along occupied rivers was noted as a potential threat in Maine (deMaynadier pers. comm.).

Trends:
There is no information to assess trends for this species in New York State. The historical location on the Sacandaga River has been lost due to inundation through the creation of the Sacandaga Reservoir. There is no long term information to assess trends for the population on the Black River. New sites have been found through targeted surveys in recent years in Maine, but these undoubtedly reflect increased survey effort rather than population increases.

SEQR - No Action Alternative:
The Black River population may be stable, but there is no information to assess that possibility and it is possible that the population in that river has been negatively impacted by dams and other activities and is declining. Without the indicated actions the status of this unique species will remain uncertain at best, and there is the possibility that the species could be lost from the state.

Species in the Group and their Management Status

Species	Federal Listing	NE Concern	State Rank	Global Rank	State Protection	Migratory Status
Tomah mayfly (Siphlonisca aerodromia)			S1	G2	E	Resident

Species Distribution - Watershed Basin

Species	Historical	Current	Stability
Tomah mayfly (Siphlonisca aerodromia)	Upper Hudson NE Lake Ontario - St. Lawrence	Upper Hudson	Unknown

Species Distribution - Ecoregion

Species	Historical	Current	Stability

Species Distribution - Ecoregion

Species	Historical	Current	Stability
Tomah mayfly (Siphlonisca aerodromia)	Lower New England Piedmont St. Lawrence-Lake Champlain Valley	Lower New England Piedmont	Unknown

Critical Habitats for Species in the Group

Species	Life Stage or Use	System	SubSystem	Habitat
Tomah mayfly (Siphlonisca aerodromia)				
	Breeding	Riverine	coldwater stream	sand/gravel bottom
	Hibernating/Overwintering	Riverine	coldwater stream	sand/gravel bottom
	Nursery/Juvenile	Palustrine	mineral soil wetland	meadow

Goal and Objectives for Tomah mayfly

Goal: Document the current distribution of the Tomah mayfly in New York State and ensure the perpetuation of the species as part of the NY fauna.

Objective 1 : Conduct more complete surveys of the Black River to determine the full extent of the occurrence in that system and monitor the population over time.

Measure: *Number of sites surveyed, full extent of occurrence defined and mapped, standardized counts of number of individuals from sampling of sites on the Black River.*

Objective 2 : Identify other rivers and streams that appear to have potential habitat for the species and conduct surveys. Focus should be on sites in the Appalachian, NE Lake Ontario-St. Lawrence, and Lake Champlain watersheds.

Measure: *Number of potential sites identified and number of sites surveyed.*

Objective 3 : Increase our understanding of the ecology of this species including habitat preferences and threats, especially as they apply to the sole, known, existing occurrence in New York State, the Black River.

Measure: *Full extent of the Black River occurrence defined and mapped, knowledge of larval and adult habitat usage on the Black River, understanding of threats to the species on this river.*

Objective 4 : Maintain the existing Black River population and, if needed and possible, establish or restore additional populations to ensure the long-term persistence of this mayfly in New York State.

Measure: *Number of maintained/established populations.*

Objective 5 : Obtain baseline distribution data by conducting surveys of the Sacandaga River tributaries in the Upper Hudson watershed (historical location) to determine if the species is still present in this river system.

Measure: *Number of sites surveyed.*

Recommended Actions

Habitat monitoring:

* Review development or other proposals that could impact the flow, water quality, or other factors that could threaten the population in the Black River.

Habitat research:

* Support and encourage research that would increase knowledge of the impact of poorly known threats to this species (e.g. water quality degradation, removal of forested riparian buffers, hydrological flow alterations from existing or new dams).
* Conduct more complete surveys of the Black River to define larval and adult mayfly habitat usage and ecology in the Black River and any new sites that may be located as a result of statewide surveys.

Population monitoring:

* Conduct more complete surveys of the Black River to completely define the extent of the occurrence and develop and apply a standardized sampling scheme that will result in long-term monitoring of the population.

Statewide baseline survey:

* Identify rivers and streams with the necessary spring inundated sedge meadow habitat and conduct surveys for new locations including in the vicinity of the historical Sacandaga River occurrence (the exact historical location is inundated, but suitable habitat may exist elsewhere in the watershed).

References

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